



ANNUAL REPORT

2021-22



Protection of Plant Varieties and Farmers' Rights Authority

(A Statutory Authority Created by an Act of Parliament)

Department of Agriculture & Farmers welfare

Ministry of Agriculture & Farmers Welfare

Government of India

NASC Complex, DPS Marg, New Delhi- 110012

www.plantauthority.gov.in



Annual Report 2021–22



(TM-Trademark registration pending)

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**Facilitated by the Department of Agriculture & Farmers Welfare
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Preface

The year 2021-22 was free from COVID-19 restrictions of the kind that had prevented normal functioning and the Authority performed to its capacity coping with the process of registration, receiving applications for new and extant varieties, conducting testing and the other activities related. However, the receipt of seed materials from the previous season's harvest which is a mandatory part of applications for registration remained a constraint with many a plant breeder that led to a slight slack paced submission of applications during the period 2021-22. Compared to 396 applications of 2020-21, this period received 311 applications under various categories. Owing to timely receipt in terms of respective sowing season of the crop plant concerned, it was possible to initiate the process with all the varieties in respective seasons, applications for the registration of which were submitted. The Authority gratefully acknowledges the undaunted spirit displayed by the concerned staff engaged for the purpose at the Authority as well as all the Principal Investigators along with their team of Senior Research Fellows at more than 160 DUS centers completed the recording of observations at different DUS testing sites in the country in time. This promptness has enabled the Authority to showcase a separate order of sequence being followed with specific time-cut off for each activity to be observed by both applicants in replying to queries and registry to seek or analyse information made available, so that there is an predictability for the outcome of every application made or queries settled before registration.

In the recently concluded Governing Body Meeting of the International Treaty on Plant Genetic Resources in Food and Agriculture, FAO (ITPGRFA) during 19-25 September 2022 in New Delhi (though the period does not fall in the relevant reported period), it became obvious that due to the overwhelming influence of UPOV, Geneva the IPR regulatory Authorities in the member countries of ITPGRFA have not been providing the rights of farmers as per Article 9 of the ITPGRFA Agreement, though it is a binding agreement. This unique leadership PPVFRFA with the support of the Government of India has shown in the implementation of farmers' rights is an enriching and globally perfectly relevant learning experience that all the other common member countries of ITPGRFA and TRIPS need to follow irrespective of their being developed or developing or under-developed. It is high time UPOV made special efforts not to ignore under the clause of 'national government responsibility' the implementation of farmers' rights to sow, resow, use, share, exchange or sell as farm produce the seed or propagule of the variety protected under plant breeders' rights. This Authority has demonstratively confirmed that the farmers rights as provided under ITPGRFA Agreement as well as under PPVFR Act (2001) are non-overlapping and can perfectly co-exist within the provisions, making it a win-win situation. The Authority has offered with the consent of the Government of India to organize during 2023 a global workshop seminar on the various issues bothering countries in implementing farmers rights along with breeders rights on the new plant varieties.

After having clarified the distinctions among authorised person, licensee and agent for the execution of one or many or all of plant breeders' rights on a variety, the Authority has encouraged all right holder plant breeders to accordingly have information on each authorised person or registration of each licensee or agent appointed by them. One of the most gratifying consequences of this initiation is the registration of a few agents or licensees by some farmers who had their varieties registered under the category of farmers' varieties. This signifies the rising awareness among farmers to move over to a business mode in harnessing the potential of IPR on their varieties.

I am pleased to put on record that the farmers who have been granted the plant breeders' rights on their varieties have now come off tradition to work on business mode like any other seed industry by appointing licensed seed producers and marketing agents to market the seed of their varieties so that they can expand the market for their variety. This is the change in enabling farmers in exercising their rights for their socio-economic growth. Some have even started exporting their varieties after getting due registration for protection of their rights on the variety.

. In the past, farmers varieties used to be communicated by the Panchayat or State Agriculture officers for registration which were in large number like around 40-50% of total applications. Almost 80-90% of these used to be heterogenous mixtures with genetic impurity beyond acceptable levels and invariably get rejected. Since a public notice followed by directions issued to all ICAR, SAU and Central or State Government owned crop research institutions in 2020, the Registry started redirecting the farmers as above to go back to the ICAR/SAU/Central or State Government crop research set up in their area to deposit their seed with the Application duly forwarded by the Panchayat. The latter organizations would accept those varieties and assign to a breeder expert for raising at least one generation in interaction with the farmer to establish or purify for genetic homogeneity. The Authority would cover the cost for such exercise including hiring a technical expert if an expert is not available in the organization. This exercise has now reduced submission of non-descript varieties while has almost led to nearly 100% acceptability of the farmers' varieties now being forwarded by the organization's research lead. Though the number would get reduced, the chance of successful registration would increase multi-fold unlike in the past.

Over the last four years, an attempt was made in 2018 to fully streamline every activity from the moment of receiving an application till its logical final decision. I am pleased to note that within three years, 387 varieties out of about 1100 applications were successfully given final decisions on. For an Authority that grants the rights on the claims of varieties after generation of its own data rather than comparing with other IPR granting authorities, this is a significant time-line based predictability introduced in the process of registration.

I also see that I have no option but to record my anguish about the shortage of qualified staff whose need is getting more and more critical with piling applications and pendency increase. The positions of Registrars, Joint Registrars and Deputy Registrars have to be upgraded to level 14, 13 and 12 respectively from the current levels of 13, 12 and 11 respectively on the VII Pay Commission framework. The Authority has advertised five times since 2020 with not a single aspirant applying for the position of Registrar other than one applicant already in the level 13 in a State Department. This is so because all the eligible plant breeder or horticulture researchers in ICAR, CSIR, ICFR, SAUs, CAUs would be already in either level 14 as Principal Scientists or above level 13a as Senior Scientists, thus making almost every eligible person overqualified to apply for the position of Registrar. It is the same fate with Joint Registrar as well as Deputy Registrar. As such to expect that any practicing plant breeder would be willing to join on deputation showing no conflict of interest in favour of his parent organization would be unnatural and extremely dangerous when the position has full judicial powers to issue orders and seek evidences, etc., with every action in process of registration being a judicial procedure. All the positions of the Registry mentioned above therefore have to be permanent and by direct recruitment so that there is no conflict of interest and competitive influence in making the judicial orders or deciding on the fate of an application for protection of plant breeder's right on the variety. The matter has been put up to the Government which is yet to materialise as few amendments in the recruitment rules, Rules 2003 and Regulations 2006 would be required to effect this. At the time of filing this Report, there is NOT EVEN ONE REGISTRAR in position, the position that has most executive

responsibility of implementing the Act for registration of the plant varieties. If the same position continues, one Registrar General will not be able to handle even one tenth of the workload currently pending. This would be my anguish still not resolved as it is the responsibility of the Government to give approval before the Registrars are appointed.

It is matter of urgency that required upgraded positions are to be provided as soon as possible as the Authority's procedures of registration and balancing both plant breeder's rights with that of farmers' rights on every variety have now been brought to the global attention in the UPOV related international meetings in the Ministry of Commerce or during the Governing Body Meeting of ITPGRFA where the Authority showcased its revised mechanisms of registration and grant of protection based on the genetic nature of the variety applied for. It is a matter of pride that the Indian Authority has been able to impress on the UPOV system about the ambiguities not being considered in genetical terms under the Technical guidelines of UPOV. Some member countries of UPOV are understood to be now considering these view points in their national legislations or statutes, as has been requested by the International Seed Federation at the Annual Meetings of UPOV 2022 to be considered for discussion/interpretation.

Acknowledgements

I am grateful to the Hon'ble Union Minister of Agriculture and Farmers Welfare, Sh. Narendra Singh Tomar and his office for providing all encouragement and support to the Authority, especially in resolving any concerns on facilitation of the Authority's functional needs by the Government. The Hon'ble Minister of State, Ms Shobha Shobha Karandlaje supported the Authority on each occasion with unrestricted encouraged us on every occasion and extended their full support to the Authority.

I owe a huge element of thanks to Shri Sanjay Agarwal, Secretary, Department of Agriculture, Co-operation & Farmers Welfare for enabling the Chairperson have the administrative and financial powers restored which was pending for the last four years. In addition, the Department showed positive orientation towards the Authority's needs and requirements. This had put on an artificial unwarranted speed breaker imposed in 2017 owing to some misinterpretation of the provisions in the Act which was resolved on April 4, 2022 after nearly five years finally, after exercising due diligence and involved deliberations with interventions by the highest officials in the Department, including the then OSD Shri Manoj Ahuja, who later took over the reigns from Shri Agarwal as Secretary, Agriculture during the current year. Had this restoration come about immediately after the matter was brought to the notice of the Ministry, may be, the performance and activities in full implementation of the provisions of the Act could have been at a much higher level than being reported here. The national judiciary system, law enforcing authorities, customs, NBA, SBA, State departments of Agriculture, Horticulture, Forestry etc., would have been brought on board to have a participatory role or executive role when called up to in implementing both plant breeders' rights and farmers' rights. Such national level programmes could not be taken up due to issues related redelegated financial powers. Similarly, on many issues he showed his willingness to give a patient hearing to the matters of concerns that were to be resolved at the Department thereby, moving towards the right solution that would ultimately help the Authority to function as a Statutory Body. There are still a few issues related to amendments required in the Rules and Regulations primarily in addition to revising recruitment rules for upgrading the staff positions at the Registry of the Authority. The Secretary, in position at the time of filing this Report, Shri Manoj Ahuja has been very positive and open to review the requirements at the Authority and has accorded sufficient time in dealing with the issues requiring reforms and governmental support a statutory body like

this deserves to receive from the Government. In Mr Sanjiv Kumar, Additional Secretary and Financial Adviser, the Authority found a positive support who provided the required grants in time by settling all queries and satisfying himself with the justification etc., by according a priority required to be lent to a Statutory body by the Government. .

Shri Ashwani Kumar, Joint Secretary (Seed) and one of the exofficio Members of the Authority continued to play a key role, the most important contact point with the Government for the Authority to be facilitating all the support as envisaged in the provisions of the Act. On several issues Shri Kumar provided pro-active and creative support in arranging the logistics etc., for the execution of the Indo-German programme on Seed Sector improvement or timely release of funds for the building and day-to-day execution of the registration process of the plant varieties. Shri Kumar was very respectful and dignified in executing his responsibility in the facilitation or approvals proposed, thereby providing the Authority the needed support despite being a very busy.

I gratefully acknowledge the contributions of the Hon'ble ex-officio members of the Authority including the Commissioners of Agriculture and Horticulture, Deputy Director General (Crop Sciences) and Joint Secretary (Seed) from the Ministry of Agriculture & Farmers Welfare, Deputy Director General (Crop Sciences) of ICAR, Director, NBPGR; Joint Secretary (Law), Nominees of the Departments of Environment, Forests and Climate Change, Biotechnology for their support, though for the reason on non-filling of the post of Registrar-General no Authority Meeting could be held, other officers who served on various committees/task forces with dedication which have helped the Authority in scaling new horizons and setting new standards.

I thank the Indian Council of Agricultural Research (ICAR), State Agricultural Universities (SAUs), Council of Scientific and Industrial Research (CSIR), Indian Council of Forest Research and Education (ICFRE) and other Research Institutions for providing continuous support to the Authority and facilitating conduct of the DUS Trials.

The technical wing of the Seed Division with Shri M Gunasekaran, Assistant Commissioner along with his team on technical matters, and Shri Rakesh Singh Nayal, Deputy Secretary and Shri Vagulaparnam, Under-Secretary, Seed Division on administrative matters were always considerate and prompt in providing the functional connectivity required between the nodal Ministry and the Authority. I also take this opportunity to acknowledge the cooperation and help extended by Dr A K Singh, Director, ICAR-Indian Agricultural Research Institute (IARI), Dr D K Yadava, Assistant Director General (Seed) and Dr Kuldeep Singh, Director, ICAR-National Bureau of Plant Genetic Resources (NBPGR) for successfully shouldering various responsibilities entrusted by the Authority.

I acknowledge with thanks the services of State Bank of India and Syndicate Bank for their financial services. I am grateful to CAG team for their timely auditing, guidance and direction. I thank the CAG for organizing timely audit of the organization and am grateful to the team for putting in extra in order to correctly assess the documentations recorded by the understaffed procurement and IFD units, though without slightest of compromise. The Annual Account of the Authority has been audited and submitted to CAG within prescribed time schedule.

The Registrar Dr T K Nagarathna shouldered the entire responsibility of the Registry by extending her whole hearted cooperation with a commitment displayed in effecting several procedural changes in the registration of the plant varieties. I express my appreciation and grateful thanks to her for reforming or also correcting the past inconsistencies or oversights while dealing with the applications and the processes of the technical protocols development for new plant species, DUS testing, monitoring of the test locations in the country so that the data generated

were consistent and authentic to stand the various tests of scrutiny and comparisons with the other international authorities. In fact Shri Dipal Roy Choudhury, the only Joint Registrar in the Registry, she found a genuine officer who could participate in the actions with complete involvement, dedication and perfect management of the Gene Bank as well as managing seed distribution after facilitating coding of two levels prior to dispatch. . Often these actions involved time-bound hard work and large data handling. Both these officials of the Registry also handled several additional responsibilities keeping the Authority work as the priority over anything else working as a team making best use of the talented young post-graduates who provided the database inputs on each application made for registration of plant varieties maintaining the confidentiality as well as integrity about the files handled. I am pleased to record that the legal team now is arguably one of the best in the IPR regulatory authorities in the country as well as among the plant variety protection authorities globally, with two BAR qualified senior persons experienced in dealing with the legal issues. Head of the Legal section, Shri Raj Ganesh most efficiently managed all the petitions and applications for correctly taking each to logical conclusions. Whether the orders were issued by the Registrar, Registrar General or Chariperson, none was set aside in the High Courts. This excellent support he provided along with effective participation of his team mate Shri Arun Kumar, Legal Advisor who joined the Authority last year is highly appreciated as it would not have been otherwise possible to confidently dispose of the petitions made. Both Raj Ganesh and Arun Kumar provided totally involved participatory support to several other assigned responsibilities given owing to shortage of staff, ungrudgingly and enthusiastically in the interest of the Authority's well being. I thank Shri Raj Ganesh and Shri Arun Kumar along with their team for standing by my side solidly while I executed business. They made me feel that I was a full time judge qualified as a law professional by the approach and in-principle execution of the judicial proceedings despite the high level of technical bases of plant breeding science involved in many cases. .

Shri Vipin Tyagi, Financial Advisor played a superb role auditor and accounts manager of the Authority with "no frills" attitude and simple direct set of advice done without compromise, but in a fully comprehensible and amicable assertions. If financial advisors followed such approach that enables an easily interpretable rule position on any matter, I am sure most competent authorities will not only turn out to be smart decision makers but also efficient ones making best use of public funds. I consider it as one of the best set of financial management team I have come across in my career. Vipin has been able to fully streamline and comply with the CAG advice so that the procedure of auditing is facilitated with clarity.

Even though staff is not adequate in any meaning of adequacy at the Authority including the Registry, I accord huge appreciation to the three Deputy Registrars, Shri Uma Kant Dubey, Shri Ravinder Singh Sengar and Shri P S Malviya, for their unflinching readiness to take up any task given to complete it as required and within time, each time. While Shri Dubey came up with being up to date with the Plant Variety Journal, bringing it out on the first of every month, under Dr Nagarathna's guidance which she gave with extraordinary care, vigil and accuracy required during the period of report. This incidentally a standard that has been newly set compared to the past where there was invariably a backlog. I appreciate all the involved staff of the Registry in generating and providing the information to Shri Dubey for timely compilation and publication, as this is the only source for any opposition to be filed for pre-registration opposition as well as post-registration benefit share claims. Shri Dipal Choudhury, Ravindra Sengar, Vipin Tyagi and U K Dubey in facilitating the purchases and procurements following GEM regulations is deeply appreciated, as much as the coordination by Shri U K Dubey in managing the networking with NIC for portal management along with the technical insights on online application development by Shri Dipal Chowdury.

I must make it a point to mention how happy I am to acknowledge the exceptionally good work being done with no precedence to emote or repeat at the Authority's Shivamogga centre hosted by the University of Agriculture and Horticultural Sciences. Dr T. H. Gowda as consultant Deputy Registrar and Drs Ajay Kumar Singh and D S Pilania lived far beyond expectations in dealing with all practical problems while handling crops some of which they may have been growing for the first time in their careers.

The procedures and protocols followed during the registration process of every kind of plant variety are entirely based on the raw data generated by the nearly 200 DUS centres being put into operation with due notification. The self-less service put in by the dedicated Principal Investigators who are invariably very senior plant breeding scientists in all the public research organizations and their teams who are monitored rigorously during the crop season is most gratefully acknowledged as they happen to be the extended arms of the Authority in carrying out the judicial procedure with respect to every application being filed.

I take this opportunity to thank Shri Raj Ganesh and his team with Shri Arun Kumar who coordinated the compilation responsibility of this report from all the contributors from Registry, Gene Bank, Regional Stations, Legal Cell, Finance and Administration in time to be put before the Authority for approval. I am also happy to note that the Computer Assistants Ms Shipra Mathur, Shri Aravind Rai and Shri Sanjay Gupta and Shri Shyam Narayan have now come of age and updated themselves sufficiently to rally behind the sincere and thoughtful leadership of the new Registrar General Dr Dinesh Agarwal who assumed his office in May 2022, which gives me lots of hope on digitized documentation and registry procedure for eliminating any arbitrariness in the process, likely to happen with the Registry. It goes without saying that the nearly 90 contractual staff at all the branches and head quarters as well as a few in the Ministry who provided the required logistic support to complete the work to logical conclusions, are also the human resource of high value at the Authority whose performance is basic for functioning of the Authority, which they put in as instructed to our full satisfaction.

I am personally grateful to the unquestioned response and dutiful obedience that I received from one and all during the last four years at this only one of a kind Authority in the world dealing with plant variety protection and farmers rights protection. The Authority needs continued support from the Government to execute its responsibilities through the Registry and Authority office so that in the years to come leading to Indian hundred years after independence by being a developed country, this Authority is regarded as the global leader in perfecting the techno-legal regulation of IPR on plant varieties by balancing both plant breeders' and farmers' rights on the plant varieties.



(K V Prabhu)

Chairperson
Protection of Plant Varieties & Farmers' Rights Authority, New Delhi

Acknowledgements

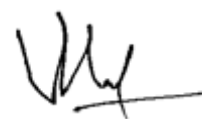
Lay on the yokes, and fasten well the traces: formed is the furrow, sow the seed within it.

Rig Veda
Hymn CI. Viśvedevas

‘To forget how to dig the earth and tend the soil is to forget ourselves’ is the apt quote of our Father of Nation which highlights the importance of Agriculture in our social, economic and cultural system. Seed is the pivot point of agriculture and is also the sustenance of life on earth. Implementation of Intellectual Property Rights over seeds assumes great significance in light of farmers being true breeders and conservers of traditional varieties which actually forms the gene pool for plant varietal development.

“A Weed is a Plant whose virtues have never been discovered” this Emerson’s quote speaks about the scope of plant breeding even in this modern era. Plant Breeding requires knowledge and passion equally as quoted by Luther Burbanks ‘The secret of improved plant breeding apart from scientific knowledge is love’. Granting Intellectual Property Rights to plant breeders came from the thought of Edison on seeing plant varieties developed by Luther Burbanks. Indian Law of Plant Varieties Protection which is unique in nature has elevated it to even higher level and thereby granting Intellectual Property Rights not only to plant breeders but also to breeders and conservers of traditional varieties being farmers who are our true Burbanks on field. Having had a rear mirror view of the last financial year from this Annual Report and now steering the Registry amidst challenges, I thank my predecessors who have done much but again much is to be done also. Hence, I have no hesitation to say that with your co-operation and assistance I will be placing this IPR Registry though the youngest as a pioneer on higher pedestal amongst other IPR Registries.

I cannot resist my praise and acknowledgements for Dr. K.V. Prabhu, our beloved Chairperson who has led from the front and achieved several milestones in the previous financial year. I thank our members of the Authority who were instrumental in deciding several important decisions of the Authority. I also thank ICAR Institutes and SAUs in discharging the statutory duties as DUS test centres of Authority. I thank all Principal Investigators of DUS test centres without their timely output the publication of this report would not have been possible. I also thank UPRNN who are involved in the construction of Plant Authority Bhawan. I also acknowledge the role played by our Nodal Ministry and Seed Division. I also thank Dr. T.K. Nagarathna, Registrar and Dr. Ravi Prakash, Registrar (on deputation) for key role played by them during the reporting period. I also acknowledge the efforts and inputs of officers of the Authority namely, Shri. Vipin Tyagi, Financial Advisor, Shri. Dipal Roy Choudhury, Joint Registrar, Sh. U.K. Dubey, Deputy Registrar and Sh. R.S. Sengar, Deputy Registrar. I also acknowledge the efforts of Dr. A.K. Singh, Plant Variety Examiner and Dr. D.S. Pilania, Technical Assistant, PPVFRA. I also thank Sh. Raj Ganesh, Legal Advisor and his team Shri. Arun Kumar, Legal Advisor and Legal Cell for coordinating in compiling and publishing this report. I thank one and all involved in the publication of this report.



(D.K. Agarwal)
Registrar-General

Executive Summary

The “Protection of Plant Varieties and Farmers’ Rights Act” (53 of 2001) is a unique Act which fulfills the spirit of International Treaty on Plant Genetic Resources for Food & Agriculture. It also strikes a balance between the rights to breeders and the farmers as per the national requirement. The Authority, since its establishment in the year 2005, has been consistently improvising the system of registering the plant varieties, connecting the stakeholders, encourage innovation in seed sector, acknowledge the contribution by the farmers/communities towards conservation of plant genetic resources and making them available to plant breeders, established a National Gene Fund, build and maintain gene banks etc.

Till the time of going for printing, the Government of India has notified 172 crop species on the recommendations of PPVFR Authority for plant variety registration. During the reporting period, the Authority notified Jackfruit, Greater Yam, Yam Bean, Seabuckthorn, Ajwain, Anise, Celery, Cumin, Dill, Fennel, Nigella. In the year 2021-22, the Authority received a total of 311 applications belonging to different categories of Public (94), Private (189), Farmers’ (27), New (142), Extant Notified (81), Extant VCK (60) and EDV (Nil) varieties. Out of 311 applications, 189 applications were filed by private sector, 94 applications were filed by public sector and 27 by farmers. Under extant notified category, 81 applications were received, 60 under extant VCK, 142 under New and 27 under farmer’s variety category were also filed for registration. During 2021-22, 311 applications were received in respect of 38 crop species. Highest number of applications is received in Rice (62) followed by Maize (48), Wheat (14), Pearl millet (28), Chilli (50), Tetraploid Cotton (8), Sorghum (4), Tomato (4), etc.

In the annual year of 2021-22, a total of 475 certificates of registration were issued. In the Farmers’ varieties (128), New Varieties (137) and Varieties of Common Knowledge (54) and Extant Notified Varieties (156) plant varieties were registered. Similarly, highest number of certificates were issued for cereals (312) followed by vegetables (38), fibre crops (55), Oilseeds (14), legumes (29), Flowers (07), Trees (07), Fruits (06), Cucurbits (04), Spices (02) and Medicinal and Aromatic Plants (01).

The Legal Cell of the Authority pursued the cases filed in different Courts. During the reporting period, 33 cases were pending against the Authority. The Notifications published in the Gazette of India were Gazette Notification No. **S.O. 3418 (E)** dated **August 23, 2021** relating to notification of four crop species, **G.S.R. 803 (E)** dated November, **16, 2021** regarding amendment in Rule 19 and Gazette Notification **S.O. 1197 (E)** dated March **16, 2022** regarding Notification of seven crop species.

During the reporting period, the Authority received 26 applications either directly from the applicant or transferred from other departments seeking information under RTI Act, 2005. The information sought was made available within the stipulated period. There are no appeals pending before the first Appellate Authority.

The following national and international seminars/webinars were either organized or in which PPVFRA participated actively are as follows:

- International Webinar on Exchange on PVP Post Control Measures (4th April, 2021)
- India's Negotiation with EU on FTA (12th August, 2021)
- Project Steering Committee Meeting between India and Germany under Indo-German bilateral co-operation on Seed Sector Development. (2nd September, 2021)
- Indo-German Co-operation on Seed Sector Development – Exchange on Biochemical and Molecular Techniques Guidelines (16 – 17th December, 2021)
- Webinar on Legal Aspects involved in PPVFR Act organised by PPVFR Authority in collaboration with DU (14th January, 2022)
- Indo-German Co-operation on Seed Sector Development meeting (17 February, 2022)

The Authority received 5999.90 lakhs as grants in aid from DAC&FW, Ministry of Agriculture and Farmers Welfare during the year and utilized Rs.6152.29 lakhs after adjustment of unspent balance of 170.39 lakhs of previous year leaving a balance of Rs. 18.00 lakhs. The Annual Account of the Authority has been audited and submitted to CAG within prescribed time schedule.

The annual accounts of the Authority for the year 2021-22 was finalized and audited within the prescribed time schedule and placed before both the houses of the Parliament within statutory time limit. The Annual Report of Authority is being forwarded in time to the Department of Agriculture & Farmers Welfare for placing before both the Houses of Parliament.

Chapter 1: Introduction

Plant varieties are vital for the survival of human beings and livestock as they serve as source of food, fibre, fodder, forest and raw materials for domestic households and industries in any society. Even before the science of genetics was discovered in late 19th Century, the scientific foundation of plant breeding science and techniques, since human beings began cultivating plants for a purpose of harvesting its product for survival, the farmers have practiced plant breeding improving the crop generation after generation by evaluating the performance and expression of the plant population they are growing. The farming community and forest dwellers, nurtured existing diversity as is how is to select for better plant type and yield from within the available adapted naturalized plant varieties such as land races to produce plants of use since millennia. As the science of genetics and plant breeding evolved, formally trained plant breeders collected genetic diversity through exploration in biodiversity rich zones, use different tool to increase values for cultivation. It is these plant breeders whose ingenious skill to detect variability, work out the genetics behind such variability and accordingly strategise the breeding methods enable development of new plant varieties, different and better than the previously existing ones. Therefore, the Plant Breeders' Right is one of the most crucial intellectual property rights in any society as food is basic requirement for both developed and developing societies. These rights granted to the plant breeders are therefore a means to recognise their contributions that results in the creation of an ecosystem that sustains innovation continuum. Such a system can establish a mechanism to exert responsible stewardship over germplasm, support long term research and development that would be crucial to enhance agricultural productivity in the form to incentivisation of plant breeding in public and private sectors while promoting the industry to competitively provide high quality seeds as well as planting materials to farmers.

Although ancient Indian history reveals records of naming of a plant variety by either the individual or commune or village native to the variety, in legal terms, the first formal enforcement of Intellectual Property Rights (IPRs) in plants used in agriculture came about in the form of the “*Plant Patent Act, 1930*” in USA which was followed in Europe by the formation of the *Union Internationale pour la Protection des Obtentions Végétales* (UPOV) or the International Union for the Protection of New Varieties of Plants in 1961 at Europe which was subsequently revised in 1972, 1978 and 1991. Presently, there are 78 member states as part of the UPOV convention including regional associations like EU, OAPI. India has not acceded to the UPOV Convention but is listed in the category of observer in the UPOV.

Plant variety protection through Plant Breeder's Rights was brought into major focus by the General Agreement on Tariffs and Trade (GATT), a multilateral instrument governing international trade. GATT negotiations in Uruguay Round led to the establishment of World Trade Organisation (WTO) in 1995. Article 27.3(b) of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) under WTO, provides that members shall provide for the

protection of plant varieties, either by patents or by an effective *sui generis* system or by any combination thereof.

The Government of India enacted the *Protection of Plant Varieties and Farmers' Rights (PPVFR) Act* in 2001 (53 of 2001) to provide for the establishment of an effective *sui generis* system for protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new plant varieties of economic importance.

PPVFR Rules were notified on 12 September, 2003 and amended from time to time, thereafter. Subsequently, for the purposes of the Act, the Government of India having exercised the powers conferred under the section 3 (1) of this Act, established the Protection of Plant Varieties and Farmers' Rights Authority on 11 November, 2005, vide Gazette notification S.O. 1588(E).

1.1 Objectives of the PPVFR Act, 2001

Following are the objectives of the Act:

- To establish an effective system for protection of plant varieties, the rights of farmers and plant breeders and to encourage the development of new varieties of plants.
- To recognize and protect the rights of the farmers in respect of their contribution made at any time in conserving, improving and making available plant genetic resources for the development of new plant varieties
- To protect plant breeders' rights to stimulate investment for research and development both in the public and private sector for development of new plant varieties.
- To facilitate the growth of seed industry in the country that will ensure the availability of high-quality seeds and planting material to the farmers.

1.2 Salient features of the Act

The PPVFR Act is based on the option under TRIPS Agreement for a member country to protect the rights of plant breeders *sui generis* system by enactment by legislation if they would not opt for UPOV (International Union for Protection of New Varieties of Plants, Geneva) Convention, and is also unique in the sense that it concurrently recognizes the rights of plant breeders, farmers (including their right as plant breeders), farming communities and researchers who breed new varieties as well as those already bred and existing prior to protection (extant). It confers exclusive rights upon the breeder or his successor, his agent or licensee, to produce, sell, market, distribute, import or export of the registered variety. As far as farmers' rights are concerned, the Act recognizes a farmer as cultivator, conservator and breeder and provides that the farmers' variety can also be registered. Further, the Act provides for compulsory license of a registered variety, if the seeds/propagating material is not available to the public at a reasonable price or quantity. Any person or group of persons or any organization can also claim for benefit

sharing, if the plant genetic material belonging to them is used in the development of a registered variety. The researchers are conferred the right to use any registered variety for conducting experiment or research and the use of a variety by any person as an initial source of variety for the purpose of creating the other varieties. India is a pioneer country where a national legislation has been enacted to establish and secure Farmers' Rights. The Act also recognizes the past, present and future contributions of the farming communities and provides an opportunity for the award to farming communities/farmers for their contributions in agro-biodiversity conservation.

1.3 PPVFR AUTHORITY

The PPVFR Authority is a Statutory Body established by the Parliament of India through the PPVFR Act of 2001. The Authority is a body corporate, having perpetual succession and a common seal with the power to acquire, hold and dispose of movable and immovable properties and to contract, and shall by the said name sue and be sued. The head office of the Authority is at New Delhi and it is functioning from a leased space in the premise of the National Agricultural Science Centre Complex, Dev Prakash Shastri Marg, Pusa Campus, New Delhi. The Authority consists of a Chairperson and fifteen members as on 31st March, 2022 (Annexure-I) along with a Registry appointed by the Authority.

1.4 PLANT VARIETIES REGISTRATION

The PPVFR Authority has finalized the Distinctiveness, Uniformity and Stability (DUS) test guidelines for registration of 172 crop species (Annexure-VII). The Authority has issued 475 (Annexure-VIII) certificates of registration for plant varieties (under new, extant and farmers' variety category) during the reporting year 2021-22. To facilitate more applications seeking plant varieties protection from different stakeholders, the Authority regularly organizes/supports awareness and capacity building programmes.

The PPVFR Authority has also established network of DUS test centres across the country under the Central Sector Scheme for the implementation of PPVFR Act, 2001, to verify the claims of candidate varieties by applicants, maintenance breeding, multiplication of reference/example varieties/ the varieties notified under section 5 of the Seeds Act, 1966, and generation of database for varietal characteristics as per crop specific DUS (Distinctiveness, Uniformity and Stability) guidelines. In addition, DUS tests for the candidate varieties are being conducted at crop specific centres. The data recorded as per the DUS test guidelines is submitted by these centres to Authority for further analysis. The Authority, in consultation with the ICAR institutes and SAUs has identified potential crop species of economic importance and supports projects for the development of the DUS guidelines. The Authority has established its National Gene Bank, field gene banks across the country. It regularly publishes *Plant Variety Journal of India* and maintains the National Register of Plant Varieties at Headquarters and also its branch offices.

1.5 CATEGORIES OF PROTECTION OF PLANT VARIETIES

The process of granting protection to a plant variety through plant breeders' rights as enshrined in the Act is based on a broad principle of internationally recognized system of DUS and novelty for a new variety. Any person can apply for registration in any of the following:

- **New variety** of such genera and species as specified under section 29(2) of the Act.
- **Extant variety** (To a limited period after the species is notified (in the case of new and VCK varieties) as announced time to time by the Authority)
 - Notified under section 5 of Seeds Act, 1966,
 - Variety of common knowledge (VCK),
 - Farmers' variety
 - Traditionally cultivated and evolved by the farmers in their fields,
 - Wild relative or landrace of a variety about which the farmers possess common knowledge.
- **Essentially derived variety (EDV)**
A variety predominantly derived from an initial variety, or from a variety that itself is predominantly derived from such initial variety, while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of such initial variety

1.6 FARMERS' RIGHTS

The Act, also provides following rights to the farmers that is unique only to India among all signatories to TRIPS and WTO and the sole reason for India not acceding to UPOV Act 1991:

- *Right to register their varieties*: A farmer who has bred or developed a new variety is entitled for registration and other protection as a plant breeder under this Act.
- *Right on seed*: A farmer is entitled to save, use, sow, resow, exchange, share or sell his farm produce including seed of a variety protected under this Act; provided that the farmer is not entitled to sell branded seed of a variety protected under this Act.
- *Right for reward and recognition*: A farmer or community of farmers engaged in the conservation and improvement of plant genetic resources (landraces and wild relatives of economic plants) are entitled for the Plant Genome Saviour Award, Reward and Recognition, provided their plant material has been used in development of varieties registrable under this Act.
- *Protection of innocent infringement*: If a farmer being, infringed according to section 65 of PPVFR Act, 2001, can prove before court that he or she was not aware of the existence of such rights at the time of infringement; he or she will not be charged.
- *Fee Exemption*: A farmer or group of farmers are not liable to pay any fee payable for inspection of any document or for obtaining a copy of any decision or order or document

under this Act. Farmers have the privilege of being completely exempted from payment of any kind of fees or other payments that are normally payable for variety registration; testing of varieties and other services rendered by the PPVFRA; as well as for legal proceedings related to infringement or other cases in courts, tribunal etc.

- *Reasonable Seed Price*: Farmers have the right to access seed of registered varieties at a reasonable and remunerative price. When this condition is not met, the breeder's exclusive right over the variety can be revoked under the provision concerning compulsory licensing, and the breeder is obligated to license the seed production, distribution and sales of the variety to any competent person. Most of the laws for plant varieties protection have provisions on compulsory licensing of protected varieties to ensure adequate seed supply to farmers.
- *Authorization of farmers' variety*: In the development of an essentially derived variety from a farmer's variety and its commercialization. The authorization should be given with the consent of the farmer or group of farmers who have contributed in the conservation or development of such a variety. Such a process can allow farmers to negotiate the terms of authorization with the breeders, which may include royalties, benefit-sharing etc.
- *Right for compensation*: When any propagating material of a variety registered under this Act has been sold to a farmer, the breeder of such variety should disclose the expected performance under given conditions. If the propagating material fails to provide such performance under such given conditions, the farmer can claim compensation before the Authority. The Authority would then notify the breeder of the variety the issue and after providing him an opportunity to file an opposition, may direct the breeder to pay compensation to the farmer as it deems fit.

The Registry of the Authority facilitates the IPR registration of farmers' varieties by equating the farmers to plant breeders as empowered by the Act, conducts country-wide training-cum-awareness programmes, and identifies farmers and farmer communities for their contribution towards conserving germplasm and developing new varieties.

1.7 PLANT BREEDERS' RIGHTS

Registration gives exclusive rights to produce, sell, market, export or imports the variety along with its denomination. This right is subject to farmers' rights that farmers can use seeds of registered varieties in an unbranded manner.

Breeders' Right is one of the pivotal provisions of this Act with far reaching implications in the context of Indian agriculture and global scenario. The breeder also enjoys provisional protection of his/her variety against any abusive act committed by any third party during the period between filing of application for registration and the final decision taken by the Authority. Similarly, researcher's rights are also granted. However, for repeated use of a registered variety

as an initial source of variety for the purpose of developing a new variety, the authorization of the breeder of the registered variety is necessary.

1.8 REGISTRATION OF PLANT VARIETIES

An application for registration of a plant variety and its denomination can be made under the following categories:

- **New Variety:** On the date of filing of application for registration if the variety has been commercialized for period of less than one year then it is a new variety
- **Extant Variety:** Consist of the following categories namely:
 - **Extant variety notified under section 5 of Seeds Act, 1966:** Varieties notified under Section 5 of Seeds Act, 1966 are eligible for registration under this category
 - **Farmers' variety:** Traditionally cultivated and evolved by the farmers in their fields and includes wild relative or land race or a variety about which the farmers possess common knowledge
 - **Variety of Common Knowledge (VCK):** which are not notified under Section 5 of Seeds Act, 1966 and are in commercial chain for more than a year
- **Essentially Derived Variety:** A variety pre-dominantly derived from an initial variety and should fall either under new or extant category.

The category of extant variety for VCK and Notified extant varieties is no more available in the following crop species since January 2021 as per the Public Notice No. 16 of 2021 issued under Section 15(2) of the PPVFR Act, 2001.

1.9 EXTENT AND NATURE OF FIELD-TESTING (DUS TESTING) OF VARIETIES

The application is processed depending on the category of the variety claimed for registration, accordingl to which the applicant is required to deposit DUS test, registration and any other fees, as may be required. After receipt of necessary fees and seeds and to a satisfactory examination of the application at the Plant Varieties Registry, the Registrar shall send the variety to crop specific centres for conducting DUS test. The period of DUS testing is as follows:

- **New Varieties:** Two similar crop seasons at two locations
- **Farmers' Variety and VCK:** One crop season at two locations
- **Extant variety notified under section 5 of Seeds Act, 1966:** No DUS testing is conducted but variety is processed by an EVRC Committee which recommends for registration
- **EDV:** DUS testing is not mandatory but field test is conducted to ascertain DUS criteria

After the receipt of DUS test result, the application is processed and distinctiveness is ascertained through DUS test and comparison across the database. Subsequently, the passport data of the variety is published in the *Plant Varieties Journal of India*.

The application is advertised in *Plant Variety Journal of India* inviting opposition within a period of three months from the date of publications. If no opposition is filed or if opposition filed is rejected, the variety proceeds for registration. The period of protection is as follows :

1.9.1 Protection Period in Different Types of Crops

A total of 172 crop species are presently eligible for protection (Annexure VII). The total period of protection for field crops is of 15 years with 6 years of protection at the time of registration renewable to next 9 years, whereas that of trees and vines is for 18 years with 9 years of protection at the time of registration renewable to next 9 years. The extant varieties notified are given a protection for 15 or 18 years for field crops or trees and vines respectively, from date of notification under Seeds Act, 1966.

1.10 AWARD/REWARDS TO FARMERS' FARMING COMMUNITIES

Section 45(2) of the Act reads with Rules 70 (2) (a) of PPVFR Rules, 2003 provides for support and reward, to farmers, communities of farmers, particularly the tribal and rural communities engaged in conservation, improvement and preservation of genetic resources of economic plants and their wild relatives, particularly in areas identified as agro-biodiversity hotspots from National Gene Fund. To operationalize these provisions, Plant Genome Savior Community Award was instituted in 2009–10. A maximum of five such awards can be conferred annually. Along with this, ten farmers are conferred the Plant Genome Saviour Farmer Reward and twenty farmers are conferred Plant Genome Saviour Farmer Recognition certificates. The details of the awards conferred are mentioned in Table 1. The selection of awardees is made by a committee of experts/ scientists headed by an eminent scientist/ subject matter specialist.

Table 1.1: Details of the Plant Genome Savior awards, rewards and recognition

Award	Details	Application
Plant Genome Saviour Community Awards	Five farming communities are awarded each year. Each award includes a citation, a memento and Rs. 10 lakhs.	Advertisement for these awards is published in the National dailies and on the Authority website: (http://www.plantaauthority.gov.in/form s.htm)
Plant Genome Saviour Farmers' Rewards	Ten farmers are rewarded every year. Each reward includes a citation, a memento and cash of Rs. 1.5	The applications should be forwarded by Chairperson/Secretary of the concerned Panchayat Biodiversity Management Committee or Concerned

	lakh.	District Agricultural Officer or
		Director of Research of Concerned
		State Agriculture University or
Plant Genome	Twenty farmers are rewarded	Concerned District Tribal Development
Saviour Farmers'	every year.	Officer
Recognitions	Each reward includes a citation,	
	a memento and cash of Rs. 1	
	lakh.	

Chapter 2: Plant Varieties Registry

2.1 PUBLICATION OF DUS TEST GUIDELINES FOR CROP SPECIES

During 2021-22, DUS guidelines have been developed for seven crop species and published in *Plant Variety Journal of India* as mentioned in Table 2.1 totalling to 172 crop species for which Authority has developed DUS guidelines and notified in Gazette of India. Registrations are now open for plant variety protection under *PPVFR Act, 2001* for the varieties under these different crop species. The proposal advising the Government of India for their notification in the Gazette of India is under consideration to facilitate registration of varieties of these crop species in future.

Table 2.1: DUS test guidelines developed for different crop species during 2021-22.

Sl. No.	Crop & Species	PVJ Publication details
1	Ajwain (<i>Trachyspermum ammi</i> L.)	December 01, 2021 (Vol. 15 No. 12)
2	Anise (<i>Pimpinella anisum</i> L.)	
3	Celery (<i>Apium graveolens</i> L.)	
4	Cumin (<i>Cuminum cyminum</i> L.)	
5	Dill (<i>Anethum graveolens</i> L. and <i>Anethum sowa</i> Roxb)	
6	Fennel (<i>Foeniculum vulgare</i> Mill.)	
7	Nigella (<i>Nigella sativa</i> L.)	

2.2 NUMBER OF APPLICATIONS RECEIVED DURING 2021-22

During 2021-22, total of 311 applications were received for registration from both public and private as well as farmers' variety sectors under different categories, despite the COVID 19 related inconvenience or difficulties in ferrying the seed or seeding materials along with the application documentation during the period of lock down that prevailed for the major part of the year. Majority of applications belonged to cereals, vegetables and fruits crops (Table 2.3).

Table 2.2: Total number of applications received during 2021-22 (Sector-wise) crops group-wise)

Category	Public Sector	Private Sector	Farmers
New	23	119	-

Extant Notified	69	12	-
Extant VCK	2	58	-
Extant Farmers	-	-	27
EDV	-	-	-

Table 2.3: Total number of applications received during 2021-22 (crop group-wise)

Crop Group	Total	Crop Group	Total
Cereals	164	Oilseeds	12
Cucurbits	8	Trees	4
Fibre Crops	9	Sugar Crops	2
Flowers	3	Vegetables	82
Fruits	18		
Legumes	9		
		Grand Total	311

Highest number of applications is received for Rice (62), Chilli (50), Maize (48), Pearl millet (28), Wheat (14), Tetraploid cotton (8), Sorghum (4), etc. (Table 2.4)

Table 2.4: Total number of applications received (crop-wise)

S.No.	Common Name	Total	S.No.	Common Name	Total
1	Rice	62	20	Sugarcane	2
2	Maize	48	21	Cowpea	1
3	Wheat	14	22	Pear	2
4	Pearl Millet	28	23	Grapes	2
5	Chilli	50	24	Dicoccum wheat	4
6	Tetraploid Cotton	8	25	Muskmelon	3
7	Sorghum	4	26	Bitter Gourd	3
8	Tomato	4	27	Cucumber	2
9	Okra/Lady's Finger	7	28	Diploid Cotton	1
10	Soyabean	4	29	Marigold	3
11	Finger Millet	1	30	Pigeon pea	3
12	Black gram	4	31	Watermelon	3
13	Cauliflower	8	32	Green gram	2
14	Brinjal	5	33	Jackfruit	5
15	Durum Wheat	1	34	Mango	1
16	Indian mustard (Sarson)	8	35	Apple	2
17	Onion	1	36	Barley	2
18	Bottle Gourd	3	37	Cashew	2
19	Datepalm	3	38	Guava	1
				Grand Total	311

Out of 311 applications, 189 applications were filed by private sector, 94 applications were filed by public sector and 28 by farmers. Under extant notified category, 81 applications were received, 60 under extant VCK, 143 under New, and 28 under farmer's variety category were also filed for registration. During 2021-22, 311 applications were received in respect of 39 crop species.

2.3. REPORTS OF BRANCH OFFICES OF THE REGISTRY

2.3.1. Branch Office, Shivamogga

During the reporting year 2021-22 the Shivamogga Branch office was headed by Dr. T.H. Gowda, Deputy Registrar up till 2nd March 2022. Thereafter, the branch office is headed as In-charge by Dr. Ajay Kumar Singh, PVE. Along with the mandated activities of the branch office which is also designated as DUS test centre involved in characterization, hybridisation and rejuvenation of different Agri-horticultural crops.

A. Plant variety Registration

The details of applications for registrations of crop varieties received under various categories are detailed below. Applications were scrutinised and verified through Registry Assistants, PVE and were forwarded to PPVFRA.

Table 2.5: Details of applications filled from this branch office

Crop	No of applications
New variety	08
Extant notified variety	02
Extant variety	01
Farmers' variety	05
Total	16

B. Visits, Participation and Extension activities

- Session with KSNUAHS Final Year students of B.Sc (Agri), regarding the activities of PPVFRA and also about the registration of varieties under PPVFRA on 01.04.2021.
- Attended webinar on "Protection of Plant varieties in India" organized by Intellectual Property Facilitation Cell (IPFC), AIP – ICRISAT on 08.04.2021 at 11.00 AM to 12.00 PM.
- Attended webinar on International webinar on Exchange on PVP Post Control Measures on 8th April, 2021 at 3.30 PM.

- Attended as Expert in Zonal Research and Extension Program (ZREP) online workshop organized by UAHS, Shivamogga on 17, 18 and 21 May 2021.
- Circulated the information regarding the Guidelines to use the Logo of PPVFR Authority to all the universities which comes under the jurisdiction of Branch office, Shivamogga on 29.07.2021.
- Delivered a lecture on the importance of registration of varieties under PPVFRA and also activities of the Branch Office to B.Sc (Agri) students of KSNUAHS on 19.09.2021,
- Delivered a lecture on the importance of registration of varieties under PPVFRA and also activities of the Branch Office to B.Sc (Agri) students of UAS Darwad on 23.09.2021
- Visited field of Mr. Anjaneya, a farmer who has applied varieties for the registration of paddy varieties and also a winner of PGSC Award on 09.10.2021,
- Participated as a member in the Committee for onsite verification for PGSC Award on 21st October 2021, for Bhoomi Sustainable Development Society, near Laxmi Nursing Home, RC Road, Hassan.
- Participated in PGSC Award function organized at New Delhi from 09.11.2021 to 14.11.2021.
- Participated in Krishi Mela - 2021 at Keladi Shivappa Nayaka University of Agricultural and Horticultural Sciences on 12 & 13 November 2021.
- Attended webinar on 16th & 17th December 2021 on “Exchange on Biochemical and Molecular Technique (BMT) guidelines and implementation of BMT in DUS”.
- Participated as a member for DUS monitoring of Okra on 20.12.2021 at IIHR, Bengaluru.
- Participated as a member in DUS monitoring of Brinjal and tomato at IIHR, Bangalore.
- In-charge Branch office, Shivamogga has been Nominated as one of member of four member team to participate in a five day study visit, consultation meeting and training in Germany on DUS Testing on Mustard and Rapeseed under Bilateral agreement of **Indo-German Cooperation on Seed Sector Development**. The visit has been planned to have a view of the most recent technologies used in Germany on DUS testing to facilitate understanding and exchanging of experience and information about DUS testing procedures.
- In-charge Branch Office and its staffs participated in the Annual Technical Meeting of Plant Science group at Department of Genetics and Plant Breeding, CoA, KSNUAHS, Shivamogga held on 10th and 11th March 2022.



Participated in Krishi mela- 2021 at
KSNUAHS, Shivamogga



Session with B.Sc (Agri) students of UAS Darwad.



Participated in Annual Technical
Meeting of Plant Science group at
Department of GPB, CoA, KSNUAHS,
Shivamogga



Session with B.Sc (Agri) students of KSNUAHS



Visited Farmer's seed bank
aDavanagere district



Onsite verification for PGSC Award at Hassan
district

	
PGSC Award function at New Delhi	DUS Monitoring of Okra at IIHR, Bengaluru

C. Publications:

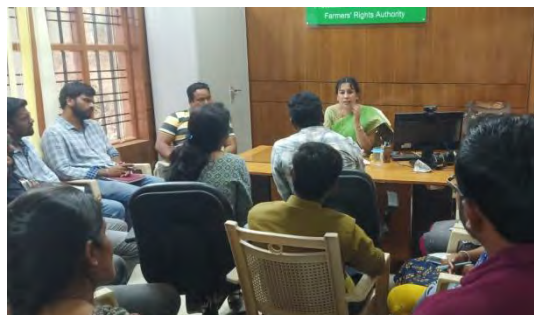
1. Published article entitled **“Farmers' Rights for Seed Self-Reliance, Independence and Role of PPVFRA”** (by T H Gowda, Janardhana B, Rashmi K P and Anup S) in Negila Miditha (Kannada language) technical tri monthly journal published by KSNUAHS, Shivamogga
2. Published technical folder entitled “Protection of Plant Varieties and Farmer’s Rights” in local language Kannada (by T H Gowda, Janardhana B, Rashmi K P and Anup S)
3. Advertised about the Plant Genome Saviour Award in local news paper to encourage the farmers to apply for the award.

D. Experts visit:

- Dr. Pitchaimuthu, Principal Scientist, Division of Vegetable crops, ICAR- IIHR, Bengaluru, visited the Branch Office on 24.12.2021.
- Dr. Ashok Dalwai, IAS, Chief Executive Officer, National Rainfed Area Authority, Dept. of Agriculture and Farmers welfare, New Delhi visited DUS Testing field and Branch Office, Shivamogga on 12.03.2022 to look after the activities going on in the Branch Office.



- Visit of Registrar & I/c of Branch Office, Shivamogga 24.03.2022 & 25.03.2022 to review the progress activities in the Branch Office.



Felicitation to Vice-Chancellor for his completion of term of service as a Vice-Chancellor, KSNUAHS, Shivamogga on 25.03.2022. Dr. T K Nagarathna, Registrar & I/c Branch Office, Shivamogga expressed thanks for his gratefulness and supportive nature to help the establishment and functioning of Branch Office in all aspects.



E. Financial Progress for the year 2021-2022

Sl.No	Project title	Sanctioned (Rs.)	Expenditure (Rs.)	Balance (Rs.)
1	Stability Assessment Hybrid Seed Production/DUS characterization of Parental Lines for Cereals (except Maize & Rice), Pulses and Vegetable crops	11,38,000.00	7,95,221.00	3,42,779.00
2	Hybrid Seed Production/ DUS characterization and testing of Parental lines of Maize and Oil Seeds Crop.	3,73,000.00	3,13,742.00	59,258.00
3	Stability Analysis/ Hybrid Seed Production/ DUS characterization of Parental Lines for Rice and Cotton.	14,65,550.00	14,12,223.00	53,327.00

F. Civil works/infrastructure development

Following is the status of the development works carried out at the PPVFRA, Branch office, Shivamogga with the help of Vice Chancellor, Director of Research, Comptroller and Estate Officer of UAHS, Shivamogga and with the kind approval of the authority.

S.No.	Particulars	Sanctioned (Rs.)	Remarks
1	Chain link fencing	41,50,000.00	Work completed
2	Office renovation	9,75,000.00	Work completed
3	Irrigation Pipeline	6,70,000.00	Work completed
4	Jack well	90,000.00	Work completed
5	CCTV Camera	45,67,000.00	Work under progress
6	CCTV server room and Temporary field structures	9,70,000.00	Work under progress

A. Projects under operation at the Centre

Project title: “Stability Assessment, Hybrid Seed Production/DUS Characterization of Parental Lines for Cereals (except Maize and Rice), Pulses and Vegetable crops”

During 2021-2022 this centre PPVFRA, UAHS, Shivamogga has received Agri-Horticultural crops for DUS characterization and production of hybrid as well as to produce selfed-seed.

Sowing: As per instructions given in the DUS guidelines crops were taken up for sowing and all the recommended package of practices (POP - UHS Bagalkot and POP-UAS Bengaluru) and plant protection measures were followed to have good crop stand and to harvest the sufficient quantity of hybrid and selfed-seeds.

Table 2.6: List of candidate varieties maintained at PPVFRA, DUS test centre, Shivamogga during 2021-2022

S. No.	Crops	Season	Date of sowing	Date of harvesting	Parental lines			Reference varieties	Total entries
					A	B	R		
CEREALS and PULSES									
1.	Pearl millet	Kharif	29.07.2021	23.11.2021	17	12	16	3	48
2.	Sorghum	Kharif	29.07.2021	07.12.2021	1	1	1	4	7
3.	Green gram	Kharif	16.08.2021	25.10.2021	-	-	-	1	1
VEGETABLES									
S. No	Crops	Season	Date of Sowing	Date of harvesting	Female	Male	Reference varieties	Total entries	
4.	Tomato	Rabi/Summer	23.09.2021	13.01.2022	14	14	17	45	
5.	Chilli	Rabi/Summer	21.10.2021	10.03.2022	29	29	18	76	
6.	Brinjal	Rabi/Summer	08.10.2021	14.03.2022	8	8	-	16	
7.	Okra	Rabi/Summer	09.10.2021	31.12.2021	5	5	8	18	
8.	Bitter gourd	Rabi/Summer	17.09.2021	06.1.2022	4	4	2	10	
9.	Bottle gourd	Rabi/Summer	17.09.2021	18.01.2022	2	2	2	6	

10.	Ridge gourd	Rabi/Summer	17.09.2021	06.01.2022	2	2	-	4
11.	Water melon	Summer	07.02.2022	28.04.2022	4	4	3	11
12.	Musk melon	Summer	07.02.2022	26.04.2022	1	1	2	4

DUS Characterization: All the DUS observations were recorded from 10 randomly selected plants by the project staff at appropriate stage and data entry into the excel sheet is in progress and same will be forwarded to PI of project after completion.

Hybridization: The manual techniques were followed for production of hybrid seed. Female and Male and A X R lines were planted together and pollen collected from male plants/R line and dusted over the female flower/emasculated female flower and bagged and labelled to avoid contamination.

Table 2.7: Details of Crops/entries for DUS characterization and F1 seed production (2021-2022)

Sl. No	Crops	No. of entries received	Purpose	Status of seeds / data submitted to Authority
1.	Pearl millet	11(A,B &R Lines) 5 (A & R line) 1 (A& B line)	-9 entries for DUS and F ₁ Seeds Production. -5entries for F ₁ Seeds Production. -3 entries for DUS testing.	-Hybrid and self-seeds submitted to Authority. -DUS data yet to be submitted.
2.	Sorghum	1 (A,B &R Lines)	DUS testing and F ₁ Seeds Production.	-Hybrid and self-seeds submitted to Authority. -DUS data yet to be submitted.
3.	Green gram	1	For Rejuvenation	Seeds submitted to authority
4.	Tomato	14 (14Female x 14Male)	-6 entries for DUS testing and F ₁ Seeds Production. -2 entries for F ₁ Seeds Production -6 entries for DUS testing.	-Hybrid and self-seeds submitted to Authority. -DUS data yet to be submitted.
5.	Chilli	29 (29Female x 29Male)	29 entries for DUS and F ₁ Seeds Production.	-Hybrid and self-seeds submitted to Authority. -DUS data yet to be submitted.
6.	Brinjal	8 (8Femalex 8Male)	-8entries for F ₁ Seeds Production.	-3 entries are not germinated and reported to the project Investigator. - 5 entries of Hybrid and self-seeds submitted.

7.	Okra	5 (5Female x 5Male)	-4entries for DUS and F ₁ Seeds Production. -1 entry for F ₁ Seeds Production.	-Hybrid and self-seeds submitted to Authority. -DUS data yet to be submitted.
8.	Water melon	4 (4Female x 4Male)	- 2entries for DUS and F ₁ Seeds Production -2 entries for F ₁ Seeds Production.	Hybrid and self-seeds along with DUS data yet to be submitted.
9.	Muskmelon	1(1Female x 1Male)	-1 entry for DUS and F ₁ Seeds Production	Hybrid and self-seeds along with DUS data yet to be submitted.
10.	Bitter gourd	4 (4Female x 4Male)	-3 entries for F ₁ Seeds Production. -1 entry for DUS testing.	- 2 entries are not germinated and reported to Project Investigator. - 1 entry of Hybrid and self-seeds submitted. - DUS data yet to be submitted.
11.	Bottle gourd	2 (2Female x 2Male)	-1 entry for F ₁ Seeds Production. -1 entries for DUS testing	-Hybrid and self-seeds submitted to Authority. - DUS data yet to be submitted.
12.	Ridge gourd	2 (2Female x 2Male)	2 entries for F ₁ Seeds Production.	-Hybrid and self-seeds submitted.



Ridge gourd DUS monitoring, IIHR, Bengaluru, with eminent scientists Dr. OP Dutta, Dr. KRM Swamy, Dr. DT Sadashiva and Dr. B. Varalaxmi



Tomato DUS monitoring, IIHR, Bengaluru, with Dr. AT Sadashiva, Dr. HC Prasanna, Dr. TH Singh and Dr. TH Gowda



Bagging Pearl Millet



Training in Tomato



Crossed Fruit set in
Chilli



Ridges and furrows opening



Earthing up in Sorghum

Project title: “Hybrid seed production/ DUS characterization and testing of parental lines of Rice and Cotton”

Site description & climatic condition:

DUS testing centre of PPVFRA, Shivamogga lies in the southern transition zone (Zone-7) and located at 13°27' to 14°39' N latitude and 74° 37' to 75° 52' E longitude with an altitude of 650m above the MSL. During the cropping season, the total rainfall received was 621.6 mm. The rainfall received during August-2021 to January-2022 was highest in the month of August (265.8 mm) followed by September (191.6 mm). There was not much variation with respect to rainfall distribution during crop growth period. The mean monthly maximum temperature was highest during November (30.70°C) while, it was least in the month of August (27.4°C). The mean minimum temperature was highest in the month of September (20.2°C) and lowest in the month of December (15.7°C). The maximum relative humidity was observed in the month of September (83 %) and minimum during December (64 %). The sunshine hours recorded was higher in the month of January (8.9 hrs.). The overall weather condition prevailed during the cropping season was normal.

(A) Rice

During the reporting year, parental entries of rice were taken up for DUS test as well as production of hybrids accommodated under project entitled “*Stability Analysis, Hybrid Seed Production and DUS characterization of parental lines of Rice and Cotton*”. Project was led by Dr Ajay Kumar Singh, PVE and Dr D.S. Pilania, TA respectively as Co-



Principal Investigator(s) and Sh Dipal Roy Choudhury, Joint Registrar as Principal Investigator. Under the project, one Senior Research Fellow (Sh R. Dhinesh Kumar) & One Technical Assistant (Mr Venkateshan, R.) were recruited for handling the rice crop.

Soil Testing

The soil of the trial plot(s) was found to be acidic (pH ranges between 5.78 - 5.82) in nature and has low organic carbon. Therefore suitable control measures like lime application for acidic soil and organic manure application for increasing organic carbon status of soil were made, 25kg of extra fertilizers in addition to regular prescribed NPK dosage and 8kg of Zn was applied since the field was more acidic and less nitrogen content.

Main field preparation

The well grown green manure crop (dhaincha) was incorporated and FYM were added. The field was irrigated, well puddled and leveled prior to transplanting.

Seed Material

During *Kharif* 2021 from Authority the centre received 27 entries (A, B & R) for hybridization and 1st year DUS characterization along with 15 reference varieties (A, B & R) and 30 entries (A, B & R) for 2nd year DUS characterization as per DUS guideline. Also received 31 entries (A x R) for F₁ seed production. Accordingly, the trial was planned and conducted with one replication as per available land/area.

Nursery raising & sowing

Nursery sowing was taken up in 14th July 2021. The recommended NPK fertilizers, FYM, compost along with Trichoderma were applied for the nursery beds.

- Staggered nursery sowing of R lines was done for three times with one week interval to get the synchronization between A and R lines in 1st year hybridization and F₁ seed production program
- Normal sowing was done for A, B and R lines for 1st year DUS & (AxB) program, 2nd year DUS and Reference varieties.

Transplanting

25-30 days old seedling were uprooted & transplanted on 14th August of 2021 at depth of 2-3 cm with recommended spacing for each program According to test plot design the crop was transplanted in to the three different blocks, viz. :

1. Test plot design: 1st year, 2nd year DUS and Reference block

- Number of rows : 1 row for each A, B & R lines of 1st year DUS & Reference trial
2 rows for each A, B & R lines of 2nd year DUS trial
- Row length : 5m for each A, B & R lines
- Row to Row distance : 40 cm

- Plant to plant distance : 20 cm
- Number of replication : 01

2. Maintenance block (A x B): 1st year DUS only

- Number of rows : 2 rows of A & B lines
- Row length : 8m
- Row to Row distance : 30 cm
- Plant to plant distance : 20 cm
- Number of replication : 01



In the maintenance block, each B line (Maintainer line which is fertile in nature) were transplanted at both the sides of A line (Male sterile line which is non fertile in nature) in BAAB manner to get the desired quantity of A line seeds.

3. Hybridization block (A x R): 1st year DUS and F1 seed production

- Number of rows : 2 rows of R line & 3 rows of A line
- Row length : 8m
- Row to Row distance : 30 cm
- Plant to plant distance : 20 cm
- Number of replications : 01

This block was planted with A and R lines with 8 meter row length (40 plants in each line). Plants of staggered dates were mixed before transplanting to get synchronization between A and R lines in RAAAR manner.

Irrigation and intercultural practices

Maintained continuous, shallow submergence of rice plants with a water depth up to 5 cm from the day of transplantation till mid of grain filling stage. As and when required, weeding was done.

Fertilizer management

Based on the soil test report recommendation, fertilizers (Urea, DAP, MOP) and other micronutrient fertilizers like Zn based were applied. 0.5% zinc spray was given at the time of Zn deficiency symptoms.

Plant protection

Plant protection measures including foliar application of Fipronil, Fertera, Malathion spray was provided timely when the pest incident of gall midges, stem borer and gundi bugs were observed in the field. Ridomil Gold spray was given to control the Blast incidence. To control the thrips and BPH, Starthene spraying was done based on recommendation.

Techniques used for hybridization

In order to avoid contamination and to maintain purity of hybrid seed, artificial barrier isolation technique was adopted. In the hybridization (A x R) and maintenance (A x B) blocks, tarpaulins tied across wooden poles (8 feet height) and covered across length and breadth of the test plots for the entries combo was arranged in the field and maintained till harvesting.

Roughing

Off-types, if any, were identified, recorded and removed from the seed production plots during cropping season and maximum attention was given at tillering stage, flowering stage and before harvesting stages.

Pollination



Pollination started from 18th of October 2021 and continued till mid of November 2021. The rope pulling pollination method was adopted and separate rope was used in each blocks (A x B & A x R) entry wise for pollination and three times each entry was attended daily from 09:00 to 12:30 noon to get sufficient quantity of hybrid and self-seed. In some entries where some non synchronization was observed, application of GA₃ and flag leaf clipping methods were followed based on the condition and necessarily in order to get synchronization and produce sufficient seed production.

DUS Observations

All the DUS observations were recorded from 10 randomly selected plants as per DUS guideline at appropriate stage of plants in the field record book by the project staffs and same is being reciprocated to the excel Data sheet. Seeds of all parental lines (A, B and R line) were sent to IIRR, Hyderabad for analysis of quality traits. Data was entered in prescribed excel sheet.

Harvesting and seed submission

After attaining complete physiological maturity, harvesting of A, B & R lines was done. Healthy seeds with appropriate moisture content after threshing and cleaning were packed and submitted to Gene bank.



Due to non-clay type of soil, many efforts like soil, silt and FYM incorporation were done. Heavy rainfall after sowing was observed and proper drainage facilities were made. Heavy wind caused the isolation barriers damage once and it was rectified by providing isolation barrier another time

Visit of Project staff:

During 30th and 31st October 2021; Dr. D.S. Pilania (TA & Co-PI), Sh. Venkateshan, R. (TA) and Ms. Anitha Itnal (TA-worked till November 2021) visited ICAR-Indian Institute of Rice Research, Hyderabad to attend DUS monitoring.

(B) Cotton

During the reporting year, entries of Cotton were taken up for DUS test as well as production of



hybrids under project entitled “*Stability Analysis, Hybrid Seed Production and DUS characterization of parental lines of Rice and Cotton*”. Project was led by Dr. Ajay Kumar Singh, PVE and Dr. D.S. Pilania, TA respectively as Co-Principal Investigators and Sh. Dipal Roy Choudhury, Joint Registrar as Principal Investigator. Under the project, one Senior Research Fellow (Gururaja, M) and one Technical Assistant (Ms. Kavyashree, K R) were recruited for handling the cotton crop. Dr Irfan, was also recruited

under the Rice/Cotton project as SRF (Agronomy). Four YP's were recruited for 4 months duration during selfing and hybridization period of crop growth.

Seed material

In *Kharif* 2021, Branch office Shivamogga centre received 190 entries (95 male + 95 female) along with 35 entries for second year DUS trial and 19 reference varieties of Cotton from PPVFRA, New Delhi for DUS characterization and hybridization as per DUS guideline.

Site description, Soil test, Weather parameters and Plan of work

The experiment was carried out at DUS testing center, Shivamogga of PPVFRA geographically lying in southern transition zone (Zone-7) and located at 13⁰27' to 14⁰39' N latitude and 74⁰37' to 75⁰52' E longitude with an altitude of 650 m above the MSL. The soil of the experimental location was tested and the results depicted that the soil was acidic (p^H 5.78 and 5.82) in nature and has low per cent of organic carbon status. Soil amendments like lime application for acidic soil and organic manure application for increasing organic carbon status of soil were taken. During the cropping season, the total rainfall received was 621.6mm. The rainfall received during August-2021 to January-2022 was highest in the month of August (265.8 mm) followed by September (191.6 mm). The mean monthly maximum temperature was highest during November (30.70°C) while, it was least in the month of August (27.4 °C). The mean minimum temperature was highest in the month of September (20.2 °C) and lowest in the month of December (15.7 °C). The maximum relative



humidity was observed in the month of September (83.0 %) and minimum during December (64.0 %). Max sunshine hours (8.9 hrs) were observed in Jan 2022. There was not much variation with respect to rainfall distribution during crop growth period. The overall weather condition prevailed during the cropping season was normal.

Total entries were accommodated in an area about 2.5 acre. All the parental lines were sown in two replications with each hybrid combination consisting eight rows, four rows of female parents and four rows of each male parent with five plants in each row of 2.4 m length with a spacing of 120 x 60 cm in Hybrid block and 90 x 60 cm in Selfing block. These entries were sown as per the approved plan and in each entry, ten plants were selected and DUS observations were recorded. Sowing of all the entries received was done on 05.08.2021 and 06.08.2021.

Crop management

Recommended dose of fertilizers were applied at timely interval based on crop requirement. Nitrogen applied in two splits during sowing and 45 days after sowing and full dose phosphorous and potassium applied as basal dose during sowing. Water soluble fertilizers and micronutrients were applied through foliar application during the critical crop growth period. Plano fix application was taken up to reduce the flower and boll drop during crop period. Inter-cultivation and bullock operations were carried out for ridges and furrows formation and earthing up was also carried out for better crop stand and growth. Nipping operation was carried out by removing the terminal portion of the main stem beyond the 15th to 16th node to facilitate more sympodial branches to increase boll count during the cropping period. All prescribed crop management practices and pest control measures were taken up timely and also as and when required for raising the healthy crop.



DUS Characterization

Totally 31 and 37 DUS observations were recorded in diploid and tetraploid cotton, respectively. DUS observations were recorded in 67 entries taken up in first year trial and 35 entries of second year trial along with 19 reference varieties. Ten plants in each entry were selected at random for recording DUS observations according to DUS guidelines at specified stages. DUS readings recorded in the field has been transferred to field record book and the same has been entered in to the prescribed standard excel sheet format. Cotton lint of 60 gm per entry was sent to ICAR-Central Institute for Research on Cotton Technology, CICR Campus, Coimbatore for fibre quality analysis and subsequently the Data, received from them has been transferred to both register and standard excel sheets.

Hybridization

Selfing, emasculation and crossing was initiated after square formation from 13.10.2021 to 10.12.2021. Manual emasculation was done by choosing healthy flower buds of female between 3.00 to 5.00 pm one day before anthesis. Pollination was carried out next day morning hours between 9.00 to 11.00 am by dusting ripen anthers from the selected healthy male flowers. Selfing of parental lines and reference varieties was performed by placing butter paper bags on un-opened flowers. More than 400 crosses were attempted in each hybrid combinations in order to get sufficient F₁ hybrid seeds, which will be used for next year DUS trial. Sufficient selfing were also done in each entry including reference varieties and II year DUS trial.

Harvest and Post-harvest operations

Entry wise harvested cotton was ginned using Cotton Lilliput Ginner to separate cotton lint and seeds. Seed cleaning was carried out simultaneously. Harvesting and ginning of all entries was carried out from 14.12.2021 to 20.02.2022. F₁ hybrid seeds and parental seeds produced were cleaned, weighed and packed in triple layered Aluminium foils and were submitted to National Gene Bank, New Delhi on 3rd March, 2022.

Issues faced

Due to unfavorable weather and climatic conditions like rainfall, heavy wind and long dry spell/water scarcity during flowering and hybridization program, it lead to significant flower and boll drop in cotton. Issues like leaf reddening due to Mg deficiency, sucking pests, boll worm and mirid bug infestation were faced during crop growth period. Remedial measures were taken immediately to control them. Pink boll worm infestation was observed after picking of cotton. So, simultaneous picking and ginning were carried out to control further seed damage and subsequent control measures were taken.

Visits

- ✓ Dr. R.C. Agrawal, Deputy Director General (Education) ICAR, New Delhi and Vice Chancellor, KSNUAHS, Shivamogga visited the field on 1/10/2021.
- ✓ Sh. D.R. Choudhury, Joint Registrar and PI, visited Branch office Shivamogga on 22/10/2021.
- ✓ Dr. Ashok Dalwai, CEO of National Rainfed Area Authority (NRAA) in Ministry of Agriculture and Farmers Welfare visited the PPVFRA field unit on 12/03/2022.

Dr. T. K. Nagarathna, Registrar, PPVFRA, branch In-charge Shivamogga, visited the field on 24/03/2022.

Project title: “Hybrid Seed Production/ DUS characterization and testing of Parental lines of Maize and Oil seeds”

(A) Maize

The project entitled “Hybrid seed production/DUS characterization and testing of parental lines of Maize and Oilseeds” led by Sh. Dipal Roy Choudhury, Principal Investigator & Joint Registrar, PPVFRA, New Delhi, Dr. TK Nagarathna, Registrar & Co-PI, PPVFRA, New Delhi, Dr. Ajay Kumar Singh, PVE & CO-PI, PPVFRA, Branch Office, Shivamogga was started during July, 2019 and being continued at PPVFRA Branch Office, Shivamogga which has been notified as DUS testing of parental lines and hybridization testing center of different Agricultural and Horticultural crops in India. Technical team for DUS evaluation and F₁ seed production under the project includes Sh. Chandrasekhara, G. as a Senior Research Fellow and Ms. Pallavi K. R., as a Technical Assistant.



Seed material

During *Kharif* 2021-22, Branch Office, Shivamogga received 83 parental entries of maize, out of which 10 hybrid combinations for hybrid seed production and DUS evaluation, 30 M/F lines for second year DUS evaluation along with 33 reference varieties.



Site description, Soil test, Weather parameters and Plan of work

The soil of the experimental location at DUS testing center, Shivamogga was tested for its texture and nature which revealed that due to silt predominated over sand and clay in the soil, a silt loam texture with a slightly acidic p^H (5.8) was observed. To overcome the acidic nature of the soil, the application of lime was recommended and the same was taken in the field of maize trial. During the crop season *Kharif*-2021, the average temperature ranged from 18.87°C to 29.28 °C, with an average of 24.08°C at the experimental site. The highest and lowest temperatures recorded during the crop-growing season were in Nov-2021 (30.70°C) and December-2021(15.7°C), respectively. Similarly, the greatest precipitation (5.5 mm/day) and relative humidity (93%) noticed in Nov & Dec-2021 and September 2021, respectively. The entries were accommodated in an area about 1600 m² as per the approved plan with two replications. Each hybrid combination consisting a pair of rows i.e. two rows of female parent and two rows of male parent with twenty plants in each row of 4 m length at a spacing of 75 x 20 cm. 33 reference lines were raised in two rows for each with two replications. The sowing of all entries received was done on 29/07/2021.

Crop management

As per the recommended package of practices of KSNUAHS, Shivamogga, intercultural operations including thinning, weeding to control weeds, bullock operated intercultural operation; irrigation to achieve optimum moisture for crop growth, earthing up to provide support to crop and control weeds, application of recommended dose of fertilizers as basal and top dressing at two splits to provide the essential macro nutrients to the crop were done in time. Furthermore, plant protection measures including timely foliar application of Emamectin Benzoate/Coragen /prophenophos to control stem borer & fall army worm were practiced and also to overcome Zn deficiency in maize, Zinc sulphate was applied to soil as well as foliar Zn application.



Hybrid and selfed seed production

The hybridization and selfing activity in maize during *Kharif* 2021 trial was started at 57 DAS (i.e. on 18-09-2021) and performed for a period of 22 days (i.e. till 07.10.2021) to generate F₁ seeds from the 10 hybrid combinations and selfed seeds of 10 hybrid entries of first year DUS trial, 15 hybrid entries of second year DUS trial and 33 reference varieties.

Post-harvest processes

After attaining physiological maturity, parental lines, hybrids and reference lines of maize were harvested separately from 14-12-2021 to 16-12-2021. The cobs were threshed; kernels were



winnowed, cleaned and sundried for another 2 to 3 days till the seed moisture content attained 8 per cent. The hybrid and selfed seeds were weighed and packed. The selfed (of 10 hybrid combinations, i.e. 20 parents) and F₁ hybrid (of 10 hybrid combinations) seeds of maize generated during *Kharif*-2021 at PPVFRA Branch Office, Shivamogga submitted phase wise to National Gene Bank, New Delhi on 03.03.2022 and 21.03.2021

respectively.

The issues faced during the *Kharif*-2021 in maize

Issues like rotting of seeds during germination in the field, severe damage caused to germinated seedlings due to attack of natural enemies (birds, rats and squirrels), heavy & continuous rainfall after sowing of crop, rotting of selfed and crossed cobs, leaching of micro and macro nutrients, nutrient deficiency for Zn & Mg were observed and heavy infestation of insect pests (fall army worm & cob borer) were faced for which timely remedial measures were followed during the entire crop cycle.

DUS test and DUS Data

Overall crop stand and expression of DUS trial was ideal. A total of 31 DUS characters were observed and recorded during eight growth stages on randomly tagged ten plants of each of parental lines and reference varieties in each replication according to the DUS guidelines of PPVFRA for maize. All the readings recorded in the field (DATA record sheets) was reciprocated from DATA register into standard excel sheets and submitted to PI of the project for further purpose on 09.06.2022.

Visits

Dr. Ajay Kumar, PVE & Co-PI and Mr. Chandrashekhara, G. SRF, visited SRTC, Hyderabad to participate in maize DUS monitoring program on 05.10.2021.

Sh. Dipal Roy Choudhury, Joint Registrar and PI visited maize trial field at DUS Testing Center, PPVFR Authority, Branch Office, Shivamogga during *Kharif* 2021-22 for review purpose on 22.10.2021.

(B) SUNFLOWER

The project entitled “Hybrid seed production/DUS characterization and testing of parental lines of Maize and Oilseeds” led Dr. T K Nagarathna, Registrar, New Delhi and assisted by Dr. Ajay Kumar Singh, PVE & Co-PI, PPVFRA, Branch Office, Shivamogga was started during July, 2019 and being continued at PPVFRA Branch Office, Shivamogga which has been notified as DUS testing of parental lines and hybridization testing center of different Agricultural and Horticultural crops in India. Technical team for DUS evaluation and F₁ seed production under the project includes Sh. Chandrasekhara, G. as a Senior Research Fellow and Ms. Pallavi K. R., as a Technical Assistant.

Site description, soil test, weather parameters, seed material and plan of work

During *Rabi*-2021-22, Branch Office Shivamogga received one each ABR entries (i.e., 1 A line + 1 B line + 1 R line) along with 6 reference lines for second year DUS testing. The acidic nature (slightly acidic p^H-5.8) of soil of the experimental location revealed by the soil test and to overcome that the soil application of lime was performed. During the crop cycle, Temperatures ranged from 17.02°C to 30.80°C, with an average of 23.91°C at the experimental site. Rainfall was 32.84 mm on average. The highest and lowest temperatures observed during the crop-growing season were in February-2022 (34.7°C) and December-2021(15.7°C), respectively. Similarly, the greatest precipitation (5.9 mm/day) and relative humidity (92%) were noticed in February-2022 and October- 2021, respectively. The entries were sown on 08-10-2021 as per the approved plan with 3 replications. All ABR lines were sown in 4 rows each i.e., four rows for A line, four rows for B line and four rows for R line with 13 plants in each row of 4 m length with a spacing of 60 x 30 cm. The same spacing was followed for 6 reference lines too.

Crop management

After thorough land preparation, sowing was done by hand dibbling of seeds with one seed per hill and the plot was irrigated. The recommended doses of fertilizers (60 N, 80 P₂O₅ and 60 K₂O kg/ha) was given to the crop. The entire dose of P₂O₅, K₂O and half of nitrogen was applied as basal dose and remaining half of the nitrogen was top dressed at fourth week after planting. Intercultural operations *viz.*, thinning, hand weeding, earthing up and staking were performed during crop growth cycle in *Rabi*-2021-22. Furthermore, irrigation was provided at weekly interval to crop until maturity stage. Crop protection measures like foliar application of Imidacloprid and Coragen to control sucking pest and leaf eating caterpillar respectively.



Hybrid and selfed seed production

The hybridization and selfing activity in sunflower during *Rabi*-2021 trial was started at 54 DAS (i.e. on 01-12-2021) and performed for a period of 16 days (i.e. till 17.12.2021) to generate seeds for maintenance (AXB) and selfed seeds of R line and



6 reference varieties.

Post-harvest processes

After attaining physiological maturity, heads of R line, AXB cross, and reference lines of sunflower were harvested separately. After post-harvest activities and sun drying, the hybrid and self-seeds were weighed and packed. Since the trial was for second year DUS trial, the seeds generated were burnt after the completion of DUS evaluation.

Lodging of sunflower plants due to heavy rain, infestation of sucking pests were the major issues faced for which recommended timely remedial measures were performed.

DUS test and DUS Data

A total of 34 DUS characters were observed and recorded during four growth stages on randomly tagged ten plants of each of ABR lines and reference varieties in each replication according to the DUS guidelines of PPVFRA for sunflower. All the readings recorded in the field was reciprocated from DATA register into standard excel sheets.



Visits

Dr. Sharanabasappa Deshmukh, Entomologist, KSNUAHS, Shivamogga were consulted to diagnose and prescribed

remedial measure for the trial in Sunflower.

(C) INDIAN MUSTARD

The project entitled “*Hybrid seed production/DUS characterization and testing of parental lines of Maize and Oilseeds*” led Dr. T K Nagarathna, Registrar, New Delhi, Dr. Ajay Kumar Singh, PVE & Co-PI, PPVFRA, Branch Office, Shivamogga was started during July, 2019 and being continued at PPVFRA Branch Office, Shivamogga which has been notified as DUS testing of parental lines and hybridization testing center of different Agricultural and Horticultural crops in India. Technical team for DUS evaluation and F₁ seed production under the project includes Sh. Chandrasekhara, G. as a Senior Research Fellow and Ms. Pallavi K. R., as a Technical Assistant.

Seed material, plan of work, site description, soil test and weather parameters,

The experimental material was comprised of A, B and R lines of single entry and three reference varieties of Indian mustard, Each of which raised in 4 lines of 4 m row length with the spacing of 45×15 cm of inter and intra row spacing in three replications in a RCBD experimental design as per the guidelines of PPVFRA for DUS characterization and hybrid seed production at DUS Testing Centre, Branch office, PPVFRA, Shivamogga The sowing of all the entries was done on 10.11.2021. The soil of the experimental location was tested for its texture and nature which revealed that due to silt predominated over sand and clay in the soil, a silt loam texture with a slightly acidic pH (5.8) was observed. To overcome the acidic nature of the soil, application of lime was recommended and the same was taken in the field of mustard trial. During *Rabi* 2021-22, temperatures ranged from 17.18°C to 31.78°C, with an average of 24.48°C at the experimental site. Rainfall totaled 3.8mm on average. The highest and lowest temperatures observed during the crop-growing season were in March 2022(34.7°C) and December 2021(15.7°C), respectively. Similarly, the max precipitation (6.3mm/day) and relative humidity (88%) recorded in March-2022 and December-2021, respectively.

Crop management

The recommended dose of NPK fertilizers is 60:40:40 kg; compost was added during field preparation. For better efficiency, half of the nitrogen and full doses of phosphorous and potash and remaining dose of nitrogen were applied as basal and split application at the time of sowing and at the first irrigation. Intercultural operations like earthing up combined with hand hoeing (weeding) and mulching with rice straw were followed which helps in soil moisture conservation, weed control, maintenance of soil temperature, thorough mixing of applied manure with soil. The irrigations at weekly interval were provided to crop until maturity stage. Zinc sulphate, wettable sulphur, boron, gypsum, magnesium sulphate applied as foliar application to meet the requirements of micronutrients in mustard. Foliar Spray of Humic Acid (2.5gm/lit) & soil application of Humic Acid mixed with FYM resulted increased vegetative growth in mustard. Crop protection measures like foliar application of Chloropyriphos and Acephate to

control mustard sawfly and aphids respectively, and drenching of COC (3gm/lit) combined with soil application of lime to control club root of mustard are performed.

Hybrid and selfed seed production

The hybridization and selfing activity in mustard during *Rabi-2021* trial was started at 49 DAS and performed for a period of 27 days to generate F₁ seeds from the one A x R hybrid combination, seeds for maintenance (AxB) and selfed seeds of R line and 3 reference varieties.

Post-harvest processes

After attaining physiological maturity, silique of R line, B line (AxB), AxR hybrids and reference lines of mustard were harvested separately from 28.02.2022. After post-harvest activities, the dried seeds the hybrid and self-seeds were weighed and packed. Following this, seeds of hybrid, maintainer line, selfed seeds of B & R lines and selfed seeds of 3 reference varieties were submitted to National Gene Bank, New Delhi on 21.3.2022.

Various hurdles faced in mustard during *Rabi 2021-22* has been categorised as follows:

- Crop growth hurdles: Notable infestation of insect-pests (mustard sawfly & mustard aphids) and diseases (club root) were faced and timely-recommended protection measures were followed.
- Stunted growth of plants from seedling to flowering stage was noticed, to overcome this, measure like soil application of 95 % water soluble humic and fulvic acid accompanied with soil and FYM in 1:1:1 ratio was taken.
- DUS test and Hybrid development related hurdles: Stunted growth of R-line during pod development, reduction in cross success due to human movement between two rows which distanced at a row-to-row distance of 45cm.



DUS test and DUS Data

A total of 24 DUS characters were observed and recorded during eight growth stages on randomly tagged ten plants of each of ABR lines and reference varieties in each replication according to the DUS guidelines of PPVFRA for mustard. All the readings recorded in the field (Data record sheets) was reciprocated from Data register into standard excel sheets.



Visits

- Dr. Sharanabasappa Deshmukh, Entomologist, KSNUAHS, Shivamogga visited the plots and advised about treatment for the sawfly and mustard aphid infestation
- Dr. T. K. Nagarathna, Registrar, PPVFR Authority, New Delhi

made visit to at DUS Testing Centre, PPVFRA, Branch Office, Shivamogga.

2.3. 2. Branch Office, Palampur

Farmer variety of Blackgram (*Vigna mungo* L.) KDM1 was received through Director of Research CSK HPKV, Palampur which was submitted after proper checking of the application with registration PVP PL No. 0803220001 to PPVFR, Authority, New Delhi.

Following notified, farmers' and new varieties were received from Directorate of Research, CSK HPKV, Palampur and were submitted to the PPVFR Authority, New Delhi for registration as per details given below:

Sr. No.	Name of Crop	Denomination	PVP PL
1.	Rice (<i>Oryza sativa</i>)	GOSHA DHAN	0102220002
2.	Rice (<i>Oryza sativa</i>)	Phool Patas	0102220001
3.	Bread wheat (<i>Triticum aestivum</i> L.)	HIM Palam Gehun-3 (HPW-373)	0301220001
4.	Barley (<i>Hordeum vulgare</i> L.)	Him Palam Jau 1 (HBL 713)	0301220002
5.	Kidney bean (<i>Phaseolus vulgaris</i> L.)	Marwah Rajma (MR-01)	2102220001

2.3.3. Branch Office, Pune:



Participation in “ India’s Premier Agri Summit-12th Agrivision” at Reshambagh ground, Nagpur, Maharashtra

Applications for registration of twenty six varieties were received and communicated to the Registry for further processing by Branch office, Pune. The details of varieties submitted are as follows:

Category	Public Sector	Private Sector	Farmers
New	03	--	--
Extant Notified	01	--	--
Extant VCK	11	--	--
Extant Farmers	--	--	06

2.3.4. PPVFR Authority, Branch Office Guwahati

The branch office, Guwahati of Protection of Plant Varieties and Farmers' Rights Authority started functioning from the campus of Assam Agriculture University, Khanapara, Guwahati with the Jurisdiction of Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland, Sikkim, Mizoram and Tripura.

- During the reporting period, one farmer variety application was forwarded to Director Research AAU for characterization.
- Deputy Registrar participated in on-site verification committee in respect of Plant Genome Saviour Community Awardee namely, Dansuri Agril Co Operative Society, Village Langsanti, PO Sarihajan, Dist. Karbi Anglong, Assam 782470 on 21-10-2022.



2.3.5. PPVFR Authority, Branch Office Ranchi

The branch office, Ranchi of Protection of Plant Varieties and Farmers' Rights Authority started functioning from Birsa Agriculture University Campus, S-2, Kanke, Ranchi with the jurisdiction of Jharkhand, Bihar, West Bengal, Odisha, Chhattisgarh and Andaman & Nicobar Islands.

- During the reporting period, one Extant variety application was received at branch office.
- During the reporting period branch office Ranchi has received 4 applications for Plant Genome Saviour Community Award, Plant Genome Savior Farmer Reward and Recognition.

- Deputy Registrar participated in Exhibition of IITF-2021 at Pragati Maidan on November 23, 2021.
- Deputy Registrar participated in “Agrovision Uttar Pradesh 2021” at ICAR- IISR, Lucknow, UP from 16 to 18 December, 2021.
- Deputy Registrar participated in “India’s Premier Agri Summit 12th Agrivision at Reshambagh Ground, Nagpur, Maharashtra, from 24 to 27 December, 2021.



Participation in “Agrovision Uttar Pradesh 2021”

2.4 REGISTRATION OF PLANT VARIETIES

During 2021-22, registration process is completed and certificates were issued for 475 varieties under different crop species (Fig) with maximum number of certificates issued under Extant Notifies Variety 156 followed by New category (137), Farmer (128) and VCK (54). Similarly, highest number of certificates were issued for cereals (312) followed by fibre crops (55), vegetables (38), legumes (29), Oilseeds (14), Flowers (07), Trees (07), fruits (06), Cucurbits (04), Spices (02) and Medicinal & Aromatic Plants (1).

Table 2.8: No. of certificates issued crop group-wise (2021-22)

Crop group	No. of certificate issued	Crop group	No of certificate issued
Cereals	312	Fruits	06
Vegetables	38	Cucurbits	4
Fibre crops	55	Spices	02
Oilseeds	14	Medicinal & Aromatic Plants	01
Legumes	29	Total	475
Flowers	07		
Trees	07		

Chapter 3: DUS Test Centers

3.1 DUS TESTING CENTERS ESTABLISHED UNDER SECTION 19 OF PPVFR ACT 2001 AND RULE 29 (7) OF PPVFR RULES, 2003 IN GOVERNMENT OWNED NATIONAL AGRICULTURAL RESEARCH SYSTEM.

During the period under report 497 double coded candidate varieties representing 37 crop species were tested for DUS characterization and evaluation at 47 centres in the country. These centres are established at locations most suitable either under Central Government or State Government owned agricultural research systems comprising the ICAR, CSIR, SAU or CAU. Dedicated research staff and support were provided as required, to maintain under the control of a designated Principal Investigator nominated by the Head of the Institution at each centre to operate for the testing and evaluation procedures required under the Act, in project mode with the approval of the Authority. The summarised results are as follows:-

3.1.1. DUS TESTING CENTRES FOR RICE:

ICAR-INDIAN INSTITUTE OF RICE RESEARCH, HYDERABAD

DUS testing of 35 new candidate varieties and 2 VCKs (along with F1 seed received from Shivamogga) of 2nd year, 24 new candidate varieties (including 7 EDVs) of 1st year were tested along with 12 reference varieties. The characterization of 65 Farmers varieties were carried out during *kharif* 2021 at ICAR-Indian Institute of Rice Research, Hyderabad as per the guidelines and were characterized for all DUS descriptors. A total of 250 Reference collections of varieties (RCV's) were also grown for multiplication during Rabi season.



Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Rice	24	35	2	65	30/10/2021

The sowing of nursery was done on 8.7.2021(2nd year), 23.7.2021(1st year) & 15.7.2021(FVs). Later, 25-28 days old seedlings were transplanted in the main field on 2.8.2021 & 3.8.2021(2nd year), 21.8.2021(1st year) and 13.8.2021(FVs). The grouping characters (basal leaf sheath color, D50%F, stem length, decorticated grain length, grain type, grain color, amylose content and grain



aroma) among the entries were mostly uniform.

The monitoring team consisted of Dr. L.V. Subba Rao, Principal Scientist/Nodal Officer, Dr. J. Aravind Kumar, Principal Scientist/Co-Nodal Officer, Dr. Jyothi Badri, Senior Scientist/Co-Nodal Officer from ICAR-IIRR, Hyderabad along with representatives from PPVFRA, ICAR-IARI RS, Karnal, ICAR-NRRI and online monitoring was done.

The team opined that grain features should be recorded as per prescribed in DUS guidelines and variability if any be recorded accordingly.

ICAR-NATIONAL RICE RESEARCH INSTITUTE, CUTTACK

The experiment was carried out in Kharif-2021 for DUS testing which had several unique results. All the data from morphological to biochemical analysis were recorded on proper growth stage of crop by following proper guidelines of the Authority. Selfing was done in all purelines for stability analysis in the next year of testing. All the entries varied widely for both qualitative and quantitative characters. These data were computerized in proper format and sent to PPVFRA. The data of reference varieties, local and regional checks which were grown against the candidate varieties and FVs 2nd Year were also sent to PPV &FRA.



Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Rice	30 entries	27 entries	2	5	05.11.2021

A set of 80 (20 FVs for 1st year testing, 31 Candidates for 1st year testing and 29 Candidates for 2nd year testing) rice variety received from PPV & FRA, New Delhi. Germination test results were taken after one week of receiving of seed packets. 1st year FVs, 1st year Candidate and 2nd year Candidate were sown in the nursery on 16.06.21, 26.06.21 and 28.06.21 and transplanted on 27.07.2021, 29.07.2021 and 2.08.2021 respectively with randomized block design in three replications as per the standard recommended DUS test guideline. *Coleoptile colour* was recorded after 7 days of sowing. The crop started attaining flowering in the month of September-October. All the data (Quantitative and qualitative) from morphological to biochemical analysis were recorded in the appropriate growth stage of crop. Selfing was done in FVs 1st year and 4 typical 1st year candidates and selfed seed was collected and stored for the next year testing. A total of 42 reference varieties, 16 local checks and 19 regional checks were used against the candidates and 2nd year FVs having fulfilled the demanded characters. All the data were recorded

in the proper format provided by the authority and send to PPV & FRA, New Delhi on 11th April, 2022.

All the entries were having erect culm attitude except **2122-28** and **2880/3491** (semi erect). Only FV **2880/3494** was found to have very strong Lemma anthocyanin colouration of keel and Lemma anthocyanin colouration below apex. Only FV **2880/3490** were found to have droopy flag leaf attitude of blade in early observation. Only **20RII-H38** Candidate hybrid was showing maximum panicle length of main axis. Among candidate 1st year, only **2122H12** was found to have horizontal flag leaf attitude of blade in late observation. Variety **2122-28**, **2122-29** and **2880/3488** were found to have gold and gold furrow lemma and palea colour. Among 2nd year candidates, only **20RII-H12** were found to have semi erect attitude of secondary branches. Among all the entries FV **2880/3490** was found to have maximum 1000 GW(35g) and FV **2880/3491** was having very low 1000 GW(11g). Grain phenol reaction was present in all entries except **2122H21**, **2122H25**, **2880/3491** and **2880/3494**. Maximum and minimum grain length was found in **20RII-H38** (11.03mm) and **2880/3491**(5.76) respectively. Maximum and minimum grain width was found in **2880/3480**(3.21) and **20RII-H13** (1.98) respectively. Entries **20RII-H19** (8.15mm) and **20RII-H38** (7.82mm) was found to have very long decorticated grain. Entries **2122H16**(2.63mm) and **2880/3480**(2.73) was found to have broad decorticated grain. Only entries **2122H25**, **2122-26**, **20RII-H13**, **20RII-H51** were having short slender decorticated grain. Only entries **20RII-H38** and **20RII-H19** were found to have extra long slender decorticated grain. Among all the entries **2122-26**, **2880/3490** and **2880/3480** were found to have light brown, light red and dark purple decorticated grain respectively. Only entries **2122H17**(30.75) and **2122H18**(1.575) were found to have maximum and minimum content of amylase respectively. Aroma was present in all FVs 1st year. Low alkali spreading value was found in **2122-30**, **20RII-H17** and **2877/2328**.

Out of 64 entries 14 candidates 1st year, 23 Candidates 2nd year were found to be uniform with respect to all the DUS characters. Most of the varieties were showing variation in stem length, panicle length, panicle number/plant, leaf width, leaf length, grain length, decorticated grain length, decorticated grain width. Maximum numbers of offtypes were seen in **2122H22**, **2122-28**, **2122-30** in all three replications. All FVs were found to be non-uniform with respect to two or three quantitative characters. Heterogenous plant populations were found in **2880/3488**(fv 1st year). In this variety 50% plant population was having long grain type of spikelet and while another 50 % population was having short grain type of spikelet.

All the candidate hybrids were found to be similar with their F1 Shimoga with respect to all the DUS characters except a few differences in plant height, Maturity and culm attitude were seen.

Due to COVID-19, the monitoring of DUS plot of ICAR-NRRI was conducted through virtual (online) mode on 05.11.2021 which includes Monitoring Team, Project In-charge, HODs and related staffs.

ICAR-INDIAN AGRICULTURAL RESEARCH INSTITUTE (REGIONAL STATION), KARNAL



DUS testing of seven candidate varieties (CVs) and 10 Farmers varieties (FVs) were undertaken during *Kharif* 2021 at IARI RS, Karnal. Five FVs (2886/2402, 2887/2021, 2887/2020, 2887/2054 and 2881/3945) were under first year testing and another five FVs (*Saraikela*, *Panisayir*, *Badka Gora*, *Dhuchri Dhan* and *Rameshwar Vishnu Bhog*) were under 2nd year testing. The seven CVs and ten FVs were raised along with seventeen reference varieties and seven zonal and national checks. In addition, 15 reference varieties (RVs) were also maintained during *Kharif* 2021.

Another trial on “EDVs vis a vis IV: Herbicide Trial” of candidate varieties was also conducted as per prescribed protocol under transplanted conditions at IARI, RS, Karnal during *Kharif* 2021. Virtual online monitoring of DUS Trials was conducted by Joint Registrar, PPVFRA, New Delhi on 18.10.2021. DUS Data and Test Report of candidate Varieties, Farmers Varieties, Reference Varieties and data of maintenance of reference varieties along with the EDV vs IV Herbicide trial report had already been submitted to Nodal Officer (DUS), IIRR, Hyderabad and to Joint Registrar, PPVFRA, New Delhi



TNAU, COIMBATORE

In rice DUS testing is carried out for 72 entries (1st year entries -17, 2nd year entries -12 & Farmers variety - 43) as per the DUS guidelines. In addition, maintenance and

Crops	New		FV
	1 st year entries	2 nd year entries	
Rice	17	12	43



characterization of ADT 53, ADT 54, CO 52, CO 53 and CR 1009 Sub 1 was carried out.

Some of the entries in farmers' varieties seeds of few entries showed very poor germination. Otherwise candidate entries showed uniformity and stability. Little or no deviation between the candidate hybrid with F1 SMG were observed. Off types were present in one entry however, they are within prescribed limit.

INDIRA GANDHI KRISHI VISHWAVIDYALAYA, RAIPUR

Total 13 farmers' varieties (including 8 Farmer Varieties characterized in 2020) were evaluated for DUS performance. Overall trial condition was good. The date of sowing of seed materials was 06/07/2021 and the materials were transplanted on 25/07/2021.



In the season of *Kharif* 2021-22 we have received total 05 farmers' varieties for DUS testing. Out of these 04 varieties were fully germinated and 01 (one) variety was partially germinated and completed morphological characterization of all the 05 varieties. Online monitoring was done on 28-10-2021. Six (06) out of 08 varieties were uniform for all the traits. The remaining two varieties viz. Reg/2016/1170 and Reg/2018/652 had seed mixture and did not show uniformity for traits. One entry, Reg/2017/2260 was observed to be unique for multiple traits like purple leaf sheath, purple ligule, distribution of anthocyanin colouration on leaf margins with strong anthocyanin colouration on leaf sheath, purple stigma. It was short heighted and medium in duration with late leaf senescence.

ICAR-NEH RESEARCH STATION, LAMPHELPET, MANIPUR

During 2020-21, first year DUS characterization was carried out for 25 farmer varieties of rice along with five reference varieties namely, Mahamaya, Prasanna, Nidhi, RC Maniphou-11 and RC Maiphou-13. The experiment was carried out in randomized complete block design with



three replications under rainfed lowland transplanted condition. Observations were recorded for 48 morphological characters and 14 post harvest characters. In comparison to reference varieties, entry **2886/2239** found distinct for twelve traits namely, presence of basal leaf sheath colour, highest leaf pubescence of blade surface, leaf coloration of auricles (purple), leaf colouration of collar (present), stem length (141-151.7 cm), presence of anthocyanin coloration of internodes, few

panicle number per plant (<11 no.), strong secondary branching, higher 1000 grain weight (≥ 28 g), grain shape being short bold, white decorticated grain color and presence of decorticated grain aroma. Entry(s)



2886/9198, 2886/2208, 2886/2237 & 2886/2198 were found distinct for seven traits namely leaf coloration of auricles (light purple & purple), leaf colouration of collar (present), yellow & purple spikelet colour of stigma, high secondary branching, absence and present of grain phenol

reaction of lemma, short grains with short bold grain shape. The varieties were uniform in their characteristics across three replications. Among them, the lines RCMANIPHOU-6(RCM-5) and RCMANIPHOU-11 (RCM-11) were found to be distinct in few characters in comparisons with reference variety.

ICAR NEH REGIONAL STATION, NAGALAND

Cha 2. Basal leaf sheath colour



ICAR, Nagaland Centre received a total of 23 entries from the PPV & FRA, New Delhi in the year 2021-22. These 23 entries along with Gundri Bhog (REG/2013/757) received in the year 2020-21, were evaluated with 3 checks, RCM-9, Pusa Sughand and Ranjit during kharif season in lowland ecology. The layout and spacing of the field was prepared according to the DUS guidelines. Observations were recorded for the 62 DUS characters on 10 randomly selected plants.

All the entries were found to be distinct from the check varieties. Twenty farmers' varieties were DUS characterized for registration. A total of three varieties, RCM 9, Pusa Sughand and Ranjit are under maintenance breeding and this year we have collected four varieties from Sikkim. Collection of few more rice varieties of NEH region is under progress. A total of 58 rice landraces were collected from Mesulumi, Kikrumba, Losami, Sakraba, P futseromi, Khomi, Porba, Enhulumi and Chobama villages of Phek district, Nagaland. However, there were high incidences of bird damage in rice fields at ICAR Nagaland centre, Medziphema during the crop season.

Table 3.1: Details of DUS testing of candidate varieties in 2021-22:

Crops	New		FV	Date of online monitoring
	1 st year entries	2 nd year entries		
Rice	23 entries received from PPV & FRA, New Delhi during 2021	The entry, REG/2013/757 received in the year 2020	Total=24 (1 entry in 2020 + 23 entries in 2021). So finally 24 candidate varieties were evaluated for DUS testing.	27/10/2021

Table 3.2: List of rice landraces submitted for registration with PPV & FRA

Sl. No .	Denomination	Ecology	Farmer's Name	Address		Geographical Co-ordinates		Altitude (in metres)	Endorsed by
				Village	District	Latitude	Longitude		
1	Muchihalü	Lowland	1. Shekhocuyi	Sakrab a	Phek	25.6169	94.3614	4440	Dr. A ze ze Seyie (Scientist); Dr. Harendra Verma (Scientist) Plant Breeding & Genetics ; Dr. D. J. Rajkhowa (Joint Director) ICAR Research Complex for NEH Region, Nagaland Centre, Medziphema -797106, Nagaland
			2. Thunosolü						
			3. Zashehulü						
			4. Shezopralü						
2	Matikhu	Lowland	1. Shevotolü						
			2. Cusazolü						
			3. Veculü						
			4. Ciekroveyi						
3	Porari	Lowland	1. Zhoduyi						
			2. Muramu						
			3. Khoto						
			4. Vemutha						
4	Mudotsuri	Lowland	1. Suhlüpo						
			2. Veduculü						
			3. Thunohulü						
5	Nejulü	Lowland	1. Kukuhulü						
			2. Nuvekhölü						
			3. Tsüno						
			4. Vemuralü						
6	Vepratso Ri	Lowland	1. Kuvevolü						
			2. Abino						
			3.Vezhoshelü						
			4. Suhlüpo						
7	Nyode	Lowland	1. Zavekho						
			2. Vemuralü						
			3. Veposwulü						
8	Khrumube	Lowland	1. Kewengu						
			2. Zolhi Venuh						
			3. Awele						
9	Visapu Rübe	Lowland	1. Kewengu						
			2. Khwetsolou						
			3. Awele						
			4. Huzumo						
10	Kehabe Mena	Lowland	1. Kewengu	Mesul umi		25.5787	94.3417	156	

			2. Khwetsolou					
			3. Zolhi					
			4. Awele					
11	Pelhi-u Rübe	Lowland	1. Kewengu					
			2. Awele					
			3. Zolhi					
			4. Khwetsolou					
12	Tangu	Lowland/ Upland	1. Kewengu					
			2. Khwetsolou					
			3. Zolhi					
			4. Awele					
13	Nade	Lowland	1. Kewengu					
			2. Khwetsolou					
			3. Zolhi					
			4. Awele					
14	Neingutsu Rübe	Lowland	1. Kewengu					
			2. Khwetsolou					
			3. Awele					
15	Neqha Kumukao	Lowland	1. Theyecülü					
			2. Vecühülü					
			3. Venekholü					
16	Node	Lowland	1. Theyecülü					
			2. Vecühülü					
			3. Venekholü					
17	Nerie Kucho-o	Lowland	1. Mhasheyi					
			2. Venekholü					
			3. Vejilü					
			4. Dzutholü					
18	Hüsüsa Ha	Lowland	1. Mhasheyi					
			2. Dzutholü					
			3. Venekholü					
19	Nerie	Lowland	1. Venekholü					
			2. Mhasheyi					
			3. Dzutholü					
20	Teivelü Ha	Lowland	1. Vejilü					
			2. Mhasheyi					
			3. Venekholü					
			4. Zholü					
				Khomi	25.5869	94.3761	154	

3.1.2. DUS TESTING CENTRES FOR COTTON:

MAHATMA PHULE KRISHI VISWA VIDYALAYA (COTTON), RAHURI

During Kharif 2021, at Cotton Improvement Project MPKV, Rahuri (DUS center for Cotton), there were 6 new hybrids for 1st year, 31 extant VCKs, New and their 29 F1 SMG hybrids for 2nd year under central zone trial, and 14 (Extant VCK, New and EDV) with 14 F1 SMG hybrids were tested for 2nd Year as a candidates varieties.

Due to ongoing Covid Pandemic issues, monitoring was conducted online on 16th November, 2021, with the participation of Dr. K. Rathinavel, (Principal Scientist, CICR, Coimbatore); Dr. V.B. Amolik (Head, Dept of Agril. Botany MPKV, Rahuri); Dr. R.S. Wagh (Cotton Breeder, MPKV, Rahuri); Dr. V. Santhy, (Principal Scientist, CICR, Nagpur) and Joint Registrar, PPVFRA, New Delhi. All observations were recorded and results were submitted in stipulated time with photograph of field. The performance of tested varieties was uniform, satisfactory and good upto harvesting.

Most of the entries were found uniform and stable, except one entry showed differences in few characters in candidate hybrid as compared to F1 SMG hybrid. It may be noted that high rainfall during flowering stage cause flower and boll dropping, excess moisture affected boll opening and more infestation of pink bollworm at latter stage of crop, hence overall productivity of cotton decreased during *Kharif* 2021. The trial included few of the national and common Bt hybrids, e.g., Ajeet-155, Ajeet-199, Ajeet-1155, Dhandev, Rasi-659, Rasi Magic, NCS-9011, Phule 688, Phule Yamuna, Phule Suman, Asha.

Centre has maintained following reference varieties received from CICR Coimbatore, performance of reference varieties were found satisfactory, DUS characters of reference varieties were recorded and maintained purity of particular varieties by roughing and selfing by avoiding the contamination.

Table 3.3: List Varieties under maintenance/characterized:

Sr. No.	Name of Reference Varieties	Sr. No.	Name of Reference Varieties	Sr. No.	Name of Reference Varieties
1	MCU-10	30	SAHANA	59	G.COT.16
2	H-1098	31	KHANDWA-3	60	MCU-12
3	MCU-3	32	NH-452	61	JLH-168
4	SUMAN	33	GSHV-112	62	G.COT.16
5	MCU-11	34	G.COT.18	63	PRS-74
6	REBA-B-50	35	MCU-7	64	MCU-4
7	HLS-329	36	DEVIRAJ	65	SUJATHA
8	LH-900	37	ABADHITA	66	H-974

9	MCU-13	38	MCU-9	67	H-1220
10	SUPRIYA	39	LAKSHMI	68	LRA-5166
11	AKH-07R	40	G. COT.12	69	SUMANGALA
12	JK-4	41	KANCHANA	70	L-604
13	AH-107	42	BADNAWAR-1	71	NARASIMHA
14	NH-545	43	SUMAN GALA	72	F-846
15	MCU-5	44	GUJRAT-67	73	BIKANERI NERMA
16	RMPBS-155	45	J-34	74	SUMAN
17	PH-93	46	DHY-286-1	75	ANJALI
18	RCH-001	47	LH-1556	76	BANDAWAR
19	F-1378	48	BUNNY-FEMALE	77	VIKRAM
20	VC-21	49	NCH-11	78	Phule -688
21	SUVIN	50	T-7	79	Phule -717
22	ACP-71	51	MCU-8	80	Phule 388
23	PRATIMA	52	MCU-5VT	81	Phule-492
24	JCC-1	53	SURABHI	82	Phule-622
25	NCH-419	54	PKV RAJAT	83	NCS-954
26	TCB-209	55	VC-32	84	Ajit-155
27	MDH-89	56	RSP-4	85	Ajit-199
28	SH-2379	57	KHANDWA-2		
29	AKH-081	58	F-846		

ICAR- CENTRAL INSTITUTE FOR COTTON RESEARCH, REGIONAL STATION, NAGPUR

The DUS testing trial for the *Kharif* 2021 was consist of five trials and variety maintenance at ICAR-CICR, Nagpur. The trials included New: 1st Year (6), second year (20), EDV (3), VCK (7) and additional sowing of 46 varieties for maintenance was also taken up. The sowing was at the normal date following the test guidelines. The germination and plant stand were satisfactory for all except two entries in VCK. All the characters as per the National test guideline, descriptors were recorded in the entries sown in three replications for both candidate and F1 SMG separately. The photos of traits have been captured and documented. The virtual monitoring of the trial was held on 16th November 2021. The fibre quality test results for



the entries are awaited and once received the compiled data will be mailed to PI with a copy to the authority. The entries under maintenance breeding were observed for their major characters to ascertain purity and then selfed. Only selfed seeds are being carried forward for next season.

The season witnessed continuous infestation of all types of insect pests and diseases, physiological wilting and leaf reddening due to erratic rainfall and due to heavy rainfall, overall growth of many entries was severely affected. Under EDV trial, the entry, 2873/2495 showed high number of off-types. But, F1 SMG plot was uniform with very a few numbers of off-types. Under VCK trial, one entry 2879/2346 showed poor germination for candidate plot, whereas, >80% germination for F1 SMG plot.

ICAR- CENTRAL INSTITUTE FOR COTTON RESEARCH, REGIONAL STATION, COIMBATORE

Details of DUS testing of candidate varieties in 2020-2021: At ICAR-Central Institute for Cotton Research, Regional Station, Coimbatore, as a nodal center for DUS testing, Distinctiveness Uniformity and Stability testing of cotton genotypes has been done under this project. In addition to ICAR-Central Institute for Cotton Research, Regional Station, Coimbatore, ICAR-Central Institute for Cotton Research, Nagpur; National Seeds project Unit, UAS, Dharwad; Department of Cotton CCSHAU, Hisar; Regional Research Station Bhatinda, PAU and the Department of Cotton, MPKV, Rahuri are the co-nodal centers involved in conducting DUS trials.

Field trials for the characterization and establishment of Distinctiveness, Uniformity and Stability was conducted with 8 hybrids in the first-year trial and 48 candidate hybrids along with its corresponding hybrids produced at PPVFRA center at Shivamoga were accommodated in the second-year trial. Another three entries were for 2nd year trial. The Bt. Hybrids involved in both the trials as references were 17 recommended for cultivation in central and south zone. Field



sowing was taken up on 16.8.2021 in randomized block design with 3 replications. Germination count at 12 DAS in corresponding plot was recorded in all the entries. Morphological characters such as Hypocotyl: Pigmentation, Leaf: Colour, Leaf: Hairiness, Leaf: Appearance, Leaf: Gossypol glands, Leaf: Nectaries, Leaf: Petiole pigmentation, Leaf: Shape, Plant: Stem hairiness, Plant: Stem pigmentation, Bract: Type, Flower: Time of flowering, Flower: Petal colour, Flower: Petal spot, Flower: Stigma, Flower: Anther Filament colouration, Flower: Pollen colour, Flower: Male Sterility, Boll: Bearing habit, Boll: Colour, Boll: Shape, Boll: Surface, Boll: Prominence of tip were recorded in 10 plants of all varieties. The data received from participating centers would be compiled and submitted to PPVFRA for



issue of registration certificate. Monitoring of DUS trials at the participating centers have also been done through online meetings on 16.11. 2021 at CICR, Nagpur and MPKV Rahuri; on 29.12.2021 at CICR Coimbatore and on 20.1.2022 at UAS Dharwad.

Crops	New		VC K	FV	EDV	IV	Date of monitoring
	1 st year entries	2 nd year entries					
Tetraploid cotton	8	96*+3=99		-	-	-	29.12.2021
Diploid cotton	-	-	-	-	-	-	

* 48+48 F1s produced at Shimoga were compared along with the candidate hybrid

During the year 2021-22, the data base on extant cotton varieties and cotton varieties notified under section 5 of the Seeds Act, 1966 has been updated. Data sets of tetraploid and diploid cotton varieties registered under PPVFRA Act, 2001 was acquired from PPVFRA, New Delhi. Maintenance breeding and characterization and of 126 extant cotton varieties and parental lines were carried out in tetraploid and Diploid cotton viz., 80 in *G. hirsutum*, 7 in *G. barbadense*, 36 in *G. arboreum*, 3 in *G. herbaceum*.

Table 3.4: Following varieties under maintenance/characterized:

Crops	Name or no of varieties under maintenance breeding in 2020-2021
Tetraploid cotton- <i>G. hirsutum</i> (80)	Arizona super okra, Anjali, American Nectariless, Acala glandless, Abadhitha, Badnawar, Bhaghya, Bikaneri Nerma, BN Frego, BN Red, CCH 2623, Deviraj, DHY 286-1, EC 344025, EC 344034, Extreme Okra, G Cot. 12, G.Cot. 100, GLM 5, Gujarat 67, HC 122-66, HLS 329, HS 6, J 34, Jalandar , JCC 1, JK 35, JLH 168, K 34007, Khanchana, KEKCHI red, Kemp, Khandwa 2, Khandwa 3, L 604, LAHH 5, Laxmi, LH 900, LRA 5166, LSS, Mahalakshmi, MCU 11, MCU 12, MCU 3, MCU 4, Rajat Bt, Rajat Bt, GJHV 372 Bt, GJHV 372 Bt, PKV 081 Bt, PKV 081 Bt, 2880/3220, P 15(Var. fl.), NC 105, Vikram, Vagad Kalyan, TCH 1716, SVPR 5, Supriya, Suman, Sowbhagya, Sivanandi, Sahana, PRS 74, PRS 72, PKV Rajat, P 15 1, P 15 DP, P 15, NCH 11, NC 217, Narmada, N 1, Mysore Vijaya, MDH 89, MCU 9, MCU 8, MCU 7, MCU 5 VT, MCU 5
Tetraploid cotton- <i>G. barbadense</i> (7)	P 4, RHC 001, RSP 4, SB(YF) 425, Sujatha, Suvin, TCB 209
Diploid cotton- <i>G. arboreum</i> (36)	AKA 7, Aravinda, PA 255, PA 255, Raghavendra, Jayadhar, AK 235, AKA 5, AKA 8, AKA 8401, Cat No.8405 -Brown fuzz, Dhumad, DLSa-17, DS 5, G.Cot. 15, G.Cot. 19, HD 107, HD 226, HD 432, HD110-151, Jawahar tapti,

	JK5, JLA 794, K11, LD 210, LD 327, LD 491, LD 694, PA 183, PA 402, Phule Anmol, Phule Dhanwanrty, RG 18, RG 8, Veena, Y1
Diploid cotton- <i>G. herbaceum</i> (3)	DDhc 11, G.Cot. 23, G.Cot. 25

CCS HISAR AGRICULTURAL UNIVERSITY, HISAR

Details of DUS testing of candidate varieties in 2021-22:

During the year 2021-22 only 15 reference varieties were characterized as per DUS guidelines. Nineteen candidate hybrids and varieties along with 18 reference varieties were grown on 08.05.2022 for testing during 2022-23. Six rows of each entry were sown in two replications with row to row spacing of 90 cm and plant to plant of 60 cm. Plant population maintained as per the DUS Test guidelines. The observations will be recorded on plant, flower, boll, lint and seed characters along with fibre quality parameters.



Crops	New & VCK	
	1 st year entries	2 nd year entries
Cotton	15 (Reference varieties only)	19 + 18 (Reference varieties)

Centre has also maintained/characterized 11 varieties/hybrids in triploid and 4 varieties/hybrid in diploid cotton.

Crops	Name or No of varieties under maintenance breeding in 2021-22
	11 varieties and hybrids: <i>G. hirsutum</i>
	4 varieties and hybrids: <i>G. arboreum</i>

PAU REGIONAL STATION, BHATINDA

PAU RRS Bathinda (DUS centre) has irrigated conditions with cotton sowing window April to mid-May. Due to covid incidences, seeds of entries were recd late from PPVFRA and therefore sowing was delayed till June 2021 due to which crop growth and vigor was not very satisfactory. DUS testing trial was conducted successfully and data was recorded, tabulated and submitted as per guidelines. Breeding lines/reference varieties were maintained with selfing.

New	VCK	EDV	Reference Varieties	Date of monitoring
2876/2230/H	2874/2287/H	2873/2480/H	JCC 1, F 1861, MCU 10,	16/11/2021
2871/2073/H	2870/2104/H	2873/2504/H	RS 810, H 1157, Laxmi,	
2871/2100/H	2869/2385/H	2873/2470/H	Pratima	

2880/2324/H	2874/2285/H	2871/2072/H	J 34, ACP 71, NH 452, Sumangala, NH 545, Kanchana, F 2228 (ZC), JK 4, Badnawar, LH 2298, Abadhita, GSHV 112	
2871/2132/H				
2871/2128/H				

Table 3.5 : List Varieties under maintenance/characterized:

Sl No.	List of varieties under maintenance breeding in 2021-22	Source, Release/commercial release date, if any
1.	LH 2298, F 2228	PAU Ludhiana
2.	H 1157, Sumangala, J 34, Pratima NH 452, NH 545, GSHV112, MCU 5, JK 4, Badnawar, Abadhita, JCC 1, CU 10, Laxmi, ACP 71, Kanchana	Received from CICR Regional Station, Coimbatore

3.1.3. DUS TESTING CENTRES FOR JUTE:

ICAR-CENTRAL RESEARCH INSTITUTE FOR JUTE AND ALLIED FIBERS, BARRACKPORE & CSRSJAF, BUD BUD BURDWAN, WB

Two entries, one each from *Corchorus olitorius* and *Corchorus capsularis* was tested for 1st year growing cycle during 2021. In case of *olitorius* entries, one entry was found to be distinct with respect to seed colour. In case of *capsularis* entries, one was different from other entries with respect to fibre strength. Overall crop growth was satisfactory. Reference collection of both *Corchorus olitorius* (30 varieties) and *Corchorus capsularis* (21 varieties) have been maintained through plant to progeny row method. Database of reference collection has been prepared taking observations during the maintenance of reference collection.



Salient details	Information on practice
Date of receipt of seeds+ list	26.02.2021
Date of planting	16.03.2021
Details of fertilisers given (dose/per acre wise)	N:P:K @14:12:14 kg
Details of pesticides/fungicides/others applied	Carbendazim for seed treatment and spraying in stem rot disease, Profenofos for caterpillars, Spiromesifen for yellow mite

Date of DUS Monitoring	23.8.2021
Date of Harvesting	16.07.21 (for fibre) 23.11.21 (seed)
List of Zonal/Regional check used in trial	JRO 204, JRC 517

Table 3.6: Status of candidate variety registration/Notified by the Centre:

Crops	No of Var notified by the center Since 1966	No of Var notified by the center Since 1999	No of applications filed		Certificates issued
			Extant	Notified New	
<i>C. olitorius</i>	18	14	11	7	9
<i>C. capsularis</i>	11	9	7	5	9

3.1.4. DUS TESTING CENTRES FOR MAIZE:

ICAR-INDIAN INSTITUTE OF MAIZE RESEARCH (ICAR-IIMR)

The DUS testing was carried out successfully on total 53 candidate entries which include 42 hybrids, 8 inbred lines and 3 farmer varieties. Out of 42 hybrids, 10 hybrids were under 1st season of testing and 16 hybrids were in the 2nd season of testing along with their parental crosses which were re-constituted by crossing parents of the hybrids to test stability of the hybrids.

Table 3.7: Details of DUS testing of candidate varieties in 2021-22:

Crops [Maize]	New			Total	Date of monitoring
	1 st year entries	2 nd year entries			
Hybrid	Candidate	Candidate	F ₁ Shivamoga	42	21.09.2021
	10	16	16		
Inbred	07	01		08	
FV	03	-		03	
Total	20	33		53	

The entries of 2nd season were sown side-by-side along with their parental crosses for comparison. In addition, 7 inbred lines were in 1st season of DUS testing, and 1 inbred line was in 2nd season of DUS testing. The DUS trial also includes 20 references, out of which 14 were



hybrids and six were inbred lines.

The overall plant stand, growth and expression of DUS trial were very good in all three replications. Heavy rains along with winds in the months of August caused flood like situations and severe lodging. However, timely intervention through lifting of plants and also earthing-up could save the trial. Data pertaining to DUS characters 1 to 17 have been recorded on standing crop and for the traits 18 to 31 was recorded on the harvested crop as per DUS guideline for all the entries. Maize DUS data of Hybrids and Inbred Lines for 1st and 2nd year entries were



submitted on January 14, 2022. For the trials of entries in 2nd year, all the test entries except few for one or two traits were showing uniformity, the details of discrepancies or mismatch observed were submitted in the monitoring report. Most of F₁ SMG was matching with the original hybrid, however in some particular instances for few traits there were some discrepancies were observed which were pointed-out and submitted in the monitoring report.

The farmers' varieties were not uniform making it difficult for DUS characterization. However, DUS data was recorded based on the common characters in majority of plants with details on variation observed. Farmer's Varieties, i.e., 2886/2211, 2886/2212 and 2877/2761 tested in the first year showed variation in few traits like presence of pigmentation in brace root, silk, tassel structure and also relatively more variation in days to flowering.

3.1.5. SRTC, PROF. JAYASHANKAR TELANGANA STATE AGRICULTURAL UNIVERSITY (PJ TSAU), HYDERABAD

During 2021-22, DUS testing trials of hybrids, inbred lines and farmer's varieties were conducted as per the DUS test guidelines. The trials were conducted for 53 candidate entries comprising 26 hybrids, 16 parental crosses, 3 farmer varieties and 8 inbred lines. Second year candidate hybrids were sown along with the parental crosses produced by PPVFRA at Shivamogga, Karnataka side-by-side for comparative DUS testing. The trial included 22 references comprising 14 hybrids, 6 inbred lines, one zonal check hybrid and one local check hybrid.



The overall plant stand, growth and expression of hybrids and inbred lines were satisfactory and data was recorded accurately and precisely.

All the test hybrids were sown on 28.7.2021 while the inbred lines were sown on 29.7.2021. A healthy crop was raised duly following all the recommended package of practices.

Overall plant stand, growth and expression of test entries were good in all the replications except one 1st year inbred candidate entry (Trial code-2886/2150) which failed to germinate.

Except few, most of the entries have shown uniform expression. Variation within entry for some traits was observed in 2122H2 (1st year candidate hybrid), 2886/2211 (1st year FV), 2886/2212 (1st year FV), 2877/2761 (1st year FV) and 2880/2817 (1st year candidate inbred).

3.1.6. VPKAS, ALMORA

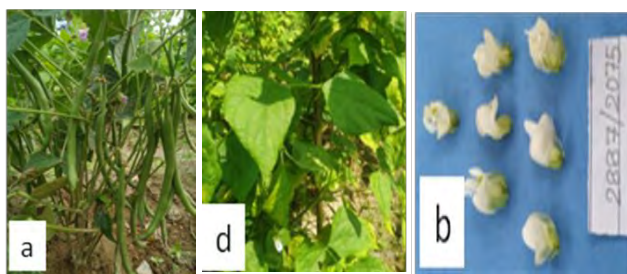
The centre is having a responsibility testing of Kidney bean (Rajma), Soybean and Maize DUS testing. In Kidney bean: Four varieties (one new viz., 2884/2107 & 3 FV viz., 2887/2075, 2887/2076 & 2887/2077) along with three reference varieties viz., IPR 98-5, HUR 137 and PDR 14 were raised and characterized for 22 DUS traits as per national guidelines for the conduct of test for DUS on kidney bean.



Maintenance breeding

Soybean:

One hundred and seventeen 117 reference varieties of soybean and 14 varieties of kidney bean



were raised for maintenance breeding during *Kharif* 2021. Measures were taken to ensure the genetic and physical purity of reference varieties at every stage of crop growth by observing varietal characteristics. The list of the varieties under maintenance is given below.

Table 3.8 :Reference varieties under maintenance at ICAR-VPKAS, Almora

Crop Species	Source of Varieties	Name of the varieties
Soybean	ICAR	DS 228, DS 97-12, Pusa 16, Pusa 20, Pusa 22, Pusa 24, Pusa 37, Pusa 40, NRC 2, NRC 7, NRC 12, NRC 37
	Own	VL Soya 1, VL Soya 2, VL Soya 21, VL Soya 47, VL Soya 59, VL Soya 63, VL Baht 201, VL Soya 77, VL Soya 65 and VL Soya 89
	Others (specify)	ADT1, Alankar, Ankur, Birsa Soya 1, Bragg, CO 1, CO 3, CO Soya 2, Durga, Gujrat Soya 1, Gujrat Soya 2, Gaurav, Hara Soya, Hardee, Improved Pelican, Indira Soya 9, JS 2, JS 71-05, JS 75-46, JS 76-205, JS 79-81, JS 80-21, JS 90-41, JS 93-05, JS 95-60, JS 97-52, JS 335, KB 79, KHSB 2, Kalitur, Lee, LSB 1, MACS 13, MACS 57, MACS 58, MACS 124, MACS 450, MAUS 1, MAUS 2, MAUS 32, MAUS 47, MAUS 61,

		MAUS 61-2, MAUS 71, MAUS 81, Monetta, Palam Soya, PK 262, PK 308, PK 327, PK 471, PK 416, PK 472, PS 564, PS 1024, PS 1029, PS 1042, PS 1092, PS 1241, PS 1347, PS1368, Punjab 1, RAUS 5, Shilajeet, Shivalik, SL 96, SL 295, SL 525, SL 688, TAMS 38, TAMS 98 and Type 49
Rajmash	ICAR	IVFB 1, Arka Anoop, Arka Komal, Suridha & PDR 14
	Own	VL Rajma 63 and VL Rajma 125
	Others	HUR 15, HUR 137, HUR 203 and HUR 35

3.1.7. DUS TESTING CENTRES FOR BREAD WHEAT, DURUM AND OTHER TRITICUM SP.:

ICAR-INDIAN INSTITUTE OF WHEAT AND BARLEY RESEARCH, KARNAL, HARYANA

1. DUS testing in Wheat

In crop season 2021-22, the seed of 25 entries were received from the Authority for DUS testing. These were tested against 37 reference varieties. 07 entries (GKRA-1, WBPR-249, WLCM-257, GBRB-1, GTRA-251, WRCB-421, WRCB- 420) were in 2nd year of DUS testing, while 11 entries (21 N3, 21 N5, 21 N6, 21 N9, 2883/2404, 2883/2409, 2883/2420, 2883/2421, 2883/2424, 2883/2447, 2883/2694) were in 1st year of DUS testing. These were tested in three replications against 37 reference varieties. The trial was sown as per the DUS testing guideline of wheat. The seed of 7 entries (21 N1*, 21 N2*, 21 N4*, 21 N7*, 21 N8*, 21 N10*, 21 N11*) was received in less quantity. So, the DUS test was conducted in three rows plot with three replications. Observations were recorded as per the prescribed guidelines in all the trial.



Fig. 1: DUS trial in wheat during 2021-22

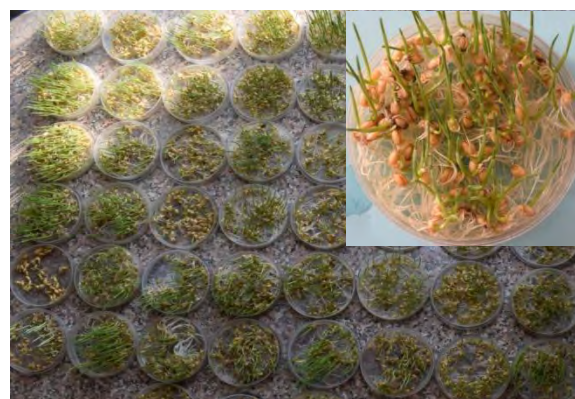


Fig.2: Coleoptile colour in wheat

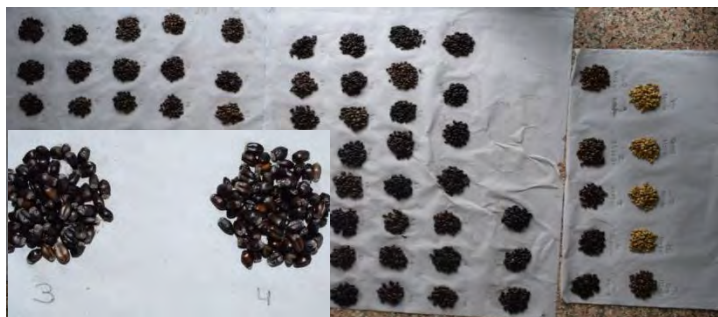


Fig.3: Phenol colouration in wheat

2. Stability testing in Wheat

Stability in the DUS traits was also observed in 07 varieties (2nd year GoT). The harvested seed of the candidate varieties along with original seed received from authority was grown side by side during 2nd year of DUS testing. The observations on DUS character were recorded from both the plots for comparison. All the traits in 07 varieties were stable in 7 varieties.



Fig. 4: Stability in last year harvest seed and PPVFRA seed (1st year)

3. Uniformity testing in Wheat

All the entries except 2 entries (2883/2420 & GBRB 1) exhibited uniformity in DUS testing.



Fig. 5: Variation in plant length in two candidate entries

4. Maintenance of reference and example varieties of wheat

In wheat, one kg seed of 123 example varieties beside 427 reference collection of released varieties are being maintained at IIWBR, Karnal.



Fig. 6 : maintained Reference and Example varieties

5. Registration of varieties with the PP&VFRA

Five wheat varieties namely DBW303, DDW48, MPO1255, DBW93 and MP3382 were registered under extant category by the PPVFRA, New Delhi vide registration number REG/2021/0076, REG/2021/0077, REG/2017/152, REG/2016/421 and REG/2016/1387, respectively. Three registration applications of wheat varieties namely DBW 296, DBW 327, DBW 332 were submitted to PPVFRA.

ICAR-INSTITUTE OF AGRICULTURAL RESEARCH INSTITUTE, REGIONAL STATION, INDORE, MADHYA PRADESH

Details of DUS Testing of Candidate Varieties in 2021-22

IARI, RS, Indore is the Co-Nodal center for Bread Wheat DUS Testing. Wheat Trials during 2021- 22 were sown as per the DUS Test Guidelines of PPVFRA. In crop season 2021-22, seven **Candidate Varieties** (Table 3.10) are being tested against 37 **Reference Varieties** under New/VCK Category in DUS Testing. In addition, 18 **Farmers' Varieties** after purification (1st year) are being tested in two replications.

Table 3.9. Details of varieties in DUS trial at ICAR-IARI, Regional Station, Indore, Madhya Pradesh

Crops	New		VCK	FV	
	1 st year entries	2 nd year entries		1 st year entries	2 nd year entries
Bread Wheat	21N1, 21N3,	21N2, 21N4,	WRCB420, WRCB421,	2883/2694, 2883/2409,	-

21N5, 21N7, 21N9, 21N11,	21N6, 21N8, 21N10,	GTRA251, GBRB1, WLCM257, WPRA249, GKRA1	2883/2424, 2883/2447, 2883/2421, 2883/2404, 2883/2420
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Table 3.10. Details of seven **Candidate Varieties** and 37 **Reference Varieties** in DUS trial at ICAR-IARI, Regional Station, Indore, Madhya Pradesh, as Second Year Entries.

Candidate Varieties	Reference Varieties					
WRCB420	HD 2824	WH1080	DBW88	WH1105	NW1067	Ajanta
WRCB421	PBW373	WH1124	HD2967	HW1085	MP3211	WH416
GTRA251	HD2281	DBW17	PBW660	UP2554	HD2135	
GBR1	GW89	PBW502	Raj4037	HD2932	HS1138-6-4	
WLCM257	GW322	DPW621-50	GW496	HW2045	MLKS11	
WPRA249	DBW110	MP(JW)4106	Ratan (CG5016)	NI5439	RW346	
GKRA1	Raj 4083	KRL210	HD3090	AKAW4627	TAWA267	

Figure 1-12. Snapshots of DUS trials during various phases of data recording, conducting and miscellaneous observations







		
Figure 1. Layout of DUS Trial at ICAR-IARI RS Indore Experimental Block	Figure 2. Sowing of DUS Trial at ICAR-IARI RS Indore Experimental Block	Figure 3. DUS Trial at ICAR-IARI RS Indore Experimental Block at Early Growth Stage
		
Figure 4. Cross testing of coleotile colouration of wheat samples as per directives of PPVFRA	Figure 5. Field View of DUS Trial at ICAR-IARI RS Indore Experimental Block at Early Growth Stage	Figure 6. Field View of DUS Trial at ICAR-IARI RS Indore Experimental Block at Grand Growth Stage



Figure 7. Extending working knowledge of PPVFRA about DUS Testing to the post graduate students of Gujarati Science College, Indore, Madhya Pradesh



Figure 8. Field View of DUS Trial at ICAR-IARI RS Indore Experimental Block at Physiological Maturity Stage



Figure 9. Recording Observations of DUS Trial at ICAR-IARI RS Indore Experimental Block



Figure 10. Field View of DUS Trial at ICAR-IARI RS Indore Experimental Block at Maturity Stage



Figure 11. Harvesting of DUS Trial at ICAR-IARI RS Indore Experimental Block in presence of Co-PI (DUS Wheat) project



Figure 12. Recording phenol colouration test of wheat grain sample as per directives of PPVFRA

Varieties under maintenance/characterized: 130 reference collection of wheat varieties are being maintained at Referral Library of ICAR-IARI, Regional Station, Indore.

Crops	Name or No of varieties under maintenance breeding in 2021-22
Wheat	Released varieties <i>aestivum</i> -80 Released varieties <i>durum & dicoccum</i> -50
Total	130

Summary: The plots were laid out as per PPVFRA guidelines. Candidate varieties were grown side by side to the reference varieties for comparison. The overall performance of the DUS trials was very good. Few of the candidate varieties have 1.5-3.5% mixture whereas the mixture percentage in farmer's varieties was quite high. The claimed characteristics were found to be expressed throughout the trials. The monitoring was conducted when the crop was in the soft dough stage by the Co-nodal Officer of the DUS Test at Indore, due to COVID-19 pandemic. Most of the candidate varieties of DUS trials expressed the claimed characteristics at the time of monitoring. Awareness about importance and knowhow including legality of the importance of PPVFRA, New Delhi was disseminated to the visiting farmers during the growth stages and students also.

UNIVERSITY OF AGRICULTURAL SCIENCES, DHARWAD, KARNATAKA

During 2021-22, none of the durum wheat candidates were there for evaluation, and hence, 68 reference varieties were characterized for DUS characters and maintained.

Additional DUS characters which are most feasible for durum wheat namely, Flag leaf: anthocyanin coloration of auricles, Flag leaf: hairs on auricle, presence of bristles, beak colour and awn colour (green stage) were recorded during 2021-22. These traits may be relooked in other centers to be proposed to include in DUS guidelines. Majority of the dicoccum wheat cultivating farmers have maintained local types and cultivating for consumption purpose. In this regard, fifteen Farmers' Varieties including *T. dicoccum* and *T. aestivum* species collected from three different districts were evaluated and purified during previous *rabi* season 2020-21. During *rabi* 2021-22, these farmers varieties were evaluated as per DUS guidelines involving 45 characters representing growth habit characters, ear head characters, grain characters, etc.

The data generated will be utilized for registration of these Farmers' Varieties which is under process.

Table 3.11: Details for Farmers' Varieties

Sl. No	Name of the applicant	Species	Local Name
1	Roopa Chidambar Kulkarni, At: Dhavaleshwar, Tq: Mudalagi, Dist: Belgavi	<i>Triticum dicoccum</i>	Kapali
2	Dhareppa Parappa Kittur, At:Sasalatti, Tq: Rabakavi-Banahatti, Dist: Bagalkot	<i>Triticum dicoccum</i>	Sadak
3	Mahadev Bheemappa Rangapur, At: Itnal, Tq: Raibag, Dist: Belgavi	<i>Triticum dicoccum</i>	Sadak
4	Shivappa Basappa Mugalkod, At: Mudalgi, Tq: Mudalgi, Dist: Belgavi	<i>Triticum dicoccum</i>	Sadak
5	Smt. Suvarna Babu Kamate, At: Hirekodi, Tq: Chikkodi, Dist: Belgavi	<i>Triticum dicoccum</i>	Kapali godi
6	Kallappa Gurupad Yaladegi, At: Shegunshi, Tq: Athani, Dist: Belgavi	<i>Triticum dicoccum</i>	Sadak
7	Prabhukar Shivaling Sollapure, At: Yaksamba (Kallol), Tq: Chikkodi, Dist: Belgavi	<i>Triticum dicoccum</i>	Kapali
8	Krishnappa Arjun Channal, At: Dhavaleshwar, Tq: Gokak, Dist: Belgavi	<i>Triticum dicoccum</i>	Sadak
9	Baramgouda Hanumanthgouda Chikkangoudar, At: Bairanatti, Tq: Naragund, Dist: Gadag	<i>Triticum dicoccum</i>	Sadak
10	Mr. Santhoshkumar Pujer, Gosabal, Tq Gokak, Dst: Belgaum-591229	<i>Triticum dicoccum</i>	Sadak
11	Praveen Pattar, At:Darur, Tq: Athani, Dist: Belgavi	<i>Triticum dicoccum</i>	Sadak

12	Kallappa Mali, At: Hidkal, Tq: Raibag, Dist: Belgavi	<i>Triticum dicoccum</i>	Sadak
13	Rudrappa Julpi, At: Hulyal, Tq: Jamakhandi, Dist: Bagalkot	<i>Triticum aestivum</i>	Hulyal Julpi Godi (HZG 30)
14	Rudrappa Julpi, At: Hulyal, Tq: Jamakhandi, Dist: Bagalkot	<i>Triticum aestivum</i>	Hulyal Local -1
15	Rudrappa Julpi, At: Hulyal, Tq: Jamakhandi, Dist: Bagalkot	<i>Triticum aestivum</i>	Hulyal Local -2
16	Rudrappa Julpi, At: Hulyal, Tq: Jamakhandi, Dist: Bagalkot	<i>Triticum aestivum</i>	Hulyal Local -3

3.1.8. DUS TESTING CENTRES FOR SORGHUM:

ICAR- INDIAN INSTITUTE OF MILLETS RESEARCH, RAJENDRANAGAR, HYDERABAD, TELANGANA

1. No. of varieties for DUS testing

Crops	New		VCK	FV
	1 st year entries	2 nd year entries		
<i>Kharif</i> 2021	2	-	-	-
<i>Rabi</i> 2021-22	-	-	-	-

2. No. of reference and example varieties maintained at the centre

No. of reference and example varieties under maintenance breeding during 2021-22	119 Sorghum varieties (including parental lines- male sterile/maintainer/restorer, hybrids and OPVs)
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3. Summary of the DUS result (in only in one para)

During the year under report, field trials were conducted during *kharif* 2021 and *rabi* 2021-22 seasons for examining the DUS traits in candidate varieties and reference varieties of sorghum as per the PPVFRA test guidelines. Two candidate varieties were tested during *kharif* season under 1st year testing. The crop growth and expression of DUS traits were very good during the season. Data were enumerated as per revised DUS test guidelines and submitted to PPVFRA. All the *kharif* adapted example varieties were planted in a replicated trial for characterization. During *rabi*

2021-22 maintenance breeding/characterization was undertaken for 119 reference varieties including parental lines of hybrids and open-pollinated varieties under enforced selfing/controlled pollination.

4. Whether monitoring is done or not (date of monitoring and committee members): No

5. Any other information—List of varieties under maintenance breeding

Sl.No.	Reference variety	Sl.No.	Reference variety	Sl.No.	Reference variety
1	AKR 354	41	DJ 6514	81	PhuleMadhur
2	AKR 73	42	GFS 4	82	PhuleMaulee
3	AKSSV 22	43	GFS 5	83	Phule Panchami
4	APK 1	44	GJ 9	84	PhuleRevathi
5	BP 53	45	GJ 35	85	PhuleRohini
6	BSR 1	46	GJ 36	86	PhuleVasudha
7	C 43	47	GJ 37	87	PKV Kranti
8	CB 11	48	GJ 38	88	PSB 3
9	CB 33	49	GJ 39	89	PSB 9
10	CO(S) 28	50	GJ 40	90	PSR 23
11	CS 3541	51	HC 171	91	PSR 34
12	CSV 7R	52	HC 260	92	PSV 1
13	CSV 8R	53	HC 308	93	PSV 2
14	CSV 10	54	HJ 513	94	PSV 56
15	CSV 12R	55	Indore 12	95	PusaChari 23
16	CSV 13	56	JJ 741	96	PVK 400
17	CSV 14R	57	JJ 938	97	PVK 801
18	CSV 15	58	K 8	98	PVR 453
19	CSV 17	59	K 11	99	RS 29
20	CSV 19SS	60	M 35-1	100	RS 627
21	CSV 20	61	Mant 1	101	RS 647
22	CSV 21F	62	MP Chari	102	RS 673
23	CSV 23	63	MR 750	103	Selection 3
24	CSV 24SS	64	NSV 13	104	SPSSV 30
25	CSV 216R	65	N 15	105	SPV 1430
26	CSV 27	66	NTJ 3	106	SPV 2018
27	CSV 28	67	NTJ 5	107	SPV 462
28	CSV 29R	68	PalamuruJonna	108	SSG 59-3
29	CSV 33MF	69	Pant Chari 3	109	SSV 74
30	CSV 34	70	Pant Chari 4	110	SSV 84
31	CSV 36	71	Pant Chari 5	111	SU 1080
32	CSV 37	72	Pant Chari 6	112	Surat 1
33	CSV 39	73	Parbhani Dagadi	113	Swathi
34	CSV 40F	74	Parbhani Moti(1411)	114	UP Chari 2
35	CSV 41	75	Payur 2	115	463 A
36	CSV 42	76	PDKV HurdaKartiki	116	463 B
37	DSV 1	77	PDKV Kalyani	117	ICS 467 B
38	DSV 4	78	PhuleAmrutha	118	CSH 14 (AKMS 14A x AKR 150)

39	DSV 5	79	PhuleAnuradha	119	CSH 24MF (ICS 467A x Pant Chari 6)
40	DSV 6	80	PhuleChitra		

5. Few selected important photographs

Photographs of some DUS traits

a. Leaf sheath: Anthocyanin pigmentation



Absent (2886/2137/H)



Present(CSH 24 MF)

b. Stigma: Yellow colouration



Present (2849/2023/H)

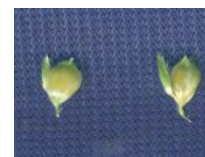


Absent
(CSH 24 MF)

c. Flower with pedicel: Length of flower



Long
(2886/2137/H)



Medium (CSH 24 MF)

d. Panicle: Density at maturity (ear head compactness)



Semi loose
(2886/2137/H)



Loose (CSH 24 MF)



Long (2849/2023/H)



Medium (CSH 24 MF)

e. Grain: Texture of endosperm (in longitudinal section)

 $\frac{3}{4}$ farinaceous
(2849/2023/H)Half vitreous (CSH 24
MF)

f. Grain: Colour of vitreous albumen

Greyed yellow
(2849/2023/H)Greyed orange (CSH 24
MF)

g. Grain: Size of mark of germ

MAHATMA PHULE KRISHI VIDYAPEETH, RAHURI, AHMEDNAGAR, MAHARASHTRA

I) Season: *Kharif*-

Trial No I- Candidate varieties 02 along with 01 reference varieties. Trial No 2- 56 reference varieties.

II) Season: *Rabi*-

114 Reference varieties.

2. Performance/Target achieved:

In the 1st trial 02 Candidate varieties along with 01 reference variety and 2nd trial 56 reference varieties tested during *Kharif*-2021 and 114 reference varieties were tested during *rabi* season in year 2021-22. The recorded datasheet of trial is submitted to the Nodal centre: Indian Indian Institute of Millet Research, Rajendranagar, Hyderabad.

I) Season: *Kharif*-

Trial No 1- Candidate varieties 02 along with 01 reference varieties

Trial No 2- 56 reference varieties .

II) Season: Rabi-

114 Reference varieties

3. Financial performance/Target fixed:

As per the budget DUS Project on Sorghum at All India Co-ordinates Sorghum Improvement Project, MPKV, Rahuri has received following grants during financial year 2021-22

Table 3.12: Funds received during 2021-22

S. No.	Particulars	Amount (Rs.)
1	Allocated budget for F.Y. 2021-22	6,75,000/-
2	Man Power: One IRF @ 31,000/- + HRA	4,87,000/-
3	Field expenses + Contingency	1,63,000/-
4	Travel	25,000/-

Annexure-B Details of Manpower

Sr. No	Post	Number of Post	Amount (Rs.)
1	*Junior Research Fellow	One	@31,000/- + HRA

*Note- One IRF appointed from 12th April 2022 (Mr. Ranjeet Anil Tambe)

4. Financial performance/Target achieved:

DUS Project on Sorghum at Sorghum Improvement Project, MPKV, Rahuri had utilized the grants received during financial year 2021-22 as below

Sr. No	Budget head	Amount (Rs.)
1.	Salary	2,62,948/-
2.	T.A.	00/-
3.	Recurring contingency	1,63,000/-
4.	Balance	2,49,052/-
	Total	6,75,000/-

3.1.9. DUS TESTING CENTRES FOR PEARL MILLET

BAJRA RESEARCH SCHEME, COLLAGE OF AGRICULTURE, DHULE, MAHARASHTRA

Financial progress

As per the budget DUS Project on Pearl Millet at ICAR-All India Co-ordinated Research Project on Pearl Millet, Bajra Research Scheme, College of Agriculture, Dhule has received following grants during financial year 2021-22

1	Sanctioned budget during FY 2021-22	6,82,800/--
2	Fund released during FY 2021-22	5,79,340 (Unspent from FY 2020-21) + 2,00,000 = 7,79,340/-
3	Amount utilized	5,25,412/--
4	Unspent balance, if any	2,53,928/--
5	Whether UC/work done report/SoE is submitted	Submitted

Part B: Technical progress (Performance/Target achieved):

The DUS testing of 21 candidate and one farmer's varieties for first year and 04 candidate varieties and one farmer's varieties for second year as per guidelines conducted successfully during *kharif* 2021 and data recorded. The stage wise photographs were also taken for candidate varieties. The recorded datasheet and stage wise photographs of *Kharif* 2021 trial is submitted to the Nodal center: P.C., Unit, ARS, Mandor, Jodhapur.

1.	No. of entries tested for DUS in the last three years	
	2019: Ist Year -Candidate Varieties-06, Farmer varieties -12 IInd Year -Candidate Varieties-07, Farmer varieties -02 2020: Ist Year -Candidate Varieties-08, Farmer varieties- IInd Year -Candidate Varieties-03, Farmer varieties -02 2021: Ist Year -Candidate Varieties-21, Farmer varieties- 01 IInd Year -Candidate Varieties-04, Farmer varieties -01	
2.	Whether results submitted along with replication-wise 10 plants data and photographs representing distinct trait of candidate varieties	Submitted to Nodal Centre, PC Unit, Mandor, Jodhapur (Rajasthan) for onward transmission to Registrar, PPVFRA No.ACD/BRS/data sheet/DUS/408/22 dated 14/01/2022
	If submitted, date of submission of softcopy to the Registrar/Joint Registrar	
3.	No. of reference varieties maintained at DUS centre	--
	Whether replicated data of reference varieties submitted to the Authority	Yes
4.	Technical man-power engaged in the DUS project	01 JRF from 1/06/2021

AGRICULTURE RESEARCH STATION, MANDORE, JODHPUR

Details of DUS testing of candidate varieties in 2021-22

Crops	New		FV	Date of monitoring
	2 nd year entries	1 st year entries + Reference varieties		
Pearl Millet	04	21	02	-

Table 3.18: List of varieties under DUS testing during 2021-22

A. Second Year Test (New):04

S. No.	Name of Variety	S. No.	Name of Variety
1	2020 PM H1 - CH	3	2020 PM H2 - CH
2	2020 PM H1 - SMGH	4	2020 PM H2 - SMGH

B. First Year Test (New + Reference): 21

S. No.	Name of Variety	S. No.	Name of Variety	S. No.	Name of Variety
1	2021 H1	8	2021 H9	15	2021 - 4
2	2021 H2	9	2021 H10	16	2021 - 5
3	2021 H3	10	2021 H11	17	2021 - 6
4	2021 H4	11	2021 H12	18	2021 - 7
5	2021 H5	12	2021 H13	19	2021 - 8
6	2021 H6	13	2021 - C	20	2021 - 9
7	2021 H7	14	2021 - 2	21	2021 - 10

C. Farmers' Varieties:02

S. No.	Name of Variety
1	FV 1 - 2879/2288
2	FV 2 - 2886/2407

b) Data submission of Kharif 2021-22: √Yes/No (hard copy/soft copy√)

Key observations of the Monitoring team (1-2 points max):

c) Varieties under maintenance/characterized: 56

Crops	Name or No of varieties under maintenance breeding in 2020-21
Pearl Millet	56 (List enclosed) updated data has been submitted for 2020-2021

Data submission (Maintenance Breeding): √Yes/No

D: Reference/example varieties maintained:

S.No.	Reference/example varieties	S.No.	Reference/example varieties	S.No.	Reference/example varieties
1	81 B	20	J 2454	39	RHB 173
2	841 B	21	J 2467	40	MPMH 17
3	842 B	22	ICMR 356	41	RHB 121
4	843-22 B	23	H 77/833-2-202	42	GHB 558
5	ICMB 88004	24	G 73-107	43	GHB 744
6	ICMB 92333	25	H 77/29-2	44	GHB 732
7	ICMB 92777	26	H 77/833-2	45	ICMH 356
8	ICMB 93333	27	H 90/4-5	46	HHB 67 Improved
9	ICMB 94555	28	HBL 11	47	HHB 197
10	ICMB 94111	29	RHRBI 1314	48	HHB 223
11	ICMB 95222	30	RIB 3135-18	49	Pratap
12	ICMB 97111	31	RIB 494	50	Nandi 61
13	ICMB 97444	32	RIB 335/74	51	86M64
14	ICMB 02333	33	PIB 686	52	Kaveri Super Boss
15	ICMB 04999	34	MIR 525-2	53	86M86
16	RHRB 1B	35	RHB 177	54	MP 7792
17	RHRB 5B	36	GHB 538	55	JKBH 26
18	RHRB 13B	37	GHB 719	56	Proagro 9444
19	J 2340	38	PB 106		

5. Financial progress (copy of SoE and UC for FY 2021-22 are enclosed) (item details may be mentioned)

Items	Unspent balance as on 1 st April, 2021	Interest accrued/other income for the DUS centre	Budget FY 2021-22	Funds released in FY 2021-22	Total fund available for expenditure 2021-22	Expenditure in FY 2021-22	Unspent balance as on 1 st April 2022
Manpower (SRF/RA/TA)	34825.00	0.00	487000.00	1215175.00	1250000.00	487200.00	525765.00
Non-Recurring		0.00	0.00			0.0	
Recurring (field expenses and contingency)		0.00	237800.00			237035.00	
Others (TA)		0.00	25000.00			0.00	

Total	34825.00	0.00	750000.00	1215175.00	1250000.00	724235.00	525765.00
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Table 3.13: Financial requirement for 2022-23

Items	Funds required	Justification
Existing Position		
Technical manpower (indicate JRF/SRF/RA/TA and no of manpower required)	495600.00	SRF Salary @ Rs. 35000 +18% HRA(Rs. 41300 x 12 month)
Field Expenses and Contingency	350000.00	Contingency amount for field research work
T.A.	50000.00	T.A. for P.I./Technical Manpower
Total	895600.00	

1. **Training cum Awareness programme conducted, publications and other significant achievements, if any:**

Training cum Awareness programme was held at ICAR-AICRP on Pearl Millet at Jodhpur on 28th September 2021.



3.1.10. DUS TESTING CENTRES FOR FINGER MILLET, FOXTAIL MILLET, BARNYARD MILLET, PROSO MILLET, LITTLE MILLET, KODO MILLET

AICRP ON SMALL MILLETS, UNIVERSITY OF AGRICULTURAL SCIENCES, GANDHI KRISHI VIGYAN KENDRA, BANGALORE

Table 3.14: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Finger millet	7	-			-

Foxtail millet	2	-			-
Kodo millet	1	-			-
Barnyard millet	2	-			-
Little millet	1	-			-

Table 3.15: Varieties under maintenance/characterized:

Crops	Name or No. of varieties under maintenance breeding in 2021-2022
Finger millet	77
Foxtail millet	28
Kodo millet	26
Little millet	17
Proso millet	12
Barnyard millet	12

Salient Achievements

The testing entries in finger millet, foxtail millet, little millet, barnyard millet and Kodo millet were characterized in replicated trails for DUS traits along with reference varietal sets as per the DUS guidelines prescribed for each crop by PPV and FRA. During the *Kharif* 2021, first year DUS characterization has been done for finger millet, foxtail millet, little millet, barnyard millet and Kodo millet lines. Trails were conducted in three replications and all entries were characterized for DUS traits along with reference varietal sets.

Progress report

During the *Kharif* 2021, first year DUS characterization has been done for Finger millet, Foxtail millet, little millet, barnyard millet and Kodo millet lines. Testing entries were evaluated in replicated trials were characterized for DUS traits along with reference varietal sets as per the DUS guidelines prescribed for each crop by PPVFRA. The description of the progress report in different millets has been mentioned below.

Finger millet

DUS testing for finger millet has been conducted at DUS lead center, PC unit (Small millets), AICRP on Small Millets, Bengaluru and cooperative center Athiyandal, Tamilnadu during *Kharif* 2021. For Finger millet, a total of 7 testing entries in replicated trial and along with 77

reference varieties have been characterized as per the DUS guidelines prescribed for finger millet by PPVFRA. The DUS testing entries were sown 3 replications, four rows each of 3.0 m length with spacing of 22x10 cm.

For finger millet, a total of 26 characters have been considered for DUS characterization. For each character, the range of values were recorded in the coded form. Further, these 26 characters have been grouped in to 5 grouping characters as per the DUS guidelines prescribed for finger millet crop by PPVFRA.

Foxtail millet

DUS testing for Foxtail millet has been conducted in PC unit, Small millets, AICRP on Small Millets, Bengaluru and Athiyandal, Tamilnadu during *Kharif* 2021. For Foxtail millet, a total of 2 testing entries, along with 28 reference varieties have been considered for DUS characterization as per the DUS guidelines prescribed for each crop by PPVFRA. The DUS testing entries were sown in 3 replications, four rows each of 3.0 m length with spacing of 22x10 cm.

For Foxtail millet, a total of 23 characters have been considered for DUS characterization. For each character, the ranges of values were recorded in the coded form. Further, these 23 characters have been grouped in to 5 grouping characters as per the DUS guidelines prescribed for foxtail millet by PPVFRA.

Kodo millet

Kodo millet one test entry along with 26 reference varieties were tested in the field for DUS characterization during *Kharif* 2021. DUS characterization is carried out as per the DUS guidelines prescribed for Kodo millet by PPVFRA. According to DUS guidelines, a total of 30 characters were recorded in Kodo millet for both DUS observation lines and reference variety set. For each character, the ranges of values were recorded in the coded form.

Barnyard millet

DUS testing for barnyard millet has been conducted in PC unit, Small millets, AICRP on Small Millets, Bengaluru and Athiyandal, Tamilnadu during *Kharif* 2021. For Foxtail millet, a total of two testing entry, along with 12 reference varieties have been considered for DUS characterization as per the DUS guidelines prescribed for each crop by PPVFRA. The DUS testing entries were sown in 3 replications, four rows each of 3.0 m length with spacing of 22 x10 cm.

For barnyard millet, a total of 22 characters have been considered for DUS characterization. For each character, the ranges of values were recorded in the coded form. Further, these 23 characters have been grouped in to 5 grouping characters as per the DUS guidelines prescribed for foxtail millet by PPVFRA.

Little millet

DUS testing for little millet has been conducted in PC unit, Small millets, AICRP on Small Millets, Bengaluru and Athiyandal, Tamilnadu during *Kharif* 2021. For Foxtail millet, a total of

1 testing entry, along with 17 reference varieties have been considered for DUS characterization as per the DUS guidelines prescribed for each crop by PPVFRA. The DUS testing entries were sown in 3 replications, four rows each of 3.0 m length with spacing of 22x10 cm.




For little millet, a total of 20 characters have been considered for DUS characterization. For each character, the ranges of values were recorded in the coded form. Further, these 23 characters have been grouped in to 5 grouping characters as per the DUS guidelines prescribed for foxtail millet by PPVFRA.








Table 3.16: New testing entries were received during *Kharif-2022*

SL. No	Crop	Trial Code
1	Finger Millet	22 K Ragi 1
2	Finger Millet	22 K Ragi 2
3	Finger Millet	22 Kh Ra F1
4	Finger Millet	22 KhRa F2
5	Finger Millet	22 Kh Ra F3
6	Finger Millet	22 Kh Ra F4
7	Finger Millet	22 Kh Ra F5
8	Finger Millet	22 Kh Ra F6
9	Finger Millet	22 Kh Ra F7
10	Foxtail Millet	22 Kh FF1
11	Foxtail Millet	22 Kh FF2

Test entries of finger millet and foxtail millet will be evaluated during kharif-2022 with references sets as per the DUS guidelines prescribed for each crop by PPVFRA. The DUS testing entries were sown in 3 replications, four rows each of 3.0 m length with spacing of 22x10 cm.

Representative images of test entries (Finger millet and Little millet)

Finger millet (2886/2335)	Finger millet (2886/2336)	Finger millet (2887/2046)
		

Finger millet (2887/2047)	Finger millet (2880/3389)	Finger millet (2883/2663)
		
Finger millet (2883/2680)		
		
Foxtail millet (2887/2048)	Barnyard millet (2886/2334)	Little millet (2886/2332)
		

Foxtail millet (2887/2050)	Barnyard millet (2887/2049)	Kodomillet (2887/2040)
		

CENTRE OF EXCELLENCE IN SMALL MILLETS, TAMIL NADU AGRICULTURAL UNIVERSITY, ATHIYANDAL, TAMIL NADU

1. Details of DUS testing of candidate varieties in 2021-22

Crops	1 st year entries	2 nd year entries	VCK	FV	Date of Monitoring
1. Finger millet	7	-	-	-	-
2. Foxtail millet	2				
3. Kodo millet	1				
4. Little millet	1				
5. Barnyard millet	2				

5. Varieties under maintenance/characterized:

Crops	No. of varieties under maintenance breeding in 2021-22
Finger millet	77 reference varieties
Foxtail millet	28 reference varieties
Kodo millet	26 reference varieties
Little millet	17 reference varieties
Barnyard millet	12 reference varieties
Proso millet	12 reference varieties
Browntop millet*	69 reference varieties

Progress during 2021-22

Finger millet:

Seven new first year DUS test entries 2880/3389, 2883/2663, 2883/2680, 2886/2335, 2886/2336, 2887/2046 and 2887/2047, were characterized along with 77 reference materials were evaluated during *kharif*, 2021. The test entries were evaluated in four rows, each in 3m length in four replications with the spacing of 22.5 x 10 cm. Each reference entry was raised in two rows of 3m in length. In finger millet 26 characters were used for characterization.

Foxtail millet:

A total of two testing entries 2887/2048 and 2887/2050 along with 28 reference varieties have been characterized as per the DUS guidelines during *kharif*, 2021. All the test entries were evaluated in four rows, each in 3m length in four replications with the spacing of 22.5 x 10 cm. Each reference entry was raised in two rows, each in 3m length. In foxtail millet, 23 characters were used for DUS characterization. All the entries were uniform.

Kodo millet:

One test entry 2887/2040, of kodo millet along with 26 reference varieties were characterized during *kharif*, 2021 at Athiyandal, Tamil Nadu. The test entries were evaluated in four rows, each in 3m length in four replications with the spacing of 22.5 x 10 cm. Each reference entry was raised in two rows, each in 3m length. A total of 30 characters were recorded for DUS observation.

Little millet:

One test entry 2886/2332 in little millet along with 17 reference varieties were characterized during *kharif*, 2021 at Athiyandal, Tamil Nadu. A total of 20 characters were recorded for DUS observation. All the test entries were evaluated in four rows, each in 3m length in four replications with the spacing of 22.5 x 10 cm. Each reference entry was raised in two rows, each in 3m length.

Barnyard millet :

A total of two test entries 2886/2334 and 2887/2049, in barnyard millet along with 12 reference lines were evaluated at Athiyandal during *kharif*, 2021. The test entries were evaluated in four rows, each in 3m length in four replications with the spacing of 22.5 x 10 cm. Each reference entry was raised in two rows, each in 3m length. A total of 20 characters were recorded for DUS observation.

Salient Achievements

- All the seven finger millet varieties were uniform
- Two foxtail millet entries and two barnyard millet entries were uniform.
- Kodo millet and Little millet entry was also uniform

- The first year entries of seven number in finger millet 2880/3389, 2883/2663, 2883/2680, 2886/2335, 2886/2336, 2887/2046 and 2887/2047, two number in foxtail millet 2887/2048 and 2887/2050, one number in Kodo millet 2887/2040, two number in Barnyard millet 2886/2334 and 2887/2049, and one in Little millet 2886/2332 were evaluated during *kharif*, 2021. The same entries will be evaluated for second year DUS testing during *kharif*, 2022 for validation.

Finger millet



Foxtail millet



Kodo millet



Little millet



3.1.11. DUS TESTING CENTRES FOR CHICKPEA

MAHATMA PHULE KRISHI VIDYAPEETH, RAHURI, AHMEDNAGAR, MAHARASHTRA

I) Season: *Rabi* 2021-22

Total Varieties Tested: 22 (Farmer's varieties: 02 + 20 Reference varieties were sown on 10.11.2021 and tested during *Rabi* 2021-22.

2. Performance/Target achieved:

The DUS testing of 02 farmer's varieties along with 20 reference varieties of chickpea was tested during *Rabi* 2021-22. The soft copy of recorded data of 02 farmer's varieties along with 20 reference varieties of chickpea was submitted to PPV & FRA Authority and Nodal Center, Project Coordinator (Chickpea), IIPR, Kanpur on 20.05.2022 by email and similarly same copy of data (hard copy) submitted by speed post on 23.05.2022.

3. Financial performance/Target fixed:

As per the sanctioned budget this Project has received following grants during financial year 2021-22

Funds received during 2021-22 Annexure-A

Sr.No	Perticulars	Amount (Rs.)
1	Allocated Budget for F.Y. 2021-22	6,62,200/-
2.	Man Power: One SRF @ 35,000/- + HRA	4,53,600/-
3.	Field expenses + contingency	1,83,600/-
4.	Travel	25,000/-

Annexure-B Details of Manpower

Sr.No	Post	Number of post	Amount (Rs.)
1	*Senior Research Fellow	One	@35,000/- + HRA

*Note- One SRF appointed from 8th April 2022 (Dr. Arvind Sanjay Totre)

4. Financial performance/Target achieved:

“DUS Testing of Chickpea” at Pulses Improvement Project, MPKV, Rahuri has utilized the grants as below received during financial year 2021-22.

Sr. No	Budget head	Amount (Rs.)
1	Salary	2,85,740/-
2	T.A.	-
3.	Recurring contingency	1,83,293/-
4.	Balance	1,93,167/-
	Total	6,62,200/-



Visit of Dr. S.R. Gadakh, Director of Research, MPKV, Rahuri on 18 Jan. 2022



Visit of Mr. Pramod Lahale, Registrar, MPKV, Rahuri on 28 Feb. 2022



Field View of Chickpea DUS trial Rabi 2021-22 at Pulses Improvement Project, MPKV,

ICAR- INDIAN INSTITUTE OF PULSES RESEARCH, KANPUR, UTTAR PRADESH

Two farmers chickpea varieties viz., (2880/4108 and 2881/4278) were tested for DUS trait during 2021-22 (First Year). Observations were recorded on 20 DUS traits as per National Guidelines of DUS testing for chickpea. The farmers variety 2881/4278, had no anthocyanin on stem, first flower initiation at 7 nodes (high), was spreading type with medium green foliage, medium leaflet size, had compound leaves and single flowers per peduncle with no stripes on standard. It had medium peduncle length, short plant height, medium pod size, more than one seeds/pod and pea shaped seeds. Seed testa texture was rough with no seed ribbing and seed was desi type. Based on grouping traits, the Farmers Variety 2881/4278 is late flowering (89 Days of Flowering) with white flowers. It has very small orange colour seed of size 14.7g/100 seeds. Based on these grouping traits, reference varieties will be selected for DUS testing during next year. One Farmers variety 2880/4108 did not germinate. Besides, 185 reference varieties were maintained.

Photographs

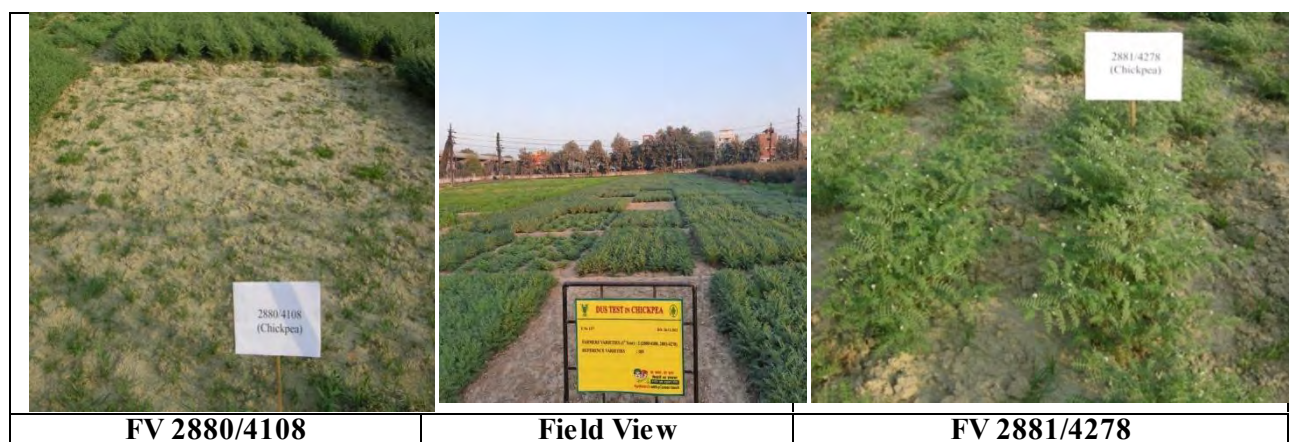


Table 3.18: Table of Characteristics is given below:

Farmers Variety	Characteristics	States	Note
2881/4278	Stem: Anthocyanin Colouration	Absent	1
	Stem: Height at initiation of first flower	High	7
	Time of flowering (50% of the plants with at least one open flower)	Late	7
	Plant: Growth Habit	Spreading	7
	Plant: Colour of foliage	Medium Green	2
	Leflet: Size(length) (middle of the plant and middle of the leaf)	Medium	5
	Leaf: Pattern	Compound	2
	Flower: Number per peduncle	Single	1
	Flower: Colour	White	1
	Flower: Stripes on standard	Absent	1
	Peduncle: Length	Medium	5
	Plant: Height	Short	3
	Pod: Size(length)	Medium	5
	Pod: Number of seeds	More than one	3
	Seed: Colour	Orange	5
	Seed: Size (weight of 100 seeds at 10% moisture content)	Very small	1
	Seed: Shape	Pea shaped	1
	Seeds: Testa Texture	Rough	1
	Seed: Ribbing	Absent	1
	Seed: Type	Desi	1

3.1.12. DUS TESTING CENTRES FOR PIGEONPEA

ICAR- INDIAN INSTITUTE OF PULSES RESEARCH, KANPUR, UTTAR PRADESH

During Kharif 2021-22 seven farmers' varieties (One in second year DUS Testing & six in first year DUS Testing) were sown on 5th July 2021 for DUS characterization along with the reference varieties at ICAR-IIPR, Kanpur. Observations were recorded on 21 DUS traits as per national Guide Lines of DUS testing for pigeon pea. These traits include Anthocyanin colouration of hypocotyls, Plant: Branching pattern, Time of flowering, Plant growth habit, Stem colour, Leaf shape, Leaf pubescence on lower surface of leaf, Flower colour, Streak pattern of the petal, Pod colour, Pod pubescence, Pod waxiness, Pod surface stickiness, Pod waxiness, Pod constriction, Pod size, No. of seeds in pod, Plant height, Seed colour, Seed colour pattern, Seed shape and Seed size (100 seed weight). Results of the above mentioned candidate varieties were already reported as per format to PPVFRA. Besides this 86 reference varieties were maintained. A detailed list of candidate varieties and reference variety maintained under the DUS test pigeonpea project is given below.

Farmers Varieties under DUS Test 2021-22		
S.No.	Farmer Varieties	Year of testing
1	Urrahar (Reg/2018/543)	2 nd Year DUS Testing
2	2877/2679	I st Year DUS Testing
3	2886/2139	I st Year DUS Testing
4	2879/3134	I st Year DUS Testing
5	2881/4249	I st Year DUS Testing
6	2881/4250	I st Year DUS Testing
7	2881/4277	I st Year DUS Testing
Reference Varieties Under Maintenance (2021-22)		
1.	Early Duration Reference varieties: 25	ICP 84031, AL 15, GT 100, ICPL 151, ICPL 87, PUSA ARHAR-16, PUSA 855, PUSA 2001, PUSA84, PUSA 33, PUSA 991, PUSA 992, PARAS, PA 291, AL 2091, AL 1992, AL 201, MANAK, GT 101, CORG 9701, TAT 10, VLA 1, PAU 881, UPAS 120, IPA 15-06
2.	Medium Duration Reference varieties: 38	BDN 708 LRG 38, ICPL 85063, AK 101, TS 3, WRG 27, BRG 2, LRG 30, GS 1, WRG 53, GC 11-39, JA 4, AKP 1, JKM 7, CO 5, JKM 189, GT 1, TV 1, VIPULA, VAMBAN-2, PT 221, AK 022, WRP 1, T 15-15, TJT 501, C11, ICPL 332, TTV 7, CO 6, VBN 3, PRG 176, AASHA, MARUTHI, BSMR 853, BSMR 736, BDN 2, GNP 2, AGT-2

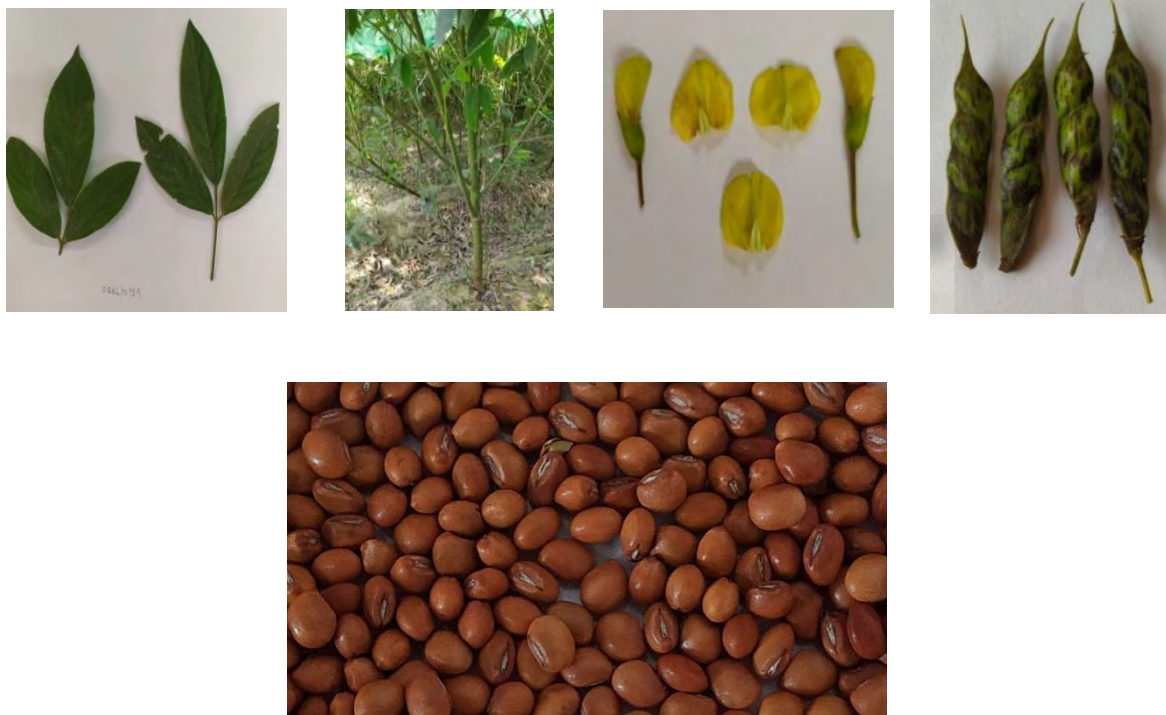
3.	Long Duration Reference varieties: 25	IPA 15-2, IPA 206, IPA 203, NDA 1, BAHAR, NDA 2, MAL 13, PUSA 9, AMAR, MA 6, AZAD, T7, DA11, MA 3, IPA 8F, IPA 9 F, IPA 15F, IPA 16F, KPL 43, KPL 44, IPA 2012-1, KUDRAT-3, Errama Chachakamti, DHOLI, RAJENDRA ARHAR-1,
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Field Photograph (DUS Test 2021-22)

2886/2139 (First year DUS Test)





Pigeon Pea and Safflower

DR. PANJABRAO DESHMUKH KRISHI VIDYAPEETH, AKOLA, MAHARASHTRA

A) Maintenance of pigeon pea varieties under DUS programme.

No. of varieties : 95 Nos.
(Late: 26, Medium: 44, Early: 25)

B) Characterization of Pigeon pea varieties under DUS programme.

i) First Year Testing

List of Varieties

Sr. No	Registration no. of Candidate varieties
01	2886/2139
02	2879/3143
03	2881/4249
04	2881/4250
05	2881/4277
06	2877/2679

C) Purification of farmer's varieties under DUS programme.

Sr. No.	Name of Crop	List of varieties
1.	Pigeon pea	1. Gajab-5 2. Renuka-25

		3. Samrudhhi-22
2.	Chickpea	1. Kharbada chana
3.	Sorghum	1. Lilia Jodhala harawa 2. Lilia Jodhala jalan 3. Ramkee 4. Ringni 5. Umarkhedi

TESTING OF SAFFLOWER VARIETIES UNDER DUS PROGRAMME.

A. Maintenance of Safflower varieties under DUS programme.

No. of varieties : 23 Nos.

Field View: - Maintenance of Reference Varieties of Pigeon pea at Dr. PDKV., Akola (Kharif 2021-22)

Early- 25 Medium- 44 Late- 26



Field View: - First Year Testing, *Kharif* 2021-22**Characterization of Pigeon pea Farmer's varieties –(06 Nos.-Replicated trial)****Field View: - Maintenance of Reference varieties of Safflower Rabi 2021-22 at Dr. PDKV., Akola (23 Nos.)****3.1.13. DUS TESTING CENTRES FOR LENTIL, MUNG BEAN, URD BEAN, RAJMASH AND PEA:****ICAR- INDIAN INSTITUTE OF PULSES RESEARCH, KANPUR, UTTAR PRADESH****Details for DUS testing of candidate varieties in 2021-22**

Crop	New		VCK	FV		TOTAL Candidate varieties	Date of monito ring
	1 st Year	2 nd Year		1 st Year	2 nd Year		
Mungbean	-	-	-	4	-	4	
Urdbean	-	1	-	1	-	2	
Lentil	-	-	-	-	-	-	
Field pea	-	-	2	4	-	6	
Rajmash	-	1	-	4	-	5	

Report on Mungbean, Urdbean, Pea, Lentil and Rajmash(2021-22)

- During *Kharif* season (2021) total 70 varieties of Mungbean and 41 varieties of Urdbean were maintained. Similarly, in *Rabi* season (2021-22) 61 varieties of pea, 39 varieties of Lentil and 14 varieties of Rajmash were maintained.
- For maintenance of these varieties 10 single plants were selected from each variety and harvested individually.
- In *Kharif* season (2021) only one **new variety** of urdbean was received and tested along with reference varieties & data recorded as per DUS guideline. Likewise, four farmers' varieties of mung bean and one farmer's variety of urdbean tested for first year along with reference varieties & data recorded as per DUS guideline.
- In *Rabi* season (2021-22) two VCK varieties of pea evaluated in second year with reference varieties & data recorded as per DUS guideline. Likewise one **new variety** of rajmash tested in second year along with reference varieties & data recorded as per DUS guideline. On similar note, four farmer's varieties of each pea and rajmash were tested in first year along with reference varieties & data recorded as per DUS guideline.
- In urdbean one farmer variety i.e. **2886/2054** evaluated in first year showed susceptible reaction towards the MYMV.
- In urdbean one new variety i.e. **2883/2129** tested in second year which demonstrated susceptible reaction to MYMV.
- In case of pea both the VCK varieties of pea (2FP1, 20FP2) were vegetable type.
- Rajmash two farmers' varieties were spreading type in growth habit.

Key observations of the monitoring team:

5. Varieties under maintenance breeding 2021-22.

S.No.	Crop Species	Name of the varieties
1.	Green gram [<i>Vignaradiata</i> (L.) Wilczek]	Total Number of reference varieties : 70 JM 721, TARM 1, PANT M-5, SML-32, OUM 11-5, PUSA BAISAKHI, ML-818, LGG-407, GM-3, TARM-2, PANT-M-2, GM-4, BM-2002-1, PUSA 9072, ML-131, GANGA-8, PUSA-9531, BPMR-145, VAMBAN-1, IPM-2-3, BM-2003-2, MH-2-15, PANT-M-5, CO-6, TMB-37, ML-613, BM-4, LGG-450, ML-267, IPM-2-14, PUSA-VISHAL, ML-5, HUM-1, TARM-18, SML-134, NDM-1, PUSA-RATNA, SML-668, BM-2003-1, PDM-139, OBG-52, SUJATA, SHALIMAR-M-1, KM-2, ASHA, PRATAP, RMG-62, RMG-344, RMG-268, IPM-99-125, HUM-12, PUSA-0672, PKVAKM-4, PANT M-1, MH-96-1, PAIRY MOONG, MUM-2, SONA MUNG, BDN-2, PDM-54, PS-16, DHOULI, T-44, AKM 8803, CO-4, GANGA-1, HUM-6, IPM 205-7, IPM-410-3, KOPERGAON
2.	Black gram [<i>Vignamungo</i> (L.) Hepper]	Total Number of reference varieties : 41 TAU-1, VAMBAN-7, TBG-104, LBG-685, PANT-U-30, BARABANKI LOCAL, PANT-U-19, LBG-709, NDU-1, IPU-2-43, KUG-479, LBG-645, LBG-787, NUL-7, SHEKHAR-3, LBG-752, TPU-4, TU-96-2, LBG-623, IPU-94-1, BDU-1, PANT-U-40, LBG-20, MASH-1-1, PANT-U-31, TBG-123, INDIRA, NAVEEN, SHEKHAR-1, KU-96-7, AZAD-2, HIM-MASH-1, SHEKHAR-2, UG-338, AZAD-1, MASH-144, GU-1, SARLA, WBU-108, PDU-1, T-9
3.	Lentil (<i>Lens culinaris</i>)	Total Number of reference varieties 39 DPL-62, DPL-15, IPL-81, IPL-315, IPL-406, NDL-1, PL-4, PL-5, PL-24, PL-63, PL-234, PL-406, PL-639, PL-77-12, L-4076, LL-56, LL-147, LL-699, L-4147, LH-84-8, VL-1, VL-4, VL-103, VL-126, VL-507, WBL-77, JL-1, JL-3, K-75, KLS-218, HUL-57, ASHA, RANJAN, SUBRITA, BARABHIA LOCAL (RUST SES.), S.SI.5, IPL-316, PL-7, PL-8.
4.	Pea (<i>Pisumsativum</i>)	Total Number of reference varieties 61 ARKEL, AZAD P-1, AZAD P-2, AZAD P-3, AZAD P-4, AZAD P-5, AZAD P-31, AGETA-6, DDR-23, DDR-27, VRP-3, VRP-5, VRP-6, VRP-7, VRP-22, KPMR-9, DDR-44, HUDP-15, HFP-4, HFP-529, HFP-8909, IPFD-99-13, IPFD-1-10, IPFD-6-3, JAYANTI, KPMR-144-1, KPMR-400, KPMR-522, IFP-48, PG-3, PANT P-14, SWATI, VL-3, HFP 715, PANT 25, RFPG 79, INDIRA MATAR 1, B-22, DMR-7, HUP-2, IM-9101, IPF-99-25, IPF-4-9, IPF-5-19, IPF-4-26, JM-6, JP-885, KFP-103, PANT P-5, RACHNA, TRCP-8, VL-1, VL-42, VL-45, VL-46, PANT P 42, HFP-9426, HFP-9907B, IM9102, PANT P74, SKNP 04-9.

5.	Rajmash (<i>phaseolus vulgaris</i>)	Total Number of reference varieties 14 HUR-15, ARKA KOMAL, PDR-14, IPR-98-5, SHRIDHA, ARKA ANOOP, IPR-98-3-1HUR-137, IVFB-1, HUR-203, ARKA BOLD, HPR-35, GUJRAT RAJMASH, Amber
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7. Financial progress (pls also carry a copy of UC and SOE upto 01.04.2021 to 31.03.2022)

S. N.	Items	Unspent balance carried forward from previous year	Grant received from (1.4.2021 to 31.03.2022)	Other receipts/Interest earned, if any on the grants	Total of Col. (2+3+4)	Expenditure from 1.4.2021 to 31.03.2022	Balance (5-6)	Re-marks
	1.	2.	3.	4.	5.	6.	7.	8.
1.	Non-Recurring	3794.00	0	0	1212200	0		0
2.	Recurring		12,08,406	0			501345.00	0
	(i)Research expenses			0		493500		0
	(ii)Operational experiment			0		195387		0
	(iii)T.A.			0		21968		0
	(iv)Misc.			0		0		0
	Total	3794.00	12,08,406	0	1212200.00	710855.00	501345.00	0

8. Training cum awareness programme conducted, publication and other significant achievements, if any: NA

9. Application field with PPVFRA (applicable only for 57 notified crop species. Other files column 2 and 3, if applicable)

Crops	No of variety notified by the center since 1966	No of variety notified by the center since 1999	No of applications field			Certificates issued	Pending applications	Reason for pendency
			Extant Notified	NEW	VCK			
Mungbean	120	41	33	2	-	18	17	
Urdbean	82	29	14	2	-	8	8	
Lentil	43	17	12	1	-	6	7	
Rajmash	6	3	4	1	-	2	3	
Pea	44	25	18	3	-	10	11	
Lathyrus	3	2	-	-	-	-	-	





3.1.14. DUS TESTING CENTRES FOR TOMATO, BRINJAL, OKRA, BOTTLE GOURD, PUMPKIN:

ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, HESSARGHATTA LAKE POST, BENGALURU, KARNATAKA

Table 3.19: Details of DUS testing of candidate varieties in 2021-22, if any:

Crops	Candidate/New Varieties					VC K	Referenc e Varieties	Date of monitorin g
	1 st year entries			2 nd year entries				
	Hybrid	Typica l	FV	Candidat e Hybrid	F1 Hybrid SMG			
Tomato	2	-	1	19	19	-	7	09-02- 2022
Brinjal	-	-	11	-	-	-	7	09-02- 2022
Okra	08	03	05	09	09	-	03	20-12- 2021
Cucumber	-	-	-	-	-	-	-	-
Bitter Gourd	-	-	-	-	-	-	-	-
Bottle Gourd	-	-	-	-	-	-	-	-
Pumpkin	-	-	-	-	-	-	-	-

DUS Testing: Tomato

A total of **41** tomato new/candidate varieties and **7** reference varieties and have been raised for conduct of DUS Test for **47** morphological characters as per DUS test guidelines for the year 2021-22. All the entries were characterized for DUS traits and monitoring of the DUS entries was conducted successfully under the chairmanship of Dr. A.T Sadashiva, Former Head, Division of Vegetable Crops, and IIHR Bengaluru on **09.02.2022**.

Monitoring photos:



Key observations of the Monitoring team (1-2 points max):

- DUS plots were well maintained and all DUS trails were systematically recorded
- It is suggested that seeds of reference varieties/hybrids may be supplied for comparison.

Brinjal: A total of **11** brinjal farmers varieties and **7** reference varieties and have been raised for conduct of DUS Test for **47** morphological characters as per DUS test guidelines for the year 2021-22.

Monitoring photos:



DUS Testing: Okra

Twenty nine (**29**) Okra new/candidate varieties, **5** Farmer Varieties and **3** reference varieties were raised for conduct of DUS testing during the year 2021-22. Monitoring of the DUS entries was conducted successfully under the chairmanship of Dr. O.P Dutta, Crop expert and former Head, Division of Vegetable Crops, and ICAR- IIHR Bengaluru on **20.12.2021**.

Monitoring photos:



Cucumber: we have not received any candidate varieties during 2021-22. 12 Reference varieties were selfing and maintaining for further utilization. **Maintenance:** 16 Reference varieties of Okra and 12 reference varieties of Cucumber were raised and selfed seeds were collected for further utilization.

Maintenance of Bitter gourd Reference varieties: Sixteen Bitter gourd reference varieties namely, Pusa Vishesh, Pusa Do-Mausami, Sel.5, MC-84, Sel.1, Arka Harit, Hirkani, Phule Green Gold, Phule Ujwala, Meghana-2, Preethi, NDBT-9, Kalyanpur, Baramashi, NDBT-7, HABG-1, Co-1 were maintained.

Bottle gourd: 25 bottle gourd reference varieties were raised for DUS testing during the year 2021-22 and characterized for 31 morphological traits as per the crop specific DUS test guidelines.

Pumpkin: Four reference varieties (Arka Chandan, Kashi Harit, CO-2 and Pusa Vishwas) have been raised for conduct of DUS Test for 32 morphological characters as per DUS test guidelines for the year 2021-22.

3.1.15. DUS TESTING CENTRES FOR AMARANTHUS, PALAK, RIDGE GOURD

ICAR- INDIAN AGRICULTURAL RESEARCH INSTITUTE, PUSA, NEW DELHI

- **No. of varieties for DUS testing**

Under DUS Cucurbits following four vegetable crop were tested.

A. Ridge gourd -4

(RG21H1, RG21H2, RG21H3 and RG21H4) all were candidate varieties.

No. of reference & example varieties maintained at the centre

A. Ridge gourd – 9

(Pusa Nasdar, Pusa Nutan, Arka Sumeet, Jaipur Long, Phule Sucheta, Arka Sujat, Co-1, Deepthi and GARG-1)

B. Amaranth – 19

(Arka Samraksha, Arka Suguma, Arka Verma, Canara Local, Pusa Lal Chaulai, Arun, Pusa Kiran, Arka Arunima, Krishna Sree, Rene Sree, Co-2, Co-3, Co-4, Co-5, IIHR-109-1, IIHR 109-4, IC-551606, IC551608 and RNA-1)

C. Palak-5

(Arka Anupama, Pusa All Green, Pusa Bharti, Co-1, and HS-23)

Experimental details

Ridge gourd

The Ridge gourd trial was laid out as per the DUS testing guidelines. The varieties were evaluated in RBD design with 3 replications with 20 plants in each replication. No of Rows 4, Row length 4.2m, Row-to-Row distance 3.0 m, Plant to Plant distance 60 cm.

Amaranth

The Amaranth trial was laid out as per the DUS testing guidelines. The varieties were evaluated in RBD design with three replications and observations were recorded from 20 plants in each replication. No of Rows 4, Row length 3m, Row to Row distance 50cm, Plant to Plant distance 20 cm.

Palak

The Palak trial was laid out as per the DUS testing guidelines. The varieties were evaluated in RBD design with three replications and observations were recorded from 20 plants in each replication. No of Rows 5, Row length 2m, Row-to-Row distance 50cm, Plant to Plant distance 20cm.

Few selected important photographs

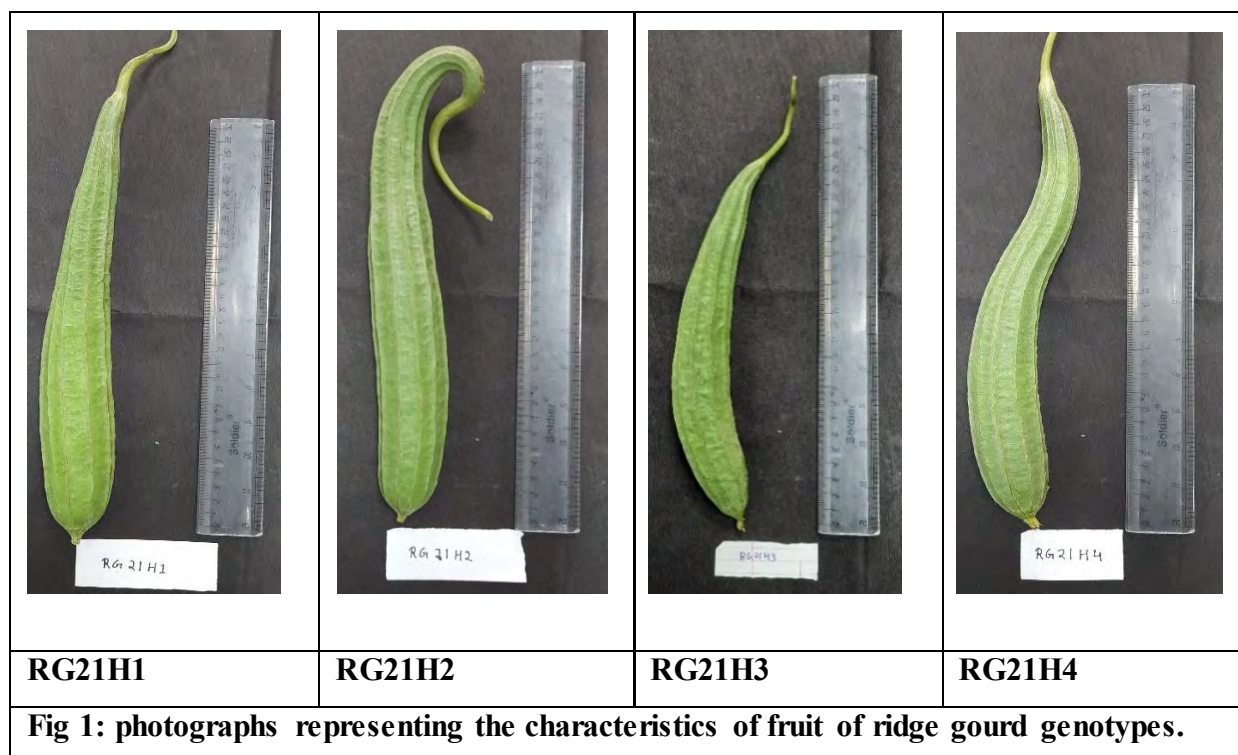




Fig2: Photograph of amaranth and palak maintenance block

CENTRE FOR DUS TESTING ON AMARANTH, CENTRE FOR CROP IMPROVEMENT, S. D. AGRICULTURAL UNIVERSITY, SARDARKRUSHINAGAR, GUJARAT

1. Financial Progress 2021-22

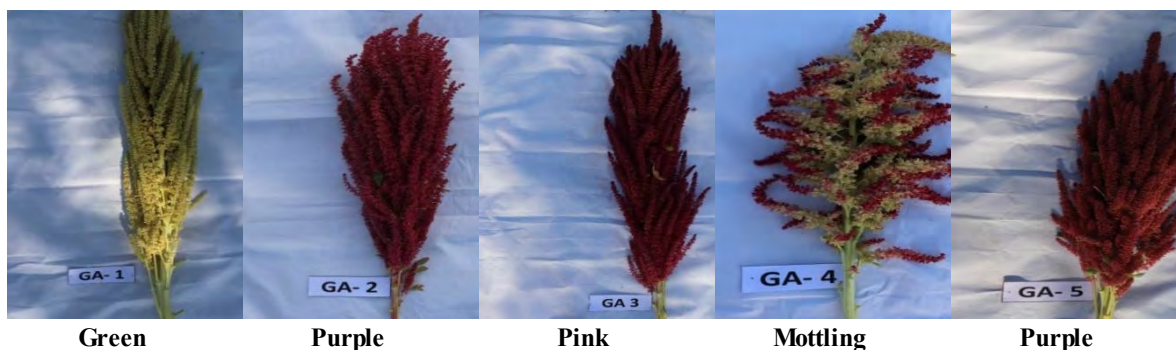
Items	Allocated Budget for FY 2021-22	Fund released in FY 2021-22 (Rs. Lakhs)	Expenditure in FY 2021-22	Unspent balance as on 1 st April 2022
Manpower (Young professional II @ 35,000/-)	6,45,000/-	4,20,000/-	91,451/-	3,28,549/-
Field expenses and contingency		2,00,000/-	32,980/-	1,67,020/-
Travel Allowance		25,000/-	-	25,000/-
Total	6,45,000/-	6,45,000/-	1,24,431/-	5,20,569/-

2. Field Report, 2021-22

- We have been evaluated below listed 10 varieties of Grain Amaranth under the **Guidelines for the conduct of tests for Distinctiveness, Uniformity and Stability Grain Amaranth (*Amaranthus* L. excluding ornamental or vegetable varieties) Protection of Plant Varieties and Farmer's Rights Authority Government of India.**

- | | |
|------------------------------|------------------------------|
| 1. Gujarat Amaranth 1 (GA 1) | 6. Gujarat Amaranth 6 (GA 6) |
| 2. Gujarat Amaranth 2 (GA 2) | 7. RMA 7 |
| 3. Gujarat Amaranth 3 (GA 3) | 8. Suvarna |
| 4. Gujarat Amaranth 4 (GA 4) | 9. BGA 2 |
| 5. Gujarat Amaranth 5 (GA 5) | 10. Annapurna |

- Total 18 morphological characters were studied. Out of 10 entries, five entries (GA 2, GA 3, GA 5, Suvarna and BGA 2) exhibited anthocyanin coloration at seedling hypocotyls. On the basis of inflorescence colour, five class were observed i.e. green (GA 1, GA 6, RMA 7 and Annapurna), yellowish green (Suvarna and BGA 2), purple (GA 2 & GA 5), Pink (GA 3) and Mottling (GA 4). Two type of leaf blade main colour was observed i.e. Green (GA 1, GA 4, GA 6, RMA 7, Suvarna, BGA 2 and Annapurna) and Purple (GA 2, GA 3 and GA 5). All entries classify as early mature. The taken varieties have short (GA 3, Suvarna, BGA 2 and Annapurna) to medium (GA 1, GA 2, GA 4, GA 5, GA 6 and RMA 7) plant height. The seed volume was found ranged from 6.71 to 7.51 g/10 ml. All entries expressed ridge type of stem surface and creamish coloured seed.
- Plate no. I and II showed the variation in inflorescence colour and anthocyanin pigmentation of grain amaranth entries.





Green

Green

Yellowish
greenYellowish
green

Green

Plate I: Inflorescence colour Grain amaranth entries.



Absent

Present

Present

Present

Absent



Absent

Present

Present

Absent

Plate II: Seedling anthocyanin coloration of hypocotyl of Grain amaranth entries.

3.1.15 DUS TESTING CENTRES FOR BARLEY:

ICAR-Indian Institute of Wheat and Barley Research, Karnal, Haryana

A total of 06 farmer's varieties of barley were tested against 18 reference varieties as per DUS trial during 2021-22. This includes one farmer variety 2881/3965 for revalidation in grow-out test while 05 farmer's varieties were grown for characterization in grow-out test during the season.

Crops	New	VCK	FV	
	1 st year entries	2 nd year entries	1 st year entries	2 nd year entries

Barley	-	-	2881/3965	20Bar1
				BDPJ238
				BRDJ287
				BSLM262
				BBPC286

Reference and example varieties maintained at IIWBR: A set of 105 barley reference varieties were maintained for validation of 32 DUS characters.

Summary of DUS Result: A total of 06 barley farmers varieties were tested under DUS trial during 2021-22 including one farmer variety, 2881/3965 is in grow-out test for characterization and recording of grouping characters. 105 reference varieties were also grown for validation of 32 DUS characters. All the data of the trial was recorded for morphological and metric traits as per DUS barley guidelines. Data was compiled, analyzed and ready for submission to the PPVFR Authority. Further, the proposal of barley variety, DWRB 187 in extent categories was submitted to the PPVFRA, New Delhi for seeking protection under PPVFRA, 2001.

Training programme attended by PI & Co-PI:

1. Online training on DUS testing on June 30th, 2021
2. Exchange on Biochemical and Molecular Techniques (BMT) guidelines and implementation of BMT in DUS” from December 16-17th, 2021
3. Prospects of varieties/crops developed through Genome Editing (regulatory framework, technologies and experience on 24th May 2022
4. Study visit consultation meeting & training on DUS testing on Wheat & Barley at Germany from 20-24 June, 2022

Barley DUS trial photographs, 2021-22





RAJASTHAN AGRICULTURAL RESEARCH INSTITUTE, DURGAPUR (SRI KARAN NARENDRA AGRICULTURE UNIVERSITY, JOBNER)

During Rabi 2021-22, for evaluation work three trials were framed i.e. DUS Trial, DUS Trial – 1 and DUS Trial – 2. In DUS Trial, Eighteen reference varieties and six candidate varieties (5 for second year DUS testing and 1 for 1st year DUS testing) were planted with three replications and evaluated for different qualitative as well as quantitative traits decided. In DUS Trial – 1, forty nine reference varieties and in DUS Trial – 2 one hundred five release varieties were planted in two rows each of 4 meter. All DUS Trials data recorded done for all the thirty two characters/traits mandatory including both the qualitative as well as quantitative traits, for the project DUS on barley.

Crops	New	VCK	FV	
	1 st year entries	2 nd year entries	1 st year entries	2 nd year entries
Barley	-	-	2881/3965	20Bar1
				BDPJ238
				BRDJ287
				BSLM262
				BBPC286

Observations were recorded on randomly selected ten plants for each variety and their values were averaged. Data recording for characters 1-26 was done in standing crop in the field while for grain characteristic (27-32) observations were made after harvesting as per the prescribed guidelines.

The crop growth and expression of morphological characters were good in all the entries. Observations on DUS characters on all the characters were recorded as per the prescribed guidelines. All the farmer's varieties were showing uniformity.

The crop growth and expression of morphological characters were good in all the entries.. All the farmer's varieties were showing uniformity. Apart from this, stability in the DUS traits was also observed and all the traits in varieties were stable.

We also maintained the seeds of one hundred five barley release varieties.

All the data so recorded were submitted to Dr. Charan Singh, Nodal Officer, DUS Barley Project, IIWBR, Karnal.



Flag leaf attitude – Semi erect (5)



Stem: Basal pigmentation –Present (9)



Upper node pigmentation – Present (9)



Auricle(flag leaf):Anthocyanin
Pigmentation –Absent (1)

3.1.16. DUS TESTING CENTRES FOR CABBAGE AND CAULIFLOWER

ICAR- INDIAN AGRICULTURAL RESEARCH INSTITUTE, PUSA, NEW DELHI

1. a) Details of DUS testing of candidate varieties in 2021-22, if any: (indicate no only)

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
1 Cabbage	01 (Cabbage 2881)	-	-	Yes	30.12.2021
2 Cauliflower	01 (Cauliflower 2883/2687)	-	-	Yes	30.12.2021

b) Key observations of the Monitoring team (1-2 points, max):

- Trials are done in proper design and as per experimental requirement.
- New traits to be added for revision of guidelines to finalized.

c) Varieties under maintenance/characterised:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2017-18	Data Submission (Maintenance Breeding) Yes/No
Cabbage	01 (PusaAgeti)	Yes
Cauliflower	07 :Pusa Meghna, Pusa Deepali, Pusa Sharad, Pusa Ashwini, PusaKartiki, PusaPaushja, PusaShukti	Yes

d) Salient Achievements (1 paragraph only):

One new entry each in cabbage (2881) and cauliflower (2883/2687) supplied by PPVFRA were tested along with four (4) reference & example varieties/ hybrids for first year. In total, 28 DUS characteristics, including four grouping characters were recorded from all these entries. The trial was monitored on 30-12-2021 and the evaluation sheets and trial data will be submitted soon to PPVFRA.



Cauliflower trial field view



Cauliflower trial monitoring (30.12.2021)



Cauliflower trial monitoring (30.12.2021)

Cabbage trial monitoring (30.12.2021)





Cabbage trial field view

5. **Financial progress (pls also send a copy of AUC & SOE for FY 2021-22)**

Items	Unspent balance as on 1 st April, 2021	Interest accrued/other income for the DUS centre	Budget FY 2021-22	Funds released in FY 2021-22	Expenditure in FY 2021-22	Unspent balance as on 1 st April 2022
Manpower (indicate SRF/JRF/RA/TA etc and no of technical manpower engaged in each category)						
Non Recurring						
Recurring(field expenses and contingency)						
Others						
Total	71608			538392	592469	17531

6. Training cum Awareness programme conducted, publications and other significant achievements, if any:

Nil

7. Applications filed with PPVFRA (applicable only for 172 notified crop species. Others file Column 2 and 3, if applicable)

Crops	No of Var notified by the center Since 1966	No of Var notified by the center Since 1999	No of applications filed			Certificates issued	Pending applications	Reasons for pendency
			Extant Notified New VCK					
Cabbage		01				Yes		
Cauliflower		02				Yes		

ICAR- INDIAN AGRICULTURAL RESEARCH INSTITUTE, KATRIN, KULLU, HIMACHAL PRADESH

1. No. of variety undergone maintenance breeding / characterisation / progress of development of DUS guidelines, if applicable (as the case maybe)

Name of the species	No of varieties	Source(own released/ICAR/SAU)
Cabbage	20	Own/ICAR/SAU
Cauliflower (snowball group)	14	Own/ICAR/SAU

2. No. of varieties undergone DUS testing in FY 2021-22

Crops	New		VCK	FV	EDV IV (if any)		Total	Monitoring done on	Chairman
	1 st yr	2 nd yr							
Cabbage	-		-	2881/4255			1	-	-
Total	-		-	1			1		

Under each category of New and VCK, pls mention, private or public sector var:

Brief observations during monitoring:

a) Text in brief and supported by pictures and photographs

4. Technical Progress:

- i) **Cabbage:** DUS testing of one candidate variety of cabbage viz., 2881/4255 in first year has been done with reference varieties viz., Golden Acre, Pusa Hybrid 81, Pride of India, Pusa Mukta and Pusa Drum Head as per DUS guidelines. Besides this 16 notified varieties viz., Golden Acre, Pusa Mukta, Pusa Drum Head, 83-1, 6A, C-121, Pride of India, Pride of Asia, Pusa Ageti,, 208A, 208 B, C-122, Kinner Red, KTCB-R3A, KTCB-R3B, KTCB-R5 and 4 hybrids viz., Pusa Cabbage-1 (KGMR-1), Pusa Red Cabbage Hybrid-1, Pusa Hybrid-81, Pusa Hybrid-82 have been characterized, purified and suitably maintained.



Candidate Variety of cabbage: 2881/4255



Pusa Hybrid 81



Golden Acre



Pride of India

**Pusa Mukta****Pusa Drum Head**

Cauliflower: Characterization, purification and maintenance of 11 varieties viz., Pusa Snowball-1, Pusa Snowball K-1, Pusa Himjyoti, Snowball-16, Pusa Snowball K-25, SK-1, Sel-27, KTDH-53-1, 33A-1, Kt-22 and Pusa Purple Cauliflower-1 along with 3 hybrids of snowball cauliflower namely Pusa Snowball Hybrid-1, Pusa Snowball Hybrid-2, Pusa Hybrid-301 were taken up. However, no candidate varieties/ entries of cauliflower were received for DUS testing.

5. Financial progress with UCs/SoEs

Unspent Balance 2020-21	Budget FY 2021-22	Funds Released FY 2021-22	Expenditure up to 31-03- 2022	Unspent Balance as on 01-04-2022
3,593	4,40,000	4,36,407	95,957	3,44,043

3.1.17. DUS CENTRES FOR ONION AND GARLIC

ICAR-DIRECTORATE OF ONION AND GARLIC RESEARCH, PUNE, MAHARASHTRA

1. DUS Testing and Varieties under Maintenance

- a. Details of DUS testing of candidate varieties in 2021-22, if any: (indicate no only): **Nil**

Note: None of the entry received for DUS testing but one multiplier onion Denomination Hari Onion-1 (REG/2014/1961) received on 29th Nov 2021 which is under multiplication and maintenance breeding.

- b. Key observations of the Monitoring team (1-2 points, max): **NA**

- c. Varieties under maintenance/ characterized:

Mandated Crop Species	Name or No. of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Onion	We are maintaining 52 <i>rabi</i> and 10 <i>kharif</i> varieties of common onion	Yes
Garlic	We are maintaining 29 varieties of garlic	Yes
Multiplier onion	We are maintaining 2 varieties of multiplier onion	Yes

d. Salient Achievements (1 paragraph only)

ICAR-DOGR is working as Nodal Centre for conduct of DUS test of onion and garlic and maintaining 62 onion and 29 garlic varieties under this project. These varieties of onion and garlic are treated as reference varieties. In onion, 52 *rabi* season varieties and 10 *kharif* season varieties and in garlic 29 varieties are being maintained at ICAR-DOGR, Rajgurunagar, Pune. Long day onion and garlic varieties are being maintained at ICAR-CITH, Srinagar and multiplier onion varieties at TNAU, Coimbatore. All the data have been recorded as per DUS test guideline in all the maintained varieties of onion and garlic under DUS project. Two onion farmers' varieties *i.e.* Sona-40 and Sandip Pyaz planted for field screening test for genetic purity and uniformity and one multiplier onion 'Hari Onion-1' for multiplication and maintenance breeding.

2. Financial progress (pls. also send a copy of AUC & SOE for FY 2021-22)

S. No.	Head-wise items	Sanctioned Budget	Release	Utilization	Unspent balance (as on 1 st April 2022)
1	Man power SRF-1 @35000/- + HRA	4,87,000/-	7,00,000/- (-1,67,271/- as opening balance on 1 st April, 2021)	4,37,410/-	1,68,570/-
2	Field Expenses and Contingency	1,88,000/-		94,020/-	
3	TA	25,000/-		0/-	
	Others	-	-	-	-
	Total	7,00,000/-	7,00,000/-	5,31,430/-	1,68,570/-

3. Training cum Awareness programme conducted, publications and other significant achievements, if any: Nil

4. Applications filed with PPVFRA (applicable only for 172 notified crop species. Others file Column 2 and 3, if applicable)

Crops	No of Var notified by the center Since	No of Var notified by the center	No of applications filed			Certificates issued	Pending applications	Reasons for pendency
			Extant Notified	New	VCK			

	1966 (ICAR- DOGR)	Since 1999 (ICAR- DOGR)						
Onion	10	10	9	1	-	9	1	Re- submissio n under progress
Garlic	2	2	1	-	-	1	1	

Three extant onion varieties (Bhima Shakti, Bhima Dark Red and Bhima Super) have been registered with PPVFRA, New Delhi for its protection. Six onion varieties (Bhima Kiran, Bhima Red, Bhima Raj, Bhima Light Red, Bhima Shubhra and Bhima Safed as well as one garlic variety Bhima Omkar have been already registered with PPVFRA. One onion variety Bhima Shweta and one garlic variety Bhima Purple are under registration with PPVFRA.

Crop	Variety	Category	Source	Reg. No.
Onion	Bhima Raj (B-780-5-2-2)	Extant	DOGR, Pune	262 of 2015
	Bhima Kiran (DOGR-597)	Extant	DOGR, Pune	341 of 2016
	Bhima Red (B-780-5-3-1)	Extant	DOGR, Pune	342 of 2016
	Bhima Safed	Extant	DOGR, Pune	115 of 2019
	Bhima Shubhra	Extant	DOGR, Pune	120 of 2019
	Bhima Light Red	Extant	DOGR, Pune	261 of 2020
	Bhima Shakti	Extant	DOGR, Pune	REG/2014/984
	Bhima Dark Red	New	DOGR, Pune	REG/2014/985
	Bhima Super	Extant	DOGR, Pune	REG/2015/2018
Garlic	Bhima Omkar (AC-200)	Extant	DOGR, Pune	427 of 2016

Few selected important photographs:





Maintenance of onion and garlic varieties under DUS Project

3.1.18. DUS CENTRES FOR CHILLI, BELL PEPPER AND PAPRIKA

UNIVERSITY OF HORTICULTURAL SCIENCES, BAGALKOT, KARNATAKA

1. a) Varieties under maintenance/characterised:

Mandated Crop Species	Name or No. of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Chilli (<i>Capsicum annuum</i> L.)	2021 H-3, 2021 H-4, 2021 H-5, 2021 H-6, 2021 H-7, 2021 H-10, 2021 H-11, 2021 H-12, 2021 H-13, 2021 H-14, 2021 IV-1, 2021 IV-7, 2021 IV-8, 2021 IV-19, 2021 IV-20, 2021 IV-21, 2021 IV-22, 2021 IV-23, 2887/2051, 2887/2053, 2880/3555 Rudra, Shuka, Hy-80, GCS-94/68 and Arka lohit.	No
Paprika (<i>Capsicum annuum</i> L.)	BDE-1, BDE-2, BDE-3, BDE-4, BDE-5, BDE-6, BDE-7, BDE-8, BDE-9, BDE-10, BDE-11, BDE-12, BDE-13, BDE-14, BDE-15, BDE-16 and BDE-17	Yes
Bell Pepper (<i>Capsicum annum</i> L. var. <i>grossum</i>)	Apoorva	

b) Salient Achievements:

1. All the collected genotypes (21) were characterized as per the DUS guidelines.

2. Maintained in the field in three replications
3. At peak flowering stage of the crop new invasive pest incidence was very serious so, performance and expression of the lines not up to level.
4. In Horticultural Research and Extension Centre, Devihosur, Haveri 17 Byadgi Dabbi segments (Indian Paprika) have collected, evaluated and maintained.

2 Financial progress(pls also send a copy of AUC & SOE for FY 2021-22)

Items	Unspent balance as on 1 st April, 2021	Interest accrued/other income for the DUS centre	Budget FY 2021-22	Funds released in FY 2021-22	Expenditure in FY 2021-22	Unspent balance as on 1 st April 2022
Manpower (indicate SRF/JRF/RA/TA etc and no of technical manpower engaged in each category)			215750	500000	21949	193801
Non Recurring			284250		263561	20689
Recurring(field expenses and contingency)						
Others						
Total				500000	285510	214490

2. Training cum Awareness programme conducted, publications and other significant achievements, if any: -NA-
3. **Applications filed with PPVFRA (applicable only for 172 notified crop species. Others file Column 2 and 3, if applicable)**

Crops	No of Var notified by the center Since 1966	No of Var notified by the center Since 1999	No of applications filed			Certificate s issued	Pending applications	Reasons for pendency
			Extant	New	VCK			
-	-	-	-	2	-	-	-	-



Fig. 1 General View of Experimental Block

2. Leaf: Shape



17a Lanceolate



17b Broad elliptic

3 Stem: Shape

11a Round



11b. Angled

4 Anthocyanin coloration of nodes

Green



Purple

5 Flower: Petal colour

21a Yellowish green



21b White

1. Flower: Anther Colour

22a Pale blue

2. Fruit: Shape at base

41a Round



41b Acute

Calyx: Cover

46a Enveloping



46b Non-enveloping

3. Fruit: Curvature



31a Present



31b Absent

4. Fruit: Sinuation of pericarp



35a Weak

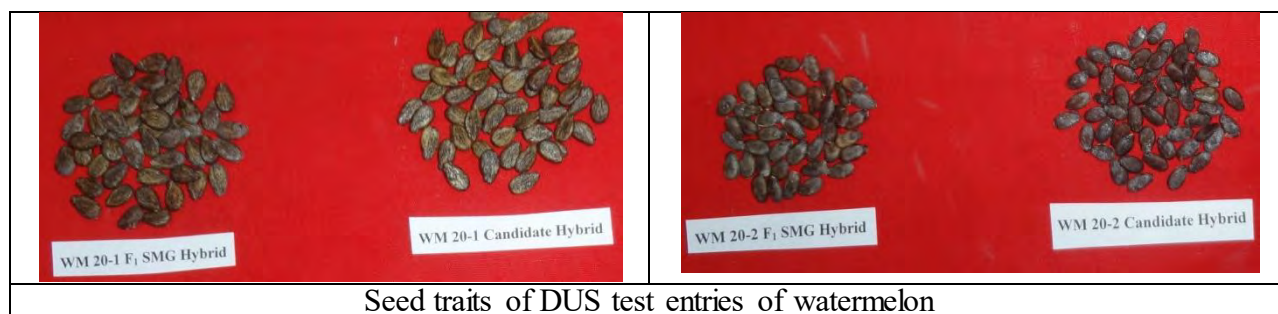


35b Strong

3.1.19. DUS TESTING CENTRES FOR WATERMELON AND MUSKMELON

ICAR-CENTRAL INSTITUTE OF ARID HORTICULTURE, BIKANER, RAJASTHAN

Received the seed of watermelon viz., WM 20-1 F₁ SMG Hybrid, WM 20-1 Candidate Hybrid, WM 20-2 F₁ SMG Hybrid, WM 20-2 Candidate Hybrid for DUS testing and the trial was laid down in February, 2022. In muskmelon, MM 22 H₁ Hybrid, MM 22 H₂ Hybrid, MM 22 H₃ Hybrid, MM 22 H₄ Hybrid has been received and sown in the month of February, 2022 for DUS testing. Under typical category, the seed of 22 MM-1, 22 MM-2, 22 MM-3 of muskmelon has been supplied by PPVFRA, New Delhi for DUS testing.



Varieties under maintenance/ characterized

During the summer season of 2021, maintained the seed of following reference varieties of watermelon and muskmelon to utilize in DUS testing.

Crops	Varieties undergone maintenance breeding during summer 2021
Watermelon { <i>Citrullus lanatus</i> (Thunb.) Mansf.}	Sugar Baby, Durgapura Kesar, Arka Manik, AHW-19, AHW-65 and Thar Manak.
Muskmelon (<i>Cucumis melo</i> L.)	Arka Jeet, MHY-3, MHY-5, RM-43, RM-50, Durgapura Madhu, Kashi Madhu, Pusa Madhuras, GMM-3, Punjab Sunehri and Hara Madhu.

Supplied the seed of reference varieties of watermelon (AHW-19, Thar Manak and RW 187-2) and muskmelon (Arka Jeet) to the PPVFRA, New Delhi to utilize in DUS testing.

ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, HESSARGHATTA LAKE POST, BENGALURU, KARNATAKA

Maintenance and regeneration of reference varieties

- A total of ten reference varieties in watermelon and 12 reference varieties in muskmelon have been maintained and regenerated during Summer, 2021-22.

Watermelon:

- DUS testing of one entry of watermelon (Candidate hybrid-WM 20-2) and Shimoga hybrid (WM 20-2 F₁ SMG) along with ten reference varieties were carried out recently. The crop was sown on 28th Feb 2022.
- The 10 reference varieties include Arka Manik, Sugar Baby, AHW-19, AHW-65, Crimson Sweet, Durgapur Lal, Durgapur kesar, Asahi Yamato, Thar manak, Arka Muthu
- Data was recorded on 27 characters.

Muskmelon:

- Muskmelon three typical (22 MM-1, 22 MM-2, 22 MM-3) and four hybrids (MM 22 H1, MM 22 H2, MM 22 H3, MM 22 H4) were raised along with five reference varieties for conduct of DUS testing during the year 2021-22. The crop was sown on 9th March 2022.
- Data was recorded on 34 characters.

Monitoring of the Watermelon and Muskmelon trial were conducted on 15th June 2022 in Block-IV of ICAR-IIHR, Bengaluru under the chairmanship of Dr. O.P. Dutta. The monitoring committee recommends that “DUS guidelines of descriptors need modification and revision urgently. The states for some characters may be made more elaborate to bring in clarity”.



Field view of Watermelon DUS plot



Field view of Muskmelon DUS plot



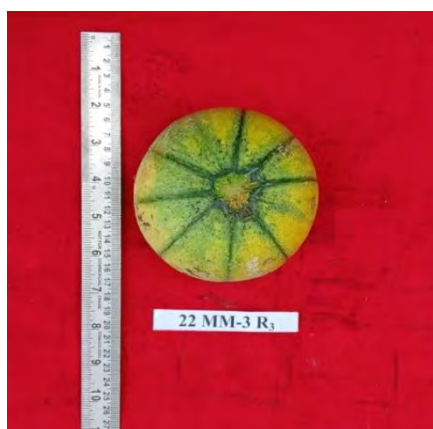
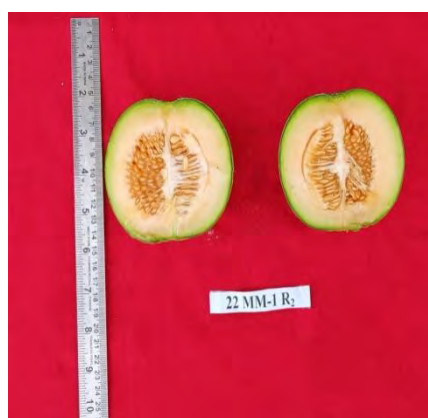
Monitoring team at Watermelon and Muskmelon DUS monitoring field at ICAR-IIHR, Hesaraghatta, Bengaluru



FRUIT SHAPE, RIND PATTERN, FLESH COLOUR OF WATERMELON- WM20-2, WM 20-2F1, ARKA MANIK, SUGAR BABY



FRUIT SHAPE, RIND PATTERN, FLESH COLOUR OF MUSKMELON- MM 22 H1, MM 22 H2, MM 22 H3, MM 22 H4 - (FOUR HYBRIDS)



FRUIT SHAPE, RIND PATTERN, FLESH COLOUR OF MUSKMELON- 22 MM-1, 22 MM-2, 22 MM-3 – (THREE TYPICAL)

3.1.20. DUS TESTING CENTRES FOR POINTED GOURD

BIDHAN CHANDRA KRISHI VISWAVIDYALAYA, KALYANI, WEST BENGAL

Thirty five local clones/varieties of common knowledge of pointed gourd were planted during the 2nd week of November, 2020 in 15-20 cm raised bed that were 6.0 m long and 1.5 m width, accommodating twelve plants per plot following Randomized Block Design with three replications. The crop was harvested up to middle of October, 2021. Again 35 local clones/varieties of common knowledge were planted during the 2nd week of November, 2021. The traits described in the table of characteristics were used for the testing of candidate/reference varieties for DUS.

6a) Varieties under maintenance/characterized:

Sl No	Name or No of varieties* under maintenance breeding in 2021-22	Source, Release/commercial release date, if any	Maintenance Breeding data compilation and sent to PPVFRA
1.	BCPG-1*, BCPG-3*, BCPG-4*, BCPG-5*, BCPG-6*, BCPG-14, BCPG-16*, BCPG-17*, BCPG-22, BCPG-23, BCPG-24, BCPG-25*, BCPG-26*, BCPG-27*, BCPG-29, BCPG-30*, BCPG-31, BCPG-32, BCPG-33, BCPG-34, BCPG-35, BCPG-36*, BCPG-37*, BCPG-38	BCKV, West Bengal	Data of previous season (2020-21) sent to PPVFRA. Present crop is in reproductive stage and complete data will be sent to PPV FRA after the end of the cropping season (November, 2022)
2.	Swarna Alaukik*, Swarna Rekha*	ICAR Regional Institute for eastern India, Ranchi	
3.	BAUPG-1, BAUPG-2, BAUPG-3, BAUPG-4	Bihar Agricultural university, Sabour	
4.	Narendra Parwal-260*, NP-520	NDUAT, Faizabad	
5.	Rajendra Parwal-1, Rajendra Parwal-2	Rajendra Prasad Central Agricultural University, Samastipur	
6.	Kashi Suphal*, Kashi Alankar*	ICAR-IIVR, Varanasi	
7.	Tripura Local	College of Agricultural Sciences, Tripura	

***Identified as reference entries in DUS characterization**, other entries designated as clonal selection from landraces are also being maintained.

4. The following characteristics were used for grouping of pointed gourd cultivars/ varieties

Sl. No.	Plant parts	Characteristics	Reference entries/Varieties
a.	Leaf: Shape	Auriculate Cordate	BCPG-4, Kashi Suphal BCPG-1, Kashi Amulya*
b.	Fruit: Shape	Club Cylindrical Oval Spindle Elongated spindle Ovate Spheroid Spindle tapering	BCPG-27 BCPG-6, VRPG-126* BCPG-1, VRPG-103* BCPG-36 BCPG-30, VRPG-173* BCPG-3 VRPG-219* Narendra Parwal-260, Kashi Alankar
c.	Fruit: Skin primary colour	Light Green Green Dark green	Swarna Alaukik, Kashi Alankar Kashi Amulya*, Kashi Suphal VRPG-219*, VRPG-221*
d.	Fruit: Surface colour pattern	Uniform Mottled Striped	Swarna Alaukik, VRPG-141* Kashi Amulya, Swarna Rekha VRPG-219*, VRPG-221*
e.	Fruit: Length	Small (<5 cm), Medium (5-10 cm), Long (> 10 cm)	VRPG-219*, VRPG-103* Kashi Amulya*, Kashi Alankar Narendra Parwal-260

* These reference entries are being maintained by ICAR-IIVR

Other activities

- Training cum Awareness programme on PPVFRA conducted, if any: Farmers across the state of West Bengal, Tripura and Odisha visited our field. Scientists attached with this project imparted training to the farmers regarding planting system, crop management, pollination management and insect-pests and disease management. An awareness programme on registration of Farmers variety to PPV & FRA was conducted.
- Publications and other significant achievements on PPVFRA, if any: The guidelines of DUS testing of pointed gourd have recently been published with the active cooperation and support from PPV & FRA, ICAR-IIVR, Varanasi

Distinguishing Photos of few important Reference varieties



Uniform



Striped



Mottled

Variability in fruit surface color pattern



Spindle tapering



Spindle



Club shaped

Variability in fruit shape





Field view of pointed gourd DUS characterization at BCKV, Kalyani, West Bengal

ICAR-INDIAN INSTITUTE OF VEGETABLE RESEARCH, VARANASI, UTTAR PRADESH

Reference varieties under maintenance and characterized:

The reference varieties of pointed gourd were collected from different ICAR institute and SAUs are being maintained at IIVR, Varanasi. Sixteen pointed gourd varieties/germplasm were maintained at ICAR-IIVR, Varanasi (Table 3.20). Data was recorded for 26 morphological characters (Table 3.21).

Table 3.20: Reference varieties of pointed gourd is under maintenance at ICAR-IIVR, Varanasi

S.N.	Varieties	S.N.	Varieties
1.	KashiAlankar	9.	VRPG-219

2.	KashiSuphal	10.	VRPG-141
3.	KashiAmulya	11.	VRPG-176-1
4.	VRPG-220	12.	VRPG-105
5.	VRPG-221	13.	SwarnaAlaukik
6.	VRPG-103	14.	SwarnaRekha
7.	VRPG-126	15.	BCPG-1
8.	VRPG-173	16.	BCPG-3

4. Technical Progress:

- 16 reference varieties of pointed gourd are being maintained and characterized.

Table 3.21: Characterization of 16 reference varieties of pointed gourd at ICAR-IIVR for various DUS characteristic during 2021-22 (A)

Reference varieties	Stem: Shape	Leaf: Shape	Leaf: Margin	Stem: Number of secondary branches up to 20 th node	Stem: Node number at which 1st female flower appears on the main vine (indicates earliness)	Stem: Intensity of Pubescence	Leaf blade: Length (cm)	Leaf blade: Width (cm)	Leaf blade size: Length/width ratio (cm)
KashiAlankar	Angular	Auriculate	Undulate	9	10	Sparse	Long	Medium	Large
KashiSuphal	Angular	Auriculate	Undulate	9	12	Sparse	Long	Medium	Large
KashiAmulya	Angular	Cordate	Undulate	5	10	Sparse	Long	Narrow	Medium
VRPG-220	Angular	Auriculate	Undulate	10	12	Sparse	Long	Narrow	Medium
VRPG-221	Angular	Auriculate	Lobed	12	11	Sparse	Long	Medium	Medium
VRPG-103	Angular	Cordate	Undulate	13	13	Sparse	Long	Medium	Medium
VRPG-126	Angular	Auriculate	Undulate	13	13	Sparse	Medium	Medium	Medium
VRPG-173	Angular	Auriculate	Undulate	11	11	Sparse	Medium	Narrow	Medium
VRPG-219	Angular	Auriculate	Undulate	12	11	Sparse	Medium	Medium	Medium
VRPG-141	Angular	Cordate	Undulate	12	14	Sparse	Medium	Narrow	Medium
VRPG-176-1	Angular	Auriculate	Undulate	11	14	Sparse	Medium	Medium	Medium
VRPG-105	Angular	Cordate	Undulate	14	13	Sparse	Medium	Medium	Medium
SwarnaAlaukik	Angular	Auriculate	Undulate	12	14	Dense	Medium	Medium	Medium
SwarnaRekha	Angular	Auriculate	Undulate	10	15	Sparse	Medium	Medium	Medium
BCPG-1	Angular	Cordate	Undulate	5	13	Sparse	Medium	Medium	Medium
BCPG-3	Angular	Auriculate	Undulate	3	13	Sparse	Medium	Medium	Medium

Table 3.21: Characterization of 16 reference varieties of pointed gourd at ICAR-IIVR for various DUS characteristic during 2021-22 (B)

Reference varieties	Leaf lobes	Leaf blade: Depth of lobing	Petiole: length (cm)	Flower: Sex type	Fruit: Peduncle attachment	Fruit: Shape	Fruit: Skin primary colour	Fruit: Surface colour pattern	Fruit: Glossiness
KashiAlankar	Absent	Medium	Short	Dioecious	Soft	Spindle tapering	Light Green	Uniform	Glossy
KashiSuphal	Absent	Medium	Short	Dioecious	Hard	Spindle tapering	Green	Mottled	Non Glossy
KashiAmulya	Absent	Medium	Short	Dioecious	Soft	Club shaped	Green	Mottled	Glossy
VRPG-220	Present	Medium	Medium	Dioecious	Soft	Spindle tapering	Green	Mottled	Non Glossy
VRPG-221	Present	Medium	Medium	Dioecious	Hard	Spindle tapering	Dark green	Striped	Non Glossy
VRPG-103	Absent	Medium	Medium	Dioecious	Soft	Oval	Green	Mottled	Non Glossy
VRPG-126	Absent	Medium	Medium	Dioecious	Soft	Cylindrical	Green	Mottled	Non Glossy
VRPG-173	Absent	Shallow	Medium	Dioecious	Soft	Elongated Spindle	Light Green	Uniform	Glossy
VRPG-219	Absent	Shallow	Medium	Dioecious	Soft	Spheroid	Dark green	Striped	Non Glossy
VRPG-141	Absent	Shallow	Short	Dioecious	Soft	Spindle	Light Green	Uniform	Glossy
VRPG-176-1	Absent	Shallow	Medium	Dioecious	Soft	Club shaped	Green	Striped	Non Glossy
VRPG-105	Absent	Shallow	Medium	Dioecious	Soft	Oval	Light Green	Striped	Non Glossy
SwarnaAlauki	Absent	Shallow	Medium	Dioecious	Hard	Spindle tapering	Light Green	Uniform	Non Glossy
SwarnaRekha	Absent	Shallow	Medium	Dioecious	Hard	Spindle tapering	Dark green	Mottled	Non Glossy
BCPG-1	Absent	Shallow	Medium	Dioecious	Hard	Oval	Dark green	Striped	Non Glossy
BCPG-3	Absent	Shallow	Medium	Dioecious	Hard	Club shaped	Dark green	Striped	Non Glossy

Table 3.21: Characterization of 16 reference varieties of pointed gourd at ICAR-IIVR for various DUS characteristic during 2021-22 (C)

Reference varieties	Fruit Length (cm)	Fruit: Diameter (cm) (at the widest portion)	Fruit size: Length/width ratio (cm)	Fruit: Shape of apex at blossom end	Plant: Vine length (to be observed at full maturity) (m)	Seediness	Number of seeds/fruit
KashiAlankar	Medium	Small	Large	Pointed	Medium	Present	Medium
KashiSuphal	Medium	Small	Large	Pointed	Long	Present	Medium

KashiAmulya	Medium	Small	Medium	Pointed	Long	Present	Very less
VRPG-220	Medium	Small	Medium	Pointed	Long	Present	Many
VRPG-221	Medium	Small	Medium	Pointed	Long	Present	Many
VRPG-103	Small	Small	Small	Flattened	Long	Present	Many
VRPG-126	Medium	Small	Medium	Pointed	Long	Present	Many
VRPG-173	Medium	Small	Medium	Pointed	Long	Present	Many
VRPG-219	Small	Large	Small	Depressed	Long	Present	Many
VRPG-141	Medium	Small	Medium	Pointed	Long	Present	Many
VRPG-176-1	Medium	Small	Medium	Depressed	Long	Present	Many
VRPG-105	Medium	Small	Small	Flattened	Long	Absent	Many
SwarnaAlaukik	Medium	Small	Medium	Rounded	Long	Present	Many
SwarnaRekha	Medium	Small	Medium	Rounded	Long	Present	Many
BCPG-1	Medium	Small	Medium	Pointed	Long	Present	Many
BCPG-3	Medium	Small	Medium	Pointed	Long	Present	Many

3.1.21. DUS TESTING CENTRE FOR DRUMSTICK :

UNIVERSITY OF HORTICULTURAL SCIENCES, BAGALKOT, KARNATAKA

Moringa (*Moringa oleifera* Lam.), popularly known as drumstick, is known for its wide variety of nutraceutical values is the only genus of the Moringaceae family which is comprised of 13 species, suggested to have originated from India and Africa (Amaglo *et al.*, 2010). All Moringa species have been widely introduced into many tropical and subtropical countries including India as food, medicinal or ornamental plants, of which two species viz., *M. oleifera* Lam. and *M. concanensis* Nimmo occur in India. It is an exceptionally nutritious vegetable tree with multiple uses and beneficial properties and has therefore been called a “miracle tree” or “one of the world’s most useful trees” *Moringa* has many medicinal properties. Almost all parts viz., root, bark, gum, leaf, fruit (pod), flower, seed and seed oil have been used for treatment of various inflammation and infectious diseases along with cardiovascular, gastrointestinal, haematological and hepatorenal, disorders.

Realizing the importance of Moringa, PPV and FRA established DUS center for Drumstick at Department of Biotechnology and Crop Improvement, College of Horticulture Bagalkot. At this center, good number of moringa germplasm and released varieties have been collected and established in three replication at DUS testing block. DUS testing guide lines have been developed and submitted to PPV& FRA. All the collected 21 genotypes were well characterized as per the DUS guidelines and maintained in good condition in field. Another 16 moringa genotypes have been collected from different geographical areas and multiplied in the nursery. These seedlings will be transplanted to main field. After the establishment, all the genotypes will be characterized as per the DUS testing guidelines. Apart from this, efforts have been made to create awareness about the various provisions of PPV and FRA act-2001 among the farmers, students and faculty members.

Table 3.22: Details of the reference varieties maintained at DUS center experimental block

Sr. No.	Name of the accession	Code	Area of collection	State of collection
1	PKM-01	MO_1	Periyakulam	Tamil Nadu
2	PKM-02	MO_2	Periyakulam	Tamil Nadu
3	Dhanraj	MO_3	Dharwad(UASD campus)	Karnataka
4	Bhagya (KDM-01)	MO_4	Bagalkot(UHSB campus)	Karnataka
5	Karwar-01	MO_5	Kumburda village, Karwar	Karnataka
6	Badami-02	MO_6	Badami	Karnataka
7	Mysore-01	MO_7	Mysore	Karnataka
8	Mysore-02	MO_8	Mysore	Karnataka
9	Mysore-03	MO_9	Mysore	Karnataka
10	Yelwala-01	MO_10	Shettinayakanahalli, Mysore	Karnataka
11	Shirdi-01	MO_11	Shirdi	Maharashtra
12	Tangi-01	MO_12	Tangi village	Orissa
13	Bhubaneshwar-01	MO_13	Bhubaneshwar	Orissa
14	Cuttack-01	MO_14	Cuttack	Orissa
15	Bagalkot-01	MO_15	Bagalkot	Karnataka
16	Thar-harsha	MO_16	Vejalpur, Godhra	Gujarat
17	Mandya-01	MO_17	Mandya	Karnataka
18	BG-1	MO_18	Bagalkot	Karnataka
19	BG-2	MO_19	Bagalkot	Karnataka
20	BG-3	MO_20	Bagalkot	Karnataka
21	BG-4	MO_21	Bagalkot	Karnataka



General View of DUS testing block of Moringa



Newly collected Moringa genotypes multiplication in Nursery.

3.1.22. DUS TESTING CENTRES FOR COWPEA:

DUS TESTING OF COWPEA AT UAS, DHARWAD

a) Details of DUS testing of candidate varieties in 2020-21, if any: (indicate no only)

Crops	New		VCK	FV	Date of monitoring
	1 st year Entries	2 nd year Entries			
Cowpea	24	-	12 Released Varieties + 8 Germplasm accessions obtained from NBPGR, New Delhi	-	First year of the project 2021-2022: Initiation of the program for seed multiplication, purification during <i>Kharif</i> 2021, ensuing <i>Rabi-Summer</i> 2021-22

b) Key observations of the Monitoring team (1-2 points, max): ----Nil----

c) Varieties under maintenance/characterized:

Mandated Crop Species	Name or No. of varieties under maintenance breeding in 2020-21	Data Submission (Maintenance Breeding) Yes/No
Cowpea	12 varieties viz., C 152, RC 101, GC 3, DC 15, DCS 47-1, TPTC-29, KBC 5, KBC 6, KBC 8, KBC 9, Bhagyalakshmi, Phule CP05040	Maintenance breeding – yes
	8 germplasm accessions viz., EC390219, EC390500, IC202918, IC202849, EC724153, EC724157, EC724160, EC738126)	Maintenance breeding – yes

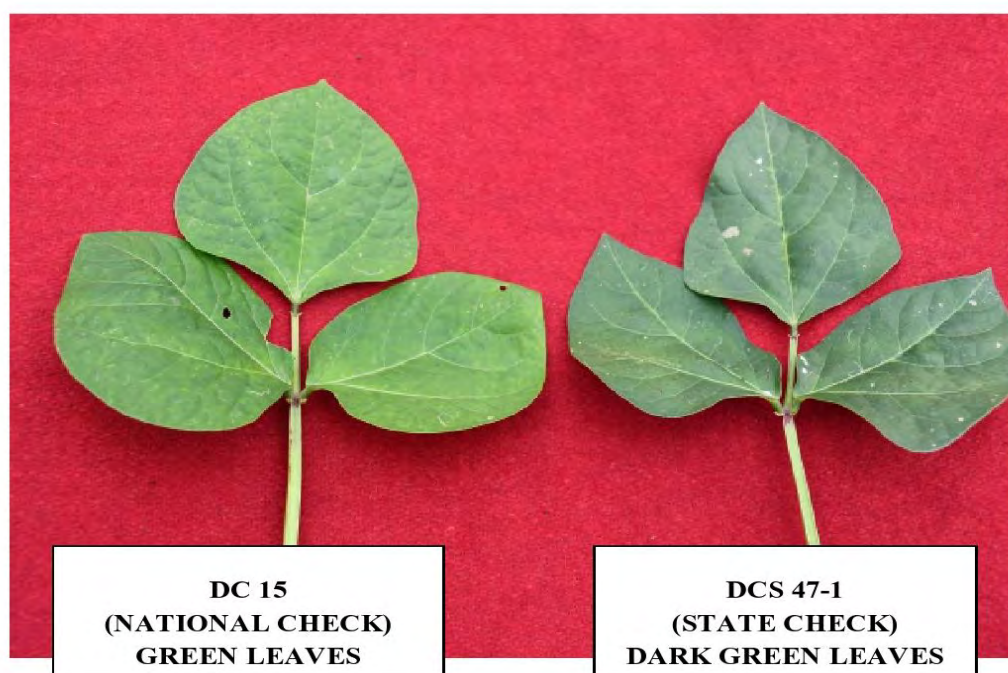
d) Salient Achievements (1 paragraph only)

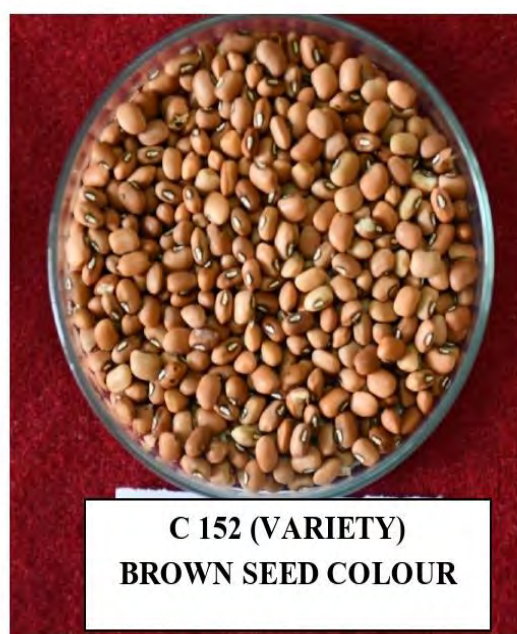
12 released varieties, 8 germplasm accessions of Cowpea were sown during *Kharif* 2021 and *Rabi-Summer* 2021-22. The above enlisted varieties and germplasm accessions were maintained with utmost purity by ensuring strict self-pollination of 5 randomly selected plants using selfing nets followed by individual plant selection during harvest based on Cowpea DUS guidelines developed by PPVFRA, New Delhi. Observations on all the 24 DUS traits were recorded at appropriate crop growth stages as per the guidelines. Some of the important DUS traits recorded are leaf shape, leaf color, growth habit, seed shape, seed color etc. Some important photographs depicting unique DUS traits are included (attached JPEG photos). In addition, total soluble protein percentage in cowpea grains was also estimated in 4 released varieties (DC 15, DCS 47-1, GC3 and RC 101) and 2 germplasm accessions (EC 724153 and EC 724157).

Table 3.23: Financial progress(pls also send a copy of AUC & SOE for FY 2020-21: Project has been initiated and started during FY 2021-22 at UAS, Dharwad)

Items	Unspent balance as on 1 st April, 2021	Interest accrued/other income for the DUS centre	Budget FY 2021-22	Funds released in FY 2021-22 (Rs.)	Expenditure in FY 2021-22 (Rs.)	Unspent balance as on 1 st April 2022 (Rs.)
Manpower (indicate SRF/JRF/RA/TA etc and no of technical manpower engaged in each category)	0	0	0	1,75,000	0	1,75,000
Non Recurring						
Recurring(field expenses and contingency)		0	0	2,00,000	1,11,629	88,371
Others (Travelling allowance)			0	25,000	0	25,000
Total	0	0	0	4,00,000	1,11,629	2,88,371

Photographs showing distinct morphological features







3.1.23. DUS TESTING CENTRES FOR FABA BEAN:

DUS TESTING OF FABA BEAN AT ICAR-NBPGR, NEW DELHI

During the year 2021-22, a new center for DUS testing of Faba bean was started at ICAR-NBPGR, New Delhi. The guidelines for the conduct of tests were consulted and seeds of nine reference varieties were taken out from National Gene Bank, ICAR-NBPGR, New Delhi. Simultaneously, letters were sent to the breeder's (or Institutions) for fetching Breeders' seed of seven released varieties of faba bean in India. These sixteen varieties were sown at ICAR-NBPGR, Issapur, Delhi farm along with one farmers' variety (Trial Code 2883/2677) provided by the PPV & FRA, New Delhi for multiplication/ recording of observations as per guidelines during Rabi 2021-22. The visual inspection and later plant emergence proved that the farmers' variety didn't belong to Faba bean crop. It was Dolichos bean and the same was communicated to the Registrar, PPV & FRA vide email dated 10.11.2021. The genotypes were protected by insect-proof nets during the flowering period to avoid cross-pollination and to maintain the genetic purity. Data of 27 traits were collected on rest of the 16 varieties/ reference genotypes and after harvesting, the seeds were stored in Medium Term Storage at Division of Germplasm Evaluation, ICAR-NBPGR, New Delhi for growing during Rabi 2022-23.

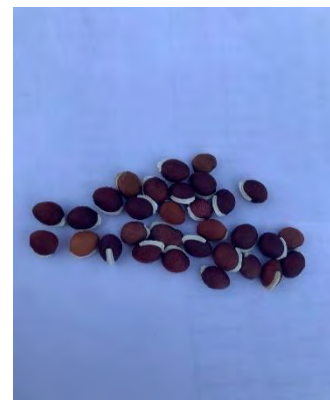
Field Pictures ICAR-NBPGR Farm, Issapur



1. Reference varieties protected by net cages



2. ICAR dignitaries visiting Faba bean field at Issapur



3. TC 2883 2677 Crop, Pods and Seeds.

3.1.24. DUS TESTING CENTRES FOR BETELVINE

INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, BANGALORE

It is the lead centre maintained 40 (4 released, 36 FV/VCK/germplasm). DUS traits recorded in 11 example varieties and 29 germplasm lines

Table 3.24: Varieties under maintenance/Characterized:

Crops	Name or No of varieties under maintenance breeding in 2020-21
Betelvine	40 (4 released, 36 FV/VCK/germplasm)

DUS traits were recorded on eleven reference clones of betelvine grown under *sesbania grandiflora* L. (Sesbania) at ICAR-IIHR experimental farm. Observations were recorded on six quantitative traits viz. orthotropic stem internodal length(cm), number of Plagiotropic shoots/unit length(no/m), Plagiotropic leaf l/b ratio, Female inflorescence length(cm), Male inflorescence length(cm), Number of inflorescence /Plagiotropic shoots.

The data on 11 qualitative characteristics i.e. Orthotropic leaf lamina colour, Orthotropic leaf apex shape, Orthotropic leaf texture, Plagiotropic stem colour, Plagiotropic leaf lamina shape, Plagiotropic leaf apex shape, Plagiotropic leaf texture, sex of the plant, Flowering habit, Female inflorescence colour, Number of inflorescence/Plagiotropic branch, as these traits were recorded and the data is presented below

BIDHAN CHANDRA KRISHI VISWAVIDYALAYA, KALYANI IS THE COLLABORATING CENTRE OF BETEL VINE.

Germplasm augmentation and maintenance of example varieties under closed (Boroj) system of cultivation at BCKV

The varieties of betelvine collected from different parts of the country are being maintained under boraja structure in two places at Bidhan Chandra Krishi Viswavidyalaya (BCKV), Kalyani, Nadia, West Bengal. In total 41 lines/varieties are maintained at this Co-nodal center of the project

(Table-3.25). This includes all the example varieties mentioned in the DUS testing guidelines. Besides this 20 hybrid lines are being maintained at this center.

Table 3.25: List of varieties of *Piper betle* L. maintained at BCKV (Fig.1)

Bangla Cultivars			Sanchi Cultivars		
1.	Bagerhat Bangla	16	Lakshman	30	Halisahar Sanchi
2	Bankura Bangla	17	Malishapur Bangla	31	Kalipatti
3	Bhabani Bangla	18	Sada Bangla (Baheral)	32	Simurali Sanchi
4	Bhainchigodi	19	Sada Bangla (Fatepur -1)	33	Gangarampur Sanchi
5	Bhandarkhola	20	Sada Bangla (Fatepur -2)	Kapoori Cultivars	
6	Dogapan Sada	21	Sada Bangla (Gangarampur)	34	CARI-6 (AN)
7	Ghanagette	22	SGM -1	35	Kapoori (Chinacheppali)
8	Godi Bangla	23	Simurali Bhabna	36	Kapoori (Doddipatla)
9	Halisahar Jhal	24	Simurali Chamundali	37	Kapoori (Pedacheppali)
10	Harishpur Bangla	25	Simurali Deshi	38	Kapoori (Swarna)
11	Jabalpur Bangla	26	Simurali Gole Bhabna	Meetha Cultivars	
12	Kadwa	27	Uttare Pan	39	Meetha-1
13	Kal Bagini	28	CARI-2 (AN)	40	Meetha-2
14	Kali Bangla	29	Bilhari	41	Meetha-3
15	Kotki Bangla				

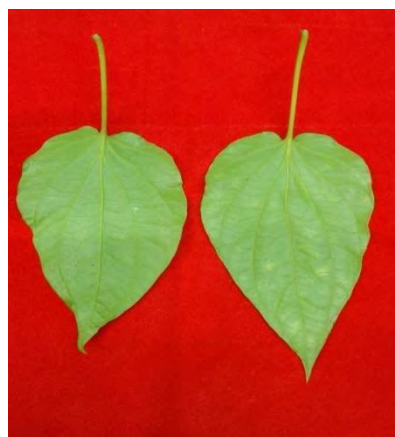
**Fig.1. Betelvine varieties inside Boreja****Fig. 2. Boreja (Outside & inside)**

DUS testing of candidate varieties

This centre received about 20 cuttings of **Huikhadan Deshi Kapuri Pan** in coco peat from Dr. Alice Tirkey of IGVK, Raipur around end of October, 2019. These cuttings were very thin and feeble. Most of the cuttings survived. So, it took much time to get proper stand. The test/ candidate variety, “Huikhadan Deshi Kapuri Pan” is a Kapoori type variety. The characters of this variety were thoroughly compared with four Kapoori varieties maintained in closed condition at Kalyani and presented in the table below. The data were taken as per guidelines.



Growing vines of Huikhadan Deshi Kapuri Pan



Leaf type

3.1.25. DUS TESTING CENTRES FOR AONLA

ICAR- CENTRAL INSTITUTE FOR SUBTROPICAL HORTICULTURE, LUCKNOW, UP

Aonla varieties (8) planted in the field gene bank were characterized. The reference varieties (8) are being maintained in the field gene bank. DUS testing was performed on 1 candidate variety including

five varieties submitted for registration to the Authority. UP orchardists were sensitized about benefits of registering their varieties with PPVFRA.

Table: 3.26: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2021-2022	Data Submission (Maintenance Breeding) Yes/No
Aonla	8	Yes



Farmer variety Sanjeevani Pink

3.1.26. DUS TESTING CENTRES FOR BAEI

ICAR-CENTRAL INSTITUTE OF SUBTROPICAL HORTICULTURE, LUCKNOW, UTTAR PRADESH

During 2021-22 Bael (12) planted in the field gene bank were characterized. The reference varieties (15) are being maintained in the field gene bank. DUS testing was performed on 4 candidate varieties including three varieties submitted for registration to the Authority. UP orchardists were sensitized about benefits of registering their varieties with PPVFRA.

Table 3.27: Varieties under maintenance/characterized

Mandated Crop species	Name or No of varieties under maintenance breeding in 2021-22	Data submission (Maintenance breeding) Yes/No
Bael	15	Yes

Table 3.28: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Bael		-	-	4	-



Farmer variety Barsati Bael

Farmer variety Swati Bael

3.1.27. DUS TESTING CENTRES FOR JAMUN

ICAR- CENTRAL INSTITUTE FOR SUBTROPICAL HORTICUTURE, LUCKNOW

It is the lead centre, during the year 2021-22 DUS Characterization of jamun accessions (34) available in the field gene bank was continued as per guidelines for the conduct of test for distinctiveness, uniformity and stability in jamun. Reference varieties of jamun (7) were maintained in the field gene bank under recommended cultural practices. Out of these, 11 accessions were characterized using DUS descriptors for tree growth and fruit quality traits. Farmers were sensitized for registering their varieties under PPV & FRA.

Table 3.29: Varieties under maintenance/characterized:

Crop	Name or No of varieties under maintenance breeding in 2021-22
Jamun	34

CENTRAL HORTICULTURAL EXPERIMENT STATION (ICAR-CIAH), VEJALPUR-389340, GODHRA, GUJARAT

It is the collaborating centre for Jamun.

During 2021-22 seven candidate/reference varieties (Goma Priyanka, Konkan Bardoli, CISHJ-42, Thar Kranti and Jamwant) were maintained in field repository at the Station, CHES, Godhra for testing of farmers variety. Some field views and salient features of varieties are as under:

Goma Priyanka: It is semi-dwarf, spreading growth habit, dense foliage and drooping branches, precocious bearer (starts flowering in 4th year) and suitable for high density planting. It starts flowering in the month of March, ripens in the fourth week of May and recorded 19.86 g average fruit

weight, 85.06 per cent pulp, 16.80°Brix TSS, 0.38 % titratable acidity, 12.10 % total sugar, 6.11 % reducing sugar, 45.44 mg/100 g vitamin C. The fruit yield was 60.80 kg/plant during 8th year of plantation under rain-fed conditions of hot semi-arid ecosystem.

Thar Kranti: It is spreading type, starts flowering in 3rd year, regular bearer, ripens in the fourth week of May and recorded 20.10 g average fruit weight, 85.57 per cent pulp and 17.10° Brix TSS. Mean fruit yield per plant was recorded 65.00 kg during 10th under rainfed conditions of hot semi-arid ecosystem.

Jamwant: It is a mid season maturing variety which is ready for harvest during the second week of June. The fruit is oblong having average weight 24.05 g, length 3.90 cm, diameter 3.03 cm, pulp 92.26 % and TSS 16.4 °Brix. The fruit yield was 68.70 kg/plant during 10th year of plantation under rain-fed conditions of hot semi-arid ecosystem.

CISH J-42: Its uniqueness lies in seedlessness (rudimentary seed) with high pulp content (97-98%). The fruit is round shaped and has average weight 6.87 g with a length of 2.57 cm. Fruits are good in test having 14-16 TSS °Brix. Yield potential is 180-250 kg/tree. Fruits mature during second week of June.

Konkan Bahdoli: It has heavy and cluster bearing habit with bold fruits, small seeds, high pulp to seed ratio, better table and processing qualities. The average weight of fruit is 14 to 16 g with 16 °Brix TSS.

Table 3.30: Varieties under maintenance/characterized:

Name or No of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Goma Priyanka, Konkan Bardoli, CISHJ-42, Thar Kranti and Jamwant	Yes

Goma Priyanka
semi spreading



Konkan Bardoli
semi spreading



CISHJ-42
up right



CISHJ-37
semi spreading



3.1.28. DUS TESTING CENTRE FOR GUAVA

ICAR- CENTRAL INSTITUTE FOR SUBTROPICAL HORTICUTURE, LUCKNOW

During the year 2021-22 Guava varieties (29) planted in the field gene bank were characterized. The reference varieties (40) are being maintained in the field gene bank. DUS testing was performed on 3 candidate varieties including two varieties submitted for registration and another one submitted to the authority. Ten plants of candidate variety (Jarvi Red) were provided by the farmer Heenaben Jeyeshbhai Patel. The guava growers of Farrukhabad district, UP were sensitized about benefits of registering their varieties with PPV& FRA. Six farmers' varieties of guava were collected from Farrukhabad (UP).

Table 3.31: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV
	1 st year entries	2 nd year entries		
1	-	-		1

Table 3.32: Varieties under maintenance/characterized:

Crop	Name or No of varieties under maintenance in 2021-22
Guava	135

3.1.29. DUS TESTING CENTRE FOR LITCHI

ICAR-NATIONAL RESEARCH CENTRE ON LITCHI

During the year, the centre has 75 varieties under maintenance breeding. The centre is maintaining 6 reference varieties in the DUS testing block. Total 22 germplasm were characterized as per DUS descriptors. There are no farmers' variety at present in the DUS block.

Table 3.33: Varieties under maintenance/characterized

Mandated Crop Species	Name or no of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Litchi	75	Yes

3.1.30. DUS TESTING CENTRE FOR ARECANUT

ICAR-Central Plantation Crops Research Institute (CPCRI), Dakshina Kannada, Karnataka is the lead centre recorded morphological traits like plant height, stem height, crown length, crown shape,

girth, internodal length, no. of leaves, no. of leaflets L, no. of leaflets R etc. and fresh nut and dry nut characteristics viz., fresh fruit weight, fruit length, fruit breadth, dry nut weight, dry kernel weight etc. from example/reference varieties at ICAR-CPCRI, Regional Station, Vittal. Fifteen arecanut example/reference varieties viz., Mangala, Sumangala, Sreemangala, Mohitnagar, Swarnamangala, Kahikuchi, Madhuramangala, Nalbari, South Kanara Local, Sirsi, Sagar, Thirthahalli, Hirehalli Dwarf, VTLAH-1 and VTLAH-2, were studied for vegetative growth characters under Assam condition at ICAR-CPCRI, Research Center, Kahikuchi, Guwahati. Among the varieties studied, Kahikuchi variety recorded the maximum seedling height (171.00 cm) 18 months after germination. Maximum girth at collar was recorded in the hybrid VTLAH-1 (2.83 cm). Number of leaves among the varieties varied from 3.29 to 5.00. VTLAH-2 recorded higher number of leaves (5.00) followed by VTLAH-1 (4.57)

Table 3.34: Varieties under maintenance/characterized:

Crops	Name or No. of varieties under maintenance in 2021-22	Data submission (Maintenance): Yes/No
<i>Areca catechu</i> L.	16	Yes

3.1.31. DUS TESTING CENTRE FOR CASHEW

ICAR- DIRECTORATE OF CASHEW RESEARCH, PUTTUR, KARNATAKA

The application for registration of a variety H-126, a jumbo nut with high uniformity in nut size (released from the institute) has been sent to the authority and its registration is pending.

Facilitated the application of Vengurla-9 variety from Regional Fruit Research Station, Vengurla, Maharashtra which is an AICRP center under ICAR- Directorate of Cashew Research, Puttur for registration.

The application for H-130, a jumbo nut cashew hybrid (released from the institute) registration under PPV-FRA has been sent to the authority and its registration is pending

The application for NRC-492 (Nethra Vaaman), a novel dwarf variety of cashew recently released at the Directorate has been sent to the authority and its registration is pending

Forty four released varieties that are characterized for 68 characters are maintained in the National Cashew Field Gene Bank

The cashew germplasm database (<https://cashew.icar.gov.in/dcr>) was enriched with 82 images belonging to 26 germplasm accessions. The database has been visited 4073 times as on 16-04-2022.

The core collection of 61 cashew germplasm accessions established during 2017 was maintained following recommended agronomic practices and shape pruning.

The block of 30 reference varieties is maintained

Table 3.35: Details of DUS testing of candidate varieties in 2021-22:

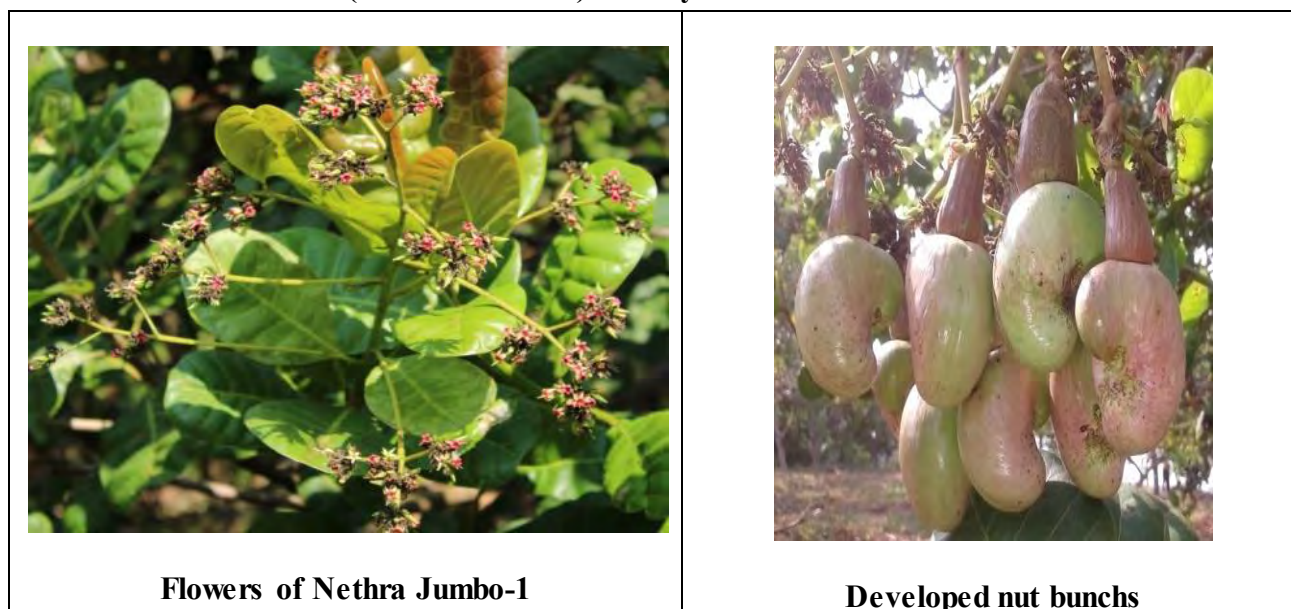
Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Cashew	-	H -130	NA	NA	NA
Cashew	Nethra Vaaman	NA	NA	NA	NA

Table 3.36: Varieties under maintenance/characterized:

Crops	Name or No of varieties under maintenance breeding in 2021-22
Cashew	A total of 44 varieties characterized and maintained. Database developed and a block of reference varieties (30 No.) has been established and maintained

Table 3.37: Applications filed with PPVFRA

Crops	No of Varieties notified by the center Since 1966	No of Var notified by the center Since 2001	No of applications filed			Certificates issued	Pending applications	Reasons for pendency
			Extant Notified VCK		New			
Cashew	5	2	1	3	0	1	3	Under processing

Photos of H-126 (Nethra Jumbo-1) variety of cashew



Nut and fruit bunches



Kernels of Nethra Jumbo-1

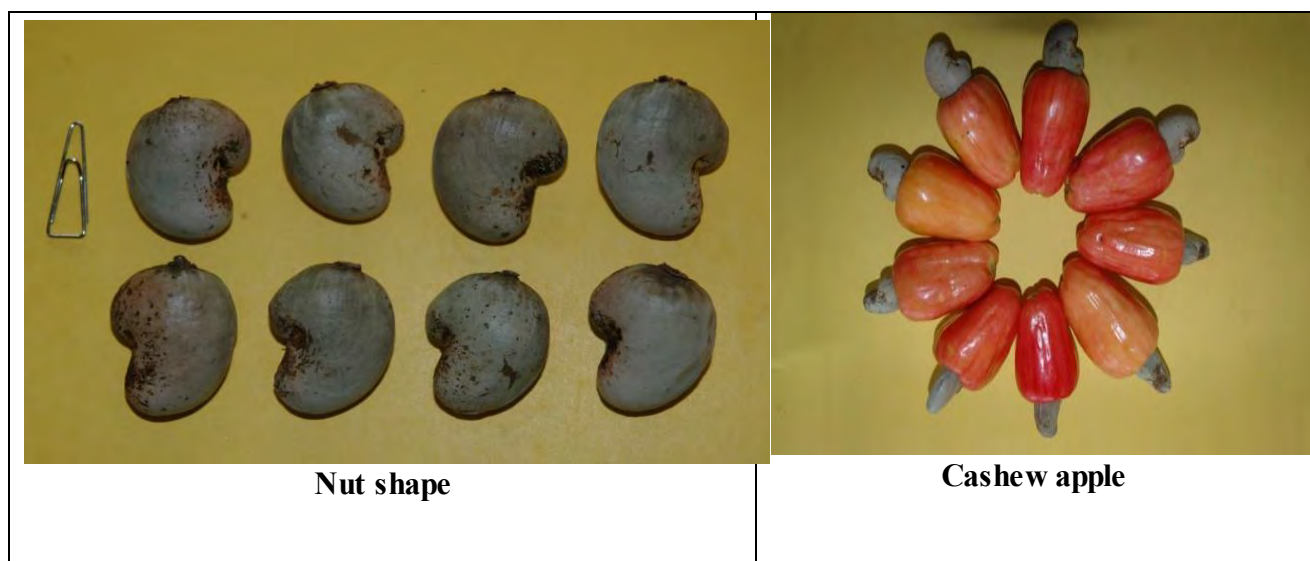
Photos of Nethra Vaaman- A novel dwarf variety of cashew



Tree habit



Stem galling



3.1.32. DUS TESTING CENTRE FOR CHIRONJI (BUCHANANIA LANZAN SPRENG.) AND TAMARIND (TAMARINDUS INDICA L.)

CENTRAL HORTICULTURAL EXPERIMENT STATION (ICAR-CIAH), VEJALPUR, GODHRA, GUJARAT

Tamarind: Eleven reference varieties of tamarind namely Goma Prateek, Pratisthan, T-263, PKM-1, Ajanta, DTS-1, Red Type, Sweet Type, Bantoor, Urigum and CHEST-10 were maintained.

Chironji: Ten varieties/ genotypes of chironji namely Thar Priya, CHESC-1, CHESC-2, CHESC-3, CHESC-4, CHESC-5, CHESC-6, CHESC-8, CHESC-9, CHESC-10 were maintained in the field.



Fruiting pattern of chironji cv Thar Priya



Harvested fruit and fruiting pattern of Tamarind cv. Goma Prateek

3.1.33. DUS TESTING CENTRE FOR MULBERRY

CSRTI, CENTRAL SILK BOARD (MINISTRY OF TEXTILES), MYSORE

It is the lead centre. The DUS test plot with 52 accessions in three replications was maintained with regular weeding, irrigation, FYM application, regular pruning and other farm operations.

Example genotypes (34) were DUS characterized for 35 characters.

Candidate varieties (G-4, G-2, AR-12, RC-1, MSG-2 and Sahana) were planted in three replications with 8 plants in each replication at DUS test plot.

One round of DUS testing of candidate (G4, G2, RC1, AR12, Sahana and MSG2) and reference varieties at demonstration plot for 35 DUS characteristics was completed.

Raised the nursery for 13 reference and 6 candidate varieties in RCBD with 3 replications for recording survival % and rooting % of genotypes.

Recorded survival data of genotypes after 90 days of growth.

Mulberry cuttings of Vishwa (DD), TG, Suvarna-1, Suvarna-2, Suvarna-3 were procured from KSSRDI, Thalagattapura, Banaglore to increase the reference collection of the mulberry genotypes.

Isolated genomic DNA from 52 accessions which include example genotypes, reference and candidate varieties.

Completed DNA quantification of 52 accessions which include example genotypes, reference and candidate varieties.

Based on DNA quantification results, the DNA stock solutions were diluted to a uniform concentration of 40 ng/μl for PCR amplification.

Reference and candidate varieties were characterized with 5 SSR markers.



Mulberry nursery of candidate and Reference varieties raised to record survival % of cuttings



Mulberry varieties of KSSRDI, Thalagattapura

3.1.34. DUS TESTING CENTRE FOR POPLAR

DR YSP UHF, NAUNI, SOLAN

The 15 Clones were maintained in the experimental area of the Department of Tree Improvement and Genetic Resources, Dr YSP UHF Nauni, Solan. The leaf data was recorded in the month of August, 2021 and growth data in the month of December. The data was analyzed in the month of February 2022. The DUS character for each clone of Poplar (*Populus spp.*) under maintenance testing were validated according to the guidelines which have already been published by Protection of Plant Varieties and Farmer's Right Authority.

Table 3.38: No. of variety undergone maintenance breeding / characterization / progress of development of DUS guidelines

Name of the species	No of varieties		Source (own released/ICAR/SAU)
	Source	Clones	
<i>Populus deltoides</i>	Uttarakhand Forest Department	L-61/05, L-30/06, L-62/84, G-48	SAU, Forest Deptt, WIMCO
	Wimco Seedlings Ruderpur, UK	S ₇ C ₁₅ , S ₇ C ₈ , WSL-22, WSL-39	
	Department of TIGR, UHF, Nauni	6503, 5503, 1007, L-200/86	
	Department of Forestry PAU, Ludhiana	PL-3, PL-6, PL-7	
	Total	15	

3.1.35. DUS TESTING CENTRE FOR WILLOW

Y.S. PARMAR UNIVERSITY OF HORTICULTURE & FORESTRY, NAUNI, SOLAN, HP

During the year 2021-22 the 17 varieties/clones were maintained in the experimental area of the department. The leaf data was recorded in the month of August, 2021, growth data in the month of December, 2021 and sprouting in the month of January 2022. The data was analyzed in the month of February, 2022. The DUS characters for each variety of willow (*Salix spp.*) under maintenance testing were validated according to the guidelines which have already been published by Protection of Plant Varieties and Farmers' Rights Authority.

The applications of four farmer varieties (REG/2021/0128 denomination DOODER-1; REG/2021/0129 denomination Narag-1; REG/2021/0130 denomination SHOTTI-1; REG/2021/031 denomination Sanog-1) were received and propagules were collected and replicated in the nursery for DUS testing during 2022-23.

Table 3.39: Details of DUS testing of candidate varieties in 2021-22

(Indicate no. only) = 4

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Willow species) (<i>Salix</i>				1. DOODER-I	

				2. NARAG-I	
				3. SHOTTI-I	
				4. SANOG-I	

Table 3.40: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Willow (<i>Salix</i> species)	(17 Varieties) (PN-731, SI-64-016, PN-227, FLS, SI-64-017, SI-63-007, 006/05, Ghagas, J-799, NZ-1140, 131/25, J-194, J-795, AUSTREE, Kashmiri local, V-99, DEVMATA)	Yes

3.1.36. DUS TESTING CENTRE FOR EUCALYPTUS AND CASUARINA

INSTITUTE OF FOREST GENETICS & TREE BREEDING, COIMBATORE, TAMIL NADU

Eucalyptus DUS Centre

The clonal trials of *Eucalyptus camaldulensis* planted at different locations such as Karunya, Marakkanam, Kallakurichi, IFGTB and Salem were evaluated for both quantitative (MG) and qualitative traits (VS). The DUS Characterization of reference clones were done according to the 33 morphological characters described in PPVFRA guidelines.

The qualitative assessment of characters such as Mature Fresh, dried and Rhyditome bark colours, Crown shape, primary branch attitude, Bark peeling type, Mature leaf shapes, Scar shapes, scar periphery projection, Trunk Waxiness, Trunk clear bole height, Bark texture, Annual peeling were observed and recorded for all replications in their respective locations. The quantitative assessment (MG) referred as Measurable traits such as mature leaf length, mature leaf area, mature leaf breadth, mature petiole length, mature blade ratio were observed and analyzed through Image Analyzer in Laboratory. Samples of flowers, fruits, and inflorescence were collected and recorded. Furthermore, the visual documentation was maintained for all different locations of all reference clones. This is used for grouping and recording DUS Matrix for future references.

Karunya Nagar Clonal Trial:

The clonal trial of *Eucalyptus camaldulensis* was situated in Karunya nagar, Coimbatore.

The Field Visit was conducted for assessing the DUS characters of the reference clones and IFGTB released clones C3, C6, C7, C9, C14, C15, C16, C19, C20, C22, C33, C53 (EC-1), C63, C68, C75,

C86, C92, C94, C100, C101, C111(EC-3), C124, C154, C157, C187, C188, C191, C207 planted in Randomized Block Design with spacing of 3m x 2m.



Kurumbapatti Research Station, Salem

The *Eucalyptus camaldulensis* clonal seed orchard is situated in Kurumbapatti Research station, Salem.

The field visit was conducted to observe and assess DUS (Distinctness, Uniformity, and Stability) of 10 Reference Clones of *Eucalyptus camaldulensis* (CSO) C14, C100, C188, C123, C187, C191, C7, C9, C75, and C63 planted in Randomized Block Design, with spacing: 3m x 2m.



TAFCON Plantation, Marakkanam

The TAFCON Plantation situated in Thiyaadurgam in Kallakurichi, Randomized block design with spacing 3m x 2m.

The field trip was conducted to document the *Eucalyptus camaldulensis* of 18 reference clones and to collect samples of Leaves, Buds and Fruits of all four replications. The reference clones were C53, C111, C101, C191, C123, C63, C14, C100, C188, C207, C124, C9, C69, C303, C307, C301, C187, and C198.



TAF CORN Plantation, Thiya gadurgam, Kallakurichi

The TAF CORN Plantation situated in Thiya gadurgam in Kallakurichi, Randomized block design with spacing 3m x 2m.

The Field Visit was conducted for assessing the DUS characters of the 15 reference clones and IFGTB released clones C123, C207, C101, C9, C63, C53, C188, C111, C7, C19, C196, C100, C124, C14 and C16.



Works carried out in DUS centre - Casuarina

The registration process was completed for six new varieties of Casuarina and certificates have been issued by the Authority. This is the first instance of registration for forestry crops in the country. The details of the registered varieties are given below.

S. No.	Name of the variety	PPVFRA Registration Number	Date of issue of certificate
1	IFGTB-CJ-9	REG/2015/1658	16.06.2021
2	IFGTB-CH-1	REG/2017/1564	16.06.2021

3	IFGTB-CH-2	REG/2017/1565	16.06.2021
4	IFGTB-CH-3	REG/2017/1566	02.07.2021
5	IFGTB-CH-4	REG/2017/1567	02.07.2021
6	IFGTB-CH-5	REG/2017/1568	02.07.2021

Organizations involved in varietal development for Casuarina have been contacted and for possible registrations of varieties developed by them. In particular, paper industries were requested to register the varieties developed by them before deploying them in their farm forestry programmes. It is expected more applications for registrations will be submitted in the next few years. The reference collection of released and example varieties are being maintained in Coimbatore and Chennai Stations. The stocking is maintained by continuously propagating the varieties and replanting them in the collection. At present more than around 110 varieties / clones are maintained in two locations. DUS characters are recorded for the registered and example varieties.

Casuarina hybrid clones multiplied and planted by farmers



3.1.37. DUS TESTING CENTRE FOR BER

ICAR-CENTRAL INSTITUTE FOR ARID HORTICULTURE, BIKANER, RAJASTHAN IS THE LEAD CENTRE FOR DUS TESTING IN BER VARIETIES.

During the year 2021-22 twenty-five references, 85 example varieties, and 21 new ber genotypes have been characterized and maintained in the field gene bank of ICAR-CIAH, Bikaner. Eight claimed varieties from Jai Durga Krishak Club, VPO-Lakhuri, Janjgeer-Champa, Raipur scion bud wood was received for raising of saplings for onwards testing (as per DUS guideline) the claimed material in this ecosystem, but during postage delay and improper handling all budded saplings could not survive in the nursery. In reference ber varieties apart from field maintenance and DUS parameters study additionally recorded some flowering and fruit set pattern data as well as frost injury levels and some ancillary observations. Other germplasm were characterized also as per DUS guidelines with the

objective to compare a wide range of *Zizyphus* material in the future. In the reporting year, 21 new germplasm were characterized morphometrically for two consecutive years (any doubt will be characterized with molecular protocol).

Table 3.40: Details of the varieties under maintenance/characterized:

Crops	Name or No. of varieties under maintenance as reference varieties	Data submission
Ber	25 varieties : Gola, Seb, Banarasi Karaka, Banarasi Pawandi, Chhuhara, Kaithali, Mundia, Illaichi, Reshmi, Sanur-5, Umran, ZG-3, Jogia, Chhuhara Bawal, Narma, Kismish, Safeda Rohtak, Mehrun, Kala Gola, Katha Phal, Dharki No.1, Lakhan, Gularbasi, Safeda Selection, Tikadi	Yes

Crops	Name or No. of varieties under characterized as new varieties	
Ber	21 varieties : From germplasm block BC series (14), Jodhpur series (6) and one cross (Sebx Katha) were described as per DUS descriptor	Yes

Table 3.41: Details of DUS testing of example varieties:

Crops	Name or No. of varieties as example varieties	
Ber	85 varieties : Akharota, Aliganj, Alwar Desi, B. S. 75-1, B. S. 75-2, B. S. 75-3, Badami, Bagwadi, Bahadurgrhi, Banarasi, Banarasi Karaka, Banarasi Pawandi, Bawal Selection, Betawadi, Betawadi Hetal, CAZARI Gola, Chandni (Supari), Chhuhara, Chhuhara Bawal, Chirana-1, Dandan, Dharki No. 1, Dharki No. 2, Foliso Alwari, Glori, Gola, Gola Gurgoan, Golar, Goma Kirti, Gorafa, Gularbasi, Illaichi, Jhajjar Selection, Jogia, Kaithli, Kakrola Gola, Kala Gola, Kali, Katha, Katha Bombay, Katha Phal, Katha, Rajasthan, Kheera, Laddu, Lakhan, Maharwali, Mehrun, Mundia, Mundia Murhera, Nalgarhi, Narikali, Narma, Neharu (Mandal), Nonki, Panthani, Popular Gola, Reshmi, Rohataki Gola, Safar Chandani, Safeda, Safeda Rohatak, Safeda Selection, Sandura Narnol, Sandura No. 1, Sanur-1, Sanur-2, Sanur-3, Sanur-4, Sanur-5, Sanur-6, Sauveda, Seb, Shamber, Sua, Surati, Tesbetes, Thar Bhuhhraj, Thar Sevika, Thornless, Tikadi, Umran, Villiati, ZG-1, ZG-2, ZG-3	No

New ber genotype under characterization (During 2021-22)

Along with 25 References varieties with BC (14), Jodhpur (6) series and Seb x Katha (P1) germplasm were evaluated as per DUS discraptor consecutively for two years and being maintained at National Active Germplasm site of ber at ICAR-CIAH, Bikaner.

S.No.	Name of varieties	Source of planting material
1.	BC1P1	Back cross population at CIAH, Bikaner
2.	BC1P2	
3.	BC1P3	

4.	BC1P4	
5.	BC1P5	
6.	BC1P6	
7.	BC1P7	
8.	BC1P8	
9.	BC1P9	
10.	BC1P10	
11.	BC1P11	
12.	BC1P12	
13.	BC1P13	
14.	BC1P14	
15.	Jodhpur-1	Collected and maintained in field repository at CIAH, Bikaner
16.	Jodhpur-3	
17.	Jodhpur-4	
18.	Jodhpur-5	
19.	Jodhpur-6	
20.	Jodhpur-7	
21.	Seb x Katha (P2)	Crossing progeny at CIAH, Bikaner

3.1.38. DUS TESTING CENTER FOR CASSAVA, SWEET POTATO, GREATER YAM, YAM BEAN, ELEPHANT FOOT YAM AND TARO

ICAR – CENTRAL TUBER CROPS RESEARCH INSTITUTE, BHUBANESWAR, ODISHA

It is the lead centre for DUS testing of tuber crops.

During the year 2021-22 maintained the field gene bank with 21 taro reference varieties and 18 no's of Elephant Foot Yam reference varieties. Planting materials of varieties/clones were multiplied.

Characterization of two candidate varieties (**Guchedar and Narendra Ghuiya**) received from PPVFRA has been done for Second year.

Two new candidate varieties **GiddiMudli (Dasheen Taro)** and **PhoolaMudli (Dasheen Taro)** were received on 22.12.2021 from Uttar Kannada, Karnataka for characterization. Both the lines were planted at field gene bank for multiplication.

Three local taro lines and two local EFY lines were planted in the field and characterizations have been done as per DUS guidelines for second year.

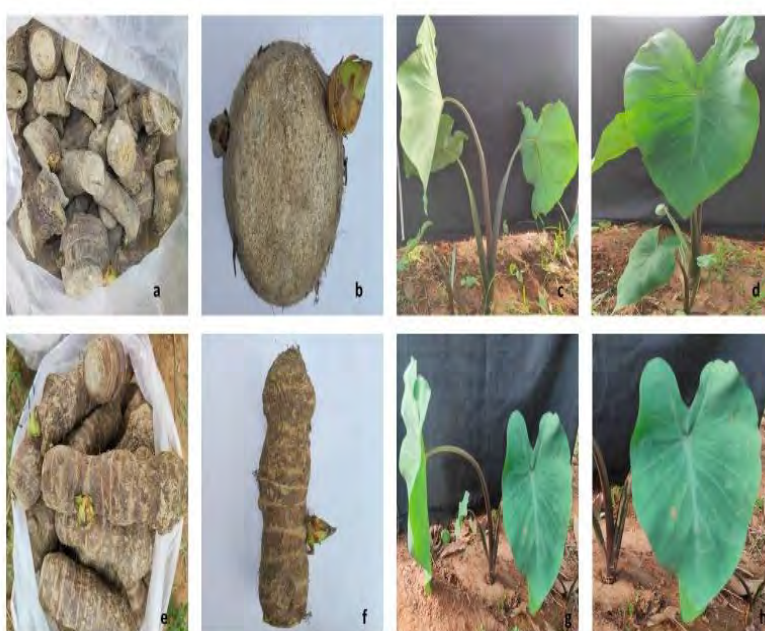
Individual distinct characters of all the local lines have been identified and documented.

As cyclone prone area conserving Taro and EFY varieties under *in vitro* condition. Tissue

cultured raised planting materials were acclimatized and being maintained at net house.

Table 3.42: Taro DUS entries (Two) received from PPVFRA New Delhi for characterization

SL NO	Local name of the TARO lines	Person name	REMARKS
1.	GiddiMudli (Dasheen Taro)	Chaitanya P. Gavada Village: Kateli, PO: Kumbarwada, Uttar Kannada, Karnataka	Received on 22.12.21 and Planted for tuber multiplication
2.	PhoolaMudli (Dasheen Taro)	ChandrakantGavada Village: Ambarde, PO:Joida, Uttar Kannada, Karnataka	Received on 22.12.21 and Planted for tuber multiplication



Taro: (a-d): GiddiMudli and (e-h): PhoolaMudli

Table 3.43: Taro DUS entries (Two) received from PPVFRA New Delhi and Characterized

SL NO	Local name of the TARO lines	Person name	Remarks
1.	Guchedar	Ragupat Singh Village: Samathal, PO: Sayodara, Muradabad, UP	Characterization has been done for Second year.
2.	Narendra Ghuiya	Narendra Kumar Kushwaha	Characterization has been done for Second year.

Cassava and Sweet potato

Maintaining the field gene bank with 43 sweet potato reference varieties and 17 no's of Cassava reference varieties. Planting materials of varieties/clones were multiplied.

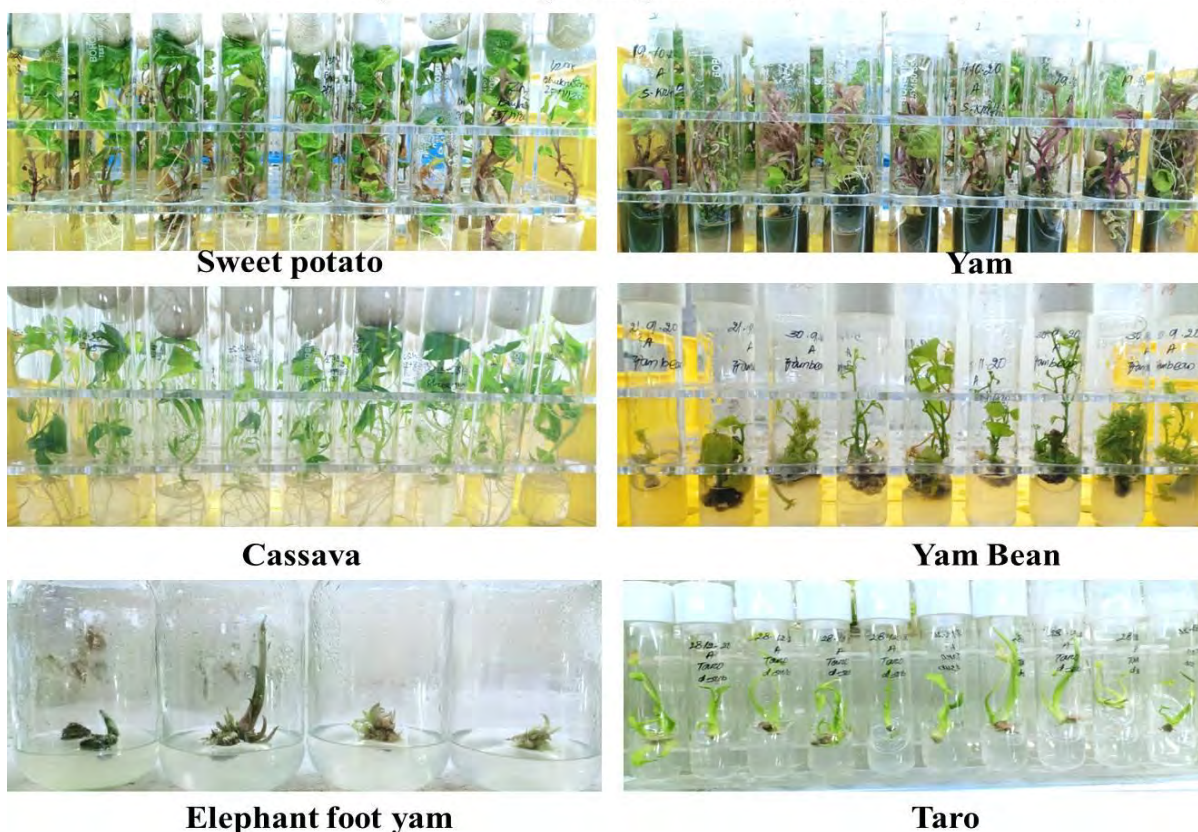
Planted one farmers variety (Manna) received from CTCRI, Kerala for maintaining at the field gene bank. Individual distinct characters of all the reference lines have been identified and documented. As cyclone prone area conserving sweet potato and cassava varieties under *in vitro* condition. Tissue cultured raised planting materials were acclimatized and being maintained at net house.

A total of 43 sweet potato varieties have been maintained in field and gene bank of Regional centre, ICAR-Central Tuber Crops Research Institute, Bhubaneswar. Morphological characterization of 43 sweet potato varieties have been carried out.

In-vitro conservation has been carried out.



Filed gene bank of sweet potato varieties at regional Centre, ICAR-CTCRI, Bhubaneswar, Odisha

In vitro* conservation of tropical tuber crops at Regional Centre, ICAR-CTCRI, Bhubaneswar****Fig.** *In vitro* conservation of tropical tuber crops**ICAR-CENTRAL TUBER CROP RESEARCH INSTITUTE*It is the collaborating centre for DUS testing of tuber crops.**

During 2021-22 the gene bank of reference varieties of greater yam (461) and yam bean (24) are being conserved in the field. Ten new collections of greater yam were made. The DUS testing guidelines of both greater yam and yam bean were standardized. For the DUS testing of greater yam, 20 characteristics were selected, of which five characteristics viz., petiole colour, leaf shape, tuber shape, tuber cortex colour and tuber flesh colour were identified as grouping traits. Yam bean DUS test guidelines included 17 characteristics. Four characteristics viz., flower colour, pod length, tuber shape and seed shape were selected as grouping traits. 10 yam bean lines were maintained in the field gene bank. The DUS testing guidelines have been developed and published in the PPVFRA website. All the reference varieties were replanted. Forms for the registration of 4 varieties of greater yam were prepared and submitted under extant variety category and are under revision.

The gene bank of reference varieties of cassava (55) and sweet potato (52) are being conserved in the field. All the reference varieties were harvested and replanted. Farmers were sensitized to start registration of cassava and sweet potato varieties. One farmer, Shri. John from

Kozhikode, Kerala sent the planting material of one promising farmers' variety of cassava named *Manna* for registration and it was planted in the field for characterization and registration. Planting material was sent to Co Nodal Centre, Bhubaneswar. Received planting material of two sweet potato varieties from a farmer, Mr. Tipson, for registration. Conducted trials and recorded DUS traits. The digital database of sweet potato has been updated.

Forms for the registration of 4 varieties of greater yam were prepared and submitted under extant variety category and are under revision

Table 3.44: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in	Data Submission (Maintenance Breeding) Yes/No
Cassava	55	Completed Data will be submitted by July 31, 2022
Sweet potato	52	-
Greater yam	485	Completed Data will be submitted by July 31, 2022
Yam bean	7	-

Table 3.45: Details of DUS testing of candidate varieties in 2020-21

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Greater Yam				4	March 2022-Dec 2022
Yam bean					
Greater Yam				1	Sept 2021-May 2022
Sweet potato				2	Jan 2022-May 2022

3.1.39. DUS TESTING CENTRE FOR MANDARIN, SWEET ORANGE, ACID LIME

ICAR – CENTRAL CITRUS RESEARCH INSTITUTE, NAGPUR, MAHARASHTRA

It is the lead centre during 2021-22 maintenance breeding as per DUS norms is being conducted for mandated crops viz. Mandarin, Sweet orange, Acid lime.

Table 3.46: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2020-21	Data Submission (Maintenance Breeding) Yes/No
Mandarin	NRCC Nagpur Mandarin Seedless – 4 (N - 4), Mudkhed seedless, Sikkim mandarin, Darjeeling mandarin, N-28, N-34, N-38	In progress
Sweet orange	M3, M4, M8, Mosambi, Sathgudi	In progress
Acid lime	Vikram, Pramalini, Sai Sharbati, NRCC Niboo – 2, NRCC Niboo – 3, NRCC Niboo – 4, NRCC Niboo – 5, NRCC Acid Lime – 7 and NRCC Acid Lime - 8	In progress

3.1.40. DUS TESTING CENTRE FOR TEMPERATE FRUITS AND NUTS

ICAR- CENTRAL INSTITUTE OF TEMPERATE HORTICULTURE, SRINAGAR IS THE DUS TESTING CENTRE FOR VIZ. APPLE, PEAR, PEACH, PLUM , APRICOT , CHERRY, ALMOND, WALNUT AND STRAWBERRY.

During the reporting period 2021-22 reference varieties characterized and maintained are tabulated as mentioned below at ICAR-CITH, Srinagar.

Table 3.47: Reference varieties maintained at ICAR-CITH, Srinagar:

Crops	No. of varieties under maintenance and characterized as per DUS descriptor during 2021-22
Apple	120
Pear	21
Walnut	27
Almond	13
Peach	31
Plum	25
Apricot	18
Cherry	10
Strawberry	107

Table 3.48: Reference varieties characterized:

Crops	No. of varieties under maintenance and characterized as per DUS descriptor during 2021-22
Apple	35
Walnut	27
Almond	13

Table 3.49: List of entries tested during 2021

Crop:	Number and list of entries
Peach	03 Reg/2016/1122; Reg/2016/1124; Reg/2016/1125
Walnut	05 Reg/2015/1527; Reg/2016/1095; Reg/2016/1096; Reg/2016/1097; Reg/2016/1098
Pear	01 Reg/2016/1128 (Partial testing)
Apple	01 Reg/2019/121

Table 3.50: Candidate varieties tested:

Crops	No. of candidate varieties tested as per DUS descriptor during 2021-22	Place	Date of monitoring
Walnut	05		
	Hemlata	Jyamla, Kunihar, Solan, HP	2 nd September, 2021
	Rkangstar Hasa and Chunstar,	Hunderman, Kargil	23 rd September, 2021
	Singay and Zangstar	Sanjak, Kargil	24 th September, 2021
Peach	03		
	Shambyar, and Karpota	Sanjak, Kargil	24 th September, 2021
	Snupo Takushu	Dargoo, Kargil	24 th September, 2021
Apple	01		
	Kanwar Majholi Selection-1	Majholi, Theog, Shimla, HP	3 rd September, 2021





3.1.41. DUS TESTING CENTRE FOR BANANA

ICAR- NATIONAL RESEARCH CENTRE FOR BANANA, TIRUCHIRAPALLI, TAMIL NADU

During the year 2021-22 maintained the soil fertility, the whole set of reference accessions have been shifted to new area and planted with six replications each.

DUS characterization has been completed for two farmers varieties viz., Chingan and Semmatti and in progress for Thottuchingan and Kudhiraival Chingan.



Field view of newly replanted DUS accessions

3.1.42. DUS TESTING CENTRE FOR NONI

ICAR- CENTRAL ISLAND AGRICULTURAL RESEARCH INSTITUTE, PORT BLAIR

During the year 2021-22 regular month wise fruit yield was recorded from the cluster bearing noni accession identified from noni plantation maintained at Garacharma Research Farm of the

ICAR- CIARI. The average fruit yield of 2.86 kg/tree/month and mean single fruit weight of 297 gm was recorded from the tree. The fruit seed, pulp and pulp recovery was estimated and recorded viz., percentage of seed (10.77), percentage of pulp (91.90) and percentage of fruit pulp recovery (69.96).

The cluster bearing accession was submitted to the ICAR-NBPGR, New Delhi and obtained IC number 0641086. The cluster bearing noni germplasm Distinctness, Uniformity and Stability (DUS) characterization viz., 12 tree morphology and 24 fruit characters were documented. This characterization will be useful to release this as a variety for the benefit of the Island farmers to improve their farm income.

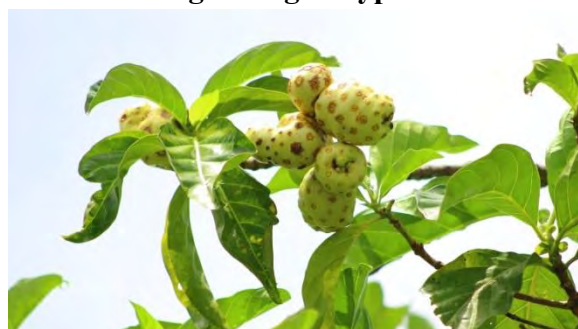
Registration of noni germplasm

Two noni germplasms (TRA-1 and HD-6) registration proforma were prepared and submitted to ICAR-NBPGR, New Delhi for their specific traits along with the seeds for depositing in the National active germplasm center for its conservation.

Table 3.51: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2021-2022	Data Submission (Maintenance Breeding) Yes/No
Noni (<i>Morinda citrifolia</i>)	CIARI Sampada, CIARI, Sanjivini, CIARI, Rakshak and CIARI Samrudhi	Maintained
	Cluster bearing noni	Maintained

Cluster bearing noni genotype



3.1.43. DUS TESTING CENTRE FOR SEED SPICE CROPS (CORIANDER, FENUGREEK, FENNEL & CUMIN)

ICAR- NATIONAL RESEARCH CENTRE ON SEED SPICES, AJMER

It is the lead centre

During the year 2021-22 DUS experiment of major seed spices (coriander, fenugreek, fennel and cumin) was laid out at NRCSS, Ajmer, Rajasthan. In this experiment 35 varieties of coriander, (26

references and 1 candidate), 22 varieties of fenugreek (3 candidate), 21 varieties of fennel, 9 varieties of cumin were included for maintenance breeding. The DUS guidelines in fennel and cumin seed spices were developed and published in PPV & FRA journal. The DUS guidelines in five minor crops (Ajwain, Celery, Dill, Anise & Nigella) of seed spices were developed and Published in PPV & FRA, Plant Variety Journal. Testing of candidate variety in coriander 1 and fenugreek 3.

Table 3.52: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Coriander	-	1	-	-	
Fenugreek	1	2	-	-	

Table 3.53: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Coriander	27	yes
Fenugreek	22	yes

Table 3.54: List/ No. of varieties (crop wise) under maintenance breeding

S. No	Crop species	Source of varieties	Name of the varieties
1.	Coriander (<i>Coriandrum sativum</i> L.),	ICAR & SAU'S	Swathi, Sadhan, Sudha, GCr-2, GCr-1, RCr-684, RCr-446 RCr-435, RCr-436, RCr-20, RCr-41, Co-1, Co-2, Co-3, Co-4, Hisar Anand, Hisar Sughandha, Hisar Surbhi, Pant Haritma, Rajendra Swathi, ACr-1, Azad Dhanai, Jd-1, ACr-2, ACr-3, Sindhu & AGCr-1 (Total varieties -27)
2.	Fenugreek (<i>Trigonella foenumgraecum</i> L.),	ICAR & SAU'S	GM-2, RMt-143, Azad Methi, AM-2, RMt-303, CO-2, Pant Ragini, RMt-1, Lem Selection, Hisar Suvarna, AM-1, Rajendra Kranti, Hisar Madhavi, RMt-305, Hisar Sonali, RMt-351, GM-1, RMt-361, AFg-3, AFg-4, AFg-5 & AFg-6 (Total varieties -22)
3.	Fennel	ICAR &	Hisar Swarup, AF-1, GF-12, Pant Madurika, GF-2,

	(<i>Foeniculum vulgare</i> MILL.)	SAU'S	RF-125, RF-178, RF-101, Rajendra Saurabh, Azad Saunf-1, RF-205, RF-281, RF-145, CO-1, RF-143, RF-157 GF-11, AF-2 & AF-3 (Total varieties -20)
4.	Cumin (<i>Cuminum cyminum</i>)	ICAR & SAU'S	GC-1, GC-2, GC-3, GC-4, RZ-19, RZ-223, RZ-209, RZ-341 & RZ-345 (Total varieties -09)

Field view of Fenugreek field



DUS experiment of major seed spices



ICAR- DIRECTORATE OF MEDICINAL AND AROMATIC PLANTS RESEARCH, BORIAVI, ANAND

As Collaborating Centre for seed spices and as Nodal centre for Kalmegh and Isabgol

a. Coriander:

During 2021-22, one Farmers' variety of Coriander was tested along with five reference varieties received from the nodal centre *i.e.*, ICAR-NRCSS, Ajmer (Table 3.47). The data were sent to the nodal centre for compilation.

Table 3.55: List of new entries of Coriander (*Coriandrum sativum*)

Sl.No.	Candidate varieties	Reference varieties
1.	Proza	ACr-1
		Azad Dhaniya
		CO 2 (Reference variety)
		Hisar Anand
		R Cr 20

b. Methi (*Trigonella foenum-graecum* L.)

During 2021-22, three Farmers' varieties of methi along with four reference varieties received from the nodal centre *i.e.*, ICAR-NRCSS, Ajmer were tested. The data were sent to the nodal centre for compilation.

Table 3.56: List of entries of Methi (*Trigonella foenum-graecum* L.)

Sl.No.	Candidate varieties	Reference varieties
1.	FV Sugandimethi (REG/2015/391)	AFg-1
2.	FV Jagriti-1 (REG/2018/293)	CO 2 (Reference variety)
3.	FV (2883/2416)	GM-1
		Hisar Sonali

Maintenance of example/reference varieties of Isabgol (*Plantago ovata*)

During the year 2021-22, 11 example varieties of Isabgol (*Plantago ovata*) *i.e.* DMAPR PO1, DMAPR PO2, DMAPR PO3, DMAPR PO4, DMAPR PO5, DMAPR PO6, DMAPR PO7, DMAPR PO8, DMAPR PO9, DMAPR PO10 and DMAPR PO11 were maintained. (Data submitted separately).

Maintenance of reference/example varieties of Kalmegh (*Andrographis paniculata*).

The major characteristics finalized for descriptors for DUS testing of kalmegh were leaf colour (light green, green or dark green), leaf lamina shape (lanceolate, elliptical, ovate/ovate lanceolate/elliptical); leaf lamina length (short, long), leaf lamina breadth (narrow, medium, broad); stem shoot apex (tender leaf grouped at apex, tender leaf not grouped at apex), leaf lamina (inwardly closed or outwardly curved); leaf lamina surface (smooth, wrinkled); stem branching pattern (erect, spreading); anthesis pattern (early, medium and late); spikelet type (flower buds closely arranged or distantly arranged); plant main axis growth habit (erect or prostrate); stem internode length (short, long); plant canopy shape (columnar, bushy/globular, pyramidal); plant height (short, medium, tall); leaf andrographolide content (low, medium, high). Accordingly, 24 reference/example varieties identified were maintained during the kharif 2021

3.1.44. DUS TESTING CENTRES FOR MANGO

ICAR-CENTRAL INSTITUTE FOR SUBTROPICAL HORTICULTURE, LUCKNOW

It is the lead centre.

During the year 2021-22 DUS testing was performed and data submitted for 23 farmer's mango varieties out of 37 varieties submitted earlier for registration. DUS characterization of mango varieties (133) available in the field gene bank. The reference and farmer varieties (415) were maintained. One awareness campaign for registration of mango farmers varieties was held in the area where farmer's varieties of mango exist. Training and awareness programs were held to educate farmers about the

existing varieties and the benefits of registering their varieties with PPVFRA. The registration proposal for one mango farmers' variety 'Nehal Pasand' was submitted.

Table 3.57: Details of DUS testing of candidate varieties in 2021-22:

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Mango	01	-		23 (variety)	

Table 3.58: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No. of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Mango	415 (No. of varieties under maintenance and characterized)	No

Table 3.59: Applications filed with PPV& FRA

Crops	No. of Var notified by the center Since 1966	No. of Var notified by the center Since 1999	No. of applications of filed Extant New			Certificates issued
			Notified	VCK		
Mango		02			02	

INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, BANGALORE

It is collaborating centre for DUS testing of Mango

Inflorescence characteristics

During the period under report, the inflorescence characteristics viz., Time of flowering, inflorescence length, inflorescence diameter, inflorescence ratio, and anthocyanin coloration of axis and branches of 10 varieties were recorded as per the DUS guidelines. The inflorescence length was maximum in Tajmahal (36.00 cm) whereas the minimum inflorescence length recorded in the variety Morish Badam (24.40 cm). The width ranged from 15.8 cm in Manjbe Pasand to 26.4 cm in Kawa Pasand. The inflorescence anthocyanin coloration of axis and

branches was strong in most of the accessions. It was found to be weak in Mosambika aam and Muzu and strong in Kawa Pasand, Morish Badam and Lalbadam.

Quality Traits

- Ten mango varieties from DUS plot were characterized (Leaf, Inflorescence and fruit) based on DUS mango guidelines (Table -1&2).
- The maximum fruit length was recorded in the variety Tajmahal (7.67 cm) whereas the minimum fruit length was recorded in the variety Muzu (4.60 cm).
- Total soluble solids ranged from 10.5 to 21.66 °Brix. The highest value was recorded by the variety Manjbe Pasand (21.66 °Brix) and lowest value was recorded in the variety Cavery (10.5 °Brix).

Table 3.60: Details of DUS testing of candidate varieties in 2021-22

Crops	New			VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries	3 rd year entries			
Mango	15	10	5		30	

Table 3.61: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Mango	30	Yes

3.1.45. DUS TESTING CENTRES (TROPICAL SUGARCANE VARIETIES)

ICAR-SUGARCANE BREEDING INSTITUTE, COIMBATORE (LEAD CENTRE)

ICAR-SUGARCANE BREEDING INSTITUTE, RESEARCH CENTRE, AGALI (COLLABORATING CENTRE)

Field maintenance of Reference varieties:

During the year 2021-22 two hundred and thirty three reference varieties (RV) of tropical sugarcane varieties are being maintained in field at Lead Centre (ICAR – SBI, Coimbatore) and Co-Operating Centre (Agali Centre, Kerala).

At lead Centre the reference varieties were planted in field on 01.03.2021 in two rows with a plot size of 6m length x 0.9 m spacing between rows. The crop was harvested during March 2022 and replanting was done immediately.

At Co-Operating centre (Agali Centre, Kerala) settlings of the reference varieties were raised in poly bags and were transplanted in the main field on 15-16th February 2021. Each entry was planted in two rows (6 m long) and row to row distance was 0.9 m. Re-planting was done on 11.2.2022 and crop was harvested on 15.3.2022.

The cultural practices were followed in both centres as recommended by the ICAR-SBI to raise a disease free crop.

Recording of DUS data for 189 reference varieties have already been completed (during 2018-19 season) and data for the newly included 45 reference varieties has been taken during this season (2021-22)

Multiplication of seed cane of candidate varieties:

Two new varieties (NV) namely, CoA 14321, CoA 14323 and one extant variety (EV) CoM 0265 received for multiplication and further DUS test at both Coimbatore and Agali Centre.

Conduct of DUS test:

DUS test for three new varieties namely, Co 09004, Co 11015 and Co 10026 were carried out during 2021-22 season at both Coimbatore and Agali Centres.

First year DUS test for two new varieties namely Co 11015 and Co 10026 and its closely resembling RV's (Co 85002, Co 85019 for Co 11015 and CoN 95132, Co 7508 for Co 10026) were done both at Coimbatore and Agali Centres.

Second year DUS test for the candidate variety Co 09004 and its RV (CoV 89101, CoN 95132, Co 7717 along with zonal standards Co 86032 and CoC 671) was completed during this crop season (2021-22).

Settling of varieties of both the trials along with closely resembling RV's were raised in polypags during 3rd week of January 2021 at both the centres.

About 40 seedlings of the all DUS testing NV and its RV were transplanted in 4 row plots (4 rows per variety x 6 m long row x 10 settlings per row x 0.9 m between rows) at Coimbatore during 1st March 2021 and at Agali Centre during 10th March 2021. Each variety was planted in two replications.

Observations of 27 DUS traits were recorded data of both Lead and Collaborating Centres.

3.1.46. DUS TESTING CENTRES FOR SUGARCANE (SUBTROPICAL SUGARCANE VARIETIES)

ICAR- INDIAN INSTITUTE OF SUGARCANE RESEARCH, LUCKNOW

It is the lead centre

- **Maintenance of reference collection of sugarcane varieties:** One hundred and sixty seven reference varieties of sugarcane planted in DUS field for maintenance during spring season of 2021-22 were maintained. This reference collection includes all the identified, released and notified varieties from CVRC, varieties released from states and clones from Advanced Varietal Trials of AICRP(S) available with different research organization working on sugarcane. DUS characters were recorded on more than 100 varieties in reference collection as per the DUS Testing guidelines.
- **DUS Testing Trial:** The status of DUS Testing during 2021-22 was as below:
Farmer's Variety:
 1. Pursa (REG/2017/1416): As reported in Annual Report 2019-20, two sets of planting material were received in different dates. The crop from both the seed materials was planted separately in field during February, 2020 for observation during 2020-21 crop season. It was observed that the variety is susceptible to wilt and the survival is poor, indicating that it might be some old advanced line of sugarcane in possession of the farmer.
 2. Paseri (REG/2016/929): The DUS Data submitted during 2020-21.

New Variety:

1. **Three** newly released sugarcane varieties viz. CoLk 11203, CoLk 11206 and Co 12029 were planted for DUS Testing during 2020-21 crop season. First year Data were recorded as per schedule and the varieties were again planted for second year trial during 2021-22 crop season. The Final Data is under tabulation for submission.
2. **The** DUS Testing Trial (1st Year) has been planted in the month of February, 2022 for newly released sugarcane varieties viz. Co 13035, CoLk 12207 and CoLk 12209.

ICAR- SUGARCANE BREEDING INSTITUTE, REGIONAL CENTRE, KARNAL

It is collaborating centre for Subtropical Sugarcane varieties

Maintenance of reference varieties (RV) of sugarcane: A total of 167 sub-tropical sugarcane reference varieties were maintained in field under the disease free conditions in a plot of size 6m L x 0.9 m spacing between rows x 2 R per RV at ICAR-Sugarcane Breeding

Institute-Regional Centre, Karnal. Verification of DUS descriptors of reference varieties were undertaken as part of DUS characterization of the reference varieties.

The following category DUS reference varieties are being maintained at the centre:

BO series-17 varieties; CoP series-7; CoB series-1; CoBln series 8; CoH series 12; CoJ series 5; CoPb series4; CoLk series 9; CoPant series 9; CoS series 50; CoSe series 14; CoPk 1; UP series 6 varieties, Co varieties 23.

Re-characterization of Reference Varieties: DUS traits of 167 RV maintained at ICAR-SBIRC, Karnal were verified /re-characterized during 2021-22 and the database of all the verified DUS reference varieties is being submitted to the PPVFR Authority.

DUS testing for New Sugarcane Variety: Second year DUS test for one new sugarcane varieties viz., Co 12029 was conducted at ICAR-SBI Regional Centre, Karnal along with reference varieties (Co 05011 and CoS 97264). A total of one hundred and sixty settlings derived from single bud setts of each varieties, were transplanted into RBD design with two replications in the DUS testing field. The plot size of 4 Rows x 6 m length x 0.9 m row to row spacing was maintained. Observations on twenty seven morphological traits were recorded from the candidate as well as reference varieties. The result of 2nd year trial shows that the candidate varietie Co 12029 was distinct from each other as well as from the reference varieties and the population of these varieties was uniform in both the years. The claimed /essential characters recorded from these entries had shown stable performance in second year as well.

First year DUS testing of CoLk 11203 and CoLk 11206 and second year DUS testing of Co 12029 was completed as per the DUS testing guidelines of PPVFR authority. DUS results indicates that the population of CoLk 11206 and CoLk 11203 was uniform during the first year trial.



Field view of DUS testing of candidate varieties of sugarcane at ICAR-SBI Regional Centre, Karnal during 2021-22 crop season

3.1.47. DUS TESTING CENTRE FOR COCONUT

ICAR-CPCRI, KASARAGOD

IT is the lead centre for Coconut DUS testing during the year 2021-22 third year growth measurements were recorded in candidate variety (REG/2015/415) at the DUS centre. Higher palm height, longer petiole and leaves were recorded in candidate variety as compared to reference varieties. During current year, flower initiation was observed in four palms out of the twelve palms planted in the candidate variety, amounting to 33% flowering of palms in the candidate variety. Inflorescence characteristics were recorded during September- November as mentioned in the DUS test guidelines for coconut. Higher inflorescence length, medium stalk girth, medium number of spikelets and female flowers, medium duration of female phase, absence of intra spadix overlapping was observed under DUS testing of candidate variety and was different from the claimed characters by the applicant. On site recording of data of the farmer's variety (Reg/2014/1949) was initiated in the variety Edava long fibre coconut from Thiruvanthapuram. DUS table of characteristics was recorded from a total of ten mother palms from five farmers plot viz., S. Sreekumar, Usha Kumari, Rajendran, Prasad Kappil, Prasanna Kumar, Mohan at Kappil, Edava panchayath, in consultation with Mr. S Sreekumar. Due to non availability of one year old seedlings and juvenile palms of candidate variety, Inflorescence characteristics and leaf characters were recorded from the adult mother palms of the candidate variety. Seven month old tender nuts were harvested from the mother palms and tender nut parameters were recorded. Mature fruits was harvested and studied for recording fruit characters. Data generated from mother palms of this candidate variety. Documentation of data from more mother palms is to be undertaken and this work is getting delayed, due to poor response from the applicant.

- Growth characters were recorded in field planted extant/reference/example varieties of coconut and data on fruit component traits and tender nut characters were studied for generation of characterization data and refining of descriptor traits for DUS testing. Significantly higher trunk length, leaf length, leaflet length and leaf production were observed in Chandra Kalpa under 4m x 4m spacing whereas higher trunk length and broader leaflet was observed in Kalpa Dhenu while longer leaflet was recorded in Kalpa Pratibha under 6m x 6m spacing. Higher fruit yield was recorded from 6m x 6m as spacing compared to 4m x 4m spacing. Average fruit yield ranged from 105 nuts/palm/year (Chandra Sankara) to 77 nuts/palm/year (Kalpa Dhenu) in field planted released/ extant/ reference coconut varieties, under 6m x 6m spacing, while it ranged from 83 nuts/palm/year (Chandra Sankara) to 42 nuts/palm/year (Kalpa Dhenu) under 4m x 4m spacing . Fruits were utilized for generating seedlings and fruit trait studies.
- Twenty seed nuts each were selected and sown in poly bag for generating seedlings of reference/released/extant varieties viz., Chowghat Orange Dwarf, West Coast Tall, Chowghat Green Dwarf, Malayan Yellow Dwarf, Malayan Orange Dwarf, Gangabondam Green Dwarf,

Kalparaksha, Kalpa Dhenu, Kalpa Pratibha, Kalpa Mitra, Chandra Kalpa, Kera Chandra, Tiptur Tall, San Ramon Tall, Spicata Tall, Laccadive Micro Tall, Chandra Sankara, Kera Sankara for meeting requirements of DUS testing.

Table 3.62: Details of DUS testing of candidate varieties in 2021-22:

Crops	New			VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries	3 rd year entries			
COCONUT	-	-	1	-	-	-

Table 3.63: Varieties under maintenance/characterized:

Mandated Crop Species	No of varieties under maintenance breeding in 2021-22
COCONUT	14

3.1.48. DUS TESTING CENTRE FOR DATEPALM

ICAR-CENTRAL INSTITUTE FOR ARID HORTICULTURE, BIKANER, RAJASTHAN

During the reporting period 2021-22 conservation and maintenance of forty two date palm varieties/genotypes was carried out. The thirty eight genotypes of date palm were evaluated for morphological, yield, fruiting, and quality attributing characters. The observation of plant morphological characters (leaf length, leaflet length & width, number of thorns per rachis, inter thorn distance, thorn length and leaf folding angle), yield attributing characters (number of bunches per plant, stalk length, bunch length, number of strands per bunch, strand length, number of fruits per strands at pea stage, fruits drops per strands, number of harvested fruits per strands, fruit set & drop per cent), fruiting characters (bunch weight, fruit weight, fruit length & width, stone weight, pulp weight, pulp stone ratio, stone length & width, pulp thickness), quality characters (fruit colour and TSS) and yield respectively were recorded & exhibited large variation in among the parameters. The maximum leaf length in Sabiah (353 cm) and minimum in Hillali (160 cm), maximum leaf width in Hatemi (3.67 cm) and minimum Nagal Hillali (1.77 cm), maximum leaf length in Khasab (51.7 cm) and minimum in Binte-A-Isha (29.7 cm), maximum leaflet width in Nagal Hillali (3.7 cm) and minimum in Hatemi (1.8 cm), maximum number of thorns per rachis in Umshok (34.3) and minimum in Muscut (8), maximum thorn length in Gijaj (14.7 cm) and minimum in Medini (6.1 cm), Maximum thorn width in Gijaj (8 mm) and minimum in Hamara (0.4 cm), maximum inter thorn distance in Dayari (10.5 cm) and minimum in Hamara (3.2 cm) and leaf folding angle narrow, medium and wide was recorded in among the genotypes.



The yield attributing characters of the various genotypes were evaluated and recorded harvesting of fruit starts from last week of June (Dhamas) to September (rain tolerant genotypes). The maximum number of bunches in genotype in Sewi (15) and minimum number in Sakloti (4), maximum stalk length in Sabiah (80 cm) and minimum in Gulchati (14.3 cm), maximum bunch length in Hayani (39 cm) and minimum in Sakloti (6.7 cm), maximum number of strands per bunch in Muscut (58.3 cm) and minimum in Sakloti (6.7), maximum strand length in Sewi (61 cm) and minimum in Zaglool (22.2 cm), maximum number of fruit per strands at pea formation stage in Khadrawy (40) and minimum in Muscut (15) minimum number of fruits drop in Zahidi (2.2) and maximum number of fruit drop in Khadrawy (25), maximum number of harvested fruit in Zahidi (20.7) and minimum number in Gulchati (3.7), the maximum number of fruit drop per cent in Gulchati (80.8 %) and minimum fruit drop per cent in Zahidi (9.1 %) and maximum fruit set per cent was recorded in Zahidi and minimum fruit set per cent was recorded in Gulchati (19.2 %) genotypes.



The fruiting characters of date palm genotypes are recorded and found the maximum bunch weight was in Hayani (8.2 kg) and minimum in Gijaj (1.5 kg), maximum fruit weight in Medjool (17 gm) and minimum in Tayer (3.3 gm), maximum fruit length in Dhamas (45.7 mm) and minimum in Javantri (21 mm), maximum fruit width in Medjool (26 mm) and minimum in Tayer (15 mm), maximum stone weight in Dayari (2.1 gm) and minimum in Tayer (0.7 gm), maximum pulp weight in Medjool (16 gm) and minimum in Dayari (1.6 gm), maximum pulp stone ratio in Medjool (11.8) and minimum in Dayari (0.8), maximum stone length in Dhamas (31.2 mm) and minimum in Tayer (16.9 mm), maximum stone width in Javantri (11.4 mm) and minimum in Chichap (7.6 mm) and maximum pulp thickness in Medjool (9.17 mm) and minimum Tayer (2.77 mm), fruit colour yellow, red, green yellow, dark red, light yellow, orange yellow, greenish red, maximum fruit yield per plant in Hayani (86.2 kg) and minimum in Zaglool (8.1 kg) and maximum TSS was in Medjool (52.6 °Brix) and minimum was recorded in Zaglool (19.6 °Brix).



Fruit laden palms of Zahidi and Khuneizi varieties of Date palm

3.1.49. DUS TESTING CENTRE FOR POMEGRANATE

ICAR-NATIONAL RESEARCH CENTRE ON POMEGRANATE, SOLAPUR

On site DUS characterization of farmer variety namely Sharad king" was carried out in 2021-22 at Tupewadi (V), Aurangabad (D), Maharashtra and it was compared with the reference variety (Bhagawa) for 36 DUS characters. The tested candidate variety was found to have distinctive characteristic features for petal length (long), fruit length (long), fruit shape, Aril length (short) and fruit maturity (medium) in comparison to reference variety (medium, medium, medium, and late maturity) submitted the consolidated report of two new pomegranate varieties (NRCP H-4 and NRCP H-14) whose on-site DUS testing was completed during 2019-20 and 2020-21. The two years consolidated report of the two hybrid varieties (NRCP H-4 and NRCP H-14) has showed that the NRCP H-14 is having vigorous plant growth habit with yellow with red tinge fruits, pink very sweet arils and hard seeds. While, NRCP H-4 also observed to be a vigorous hybrid variety whose fruit rind is yellow with red tinge colored, arils are pink with acidic juice embedded with hard seeds. All these are medium duration varieties takes about 140-165 days to mature after anthesis started to work on identification of polymorphic SSR markers for DUS testing in pomegranate. In the preliminary study, 48 diverse pomegranate genotypes consist of both wild and cultivated types were assessed by using 30 SSR markers. All the 48 genotypes genotypic data was scored and analyzed. The number of alleles of loci was varied from 2 to 4. Total of 40 alleles were found in the studied genotypes. DARwin ver.2.0 was used to analyse the data. Maximum genetic dissimilarity (0.53) was observed between IC-

318712 and IC-318718 as well as IC-318712 and Acc-08 collection. The polymorphic information content ranged from 0.12 to 8.69 with an average of 0.53. The clustering analysis was well supported by principle component analysis (PCA). The first two axis of PCA with positive two values 0.0197 and 0.0122 accounted for 46.71% of the total variation. The first axis has accounted 28.76%, whereas second axis covered 17.95% of variance. The PgSSR 54, 57 and 32 were found to be highly polymorphic with given set of markers, which can be used for validating in selected reference varieties and DUS testing in candidate varieties.



DUS characteristic features of farmer variety (“Sharad King”)

3.1.50. DUS TESTING CENTRE FOR MELIA DUBIA

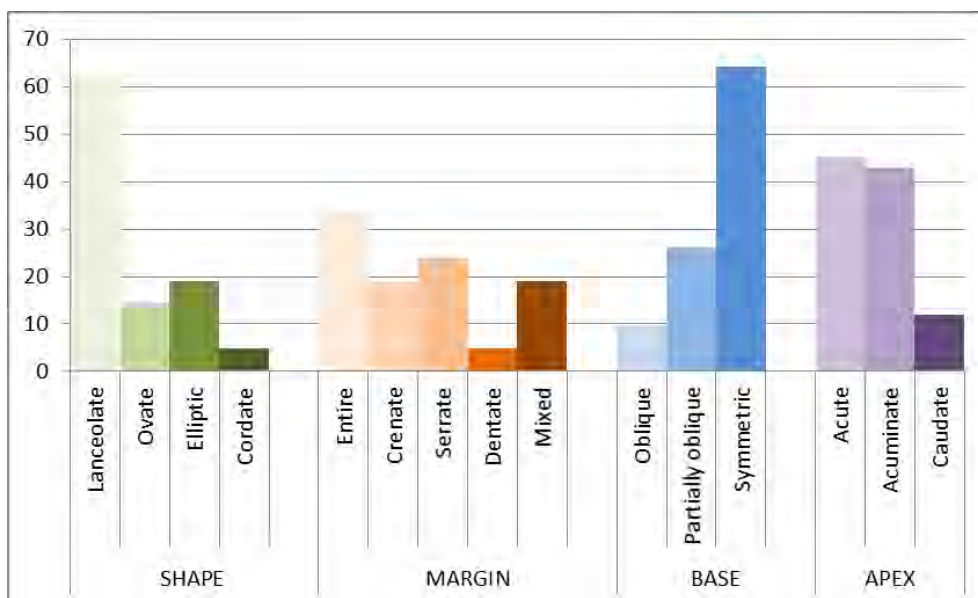
INSTITUTE OF FOREST GENETIC AND TREE BREEDING (IFGTB), COIMBATORE.

Coimbatore is maintaining the already established germplasm bank at IFGTB, Recording observations in the germplasm bank and propagation of the varieties at the DUS centre. Maintaining the clones for further trials to observe changes in stability.

Maintenance of DUS reference collections established in March 2020 at Panampally Research Station, Recording observations in field germplasm.

Juvenile characters of *Melia dubia* were observed in 6-month-old IFGTB clones. Leaf waxiness and Rachis anthocyanin colouration, the dimorphic characters vary between clones and individual plants.

Distribution of qualitative leaf traits among the clones is presented.



3.1.51. DUS TESTING CENTRE FOR NEEM, KARANJ AND JATROPHA

FOREST COLLEGE AND RESEARCH INSTITUTE, TNAU, METTUPALAYAM

During the year 2021-22 validation of 15 DUS descriptors out of 19 descriptors for the 32 neem reference collection was completed and documented.

Validation of 11 DUS descriptors out of 23 descriptors for the 33 Pungam reference collections was completed and documented.

The biometric observation in terms of height, girth and number of branches in the 32 neem reference collection and 33 Karanj reference collections are recorded periodically.

1	No. of reference varieties maintained at DUS centre	Neem – 32 reference collection Karanj – 33 reference collection
	Whether replicated data of reference varieties submitted to the authority	Submitted along with the report
2	Technical man-power engaged in the DUS project	Senior Research Fellow

DUS field – Neem reference collection**DUS field - Karanj reference collection****3.1.52. DUS TESTING CENTRE FOR JASMINE****ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, HESARAGHATTA, BANGALORE AS LEAD CENTRE**

During the year varieties under maintenance breeding were characterized in different commercially cultivated *Jasminum* spp. are *J.sambac* (24nos.), *J. auriculatum* (6 nos.), *J. multiflorum* (3 nos.) and *J.grandiflorum* (4 nos.) and in six other lesser-known *Jasminum* species.

All the genotypes under maintenance breeding were multiplied and planted in a newly established field gene bank as the plants in the existing one are > 10 years old and past their productive life span.

Table 3.64: Varieties under maintenance/characterized:

Crop/ species	Name or number of varieties under maintenance breeding in 2021-22
<i>Jasminum auriculatum</i>	6
<i>J.sambac</i>	24
<i>J.multiflorum</i>	3
<i>J.grandiflorum</i>	4

In addition to the commercial species of *Jasminum*, six other lesser-known species (*Jasminum rigidum*, *Jasminum nitidum*, *Jasminum flexile*, *Jasminum malabaricum*, *Jasminum humile* and *Jasminum primulinum*) are being maintained in the field gene bank and characterized.

Data submission (Maintenance Breeding):

Jasminum sambac, *Jasminum auriculatum*, *Jasminum multiflorum*, *Jasminum grandiflorum* genotypes and other lesser-known species (*Jasminum rigidum*, *Jasminum nitidum*, *Jasminum flexile*, *Jasminum malabaricum*, were evaluated based on the morphological characteristics and their corresponding states and the data has been submitted.

3.1.53. DUS TESTING CENTRE FOR BOUGAINVILLEA, CANNA AND GLADIOLUS**INDIAN AGRICULTURAL RESEARCH INSTITUTE, NEW DELHI IS THE LEAD CENTRE FOR DUS TESTING OF BOUGAINVILLEA****Germplasm maintenance of reference varieties.**

Multiplication and Maintenance of varieties and development of multigrafted bougainvillea and their multiplication. Experiment has been carried out on physical and chemical mutation for the development of bougainvillea varieties for novel colour. Multiplication of mutants emerged from spontaneous mutation.

Table 3.65: Varieties under maintenance/characterized:

S. N.	Cultivar	S. N.	Cultivars	S. N.	Cultivars
1	Abraham Kavoor	35	Hawaiine White	68	Philomina
2	Alick Lancaster	36	IsabeleGreensmith	69	Pink Beauty
3	Aruna	37	Jawaharlal Nehru	70	PixiVariegata
4	B T Red	38	Jayalakshmi	71	Poultoni
5	Bangalore Variegata	39	Jubille	72	Poultoni Special
6	Begum Sikander	40	Killie Campbell	73	Quen Elizabeth
7	Blondie	41	Krumbigel	74	R S Bhatt
8	Cascade	42	Lady Hope	75	Radha
9	Chandrabieri	43	Lady Hudson	76	Red Septeber
10	Cherry Blossom	44	Lady Mary Baring	77	Refulgens
11	Chitra	45	Lady Richards	78	Rose Ville Delight
12	Coleoptera	46	Lakshmi	79	RoseaFuschia
13	Deep Red	47	Los Banos Beauty	80	Sanderiana
14	Dr. B. P. Pal	48	Los Banos Variagata	81	Sensation
15	Dr.Bhabha	49	Los Banos Variagata Jayanti	82	Shubhra
16	Dr. H. B. Singh	50	Louis Wathen	83	Singapore Red
17	Dr. H. C. Buck	51	Mahara	84	Sofia Mutant
18	Dr.Hadu	52	Mahatma Gandhi	85	Sonnet
19	Dr.Homibhabha	53	Manohar Chandra	86	Spectable
20	Dr. P.V. Sane	54	Mary Palmer Special	87	Splendens
21	Dr. R. R. Pal	55	Mataji Agnihotri	88	Spring Festival
22	Dr. Rao	56	Meera	89	Stanza
23	Dream	57	Mrs. Bakery	90	Summer Time
24	Elizabeth Angus	58	Mrs. Butt	91	Superba

25	Fantasy	59	Mrs. Frasser	92	Sweet Heart
26	Filoman	60	Mrs. McClean	93	Swetha
27	Flame	61	Padmi	94	Tetra Mrs. McClean
28	Gangaswamy	62	Palekar	95	Thimma
29	Garnet Glory	63	Pallavi	96	Tomato Red
30	Glabra	64	Partha	97	Torch Glow
31	Glady's Heburn	65	Parthasarthy	98	Versicolour
32	Gloriosus	66	Perfusion	99	Vishaka
33	Golden Glow	67	Phillips	100	Zakiriana
34	Gopal				

CSIR-NATIONAL BOTANICAL RESEARCH INSTITUTE, LUCKNOW

It is the Collaborating centre

A. Bougainvillea

Total 184 varieties were maintained in the Germplasm collection as Reference Varieties. No candidate varieties were received. Measurements of morphological characters were done based on DUS Test guidelines, characters such as stem colour, thorn size, shape, leaf shape, size, bract colour, flower size and colour etc, of selected varieties were recorded, analysed and photographed at DUS Test germplasm collection facility for identifying character and variations occurred within the varieties. Characterization of the following references varieties viz., **Vishakha Variegata, Lady Hudson of Ceylon, Pixie Variegata, Aruna, Poultoni Special, Abhimanyu, Asia, B.T Red, Jaya, Shubhra** were done.

B. Gladiolus

Total 69 exotic cultivars and 46 Indian bred cultivars were maintained as reference varieties while no candidate varieties were received. Measurements of morphological characters were done based on DUS Test guidelines, characters such as height, leaf length, width, colour, curvature, spike, rachis length, number of flowers / spike, arrangement of flowers, shape, size, attitude, colour, etc, of 70 gladiolus varieties were recorded, analysed and photographed at DUS Test germplasm collection facility, to collect the information about distinct features of these varieties and use it as reference varieties for protection of other new varieties under PPVFR Act, 2001. Characterization of the following varieties viz., **Sunayna, Punjab Delight, Apollo, Fortuna, American Beauty Pink, Palampur Pride, Jwala, Fidelio, Zeus, Punjab Don** were documented .

C. Canna

The germplasm (52 Canna varieties and five Canna species) was conserved in field beds (Area 3000 m²) designated for the DUS Test Centre by providing regular cultural practices round the year. Measurements of morphological characters were done based on DUS Test guidelines, characters such as stem diameter, shape, length, leaf size, number, shape, colour, rhizome colour,

diameter, number of eyes, inflorescence length, number of flowers, flower size, calyx size, corolla size shape, colour, staminode size, shape, colour, labellum size, shape, colour, fertile stamen size, colour, were recorded, analysed and photographed at DUS Test germplasm collection facility. Characterization of the following varieties viz., **Pink Sunrise, Cleopatra, Wyoming, Red Sindoor, Agni Shikha** were documented.



3.1.54. DUS TESTING CENTRE FOR SPICES

ICAR-INDIAN INSTITUTE OF SPICES RESEARCH KOZHIKODE, KERALA

It is the nodal DUS testing centre for Spices, Kozhikode, Kerala

Major programs carried out during the year by the DUS centre was the maintenance of example varieties of black pepper, small cardamom, ginger and turmeric ; multiplication of ginger and turmeric provided by farmers for DUS testing. DUS testing completed for 19 turmeric varieties which include

14 farmers' varieties and 4 varieties of common knowledge and one new variety. DUS testing completed for 7 ginger varieties which include 4 farmers' varieties and 3 varieties of common knowledge. On site preliminary observation of 3 black pepper and 6 small cardamom varieties were undertaken and corresponding reference varieties were identified based on essential characteristics. Ongoing 2 ginger and 4 turmeric farmer varieties are under DUS testing.

At presently the authority issued certificate for;

8 Black pepper varieties (4 Farmer & 4 VCK)

9 Small cardamom varieties (6 Farmer, 2 VCK & 1 Extant)

5 Turmeric varieties (1 New & 4 Extant)

Other Events:-

- Characterization of candidate varieties of black pepper, ginger, cardamom and turmeric were carried out and submitted the reports
- In order to undertake DUS testing for ginger planted 23 reference varieties and 9 farmers varieties at ICAR-IISR, Kozhikode
- In turmeric, planted 39 reference varieties, 13 farmers varieties and 17 test completed varieties at ICAR-IISR, Kozhikode.
- One set of these varieties were send to alternative testing centre for DUS at ICAR Research complex for NEH Region, Barapani

3.1.55. DUS TESTING CENTRE FOR CHRYSANTHEMUM

ICAR- INDIAN AGRICULTURAL RESEARCH INSTITUTE, NEW DELHI

It is the lead centre

During the year 2021-22 total 145 reference varieties are maintained.

Table 3.66: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2017-18	Data Submission (Maintenance Breeding) Yes/No
Chrysanthemum morifolium	145	DUS data of 25 varieties

Table 3.67: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			

Chrysanthemum	02 Nos.				-
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ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, HESARAGHATTA LAKE POST, BENGALURU

It is collaborating centre for DUS testing of Chrysanthemum varieties

During the year 2021-22 total of 90 genotypes were characterized for 77 traits as per DUS test guidelines.

Two Chrysanthemum candidate varieties namely NBRI-Pukhaj and NBRI-Himjyoti received for DUS testing. These varieties were multiplied through terminal cuttings and planted in main plot. The crop is in vegetative phase and is under observation.

Table 3.68: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Chrysanthemum	02 Nos. from CSIR-NBRI, Lucknow	-	-	-	-

Table 3.69: Varieties under maintenance/characterized: 90 genotypes

Mandated Crop species	Name or No of varieties under maintenance breeding in 2021-22	Data submission (Maintenance breeding) Yes/No
Chrysanthemum	90 named varieties	Yes

3.1.56. DUS TESTING CENTRE FOR MARIGOLD

ICAR-INDIAN AGRICULTURAL RESEARCH INSTITUTE, NEW DELHI

It is the Lead centre for DUS testing of marigold varieties.

In this year 2021-22, 62 genotypes including 23 reference varieties of marigold were maintained well following standard package of practice necessary for marigold crop. These varieties were propagated in the nurseery and transplanted in the main field at the research farm of lead centre IARI, New Delhi. The sexually propagated reference varieties were subjected for selfing after first flowering after roughing out undesired plants to maintain purity of genotype. In addition one candidate variety

(farmer variety) i.e. trail code 02880/4169 was also grown along with reference varieties for DUS testing.

Table 3.70: Varieties under maintenance/characterized:

Crops	Name or No of varieties under maintenance breeding in 2020-21	Data Submission (Maintenance Breeding) Yes/No
Marigold	34 IARI, New Delhi (released varieties/selection) 09 IIHR, Bangalore(released varieties/selection) 02 CCS HAU, Hisar (released varieties) 02 BCKV, Kalyani (released varieties) 15 other (released varieties) Total=62	Yes

ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, BANGALORE

IT is the collaborating centre In 2021-22 DUS data recording was done for a total of 22 varieties of which 12 are example varieties and remaining 10 were reference varieties.

Table 3.71: Details of DUS testing of candidate varieties in 2021-22:

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Marigold					
1	02880/4169	-	-		

Table 3.72: Details of varieties being maintained and DUS characters recorded in 2021-22

		Total no.	Example No. and Name	Reference no.& Name
A	Public Sector varieties			
1	IARI			
a	African	5	4	1
			IARI/AP/W-4, PUSA NARANGI, PUSA BASANTI, IARI/AP/W-8	PUSA BAHAR
b	French	2	1	1

	Marigold			
			PUSA ARPITTA	PUSA DEEP
2	IIHR			
a	African	10	6	4
			Arka Agni, IIHRMYs-3, Arka Bangara-2 (Arka Alankara as published in Guideline), IIHRMO-3, IIHRMy-4, IIHRMy-5	ArkaShubha, ArkaVibha, ArkaAbhi, ArkaBhanu
b	French Marigold	3	3	
			ArkaMadhu (IIHRFM-1 as published in guideline), ArkaPari, IIHRMO-4	
B	Other than public Sector(private sector)			
a	African	8		8
				Helius, Helium, Super Orange, T.N Ball, Bali orange, F.F. BIOWORKS, Katraphyta chem., OM Green tech
b	French Marigold	7		7
				Orange Winner, Gulzafr Yellow, Valencia Yellow, Gulzafr Orange, Bolero Red, Queen Sophia, Dainty Marietta
	Total	38		



Candidate variety under DUS testing

3.1.57. DUS TESTING CENTRES FOR ORCHIDS

ICAR-NATIONAL RESEARCH CENTRE FOR ORCHIDS, PAKYONG, SIKKIM

It identified four (4) traits of farmers varieties namely Plant height & Inflorescence no. of plant, nature of shoot, flower width, lip width, lobation and predominant colour in *Dendrobium transparens*; Nature of shoot, Internode numbers, Inflorescence number /plant and flower number/inflorescence, Lip lobation, predominant colour, colour pattern in *Dendrobium devonianum*; Nature of shoot, inflorescence no. per plant, and flower number/inflorescence, Inflorescence length, flower width, Lip lobation & predominant colour in *Dendrobium chrysanthum* and Pseudobulb shape and Number of flowers per inflorescence and pedicel length in *Cymbidium ensifolium spp. haematodes* through PPV & FRA, NASC Complex, New Delhi.

Table 3.73: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
1. Cymbidium				Cym. Ensifolium sp. Haematodes Cym. eburneum	
2. Dendrobium				Den. devonianum, Den. chrysanthum, Den. aphyllum, Den. transparens	

Table 3.64: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Cymbidium	30	Yes
Dendrobium	12	Yes
Vanda	10	Yes
Phalaenopsis	10	Yes
Cattleya	9	Yes

Oncidium	8	Yes
Paphiopedilum	10	Yes
Mokara	7	Yes

3.1.58. DUS TESTING CENTRES FOR ROSE

ICAR- INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, BANGALORE

It is the lead centre

During the year 2021-22 varieties under maintenance/characterized: 174 varieties are being maintained in field and around 15 are maintained naturally ventilated polyhouse. Digital repository all the varieties for 60 characters are being built that includes data as well as pictures.

Table 3.65: List of rose varieties maintained as example and reference varieties

	No	Name
Example varieties	20	Dr. G.S.Randhawa, Ahalya, Abhisarika, Arunima, Dr.B.P.Pal, Gladiator, Iceberg, M.S.Randhawa, Pusa Prema, Pusa Sonora, Pusa Baramasi, Pusa Vihangana, Queen Elizabeth, Rakthima, Kiss of Fire, Mrinalini, Pusa Gaurav, Arjun, Kiran, Anurag
Reference varieties	148	<u>Existing</u> Arka Pride, Nobless, Tiniki, First Red, Grand Gala, Tajmahal, Royal Claus, Tropical Amazon, Bonhair, Gold Strike, White Avalanchi, Sakeera, Bugathi, Preyasi, Srinivasa, Neela, Vaishnavi, Dream cloud, Granada, Brenessa, Maria Callas, Timeless, Happiness, Captain Harry Stebbings, Babylon, , Christian Dior, Tempo, Prestine, Hakuun, John F. Kennedy, Anhur bell, Alliance, Marine Dowell, Angkar, Rosemary Harkness, Atoll, Catalonia, Orange Flame, American Heritage, Meduse, Apricot Spice, Marry Kittil, Friendship, Festival Fanfare, Duke of 181indsor, Night 'N' Day, Strawberry Ice, Lili Marlene, Pestel Delight, Paul shirville, Sandringham Centenary, Blue Ocean, Flirtacious, Durgapur Jubilee, Bhavani, Paradise, Only You, Scentimental, Vetter Tag, Via Mala, Kasturi Rangan, Aishwarya, Girija, Tipu's Flame, Rose Anil, Queen Aishwarya, The Master, Berries N Cream, Easy Going, CLG Ole, CLG Paradise, Knockout, Care Free Beauty, Cherry Parafait, Doreys Testermann, Diplomat, Sophia Larance, Raja Surender Singh Of Nalagarh, Rangoli, Don Don, Vasavi, Agnihotri, Dr.Khane, Folklore, Red Racker, Violin D'Ingress, White Magic, Ico Delight, Otta the Blue, Prince Claus, Precious Platinum, Eterna, Blue Delight, Brass Band, General Vidhaya, Pusa Komala, Lady X, Maink, Moliter, Narthaki, Papagene, Pink Panther, Margaret Of England, Khushali, Ratan, Sarvesh, Red Cascade, White Miniature, Minister, Pink Bunch, Red Bunch, Arka Savi, Shanthi, Kulchi

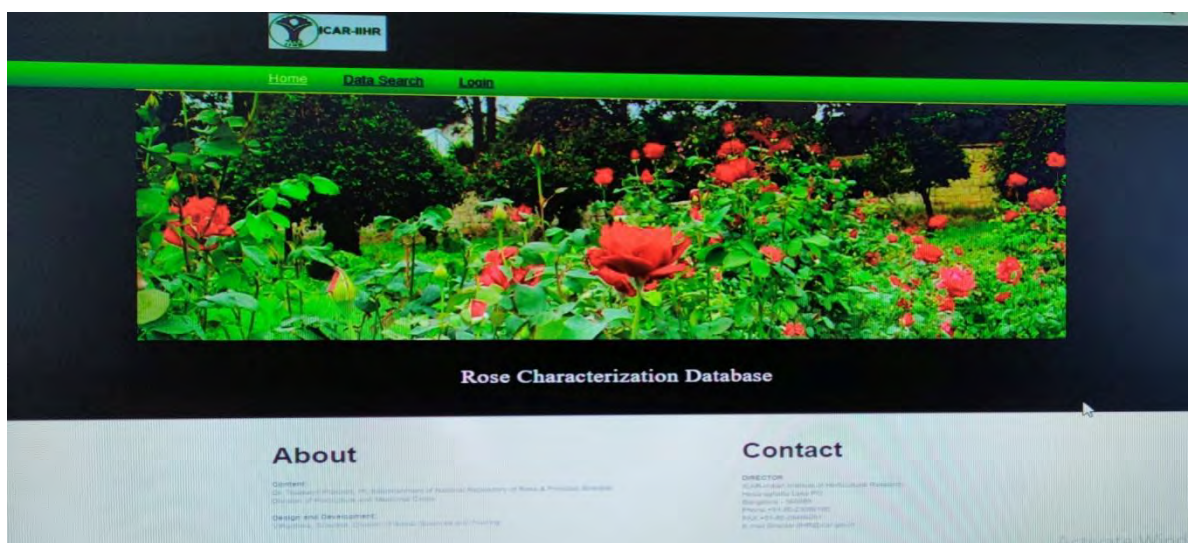
		Red, Ruby Pink, Single Orange, Chirshma, Sopha Gold, Yellow Babe, Merrable, Rubycon, Orange Babe, Five Star, Arka Parimala, Arka Sukanya, Okla Homa, American Home, Red Chief, Eiffel Tower, Panner Rose, Pushkar Pink, Pushkar Red, Arka Sharmeeli, Arka Kinnari, Arka Sinchana <u>Added in 21-22</u> Nurjahan, Ranisaheb, Caprice de Milland, Edwade Rose, Red Rose, Sweet Fragrance, Fragrant Lace, Atoll, Fancy, Gilli, Mango Yellow, Red Five Star, Tomota
DUS testing completed	6	Meiflemingue, RUICG1636A (Hotshot), Arka Swadesh, INTERGELAN, INTERORLAN, Arka Ivory

Table 3.66: Details of source and categories for rose varieties being maintained under DUS

		No	Name
A	Public sector	26	
i)	IARI	15	
a	Fragrant	1	Anurag
b	Garden	14	Abhisarika, Arjun, Arunima, Dr.B.P.Pal, M.S.Randhawa, Mrinalini, Pusa Baramasi, Pusa Gaurav, Pusa Prema, Pusa Sonora, Pusa Vihangana, Rakthima, Preyasi, Komala
c	Cut flower	0	
d	Loose flower	0	
ii	IIHR	11	
a	Fragrant	3	Arka Parimala, Arka Sukanya, Kiran
b	Garden	4	Dr. G.S.Randhawa, Arka Kinnari, Arka Sharmeeli, Arka Sinchana
c	Cut flower	3	Arka Ivory, Arka Pride, Arka Swadesh
d	Loose flower	1	Arka Savi
B	Varieties from Pvt Sector	148	
i)	Pvt varieties from India	25	
a	Fragrant	2	Nurjahan, Ranisaheb
b	Garden	23	Ahalya, Agnihotri, Aishwarya, Bhavani, Blue Delight, Blue Ocean, Dr.Khane, Girija, Ico Delight, Kasturi Rangan, Khushali, Maink, Neela, Raja Surender Singh Of Nalagarh, Rangoli, Ratan, Rose Anil, Sarvesh, Srinivasa, The Master, Tipu's Flame, Vaishnavi, Vasavi
ii	Exotic varieties (from breeders outside India)	123	

a	Fragrant	11	American Home, Caprice de Milland, Edwade Rose (Coimbature), Eiffel Tower, Fragrant Lace, Panner Rose, Pushkar Pink, Pushkar Red, Red Chief, Red Rose (Coimbature), Sweet Fragrance
b	Garden	80	Gladiator, Iceberg, Kiss of Fire, Queen Elizabeth, Alliance, American Heritage, Angkar, Anhur bell, Apricot Spice, Atoll, Babylon, Berries N Cream, Brass Band, Brenessa, Captain Harry Stebbings, Care Free Beauty, Catalonia, Cherry Parafait, Christian Dior, CLG Ole, CLG Paradise, Diplomat, Don Don, Doreys Testermann, Dream cloud, Duke of 183indsor, Durgapur Jubilee, Easy Going, Eterna, Festival Fanfare, Flirtacious, Folklore, Friendship, General Vidhaya, Granada, Hakuun, Happiness, John F. Kennedy, Knockout, Lady X, Lili Marlene, Maria Callas, Marine Dowell, Marry Kittil, Meduse, Minister, Moliter, Narthaki, Night 'N' Day, Only You, Orange Flame, Otta the Blue, Papagene, Paradise, Paul shirville, Pestel Delight, Pink Bunch, Pink Panther, Precious Platinum, Prestine, Prince Claus, Princess Margaret Of England, Queen Aishwarya, Red Bunch, Red Cascade, Red Racker, Rosemary Harkness, Sangai autumn, Scentimental, Sophia Larance, Strawberry Ice, Tempo, Timeless, Vetter Tag, Via Mala, Violin D'Ingress, White Magic, White Miniature, oklahoma
c	Cut flower	14	Bonhair, Bugathi, First Red, Gold Strike, Grand Gala, Nobless, Royal Claus, Sakeera, Tajmahal, Tiniki, Tropical Amazon, White Avalanchi, Meiflemingue, RUICG1636A (Hotshot)
d	Loose flower	18	INTERGELAN, INTERORLAN, Chirshma, Fancy, Five Star, Gilli, Kulchi Red, Mango Yellow, Merrable, Orange Babe, Red Five Star, Ruby Pink, Rubycon, Shanthi, Single Orange, Sopha Gold, Tomota, Yellow Babe

Digital respository of rose being built at ICAR-IIHR



ICAR- DIRECTORATE OF FLORICULTURAL RESEARCH, PUNE

It is collaborating centre for DUS testing of Rose varieties

During the year 2021-22 germplasm of 154 varieties consisting of both Exotic and Indigenous varieties are being maintained at the centre. During the year 0B new varieties were and 2 wild species were collected from different sources. The selected varieties were screened for various traits. DUS characterization under Pune condition was carried out for 05 varieties in 2021-22 growing season. Due to covid-19 pandemic the maintenance of germplasm at field was difficult and due which some of the varieties were lost. Centre could take up the capital works (Greenhouse construction) and required inputs were procured for making it functional.

Table 3.67: Varieties under maintenance/184haracterized :

Mandated Crop Species	Name or No of varieties under maintenance breeding in2021-22	Data Submission (Maintenance Breeding) Yes/No
Rose	154	No

3.1.59. DUS TESTING CENTRES FOR CHINA ASTER

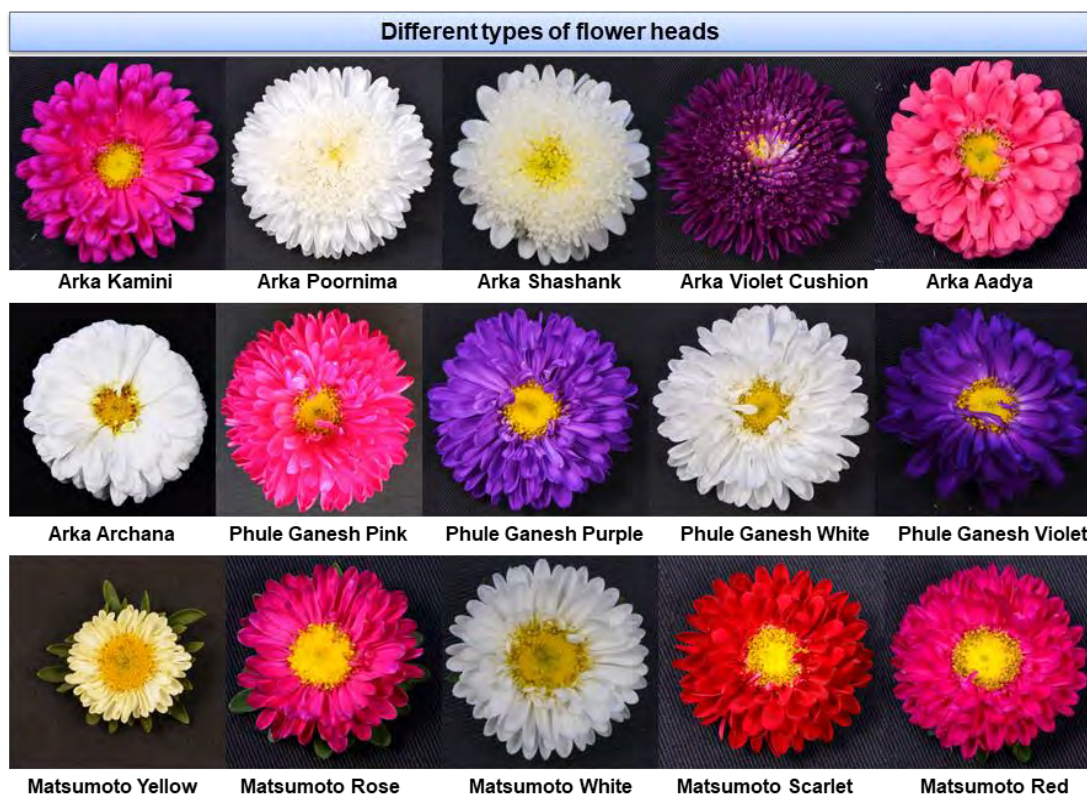
ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEACH, HESARAGHATTA LAKE POST, BENGALURU, KARNATAKA

It is the Lead Centre for CHINA ASTER

During the year total of 31 genotypes were characterized as per DUS test guidelines (10 vegetative traits and 11 flower traits).

Table 3.68: Varieties under maintenance/characterized: 31 genotypes

Mandated Crop species	Name or No of varieties under maintenance breeding in 2021-22	Data submission (Maintenance breeding) Yes/No
China aster (<i>Callistephus chinensis</i>)	31 named varieties	Yes



AICRP ON FLORICULTURE, ZONAL AGRICULTURAL RESEARCH STATION, GANESHKHIND, PUNE

It is the collaborating centre for China aster

During the year 2021-22 below mentioned varieties are maintained at AICRP on Floriculture, Zonal Agricultural Research Station, Ganeshkhind, Pune

Table 3.69: Varieties under maintenance/characterized:

Mandated crop species	Name or No of varieties under maintenance breeding 2021-22	Data submission (Maintenance Breeding) Yes/No
China Aster (reference varieties = 8)	1. Arka Shashank 2. Arka Pornima 3. Arka Kamini 4. Arka Archana 5. Phule Ganesh Pink 6. Phule Ganesh Purple	Yes

	7. Phule Ganesh Violet	
	8. Phule Ganesh White	

Photographs of reference varieties of aster

	
Local white	Local Pink

3.1.60. DUS TESTING CENTRE FOR OILSEED (CASTOR, SUNFLOWER, SAFFLOWER)

THE ICAR - INDIAN INSTITUTE OF OILSEEDS RESEARCH, HYDERABAD

It is the lead centre for testing of three oilseed crops viz., Castor, Sunflower and Safflower.

Castor

During 2021-22, Farmer's variety CDBA-345 (REG/2018/449) was sown for DUS testing in a replicated trial with three reference varieties DCS-9, Aruna and Ritesh Redi (DOS 14.07.2021). Seed sowing was undertaken in 6 rows of 6 m for each replication. Data has been recorded for 30 DUS traits in accordance with the DUS test guidelines. Consolidated DUS testing report of two centres for castor Farmer's variety CDBA-345 (REG/2018/449) along with three reference varieties is under compilation.

Initial characterization of five reference varieties (ICH-66, GCH-8, ICH-440, DPC-25 and ICS-164) was taken up in replicated trial with 5 rows of 6 m for each replication. Data has been recorded for 30 DUS traits in accordance with the DUS test guidelines and data is under compilation.

Multiplication of reference variety CO-1 and DPC-9 was also undertaken during *kharif* 2021.

Sunflower

During 2021-22, one new candidate hybrid 2886/2076 for 2nd year DUS testing with SMG Hybrid 2886/2076/H/F₁ and two reference hybrids 1/2086/H and 1/2087/H along with national check KBSH-44 were sown in *rabi*, 2021-22 (DOS 18.11.2021).

The new candidate variety 2886/2076 was sown for 2nd year testing in a replicated trial along with four reference hybrids 2886/2076/H/F₁ SMG Hybrid, 1/2086/H, 1/2087/H and KBSH-44 as per test plot design defined in the guidelines. Data has been recorded for 26 DUS traits in accordance with the DUS test guidelines and remaining eight post-harvest observations are in progress.

During *rabi* 2021-22, 14 parental lines of sunflower viz. CMS-10A/B, CMS11A/B, CMS-17A/B, CMS-38A/B, CMS-67A/B, CMS-104A/B and CMS-234A/B were maintained and multiplied.

Safflower

During *rabi* 2021-22, ten reference entries of safflower viz. PBNS-86, CG Kusum-1, SSF-12-40, SSF-13-71, TSF-1, NARI-6, NARI-96, IGKV Kusum, A-1 and PBNS-12 were maintained and multiplied.

Submission of DUS testing reports

Castor

Consolidated DUS testing report for Farmer's variety Ritesh Redi (REG/2017/2151) along with reference varieties Aruna and DCS-9 tested during 2020-21 at 2 centres, ICAR-IIOR, Hyderabad and MORS, JAU, Junagadh were submitted on 29.05.2021.

Sunflower

Consolidated DUS testing report for one new candidate 2886/2076 along with reference entries KBSH-42 and KBSH-44 tested during 2020-21 at 2 centres, ICAR-IIOR, Hyderabad and TNAU, Coimbatore and comparative DUS testing report SH1 with SH1 SMG and SH2 with SH2 SMG were also submitted on 04.09.2021.

Safflower

Consolidated DUS testing report for one new candidate 2877/4134 safflower tested for the 2nd year during 2020-21 at 2 centres, ICAR-IIOR, Hyderabad and Dr. PDKV, Akola along with reference

varieties 2877/4134(m), A-1 and Phule kusumawas submitted on 16.12.2021 and 20 plant data was also submitted through mail on 16.02.2022.

MAIN OILSEEDS RESEARCH STATION, JUNAGADH AGRICULTURAL UNIVERSITY, JUNAGADH IS

It is collaborating centre

During the current year (Kharif-2022), 1367.8 mm rainfall was received in 47 rainy days. The weekly weather and rainfall data are enclosed herewith. The seeds of castor farmers' variety (CBDA-345) for DUS testing along with reference varieties (DCS-9, Aruna, Ritesh Redi) were received from PPV & FRA, New Delhi. The experiment was sown on 17th August, 2021 as per guideline sent by Dr. N. Mukta. The crop was fertilized with dose of 75:50:00 NPK kg/ha. Out of these 37.50: 50:00 NPK kg/ha was applied as basal on 17/08/2021 and remaining half nitrogen is applied in to two split i.e. first split dose of nitrogen was applied on dated 09-09-2021 and second split dose was applied on dated 10-10-2021. Harvesting of primary spike was done on 27-12-2021.

Expt. DUS-1: DUS testing of farmers' variety of castor

Location: Main oilseed Research Station, JAU, Junagadh

Season: Kharif – 2021 Design: RBD Date of sowing: 17-08-2021

Number of entries: 4(1+3) No. of replications: 3 Row length: 6.00 m

No. of rows/entry: 6 Spacing: 90 x 60 cm Plot size: 6.00 m x 5.40 m

Fertilizer dose: 75: 50: 00 NPK kg/ha Expt. Area: 21.60 m x 21.60 m = 0.0432 ha

DAP = 4.70 kg, Urea = 5.21 kg

The observations were recorded on morphological characters viz., Hypocotyl: anthocyanin pigmentation, leaf: anthocyanin pigmentation of young emerging leaves, leaf: waxi bloom on upper side, leaf: waxi bloom on lower side, stem: waxi bloom, stem: colour (after removal of bloom), stem: type of internodes, leaf: length of 4th leaf from top, plant: time of 50 % flowering in primary spike (days), stem: number of nodes on main stem, leaf shape, leaf: no. of lobes, leaf: lincination, petiole: length, petiole: surface, inflorescence: type of flower on primary spike, spike shape, spike compactness, length of primary spike, capsule spininess, capsule length, plant: location of branches, branching pattern, plant height in the field as well as seed characters like 100-seed weight, seed shape, seed coat colour, seed mottling and seed caruncle as per Revised National Test Guidelines. The results of above castor DUS experiments were submitted to Dr. N. Mukta, The Principal Scientist & Nodal Officer (DUS), ICAR-Indian Institute of Oilseeds Research, Rajendranagar, Hyderabad.

Photo of castor DUS Testing trials conducted during *Kharif-2021* at JAU, Junagadh



TAMIL NADU AGRICULTURAL UNIVERSITY, COIMBATORE

It is the collaborating centre for dus testing of Sunflower varieties

In sunflower, DUS testing is carried out for two new entries of the first year and two entries of the second year along with National check KBSH 44 as per the DUS guidelines.

Table 3.70: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Sunflower	2	2	-	-	-

3.1.61. DUS TESTING CENTRE FOR LINSEED

JAWAHARLAL NEHRU KRISHI VISHWA VIDYALAYA, JABALPUR (M.P.)

During the year 2021-22 maintained all the reference varieties of the three crops viz., Lentil, Linseed and Fieldpea. However, centre did not receive any of the farmers varieties for these crops in current year, only three farmers varieties were tested in linseed (second year testing) which was received during the year 2020-21 from the Plant Varieties Registry, PPVFRA, NASC, New Delhi, to carry out field based GOT as per statutory requirement of the PPVFR Act, 2001. The guidelines and

instructions of the PPVFR Authority were followed while conducting the GOT and also follow crop specific DUS test guidelines, as applicable. All the precautions were taken to safeguard the interests of the PPVFRA while conducting the tests and allow time to time inspection/monitoring by PPVFRA officials/Monitoring team/applicants, as and when advised by the PPVFRA. The field data duly recorded in field record note book; photos of claimed distinct characters, number of off types observed along with specific comments on the distinctiveness and uniformity are included in the report.

Table 3.71: Details of DUS testing of candidate varieties in 2020-21:

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
Linseed	-	-	-	03	-

Table 3.72: Varieties under maintenance/characterized:

Crops	Name or No of varieties under maintenance breeding in 2021-22
Linseed	28

3.1.62. DUS TESTING CENTRE FOR SESAME AND NIGER

PC Unit (S&N) ICAR-JNKVV, Jabalpur (MP) is the lead centre. During 2021-22 the seeds of 91 reference varieties and 4 farmers' varieties were sown on 16.07.2021 at seed breeding farm, PC Unit (S&N), ICAR-JNKVV, Jabalpur during *Kharif* 2021 in 6 row of 6 m length with 45 cm row to row distance under recommended package of practices to maintain the reference varieties as per National Test Guidelines in three replication. The germination and plant population were optimum with proper expression of distinguishing traits except one farmer's variety (REG/2016/521). The environmental condition was favorable for normal growth. The expression of distinguishing traits of all the reference and other varieties were observed as National Test Guideline.

Table 3.73: Reference varieties of sesame maintained



S.No.	Reference varieties	Number
1	Total	91
2	Maintained	91
3	Not maintained	0

Table 3.74: Farmers varieties of sesame sown at PC Unit (S&N), ICAR-JNKVV, Jabalpur

S.No.	Reg. No.	Denominator
1	Reg/2016/521	Jadhnati
2	Reg/2016/476	Baishakhi
3	Reg/2016/460	Charki Bhadai
4	Reg/2015/840	Amaghawadh-51

Table 3.75: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Sesame	91	Yes
Niger	23	-

	
Field	15 (*) (+) Capsule: Arrangements-Cluster

3.1.63. DUS TESTING CENTRES FOR RAPESEED, INDIAN MUSTARD, KARAN RAI AND GOBHI SARSON

ICAR-DIRECTORATE OF RAPESEED – MUSTARD RESEARCH, SEWAR, BHARATPUR, RAJASTHAN

It is the lead centre

During the year total of 9 candidate varieties of Indian mustard were characterized using DUS characters. Out of these 04 varieties were characterized for 1st year, 03 varieties were

characterized for 2nd year and 02 hybrids were characterized for 1st year. Apart from these, 05 Farmer's varieties (01 Indian mustard, 03 yellow sarson and 01 toria) were grown for characterization for 2nd year. Out of these farmer's varieties only Piliya variety of yellow sarson was germinated with poor plant population (R1: 23 plants; R2: 22 plants; R3: 5 plants) while there was no germination in rest of the farmer's varieties.

Table 3.76: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV 2 nd year	FV 1 st year	Date of monitoring
	1 st year entries	2 nd year entries				
1. <i>B. juncea</i>	06	03	-	1	-	-
2. <i>B. rapa</i> var. yellow sarson	-	-	-	3		-
3. <i>B. rapa</i> var. toria	-	-	-	1		-

Table 3.77: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
<i>Brassica juncea</i>	93	Data for 10 <i>B. rapa</i> var. yellow sarson, 15 <i>B. rapa</i> var. toria, 7 <i>B. napus</i> , 5 <i>B. carinata</i> and 84 <i>B. juncea</i> were submitted in 2020-21
<i>Brassica carinata</i>	4	
<i>Brassica napus</i>	7	
<i>Brassica rapa</i>	27	

CSAUA&T, KANPUR, UTTAR PRADESH

It is the collaborating centre for DUS testing of Indian Mustard Karan Rai and Gobhi sarson

During 2021-22 the DUS trail was sown on 01/11/2011 adopting all recommended agronomical practices time to time. The data were recorded on 10 tagged plants of each entry in three replications. Most of the entries were found homogeneous with optimum germination percentage. Five RV were undertaken in varietal maintenance, the data have been recorded as per guidelines. Harvesting was done as on maturity in three phases (Early, Medium and Late) Harvested seed has been stored in optimum conditions for further use.

Table 3.78: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK/ RV	Total	Date of monitoring
	1 st year entries	2 nd year entries			
1	06	08	5	19	-

3.1.64. DUS TESTING CENTRE FOR GROUNDNUT

ICAR- DIRECTORATE OF GROUNDNUT RESEARCH, JUNAGADH, GUJARAT

The candidate variety trail code 2877/3187 (New var.) was received in 2020 from PPVFRA. The first year and second year DUS characterization was done in *Kharif* 2020 and *Kharif* 2021 respectively with sixteen reference varieties. Additionally multiplication and rejuvenation of 30 predescribed reference varieties was undertaken during *Kharif* 2021. All the recommended practices was followed to raise a healthy crop. All the observations was recorded at appropriate growth satge as per format given by PPVFRA under DUS test guidelines that include 13 qualitative and quantitative traits.

Table 3.79: Details of DUS testing of candidate varieties in 2021-2022

Crops	New			FV	Date of monitoring
	1 st year	2 nd year entries			
Grundnut	Trail code 2877/3 187 (2020)	Trail code 2877/3187 (2021)	-		29.10.2021



Plants of New variety trail code 2877/3187

3.1.65. DUS TESTING CENTRES FOR TUBEROSE AND CARNATION

INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, BANGALORE

It is the lead centre

Tuberose

During the year 2021-22 reference collection of 30 genotypes of tuberose along with 15 breeding lines were being maintained under field gene bank for maintenance breeding.

Observations were recorded for some of the important grouping characteristics such as leaf variegation, pigmentation on leaf base, bud colour, flower type, flower shape, spike length, stigma type, stigmatic lobes, pigmentation on peduncle, days taken for flowering and number of locules in fruit.

Four accessions of tuberose were characterized.

Arka Prajwal tuberose variety (REG/2018/71) was registered with PPV and FRA as extant variety during July 2022.

Carnation

During the year 2021-22, reference collection of 50 accessions of carnation were multiplied and being maintained under field gene bank for maintenance breeding.

Observations were recorded for the important grouping characteristics such as plant type, flower type, petal (main colour) and petal (secondary colour), qualitative and quantitative characters.

IIHRP 1 (Arka Flame/ Reg.No.284/2020) was registered with PPV and FRA as extant variety during 2020

Table 3.80: Varieties under maintenance/characterized:

Crops	Name or number of varieties under maintenance breeding in 2020-21	Data Submission (Maintenance Breeding) Yes/No
Tuberose	30	Yes
Carnation	50	Yes

Table 3.81: Applications filed with PPVFRA

Crops	No of Var notified by the center Since 1966	No of Var notified by the center Since 2001	No of applications filed Extant Notified New VCK	Certificates issued	Pending applications	Reasons for pendency
Tuberose	-	-	01 Arka Prajwal 01 Arka Sugandhi	Issued		Submitted the DUS testing report of nodal centre and co nodal centre DUS testing report of nodal centre and co nodal centre will be submitted 2021-22
Carnation		01		Yes	-	-



DUS Carnation field view



DUS Tuberose field view

ICAR – DIRECTORATE OF FLORICULTURAL RESEARCH (DFR), PUNE

It is the collaborating centre for tuberose. The DUS testing for the candidate variety 'Arka Sugandhi' during 2021-22, at Co-Nodal Centre (ICAR-Directorate of Floricultural Research, Pune) is in progress. About 14 single types were planted freshly during March-April 2021. The planting material of candidate variety, Arka Sugandhi, supplied by ICAR-IIHR, Bengaluru is uniform with 100% purity, and were planted along with reference varieties during August 2021. The data will be recorded for the candidate variety along with the reference varieties (For the given characteristics as per the guidelines given for tuberose).

Table 3.82: Details of DUS testing of candidate varieties in 2021-22

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
1	1	-	-	-	-

Table 3.83: Varieties under maintenance/characterized:

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2017-18	Data Submission (Maintenance Breeding) Yes/No
Tuberose	25 nos.	No

3.1.66. DUS CENTRE FOR MEDICINAL AND AROMATIC PLANTS (MENTHOL MINT, PERWINKLE, DAMASK ROSE AND BRAHMI)

CSIR-CENTRAL INSTITUTE OF MEDICINAL AND AROMATIC PLANTS (CSIR-CIMAP), LUCKNOW.

CSIR-Central Institute of Medicinal and Aromatic Plants (CSIR-CIMAP), Lucknow is the lead centre. During the year variety CIM-Kranti of menthol mint has been registered with PPVFRA. The morphological data on all 11 reference varieties of mint was collected afresh. Maintenance of all reference varieties of 4 mandated crops as mentioned in above table was carried out.

Table 3.84: Varieties under maintenance/Characterized:

SN	Crops	Name or Number of varieties under maintenance breeding in 2021-22		Data submission (Maintenance Breeding) Yes/No
		Number	Names	
1	Menthol mint (<i>Mentha arvensis</i>)	11	Kosi, MAS-1, Kalka, Shivalik, Gomti, Himalaya, Sakashm, Kushal, CIMAP Saryu, CIM-Kranti and CIM-Unnati	No
2	Periwinkle (<i>Catharanthus roseus</i>)	4	Dhawal, Nirmal, Prabal and CIM-Sushil	
3	Damask rose (<i>Rosa damascena</i>)	4	Ranisahiba, Noorjahan, Aligarh, Kanouj	
4	Brahmi (<i>Bacopa monnieri</i>)	2	CIM-Jagriti, Subodhak	

3.1.67. DUS TESTING CENTRE FOR CROSSANDRA

ICAR-INDIAN INSTITUTE OF HORTICULTURAL RESEARCH, HESSARGHATTA LAKE POST, BENGALURU

During the period a reference collection of 5 genotypes of crossandra along with 4 breeding lines and one species were being maintained under field gene bank for maintenance breeding. Observations were recorded for some of the important grouping characteristics.

Table 3.85: Varieties under maintenance/characterized:

Crops	Name or No of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Crossandra	10	Yes

General view of Crossandra in the field



3.1.68. DUS TESTING CENTRE FOR GRAPES

ICAR-NATIONAL RESEARCH CENTRE FOR GRAPES, PUNE

It is the lead centre

During the year 2021-22, two applications of farmers' variety (Black Kwin Berry, Siddh Golden) were filled for registration with the PPVFR Authority. On-site DUS testing was carried out based on 40 characters as per DUS guidelines for 10 candidate varieties such as Timco, Timpson, Allison, Melody, Ivory, ARRA THIRTY TWO, INIA Grape, Manjari Shyama, Black Kwin Berry and Siddh Golden. Also the data of grape reference varieties was collected from DUS plot at ICAR-NRC for Grapes, Pune for comparison of the candidate varieties. During the period registration was obtained for five varieties: Manjari Naveen, Manjari Kishmish, VSD Seedless, RK Seedless and King Berry.

Table 3.86: Details of DUS testing of candidate varieties in 2020-21

Crops	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year entries			
1	Timco, Timpson, Allison, Melody, Ivory, ARRA THIRTY TWO, INIA Grape One	Manjari Shyama	-	<ul style="list-style-type: none"> • Black Kwin Berry • Siddh Golden 	-

Table 3.87: Varieties under maintenance/characterized:

Crops	Name or No of varieties under maintenance breeding in 2020-21	Data Submission (Maintenance Breeding) Yes/No
Grape	57	Yes

3.1.69. DUS TESTING CENTRE FOR JACKFRUIT**UNIVERSITY OF AGRICULTURAL SCIENCES, GKV, BANGALORE**

During the 2021-22 released new Jackfruit variety Byrachandra from UAS, Bangalore. The variety bears fruits twice a year, with orange yellow colour flakes. The fruit is suitable for table purpose as well as for vegetable use. The centre also filed five Jackfruit farmers' varieties with PPV and FRA, New Delhi.

Identified eight elite Jackfruit varieties from farmers' field and will be characterized further for registration with PPV and FRA. New Germplasm block with 25 elite Farmers Jackfruit varieties are planted in GKV campus. Testing two farmers varieties - Siddu and Shankara

Table 3.88: Details of DUS testing of candidate varieties in 2021-22

S.no.	New		VCK	FV	Date of monitoring
	1 st year entries	2 nd year Entries			
1	Siddu				
2	Shankara				

Table 3.89: Varieties under maintenance/characterized: 80

Mandated Crop Species	Name or No of varieties under maintenance breeding in 2021-22	Data Submission (Maintenance Breeding) Yes/No
Jackfruit	Total varieties – Eighty (80) Yielding varieties – Thirty (30)	Yes (Table attached)

3.1.70. DUS TESTING CENTRE FOR SEABUCKTHORN

COLLEGE OF FORESTRY, DR. YS PARMAR UNIVERSITY OF HORTICULTURE AND FORESTRY, NAUNI-SOLAN, HIMACHAL PRADESH

During the year 2021-22 the 13 varieties/clones of seabuckthorn under maintenance breeding were raised and the morphological data on Qualitative, Pseudo qualitative and quantitative characteristics of all the varieties was obtained which were compared and the unique characters for each species were recorded. The DUS characters for each variety of Seabuckthorn under maintenance testing have already been published by Protection of Plant Varieties and Farmers' Rights Authority. Those characters were sincerely matched again this year. The data collected was analysed and explained which is being submitted with the report.

The four farmer varieties are under trial which is to be raised this year and next year for proper examination of morphological characters in general as well as grouping characteristics, decided as per DUS Guidelines.

Table 3.90: Varieties under maintenance / characterized:

Mandated Crop Species	Name or No. of varieties under maintenance breeding in 2021-22	Data submission (Maintenance Breeding) Yes/No
Seabuckthorn (<i>Hippophae rhamnoides</i> L.)	13 (Thirteen) Rangreek, Kaza, Sheigo, Schilling, Poh, Tabo, Lari, Mane, Hurling, Pin Valley, DIHAR-F64, DIHAR-F74, DIHAR-F75	Yes

Table 3.91: Details of DUS testing of candidate varieties in 2021-2022

Crops	New		FV	Date of monitoring
	1 st year	2 nd year entries		
Seabuckthorn (<i>Hippophae rhamnoides</i> L.)			SHINGA (REG/2021/0062)	Plant characteristics (December, 2021) Shoot characteristics (March-, 2022) Leaf characteristics (July, 2021) Thorns characteristics (September, 2021) Fruit characteristics (Second Week of October)
			KAMROO (REG/2021/0061)	
			THANGI (DL1703210001)	
			THANGI (DL170321002)	

				Seed Thorns characteristics (October,2021) Flowering characteristics (May, 2022)
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Key observation of the monitoring team:

There are four farmer varieties which are under observation/ Testing. This year, the farmer varieties were observed 'on site testing' from where the morphological data on Qualitative, Pseudo qualitative and quantitative characteristics of plant, leaf, thorns, fruit and seed were recorded. The planting material of these four farmer varieties was brought from respective site and propagated through cutting in the field for further evaluation of these varieties. It will take at least two seasons/ two year for recording the characters, by which the similarity between the maintenance variety and farmer variety will be worked out on the basis of DUS Guidelines on Seabuckthorn.

3.2 GENE BANKS OF PPVFRA

As per Section 27, of PPVFR Act, 2001, a breeder has to deposit seeds and propagating material including parental line seeds of registered variety in the National Gene Bank, as may be specified in the regulations for reproduction purpose.

The National Gene Bank of PPVFRA has been established at ICAR-NBPGR Old Campus for medium term storage of orthodox or true seeds (e.g. rice, wheat, maize, sorghum, tomato, rapeseed-mustard, jute etc) of candidate varieties for plant variety registration purpose at PPVFRA.

However, for fruit trees (like coconut, mango and citrus), plantation species (like eucalyptus and poplar), spices (black peppers, ginger and turmeric), commercial species, like rubber, that either produces recalcitrant (seed normally do not withstand desiccation or low temperature storage and are not easy to store under conventional storage conditions) seeds having long regeneration cycles or sexually sterile, no seeds at all or species that are normally clonally propagated (sugarcane and potato), planting material of these species are conserved at Field Gene Bank under *ex situ* conditions. Since the diversity of the genetic resources is abundant near the places of primary or secondary centres of origin or domestication, the species concerned are also adapted to the local agro-climatic conditions (like soil, water, temperature etc), field gene bank are also strategically established in these areas.

The Field Gene Banks facility will also be used as a repository of the varieties released (referral collection) from different geographical contexts having sub species/ intra varietal variability and conserved at one place. Field Gene Bank will also maintain specimen plants of the varieties registered under the PPVFR Act, 2001. Documentation regarding source, parentage, morphological/ sexual/ value for cultivation characteristics, digitalization and database management will help in resolving techno-legal issues and dispute settlement.

3.2.1 NATIONAL GENE BANK, NBPGR OLD CAMPUS, NEW DELHI

The working of medium-term facility is being monitored under this project, by the technical experts of ICAR-NBPGR and the electrical facility is being maintained by the electrician employed under this project. The temperature of the cold store is maintained at +4°C and the relative humidity has been adjusted to 35%. The relative humidity and temperature of the medium-term storage (MTS) module and the DUS test repository are recorded everyday by the electrician and major problems if any, are brought to the notice of technical personnel at NBPGR and resolved accordingly. During the period under report, servicing and repairing of DG set and other minor repair works in MTS has been done for uninterrupted electricity supply to the PPV& FRA Gene bank.

Seeds samples of 673 registered varieties stored in the Gene-bank (MTS) of PPVFRA were tested for germination and moisture after 5 years of their storage for cereals, legumes and vegetable seeds and 3 years of the storage for oil seeds.

Crops	No. of varieties monitored during the FY 2021-2022	Moisture range (%)	Germination Range (%)
Barley	6	12.83-13.91	100-100
Bottlegourd	1	9.37	64
Brinjal	3	9.4-11.44	12-92
Chickpea	4	11.86-12.39	16-100
Chili	2	10.10-10.17	0-24
Cucumber	1	9.63	96
Diploid Cotton	13	6.51-11.04	44-88
Durum Wheat	4	7.79-11.35	96-100
Field Pea	1	10.32	100
Finger Millet	1	13.52	84
Green gram	1	12.24	100
Jute	3	4.32-12.69	0-32
Kidney bean	2	11.67-13.62	0-20
Maize	78	5.2-16	0-100
Muskmelon	2	7.06-8.64	76-100
Okra	32	9.0-13.88	0-100
Onion	3	10.88-12.19	16-60
Pearl millet	10	11.06-16.41	16-100
Pigeonpea	2	12.16-12.25	84-100
Pumpkin	2	7.68-8.40	0-92
Rice	363	5.48-16.57	0-100
Sorghum	17	7.52-14.95	0-100
Tetraploid cotton	59	7.10-12.95	32-100
Tomato	25	6.94-15.73	0-100
Wheat	21	6.68-15.49	24-100
Castor	1	5.48	84
Indian Mustard	8	7.49-8.56	40-92

Rapeseed	1	7.09	100
Sesame	4	5.17-5.76	4-88
Soybean	2	7.84-10.13	80-100
Sunflower	1	6.54	96

3.2.1.3 Additional sample testing: During the period under report 15 seed samples of cotton and 275 seed samples of paddy were tested for standard germination. Germination tests were conducted using top-of-paper method for rice and between paper method for cotton seeds.

3.2.1.3.1 Medium term storage condition & DUS Repository (as on 31st March, 2022)

Sl.	Crops	DUS Test Repository (STS)					Medium Term Storage					GRAND TOTAL
		(Candidate varieties for DUS test kept at 22°C)					(4°C)					
		SEED RECEIVED A					CERTIFICATE ISSUED B					
		New	VCK +EDV	Farmer	Extant Notified	Total	New	VCK +EDV	Farmer	Extant Notified	Total	
						(A)					(B)	
1	Barley	11	5	37	6	59		1	5	17	23	82
2	Barnyard Millet			39	2	41				1	1	42
3	Bitter Gourd	29	25	15		69		8	1	1	10	79
4	Black Gram	4	2	111	16	133	1		2	30	33	166
5	Bottle Gourd	9	11	48		68		5	2	4	11	79
6	Brinjal	115	88	93	4	300	26	82	7	13	128	428
7	Cabbage	17	1	1		19	4	1		1	6	25
8	Bread Wheat	29	3	89	21	142	35	10	29	151	225	367
9	Castor	4	2	7		13	3	3		5	11	24
10	Cauliflower	40	12	13	1	66	16	8	1	3	28	94
11	Chickpea		1	75	14	89	2		15	51	68	157
12	Chilli	114	139	22	8	283			1	8	9	292
13	Coriander	1		30		31				1	1	32
14	Cowpea		1		4	5				1	1	6
15	Cucumber	8	21	32		61		2		2	4	65
16	Fennel			1		1						1
17	Durum Wheat	1		4	4	9	4		2	26	32	41
18	Dicoccum Wheat	4				4				5	5	9
19	Diploid Cotton	5	3		4	12	12	9		29	50	62
20	Faba Bean			2	1	3				1	1	4
21	Fenugreek			10		10			1		1	11

22	Finger Millet	1		56	6	63				10	10	73
23	Foxtail Millet			32	2	34				1	1	35
24	Garden Pea				2	2				2	2	4
25	French Bean			4		4						4
26	Grain Amaranth	1		4	3	8				1	1	9
27	Green Gram	4	3	52	12	71		1	6	35	42	113
28	Groundnut	5	1	19	2	26						26
29	Jute	10	2	4	1	17	9	1		13	23	40
30	Kidney Bean	1	2	23	1	26		2	1	9	12	38
31	Kodo Millet			98		98						98
32	Lentil			58	2	60			8	12	20	80
33	Linseed			57	2	59				7	7	66
34	Little Millet			77	1	78				3	3	81
35	Maize	329	56	285	47	717	176	60	7	92	335	1052
36	Marigold	2		4		6						6
37	Muskmelon	8		1		9				2	2	11
38	Mustard	20	9	59	7	95	4	14	11	54	83	178
39	Okra	83	44	25	3	155	16	19	1	16	52	207
40	Onion	3	12	7	2	24	2	1		11	14	38
41	Pea	5	3	92	2	102			3	29	32	134
42	Pearl Millet	155	280	20	25	480	68	37	1	56	162	642
43	Pigeon Pea	13	2	171	9	195	16	2	10	25	53	248
44	Pumpkin			30		30				3	3	33
45	Rapeseed			21	1	22			9	13	22	44
46	Rice	344	53	2588	124	3109	165	50	1720	271	2206	5315
47	Ridge Gourd	8	2	19		29		1		1	2	31
48	Safflower	3		1	3	7				7	7	14
49	Sesame			66	2	68			1	10	11	79
50	Snap Melon			12		12						12
51	Sorghum	64	8	60	23	155	70	38	19	57	184	339
52	Soybean	8		22	2	32	2	1	6	36	45	77
53	Sunflower	66	7		1	73	39	19		11	69	142
54	Tetraploid Cotton	312	161 +115	1	24	613	137	207 + 14	1	70	429	1042
55	Tomato	132	91+3	20	9	255	40	40	3	16	99	354
56	Velvet Bean			2		2						2
57	Watermelon	4	17			21		4			4	25
Total		1971	1183	4619	402	8175	847	640	1873	1223	4583	12758

3.2.3 Seed Standards

S. No	Crop	Date of Notification	Seed Requirement Candidate /Parental line Hybrid (each) in gm unless otherwise mentioned		Germination %	Moisture %	Physical Purity %	Tentative Season – Months for seed submission for DUS testing	Prescribed size of seed packets (mm)
1	Rice (<i>Oryza sativa</i> L.)	1/11/2006	3000	1500	80	11-12	98	Kharif – March-Apr	230x300
2	Bread Wheat (<i>Triticum aestivum</i> L.)		3000	1500	95	8-9	98	Rabi-Aug	230x300
3	Maize (<i>Zea mays</i> L.)		3000	1500	80(inbred/SCH) 90(var/DCH)	8-10	98	Kharif-Mar-Apr Rabi- Aug	230x300
4	Sorghum (<i>Sorghum bicolor</i> (L.) Moench)		2000	1000	80	10	98	Kharif- March Rabi-Aug	230x300
5	Pearl Millet (<i>Pennisetum glaucum</i> (L.) R.Br.)		600	300	80(inbred/SCH) 90(var/DCH)	10	98	Kharif- March	165x220
6	Chickpea (<i>Cicer arietinum</i> L.)		2000 (desi) 3000 (kabuli)	N.A.	95	8-9	98	Rabi-Aug	230x300
7	Green Gram (<i>Vigna radiate</i> (L.) Wilczek)		1000	N.A.	95	8-9	98	Kharif- March	230x300
8	Black Gram (<i>Vigna mungo</i> (L.) Hepper)		1000	N.A.	95	8-9	98	Kharif- March	165x 220
9	Field Pea (<i>Pisum sativum</i> L.)		2000	N.A.	85	8-9	98	Rabi-Aug	230x 300
10	Kidney Bean (<i>Phaseolus vulgaris</i> L.)		3000	N.A.	85	8-9	98	June-July	230x 300
11	Lentil (<i>Lens culinaris</i> Medik)		1000	N.A.	85	8-9	98	Rabi-Aug	230x 300
12	Pigeonpea (<i>Cajanus cajan</i> (L.) Millsp.)		2000	1500	95	8-9	98	Kharif-Mar	230x 300
13	Cotton (<i>Gossypium hirsutum</i> L.)	31/12/2007	2000	1000	75	10	98	Kharif- North- Feb Peninsular- South-May- June	230x 300
14	Cotton (<i>G. barbadense</i> L.)		2000	1000	75	10	98		
15	Cotton (<i>G. arboreum</i> L.)		1500	750	75	10	98		
16	Cotton (<i>G. herbaceum</i> L.)		1500	750	75	10	98		
17	Jute (<i>Corchorus</i>		1000	500	85	9	97	Pre-Kharif-	165x

	<i>capsularis</i> L.)							early Jan	220
18	Jute (<i>Corchorus olitorius</i> L.)		1000	500	85	9	97	Pre-Kharif-early Jan	
19	Sugarcane (<i>Saccharum</i> L.)	27/7/2009	400 single bud sett						
20	Ginger (<i>Zingiber officinale</i> Rosc.)		5000 g (clean and whole sum rhizome of 25-30 g each of 150 pieces)						
21	Turmeric (<i>Curcuma longa</i> L.)		6 kg (clean and whole sum fresh rhizome with 35-40% moisture content)						
22	Indian Mustard (<i>Brassica juncea</i> L. Czern & Coss)	30/4/2010	500	250				Jun-Jul	165x100
23	Karan rai (<i>Brassica carinata</i> A Braun)		500	250				Jun-Jul	165x100
24	Rapeseed-Mustard (<i>Brassica rapa</i> L.)		500	250	85	8	98	June-Jul	165x100
25	Gobhi sarson (<i>Brassica napus</i> L.)		500	250				Jun-Jul	165x100
26	Groundnut (<i>Arachis hypogaea</i> L.)		3000(Spanish & Valencia) 8000(kernel) for Virginia bunch and runner type	1500 4000	80	9	98	Kharif: May-June Rabi: Aug-Sep	300x450
27	Soybean (<i>Glycine max</i> (L.) Merrill)		3000	---	70	9	98	Apr-May	230x300
28	Sunflower (<i>Helianthus annuus</i> L.)		3000	2000	70	9	98	July-Aug	230x300
29	Safflower (<i>Carthamus tinctorius</i> L.)		3000	1500	80	9	98	June-July	230x300
30	Castor (<i>Ricinus communis</i> L.)		6000	2500	70	10	98	April-May	300x450
31	Sesamum (<i>Sesamum indicum</i> L.)		500	250	80	9	97	April-May	165x100
32	Linseed (<i>Linum usitatissimum</i> L.)		500	250	85	9	98	May-June	165x100
33	Black pepper (<i>Piper nigrum</i> L.)		40 no of rooted cuttings						
34	Small cardamom (<i>Elettaria cardamomom</i> Maton)		50 Suckers						
35	Tomato (<i>Lycopersicon lycopersicum</i> (L.) Karsten ex. Farw.)	2/12/2010	15(open field) 8 (Greenhouse)	same	85	8	98	April- May	165x100
36	Brinjal (<i>Solanum</i>		15(open	15(ope	85	8	98	April- May	165x100

	<i>melongena</i> L.))	n)					
37	Okra (<i>Abelmoschus esculentus</i> (L.) Moench.)		200	-				May-June	230x300
38	Cauliflower (<i>Brassica oleracea</i> L. var. botrytis)		15	15	*	*	*	April- May	165x100
39	Cabbage (<i>Brassica oleracea</i> L. var capitata)		15	15	*	*	*	April- May	165x100
40	Potato (<i>Solanum tuberosum</i> L.)		300 Fully matured tubers (Tuber size should be 3.5-5.0 cm)						
41	Onion (<i>Allium cepa</i> L.)		100 1200 bulblet (multiplier) 50 bulbs(MS lines)	50	70	*	*	As per respective sowing seasons	
42	Garlic (<i>Allium sativum</i> L.)		2000 viable clove	--	*	*	*	Aug-Sep	-
43	Rose (<i>Rosa</i> spp. (other than <i>R. damascena</i>))		9 grafted/budded plants 9 plants in 12 inch or 30 cm pots size						
44	Chrysanthemum (<i>Chrysanthemum</i> spp.)		100 two node terminal rooted cutting taken from mother plant						
45	Mango (<i>Mangifera indica</i> L.)		7 grafted for each location						
46	Duram wheat (<i>Triticum durum</i> Desf.)		3000	1500	95	8-9	98	Same as wheat	230x300
47	Dicoccum wheat (<i>Triticum dicoccum</i> L.)		3000	1500	95	8-9	98	Same as wheat	230x300
48	Other <i>Triticum</i> sp		3000	1500	95	8-9	98	Same as wheat	230x300
49	Isabgol (<i>Plantago ovata</i> Forsk)		250	-	95	8-9	98	Rabi: Nov-Dec	230 x 300
50	Menthol mint (<i>Mentha arvensis</i> L.)	18/8/2011	5 Kg suckers (10-15 cm long)						
51	Damask Rose (<i>Rosa damascena</i> Mill)		100 Cutting						
52	Periwinkle (<i>Catharanthus roseus</i> L.)		10 gm	-	85	8	98	Kharif : June-July	230 x 300
53	Brahmi (<i>Bacopa monnieri</i> L. Pennell)		500 Cutting (clean and wholesome vegetative parts 10-15 cm long)						
54	Coconut (<i>Cocos nucifera</i> L.)		30 number of one year old seedlings raised in polybag containing standard potting mixture						
55	Orchids (<i>Cymbidium</i>	27/3/2012	20 plants (10 for each centre) with at least two pseudo-bulbs and one back-bulb. Age 3-4 years						

	Sw.)									
56	Orchids (<i>Dendrobium Sw.</i>)			20 plants (10 for each Centre) with at least two shoots. Age 2-3 years						
57	Orchids (<i>Vanda jones</i> ex R. Br.)			20 plants, Age 2-3 year						
58	Pomegranate (<i>Punica granatum</i> L.)			10 propagules, One year old raised through air layering or rooted stem cutting (multiplied from the same tree) or tissue culture raised plants for each location.						
59	Orchid (<i>Cattleya Lindl.</i>)			20 plants two or three year old with at least two shoot						
60	Orchid (<i>Phalaenopsis Blume</i>)			20 flowering size plants						
61	Casurina (<i>Casurina equisetifolia</i> L.)			50 rooted cutting (at least three month old), measuring minimum 20 cm from collar to apical tip with a well developed root system						
62	Casurina (<i>Casurina junghuhniana</i> Miq.)									
63	Bitter gourd (<i>Momordica charantia</i> L.)			300 gm or 1500 no	-	80	8	98	Dec-Jan	230x300
64	Bottle gourd (<i>Lagenaria siceraria</i> (Mol.) Standl.)			250 gm or 1500 no	-	80	8	98		230x300
65	Cucumber (<i>Cucumis sativus</i> L.)			50 gm or 1500 no	-	80	8	98		230x300
66	Pumpkin (<i>Cucurbita moschata</i> Duch. ex Poir.)			200 gm or 1500 no	-	80	8	98		230x300
67	Barley (<i>Hordeum vulgare</i> L.)	15/4/2014		1500	1000	95	8	98	Aug-Sep	230x300
68	Coriander (<i>Coriandrum sativum</i> L.)			250	-	80	8-9	98	Jul-Aug	165x100
69	Fenugreek (<i>Trigonella foenum graecum</i> L.)			250	-	80	8-9	98	Jul-Aug	165x100
70	Almond (<i>Prunus dulcis</i> (Mill.) D.A. Webb)			10 grafted or budded plants						
71	Apple(<i>Malus domestica</i> Borkh)			6 grafted or budded plants						
72	Pear (<i>Pyrus communis</i> L.)			6 grafted or budded plants						
73	Apricot (<i>Prunus armeniaca</i> L.)			10 grafted or budded plants						
74	Cherry (<i>Prunus avium</i> L.)			10 grafted or budded plants						
75	Walnut (<i>Juglans regia</i> L.)			10 grafted or budded plants						
76	Grapes (<i>Vitis spp.</i>)			12 grafted plants(one yr old) for each location						
77	Indian jujube (Ber) (<i>Ziziphus</i>			7 plants for each DUS centre(minimum age 3 months)						

	<i>mauritiana</i> Lamk.)								
78	Eucalyptus (<i>Eucalyptus camaldulensis</i> Dehnh.)		60 rooted plant (plant should be in 250 cc root trainer)having minimum age of 6 months						
79	Eucalyptus (<i>Eucalyptus tereticornis</i> Sm.)								
80	Tea (<i>Camellia sinensis</i> L.)								
81	Tea (<i>C. assamica</i>)								
82	Tea (<i>C. assamica</i> ssp lasiocalyx.)		75 Plants (15-18 inches height), young plant having pencil thick stem with their own root						
83	Acid Lime (<i>Citrus aurantifolia</i> Swingle)		10 plants for each DUS centre. Age should be above six months						
84	Mandarin (<i>Citrus reticulata</i> Blanco)	16/10/2014	10 plants for each DUS centre. Age should be above six months						
85	Sweet Orange (<i>Citrus sinensis</i> (L.) Osbeck)		10 plants for each DUS centre. Age should be above six months						
86	Bougainvillea (<i>Bougainvillea Comm.</i> Ex Juss.)		10 well rooted and established plant						
87	Banana (<i>Musa spp.</i>)		40 uniform tissue cultured plant in one submission per location						
88	Orchid (<i>Oncidium sw.</i>)		20 plants 2-3 year old with at least two pseudo-bulbs/shoots						
89	Canna (<i>Canna</i> L.)		20 young plants or 20 matured rhizomes						
90	Gladiolus (<i>Gladiolus</i> L.)		30 Corms (4 - 4.5 cm in diameter)						
91	Muskmelon (<i>Cucumis melo</i> L.)	21/1/2015	100 gm seed for open field cultivation	-	80	8	98	Dec-Jan	230x300
92	Watermelon (<i>Citrullus Lanatus</i> (Thunb.) Mansf.)		150 gm seed for open field cultivation	-	80	8	98	Dec-Jan	230x300
93	Jasmine (<i>Jasminum auriculatum</i> L.)		20 rooted plant						
94	Tuberose (<i>Polianthes tuberosa</i> L)		75 Bulbs of more than 2 cm (diameter at broadest point) weighing 25-30 gm						
95	Papaya (<i>Carica papaya</i> L.)	2/7/2015	20 gm for gynodioecious varieties & 40 gm for	-	60	7% for ambient storage	98% for varieties & 90% for Hybrids	--	---

			dioecious varieties in both season						
96	China Aster (<i>Callistephus chinensis</i> (L.) Nees.)		2 gm each in two packets	-	60	6-9	98	---	---
97	Peach (<i>Prunus persica</i> L.Batsch.)		10 grafted or budded plants						
98	Japanese Plum (<i>Prunus salicina</i> L.)		10 grafted or budded plants						
99	Strawberry (<i>Fragaria x ananasa</i> Duch.)		120 runners or plant propagules or seedling plants (tissue cultured plant hardened at 4-5 leaf Stage)						
100	Chilli, Bell Pepper and Paprika (<i>Capsicum annum</i> L.)		15 gm for Open pollinated crop & 10 gm for Hybrid and Parental line	-	85	8	98	Aug-Sep	165x100
101	Finger Millet (<i>Eleusine coracana</i> (L.) Gaertn.)		250 gm & 10 Panicles	-	80	10-12	97	Apr-May	230x300
102	Foxtail Millet (<i>Setaria italic</i> (L.) Beauv.)		250 gm & 10 Panicles	-	80	11-12	97	Apr-May	230x300
103	Vegetable Amaranth (<i>Amaranthus tricolor</i> L.)		150 g (in one submission only)		80	<8	98	July-Sep	165x100
104	Ridge gourd (<i>Luffa acutangula</i> (L.) Roxb.)	19/4/2016	250g or 1500 seeds (in one submission only)		80	<8	98	Dec-Jan	230-x300
105	Spinach beet (<i>Beta vulgaris</i> var. <i>bengalensis</i> Roxb.)		250 g (in one submission only)		80	<8	98	Aug-Sep	165x100

106	Carnation (<i>Dianthus caryophyllus</i> L.)	13/7/2016	150 rooted cuttings						
107	Orchid (<i>Paphiopedilum</i> Pfitz.)		10 plants for each centres						
108	Noni (<i>Morinda citrifolia</i> L.)		10 grafted or budded plants for each location						
109	Bael (<i>Aegle marmelos</i> (L.) Correa)		5 Plants for each centres						
110	Jamun/Black plum (<i>Syzygium cuminii</i> (L.) Skeels.)		07 grafts for each location						
111	Nutmeg (<i>Myristica fragrans</i> Houtt.)		10 grafted or budded plants for each location						
112	Jasmine/Mogra (<i>Jasminum sambac</i> L.)		20 rooted plants for each location						
113	Custard apple/ Sugar apple (<i>Annona squamosa</i> L.)		8 grafts						
114	Kalmegh /King of Bitters (<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees)	30 gm		95	8-9	98	Kharif : May-June	230 x 300	
115	Neem (<i>Azadirachta indica</i> A. Juss.)	12/5/2017	40 clonally rooted plants with 60 cm height						
116	Karanj (<i>Pongamia pinnata</i> (L.) Pierre.)		40 clonally rooted plants with 60 cm height						
117	Indian Gooseberry (<i>Emblica officinalis</i> Gaertn.)		03-04 months old plants						
118	Betelvine (<i>Piper betle</i> L.)		Rooted cutting terminal shoots shall be 3 months old with 25 cm height						
119	Marigold (Tagetes spp. L)		10 gm seed or 200 Nos rooted cuttings		80	Not more than 8	98	Apr-May	165x100
120	Guava (<i>Psidium guajava</i> L.)		10 grafts/ air layers for each locations						
121	Litchi (<i>Litchi chinensis</i> Sonn.)		7 air layers for each location						
122	Deodar (<i>Cedrus deodara</i>) (Roxb.) G. Don		5 trees						
123	Chir pine (<i>Pinus roxburghii</i>) Sargent		5 trees						
124	Mulberry (<i>Morus</i> spp.)	50 stem cuttings of 12-15 cm length & 1.0-1.5 cm diameter							

125	Jasmine (<i>Jasminum multiflorum</i> L.)	20 numbers of 6 months old, fully rooted plants					
126	Buckwheat (<i>Fagopyrum esculentum</i>)	500 gram		80	not more than 10%	98	Kharif: May-June 165 x 100
127	Buckwheat (<i>Fagopyrum tataricum</i>)	500 gram		80	not more than 10%	98	
128	Grain Amaranth (<i>Amaranthus hypocondricus</i>)	50 gram		80	not more than 10%	98	Kharif: May-June Rabi: Sept-Oct 165 x 100
129	Grain Amaranth (<i>A. cruentus</i>)	50 gram		80	not more than 10%	98	
130	Grain Amaranth (<i>A. caudatus</i>)	50 gram		80	not more than 10%	98	
131	Grain Amaranth (<i>A. edulis</i>)	50 gram		80	not more than 10%	98	
132	Faba bean (<i>Vicia faba</i> L. var. major Harz)	150 gram		70	not more than 9%	98	Rabi: Sept-Oct 230 x300
133	Elephant Foot Yam (<i>Amorphophallus Paeoniifolius</i>)	36 tubers 200-400g each					
134	Taro (<i>Colocasia esculenta</i> var. <i>esculenta</i> , <i>Colocasia esculenta</i> var. <i>antiquorum</i> , <i>Colocasia esculenta</i> var. <i>stoloniferum</i>)	36 tubers 30-40g each					
135	Taro (<i>Cyrtosperma chamissonis</i> / <i>C. merkusii</i>)	36 tubers 30-40g each					
136	Jatropha (<i>Jatropha curcas</i> L.)	60 rooted plants with 60 cm height, in June-July					
137	Barnyard millet (<i>Echinochloa frumentaceae</i> (Roxb.) Link)	250 grams seed with 10 panicles		80	12	97	Apr-May 230x300
138	Kodo millet (<i>Paspalum scorbiculatum</i> L.)	500 grams seed with 10 panicles		80	12	97	Apr-May 230x300
139	Little millet (<i>Panicum sumatrense</i> Roth. Ex Roemer And Schultes)	150 grams seed with 10 panicles		80	12	97	Apr-May 230x300
140	Proso millet (<i>Panicum miliaceum</i> L.)	200 grams seed with 10 panicles		80	12	97	Apr-May 230x300

141	Cashew (<i>Anacardium occidentale</i> L.)	23/10/2017	8 grafted plants						
142	Arecanut (<i>Areca catechu</i> L.)		10 numbers of one year-old seedlings						
143	Chironji (<i>Buchanania lanzan</i> Spreng.)	9/1/2018	09 grafts for each location						
144	Tamarind (<i>Tamarindus indica</i> L.)		09 grafts for each location						
145	Sweet potato (<i>Ipomoea batatas</i> (L.) Lam.)		150 vine cuttings (each one with a length of 30cm with 5 to 8 buds) for both centres						
146	Cassava (<i>Manihot esculenta</i> Crantz.)		100 cuttings for each centre, length 20 cm with minimum 5 to 8 viable buds						
147	Poplar (<i>Populus deltoides</i> L.)		120 cuttings from 1 year old plants						
148 - 154	Willow (<i>Salix</i> species) <i>Salix tetrasperma</i> , <i>Salix nigra</i> , <i>Salix jessoensis</i> , <i>Salix x rubens</i> , <i>Salix matsudana</i> , <i>Salix alba</i> , <i>Salix acmophylla</i> .	11/7/ 2018	120 hardwood cuttings, diameter 1 cm and length 20 cm						
155	Oat (<i>Avena sativa</i> L.)		1,000 gm		85	10	98	Jul-Aug	230x300
156	Date Palm (<i>Phoenix dactylifera</i> L.)		06 Rooted suckers (offshoots), weight 8-10 kg						
157	Moringa (<i>Moringa oleifera</i> L.)	18/7/ 2019	30 plants or 100 pure seeds for each centre						
158	<u>Melia</u> (<i>Melia dubia</i> Cav.)	25/2/ 2019	100 rooted plants.						
159	Pointed Gourd (<i>Trichosanthes dioica</i> Roxb.)	15/12/2020	50 (fifty) tuberous root/ rooted vine cuttings (having minimum 3 nodes)						
160	Crossandra (<i>Crossandra infundibuliformis</i> (L.) Nees.)	15/12/2020	100 terminal rooted cuttings in plugs or pro-trays (50 for each center) of 6 cm to 8 cm						
161	Cowpea (<i>Vigna unguiculata</i> (L.) Walp. <i>ssp. unguiculata</i> and <i>Vigna unguiculata</i> (L.) Walp. <i>ssp. sesquipedalis</i> (L.) Verdc.)	15/12/2020	1,000 gm	95	9	98	May-June	230x300	
162	Jackfruit (<i>Artocarpus heterophyllus</i> Lam.)	23/08/2021	The plant material has to be supplied in the form of grafts / budded plants.						
163	Greater Yam (<i>Dioscorea alata</i> L.)		10 healthy tubers 750-1100g						

164	Yam Bean (<i>Pachyrhizus erosus</i> L.)		The minimum quantity of planting material (seeds), to be supplied by the applicant, should be 75 - 100g for three replications.					
165	Seabuckthorn (<i>Hippophae rhamnoides</i> L.)		The minimum required quantity of planting material, should be at least seven well rooted one-year-old plants in poly bags with at least two shoots.					
166	Ajwain (<i>Trachyspermum ammi</i> L.)	16/03/2022	New-50g,ENV-10g, VCK- 25g, FV- 25g	65%	8-9%	98%	Rabi: Oct-Nov	165 x 100
167	Anise (<i>Pimpenella anisum</i> L.)		New- 100g, ENV-20g, VCK-50g, FV-50g	65%	9-10%	98%	Rabi: Oct	
168	Celery (<i>Apium graveolens</i> L.)		New-50g, ENV-10g, VCK-25g,, FV-25g	65%	8-9%	98%	Rabi: Oct	
169	Cumin (<i>Cuminum cyminum</i> L.)		New-100g, ENV-20g, VCK-50g, FV-50g	65%	8-9%	98%	Rabi: Oct	
170	Dill (<i>Anethum graveolens</i> L. and <i>Anethum sowa</i> Roxb)		New-100g, ENV-20g, VCK-50g, FV-50g	65%	8-9%	98%	Rabi: Oct	
171	Fennel (<i>Foeniculum vulgare</i> Mill.)		New-200g, ENV-40g, VCK-100g, FV-100g	70%	8-9%	98%	Rabi: Oct	
172	Nigella (<i>Nigella sativa</i> L.)		New-100g, ENV-20g, VCK-50g, FV-50g	65%	8-9%	98%	Rabi: Oct	

3.3 REGIONAL HORTICULTURAL RESEARCH AND TRAINING STATION, MASHOBRA; DR Y S PARMAR UNIV. OF HORT. AND FORESTRY, MASHOBRA, SHIMLA

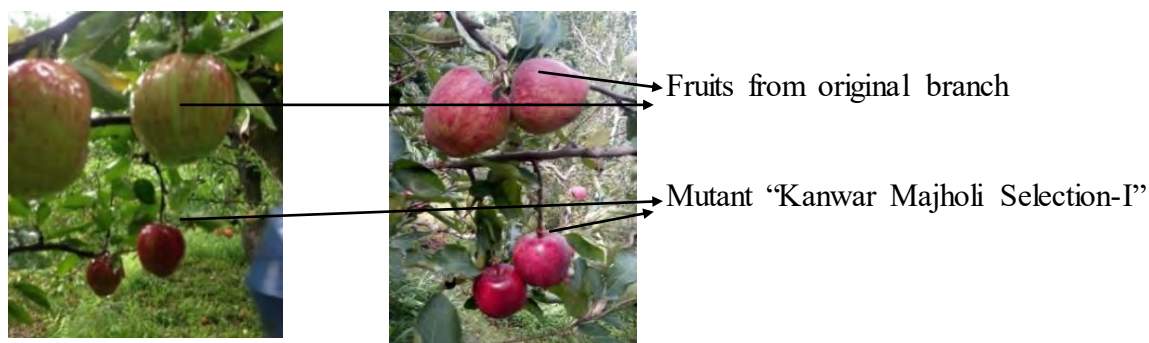
The project has the following objective (s) and madate crops (Apple, Pear and Cherry).

- Maintenance of variety collection block of temperate fruits- apple, pear and sweet cherry.
- Morphological characterization of varieties from DUS point of view.
- Collection of prominent farmer's varieties.

a) Detail of DUS testing of candidate varieties in 2021-2022:

Application for apple variety "Kanwar Majholi Selection-I" was filed by Sh. Joginder Kanwar S/O Late Sh. Narain Singh Village Majholi, P O Kathog, Tehsil Theog, District Shimla, HP for registration through Regional Horticultural Research & Training Station, Mashobra during the year 2016. During the year 2021, Scientists from CITH, Srinagar along with Dr Dinesh S Thakur, Associate Director, RHR&TS, Mashobra conducted ON-Site DUS testing of above said variety on 3rd September, 2021.

The whole limb sport having blushed (mutated) and stripped fruits (non- mutated) fruits of Red Delicious apple tree was spotted at farmer field Majholi village. The fruit samples of normal (non-mutated) as well as mutated limbs were collected and further analyzed for fruit quality characteristics. The bud wood of mutated limb was collected from the site and further grafted to obtain early bearing as well as to observe perpetuation of the character at the research farm of RHR&TS Mashobra.



b) Varieties under maintenance / Characterized:

- **Details of varieties collected/ maintained under Field Gene Bank of Temperate Fruits at RHR&TS, Mashobra, Shimla**

Crop	Number of variety in maintenance breeding blocks	Number of variety in reference /variety collection blocks
Apple	276	118
Pear	79	32
Cherry	46	21

- **Detail of total number of plants maintained in maintenance breeding and variety collection block of mandate crops at RHR&TS, Mashobra**

Crop	Maintenance Breeding Block	Reference Block	Total no. of plants
Apple	828	563	1391
Pear	267	272	539
Cherry	207	132	339
Total	1302	967	2269

Every year 4-5 varieties of apple, Pear and cherry are being collected and added in the field gene bank according to the availability of varieties.

Apple:

During the year 2021, characterization of 170 viz AAS/GP/BSP/04, AAS/GP/BSP/09, AAS/GP/BSP/13, Ace spur, Adams, Akane, Akbar, Ambred, Ambrich, Ambstarking, Antinovika, Aurora, Auvil Early Fuji, Aztec Fuji, Baldwin, Beauty of Bath, Early Shanbury, Belle -de Booskop, Ballerina, Bisbee Spu, Black Ben Davis, Boycan, Braeburn, Bright -N –Early, Brookfield Gala, Bulter's Grieve, Camspur, Carroll, Carpendoo Bianco, Chanpora Selection, Chaubatia Ambroise, Chaubatia Anupum, Chaubatia Prince, Chinese Cinnamon, Co Fuji, Commercial, Compact Winter Banana, Cooper- 4, Crimson Gala, Dessert of Issac, Devenshire Quarrenden, Dorset Golden, Early Red One, EC 349914, EC 539446, EC 539449, EC 539450, EC 539457,

EC83683, EC239451, Ellison's Orange, Eseltine, Empire, Fanny, Fuji, Fuji Kiku, Fuji Raku Raku, Fulford Gala, Gala, Gala Mitchella, Gala Must, Galaxy Gala, Giant Jenson, Gloster, Gold Rush, Gold Spur, Golden Autumn, Golden Hornet, Golden Reinders, Golden Stark Spur, Granny Smith, Green Sleeves, Hardeman, Hardi Brite Spur, Hardispur Honey Gold Honey Sweet, James Grieve, Jay Darling, Jeromine, Jona Gold, Jonathan, Jonica, King of Pippins, Lal Ambri, Lal Cardinal, Liberty Lobo Lungwort, *M. floribunda*, *M. robusta*, *M. baccata*, Maharaji, Manchurain Crab, Margrate, McIntosh Double Red, Melrose, Michael, Mollies Delicious, Neema Earliest, Neer Early Staying, Oregon spur, Oregon Spur Canada, Oregon Spur-II, Parkdale, Parlin's Beauty, Peas Good Non Such, Pink Lady, Pink Superior, Pommier Aziza, Prima, Priscella, Real Mecoy, Red Baron, Red Chief, Red Delicious, Red Flesh, Red Free, Red Fuji, Red Gold, Red June, Red Royal, Red Spur, Red Velox, Redlum Gala, Resi CR, Ribiston Pippin, Rich a Red, Rose Marie, Royal Delicious, Royal Gala, Rubijon, Rymer, Sansa, Scarlet Gala, Scarlet Spur, Scarlet Spur II, Shalimar – I, Sharp's Late Red, Shireen, Sun Fuji, Sunheri, Super Chief, Starkrimson Gold Starr, Sukh Trel, Summer Queen, Summer Red, Tallisare, Top Red, Tropical Beauty, Tydeman's Late Orange Valley Spur, Vance Delicious, Var. No. 280400, Silver Spur, Spartan Spur, Type Red Delicious, Stark Spur Golden, Starkrimson Delicious, Vered, Virginia Crab, Vista Bella, Wellspur, Willson's Red June, Winesap Virginia, Worcestor Pearmain, Yellow Delicious, Yellow Newtown, York a Red, varieties of the apple maintained in breeding block was done for fruit characters viz; Fruit weight (g), Fruit length (mm), Fruit diameter (mm), Fruit L/D ratio, Fruit shape, Fruit ribbing, Crowning at calyx end, Fruit eye size (mm), Length of sepal (mm), Bloom of skin, Greasiness of skin, Fruit ground colour, Relative area of fruit colour, Hue of over colour, Intensity of over colour, Pattern of over colour, Width of stripes, Area of russet around stalk attachment, Area of russet around cheeks, Area of russet around eye basin, Number of lenticels (cm²), Size of lenticels, Length of stalk (mm), Thickness of stalk (mm), Width of stalk cavity (mm), Depth of stalk cavity (mm), Depth of eye basin (mm), Width of eye basin (mm), Firmness of flesh, Colour of flesh and Appearance of locules.

Pear:

Vegetative and fruit characterization of following varieties was done during the year 2021.

Characterization of pear varieties for Vegetative and fruit parameters viz; Tree: vigour, branching, habit One year old shoot: growth, One year old shoot apex of vegetative bud, One year old shoot: Position of vegetative bud in relation to shoot, One year old shoot : size of bud support, Fruit: length, diameter, position of maximum diameter, symmetry (in longitudinal section), ground color of skin, relative area of over color, hue of over color, relative area of russet on cheeks, length of stalk (cm), thickness of stalk, depth of stalk cavity, orientation of sepals (at harvest), eye basin (at harvest), depth of eye basin (at harvest) and Seed: shape.

In pear only 24 varieties has come into bearing so fruit characterization of following varieties was done during the year 2021.

• **List of Pear varieties for fruit characterisation during the year 2021**

1. Badshah	13. Monarch
2. Bargmet	14. Nejjiski
3. Beure Bosc	15. PI-282935
4. Carmen	16. Santya Braskaya
5. Concorde	17. Severenta
6. Clapp's Favourite	18. Smart
7. Doyenne du Comice	19. Starkrimson
8. Flemish Beauty	20. Taylor Gold
9. Keiffer	21. Vicar of Winkfield
10. King's Pear	22. Virod Anglis
11. Leconte	23. Warden sickle
12. Louise Bonne of Jersey	24. William Pear

Cherry:

During the year 2021, characterization of cherry varieties for fruit characters were done as out of 46 varieties 43 were in bearing. Whereas, vegetative characterization for leaf character viz; Leaf blade: length, width, ratio, shape, angle of apex, angle of base, petiole length, intensity of green colour: upper side, leaf petiole: ratio, presence of nectarines and nectaries colour were done for all the varieties planted in field gene bank.

Leaf, flower and fruit characterization of cherry varieties during the year 2021

Bedford Prolific	CITH-12	Gaucher	Roundal Heart
Bigarreau Napoleon	CITH-13	Germarsdofer	Sam
Bigarreau Noir Grossa	CITH-14	Glory	Seneca
Black Heart	CITH-15	Guigne Noir Hative	Stella
Bradbourne Black	CITH-16	Guigne Pourpea Precece	Sunburst
Celisor	Desna	Lapins	Sweet Heart
CITH-1	Durone Nero-I	Merchant	Triumph Domini

CITH-3	Durone Nero-II	Merton Glory	Vega
CITH-4	Durone Nero-III	Mora de Cazzana	White Heart
CITH-5	Early River	Noir de Guben	Van
CITH-8	Foya Travida	Rainer	

Work done for monograph:

As per advice of PPVFRA, a work on Germplasms conserved at Field Gene Bank was started: preliminary work documenting : History of Apple Cultivation, germplasm maintenance and evaluation, terminology of morphological characteristics of apple diversity, characterization and evaluation of apple varieties with accession code and description and illustration of apple varieties for their identification has been completed. Data for correlation, parameters of variability and path analysis have been arranged only statistical analysis needs to be done.

3.4 DR. B.S. KONKAN KRISHI VIDYAPEETH, DAPOLI, MAHARASHTRA

Varieties under maintenance/characterised:

Sr. No.	Crop	No. of varieties/Ecotypes under maintenance
1.	Mango	36
2.	Turmeric	13 Ecotypes
		31 Varieties
3.	Citrus	4 Species
4.	Kachai Lemon	1
5.	Black pepper	6
6.	Banana	46
7.	Nutmeg	4 Varieties
8.	Jackfruit	2 Variety (14 Plants)
9.	Farmers' varieties	160

a) Collected and conserved the following material in Field Gene Bank

Sr.No.	Name of Species	No. of germplasm collected	Source
1.	Mango	20 Varieties	RFRS Mango Research Station Vengurla, Department of Horticulture, Dapoli. CES Wakwali, Shri. Bhushan Padmakar Nabar, Math, Vengurle
2.	Mango (Villaikolamban)	280 Plants	CES, Wakawli

3.	Banana	30 Varieties	NRC, Tamil Nadu
4.	Citrus	3 Varieties	National Research Centre for citrus, Nagpur
5.	Turmeric	38 Varieties	Dr. Ashok Chivate, Agri. Research Station Digras Sangli, Indian Institute of Spices Research Farm, Peruvannamuzhi, Shri Sanjay Jadhav, Badlapur, Maharashtra
6.	Ginger	4 Varieties	Dr. Ashok Chivate, Koregaon, Maharashtra, Agri. Research Station Digras Sangli, Shri. Shripad Digamane, Sangli & Shri. Santosh Darekar, Borgaon, Satara.

b) Received and conserved the following material in Field Gene Bank

Sr.No.	Name of Species	No. of germplasms received	Source
1.	Banana	8 Varieties	Sri Vijayan, President, Chengalikodan Banana Growers Association Erumaprtty, Thrissur, Kerala
2.	Kachai Lemon	10 Plants	Manipur Centre, Imphal
3.	Jackfruit	2 Varieties	PPV & FR Authority, New Delhi.
4.	Chilli	15 gm	Central Costal Agri. Research Institute, Goa
5.	Turmeric	2 Varieties	Punjab Agri. University Ludhiana
6.	Nutmeg	3 Varieties	Mr. Jose Mathew, Mr. Varkey Thomman and Mr. Tom C. Antony
7.	Planting Material	160 Plants	IPR Cell, Kerala Agricultural University, Kerala
8.	Yam	5 Varieties	Shaji . N. M. Arattuthara wayanad, Kerala
9.	Planting Material	42 Plants	Mr. P. V. Jose, Pullan House, Chalakkudy Perambra, Pootta, Thrissur Kerala 680722.
10.	Planting Material	21 species	Mr. K. R. Jayan, Kaipully Madam, Avittathur, Kallettumkara, Thrissur Kerala 680683.
11.	Planting Material	44 species	Mr. Raveendran. R., Reji Bhavan, KRA 172, Panachavila Lane, Ulloor, Medical Thiruvananthapuram, Kerala 695011
12.	Planting Material	21 species	Mr. K. R. Jayan, Kaipully Madam, Avittathur, Kallettumkara, Thrissur Kerala 680683.
13.	Medicinal (Seed material)	1 species	

14.	Lime (Plant)	6 plants	Mr. Prasad , Rama HedgeKankodlu Village Hemmadi Post, Yellapur Taluk- 581402 Uttara Kannada District, Karnataka State India.
15.	Lime (Scion Material)	4 Species	
16.	Lime (Seed material)	6 species	
17.	Banana	5 Varieties	
18.	Dalchini	2 Varieties	
19.	Mango	39 Varieties	
20.	Black Pepper	5 Varieties	

c) Nominated varieties under DUS Test maintained in Field Gene Bank

Sr. No.	Name of species	Nominated name	No. of germplasm nominated	Source
1.	Coconut	KonkanBhatye Coconut Hybrid-1	30 Nuts	Regional Coconut Research Station, Bhatye, Ratnagiri

3.5 EXTANT VARIETY RECOMMENDATION COMMITTEE (EVRC) MEETINGS

3.5.1 38th EVRC Meeting held on 21st January, 2020

The 38th EVRC Meeting was held under the Chairmanship of Dr. H.S. Gupta, Former Director, IARI. 31 applications filed by ICAR Institutes, SAUs and private companies were placed before the committee and all are approved.

Chapter 4: Projects on the Development of DUS Test Guidelines and Establishment of Gene Banks

PROJECTS ON DEVELOPMENT OF DUS TEST GUIDELINES

Out of 25 Projects proposed the following five projects were considered for funds by PPVFR Authority.

S. No.	Title	Institute
1.	Purification and Registration of Niche specific Rajmash Land Races and farmers varieties from Kashmir valley.	SKUAST, Kashmir, Rangreth, KD Farm Srinagar, Jammu & Kashmir
2.	Development of DUS testing guidelines for Pran (<i>Allium x proliferum</i>) indigenous to Kashmir region.	SKUAST, Kashmir, Dassu Pampore, Pulwama, Jammu & Kashmir
3.	Validation of DUS guidelines for Pran (<i>Allium x proliferum</i>) under Indian conditions.	ICAR-CITH, Srinagar, Kashmir
4.	Development of Descriptors for Promoting DUS guidelines for Turnip (<i>Brassica rapavar. rapa</i> L.)	SKUAST-K, Srinagar, Kashmir
5.	Development of guidelines to conduct DUS test in Bambara Groundnut (<i>Vigna subterranea</i> (L.) Verdc)	UAS, GKVK, Bangalore, Karnataka

4.1. ON-GOING PROJECTS

4.1.1 TITLE OF THE PROJECT: DEVELOPMENT OF DUS TESTING GUIDELINES FOR CHILLI, PAPRIKA AND BELL PEPPER UNDER PROTECTED CONDITIONS

Objective

- To develop DUS descriptor for chilli, paprika and bell pepper for protected environment conditions.

PI and Institution

Dr. Akhilesh Sharma, Professor
Department of Vegetable Science & Floriculture,
CSK Himachal Pradesh Krishi Vishvavidyalaya
Palampur, HP, India PIN 176062

CO-PIs

1. Dr. Parveen Sharma, Professor
Department of Vegetable Science & Floriculture,

CSK Himachal Pradesh Krishi Vishvavidyalaya
 Palampur, HP, India PIN 176062
 2. Dr. Nimit Kumar, Assistant Professor
 Department of Genetics & Plant Breeding
 CSK Himachal Pradesh Krishi Vishvavidyalaya
 Palampur, HP, India PIN 176062

Location of project

Department of Vegetable Science & Floriculture,
 CSK Himachal Pradesh Krishi Vishvavidyalaya
 Palampur, HP, India PIN 176062

Brief Technical details

- Listing of characters for DUS testing
- 46 Reference variety/example variety/common knowledge variety/landraces of targeted crops were collected, characterized under protected conditions and based on observations grouping of characteristics was done. These include 30 varieties of chilli, 11 of bell pepper and 5 of paprika.
- These varieties were planted in Randomized Complete Block Design (RCBD) with three replications in June 2021.
- Submission of descriptor data and DUS characters

Expected deliverables

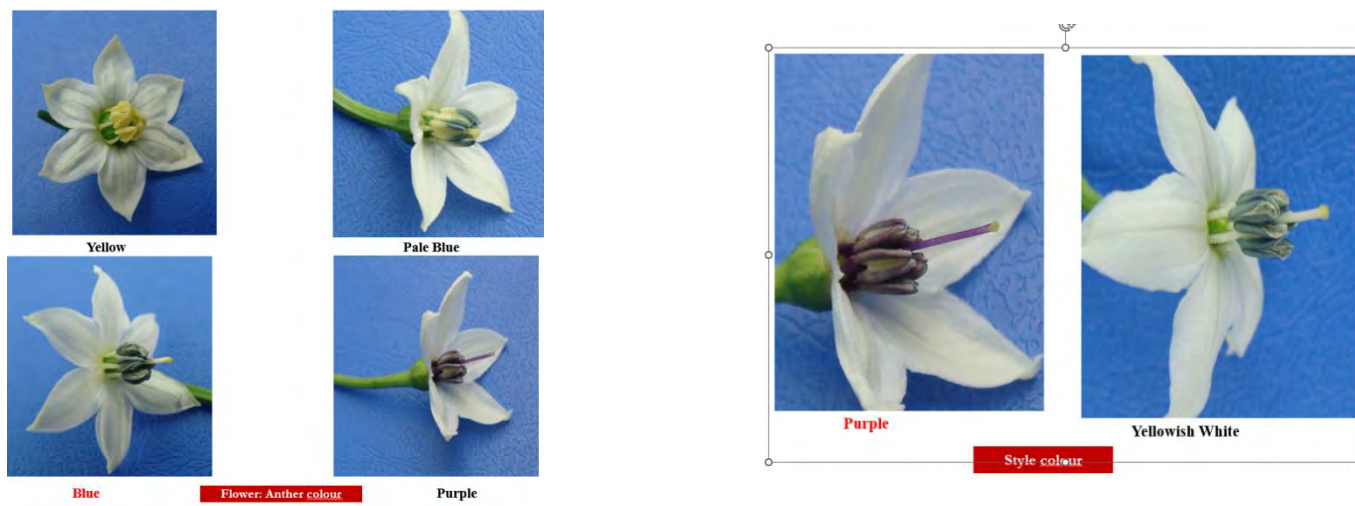
- National guidelines for DUS testing of chilli, paprika and bell pepper under protected conditions

Salient Achievements

- The observations were recorded for 66 characters for 46 example varieties that include 30 varieties of chilli, 11 of bell pepper and 5 of paprika.
- The DUS guidelines for chilli, paprika and bell pepper for field conditions include 54 characters.
- The comparative studies indicated variations in state/category for 4 traits (additional category proposed) that include
 - Plant height, leaf length of blade, leaf width of blade and fruit cross sectional corrugation (oval).
- In addition, observations were recorded for 10 new traits namely,
 - Anthocyanin colouration of nodes (at active vegetative growth stage), intensity of anthocyanin colouration of nodes (at active vegetative growth stage), stem anthocyanin colouration, stem anthocyanin colour intensity, petiole colour, petiole length, days to

50% flowering after transplanting, style colour, heterostyly, and days to 50% ripening after transplanting.

- Besides, observations for flower and fruit orientation, and number of lobes and number of locules were recorded separately due to variations for these traits.
- The crop duration was longer under protected conditions so there is need to redefine category of days to ripening in comparison to open field condition.
- The report was presented in virtual mode on 2nd March 2022 and the suggestions of the Hon'ble Chairman shall be taken into consideration while preparing the final report.



Field visit by Dr. Shiv Kumar Sharma, Deputy Registrar, Branch office Palampur of PPV&FR Authority, New Delhi on November 17, 2021

Table 4.1: Details of Expenditure (2021-22)

Head	Allocation for the year (Rs.)	ICAR share of expenditure (Rs.)	State share	Total expenditure (Rs.)
A. Recurring				
1. Manpower	445000/-	100%	Nil	243115/-
2. TA	25000/-	100%	Nil	-
3. Recurring contingencies	430000/-	100%	Nil	378546/-
Total	9,00,000/-			6,21,661/-

4.1.2 NAME OF THE PROJECT: “DEVELOPMENT OF DUS TESTING GUIDELINES FOR CHILLI/BELL PEPPER/PAPRIKA UNDER PROTECTED CONDITION”

a). Details of DUS testing of candidate varieties of Chilli/Bell pepper/ Paprika in *Kharif* 2022

Chilli				Bell pepper		Paprika	
SI No	Genotype	SI No	Genotype	SI No	Genotype	SI No	Genotype
1	Arka Meghana	20	Kashi Ratna	38	Arka Basant	54	LCA 424
2	Arka Lohit	21	Kashi Tej	39	HYB-1	55	LCA 436
3	Arka Harita	22	Kashi Abha	40	YSC-5	56	KtPL-19
4	Arka Sweta	23	Kashi Gaurav	41	Yolo wonder	57	Byadgi Dabbi
5	Arka Suphal	24	Kashi Surkh	42	California wonder	58	Kashmiri Chilli
6	Punjab Tej	25	Pusa Jwala	43	KTC-1	59	Kashi Sinduri
7	Punjab Gucchedar	26	Eagle	44	VS-1	60	Paprika
8	Punjab Sindhuri	27	HyVeg-78	45	Solan Bharpur	61	Arka abhir
9	CH-52	28	Gagan	46	Orebelle	62	Arka lohit
10	CH-27	29	Aastha	47	Indera		
11	LCA 334	30	Surajmukhi	48	DDCY-35		
12	LCA 235	31	Him Palam Mirchi-1	49	DDCY-1		
13	LCA 625	32	Him Palam Mirchi-2	50	Arka mohini		
14	LCA 620	33	KBCH 1	51	Arka Gaurav		
15	LCA 305	34	Arka Meghana	52	NS 82		
16	LCA 206	35	Arka Harita	53	NS 292		
17	LCA 353	36	GB local				
18	CA 960	37	Byadgi kaddi				
19	Kashi Anmol						

b). Salient Achievements

Sowing of the above 62 genotypes of chilli/bell pepper/ paprika were carried out on the nursery bed. Presently, seedlings are of 35 days old and these seedlings will be transplanted to poly house after a week to develop DUS guidelines under protected condition.

4.1.3 NAME OF THE PROJECT: “DEVELOPMENT OF GUIDELINES TO CONDUCT DUS TEST IN BROWNTOP MILLET (*BRACHAERIA RAMOSE* L.)”

PI & Institution: Dr. Nagaraja T E, Professor (Plant Breeding)

AICRP on Small millets, ICAR, GKV, Bengaluru-560065; E mail: smallmillets@gmail.com Phone: 080-23332387

Progress report

a). Details of DUS testing of Browntop millet germplasm accessions evaluated in 2021









Sl. No.	Genotype	Sl. No.	Genotype	Sl. No.	Genotype
1	KMBT-1	37	TNAU-144	73	TNAU 149
2	VBGT-2	38	TNAU-115	74	IC617953
3	IC617957	39	TNAU-121	75	GPUBT 1
4	TNAU159	40	TNAU-153	76	TNAU-125
5	TNAU161	41	TNAU-128	77	TNAU-117
6	TNBR012	42	TNAU-142	78	TNAU-150
7	IC613558	43	IC617962	79	TNAU-133
8	BTMNDL-3	44	IC613552	80	TNAU-155
9	HBR-2	45	VBGT-5	81	TNAU-126
10	TNAU-160	46	IC613559	82	TNAU-109
11	VBT-007	47	TNAU-147	83	BIJAPUR COLLECTION
12	GPUBT-2	48	TNAU-113	84	IC617958
13	TNAU-158	49	TNAU-154	85	TNAU-113
14	VBGT-6	50	IC617954	86	TNAU-143
15	VBT-001	51	TNAU-114	87	TNAU-171
16	VBGT-10	52	TNAU-130	88	IC613554
17	VBGT-10	53	IC613546	89	IC617961
18	GPUBT-3	54	TNAU-119	90	IC613546
19	IC613549	55	IC613555	91	TNAU-164
20	VBT-004	56	GANIGER COLLECTION	92	IC613563

Sl. No.	Genotype	Sl. No.	Genotype	Sl. No.	Genotype
21	VBTG-3	57	IC617956	93	TNAU-116
22	VBTG-7	58	GPUBT-4	94	TNAU-123
23	VBTG-9	59	TNAU-137	95	TNAU-111
24	TNAU-164	60	TNAU-145	96	TNAU-139
25	TNAU-138	61	TNAU-141	97	TNAU-136
26	VBTG-5	62	TNAU-151	98	GPUBT-6
27	VBTG-8	63	TNAU-129	99	IC613550
28	TNAU-169	64	TNAU-135	100	GPUBT-2
29	TNAU-163	65	IC613556	101	TNAU-120
30	IC613549	66	TNAU-118	102	IC617959
31	TNAU-131	67	TNAU-132	103	TNAU-152
32	GPUBT-7	68	IC613557	104	TNAU-127
33	IC613562	69	TNAU-162	105	TNAU-110
34	TNAU-122	70	IC613548	106	TNAU-166
35	TNAU-134	71	IC613353	107	TNAU-124
36	GANIGER COLLECTION	72	IC613553	108	TNAU-140

b) Salient Achievements

The testing entries in Browntop millet were characterized in replicated trails for DUS traits in *Kharif* 2021. Due to excess rainfall the crop failed, hence the same crop was used for purification of seeds. In summer 2022, a total of 108 browntop millet germplasm accessions were sown in three replications. A row length of 3.0 m, with spacing of 45 x10 cm was followed. A total of 20 characters viz., plant growth habit, basal tiller numbers, days to 50% flowering, plant pigmentation at leaf sheath, leaf sheath pubescence, ligule pubescence, panicle pubescence, inflorescence shape, peduncle length, flag leafblade length, flag leafblade width, culm branching, panicle length, panicle compactness, lodging, plant height, seed shattering, grain color, grain shape and 1000 grain weight were considered for DUS characterization. The seed material of 108 browntop millet germplasm accessions to be sown in *Kharif* 2022 is ready. Each genotype shall be sown in three replications with spacing of 45 x10 cm and row length of 3.0 m each. The genotypes shall be characterized for the above mentioned DUS characters. Further, this information shall be used to develop the DUS descriptors.

Representative images of plant growth and panicle compactness evaluated in browntop millet germplasm accessions

Characteristics	Representative image		
Growth habit	 <p>Erect</p>	 <p>Decumbent</p>	 <p>Prostrate</p>
Panicle compactness	 <p>Compact</p>	 <p>Semi-compact</p>	 <p>Open</p>
Plant Pigmentation	 <p>Presence of pigmentation</p>		 <p>Absence of pigmentation</p>

4.1.4 NAME OF THE PROJECT: "DEVELOPMENT OF DESCRIPTORS FOR PROMOTING DUS GUIDELINES FOR KNOL KHOL (*BRASSICA OLERACEA* VAR. *GONGYLODES* L.) INDIGENOUS TO KASHMIR REGION"

Name of the institution:	Sher-e-Kashmir University of Agricultural Science & Technology (K) Shalimar-190025, Srinagar (J&K)
Year of Commencement:	2021-22
Duration of the project:	Two years
Total budget of the project:	18 lakhs
Principal Investigator:	Dr. Baseerat Afroza, Professor, Division of Vegetable Science, SKUAST-K, Shalimar, Srinagar
Co- Principal Investigators:	<ol style="list-style-type: none"> 1. Dr. Rizwan Rashid, Assistant Professor, Division of Vegetable Science, SKUAST-K, Shalimar, Srinagar 2. Dr. Zahoor Ahmad Dar, Professor (Genetics and Plant Breeding), Dryland Agriculture Research Station, SKUAST-K Shalimar

Broad Objectives of the project:

- Collection of Knol khol germplasm.
- Characterization of Knol khol accessions for development of DUS descriptors.
- Development of DUS test guidelines.

Accomplishments during year 2021-22

1. Collection of Knol khol germplasm.

- a) Total no. of collection sites: 196
- b) Number of germplasm lines collected: **263** (10 lines failed to germinate)

Districts visited for germplasm collection:

Srinagar, Ganderbal, Baramulla, Kupwara, Bandipore, Anantnag, Pulwama, Shopian, Budgam, Kulgam

Table 4.2: Details of Collection from ICAR institutes/ SAU's:

S. No.	Institution	No. of germplasm lines obtained
1.	IARI, Regional Vegetable Research Station, Katrain, Kulla, H.P.	White Vienna, Pusa Virat
2.	Division of Vegetable Science and Floriculture, SKUAST-Jammu	G-40

3. Division of Vegetable Science and Floriculture, CSK

Palam Tender

4. Himachal Pradesh Agricultural University, Palampur
National Bureau of Plant Genetic Resources, Pusa, New
Delhi

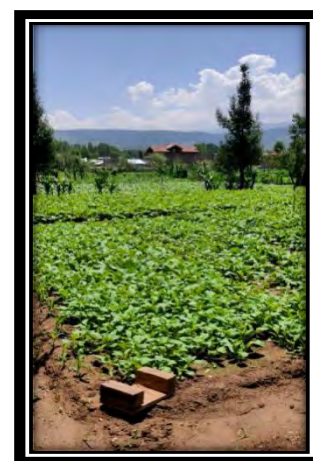
IC- 411761, IC- 537818,
IC- 369512, IC- 060500,
IC- 411798, IC- 0537822,
IC- 0539756, IC- 539771.



Aramppora, Baramulla



Shuhama, Ganderbal



Maloora, Srinagar



Dedikot, Kupwara



Izmar, Gurez



Sumbal, Bandipora

Some of the places explored for germplasm collection

Diversity existing among germplasm collections



2. Characterization of Knol khol accessions for development of DUS descriptors.

- a) Nursery was laid out in open field, raised beds were prepared with the dimensions of 3m x 1m x 0.15 m and seeds of all germplasm lines were sown on 09-08-2021. Adequate care was taken to raise a healthy nursery.
- b) Well developed and healthy seedlings were transplanted from 09-09-21 to 16-09-21 in well prepared land with the spacing of 30 x 30 cm.

Table 4.3: Observations were recorded on following traits:

S. No.	Descriptor Trait	Score/ observation
1.	Leaf attitude	Erect, Semi- erect, Horizontal
2.	Leaf blade size	Small, Medium, Large
3.	Leaf shape	Narrow ovate, Ovate, Broad ovate
4.	Leaf Crenation	Present or Absent

5.	Leaf Dentation	Present or Absent
6.	Leaf Sinuation	Present or Absent
7.	Leaf tip	Narrow acute, Acute, Obtuse, Round, Broadly round
8.	Foliage colour	Yellow green, Light green, Dark green, Blue green, Violet green
9.	Formation of crown	Weak, Medium, Strong
10.	Leaf area	Small, Medium, Large
11.	Internodal length	Small, Medium, Large
12.	Leaf puckering	Weak, Medium, Strong
13.	Colour of Midrib and veins	White green, Yellow green, Pale violet, Dark violet
14.	Waxiness	Present or Absent
15.	Leaf angle with stem	Acute, Right, Obtuse
16.	Petiole length	Small, Medium, Large
17.	Petiole colour	White green, Yellow green, Pale violet, Dark violet
18.	Number of leaf whirls	Less, average, high
19.	Number of leaves	Less, average, high
20.	Plant height	Short, medium, high
21.	Knob shape	Round, Oval, Flattened,
22.	Knob colour	White green, Yellow green, Pale violet, Dark violet
23.	Flesh colour	From RHS colour chart
24.	Knob size	Small, Medium, Large
25.	Shape of knob apex	Concave, Plane, Convex
26.	Lignification	Early, Medium, Late
27.	Knob splitting	Present or Absent

The crop was harvested during the month of November, 2021. Due to presence of duplications in the morphological traits, only 60 selections with distinct traits were carried further for seed production.

Diversity in knob shape and size



Diversity in leaf shape, size and colour



4.1.5 NAME OF THE PROJECT/CENTER: "DEVELOPMENT OF DUS TEST GUIDELINES FOR LETTUCE DUS-24-767 (TG3648), IARI, NEW DELHI"

1. **Name of Nodal/Co-Nodal Officer:** Dr. Yvonne Angel Lyngdoh, Scientist, Division of Vegetable Science, IARI, New Delhi
 2. **Contact Details:** Division of Vegetable Science, IARI, New Delhi
E mail: yvonnelyngdoh@yahoo.com **Phone:** 9718810724
 3. **Mandated Crop species:** Lettuce
- During the year 2021-22 DUS characterization of Lettuce (*Lactuca sativa* L.) was undertaken by the Division of Vegetable Science, ICAR-Indian Agricultural Research Institute, Pusa New Delhi. During the first year 15 varieties/advanced breeding lines were collected from different Institutes/Universities and from the Division of Vegetable Science for DUS characterization which is presented in Table 4.4.

Table 4.4. Source of Lettuce entries

Sl No	Name of the Institute/University	Variety/Breeding lines
1.	ICAR-Indian Agricultural Research Institute, Regional Station Katrain	Great Lakes Chinese Yellow
2.	Dr Y S Parmar University of Horticulture and Forestry, Solan	Alamo-1 Solan Kriti
3.	Mahatma Phule Krishi Vidayapeeth (MPKV), Rahuri	Phule Padma
4.	ICAR – Indian Agricultural Research Institute, New Delhi	8 advanced breeding lines (DLS 13, DLS 50, DLS 90, DLS 1-15, Red Salad, Harit Baingani, Iceberg)
5.	Seed markets	3 (Tango, Red Romaine, Red Rose)

- The trial was laid out as per the DUS testing guidelines. The varieties/lines were evaluated in RBD design with three replications and 60 plants in each replication. The seeds were sown in 14.10.2021 and seedlings were transplanted in 22.11.2021 at a spacing of 45 × 30 cm.
- 35 agro-morphological characters for DUS testing of lettuce were selected and data was recorded during the seedling stage, harvesting stage and flowering stage (Table 4.5).
- Out of these lines, 3 heading (Great Lakes, Alamo 1 and Iceberg), 10 leafy (Chinese Yellow, Phule Padma, Solan Kriti, DLS 13, DLS 50, DLS 90, DLS 123, DLS 1-15), one butterhead (Harit Baingani) and one romaine/cos types have been identified (Table 4.6).

- Monitoring at ICAR- Indian Agricultural Research Institute was done on 30.12.2021

Table 4.5. List of morphological characters taken

Seedling stage	Harvesting stage	Flowering stage
Anthocyanin at cotyledon stage	Plant type, plant diameter, plant weight, plant height number of leaves, head size head compactness, head weight, head shape, stem anthocyanin, outer leaf, leaf attitude, leaf division, leaf shape, leaf shape at apex, leaf longitudinal shape, leaf lobe, leaf anthocyanin, leaf anthocyanin area, leaf colour, leaf intensity of green colour, leaf glossiness, leaf thickness, leaf blister, leaf undulation of margin, leaf incision of margin, leaf venation, leaf covering head	Bolting of 50% plant colour of flower, anthocyanin in flower, distribution of anthocyanin, number of ligules in flower, seed colour, plant height at flowering stage

Table 4.6. Characterization of different lettuce genotypes

S.No	Geno type	Plant type	Leaf attitude	Leaf sha pe	Leaf shape at apex	Leaf long itudinal shape	Leaf lobes	Leaf antho- cyanin	Leaf antho cyanin area	Leaf colour	Leaf intensity of green colour	Leaf glossi ness	Leaf thick ness	Leaf blister	Leaf undulation of margin	Leaf incision of margin	Leaf vena tion	Leaf covering head	Head compact ness	Head shape	Color of flower	Anthocyanin in flower	Stem Anthocyanin
Heading type																							
1	Great lakes	H	SE	MO	O BC	CON V	A	A	A	G	M	M	TK	M	A	A	N F	S	S	B E/ C	D Y	A	A
2	Alam o-1	H	E	BO	O BC	CON C	A	A	A	G	M	W	TK	S	P	IR D	F L B	S/M	M/ S/ L	C/ B E	Y	A	A
3	Ice berg	H	E	BO	O BC	CON C	A	A	A	G	LG	S M	TK	M	P	IR D	N F	-	-	-	Y	A	A
Leafy type																							
4	DIS 50	L F	E	BO	O BC	CON V	M	P	P	P R	L	M	TK	S	P	R D	F L B	-	-	-	P R	P	LP
5	Phule Padm a	L F	SE	NE	O B	CON V	A	A	A	G	LG	M	M	SM	A	A	N F	-	-	-	Y	A	A
6	DLS 90	L F	E	ME	O B	F	A	P	P	L P	LG	M	TN	SM	A	A	N F	-	-	-	Y	P	LP
7	Red salad	L F	E	NE/ OB L	O B	F	A	P	P	D R P	VL	ST	TN	SM	P	CR	N F	-	-	-	Y	P	DP
8	Red rose	L F	SE	OB O	O BC	CON V	A	P	P	D B	A	ST	L	ST	P	IR D	F L B	-	-	-	Y	P	P
9	Solan Kriti	L F	E	OB L/N E	O BT	F	A	A	A	G	M	M	M	SM	A	CR	N F	-	-	-	Y	A	A
10	DIS 13	L F	SE	OB O	O BC	CON V	A	A	A	G Y	L	L	TK	SM	P	IR D	F L B	-	-	-	D Y	A	A
11	DLS 1-15	L F	E	BO	O BC	F	A	P	P	D P	VL	ST	TK	ST	P	CR	F L B	-	-	-	Y	P	P

12	Tango	LF	SE	OB	OBC	CONV	A	A	A	DG	ST	L	TK	M	P	IRD	FLB	-	-	-	Y	A	A
13	Chinese Yellow	LF	E	ME	OB	F	A	A	A	YG	LG	W	M	SM	A	A	NF	-	-	-	Y	A	A
Butterhead type																							
14	Harit Baingani	BH	E	ME	OB	F	A	P	P	BP	LG	M	M	A	A	A	NF	-	-	-	Y	P	LP
Cos/Romaine type																							
15	Red romaine	BH	E	BR	OB	F	A	P	P	BP	VL	ST	TN	M	P	CR	NF	-	-	-	Y	P	P



Fig 1. General view of the experimental plot



Great Lakes

Alamo-1

Iceberg

Fig 2. Heading types of Lettuce



Solan Kriti

DLS 13

DLS 50

Fig 3. Leafy types of Lettuce

4.1.6 Project on “Development of DUS test guidelines for Mesta (*H. cannabinus*) and Roselle (*H. sabdariffa*)”



ICAR-CRIJAF, West Bengal and ANGRAU ARS-Agricultural Research Station, Amadalavalasa, Srikakulam are working on to develop the DUS test guidelines for Mesta and Roselle. During entire crop growing season, a total of 30 characters (Hypocotyl Pigmentation, Cotyledonary leaf pigmentation, Leaf blade lobe number, Incision of leaf margin, Leaf vein colour, Leaf petiole colour, Leaf collar colour, Leaf shape, Leaf length width ratio, Leaf blade angle, Stipule colour, Stem colour, Stem pubescence, Presence of spine on stem, Density of spine on stem, Plant height, Days to 50%

flowering, Flower bud colour, Flower petal colour, Flower eye zone colour, Flower eye zone extension, Late stem colour, Fruit pigmentation, Fruit pubescence, Capsule dehiscence, Seed shape, Seed coat colour, Thousand seed weight, fiber fineness and fibre strength) were recorded. Among these characters studied 22 characters in roselle and 19 characters in kenaf were found to be useful establishing distinctness of varieties.

However, stability of these characters will be checked over season and location. Seeds of all varieties/lines have been multiplied for sowing in the upcoming season. The centres are managing 14 germplasm/varieties in Kenaf and 16 in Roselle.



Chapter 5: Activities Related to Farmers

5.1 TRAINING-CUM-AWARENESS PROGRAMMES

Training cum awareness programmes & others activities organized during 2021-22			
S.NO	ACTIVITIES	2021-22	Total
1	Awareness Programme	1	1
2	Exhibition & Fair	4	4
3	Seminar	4	4
	G. Total		09

5.2 FARMER TRAINING-CUM-AWARENESS PROGRAMME:

The Authority has conducted 1 training-cum-awareness programme for farmers under PPVFR Act, 2001 in Assam State. In the above programme, officer from Authority participated and delivered talk on Farmers' Rights and PPVFR Act, 2001.

An awareness programme on '*Protection of Plant Varieties and Farmers' Rights Act, 2001*' was organized in collaboration with Directorate of Research, Assam Agricultural University on 27th March, 2022. More than 100 farmers attended the programme. During the lecture, the importance of landraces, their conservation and farmers varietal registration procedure with PPVFRA, New Delhi was elaborated. Plant Genome Saviour Awards conferred by the authority for the conservation efforts were highlighted; brochures of PPVFRA were distributed. Also, different crop varieties brought by the farmers were showcased along with their utilities and unique traits were described for the communities.

5.3 PLANT GENOME SAVIOUR AWARDS/REWARDS/RECOGNITION:

Plant Genome Saviour Awards Ceremony on 21st November, 2021 at AP Shinde Auditorium, NASC Complex, New Delhi 110012.

Sh Narendra Singh Tomar, Hon'ble Union Minister for Agriculture & Farmers Welfare, Government of India conferred Plant Genome Saviour Community Awards to four communities for the year 2016-17, 2018-19, and 2019-20; Plant Genome Saviour Farmer Rewards to 15 farmers and Plant Genome Saviour Farmer Recognition to 8 farmers respectively from different states of India for the year 2017-18, 2018-19 and 2019-20. Smt. Shobha Karandlaje and Shri Kailash Choudhary, Minister(s) of State for



Agriculture & Farmers Welfare, Government of India; Shri Sanjay Agarwal, Secretary, DAFW, Ministry of Agriculture & Farmers Welfare, Government of India; Dr. Trilochan Mohapatra, Secretary, DARE, Ministry of Agriculture & Farmers Welfare, Government of India & Director General, ICAR; Dr. K.V. Prabhu, Chairperson, PPVFR Authority, Government of India graced the occasion. An exhibition showcased the agro biodiversity being conserved by the Awardees. In his address to the audience of Farmers, Scientist, Policy makers, Govt. officials, Press and Media, Hon'ble Union Agriculture Minister congratulated the awardees and urged that the traditional communities/farmers who are conserving biodiversity, medicinal plants, should be encouraged and suitably awarded. The function was held on Nov 11, 2021 at AP Shinde Auditorium, NASC Complex, New Delhi 110012



5.3.1. Plant Genome Saviour Community Award: This Award consist of Rs. 10 Lakhs, Citation and Memento.

For Years 2016-17:

Kalsubai Parisar Biyane Savardhan Samajik Sanstha, Akole, Khirvire, Ahmednagar, Maharashtra -411058



For Years 2018-19:

Nattu Manchottil Educational and Indigenous Fruit Plants Conservation and Research Trust, Kannur District- 670301, Kerala



Red Rice Farmers of Rohru Shimla-171207, Himachal Pradesh



For Years 2019-20:

Dansuri Agril Farming Co-operative Society Karbi Anglong, Assam-782470



Bhoomi Sustainable Development Society (R), Hassan, Karnataka-573201



5.3.2 Plant Genome Saviour Farmer Reward: This Reward consists of Rs. 1.5 Lakhs, Citation and Memento.

For years 2017-18:



Sh. Bandhana Oraon
Jharkhand



Smt. Mamtabai Deoram
Bhangre, Ahmednagar,
Maharashtra



Sh. Deendayal Yadav
Champa, Chhattisgarh

For Years 2018-19:



Sh. S. Boregowda
Mandya Taluk, Karnataka



Sh. Dattatraya Nanasaheb
Kale
Solapur, Maharashtra



Sh. Sanjay Prakash
Choudhary
Balod, Chhattisgarh



Sh. M.V. Prakash Rao
Shivamogga, Karnataka



Sh. Sathyanarayana
Beleri
Kasaragod, Kerala

For Years 2019-20:

Shri Linguram Thakur
Bijapur, Chhattisgarh



Sh. Mohammed Idris Ahmed
Quadri
Bidar, Karnataka



Sh. Vallabbhbhai Vasrambhai
Junagadh, Gujarat



Sh. Hetram
Devangan
Janjgir, Chhattisgarh



Sh. Prem Singh
Chauhan
Shimla, Himachal
Pradesh



Sh. Katrahalli Kallappa
Vijayanagara, Karnataka



Sh. Poonacha N.
Kodagu, Karnataka

5.3.3 Plant Genome Saviour Farmer Recognition: This Reward consists of Rs. 1 Lakhs, Citation and Memento.

For year 2017-18:



Sh. S.S. Paramesh
Tumakuru,
Karnataka



Sh. Alope Kumar Das
Hoogly, West Bengal



Sh. Kalluvellil Verky George
Palakkad, Kerala-



Sh. Srinivas Murthy
Shivamoga-577202,
Karnataka

For Years 2018-19:



Sh. Shivagouda M Patil
Belagavi, Karnataka



Sh. K.T. Vedamurthy
Chitradurga, Karnataka

For Years 2019-



Sh. Boloram Sarongsa
Anglong , Assam



Sh. Reji Joseph
Pathanamthitta, Kerala

Chapter 6: Plant Variety Journal of India, National Register of Plant Varieties and Publications of the Authority

6.1 PLANT VARIETY JOURNAL OF INDIA

In accordance with Rule 2(g) of PPVFR Rules, 2003 the Authority publishes its official journal “Plant Variety Journal of India” (PVJ) as a monthly publication and made available to public each month on its official website. This journal has the equivalent status of a Gazette under the PPVFR Regulations, 2006. The contents of Journal includes official and public notices, Gazette notifications, passport data of plant varieties along with photographs, published DUS test guidelines of different crop species, details of certificate of registration and other related official matters and notices.

Table 6.1: Number of Varieties advertised in Plant Variety Journal inviting opposition during the year 2021-22

S. No.	Category of variety	No. of variety	Crop	Application received From-To
1.	Farmer	166	Rice, Orchid, Soybean, Bread wheat, Cauliflower, Chickpea, Ridge gourd, Linseed, Mango, Muskmelon, Lentil, Sorghum, Pearl millet, Bottle gourd, Bitter gourd, Barley, Chickpea, Maize, Rapeseed, Grapes, Brinjal and Soybean	20.07.2009 – 26.08.2020
2	New	83	Rice, Maize, Potato, Tetraploid cotton, Barley, Okra, Muskmelon, Durum wheat, Tomato, Brinjal, Sorghum, Casuarinas, Eucalyptus, Pearl millet and Rose	13.04.2009 – 10.06.2020
3	Extant	95	Tetraploid cotton, Rice, Menthol mint, Bitter gourd, Bottle gourd, Bread wheat, Brinjal, Maize, Tuberose, Okra, Ridge gourd, Sorghum, Chickpea, Pigeon pea, Green gram, Black gram, Durum wheat, Garden pea, Kidney bean, Barnyard millet, Cowpea, Grapes, Rose, Onion, Sunflower and Tomato	15.02.2008 – 18.03.2021

6.2 NATIONAL REGISTER OF PLANT VARIETIES

The PPVFR Authority, in compliance with section 13 of the PPVFR Act, 2001, has opened the National Register of Plant Varieties at the Headquarters of the Plant Varieties Registry. It contains complete details of the names of all the registered plant varieties along with the names and addresses of the respective breeders, denomination, specifications, salient features etc.

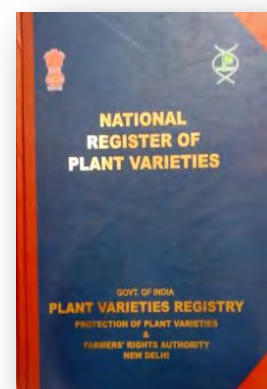


Table 6.2: Number of Varieties entered in the National Register of Plant Varieties during the year 2021-22

S. No.	Category of variety	No. of variety
1.	New	137
2.	Farmers	128
3.	Extant (N)	156
4.	Extat (VCK)	54
Total		475

Public	169
Private	178
Farmers	128

Chapter 7: Development of Database, IINDUS, NORV, Website and Information and Communication Technology (ICT)

7.1 WEBSITE:

The new official website (www.plantauthority.gov.in) of the Protection of Plant Varieties and Farmers' Rights Authority (PPVFRA) has been deployed on NIC cloud server. The website is developed in bilingual (Hindi and English) using latest technology. The New website has compliance with all the GIGW norms with mobile compatibility set for the government. The website has obtained



Website Quality Certification from STQC (Standardization Testing Quality Certification). The website has developed by NIC. The website has featured with MIS report in graphic view for registration certificates issued and important information about incoming events, PGSC award and other functions. The public notice, important orders and other significant information has published regular basis. The quick online tracking status system for registration applications on the website has also incorporated. It is a dynamic mode search page in which applicant can search its



application status either their Acknowledgement number or by denomination or Name of applicant. This page information made more user friendly by adding new field corresponding

address and present status, so that Applicant would easily find current status of application on short span of time. It is very feasible to view and print the status report. This web page is compatible with all web browsers.

The new official website (www.plantauthority.gov.in) of the Protection of Plant Varieties and Farmers' Rights Authority (PPVFRA) has been launched Online Payment through SBI Collect Interface. The Payment of Registration fee, All type of DUS Test Fee, Annual fee, Renewal fee etc.

The screenshot shows a web browser window with the URL <https://www.onlinesbi.com/sbcollect/sbclink/displaydirpaymentdetails.htm>. The page header includes the SBI logo and 'State Bank Collect'. Below the header, there are navigation links for 'State Bank Collect' and 'State Bank Mops'. The main content area features the Authority's logo and name: 'PROTECTION OF PLANT VARIETIES & FARMERS RIGHT AUTHORITY A/C, NASC COMP OPP VILL TODAPUR DPS MARG NEW DELHI, West-110012'. A section titled 'Provide details of payment' contains a 'Select Payment Category *' dropdown menu. Below this, a pink box contains instructions: 'Mandatory fields are marked with an asterisk (*)', 'The payment structure document if available will contain detailed instructions about the online payment process.', and 'Date specified(if any) should be in the format of 'ddmmYYYY'. Eg., 02082008'. The footer includes '© State Bank of India' and links for 'Privacy Statement', 'Disclosure', and 'Terms of Use'.

7.2 ONLINE TRACKING OF APPLICATION STATUS:

The Authority has developed the online tracking system of applications on the website. It is a dynamic mode search page in which applicant can search its application status either their Acknowledgement number or by denomination or Name of applicant. This page information made more user friendly by adding new field corresponding address and present status, so that Applicant would easily find current status of application on short span of time. It is very feasible to view and print the status report. This web page is compatible with all web browsers.



7.3 INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

The Authority also invites tenders on Central Public procurement portal (<https://eprocure.gov.in/eprocure/app>), purchase for Authority is taken from GeM (Government E-Marketplace), update General Pool Residential Accommodation (<http://gpra.nic.in/gpra>), quarterly reports of RTIs (<http://dsscic.nic.in/users/pn-login>), New Pension System Contributions Accounting System (<https://npSCAN-cra.com/CRA/>), Representation of Reserved Categories in Posts and Services in Govt. of India Monitoring System (<http://www.rrcps.nic.in/>). The Authority is also trying to fulfill the concept of national e-governance and has taken initiatives in this regard.

7.4 ONLINE FILING OF APPLICATION FOR REGISTRATION:

The Authority initiated registration of 12 crop species in 2007 which has been extended to 172 crop species at present. Authority is accepting the applications filled by the applicants along with prescribed fee (fee deposited in the form of demand drafts) either by hand or by postal service. Development of online process for submission of applications and payment for registration process of plant varieties will facilitate the applicants to file their applications in online mode to the Authority and also to pay the prescribed fee through 'Payment Gateway' which may be either through Debit card/Credit card/Net Banking. The system is now being implanted by NIC/NICSI and development of software is in almost final stage.

The following feature available in the Online filing software:

- ❖ On line management and processing of the applications for the Grant of rights to breeder & farmers.
- ❖ Real-time notification and communication between stakeholders like Applicants and Plant Varieties Registry to enhance user experience.
- ❖ The scrutiny of applications for grant of PVP to be done more effectively using the on-line tools thereby reducing time.
- ❖ The monitoring of the DUS Test Results shall be more effective, accurate and reduce processing time.
- ❖ Dashboard of the entire application to monitor the process, check status and progress in real-time.
- ❖ MIS Module for Generating various reports related to the applications.
- ❖ Send email and SMS to respective registered user to enter/update the relevant information.

The Online filing application software is almost completed and currently under testing phase after successfully testing application the application will be launch in the public domain by the authority.

The screenshot displays the web interface of the Protection of Plant Varieties and Farmers' Rights Authority (PPVFR). The page is titled 'Protection of Plant Varieties and Farmers' Rights Authority' and is part of the 'Department of Agriculture and Farmers Welfare'. It features a 'Login' section on the left with fields for 'Username*', 'Password*', and a 'Captcha' (b 29 b a c). Below these are 'Forgot Password' and 'Forgot User Name' links, and a 'Login' button. On the right, there is a 'New User? Register Here' section with three registration options: 'Company Registration', 'Institution Registration', and 'Applicant Registration', each with a 'Register' button. The page also includes the Government of India logo and the PPVFR logo.

7.5 PUBLIC FINANCIAL MANAGEMENT SYSTEM (PFMS)

The Authority has implemented PFMS, Digital Payment Systems and e-payment like RTGS/NEFT. The Authority discourages off-line payment system like deposition of cash in the different accounts of Authority. The Authority has been shifted on e-payment systems like PFMS and other digital payments. The list of institutes mapped in PFMS is here under



MAPPED IN PFMS SCHEME 3025

S. No.	Agency Name	Agency Type
1	Acharya N.G. Ranga Agricultural University	Statutory Bodies
2	Agriculture University, Jodhpur	Statutory Bodies
3	Assam Agricultural University	State Government Institutions
4	ATARI Guwahati	Central Government
5	ATARI Patna	Central Government
6	Bidhan Chandra Krishi Viswavidyalaya	Statutory Bodies
7	Bihar Agricultural University, Sabour Bhagalpur	Statutory Bodies
8	Birsa Agricultural University, Kanke, Ranchi, Jharkhand	State Government PSUs
9	C.S. Azad University of Agriculture & Technology, Kanpur	Statutory Bodies
10	CCS Haryana Agricultural University, Hisar	Statutory Bodies
11	Central Agricultural Research Institute, Port Blair	Central Government
12	Central Institute of Temperate Horticulture Srinagar (ICAR)	Central Government
13	Central Coffee Research Institute - Balehonnur	Registered Societies (Govt., Autonomous Bodies)
14	Central Institute for Arid Horticulture, Bikaner	Central Government
15	Central Institute for Cotton Research Nagpur (Unit of ICAR)	Central Government
16	Central Institute for Subtropical Horticulture	Central Government
17	Central Plantation Crops Research Institute	Central Government

18	Central Potato Research Institute	Central Government
19	Central Research Institute for Jute and Allied Fibres	Central Government
20	Central Rice Research Institute	Central Government
21	Central Tobacco Research Institute	Central Government
22	Central Tuber Crops Research Institute	Central Government
23	CIMAP	Registered Societies (Govt., Autonomous Bodies)
24	Comptroller, Maharana Pratap University of Agriculture and Technology, Udaipur	Registered Societies (Govt., Autonomous Bodies)
25	CSR&TI Mysore	Registered Societies (Govt., Autonomous Bodies)
26	Directorate of Cashew Research (Formerly National Research Centre For Cashew)	Central Government
27	Directorate of Groundnut Research (ICAR Unit)	Central Government
28	Directorate of Maize Research	Central Government
29	Directorate of Medicinal and Aromatic Plants	Central Government
30	Directorate of Oilseeds Research, Rajendranagar, Hyderabad	Central Government
31	Directorate of Rice Research	Central Government
32	Directorate of Seed Research, Uttar Pradesh	Central Government
33	Directorate of Soybean Research (Indian Council of Agricultural Research)	Central Government
34	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth	Registered Societies (Govt., Autonomous Bodies)
35	Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola	State Government PSUs
36	Dr.Y.S. Parmar University of Horticulture and Forestry	State Government Institutions
37	G.B. Pant University of Agriculture and Technology, Pant Nagar	Statutory Bodies
38	Icar- Agricultural Technology Application Research Institute	Central Government
39	ICAR- Agricultural Technology Application Research Institute, Kanpur	Central Government
40	ICAR Directorate of Onion and Garlic Research	Central Government
41	ICAR- IIWBR (Indian Council of Agricultural Research- Indian Institute of Wheat and Barley Research)	Central Government
42	ICAR Research Complex for NEH Region	Central Government

43	ICAR Research Complex, Goa, (Indian Council of Agricultural Research)	Central Government
44	ICAR Unit Drmr (Directorate of Rapeseed-Mustard Research)	Central Government
45	ICAR, ATARI-III	Central Government
46	ICAR, NRC For Orchids	Central Government
47	ICAR-Agricultural Technology Application Research Institute, Hyderabad	Central Government
48	ICAR-Agricultural Technology Application Research Institute, Jabalpur	Central Government
49	ICAR-Agricultural Technology Application Research Institute, Pune	Central Government
50	ICAR-Agricultural Technology Application Research Institute, Zone-I	Central Government
51	ICAR-ATARI Kolkata	Central Government
52	ICAR-ATARI, Bangalore	Central Government
53	ICAR-National Research Centre on Pomegranate (NRCP), Solapur	Central Government
54	Indian Agricultural Statistics Research Institute	Central Government
55	Indian Grassland and Fodder Research Institute	Central Government
56	Indian Institute of Horticultural Research	Central Government
57	Indian Institute of Millets Research	Central Government
58	Indian Institute of Pulses Research	Central Government
59	Indian Institute of Spices Research (ICAR)	Central Government
60	Indian Institute of Sugarcane Research, Lucknow	Central Government
61	Indian Institute of Vegetable Research (ICAR)	Central Government
62	Indian Society of Seed Technology	Registered Societies (Govt., Autonomous Bodies)
63	Indira Gandhi Krishi Vishwavidyalaya, Raipur.	Registered Societies (Govt., Autonomous Bodies)
64	Institute of Forest Genetics and Tree Breeding (Indian Council of Forestry Research and Education)	Registered Societies (Govt., Autonomous Bodies)
65	Jawaharlal Nehru Krishi Vishwavidyalaya	Statutory Bodies
66	Junagadh Agricultural University	State Government Institutions
67	Kerala Agricultural University	State Government PSUs
68	M S Swaminathan Research Foundation	Trusts
69	Mahatma Phule Agricultural University, Rahuri	State Government Institutions
70	Nagaland University	Statutory Bodies
71	Narendra Deva University of Agriculture & Technology, Kumarganj, Faizabad	State Government Institutions

72	National Botanical Research Institute, Lucknow	Registered Societies (Govt., Autonomous Bodies)
73	National Bureau of Plant Genetic Resource - NBPGR (ICAR)	Central Government
74	National Research Center for Litchi	Central Government
75	National Research Centre for Banana (ICAR)	Central Government
76	National Research Centre for Citrus, Nagpur (Unit of ICAR)	Central Government
77	National Research Centre for Grapes (ICAR)	Central Government
78	National Research Centre on Seed Spices	Central Government
79	Navsari Agricultural University	State Government PSUs
80	North-East Institute of Science & Technology (CSIR)	Registered Societies (Govt., Autonomous Bodies)
81	Prof. Jayashankar Telangana State Agricultural University, Rajendranagar, Hyderabad	State Government Institutions
82	Punjab Agricultural University	Registered Societies (Govt., Autonomous Bodies)
83	Sam Higginbottom Institute of Agriculture Technology And Sciences	State Government PSUs
84	Sardar Krushinagar Dantiwada Agricultural University	State Government PSUs
85	Sher-E-Kashmir University of Agricultural Sciences and Technology of Kashmir	Registered Societies (Govt., Autonomous Bodies)
86	Sri Karan Narendra Agriculture University, Jobner	State Government Institutions
87	Sugarcane Breeding Institute, Coimbatore, (ICAR)	Central Government
88	Tamil Nadu Agricultural University	Registered Societies (Govt., Autonomous Bodies)
89	Tea Board DTR&DC, Kurseong	Registered Societies (Govt., Autonomous Bodies)
90	Tea Research Association	Registered Societies (Govt., Autonomous Bodies)
91	University of Agricultural and Horticultural Sciences, Shivamogga	Statutory Bodies
92	University of Agricultural Sciences, Bangalore	Statutory Bodies
93	University of Agricultural Sciences, Dharwad	Registered Societies (Govt., Autonomous Bodies)
94	University of Horticultural Sciences, Bagalkot	Statutory Bodies
95	VPKAS(ICAR), Almora	Central Government
96	ICAR- Indian Agriculture Research Institute	Central Government

Chapter 8: Administration, Governance and Other Miscellaneous Activities

8.1 ADMINISTRATION:

8.1.1 MANPOWER:

During the period under report, Shri Arun Kumar, Legal Advisor assumed the charges of Legal Advisor in PPVFR Authority on 07.09.2021.

The Authority advertised for the post of Registrar-General, Registrar and Joint Registrar. In addition to this the Authority has submitted a detailed proposal to DAFW for creation of 136 new posts during the period under report. At the time of submission of this report, the positions of two Registrars of the three approved posts and that of Registrar General are vacant. Manpower in the form of Registrar and Registrar-General is most crucial and have to be in position mandatorily for the implementation of the provisions of the Act including registration of the varieties, judicial proceedings on any appeals or objections or petitions. These statutory roles cannot be executed by any other officer or temporary officers given the charge.

The posts of Registrar (two out of three vacant currently) and Joint Registrar are not being filled despite three advertisements during the year under report following four times in the past two years and one more since then, which did not find any takers so far. The reasons of why these posts are not being filled by the qualified professional scientists and technical professionals in the areas of plant variety development from public system in national agricultural research system is that the status of these positions are one to two levels lower than the qualified potential applicants. Under no circumstances the experience can be shortened as the job execution requires tremendous resolve, understanding and a standing in the field of expertise to hear senior advocates and breeders while passing orders or imposing restrictions etc. The only option left is to have the positions upgraded and the number enhanced to deal with more than 11000 of the 17000 applications in the pendency list.

Conflict of Interest: As of now, all technical positions that deal with the registration process including the Registrar General, Registrar, Joint Registrar, Deputy Registrar are all invariably placed under Deputation only through an amendment made in June 2015. It is not in natural justice to believe the registry which deals with confidential information as well as judicial action on applications till grant of rights or its denial shall do it independent of any conflict of interest favouring the parent organization which has applied for a claim of right or bias in favour of his senior colleague in the discipline or also his own group or organization in delivering an order or decision that can only be settled in an High Court. When such important responsibility is assigned, person who carries out such responsibility cannot be put in a natural dilemma of his or her fate when he joins back his organization. This can be avoided only by direct recruitment and career advancement in the same line with the national agricultural research system.

Early termination of commercial or evolutionary life of a variety as a consequence of delay in completion of registration due to shortage of qualified staff: Plant varieties are live specimens unlike the subjects in other IPR granting authorities in the country where there is no such thing involved as biological or evolutionary life span of the plant. While only innovation's life span till a new innovation overtakes the old one is the catch point in the other claims in other IPR Authorities, in the case of plant varieties, both innovation of a variety being better performer as well as the consistency of life span without disintegration due to evolutionary pressure faced in each life cycle of seed to seed become affected by every season of delay. This cannot be justified by way of being understaffed as the purpose does not get served in encouraging innovative breeders to competitively invest to breed better plant varieties.

A detailed proposal for the upgradation of positions, changed recruitment method to direct recruitment with career advancement has been proposed for a total of 164 positions in the Authority which is under consideration since last three years in the Government which is expected to be taken to due logical conclusion as desired by the Government taking into consideration the provisions in the Act and the functions to be carried out by the Authority in compliance.

8.2 LEGAL CELL

The Legal Cell of the Authority has successfully defended all cases filed against the Authority. Further in case of quasi-judicial proceedings before the Registry and Authority, legal inputs were rendered and daily order sheets were dispatched to the parties promptly. The Legal Cell of the Authority is LIMBS (Legal Information Management & Briefing System) compliant and the progress of the cases are updated regularly and monitored in LIMBS. During the reporting period, 33 cases were pending against the Authority.

Table 8.1: The details of forum and number of cases pending for adjudication are given below:

Central Administrative Tribunal	High Courts	Supreme Court
4	22	7

The Legal Cell also provided inputs to all judgements passed by the Authority/ Registrar during the Reporting Period. During this period, the landmark judgement was passed by Ld. Chairperson by order dated 3rd December, 2021 in Revocation of Registered Potato Variety FL-2027 [Kaivtha Kuruganti –Vs- PepsiCo India Holdings Pvt. Ltd., 2022 (89) PTC 280] which was reviewed and reported widely both nationally and internationally.

Legal Cell also successfully organised a webinar on 14th January, 2022, in collaboration with Law Centre-II, Entrepreneurial, Faculty of Law, University of Delhi on “Legal Aspects involved in PPVFR Act, 2001”

The following Gazette Notifications were published in the year 2021-22:

- Gazette Notification **S.O. 3418(E)** dated **August 23, 2021** regarding notification of 4 crop species (not being extant varieties and farmers' varieties) Jackfruit, Greater Yam, Yam Bean and Seabuckthorn for the purpose of registration of varieties.
- Gazette Notification **G.S.R. 803(E)** dated **November 16, 2021** regarding Amendment in Rule 19 - Protection of Plant Varieties and Farmers' Rights (Second Amendment) Rules, 2021.
- Gazette Notification **S.O. 1197(E)** dated **March 16, 2022** regarding notification of 8 crop species (not being extant varieties and farmers' varieties) Ajwain, Anise, Celery, Cumin, Dill, Fennel and Nigella for the purpose of registration of varieties.

8.3 RIGHT TO INFORMATION (RTI)

During the reporting period, under the RTI Act, 2005, Sh. U K Dubey and Sh. Vipin Tyagi continuous as central public information officer and first Appellate Authority respectively at Protection of Plant Varieties and Farmer's Rights Authority (PPVFRA) for furnishing information to the concerned applicants. The details of the designated officers are available on website of the Authority under the menu heading RTI. Compliance of provisions contained under section 25(2) of RTI Act, 2005 for submission of information to Chief Information Commissioner (CIC) are being done on a regular basis. During the reporting period, the Authority received 26 applications either directly from the applicant or transferred from other departments seeking information under RTI Act, 2005. The information sought was made available within the stipulated period.

The status of the applications received by the Authority is uploaded on its website on regular basis. The quarterly status of the applications is available on the website of the Authority and Central Information Commissioner (CIC) with full details including receipt of fees too.

8.4 GOVERNMENT e-MARKETPLACE (GEM)

During the reporting year 2021-2022, the Authority purchased different items, worth Rs. 15,86,441/- (Rupees Fifteen Lakh Eighty Six Thousand Four Hundred Forty One Only) through GeM after completing necessary formalities. The month-wise purchase with value and items are as under:-

Table 8.2: Report of Procurement (GeM) during 2021-2022 (1st April, 2021 to 31st March, 2022)

S No.	Particular	Month	Amount (Rs.)
1.	Monitor-1, Window AC-1, Server Software-1,	April, 2021	Rs. 12,200/-
2.	Sticky Notepad-30, Envelope-3000, HP	May, 2021	
3.	Mouse-20, Pen Drive-15, Acer Computer-3,	June, 2021	Rs. 56,951/-
4.	HP MFM-4, WD Hard Disk-1, Lexmark Toner-	July, 2021	Rs. 15,532/-
5.	16, Stapler Pin-100, Brown Tape-100, Stapler	August, 2021	Rs. 1,58,186/-
6.	Pin Big-100, A4 Ream-200, Reynolds Pen-300,	September, 2021	Rs. 52,617/-
7.	Cello Tape-100, Pilot Pen-50, Ball Pen-200,	October, 2021	Rs. 1,02,510/-
8.	Uniball Pen-50, Glue Stick-100, HP Toner-18,	November, 2021	Rs. 37,910/-
9.	Xerox Toner-1, Antivirus-50, HP Computer-1,	December, 2021	Rs. 62,100/-
10.	Liquid Handwash-50, Flag-50, Slip-50, Hot Air	January, 2022	Rs. 31,585/-

11.	Oven-1, UPS-3, Web-Camera-4 and Speaker-4	February, 2022	Rs. 2,77,021/-
12.		March, 2022	Rs. 14,304/-
Total Amount			Rs. 8,20,916/-
Service (Vehicle Hire)			Rs. 7,65,525/-
GRAND TOTAL AMOUNT			Rs. 15,86,441/-

8.5 INSPECTION OF RECORDS AND SUPPLY OF CERTIFIED COPY

During the reporting period, the request for inspection of records and supply of certified copies of the 11 varieties were received under section 84 of PPVFR Act, 2001 and Rule 76 of PPVFR Rule, 2003. The amount Rs. 2,29,517/- (Rupees Two Lakh Twenty Nine Thousand Five Hundred Seventeen Only) as fees for the above purpose were deposited by the concerned applicant. After receipt of fees, the certified copies were supplied to the concerned applicants.

8.6 BRANCH OFFICES:

PPVFR Authority has five branch offices located in different parts of the country headed by Deputy Registrar as detailed below:

1. **Sh. Phool Singh Malviya,**
Deputy Registrar
Protection of Plant Varieties and Farmers' Rights Authority
Department of Agriculture & Farmers Welfare,
Computer Centre Building, Near Damodar International Guest House,
Birsa Agriculture University Campus, Kanke, Ranchi (JH)-834006
2. **Sh. Phool Singh Malviya (In-charge)**
Protection of Plant Varieties and Farmers' Rights Authority
Govt. of India, Ministry of Agriculture & Farmers Welfare,
Department of Agriculture & Farmers Welfare,
Assam Agricultural University, Near Administrative Building, Khanapara, Guwahati-781022
3. **Dr. Shiv Kumar Sharma,**
Deputy Registrar (on contract basis)
Protection of Plant Varieties and Farmers' Rights Authority
Department of Agriculture & Farmers Welfare,
CSK HP Krishi Viswavidyalaya, Palampur, Dist. Kangra, Himachal Pradesh-176061
4. **Dr. S. B. Chaudhary,**
Deputy Registrar (on contract basis)
Protection of Plant Varieties and Farmers' Rights Authority
Department of Agriculture & Farmers Welfare,

Centenary Building, College of Agriculture Campus,
Mahatma Phule Krishi Vidyapeeth, Pune, Maharashtra-411005

5. Dr. T.H. Gowda, Deputy Registrar (on contract basis)

Protection of Plant Varieties and Farmers' Rights Authority
Department of Agriculture, Co-operation & Farmers Welfare,
UAHS Shivamogga, Abbalagere post, Shivamogga, Karnataka-577204

8.7. PPVFRA ENTRUSTED WITH THE CHAIRMANSHIP OF “NARAKAS” OR TOLIC (TOWN OFFICIAL LANGUAGE IMPLEMENTATION COMMITTEE)

Department of Official Language, Ministry of Home Affairs, Govt. of India, entrusted the responsibility of Chairmanship of Town Official Language Implementation Committee (TOLIC) North Delhi to Protection of Plant Varieties & Farmers' Rights Authority on September, 2018. In year annual meetings are held twice. There are 77 offices as members in the said committee. A 10 member committee was formed to operate different provisions of official languages.

8.7.1 Officials Language Implementation Committee of PPVFRA

Authority has already an existing official language implementation committee for implementation of official language in the Authority. In the reporting year all four meetings were conducted and discussed on various issues of official language.

8.7.2 Rajbhasha Fortnight

Rajbhasha Fortnight was organized in the Authority from 14 September, 2021 to 28 September, 2021. During the reporting period many competitions were organized for celebrating Hindi Fortnight in which many officials participated including contractual employee and paid cash prize to the winners.

8.7.3 Use of official Language Hindi

Official Language Hindi is used in Authority by officials. Officials of Authority have done noting and drafting in Hindi. Section 3(3) of the Official Language Act, 1963, all the official documents are issued in bilingual and the letters to different regions A, B and C are sending as per norms of Government.

8.7.4 Hindi Pakhwada

The PPVFR Authority celebrated Hindi Pakhwada from 14th to 28th September, 2021. During the period, the Authority has organized competition for the employees of the PPVFR Authority. A prize distribution function was organized on 29th December, 2021 at the Headquarter of PPVFRA, New Delhi.

8.8. OBSERVANCE OF VIGILANCE AWARENESS WEEK

Though the Authority does not come under the jurisdiction of the Central Vigilance Act or Central Vigilance Commission Act (2003), in view of the establishment of the spirit of maintaining the Authority free of any corruption and misuse of official position, the Authority in solidarity with the same observed Vigilance Awareness Week administering the oath by its staff, employees and officers.

The Authority observed the Vigilance Awareness Week where the staff of the Authority collectively participated in the prevention of corruption and the fight against corruption being vigilant as part of the Vigilance Awareness Week (26th October, 2021 to 1st November, 2021) with the theme “स्वतंत्र भारत @ 75: सत्यनिष्ठा से आत्मनिर्भरता (Independent India @ 75: Self Reliance with Integrity) ”.

The observance of the Vigilance Awareness Week commenced with the taking of the Integrity Pledge.



8.10 PARTICIPATION OF CHAIRPERSON IN VARIOUS MEETINGS AND DISCUSSIONS DURING 2021-22

MONTH	DESCRIPTION
APRIL, 2021	
08 th April, 2021	Chairperson attended an International webinar on Exchange on PVP Post Control Measures through VC mode.
16 th April, 2021	Chairperson attended a meeting with the Secretary (AC&FW) For discussing the issues relating to PPVFRA at Krishi Bhawan, New Delhi.
JUNE, 2021	
01 st June, 2021	Chairperson attended a meeting between APEDA and PPVFRA through VC

	mode.
04 th June, 2021	Chairperson attended a meeting NAAS Foundation Day Lecture 2021 Programme through VC mode.
9 th June, 2021	Chairperson attended a Review meeting with DUS Centers - Cereals and Pulses through VC mode.
10 th June, 2021	Chairperson attended a Review meeting with DUS Centers - Vegetables Crops through VC mode.
11 th June 2021	Chairperson attended a Review meeting with DUS Centers - Horticulture Crops through VC mode.
14 th June, 2021	Chairperson attended a meeting for development of a mechanism for involvement of private sector in research and development (R&D) activities and promoting new varieties of oil seeds and pulses through VC mode.
17 th June, 2021	Chairperson attended a meeting of Annual Dus Review meeting through VC mode.
23 rd June, 2021	Chairperson attended a meeting of Annual Dus Review meeting through VC mode.
24 th June, 2021	Chairperson attended a meeting for Developing a Mechanism for involvement of private sector in Research and Development (R&D) activities and promoting new varieties of Oil seeds and Pulses through VC mode.
25 th June, 2021	Chairperson attended a meeting of Putting farmers' and indigenous peoples' access to crop diversity first, in seed policy and practice for seed security through VC mode
28 th June, 2021	Chairperson attended a webinar meeting with Chairperson of Various Sub-Committee to discuss for arrangement of 9th GB of Treaty in India through VC mode.
JULY, 2021	
05 th July, 2021	Chairperson attended a PPVFRA Technical Advisory Committee Meeting through VC mode
05 th July, 2021	Chairperson attended a Review meeting of DUS Centres through VC mode
16 th July, 2021	Chairperson attended a Meeting with Secretary Agriculture regarding Filling up of the post of Registrar General, PPVFR Authority and other pending issues at krishi bhawan, New Delhi
21 st July, 2021	Chairperson attended a meeting for Management implementation of Plant Genetic Resources through VC mode.
22 nd July, 2021	Chairperson organized a meeting for Laying of Foundation Stone of the upcoming building Plant at Authority Bhawan PPVFRA
23 rd July, 2021	Chairperson discussed on the adoption of revised emoluments for technical manpower (JRF/SRF/YPs as per DST/ICAR guidelines) and their recruitment for those working under DUS projects at DUS centres at PPVFRA
28 th July, 2021	Chairperson attended a meeting on Putting farmers' and indigenous peoples' access to crop diversity first, in seed policy and pract through VC mode
AUGUST, 2021	
02 nd August, 2021	Chairperson Lead a lecture at Pusa Krishi Incubation Program, ICAR-IARI, New Delhi, MoA&FW, GoI through VC.
9 th August, 2021	Chairperson attended 28th Annual General Body Meeting of the National Academy of Agricultural Sciences through VC.
12 th August, 2021	Chairperson attended India's negotiation with EU on FTA- meeting to discuss

	issues pertaining to Department of Agriculture through VC .
13 th August, 2021	Chairperson attended a meeting TNAU with DM's and DAO's through VC.
17 th August, 2021	Chairperson attended a National IP awards ceremony 2020 through VC.
19 th August, 2021	Chairperson attended a meeting for Installation of Gene-Bank Seed Store System at the new Plant Authority Bhawan at krishi bhawan, New Delhi.
26 th August, 2021	Chairperson attended a National Workshop on Bridging the Yield Gaps to Enhance Food grain Production: A Way Forward through VC.
SEPTEMBER, 2021	
2 nd September, 2021	Chairperson attended Online Project Steering Committee (PSC) Meeting between India and Germany under Indo-German Bilateral Cooperation on Seed Sector Development through VC.
5 th September, 2021	Chairperson lead a lecture on Teachers' Day on the topic " Managing Innovations" through VC.
8 th September 2021	Chairperson attended a meeting on Horticulture Development for Farmer's Prosperity' through VC.
15 th September, 2021	Chairperson attended a meeting of Indo-German Cooperation on Seed Sector Development through VC.
25 th September, 2021	Chairperson attended a VS Mathur Memorial Award Function organize by Indian Institute of Wheat and Barley Research, Karnal through VC
27 th September, 2021	Chairperson attended a Meeting to finalize and select the awardees by screening nominations Dr.R.B.Singh Sir Chairman of the selection committee of Plant Genome Saviour Farmers Community Awards at Conference Hall of ICAR, NASC Complex
OCTOBER, 2021	
4 th October, 2021	Chairperson attended a Meeting of Conveners of Sectional Committee through VC
7 th October, 2021	Chairperson attended meeting of process of evaluation start during (9-10 October, 2021) NAAS Sectional Committee Provide valuable input in selecting suitable candidates for Academy's Fellowship/Associateship and Young Scientist Awards through VC
9-10 October, 2021	Chairperson attended a NAAS Sectional Committee meeting through VC.
11 th October, 2021	Chairperson attended a meeting for Opening the financial bid of the tender for Managing 9th Session of Governing Body of International Treaty on Plant Genetic Resource for Food and Agriculture at IARI, New Delhi.
20 th October, 2021	Chairperson lead a lecture in a Collaborative Training on "Agricultural Legislation for Agricultural Extension Professionals" Banaras Hindu University in collaboration with MANAGE, Hyderabad through VC.
NOVEMBER, 2021	
18 th November, 2021	Chairperson attended a 2 nd International Symposium on Agrobiodiversity through VC.
22 nd November, 2021	Expert Consultation on "Accelerating Export of Seed Spices: Challenges and Opportunities" VC
DECEMBER, 2021	
1 st December, 2021	Chairperson attended a meeting of Protection of plant variety, the key to improved agricultural commerce & growth through VC.

7 th 2021	December,	Chairperson attended a meeting of Nomination to the First Special Session Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) through VC.
14 th 2021	December,	Chairperson attended a meeting of International Vegetable Conference, ICVEG-21 at VC/ Auditorium Hall A, NASC Complex, New Delhi.
15 th 2021	December,	Chairperson discussed different matters/issues for organising the Bharat ki Azadi ka Amrit Mahotsav at PPVFRA
15 th 2021	December,	Chairperson attended an International Vegetable Conference, ICVEG-21 and lecture on TECHNICAL SESSION-VIII (Theme-6) EDUCATION AND IPR ISSUES INCLUDING PPVFR VC at Auditorium Hall A, NASC Complex, New Delhi
16 th 2021	December,	Chairperson attended an International Webinar “Exchange on Biochemical and Molecular Techniques (BMT) Guidelines and Implementation of BMT in DUS” under Indo-German Cooperation on Seed Sector Development through VC
17 th 2021	December,	Chairperson attended a meeting for Exchange on Biochemical and Molecular Techniques (BMT) Guidelines and Implementation of BMT in DUS” under Indo-German Cooperation on Seed Sector Development through VC
21 st 2021	December,	Chairperson attended a lectures by ISGPB award winners through VC
23 rd 2021	December,	Chairperson attended a Second meeting of Executive Committee under the co-chairmanship of Secretary (A&FW) and Secretary DARE & DG, ICAR at Krishi Bhawan, New Delhi
29 th 2021	December,	Chairperson conducted meeting for हिंदी पखवाड़ा की प्रतियोगिता के विजेता को प्रमाण पत्र देने के सम्बन्ध में at PPVFRA
30 th 2021	December,	Chairperson attended a meeting Bharat ki Azadi ka Amrit Mahotsav at PPVFRA
JANUARY, 2022		
1 st January, 2022		Chairperson attended a meeting of Sitting of the Joint Committee on the Biological Diversity (Amendment) Bill, 2021 at parliament house
3 rd January, 2022		Chairperson attended a meeting of Second meeting of Executive Committee under the co-chairmanship of Secretary (A&FW) and Secretary DARE & DG, ICAR at Krishi Bhawan, New Delhi
10 th 2022	January,	Chairperson attended a webinar during Azadi Ka Amrit Mahotsav and Interaction with PGS Rewarded Farmers through VC
10 th 2022	January,	Chairperson attended a meeting of Stakeholders Consultation on Genetically Modified (GM) Food and Feed Import and Detection of Unauthorised GM Food Events Participate as a Panellist through VC
11 th 2022	January,	Chairperson attended a webinar during Azadi Ka Amrit Mahotsav and Interaction with PGS Rewarded Farmers through VC
11 th 2022	January,	Chairperson attended a Webinar on Microbial Biotechnology for Novel Food and Food Ingredients through VC
12 th 2022	January,	Chairperson attended a webinar during Azadi Ka Amrit Mahotsav and Interaction with PGS Rewarded Farmers through VC
13 th 2022	January,	Chairperson attended a Webinar on Legal Aspects involved in PPVFRA ACT, 2001 through VC
14 th 2022	January,	Chairperson attended a Webinar on Legal Aspects involved in PPVFRA

2022		ACT, 2001 organized by PPVFRA in collaboration with Delhi University through VC
18 th 2022	January,	Chairperson attended a meeting of 1 st International Symposium “Cereals for Food Security and Climate Resilience” through VC
18 th 2022	January,	Chairperson attended a meeting to discuss for organizing 9 th Session of the Governing body of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in India through VC
21 st 2022	January,	Chairperson attended a meeting of 38th EVRC Meeting through VC
21 st 2022	January,	Sitting of the Joint Committee on the Biological Diversity (Amendment) Bill, 2021 at Parliament House, New Delhi
19-22 nd 2022	January,	Chairperson attended a meeting of Harnessing the potential of Finger millet for achieving food and nutritional security : challenges and prospects (ICMF-2022) at V.C. Farm, Mandya, Karnataka/VC
28 th 2022	January,	Chairperson attended a meeting to discuss on fixing and preponing and filing of additional documents in FSII Matter - WP (C) No.11738/2019 - FSII -Vs- UOI & Ors., at PPVFRA
28-31 st 2022	January,	Chairperson attended a meeting of “Bio-con” Bio-sciences Congress 2022 at Hindustan College of Science & Technology, Farah, Agra
31 st 2022	January,	Chairperson lead a lecture as Speaker under NIDHI-TBI, DST Govt. of India being organized by PUSA TAKSAY Society, ZTM&BPD Unit, ICAR-IARI through VC
FEBRUARY, 2022		
3 rd & 4 th February, 2022		Chairperson attended a meeting for Review of technical programme of DUS projects funded by PPVFRA from FY-2017-18 to 2021-22 through VC
9 th 2022	February,	Chairperson attended a meeting to Chair the Annual Day Function of Indian Institute of Maize Research, Ludhiana through VC
10 th 2022	February,	Chairperson attended a meeting of 52 nd Lal Bahadur Shastri Memorial Lecture through VC
11 th 2022	February,	Chairperson attended a meeting of ICAR-Indian Agricultural Research Institute 60 th Convocation through VC
17 th 2022	February,	Chairperson attended a meeting of Indo German Seed Sector Development Project through VC
17 th 2022	February,	Chairperson attended a meeting with German experts Discussion on finalizing upcoming DUS testing workshops under “ Indo-German co-operation on seed sector development” through VC
28 th 2022	February,	Chairperson attended a webinar of National Science Day Lecture through VC
MARCH, 2022		
2 nd March, 2022		Chairperson attended a meeting for Review of progress of the project “ Development of DUS Test guidelines of chilli Bell pepper and Paprika under protected condition” at HPKV, Palampur
3 rd March, 2022		Chairperson attended a meeting for discuss and decide the contents relating to the materials & posters to be presented in at Pusa Krishi Vigyan Mela PPVFRA
9 th March, 2022		Chairperson attended a meeting for Discussion on farmers’ rights and plant breeders rights with Telangana breeders VC
9 th March, 2022		Chairperson attended a meeting for Innovation and Commercialization

	among farmers' at Pusa Krishi Vigyan Mela, IARI mela ground, PUSA, New Delhi.
11 th March, 2022	Chairperson attended a meeting for Innovation and Commercialization among farmers' at Pusa Krishi Vigyan Mela, IARI mela ground, PUSA, New Delhi
15 th March, 2022	Chairperson attended a meeting of First National Project Steering Committee (NPSC) at Krishi Bhawan, New Delhi
15 th March, 2022	Chairperson attended a meeting of Joint Committee on the Biological Diversity (Amendment) Bill, 2021- Oral evidence on the provisions of the Biological Diversity (Amendment) Bill, 2021 at Parliament House Annexe Extension (PHAE), at New Delhi.
16 th March, 2022	Chairperson attended a meeting of amendment of Rule 74 of PPVFRA Rules, 2003 at Krishi Bhawan, New Delhi
22 nd March, 2022	Chairperson attended a meeting of Fifth EC Meeting of NGGF through VC
28 th March, 2022	Chairperson attended a meeting for Book Launch & Panel Discussion on Indian Agriculture Towards 2030 through VC
30 th March, 2022	Chairperson lead a Lecture on PPVFRA to Khadakpur Students through VC

Chapter 9: Financial Statements of the Authority as on 31.03.2022

The financial statements were prepared under the historical cost convention in accordance with Generally Accepted Accounting Principles (GAAP), the applicable mandatory Accounting Standards (AS) issued by the Institute of Chartered Accountants of India (ICAI) and relevant presentational requirements for Central Autonomous Bodies as prescribed by the Controller General of Accounts (CGA). The Authority follows the accrual system of accounting in respect of all items of expenditure & income except where otherwise stated. A copy of Balance sheet as on 31 March, 2022, Income & Expenditure Account and Receipt & Payment Account for the year ended 31 March, 2022 are given.

In compliance with section 62(2) of PPVFRA Act, 2001, the accounts of the Authority were submitted to the Comptroller and Auditor General of India (C&AG). The audited accounts along with audit report and management's reply shall be sent to the Ministry separately for placing before both the houses of Parliament. The Authority has received Rs.5999.90 lakh as grants-in-aid from Department of Agriculture and Farmers' Welfare, during the year 2021-22 and utilized Rs.6152.29 lakh after adjusting unspent balance of Rs.170.39 lakh (revalidation received from the Ministry) of previous year leaving a balance of Rs.18.00 lakh.

BALANCE SHEET AS AT 31ST MARCH, 2022

(Amount in Rupees)		
CORPUS / CAPITAL FUND AND LIABILITIES	As at March 31, 2022	As at March 31, 2021
Corpus / Capital Fund	75,20,01,059	62,20,31,584
Reserves and Surplus	-	-
Earmarked/Endowment Funds	10,57,87,071	46,02,39,372
Secured Loans and Borrowings	-	-
Unsecured Loans and Borrowings	-	-
Deferred Credit Liabilities	-	-
Current Liabilities and Provisions	19,59,82,510	18,75,08,026
TOTAL	1,05,37,70,640	1,26,97,78,982
ASSETS		
Fixed Assets	2,91,23,053	2,97,63,279
Less: Accumulated Depreciation	2,39,48,835	2,39,04,314
Net Fixed Assets	51,74,218	58,58,965
Capital Work in Progress	7,65,350	7,55,600
Investments-From Earmarked/Endowment Funds	-	-

Investments-Others	-	-
Current Assets, Loans Advances etc.	1,04,78,31,072	1,26,31,64,417
Miscellaneous Expenditure	-	-
(to the extent not written off or adjusted)		
TOTAL	1,05,37,70,640	1,26,97,78,982

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31st MARCH, 2022

(Amount in Rupees)

	AUTHORITY FUND		GENE FUND	
	For the year ended March 31, 2022	For the year ended March 31, 2021	For the year ended March 31, 2022	For the year ended March 31, 2021
<u>Income</u>				
Income from Sales/ Services	-	-	-	-
Grants/Subsidies	20,94,69,194	19,92,33,244	4,00,00,000	2,00,00,000
Fees/Subscriptions	1,79,25,100	2,45,18,600	2,03,88,259	1,75,15,058
Income from Investments	-	-	-	-
Income from Royalty, Publication etc.	-	-	-	-
Interest Earned	2,55,02,782	2,61,63,989	1,23,98,132	1,51,31,462
Other Income	68,07,541	3,54,028	304	1390
Increase/(Decrease) in stock of Finished goods and works in progress	-	-	-	-
Deferred Income (Depreciation/Amorization on fixed asset)	10,19,734	9,38,583	-	-
Prior period Adjustment A/c	67,01,730	27,00,175	-	4,15,79,083
TOTAL (A)	26,74,26,081	25,39,08,619	7,27,86,695	9,42,26,993
<u>EXPENDITURE</u>				
Establishment Expenses	5,50,55,443	5,08,22,130	-	-
Other Administrative Expenses etc.	1,83,23,300	1,97,00,365	1,09,57,282	25,67,897
Expenditure on Grants, Subsidies etc.	12,21,71,369	15,06,45,208	-	-
Interest	15,05,619	13,73,656	-	-
Depreciation/ Amorization including Impairment Loss	10,19,734	9,38,583	-	-
Prior period Adjustment A/c	4,96,188	5,12,05,914	40,000	81,000
TOTAL (B)	19,85,71,653	27,46,85,856	1,09,97,282	26,48,897
Balance being excess of Income Over Expenditure (A-B)	6,88,54,428	(2,07,77,237)	6,17,89,413	9,15,78,096
Transfer to special Reserve(Specify each)	-	-	-	-

Transfer to /from General Reserve	-	-	-	-
BALANCE BEING SURPLUS/ (DEFICIT) CARRIED TO CORPUS/CAPITAL FUND	6,88,54,428	(2,07,77,237)	6,17,89,413	9,15,78,096

RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31st MARCH, 2022

(Amount in Rupees)

RECEIPTS	For the year ended March 31, 2022	For the year ended March 31, 2021	PAYMENTS	For the year ended March 31, 2022	For the year ended March 31, 2021
1. Opening Balances			1. Expenses		
a) Imprest (Cash In hand)			a) Establishment Expenses	5,26,99,424	4,65,75,919
Authority	-	25,000	b) Administrative Expenses etc.,	1,96,41,212	1,95,16,093
Ranchi Branch	1,268	1,337			
Guwahati Branch	3,991	33	2. Payments made against funds		
Shivmogga Branch	490	1,891	a) Existing DUS Centres (Annexure-IV)	6,86,39,980	8,78,27,077
			b) New DUS Centres (Annexure-III)	2,27,33,907	2,78,52,040
b) Bank Balances			c) Field Gene Bank (Annexure-V)	34,33,325	30,89,746
i. In Current Account					
State Bank of India	7,72,527	3,30,63,163			
SBI (Gene Fund)	2,32,892	1,85,96,218	3. Expenditure on fixed Assets and Capital Work in Progress		
SBI Palampur Branch	33,363	1,08,189	Purchase of Fixed Assets (Authority)	2,45,340	6,98,709

ii. In Deposit Accounts			4. Advance for Construction of Building given to Uttar Pradesh Rajkiya Nirman Nigam Ltd	38,39,90,400	37,75,26,815
SBI-Gene Fund	16,26,79,459	18,16,18,576			
Canara Bank-Gene Fund	8,35,82,522	-	5. Grant release to Training Centres (Annexure-VI)	80,000	2,40,000
Canara Bank-Authority	14,21,96,474	4,69,09,627			
SBI-Authority	19,22,12,760	20,51,28,410	6. Advance to outside Deptt.	25,69,880	45,72,960
iii. In Saving Accounts			7. Contribution to Gene Fund	4,00,00,000	2,00,00,000
Canara Bank	6,14,46,622	7,00,18,402			
SBI Guwahati Branch	1,37,548	1,28,471	8. Refund of Fees/ Subscriptions/ Other Income		
SBI Ranchi Branch	1,31,268	1,21,283	Refund of Application/ Registration Fees	2,59,200	10,000
Canara Bank Shivamogga Branch	56,472	4,08,033	Refund of Annual Renewal Fees	-	7,96,520
Bank of Maharashtra Pune Branch	1,26,843	1,29,921			
			9. Contribution to ITPGFRA	21,39,512	46,98,913

2. Grants received from Government of India	59,99,90,000	61,15,59,000			
			10. Other Prior Period Adjustment A/c	5,18,670	36,000
3. Interest Received from Bank	3,04,89,421	3,31,82,825			
			11. Advance to Employee of PPVFRA	7,91,039	5,99,351
4. Refund of Grant from Training Centres	80,000	81,449			
			12. Statutory Liabilities Paid	2,76,16,080	2,82,88,175
5. Refund of Grant for Development of DUS Guidelines (New DUS Centre)	93,836	3,15,201			
			13. Other Remittances	1,50,219	1,16,048
6. Refund of Advance from Employees	950	69,701			
			14. Closing Balances		
7. Refund of Grant from Referral Laboratories	-	1,46,945	a) Imprest (Cash In hand)		
			Ranchi Branch		1,268
8. Unclassified Receipts	2,05,54,247	21,37,258	Guwahati Branch		3,991
			Shivmoga Branch		450
9. Fees / Subscriptions/Other Income			Palampur Branch	841	-
Application/Registration Fees	44,64,800	67,04,500			
Advance for Application Fees/Registration Fees		-	b) Bank Balances		
PV Subscription Fees	38,12,500	53,33,500	i. In Current Account		

Annual Fees (Including Share from sale of Seeds)- Gene Fund	1,90,14,771	1,65,09,931	State Bank of India	5,94,560	7,72,527
DUS Test Fees	74,58,000	88,74,000	SBI (Gene Fund)	2,03,93,594	2,32,892
Other Income (including prior period)	2,76,039	-	SBI Palampur Branch	33,771	33,363
Annual Renewal Fees	26,60,000	35,34,000			
Sale of Old Newspapers, Scrap	1,600	1,600	ii. In Deposit Account		
Contribution from Authority Fund	4,00,00,000	2,00,00,000	SBI-Gene Fund	7,69,75,000	16,26,79,459
			Canara Bank-Gene Fund	12,50,42,176	8,35,82,522
10. GPF Recurring Deposit	-	13,50,000	UBI-Gene Fund	10,12,46,700	-
			Canara Bank-Authority	21,36,12,151	14,21,96,474
11. CGEGIS Amount Received	1,320	360	UBI-Authority	18,88,08,444	-
			SBI-Authority	22,57,000	19,22,12,760
12. Refund	17,11,142	-			
			iii. In Saving Account		
13. Sales of Assets	10,380	-	Canara Bank	1,86,68,834	6,14,46,622
			SBI Guwahati Branch	1,17,612	1,37,548
			SBI Ranchi Branch	1,10,834	1,31,268
			Canara Bank Shivamogga Branch	7,06,593	56,472

			Bank of Maharashtra Pune Branch	1,19,963	1,26,843
			Union Bank of India	37,202	-
TOTAL	1,37,42,33,464	1,26,60,58,824	TOTAL	1,37,42,33,464	1,26,60,58,824

Chapter 10: Citizen's Charter

10.1 VISION OF THE AUTHORITY:

To ensure an effective system for protection of plant varieties, the rights of the farmers, plant breeders and to encourage the development of new varieties of plants.

10.2 OBJECTIVES OF THE AUTHORITY:

- To provide an effective system for protection of plant varieties and rights of farmers, plant breeders and researchers.
- To protect plant breeders' rights and to stimulate investment for Research & Development and evolution of new varieties.
- To recognize the farmers in respect of their contributions made for conserving, improving and making available plant genetic resources for development of new plant varieties.
- To facilitate the growth of seed industry to ensure production and availability of high quality seeds and planting material to the farmers.

10.3 FUNCTIONS OF THE AUTHORITY:

- Encourage the development of new varieties of plants and to protect the rights of the farmers and the plant breeders.
 - Establishment of National Gene bank for orthodox seeds and field gene banks for perennial crops
 - Registration of new and extant varieties of plants
 - Developing documentation of registered plant varieties
 - Documentation, indexing and cataloguing of farmers' varieties
 - Compulsory cataloguing facility for all varieties of plants
 - Ensuring seeds of varieties registered under the Act are available to farmers and providing for compulsory license, if needs arise
 - Ensuring maintenance of National Register of plant varieties
 - Utilization of Gene Fund for supporting the conservation and sustainable use of plant genetic resources and capacity building of the panchayats in carryings out such conservation and sustainable use and meeting the expenditure of the schemes relating to benefits sharing and compensations to the stakeholders
- Protection of Plant Varieties and Farmers' Rights is a unique subject involving diverse activities, initiatives and stakeholders. The stakeholders of Protection of Plant Varieties and Farmers' Rights Authority are Central Government, State Governments, Union Territories, Research Organizations including State Agricultural Universities, Seed Industries, NGOs and above all the farmers including tribal farming communities.

10.4 SERVICES OFFERED BY THE AUTHORITY:

- Providing IPR protection to plant varieties bred by farmers, researchers/ plant breeders in the form of plant variety registration
- Maintaining National Register of Plant varieties wherein details of plant varieties and the rights of respective breeders are documented
- Providing compensation to the farmers in case a registered variety does not perform as per the claim made by the breeders
- Facilitating benefit sharing to the communities/ farmers for the contribution/ sharing of plant genetic resources
- Creating awareness and capacity building for the rights of plant breeders and farmers towards implementation of PPVFR Act, 2001
- Developing plant varieties database for the stakeholders
- Supporting and rewarding farmers and communities of farmers, particularly the tribal and rural communities, engaged in conservation, improvement and preservation of genetic resources

10.5 GRIEVANCES REDRESSAL MECHANISM:

Financial Advisor, PPVFRA, is designated as the 1st Appellate Authority for RTI matters from 16.10.2020 and can be contacted at:

Sh. Vipin Tyagi,
Financial Advisor
1st Appellate Authority
Protection of Plant Varieties and Farmers' Rights Authority
S-2, A Block, NASC Complex, DPS Marg,
New Delhi-110012.
Ph: 011-25843632, Fax: 011-25840478
E-mail: fa-ppvfra@nic.in; www.plantauthority.gov.in

Deputy Registrar, PPVFRA, is designated as the Central Public Information Officer to address the RTI matters and can be contacted at:

Sh. Uma Kant Dubey,
Deputy Registrar
Central Public Information Officer
Protection of Plant Varieties and Farmers' Rights Authority
S-2, A Block, NASC Complex, DPS Marg,
New Delhi-110012.
Ph: 011-25843853, Fax: 011-25840478
E-mail: uk.dubey@gov.in; www.plantauthority.gov.in

Annexure I: Members of PPVFR Authority (As on 31st March, 2022)

List of Authority Members

S.No	Name	Designation	Address
1	Dr. S.K. Malhotra	Agriculture Commissioner	Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Govt. of India, Krishi Bhavan, New Delhi – 110 001
2	Dr. A.K. Singh	Deputy Director General (Crop Science)	Division of Crop Science, Ministry of Agriculture, Govt. of India, Indian Council for Agricultural Science, Krishi Bhavan, New Delhi - 110 001
3	Shri Ashwani Kumar	Joint Secretary (Seeds)	Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Govt. of India Krishi Bhawan, New Delhi – 110 001
4.	Dr. Anju Rathi Rana	Joint Secretary & Legal Advisor	Room No. 406B (A), 4 th Floor, A Wing, Department of Legal Affairs, Shastri Bhawan, New Delhi-110001.
5	Dr. S.K. Malhotra	Horticultural Commissioner	Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture, Govt. of India, Room no 238, Krishi Bhawan, New Delhi – 110 001
6	Dr. Kuldeep Singh	Director	National Bureau of Plant Genetic Resources, Pusa, DPS Marg, New Delhi-110 012
7	-	Adviser/Scientist 'G'	Department of Biotechnology, Ministry of Science & Technology, Govt. of India, Room No. 809, 8th Floor, Block- 2, CGO Complex, Lodhi Road, New Delhi-110003
8	-	Adviser	Ministry of Environment & Forests & Climate Change, Room No.V-235, Indira Paryavaran Bhawan, New Delhi - 110003
9	Shri Tummala Anjaneyulu	Member	Sugar Cane Grower's Association of Andhra Pradesh Village Remalle, Bapulapadu Mandal, Distt. Krishna, Andhra Pradesh – 521110
10	Smt. Jui Pethe		Vanvasi Kalyan Ashram, 1, Shripad, Vakratunda Row, House, Opp. Rama Raman Apartment, Vrindavan Nagar, Kamatwade, Nashik- 422010.
11	Shri V. Venkateswarlu	Director	M/s Vasanth Agri Biotech Pvt Ltd. 1-3-158/401, BSN Reddy Complex, Rajendranagar, Mahabubnagar, Telangana – 509001

12	Dr. Pramod Kumar Mishra,	Director of Research Services,	Jawaharlal Nehru Krishi Vishwa Vidyalaya, B-6 Krishi Nagar, Aadhartal, Jabalpur, Madhya Pradesh, Pin- 482004.
13	Dr. Sudha Tiwari	National President	SHAKTI (NGO for empowerment of Women), 50-51, Gurukripa Society, Naik Nagar, Near. Manewada Sq. Nagpur - 440027
14	-	Additional Chief Secretary (Agriculture) or/Principal Secretary (Agriculture)	Government of Gujarat
15	-	Additional Chief Secretary (Agriculture) or/Principal Secretary (Agriculture)	Government of Himachal Pradesh

Annexure II: Details of Human Resources of PPVFR Authority as on 31st March, 2022

S. No	Name	Designation	Pay Level as per 7 th CPC
1.	Dr. K. V. Prabhu	Chairperson	Level 17 (Rs. 225000/-)
2.	Vacant (w.e.f. 23.12.2019)	Registrar -General	Level 15
3.	Dr. Ravi Prakash (proceeded on deputation w.e.f 16.10.2020)	Registrar	Level 13 (Rs.123100-215900)
4.	Dr. T. K. Nagarathna	Registrar	
5.	Vacant (w.e.f. 05.12.2018)	Registrar	
6.	Sh. Vipin Tyagi	Financial Advisor	
7.	Sh. D. R. Choudhury	Joint Registrar	Level 12 (Rs.78800-209200)
8.	Vacant (11.11.2017)	Joint Registrar	
9.	Sh. Raj Ganesh	Legal Advisor	Level 11 (Rs.67700-208700)
10.	Sh. U.K. Dubey	Deputy Registrar	
11.	Sh. R. S. Sengar	Deputy Registrar	
12.	Sh. Arun Kumar	Legal Advisor	
13.	Dr. A. K. Singh	PVE	Level 7 (Rs. 44900-142400)
14.	Dr. D. S. Plania	Technical Assistant	Level 6 (Rs. 35400-112400)
15.	Sh. Arvind Kumar Rai	Computer Assistant	
16.	Sh. Sanjay Kr. Gupta	Computer Assistant	
17.	Smt. Shipra Mathur	Computer Assistant	
18.	Sh. Nitesh Kumar Verma	Computer Assistant	
19.	Sh. Shyam Narayan Prasad	Computer Assistant	

Annexure III: Statement Showing Funds Released to New DUS Centres/Projects During 2021-22

Sr. No.	Name of the New DUS Centre	Crop	Release During 2021-22 (in Rupees)
1	IIHR, ICAR-Unit, Bangalore	Papaya and Custard Apple	3,05,145
2	Dr. Y.S.Parmar University of Horticulture & Forestry, Solan	Carnation	5,25,000
3	IIHR, ICAR-Unit, Bangalore	China Astar	4,17,166
4	TNAU, Coimbatore	Papaya and Custard Apple	2,50,839
5	UHS, Bagalkot	Moringa Oleifera Lam	4,28,153
6	IFGTB, Coimbatore	Tectona Grandis	5,61,622
7	CIAH, ICAR-Unit, Bikaner	Chironji and Tamarind	8,90,696
8	CISH, ICAR-Unit, Lucknow	Bael	2,91,385
9	CIAH, ICAR-Unit, Bikaner	Bael	3,20,912
10	NRC, Puttur, ICAR-Unit, Cashew	Cashew	5,59,205
11	TNAU, Coimbatore	Neem, Karanj & Jatrapa	3,80,668
12	Dr. Y. S. Parmar University of Horticulture & Forestry, Solan	Willow (Salix Species)	3,97,422
13	IIHR, ICAR-Unit, Bangalore	Marigold	9,95,429
14	UAS Dharwad	Cowpea	7,00,000
15	CPCRI, Karnataka	Areca nut	14,50,395
16	CIAH, ICAR-Unit, Bikaner	Date palm	3,60,684
17	CIAH (Central Institute for Arid Horticulture), ICAR-Unit, Bikaner	Jamun	1,65,316
18	Dr. Y. S. Parmar University of Horticulture & Forestry, Solan	Seabuckthorn	5,79,574
19	CISH, (Central Institute for Subtropical Horticulture), ICAR-Unit, Lucknow	Anola	9,64,222

20	CISH, (Central Institute for Subtropical Horticulture), ICAR-Unit, Lucknow	Jamun	1,32,645
21	Dr B S Konkan Krishi Viswadidyalaya, Dapoli	Nutmeg	3,57,774
22	UAS, GKVK, Bangalore	Jackfruit	8,38,020
23	SKAUST- K, Srinagar	Saffron	9,00,000
24	UAHS, Shivamogga	Anthurium	7,66,437
25	IIHR, Bangalore	Dolichos Bean	3,83,125
26	BCKV, Kalyani	Dahlia & Hibiscus	7,14,902
27	ACHF, NAU, Navsari, Gujarat	Eucalyptus & Urophylla	6,88,713
28	IIR, Hyderabad	Niger	2,02,541
29	TNAU, Coimbatore	Black Gram	2,17,418
30	IARI, New Delhi	Sponge Gourd	1,97,862
31	IIVR, Varanasi	Sponge Gourd	90,000
32	CIMAP, LUCKNOW	Ashwagandha	12,90,637
33	Comptroller, SKUAST-K, Srinagar	Pran	9,00,000
34	Comptroller, SKUAST-K, Srinagar	Rajmash & valley	9,00,000
35	Comptroller, SKUAST-K, Srinagar	Turnip	9,00,000
36	IIHR, BANGALORE	Carrot	3,00,000
37	IIHR, BANGALORE	Curry Leaves	9,00,000
38	NRC on Litchi, Muzaffarpur	Litchi & Guava	6,10,000
39	UAS, GKVK, BANGALORE	Chilli, Bell Peprika	9,00,000
TOTAL			22,733,907

Annexure IV: Statement Showing Funds Released to Existing DUS Centres/Projects during 2021-22

Sr. No.	Name of DUS Centre	Crop	Release During 2021-22 (in Rupees)
1	IIHR, ICAR-Unit, Bangalore	Tuberose & Carnation	5,91,642
2	CTCRI (Central Tuber Crops Research Institute), Thiruvananthapuram	Sweet Potato and Cassava	6,66,605
3	DFR, (Directorate of Floricultural Research), IARI Campus, New Delhi	Gladiolus	4,68,606
4	BCKV, (Bidhan Chandra Krishi Visavidyalaya), Kalyani	Pointed Gourd	6,90,604
5	IIHR, ICAR-Unit, Bangalore	Jasmine	3,93,063
6	CITH, (Central Institute for Tropical Horticulture), ICAR-Unit, Srinagar	Peach, Plum, Apple, Almond, Pear, Apricot & walnut	15,78,134
7	CISH (Central Ins for Subtropical Horticulture), ICAR-Unit, Lucknow	Mango	10,86,076
8	RARI, Durgapur, Jaipur	Barley	8,86,796
9	DFR (Dir. Of Floriculture) IARI	Tuberose	4,66,334
10	IARI, Division of Floriculture, New Delhi	Bougainvillea	5,83,014
11	MPKV, (Mathma Phule Krishi Viswavidyalaya), Rahuri (Pune Station)	China astar	5,74,392
12	JNKVV, Jabalpur	Field Pea, Linseed & Lentil	7,24,684
13	BCKV, (Bidhan Chandra Krishi Visavidyalaya), Kalyani	Betel Vine	2,04,760
14	IGKV, Raipur	Rice	1,92,650
15	CIMAP, (Central Institute for Medicinal and Aromatic Plants), Lucknow	Medicinal Plants	4,23,442
16	CIAH (Central Institute for Arid Horticulture), ICAR-Unit, Bikaner	Ber	5,47,471
17	IARI, Division of Vegetable Science, New	Bottle gourd, Bitter Gourd,	5,70,259

	Delhi	Pumpkin & Cucumber	
18	IARI, Regional Station, Katrain	Cabbage and Cauliflower	5,36,407
19	IIHR, ICAR-Unit, Bangalore	Mango	5,68,779
20	NRC, ICAR-Unit, Trichy	Banana	4,23,716
21	TRA, Tocklai	Tea	2,83,652
22	CARI, ICAR-Unit, Port Blair	Noni	4,36,305
23	TNAU, Coimbatore	Small Millet	10,27,044
24	NBPGR, ICAR-Unit, New Delhi	Grain Amaranth	12,68,040
25	DGR, (Directorate of Groundnut Research), ICAR-Unit, Junagarh	Groundnut	2,49,477
26	JNKVV, Jabalpur	Sesame and Niger	4,62,752
27	IIHR, ICAR-Unit, Bangalore	Watermelon and Muskmelon	3,41,865
28	CSRTI, (Central Sericultural Research and Training Institute), Mysore	Mulberry	5,11,164
29	Dr. Y. S. Parmar University of Horticulture & Forestry, Solan	Poplar Germplasm	4,65,605
30	IFGTB (Institute of Forest Genetics and Tree Breeding), Coimbatore	Eucalyptus and Casuarina	3,50,431
31	IIHR, ICAR-Unit, Bangalore	Amaranth, Spinach & Ridge Gourd	10,12,092
32	NRCSS, (National Research Centre for Seed Spices), ICAR-Unit, Ajmer	Seed Spices	4,73,974
33	AAU, (Assam Agriculture University), Jorhat	Rice	6,13,010
34	Division of Floriculture, IARI, ICAR-Unit, New Delhi	Marigold	3,55,803
35	VPKAS (Vivekananda Parvatiya Krishi Anusandhan Shala), ICAR-Unit, Almora	Rajma, Soybean & Maize	12,21,106
36	DOGR (Directorate of Onion and Garlic Research), ICAR-Unit, Rajgurunagar	Onion and Garlic	3,32,729
37	NRCP, ICAR-Unit, Sholapur	Pomegranate	7,76,628

38	Division of Vegetable Science, IARI, ICAR-Unit, New Delhi	Onion and Garlic	3,26,557
39	IISR (Indian Institute of Sugarcane Research), ICAR-Unit, Lucknow	Sugarcane	2,69,510
40	IIHR, ICAR-Unit, Bangalore	Betel Vine	4,36,743
41	CSAUA&T (Chandra Sekhar Azad University of Agriculture and Technology), Kanpur	Mustard & Wheat	3,64,542
42	IISR, (Indian Institute of Spices Research), ICAR-Unit, Calicut	Spices	6,03,968
43	DSR (Directorate of Soybean Research), ICAR-Unit, Indore	Soybean	4,59,385
44	IIPR, (Indian Ins of Pulses Research), ICAR-Unit, Kanpur	Mungbean, Urdbean, Lentil, Rajma & Pea	10,08,406
45	NRC, (National Research Centre of Grapes), ICAR-Unit, Pune Maharastra	Grapes	10,57,147
46	IARI, ICAR-Unit, Regional Station, Karnal	Rice	7,03,150
47	Sugarcane Breeding Institute, ICAR-Unit, Coimbatore	Sugarcane	11,74,453
48	IGKV, Raipur	Grow out Test (Rice)	5,73,824
49	IIWBR, ICAR-Unit, Karnal	Barley & Wheat	16,16,070
50	RAU, Bikaner-Mandore AICPMIP, Jodhpur	Pearl Millet	10,15,175
51	PAU, (Punjab Agriculture University), Ludhiana	Oat, Cowpea & Guinea Grass & Cotton	7,33,725
52	Central Tuber Crops Research Institute, ICAR-Unit, Trivandrum	Elephant Footyam, Taro, Yam Bean & Greater Yam	6,36,313
53	CRRI, (Central Rice Research Institute), ICAR-Unit, Cuttack	Rice	8,55,401
54	PDKV, (Panjab Rao Deshmukh Krishi Viswavidyalaya), Akola	Pigeon Pea, Chickpea, Red Gram & Safflower	11,28,315
55	Division of Vegetable Science, IARI, New Delhi	Amaranth, Palak, Ridge Gourd	5,88,250

56	DMAPR (Dir. Medicinal & Aromatic Plant Research), Anand	Medicinal & Aromatic Plants	5,59,741
57	CCSHAU (Choudhary Charan Singh Hisar Agriculture University), Hisar	Cotton & Chickpea	2,01,370
58	IARI, ICAR-Unit, Regional Station, Indore	Wheat	5,77,574
59	CPRI (Central Potato Research Institute), ICAR-Unit, Shimla	Potato	13,33,918
60	NEH, ICAR-Unit, Region Station, Barapani, Manipur	Rice	12,81,040
61	Division of Vegetable Science, IARI, New Delhi	Cabbage and Cauliflower	8,38,392
62	PJTSAU, (Prof. Jayashankar Telengana State Agricultural University), Hyderabad	Maize	12,52,036
63	TNAU (Tamil Nadu Agricultural University), Coimbatore	Rice, Sunflower & Groundnut	1,15,116
64	CTCRI (Central Tuber Crops Research Institute), ICAR-Unit, Regional Station, Bhubaneswar	Sweet Potato and Cassava	4,11,325
65	IIMR, ICAR-Unit, Hyderabad	Sorghum	6,28,094
66	CRIJAFR, (Central Research Institute for Jute and Allied Fibres Research), Barrackpore & CSRS, Budbud	Jute	15,56,887
67	MPKV, Rahuri	Cotton	5,11,913
68	IIR, ICAR-Unit, Hyderabad	Sunflower, Castor & Safflower	8,40,916
69	CPCRI, ICAR-Unit, Kerala	Coconut	1,86,733
70	UAS, GKVK, Bangalore	Small Millet	11,95,593
71	CISH, (Central Ins For Subtropical Horticulture), ICAR-Unit, Lucknow	Guava & Litchi	11,82,807
72	IIPR, (Indian Ins of Pulses Research), ICAR-Unit, Kanpur	Chickpea & Pigeon pea	14,61,732
73	MPKV, Rahuri	Sorghum, Pearl Millet & Chickpea	5,84,042
74	IIHR, ICAR-Unit, Hassarghatta, Bangalore	Vegetables	29,21,589

75	UAS (University of Agriculture Sciences), Dharwad	Cotton, Soybean, Groundnut, Durum Wheat and Sesame	13,49,817
76	IIHR, (Indian Ins for Horticultural Research), ICAR-Unit, Bangalore	Rose & Chrysanthemum	9,90,929
77	IIRR, Hyderabad, ICAR-Unit, Hyderabad	Rice	13,46,021
78	IIMR, ICAR-Unit, New Delhi	Maize	13,74,383
79	CICR, ICAR-Unit, (Central Institute For Cotton Research), Nagpur	Cotton	11,21,643
80	IIVR, (Indian Institute of Vegetable Research), ICAR-Unit, Varanasi	Okra, Brinjal, Tomato, Cabbage & Cauliflower etc.	18,98,581
81	NRCC, ICAR-Unit, Nagpur	Citrus, Acid Lime Sweet Orange & Mandarin	1,09,988
82	IIHR, Bangalore	Chrysanthamum	3,85,338
83	IARI, New Delhi	Chrysanthamum	2,32,529
84	IIHR, Bangalore	Crossandra	2,08,048
85	Dr. Y S R Horticulture University, Guntur, Andhra Pradesh	Chilli & Paprika	5,53,484
86	UHS, Bagalkot	Chilli, Paprika & Bell Pepper	5,00,000
87	SDAU,SK Nagar, Gujarat	Grain Amaranth	6,45,000
88	PDKV, AKOLA COLLABRATING CENTER	Mung Bean	8,00,000
89	CSKHPKV, Palampur	Buckwheat	6,45,000
90	CSAUA&T, Kanpur	Linseed	7,00,000
91	CICR, Coimbatore	Cotton	11,64,696
92	CIAH,Bikaner	Watermelon and Muskmelon	10,63,660
Total			6,86,39,980

Annexure V: Statement Showing Funds Released to Field Gene Banks during 2021-22

S. No.	Name of Centres	Release During 2021-22 (in Rupees)
1	Dr. Balasaheb Konkan Krishi Vidyapeeth, Dapoli	8,49,082
2	NBPGR, New Delhi	15,88,362
3	YSPUH, Solan (Temperate Fruits) (FGB)	9,95,881
TOTAL		34,33,325

Annexure VI: Statement Showing Funds Released to the Organisation/Centre for Training & Awareness during 2021-22

S. No.	Name of Beneficiary	Release During 2021-2022 (in Rupees)
1	Assam Agriculture University, Jorhat (AAU)	80,000
TOTAL		80,000

Annexure VII: Crops Under Registration

Sr. No.	Crop	Botanical name
1.	Rice	<i>Oryza sativa</i> L.
2.	Bread wheat	<i>Triticum aestivum</i> L.
3.	Maize	<i>Zea mays</i> L.
4.	Sorghum	<i>Sorghum bicolor</i> (L.) Moench
5.	Pearl millet	<i>Pennisetum glaucum</i> (L.) R.Br.
6.	Chickpea	<i>Cicer arietinum</i> L.
7.	Mungbean	<i>Vigna radiata</i> (L.) Wilczek
8.	Urdbean	<i>Vigna mungo</i> (L.) Hepper
9.	Fieldpea	<i>Pisum sativum</i> L.
10.	kidney bean	<i>Phaseolus vulgaris</i> L.
13	Indian mustard	<i>Brassica juncea</i> L. Czern & Coss
14	Karan rai	<i>Brassica carinata</i> A Braun
15	Rapeseed(toria)	<i>Brassica rapa</i> L.
16	Gobhi sarson	<i>Brassica napus</i> L.
17	Groundnut	<i>Arachis hypogaea</i> L.
18	Soybean	<i>Glycine max</i> (L.) Merrill
19	Sunflower	<i>Helianthus annuus</i> L.
20	Safflower	<i>Carthamus tinctorius</i> L.
21	Castor	<i>Ricinus communis</i> L.
22	Sesame	<i>Sesamum indicum</i> L.
23	Linseed	<i>Linum usitatissimum</i> L.
24	Diploid cotton	<i>Gossypium arboreum</i> L.
25	Diploid cotton	<i>Gossypium herbaceum</i> L.
26	Tetraploid cotton	<i>Gossypium hirsutum</i> L.
27	Tetraploid cotton	<i>Gossypium barbadense</i> L.
28	Jute	<i>Corchorus olitorius</i> L.
29	Jute	<i>Corchorus capsularis</i> L.
30	Sugarcane	<i>Saccharum</i> L.
31	Black pepper	<i>Piper nigrum</i> L.
32	Small cardamom	<i>Elettaria cardamomom</i> Maton
33	Turmeric	<i>Curcuma longa</i> L.

34	Ginger	<i>Zingiber officinale</i> Rosc.
35	Tomato	<i>Lycopersion lycopersicum</i> (L.) Karsten ex. Farw.
36	Brinjal	<i>Solanum melongena</i> L.
37	Okra	<i>Abelmoschus esculentus</i> (L.) Moench.
38	Cauliflower	<i>Brassica oleracea</i> L.var. <i>botrytis</i>
39	Cabbage	<i>Brassica oleracea</i> L. var <i>capitata</i>
40	Potato	<i>Solanum tuberosum</i> L.
41	Onion	<i>Allium cepa</i> L.
42	Garlic	<i>Allium sativum</i> L.
43	Rose	<i>Rosa</i> spp. (other than <i>R.damascena</i>)
44	Chrysanthemum	<i>Chrysanthemum</i> spp.
45	Mango	<i>Mangifera indica</i> L.
46	Duram wheat	<i>Triticum durum</i> Desf.
47	Dicoccum wheat	<i>Triticum dicoccum</i> L.
48	Other Triticum species	
49	Isabgol	<i>Plantago ovata</i> Forsk
50	Menthol mint	<i>Mentha arvensis</i> L.
51	Damask Rose	<i>Rosa damascena</i> Mill
52	Periwinkle	<i>Catharanthus roseus</i> L.
53	Brahmi	<i>Bacopa monnieri</i> L.Pennell
54	Coconut	<i>Cocos nucifera</i> L.
55	Orchids	<i>Vanda</i>
56	Orchids	<i>Dendrobium</i>
57	Orchids	<i>Cymbidium</i>
58	Pomegranate	<i>Punica granatum</i> L
59	Orchid	<i>Cattleya</i> Lindl.
60	Orchid	<i>Phalaenopsis</i> Blume
61	Eucalyptus	<i>Eucalyptus camaldulensis</i> Dehnh.
62	Eucalyptus	<i>Eucalyptus tereticornis</i> Sm.
63	Casurina	<i>Casuarina equisetifolia</i> L
64	Casurina	<i>Casuarina junghuhniana</i> Miq.
65	Bitter Gourd	<i>Momordica charantia</i> L.
66	Bottle Gourd	<i>Lagenaria siceraria</i> (Mol.) Standl.
67	Cucumber	<i>Cucumis sativus</i> L.
68	Pumpkin	<i>Cucurbita moschata</i> Duch. ex Poir.

69	Barley	<i>Hordeum vulgare</i> L.
70	Coriander	<i>Coriandrum sativum</i> L.
71	Fenugreek	<i>Trigonella foenum graecum</i> L.
72	Almond	<i>Prunus dulcis</i> (Mill.) D.A. Webb
73	Apple	<i>Malus domestica</i> Borkh
74	Pear	<i>Pyrus communis</i> L.
75	Apricot	<i>Prunus armeniaca</i> L.
76	Cherry	<i>Prunus avium</i> L.
77	Walnut	<i>Juglans regia</i> L.
78	Grapes	<i>Vitis</i> spp.
79	Indian jujube (Ber)	<i>Ziziphus mauritiana</i> Lamk.
80	Tea	<i>Camellia sinensis</i>
81	Tea	<i>Camellia assamica</i>
82	Tea	<i>C.assamica</i> ssp <i>lasiocalyx</i> .
83	Acid Lime	<i>Citrus aurantifolia</i> Swingle
84	Mandarin	<i>Citrus reticulata</i> Blanco
85	Sweet Orange	<i>Citrus sinensis</i> (L.) Osbeck
86	Bougainvillea	<i>Bougainvillea</i> Comm. Ex Juss.
87	Banana	<i>Musa</i> spp.
88	Orchid	<i>Oncidium</i> Sw.
89	Canna	<i>Canna</i> L.
90	Gladiolus	<i>Gladiolus</i> L.
91	Muskmelon	<i>Cucumis melo</i> L.
92	Watermelon	<i>Citrullus Lanatus</i> (Thunb.) Mansf.
93	Jasmine	<i>Jasminum auriculatum</i> . L.
94	Tuberose	<i>Polianthes tuberosa</i> L.
95	Papaya	<i>Carica papaya</i> L.
96	China Aster	<i>Callistephus chinensis</i> (L.) Nees.
97	Peach	<i>Prunus persica</i> L Batsch.
98	Japanese Plum	<i>Prunus salicina</i> L.
99	Strawberry	<i>Fragaria x ananassa</i> Duch.
100	Chilli, Bell Pepper and Paprika	<i>Capsicum annuum</i> L.
101	Finger Millet	<i>Eleusine coracana</i> (L.) Gaertn.
102	Foxtail Millet	<i>Setaria italica</i> (L.) Beauv

103	Vegetable Amaranth	<i>Amaranthus tricolor</i> L.
104	Ridge gourd	<i>Luffa acutangula</i> (L.) Roxb.
105	Spinach beet	<i>Beta vulgaris</i> var. <i>bengalensis</i> Roxb.
106	Carnation	<i>Dianthus caryophyllus</i> L.
107	Orchid	<i>Paphiopedilum</i> Pfitz.
108	Noni	<i>Morinda citrifolia</i> L.
109	Bael	<i>Aegle marmelos</i> (L.) Correa
110	Jamun/Black plum	<i>Syzygium cumini</i> (L.) Skeels.
111	Nutmeg	<i>Myristica fragrans</i> Houtt.
112	Jasmine/Mogra	<i>Jasminum sambac</i> L.
113	Custard apple / Sugar apple	<i>Annona squamosa</i> L.
114	Kalmegh /King of Bitters	<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees
115	Karanj	<i>Pongamia pinnata</i> (L.) Pierre.
116	Neem	<i>Azadirachta indica</i> A. Juss.
117	Indian Gooseberry	<i>Emblica officinalis</i> Gaertn.
118	Guava	<i>Psidium guajava</i> L.
119	Litchi	<i>Litchi chinensis</i> Sonn.
120	Marigold	<i>Tagetes</i> spp. L.
121	Betelvine	<i>Piper betle</i> L.
122	Deodar	<i>Cedrus deodara</i> (Roxb.) G.Don
123	Chir Pine	<i>Pinus roxburghii</i> Sargent
124	Mulberry	<i>Morus</i> spp.
125	Jasmine	<i>Jasminum multiflorum</i> L.
126	Common/ Sweet Buckwheat	<i>Fagopyrum esculentum</i>
127	Tartary/ Bitter Buckwheat	<i>Fagopyrum tataricum</i>
128	Rajgeera (the King's grain) or Ramdana (Lord Rama's grain).	<i>Amaranthus hypocondricus</i>
129		<i>Amaranthus cruentus</i>
130		<i>Amaranthus caudatus</i>
131		<i>Amaranthus edulis</i>
132	Faba bean	<i>Vicia faba</i> L.
133	Jatropha	<i>Jatropha curcas</i> L.
134	Proso Millet	<i>Panicum maliaceum</i> L.
135	Barnyard Millet	<i>Echinochloa frumentaceae</i> (Roxb.) Link

136	Little Millet	<i>Panicum sumatrense</i> Roth. Ex. Roemer And Schultes
137	Kodo Millet	<i>Paspalum scorbiculatum</i> L.
138	Elephant Foot Yam	<i>Amorphophallus paeoniifolius</i>
139	Taro	<i>Colocasia esculenta</i>
140	Giant SwampTaro	<i>Cyrtosperma chamissionis/C.merkusii</i>
141	Cashew	<i>Anacardium occidentale</i> L.
142	Arecanut	<i>Areca catechu</i> L.
143	Chironji	<i>Buchananialanzan</i> Spreng.
144	Tamarind	<i>Tamarindusindica</i> L.
145	Sweet potato	<i>Ipomoea batatas</i> (L.) Lam
146	Cassava	<i>Manihotesculenta</i> Crantz.
147	Poplar	<i>Populusdeltoides</i> Bartr.
148-154	Willow (7 species)	<i>Salix tetrasperma</i> , <i>Salix nigra</i> , <i>Salix jessoensis</i> , <i>Salix x rubens</i> , <i>Salix matsudana</i> , <i>Salix alba</i> , <i>Salix acmophylla</i> .
155	Oat	<i>Avena sativa</i> L.
156	Date Palm	<i>Phoenix dactylifera</i> L.
157	Moringa	<i>Moringa oleifers</i> L.
158	Melia	<i>Melia dubia</i> Cav.
159	Pointed Gourd	<i>Trichosanthes dioica</i> Roxb.
160	Crossandra	<i>Crossandra infundibuliformis</i> (L.) Nees.
161	Cowpea	<i>Vigna unguiculata</i> (L.) Walp. ssp. <i>unguiculata</i> and <i>Vigna unguiculata</i> (L.) Walp. ssp. <i>sesquipedalis</i> (L.) Verdc. (L.) Walp.
162	Jackfruit	<i>Artocarpus heterophyllus</i> Lam.
163	Greater Yam	<i>Dioscorea alata</i> L.
164	Yam Bean	<i>Pachyrhizus erosus</i> (L.)
165	Seabuckthorn	<i>Hippophae rhamnoides</i> L.
166	Ajwain	<i>Trachyspermum ammi</i> L.
167	Anise	<i>Pimpinella anisum</i> L.
168	Celery	<i>Apium graveolens</i> L.
169	Cumin	<i>Cuminum cyminum</i> L.
170	Dill	<i>Anethum graveolens</i> L. and <i>Anethum sowa</i> Roxb
171	Fennel	<i>Foeniculum vulgare</i> Mill.
172	Nigella	<i>Nigella sativa</i> L.

Annexure VIII: Certificates of Registration issued During 2021-22

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
1	REG/2007/56	New	MIJ-008	Sorghum	M/s Crystal Crop Protection Limited
2	REG/2008/522	Extant (VCK)	LD 694	Diploid Cotton	Punjab Agricultural University
3	REG/2009/34	New	KBR 837	Pearl Millet	Kaveri Seed Company Ltd
4	REG/2009/140	New	NP-107-4	Rice	Nuziveedu Seeds Ltd
5	REG/2009/200	Extant (VCK)	NC-183	Tetraploid Cotton	Nuziveedu Seeds Ltd
6	REG/2009/214	Extant (VCK)	NC-1107	Tetraploid Cotton	Nuziveedu Seeds Ltd
7	REG/2009/231	Extant (VCK)	NC-168	Tetraploid Cotton	Nuziveedu Seeds Ltd
8	REG/2010/68	New	KBMS 261	Pearl Millet	Kaveri Seed Company Ltd
9	REG/2010/120	New	KSR 6171	Sorghum	Kaveri Seed Company Ltd
10	REG/2010/138	New	KBMS 353	Pearl Millet	Kaveri Seed Company Ltd
11	REG/2010/162	New	KBMS 229	Pearl Millet	Kaveri Seed Company Ltd
12	REG/2010/168	New	KBR 672	Pearl Millet	Kaveri Seed Company Ltd
13	REG/2010/170	New	KBR 882	Pearl Millet	Kaveri Seed Company Ltd
14	REG/2010/172	New	KBR 880	Pearl Millet	Kaveri Seed Company Ltd
15	REG/2010/259	New	NP-6226	Rice	Nuziveedu Seeds Ltd
16	REG/2010/380	Extant (VCK)	TM 61455	Tomato	Mahyco Private Limited
17	REG/2010/382	New	TM 61483	Tomato	Mahyco Private Limited
18	REG/2010/383	New	MOK 60027	Okra/Lady's Finger	Mahyco Private Limited
19	REG/2010/447	Extant (VCK)	S-EP-041	Brinjal	Mahyco Private Limited
20	REG/2010/492	New	BA-1006	Tomato	Nuziveedu Seeds Ltd
21	REG/2010/519	Extant (VCK)	PSCP-02	Tetraploid Cotton	Pravardhan Seeds Pvt Ltd

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
22	REG/2010/521	Extant (VCK)	PC-P201	Tetraploid Cotton	Prabhat Agri Biotech Ltd
23	REG/2010/522	Extant (VCK)	PC-P701	Tetraploid Cotton	Prabhat Agri Biotech Ltd
24	REG/2010/531	Extant (VCK)	PSCP-03	Tetraploid Cotton	Pravardhan Seeds Pvt Ltd
25	REG/2011/142	New	KOL 1164	Okra/Lady's Finger	Kaveri Seed Company Ltd
26	REG/2011/143	New	KOL 1163	Okra/Lady's Finger	Kaveri Seed Company Ltd
27	REG/2011/144	New	KOL 1162	Okra/Lady's Finger	Kaveri Seed Company Ltd
28	REG/2011/145	New	KOL 1155	Okra/Lady's Finger	Kaveri Seed Company Ltd
29	REG/2011/146	New	KOL 1154	Okra/Lady's Finger	Kaveri Seed Company Ltd
30	REG/2011/148	New	KOL 1147	Okra/Lady's Finger	Kaveri Seed Company Ltd
31	REG/2011/867	Farmer	SUNA PANI-G	Rice	Bharat Gouda
32	REG/2011/1345	New	S-EP-061	Brinjal	Mahyco Private Limited
33	REG/2011/1349	New	NPS-2309R	Rice	Nuziveedu Seeds Ltd
34	REG/2011/1350	New	NPS-2001A	Rice	Nuziveedu Seeds Ltd
35	REG/2012/115	Extant (VCK)	NBJ-66	Brinjal	Nuziveedu Seeds Ltd
36	REG/2012/209	New	BJ 60309	Brinjal	Mahyco Private Limited
37	REG/2012/211	New	BJ 60310	Brinjal	Mahyco Private Limited
38	REG/2012/241	New	NP-947R	Rice	Nuziveedu Seeds Ltd
39	REG/2012/243	New	NP-95151R	Rice	Nuziveedu Seeds Ltd
40	REG/2012/290	Extant (VCK)	NBJ-N04	Brinjal	Nuziveedu Seeds Ltd
41	REG/2012/394	Extant (VCK)	ACG-13-II (Ajeet-13-II)	Tetraploid Cotton	Ajeet Seeds Ltd
42	REG/2013/87	New	NC-173/1 BG-II	Tetraploid Cotton	Nuziveedu Seeds Ltd
43	REG/2013/125	New	NC-1161	Tetraploid Cotton	Nuziveedu Seeds Ltd
44	REG/2013/132	New	KPP 4012	Pigeon pea Sunflower	Kaveri Seed Company Ltd
45	REG/2013/216	Extant (Notified)	NSFH - 1001		Nuziveedu Seeds Ltd
46	REG/2013/228	New	PSCP 34 BG-I	Tetraploid Cotton	Pravardhan Seeds Pvt Ltd
47	REG/2013/422	New	JKC 1039 BGII	Tetraploid	JK Agri Genetics Ltd

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
				Cotton	
48	REG/2013/423	New	JKC 1034 BGII	Tetraploid Cotton	JK Agri Genetics Ltd
49	REG/2013/424	Extant (VCK)	JKC 728	Tetraploid Cotton	JK Agri Genetics Ltd
50	REG/2013/426	New	JKC 6067	Tetraploid Cotton	JK Agri Genetics Ltd
51	REG/2013/428	New	JKC 7235	Tetraploid Cotton	JK Agri Genetics Ltd
52	REG/2013/474	New	PAN-5010	Rice	Pan Seeds Pvt Ltd
53	REG/2013/514	New	BIO-E11	Brinjal	DCM Shriram Limited
54	REG/2013/515	New	BIO-E10	Brinjal	DCM Shriram Limited
55	REG/2013/540	New	KSF-413R	Sunflower	Kaveri Seed Company Ltd
56	REG/2013/544	New	KSF-256A	Sunflower	Kaveri Seed Company Ltd
57	REG/2013/630	Farmer	BEGUNG (Panthan)	Brinjal	Loko Farmer's Club
58	REG/2013/670	New	279B	Sorghum	Indian Council of Agricultural Research
59	REG/2013/672 A	New	415A	Sorghum	Indian Council of Agricultural Research
60	REG/2013/672 B	New	415B	Sorghum	Indian Council of Agricultural Research
61	REG/2013/672 R	New	CB 33	Sorghum	Indian Council of Agricultural Research
62	REG/2013/872	New	NP-4008	Rice	Nuziveedu Seeds Ltd
63	REG/2013/873	New	NP-4004	Rice	Nuziveedu Seeds Ltd
64	REG/2013/954	New	GG-04	Durum Wheat	Green Gold Agritech (I)
65	REG/2013/955	New	GG-24	Wheat	Green Gold Agritech (I)
66	REG/2013/956	New	GG-39	Wheat	Green Gold Agritech (I)
67	REG/2013/1171	Farmer	ADI	Black pepper	Poonacha N.N.
68	REG/2013/1172	Extant (Notified)	Sabour Surbhit	Rice	Bihar Agricultural University
69	REG/2013/1282	Extant (Notified)	Pusa-6 (IET 22290) (Pusa 1612-07-6-5)	Rice	Indian Agricultural Research Institute
70	REG/2013/1309	Farmer	RAGHUSAL	Rice	Anjan Kumar Sinha
71	REG/2014/177	Farmer	SAGG BHAT	Rice	Seed Saver Farmers' Group
72	REG/2014/446	Extant (VCK)	PC - P501	Tetraploid Cotton	Prabhat Agri Biotech Ltd

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
73	REG/2014/447	Extant (VCK)	PC - P031 Bt	Tetraploid Cotton	Prabhat Agri Biotech Ltd
74	REG/2014/449	Extant (VCK)	PC - P251	Tetraploid Cotton	Prabhat Agri Biotech Ltd
75	REG/2014/453	Extant (VCK)	PC - P311	Tetraploid Cotton	Prabhat Agri Biotech Ltd
76	REG/2014/463	Extant (VCK)	PC - P371 Bt	Tetraploid Cotton	Prabhat Agri Biotech Ltd
77	REG/2014/469	Extant (VCK)	PC - P961 Bt2	Tetraploid Cotton	Prabhat Agri Biotech Ltd
78	REG/2014/470	Extant (VCK)	PC - P071 Bt2	Tetraploid Cotton	Prabhat Agri Biotech Ltd
79	REG/2014/472	Extant (VCK)	PC - P851 Bt2	Tetraploid Cotton	Prabhat Agri Biotech Ltd
80	REG/2014/480	New	PC - P3812/2 BG-II	Tetraploid Cotton	Prabhat Agri Biotech Ltd
81	REG/2014/493	New	NP - 11	Rice	Nuziveedu Seeds Ltd
82	REG/2014/494	New	NP - 9745	Rice	Nuziveedu Seeds Ltd
83	REG/2014/534	Farmer	JOPA MANIPURI	Rice	Ananta Singphow
84	REG/2014/546	Farmer	MAIDANG CHANGNNENG	Rice	Ananta Singphow
85	REG/2014/551	Farmer	MYOCHANG	Rice	Ananta Singphow
86	REG/2014/554	Farmer	LOTHABOR	Rice	Ananta Singphow
87	REG/2014/556	Farmer	KABRI	Rice	Ananta Singphow
88	REG/2014/628	New	BIO TS 270	Tomato	DCM Shriram Limited
89	REG/2014/877	Farmer	Balinta pesalu	Green gram	Biodiversity Management Committee
90	REG/2014/899	Farmer	RUNNA CHANNA	Chickpea	Ram Chandra Prasad Singh
91	REG/2014/980	New	NP-9164	Rice	Nuziveedu Seeds Ltd
92	REG/2014/981	New	NP-4228	Rice	Nuziveedu Seeds Ltd
93	REG/2014/982	New	NP-20-2-1	Rice	Nuziveedu Seeds Ltd
94	REG/2014/983	New	NP-4201	Rice	Nuziveedu Seeds Ltd
95	REG/2014/985	New	BHIMA DARK RED (NRCRO-3/RGO-53)	Onion	Indian Council of Agricultural Research
96	REG/2014/1063	New	EAGLE-145	Durum Wheat	Eagle Seeds & Biotech Ltd
97	REG/2014/1174	Farmer	SATI	Rice	Dipak Mondal
98	REG/2014/1179	Farmer	HETOMARI	Rice	Manash Kumar Roy
99	REG/2014/1181	Farmer	SANKENE	Rice	Lakshan Pramanick
100	REG/2014/1182	Farmer	GOCHI	Rice	Dilip Kumar Sarkar
101	REG/2014/1188	Farmer	MURGI BALAM	Rice	Bishwanath Mondal

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
102	REG/2014/1189	Farmer	JHINGESAL	Rice	Bishwanath Mondal
103	REG/2014/1190	Farmer	MEGHI	Rice	Dilip Kumar Sarkar
104	REG/2014/1191	Farmer	CHINGRI FULI	Rice	Dilip Kumar Sarkar
105	REG/2014/1192	Farmer	BAKU	Rice	Dilip Kumar Sarkar
106	REG/2014/1275	New	NP-125	Rice	Nuziveedu Seeds Ltd
107	REG/2014/1276	New	NP-9311	Rice	Nuziveedu Seeds Ltd
108	REG/2014/1277	New	NP-9946	Rice	Nuziveedu Seeds Ltd
109	REG/2014/1287	New	CR 2829-PLN-23	Rice	Indian Council of Agricultural Research
110	REG/2014/1288	New	CR 2829-PLN-100	Rice	Indian Council of Agricultural Research
111	REG/2014/1289	New	CR 2829-PLN-116	Rice	Indian Council of Agricultural Research
112	REG/2014/1290	New	CR 2830-PLS-124	Rice	Indian Council of Agricultural Research
113	REG/2014/1721	New	KCL-10	Tetraploid Cotton	Kaveri Seed Company Ltd
114	REG/2014/1726	New	KCL-19	Tetraploid Cotton	Kaveri Seed Company Ltd
115	REG/2014/1727	New	KCL-17	Tetraploid Cotton	Kaveri Seed Company Ltd
116	REG/2014/1728	New	KCL-16	Tetraploid Cotton	Kaveri Seed Company Ltd
117	REG/2014/1730	New	KCL-24	Tetraploid Cotton	Kaveri Seed Company Ltd
118	REG/2014/1731	New	KCL-23	Tetraploid Cotton	Kaveri Seed Company Ltd
119	REG/2014/1732	New	KCL-22	Tetraploid Cotton	Kaveri Seed Company Ltd
120	REG/2014/1736	New	KCL-2	Tetraploid Cotton	Kaveri Seed Company Ltd
121	REG/2014/1737	New	KCL-3	Tetraploid Cotton	Kaveri Seed Company Ltd
122	REG/2014/1740	New	KCL-6	Tetraploid Cotton	Kaveri Seed Company Ltd
123	REG/2014/1895	New	KCL-41	Tetraploid Cotton	Kaveri Seed Company Ltd
124	REG/2014/2019	New	MRP 5491	Rice	Mahyco Private Limited
125	REG/2014/2029	New	CR 2830-PLS-156	Rice	Indian Council of Agricultural Research
126	REG/2014/2030	New	CR 2829-PLN-98	Rice	Indian Council of Agricultural Research
127	REG/2014/2031	New	CR 2829-PLN-32	Rice	Indian Council of Agricultural Research

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
128	REG/2014/2033	New	CR 2829-PLN-99	Rice	Indian Council of Agricultural Research
129	REG/2014/2034	New	CR 2829-PLN-37	Rice	Indian Council of Agricultural Research
130	REG/2014/2125	Farmer	Deshi Kareli	Bitter Gourd	Adresh Kumar
131	REG/2014/2126	Farmer	Sweta	Bottle Gourd	Rajghri Singh
132	REG/2014/2129	Farmer	Deshi Long	Bottle Gourd	Anikate Kumar
133	REG/2014/2133	Farmer	Adresh Round	Brinjal	Dilip Kumar Singh
134	REG/2014/2137	Farmer	Chuti Sunahari	Lentil	Montu Kumar
135	REG/2014/2166	Farmer	Sonachur Sugandhit	Rice	Prantap Kumar
136	REG/2014/2234	New	MHC4T007	Maize	Metahelix Life Sciences Limited
137	REG/2014/2293	Farmer	PRATAY-RAN	Rice	Amarkan Rural Socio-Environmental Welfare Society (ARSW Society)
138	REG/2014/2314	Farmer	SHATABDI	Rice	Amarkan Rural Socio-Environmental Welfare Society (ARSW Society)
139	REG/2014/2317	Farmer	MASHURI-II	Rice	Amarkan Rural Socio-Environmental Welfare Society (ARSW Society)
140	REG/2014/2322	Farmer	SABITRI-I	Rice	Amarkan Rural Socio-Environmental Welfare Society (ARSW Society)
141	REG/2014/2327	Farmer	SAJANI	Rice	Amarkan Rural Socio-Environmental Welfare Society (ARSW Society)
142	REG/2014/2328	Farmer	RIYA	Rice	Amarkan Rural Socio-Environmental Welfare Society (ARSW Society)
143	REG/2014/2357	New	GK951	Sorghum	Ganga Kaveri Seeds Pvt Ltd
144	REG/2014/2377	New	GK950	Sorghum	Ganga Kaveri Seeds Pvt Ltd
145	REG/2014/2402	New	GK952	Sorghum	Ganga Kaveri Seeds Pvt Ltd
146	REG/2014/2419	New	JKR 06128	Pearl Millet	JK Agri Genetics Ltd
147	REG/2014/2423	New	AEL-7	Brinjal	Ajeet Seeds Ltd
148	REG/2014/2424	New	AEL-114-1	Brinjal	Ajeet Seeds Ltd
149	REG/2014/2426	New	AEL-194	Brinjal	Ajeet Seeds Ltd
150	REG/2014/2427	New	AEL-172	Brinjal	Ajeet Seeds Ltd
151	REG/2015/213	New	NPS-2111	Rice	Nuziveedu Seeds Ltd

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
152	REG/2015/301	New	PMGP100001A	Pearl Millet	Metahelix Life Sciences Limited
153	REG/2015/314	Farmer	Baigan-GL	Brinjal	Birendra Singh
154	REG/2015/328	New	NP-7060	Rice	Nuziveedu Seeds Ltd
155	REG/2015/329	New	NP-7002	Rice	Nuziveedu Seeds Ltd
156	REG/2015/330	New	NP-7009	Rice	Nuziveedu Seeds Ltd
157	REG/2015/331	Farmer	SHARBATI	Rice	Prabhpal Singh Dhillon
158	REG/2015/358	Farmer	LAL BADSHABHOG	Rice	Dalpur Sree Sree Gyanananda Saraswati Ashram
159	REG/2015/363	Extant (Notified)	MUGAD SIRI- 1253	Rice	University of Agricultural Sciences
160	REG/2015/409	Farmer	Desi Garma Mung	Green gram	Vinay Kumar Yadav
161	REG/2015/443	New	HR411127R	Rice	DCM Shriram Limited
162	REG/2015/673	New	NP-9380	Rice	Nuziveedu Seeds Ltd
163	REG/2015/674	New	NP-9560	Rice	Nuziveedu Seeds Ltd
164	REG/2015/675	New	NP-9731	Rice	Nuziveedu Seeds Ltd
165	REG/2015/680	New	NP-9368	Rice	Nuziveedu Seeds Ltd
166	REG/2015/681	New	NP-9359	Rice	Nuziveedu Seeds Ltd
167	REG/2015/682	New	NP-9561	Rice	Nuziveedu Seeds Ltd
168	REG/2015/807	New	MZ14SO14N	Maize	Metahelix Life Sciences Limited
169	REG/2015/923	Extant (VCK)	NFS-607	Watermelon	Nuziveedu Seeds Ltd
170	REG/2015/925	Extant (VCK)	NFS-609	Watermelon	Nuziveedu Seeds Ltd
171	REG/2015/926	Extant (VCK)	NFS-608	Watermelon	Nuziveedu Seeds Ltd
172	REG/2015/1009	New	PH1RA9	Maize	Pioneer Overseas Corporation
173	REG/2015/1011	New	PH2RBR	Maize	Pioneer Overseas Corporation
174	REG/2015/1012	New	PH217Z	Maize	Pioneer Overseas Corporation
175	REG/2015/1160	Farmer	NMS-2	Rice	M.K. Shankarguru
176	REG/2015/1166	New	M172R	Pearl Millet	Pioneer Overseas Corporation
177	REG/2015/1273	New	RA320	Rice	Pioneer Overseas Corporation
178	REG/2015/1276	New	RA401F	Rice	Pioneer Overseas

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
					Corporation
179	REG/2015/1658	New	IFGTB-CJ-9	Casurina	Institute of Forest Genetics and Tree Breeding
180	REG/2015/1659	New	IFGTB-EC-6	Eucalyptus	Institute of Forest Genetics and Tree Breeding
181	REG/2015/1666	New	MZ14S018N	Maize	Metahelix Life Sciences Limited
182	REG/2015/1670	Farmer	KASHIYA BINNI	Rice	Punjan Barman
183	REG/2015/1671	Farmer	KATARIBHOG	Rice	Punjan Barman
184	REG/2015/1677	Farmer	LAL DHYAPA	Rice	Punjan Barman
185	REG/2015/1680	Farmer	MALSHIRA	Rice	Punjan Barman
186	REG/2015/1685	Farmer	PHOOL PAKRI	Rice	Punjan Barman
187	REG/2015/1688	Farmer	SADA MALA	Rice	Punjan Barman
188	REG/2015/1690	Farmer	SESHA PHAL	Rice	Ashamanjon Barman
189	REG/2015/1700	Farmer	SESHA PHAL-1	Rice	Ashamanjon Barman
190	REG/2015/1701	Farmer	SHIAL BHOMRA	Rice	Punjan Barman
191	REG/2015/1703	Farmer	SITALKUCHI-1	Rice	Ramkrishna Barman
192	REG/2015/1704	Farmer	SITALKUCHI-2	Rice	Ramkrishna Barman
193	REG/2015/1705	Farmer	SITALKUCHI-3	Rice	Ramkrishna Barman
194	REG/2015/1707	Farmer	SITALKUCHI-5	Rice	Ramkrishna Barman
195	REG/2015/1708	Farmer	SITALKUCHI-6	Rice	Punjan Barman
196	REG/2015/1709	Farmer	SUNGA BORO	Rice	Saren Roy
197	REG/2015/1710	Farmer	TARA PAKRI	Rice	Punjan Barman
198	REG/2015/1712	Farmer	TARA PAKRI SELECTION-1	Rice	Punjan Barman
199	REG/2015/1719	Farmer	TULSHIBHOG	Rice	Punjan Barman
200	REG/2015/1720	Farmer	UTTAR BANGA LOCAL-1	Rice	Punjan Barman
201	REG/2015/1721	Farmer	UTTAR BANGA LOCAL-2	Rice	Punjan Barman
202	REG/2015/1722	Farmer	UTTAR BANGA LOCAL-3	Rice	Punjan Barman
203	REG/2015/1723	Farmer	UTTAR BANGA	Rice	Punjan Barman

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
			LOCAL-4		
204	REG/2015/1724	Farmer	UTTAR BANGA LOCAL-5	Rice	Punjan Barman
205	REG/2015/1741	Farmer	UTTAR BANGA LOCAL-18	Rice	Punjan Barman
206	REG/2015/1742	Farmer	UTTAR BANGA LOCAL-19	Rice	Punjan Barman
207	REG/2015/1747	Farmer	KHATO SARSON	Rapeseed (Torja)	Punjan Barman
208	REG/2015/1792	Extant (VCK)	CIM-KRANTI	Menthol Mint	Council of Scientific and Industrial Research
209	REG/2015/1801	Farmer	SUGANDHASA L-II	Rice	Amarkan Rural Socio-Environmental Welfare Society (ARSW Society)
210	REG/2015/2018	Extant (Notified)	BHIMA SUPER	Onion	Indian Council of Agricultural Research
211	REG/2016/3	Farmer	NAGAVI MALDANDI	Sorghum	Siddarameshwar Sajjanshetly
212	REG/2016/5	New	PP56	Pearl Millet	Bayer Crop Science LP
213	REG/2016/6	New	PSP66	Pearl Millet	Bayer Crop Science LP
214	REG/2016/68	New	M297F	Pearl Millet	Pioneer Overseas Corporation
215	REG/2016/70	Extant (VCK)	JI0801FC	Indian Mustard (Sarso)	Pioneer Overseas Corporation
216	REG/2016/232	Extant (Notified)	GNR-4	Rice	Navsari Agricultural University
217	REG/2016/354	Extant (VCK)	Arka Swadesh	Rose	Indian Institute of Horticultural Research
218	REG/2016/405	Extant (VCK)	R849	Rice	Pioneer Overseas Corporation
219	REG/2016/421	Extant (Notified)	DBW 93	Wheat	Indian Council of Agricultural Research
220	REG/2016/433	Farmer	Jeera Pratap	Rice	Sukesh Kumar
221	REG/2016/452	Farmer	Kanak	Rice	Sahendra Das
222	REG/2016/474	Farmer	Balakis	Rice	Indradev Yadav
223	REG/2016/527	New	RA403F	Rice	Pioneer Overseas Corporation
224	REG/2016/553	New	NQP-23	Rice	Nuziveedu Seeds Ltd
225	REG/2016/554	New	NP - 9995	Rice	Nuziveedu Seeds Ltd
226	REG/2016/555	New	NP - 9862	Rice	Nuziveedu Seeds Ltd
227	REG/2016/556	New	NP - 10026	Rice	Nuziveedu Seeds Ltd

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
228	REG/2016/557	New	NP - 9807	Rice	Nuziveedu Seeds Ltd
229	REG/2016/558	New	NP - 7811	Rice	Nuziveedu Seeds Ltd
230	REG/2016/563	Farmer	PRERNA	Indian Mustard (Sarso)	Rohtash Singh
231	REG/2016/685	Farmer	SKF-WD-7003	Durum Wheat	N.S. Sipani
232	REG/2016/686	Farmer	SKF-WA 2022	Wheat	N.S. Sipani
233	REG/2016/687	Farmer	SKF-WA 462 (WAMAN)	Wheat	N.S. Sipani
234	REG/2016/688	Farmer	SKF-C N-5	Wheat	N.S. Sipani
235	REG/2016/689	Farmer	SKF-WA 6051	Wheat	N.S. Sipani
236	REG/2016/690	Farmer	SKF-WA 6058	Wheat	N.S. Sipani
237	REG/2016/691	Farmer	SKF-SPS-11	Soybean	N.S. Sipani
238	REG/2016/692	Farmer	SKF-433	Soybean	N.S. Sipani
239	REG/2016/693	Farmer	SKF-148	Soybean	N.S. Sipani
240	REG/2016/694	Farmer	SKF-BS-9	Soybean	N.S. Sipani
241	REG/2016/695	Farmer	SKF-1050	Soybean	N.S. Sipani
242	REG/2016/771	New	BIO EM189Z	Pearl Millet	DCM Shriram Limited
243	REG/2016/804	Extant (Notified)	Mash 1008	Black gram	Punjab Agricultural University
244	REG/2016/938	New	TH-AYB 20217	Maize	Bisco Biosciences Pvt Ltd
245	REG/2016/949	Farmer	Chwar Dhan	Rice	Yudhveer Singh Rawat
246	REG/2016/988	Extant (Notified)	KASHI AMAN (VRT0801)	Tomato	Indian Council of Agricultural Research
247	REG/2016/1307	Extant (Notified)	RH 0406	Indian Mustard (Sarso)	Indian Council of Agricultural Research
248	REG/2016/1308	Extant (Notified)	RH 0749	Indian Mustard (Sarso)	Indian Council of Agricultural Research
249	REG/2016/1332	Extant (Notified)	Bhavapuri Sannalu	Rice	Indian Council of Agricultural Research
250	REG/2016/1339	Extant (Notified)	NANDYALA SONA	Rice	Acharya N.G. Ranga Agricultural University
251	REG/2016/1387	Extant (Notified)	MP 3382 (JW 3382)	Wheat	Indian Council of Agricultural Research

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
252	REG/2016/1739	Extant (Notified)	Pant Basmati 2	Rice	G.B. Pant University of Agriculture & Technology
253	REG/2016/1832	Farmer	TICHIN	Rice	Mr. Balkrishna Kanu Daul
254	REG/2016/1943	Farmer	KHAMBA PHOU	Rice	Sh. Ningombam Khamba Meitei
255	REG/2016/1944	Farmer	Sanayambi Phou	Rice	Sh. Chanambam Sanayamba Meitei
256	REG/2017/132	Farmer	Koriya	Maize	Shyam Munda
257	REG/2017/152	Extant (Notified)	MPO (JW) 1255	Durum Wheat	Indian Council of Agricultural Research
258	REG/2017/328	Farmer	Safed Bhundi	Sorghum	Anantram Yadav
259	REG/2017/331	Farmer	Krishna Jwar	Barley	Rambhajan Yadav
260	REG/2017/339	Farmer	Jwa Nathuram	Barley	Nathu Ram Vishwakarma
261	REG/2017/534	Farmer	Jwa Gajendra	Barley	Gajendra Singh
262	REG/2017/541	Farmer	Jhundi Jwar Nirpat	Sorghum	Nirpat Singh
263	REG/2017/739	Farmer	Gajpal Jowar	Sorghum	Gajpal Dhurve
264	REG/2017/1060	Farmer	Jwar Kutki	Sorghum	Bablu
265	REG/2017/1434	Farmer	LALL BASANADHAN	Rice	Kadambini Behera
266	REG/2017/1435	Farmer	LALL S-13	Rice	Abani Behera
267	REG/2017/1436	Farmer	RATNA MENTI	Rice	Ashok Kumar Barik
268	REG/2017/1437	Farmer	LALL S-5	Rice	Bijaya Kumar Patra
269	REG/2017/1438	Farmer	LALL MANI	Rice	Sudhiranjan Barik
270	REG/2017/1440	Farmer	LALL PARI	Rice	Krushna Chandra Swain
271	REG/2017/1441	Farmer	LALL KUBERA	Rice	Kshetramohan Behera
272	REG/2017/1442	Farmer	KESHO PHOU	Rice	Wahengbam Kesho Singh
273	REG/2017/1443	Farmer	Kathai Phou	Rice	Lairenlakpam Indrajit Meitei
274	REG/2017/1444	Farmer	Darum Phou	Rice	Sorokhaibam Sanajaoba Meitei
275	REG/2017/1445	Farmer	Rajen Phou	Rice	Ngangom Rajen Singh
276	REG/2017/1564	New	IFGTB-CH-1	Casurina	Institute of Forest Genetics and Tree Breeding

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
277	REG/2017/1565	New	IFGTB-CH-2	Casurina	Institute of Forest Genetics and Tree Breeding
278	REG/2017/1566	New	IFGTB-CH-3	Casurina	Institute of Forest Genetics and Tree Breeding
279	REG/2017/1567	New	IFGTB-CH-4	Casurina	Institute of Forest Genetics and Tree Breeding
280	REG/2017/1568	New	IFGTB-CH-5	Casurina	Institute of Forest Genetics and Tree Breeding
281	REG/2017/1607	Extant (VCK)	VNR BIHI	Guava	VNR Seeds Pvt Ltd
282	REG/2017/1643	Farmer	Sulkhaniya Bajra	Pearl Millet	Shri. Hanumanaram Jhuriya
283	REG/2017/1770	New	Arka Ivory	Rose	Indian Institute of Horticultural Research
284	REG/2017/1792	Farmer	GPT-1	Pigeon pea	Goudappa Bhimashankar Patil
285	REG/2017/1898	Extant (VCK)	DOLLY	Potato	Germicopa Sas
286	REG/2017/1899	Extant (VCK)	SASSY	Potato	Germicopa Sas
287	REG/2017/1900	Extant (VCK)	NAFIDA	Potato	Germicopa Sas
288	REG/2017/1901	Extant (VCK)	EDONY	Potato	Germicopa Sas
289	REG/2017/1917	Extant (Notified)	PHULE SAMADHAN (NIAW 1994)	Wheat	Mahatma Phule Krishi Vidyapeeth
290	REG/2017/2297 H	Extant (Notified)	DRONA (KMH-2589)	Maize	Kaveri Seed Company Ltd
291	REG/2017/2297 P1	Extant (Notified)	KML2924	Maize	Kaveri Seed Company Ltd
292	REG/2017/2297 P2	Extant (Notified)	KML2323	Maize	Kaveri Seed Company Ltd
293	REG/2017/2298	Extant (VCK)	SRW231	Wheat	DCM Shriram Limited
294	REG/2017/2299	Extant (VCK)	SRW 252	Wheat	DCM Shriram Limited
295	REG/2017/2300	Extant (VCK)	SRW 303	Wheat	DCM Shriram Limited
296	REG/2017/2301	Extant (VCK)	SRW 404	Wheat	DCM Shriram Limited
297	REG/2017/2302	Extant (VCK)	SRW 111	Wheat	DCM Shriram Limited
298	REG/2017/2311	Farmer	NARENDRA 09	Wheat	Narendra Singh Mehra
299	REG/2017/2312	New	PH2YNZ	Maize	Pioneer Overseas

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
					Corporation
300	REG/2017/2370	New	PH2NFT	Maize	Pioneer Overseas Corporation
301	REG/2017/2371	New	PH177S	Maize	Pioneer Overseas Corporation
302	REG/2018/68	Farmer	BARTIA	Rice	Pragati Self Help Group
303	REG/2018/74	New	AN-5268	Rice	Pan Seeds Pvt Ltd
304	REG/2018/84	Farmer	MANIRATNAM	Rice	Chandra Shekhar Singh
305	REG/2018/86	Farmer	Vasundhara Madhuri 5555	Rice	Chandra Shekhar Singh
306	REG/2018/87	Farmer	Vasundhara Khushboo	Rice	Chandra Shekhar Singh
307	REG/2018/88	Farmer	Vasundhara Aman	Rice	Chandra Shekhar Singh
308	REG/2018/96	Extant (Notified)	CSV 33 MF (SPV-2242)	Sorghum	Indian Council of Agricultural Research
309	REG/2018/150	Farmer	TIEW LYNGKSIAR DOHNUD	Orchid	Charles Tympuin
310	REG/2018/151	Farmer	TIEW LYNGKSIAR LIENG	Orchid	Charles Tympuin
311	REG/2018/152	Farmer	TIEW LYNGSKAW	Orchid	Charles Tympuin
312	REG/2018/153	Farmer	TIEW KYRWOHKAW	Orchid	Charles Tympuin
313	REG/2018/154	Farmer	TIEW TDONGRISANG	Orchid	Charles Tympuin
314	REG/2018/319	Extant (Notified)	DEHANGI	Rice	Assam Agricultural University
315	REG/2018/325	Farmer	CBCM-206	Chickpea	Bullu Maurya
316	REG/2018/327	Farmer	CJRA-208	Chickpea	Jagvanti Devi
317	REG/2018/388	Farmer	CLCM-279	Chickpea	Lalji Prasad Verma
318	REG/2018/409	Farmer	CCRA-300	Chickpea	Chandrabhan Singh
319	REG/2018/412	Farmer	CJRB-303	Chickpea	Jagvanti Devi
320	REG/2018/531	Farmer	SBG-997	Soybean	Suresh Bapurao Garmade
321	REG/2018/677	Farmer	UJALA CH-3	Chickpea	Satya Dev Singh
322	REG/2018/694	New	MALAV-221	Durum Wheat	Malav Seeds Pvt. Ltd.
323	REG/2019/5	Extant (VCK)	MANJARI KISHMISH	Grapes	ICAR-National Research Centre for Grapes
324	REG/2019/6	Extant (VCK)	MANJARI NAVEEN	Grapes	ICAR-National Research Centre for Grapes
325	REG/2019/11	Farmer	SIGANDINI	Black pepper	Ramakanth Ramachandra Hegde
326	REG/2019/113 H	Extant (Notified)	Karimnagar Makka-1 (KNMH 4010131)	Maize	Indian Council of Agricultural Research

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
327	REG/2019/113 P1	Extant (Notified)	PFSR-3	Maize	Indian Council of Agricultural Research
328	REG/2019/113 P2	Extant (Notified)	BML-7	Maize	Indian Council of Agricultural Research
329	REG/2019/135	Extant (VCK)	Swarna Sawani	Ridge gourd	Indian Council of Agricultural Research
330	REG/2019/152	Extant (Notified)	RVK 11	Tetraploid Cotton	Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya
331	REG/2019/175	Extant (Notified)	PHULE VIMUKTA	Okra/Lady's Finger	Mahatma Phule Krishi Vidyapeeth
332	REG/2020/18	Extant (Notified)	BCCC-1, Shweta	Jute	Bidhan Chandra Krishi Viswavidyalaya
333	REG/2020/27	Extant (Notified)	KARAN MALTSONA (DWRB 160)	Barley	Indian Council of Agricultural Research
334	REG/2020/40	Extant (Notified)	SUJAY (SCS 793)	Tetraploid Cotton	University of Agricultural Sciences
335	REG/2020/42	Extant (Notified)	BGDS 1063	Tetraploid Cotton	University of Agricultural Sciences
336	REG/2020/43	Extant (Notified)	SCS 1061	Tetraploid Cotton	University of Agricultural Sciences
337	REG/2020/51	Extant (Notified)	KBGA-1	Rajgeera	University of Agricultural Sciences
338	REG/2020/61 H	Extant (Notified)	MP 3030	Rice	Mahindra Agri solutions Ltd
339	REG/2020/61 A	Extant (VCK)	100727A	Rice	Mahindra Agri solutions Ltd
340	REG/2020/61 B	Extant (VCK)	100727B	Rice	Mahindra Agri solutions Ltd
341	REG/2020/61 R	Extant (VCK)	100874R	Rice	Mahindra Agri solutions Ltd
342	REG/2020/74 H	Extant (Notified)	ADV 756 (ADV 0990296)	Maize	UPL Limited
343	REG/2020/74 P1	Extant (Notified)	330086	Maize	UPL Limited
344	REG/2020/74 P2	Extant (Notified)	330084	Maize	UPL Limited
345	REG/2020/94	Extant (Notified)	NP 9359-9 (Sandhya)	Rice	Nuziveedu Seeds Ltd
346	REG/2020/95	Extant (Notified)	YNP-9761 (IET 24338)(YNP 9761)	Rice	Yaaganti Seeds Pvt ltd
347	REG/2020/97	Farmer	VSD Seedless	Grapes	Pradeep Shankar Desai, Vijay Shankar, Dilip Shankar Desai
348	REG/2020/98	Farmer	KING BERRY	Grapes	Dattatraya Nanasaheb Kale
349	REG/2020/99	Farmer	RK SEEDLESS	Grapes	Raghunath Kedari

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
					Zambre
350	REG/2020/100 H	Extant (Notified)	Uday (DMR-248) Mahabeej-1114	Maize	Maharashtra State Seeds Corporation Ltd.
351	REG/2020/100 P1	Extant (Notified)	S-9-F-11(CMS013004X CMS003146)-3-9-1-11	Maize	Maharashtra State Seeds Corporation Ltd.
352	REG/2020/100 P2	Extant (Notified)	S-9-M-14	Maize	Maharashtra State Seeds Corporation Ltd.
353	REG/2020/103	Extant (Notified)	CO 30	Sorghum	Tamil Nadu Agricultural University
354	REG/2020/104	Extant (Notified)	Blackgram VBN 6	Black gram	Director of Research, Tamil Nadu Agricultural University
355	REG/2020/105	Extant (Notified)	Blackgram VBN 9	Black gram	Director of Research, Tamil Nadu Agricultural University
356	REG/2020/106	Extant (Notified)	Blackgram VBN 10	Black gram	Director of Research, Tamil Nadu Agricultural University
357	REG/2020/107	Extant (Notified)	Sorghum k 12 (TKSV 0809)	Sorghum	Director of Research, Tamil Nadu Agricultural University
358	REG/2020/108	Extant (Notified)	Paiyur 2 (DPI 20030)	Finger Millet	Director of Research, Tamil Nadu Agricultural University
359	REG/2020/109	Extant (Notified)	Greengram VBN 4	Green gram	Director of Research, Tamil Nadu Agricultural University
360	REG/2020/110	Extant (Notified)	CO 9 (CRG 2012-25)	Pigeon pea	Director of Research, Tamil Nadu Agricultural University
361	REG/2020/111	Extant (Notified)	Blackgram VBN 8	Black gram	Director of Research, Tamil Nadu Agricultural University
362	REG/2020/112	Extant (Notified)	Greengram VBN(Gg) 3	Green gram	Director of Research, Tamil Nadu Agricultural University
363	REG/2020/114 H	Extant (Notified)	Pearl millet HYBRID CO 9	Pearl Millet	Director of Research, Tamil Nadu Agricultural University
364	REG/2020/114 A	Extant (Notified)	ICMA 93111A	Pearl Millet	Director of Research, Tamil Nadu Agricultural University
365	REG/2020/114 B	Extant (Notified)	ICMB 93111B	Pearl Millet	Director of Research, Tamil Nadu Agricultural University
366	REG/2020/114 R	Extant (Notified)	PT 6029-30	Pearl Millet	Director of Research, Tamil Nadu Agricultural University

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
367	REG/2020/116	Extant (Notified)	Gujarat Fodder Sorghum-6 (GFS-6)	Sorghum	Navsari Agricultural University
368	REG/2020/117	Extant (Notified)	Gujarat Navsari Jowar-1 (GNJ-1)	Sorghum	Navsari Agricultural University
369	REG/2020/137	Extant (Notified)	Pusa Wheat 1621 (HI 1621)	Wheat	Indian Council of Agricultural Research
370	REG/2020/138	Extant (Notified)	Pusa Wheat 1620 (HI 1620)	Wheat	Indian Council of Agricultural Research
371	REG/2020/139	Extant (Notified)	Pusa Wheat 8805 (HI 8805)	Durum Wheat	Indian Council of Agricultural Research
372	REG/2020/140	Extant (Notified)	PUSA WHEAT 8802 (HI 8802)	Durum Wheat	Indian Council of Agricultural Research
373	REG/2020/141	Extant (Notified)	PUSA WHEAT 1628 (HI 1628)	Wheat	Indian Council of Agricultural Research
374	REG/2020/142	Extant (Notified)	VL Gehun 3004	Wheat	Indian Council of Agricultural Research
375	REG/2020/143	Extant (Notified)	VL Gehun 953	Wheat	Indian Council of Agricultural Research
376	REG/2020/144	Extant (Notified)	VL Gehun 2014	Wheat	Indian Council of Agricultural Research
377	REG/2020/145	Extant (Notified)	VL Gehun 967	Wheat	Indian Council of Agricultural Research
378	REG/2020/146	Extant (Notified)	Pusa Wheat 3249 (HD 3226)	Wheat	Director ICAR-Indian Agricultural Research Institute
379	REG/2020/149	Extant (Notified)	HD 3237 (Pusa Wheat 3237)	Wheat	Director ICAR-Indian Agricultural Research Institute
380	REG/2020/150	Extant (Notified)	HD 3271	Wheat	Director ICAR-Indian Agricultural Research Institute
381	REG/2020/151	Extant (Notified)	HS562 (Central Wheat HS562)	Wheat	Director ICAR-Indian Agricultural Research Institute
382	REG/2020/152	Extant (Notified)	HS542 (Pusa Kiran)	Wheat	Director ICAR-Indian Agricultural Research Institute
383	REG/2020/155	Extant (Notified)	K-12	Diploid Cotton	Director of Research, Tamil Nadu Agricultural University
384	REG/2020/157	Extant (Notified)	CO-14	Tetraploid Cotton	Director of Research, Tamil Nadu Agricultural University
385	REG/2020/158	Extant (Notified)	Cotton CO 15 (TCH 1705)	Tetraploid Cotton	Director of Research, Tamil Nadu Agricultural University

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
386	REG/2020/159	Extant (Notified)	Cotton CO 16 (TCH 1777)	Tetraploid Cotton	Director of Research, Tamil Nadu Agricultural University
387	REG/2020/160	Extant (Notified)	VGD 1 (VG 09006) (IET 24606)	Rice	Director of Research, Tamil Nadu Agricultural University
388	REG/2020/161	Extant (Notified)	CO52	Rice	Director of Research, Tamil Nadu Agricultural University
389	REG/2020/162	Extant (Notified)	CO(R)48	Rice	Director of Research, Tamil Nadu Agricultural University
390	REG/2020/163	Extant (Notified)	CO 43 SUB-1 (IET 25676)	Rice	Director of Research, Tamil Nadu Agricultural University
391	REG/2020/167	Extant (Notified)	Rice CR 1009 Sub 1	Rice	Director of Research, Tamil Nadu Agricultural University
392	REG/2020/168 H	Extant (Notified)	CORH 3	Rice	Director of Research, Tamil Nadu Agricultural University
393	REG/2020/168 A	Extant (VCK)	TNAU CMS 2A	Rice	Director of Research, Tamil Nadu Agricultural University
394	REG/2020/168 B	Extant (VCK)	TNAU CMS 2B (CB 9736)	Rice	Director of Research, Tamil Nadu Agricultural University
395	REG/2020/168 R	Extant (VCK)	CB87R	Rice	Director of Research, Tamil Nadu Agricultural University
396	REG/2020/170	Extant (Notified)	Blackgram KKM 1 (KKB 0511)	Black gram	Director of Research, Tamil Nadu Agricultural University
397	REG/2020/171	Extant (Notified)	MDU1 (ACM 10 145)	Barnyard Millet	Director of Research, Tamil Nadu Agricultural University
398	REG/2020/172	Extant (Notified)	ADT 6 (ADB 13004)	Black gram	Director of Research, Tamil Nadu Agricultural University
399	REG/2020/173	Extant (Notified)	Perennial Fodder Sorghum CO 31	Sorghum	Director of Research, Tamil Nadu Agricultural University
400	REG/2020/174	Extant (Notified)	UAS-466	Durum Wheat	University of Agricultural Sciences
401	REG/2020/229 H	Extant (Notified)	US 303 (IET 25804)	Rice	Seed Works International Pvt Ltd
402	REG/2020/229 A	Extant (VCK)	F-5030 A	Rice	Seed Works International Pvt Ltd
403	REG/2020/229 B	Extant (VCK)	F-5030 B	Rice	Seed Works International Pvt Ltd
404	REG/2020/229 R	Extant	M-6834-4	Rice	Seed Works International

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
		(VCK)			Pvt Ltd
405	REG/2020/230 H	Extant (Notified)	US 380 (IET 25728)	Rice	Seed Works International Pvt Ltd
406	REG/2020/230 A	Extant (VCK)	F-5014 A	Rice	Seed Works International Pvt Ltd
407	REG/2020/230 B	Extant (VCK)	F-5014 B	Rice	Seed Works International Pvt Ltd
408	REG/2020/230 R	Extant (VCK)	M-1066	Rice	Seed Works International Pvt Ltd
409	REG/2020/232	Extant (Notified)	TRY 3, TR 2003 025 (IET 19673)	Rice	Director of Research, Tamil Nadu Agricultural University
410	REG/2020/233	Extant (Notified)	ADT 52, AD 13121 (IET 25521)	Rice	Director of Research, Tamil Nadu Agricultural University
411	REG/2020/235	Extant (Notified)	TM07278 (TKM 14)	Rice	Director of Research, Tamil Nadu Agricultural University
412	REG/2020/242	Extant (Notified)	SVPR4 (TSH 9704)	Tetraploid Cotton	Director of Research, Tamil Nadu Agricultural University
413	REG/2020/243	Extant (Notified)	SVPR5 (TSH-0250)	Tetraploid Cotton	Director of Research, Tamil Nadu Agricultural University
414	REG/2020/244	Extant (Notified)	SVPR 6 (TSH-04/115)	Tetraploid Cotton	Director of Research, Tamil Nadu Agricultural University
415	REG/2020/245	Extant (Notified)	TKM 13	Rice	Director of Research, Tamil Nadu Agricultural University
416	REG/2020/247	Extant (Notified)	ADT53, AD 07073 (IET 23955)	Rice	Director of Research, Tamil Nadu Agricultural University
417	REG/2020/248	Extant (Notified)	ADT 51, AD 09367 (IET 23617)	Rice	Director of Research, Tamil Nadu Agricultural University
418	REG/2020/249	Extant (Notified)	Anna(R) 4	Rice	Director of Research, Tamil Nadu Agricultural University
419	REG/2020/250	Extant (Notified)	MDU 6 (IET 23994)	Rice	Director of Research, Tamil Nadu Agricultural University
420	REG/2020/302 H	Extant (Notified)	PAN 2423	Rice	Pan Seeds Pvt Ltd
421	REG/2020/302 A	Extant (Notified)	25A	Rice	Pan Seeds Pvt Ltd
422	REG/2020/302 B	Extant (Notified)	25B	Rice	Pan Seeds Pvt Ltd
423	REG/2020/302 R	Extant (Notified)	AN 138	Rice	Pan Seeds Pvt Ltd
424	REG/2020/303	Extant	TNAU RICE	Rice	Director of Research,

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
		(Notified)	ADT50 (IET19159)(ADO 2235)		Tamil Nadu Agricultural University
425	REG/2020/304	Extant (Notified)	ADT 49	Rice	Director of Research, Tamil Nadu Agricultural University
426	REG/2020/306	Extant (Notified)	SPV-2217	Sorghum	University of Agricultural Sciences
427	REG/2020/324	Extant (Notified)	DH 114(Him Pratham)	Wheat	CSK Himachal Pradesh Krishi Vishvavidyalaya
428	REG/2020/325 H	Extant (Notified)	Pratap Hybrid Maize-3 (PH-1974)	Maize	Indian Council of Agricultural Research
429	REG/2020/325 P1	Extant (Notified)	EI-586-2	Maize	Indian Council of Agricultural Research
430	REG/2020/325 P2	Extant (Notified)	EI-670-2	Maize	Indian Council of Agricultural Research
431	REG/2020/326 H	Extant (Notified)	Pant Pop corn 1 (DPCH-306)	Maize	Indian Council of Agricultural Research
432	REG/2020/326 P1	Extant (Notified)	DPCI 508	Maize	Indian Council of Agricultural Research
433	REG/2020/326 P2	Extant (Notified)	DPCI 513	Maize	Indian Council of Agricultural Research
434	REG/2020/327 H	Extant (Notified)	Pusa Jawahar Hybrid Maize-1	Maize	Indian Council of Agricultural Research
435	REG/2020/327 P1	Extant (Notified)	PML-93	Maize	Indian Council of Agricultural Research
436	REG/2020/327 P2	Extant (Notified)	PML-105	Maize	Indian Council of Agricultural Research
437	REG/2020/329 H	Extant (Notified)	Central Maize Sweet Corn 1 (FSCH 18)	Maize	Indian Council of Agricultural Research
438	REG/2020/329 P1	Extant (Notified)	VSL 16	Maize	Indian Council of Agricultural Research
439	REG/2020/329 P2	Extant (Notified)	VSL 4	Maize	Indian Council of Agricultural Research
440	REG/2020/331	Extant (Notified)	GNR-6 (NVSR-2031)	Rice	Navsari Agricultural University
441	REG/2020/333	Extant (Notified)	GRG 152 (Bheema)	Pigeon pea	University of Agricultural Sciences
442	REG/2020/334	Extant (Notified)	MABC-WR-SA1 (Super Annigeri-1)	Chickpea	University of Agricultural Sciences
443	REG/2020/335	Extant (Notified)	GS-23 (KANAKA)	Sorghum	Dr. G. Girish, Scientist (GBP)
444	REG/2020/337	Extant (Notified)	RAJ VIJAY JOWAR 1862	Sorghum	Director, Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya
445	REG/2020/338	Extant (Notified)	Him Palam Gehun2 (HPW 368)	Wheat	CSK Himachal Pradesh Krishi Vishvavidyalaya

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
446	REG/2020/339	Extant (Notified)	WANI 103 (PDKV HURDA KARTIKI)	Sorghum	Dr. Panjabrao Deshmukh Krishi Vidyapeeth
447	REG/2020/386	Extant (Notified)	Palam Triloki	Garden pea	CSK Himachal Pradesh Krishi Vishvavidyalaya
448	REG/2020/387	Extant (Notified)	PALAM SUMOOL	Garden pea	CSK Himachal Pradesh Krishi Vishvavidyalaya
449	REG/2021/4	Extant (Notified)	GNV 10-89 (IET 24716)	Rice	University of Agricultural and Horticultural Sciences
450	REG/2021/5	Extant (Notified)	ADILABAD KAPAS-1	Tetraploid Cotton	Professor Jayashankar Telangana State Agricultural University
451	REG/2021/7	Extant (Notified)	PHULE RAJMAH (GRB-902)	Kidney bean	Mahatma Phule Krishi Vidyapeeth
452	REG/2021/0012 H	Extant (Notified)	PHULE SUMAN (RHH-1007)	Tetraploid Cotton	Mahatma Phule Krishi Vidyapeeth
453	REG/2021/0012 P1	Extant (Notified)	RHC-566/1-1	Tetraploid Cotton	Mahatma Phule Krishi Vidyapeeth
454	REG/2021/0012 P2	Extant (Notified)	RHC-0610	Tetraploid Cotton	Mahatma Phule Krishi Vidyapeeth
455	REG/2021/0013	Extant (Notified)	JAICAR SONA (CSV 39/SPV 2358)	Sorghum	Indian Council of Agricultural Research
456	REG/2021/0014	Extant (Notified)	JAICAR HEERA (CSV 36/SPV 2301)	Sorghum	Indian Council of Agricultural Research
457	REG/2021/0015	Extant (Notified)	CSV 40F (SPV 2387)	Sorghum	Indian Council of Agricultural Research
458	REG/2021/0016	Extant (Notified)	Telangana Jonna 1 (CSV 41/SPV 2437)	Sorghum	Indian Council of Agricultural Research
459	REG/2021/0017	Extant (Notified)	MACS 4028 (d)	Durum Wheat	Agharkar Research Institute
460	REG/2021/0018	Extant (Notified)	MACS 4058 (d)	Durum Wheat	Agharkar Research Institute
461	REG/2021/0020	Extant (Notified)	CO 17 (TCH 1819)	Tetraploid Cotton	Tamil Nadu Agricultural University
462	REG/2021/0040 H	Extant (Notified)	VL Maize Hybrid 57 (FH 3754)	Maize	Indian Council of Agricultural Research
463	REG/2021/0040 P1	Extant (Notified)	V 412	Maize	Indian Council of Agricultural Research
464	REG/2021/0040 P2	Extant (Notified)	V 433	Maize	Indian Council of Agricultural Research
465	REG/2021/0042 H	Extant (Notified)	VL Sweet Corn Hybrid 2 (FSCH 75)	Maize	Indian Council of Agricultural Research
466	REG/2021/0042 P1	Extant (Notified)	VSL 26	Maize	Indian Council of Agricultural Research
467	REG/2021/0042	Extant	VSL 27	Maize	Indian Council of

S. No.	Registration No.	Type of Variety	Denomination	Crop	Applicant Name
	P2	(Notified)			Agricultural Research
468	REG/2021/0043	Extant (Notified)	BGDS 1033	Tetraploid Cotton	University of Agricultural Sciences
469	REG/2021/0044	Extant (Notified)	GUJARAT URD 2	Black gram	Junagadh Agricultural University
470	REG/2021/0060	Extant (Notified)	PDKV Sardar (AKAW 4210-6)	Wheat	Dr. Panjabrao Deshmukh Krishi Vidyapeeth
471	REG/2021/0067	Extant (Notified)	PKB 6	Cowpea	University of Agricultural Sciences
472	REG/2021/0068	Extant (Notified)	PDKV Blackgold (AKU 10-1)	Black gram	Dr. Panjabrao Deshmukh Krishi Vidyapeeth
473	REG/2021/0073	Extant (Notified)	Pusa 1692-10-20-1-1-1 (IET 26995)	Rice	Indian Agricultural Research Institute
474	REG/2021/0076	Extant (Notified)	DBW 303 (Karan Vaishnavi)	Wheat	Indian Council of Agricultural Research
475	REG/2021/0077	Extant (Notified)	DDW 48	Durum Wheat	Indian Council of Agricultural Research

Annexure IX: Acronyms

AICRP	All India Coordinated Research Project
BAU	Birsa Agricultural University
BMC	Biodiversity Management Committee
BCIL	Biotech Consortium India Limited
CAG	Comptroller and Auditor General of India
CARI	Central Agricultural Research Institute
CBD	Convention on Biological Diversity
CMD	Chairmen-Cum-Managing Director
CSIR	Council of Scientific and Industrial Research
CHES	Central Horticultural Experiment Station
CSSRI	Central Soil Salinity Research Institute
DAC	Department of Agriculture & Co-operation
DUS	Distinctiveness, Uniformity and Stability
EVRC	Extant Variety Recommendation Committee
ETL	Economic Threshold Level
GATT	General Agreement on Tariffs and Trade
IARI	Indian Agricultural Research Institute
ICAR	Indian Council of Agricultural Research
ICFRE	Indian Council of Forest Research & Education
IINDUS	Indian Information System as per DUS guidelines
IPGRI	International Plant Genetic Resource Institute (Bioversity International)
ITPGRFA	International Treaty on Plant Genetic Resource for Food and Agriculture
KAU	Kerala Agriculture University
KVK	Krishi Vigyan Kendra
NASC	National Agricultural Science Center
NGO	Non-Governmental Organization

NORV	Notified and Released Varieties of India
NSAI	National Seed Association of India
NRCPB	National Research Center on Plant Biotechnology
NSRTC	National Seed Research and Training Center
MSEZ	Mangalore Special Economic Zone Limited
OECD	Organization for Economic Co-operation and Development
PS	Principal Scientist
PD	Project Director
PGR	Plant Genetic Resources
PPVFRA	Protection of Plant Varieties and Farmers' Rights Authority
PVE	Plant Variety Examiner
PVIS	Plant Variety Information System
PVJ	Plant Variety Journal of India
R&D	Research and Development
RTI	Right to Information
SAO	Senior Accounts Officer
SAU	State Agricultural Universities
STO	Senior Technical Officer
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UPOV	International Union of Protection of New Varieties of Plants
VCK	Variety Common Knowledge
WTO	World Trade Organization

Annual Report for the year 2021-22 was adopted by the Protection of Plant Varieties and Farmers' Rights Authority in its 34th Authority meeting held on 1st December, 2022 vide Agenda item No. 6 at New Delhi.



Protection of Plant Varieties and Farmers' Rights Authority

(A Statutory Authority Created by an Act of Parliament)

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