N B P G R

GUIDELINES FOR REGISTRATION OF PLANT GERMPLASM

(THIRD EDITION, 2023)

National Bureau of Plant Genetic Resources
Indian Council of Agricultural Research
Pusa Campus, New Delhi-110 012

GUIDELINES
FOR
REGISTRATION
OF
PLANT GERMPLASM
(THIRD EDITION, 2023)

ICAR-NATIONAL BUREAU OF PLANT GENETIC RESOURCES
(INDIAN COUNCIL OF AGRICULTURAL RESEARCH)
Pusa Campus, New Delhi-110 012

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Front Cover Page Photographs (from left top to right in each row):

Wheat (*Triticum aestivum*) (IC0640680; INGR21183) High Grain Zinc concentration (57mg/kg); Rice (*Oryza sativa*) (IC0591486; INGR21016) Anaerobic germination tolerant; Oil palm (*Elaeis guineensis* Jacq.) (IC0597687; INGR17083) Virescens fruit colour, Dura fruit type; Pigeon Pea (*Cajanus cajan*) (IC0635030; INGR20025) High 100 green seed weight of 50-52 g., high 100 dry seed weight of 22.5-23.04g., Compact plant type; Groundnut (*Arachis hypogaea*) (IC0642010;INGR21229) High hundred kernel weight (85.36 g); Rose (*Rosa hybrid*) (IC0584136; INGR10071) Less thorns straight stalk of cut flower quality, light pink flowers with pointed bud and high centre; Sweet potato (*Ipomoea batatas*) (IC0593652; INGR13022) High extractable starch (20-21%); Sorghum (*Sorghum bicolor*) (IC0568489; INGR18022) Scented sorghum; Apple (*Malus domestica*) (IC0637592; INGR21070) Early maturity (114-117 days) with better fruit size quality; Chilli (*Capsicum annuum*) (IC0436231; INGR14040) Purple phenotype; Cotton (*Gossypium arboreum*) (IC0613959; INGR15005) Narrow leaf lobed & brown lint;

Technical Assistance and Designing of Cover Page:

Arup Das, Young Professional

Back cover page photograph: Front view of NBPGR Building

FOREWORD

India has a very strong crop improvement programme undertaken by Indian Council of Agricultural Research (ICAR) in the form of All India Co-ordinated Crop Improvement Projects (AICRIPs) for almost all important crops for food and agriculture. The essential features of the AICRIPs are collaborative multi-location evaluation. This has paid rich dividends in the form of development and release of improved crop varieties and hybrids that played a pivotal role in enhancing the national agricultural production. During the process of germplasm manipulations, research and experimentation to develop improved varieties for specific or multiple traits, many useful materials are developed which may not qualify for notification and release as variety. Such material may have resistance/tolerance to biotic and abiotic stresses, and other unique traits with academic, scientific and applied values. ICARhas established a mechanism to register the trait- specific germplasm through ICAR-National Bureau of Plant Genetic Resources to address the above concerns and recognizing the contributions of researchers who had developed/identified the trait- specific germplasm. The main purpose of plant germplasm registration is to bring the trait-specific germplasm in publicdomain and to disseminate the information thereof for using the same effectively in developing new varieties.

In 1996, the detailed guidelines and the proforma for the registration of plant germplasm were formalized for major food crops and approved in 1999. Since then several changes in management of plant genetic resources and related policies have taken place nationally and internationally. The present revision of the guidelines is an effort towards simplification and inclusion of provisions required as per the changing scenario for submission of application for registration, data requirement and deposition of seed/genetic material. This facilitates the availability of the information in public domain, which has become important to safeguard the national resources. Registered germplasm will be useful to search the new genes for incorporation in existing cultivars to ensure the food and nutritional security.

(TR Sharma)

New Delhi
April, 2023

Deputy Director General (Crop Science) &
Chairman, Plant Germplasm Registration Committee
Indian Council of Agricultural Research
Krishi Bhawan, New Delhi

Abbreviations

AICRP	:	All India Co-ordinated Research Project
AVT	:	Advanced Varietal Trial
CMS	:	Cytoplasmic Male Sterility
EC	:	Exotic Collection
IC	:	Indigenous Collection
ICAR	:	Indian Council of Agricultural Research
IGIC	:	Institute Germplasm Identification Committee
IPR	:	Intellectual Property Right
M&AP	:	Medicinal and Aromatic Plants
NAGS	:	National Active Germplasm Site
NARS	:	National Agricultural Research System
NBPGR	:	National Bureau of Plant Genetic Resources
NGB	:	National Genebank
NRC	:	National Research Centre
PC	:	Project Co-Ordinator
PD	:	Project Director
PGRC	:	Plant Germplasm Registration Committee
PGRFA	:	Plant Genetic Resources for Food and Agriculture
PPV&FRA	:	Protection of Plant Varieties and Farmers' Rights Act

REGISTRATION OF PLANT GERMPLASM

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

PREAMBLE

The need for recognition to the developers of new improved varieties is being served by the Central Sub-Committees on Crop Standards, Notification and Release of Varieties of Agricultural Crops (CVRC) as part of the Indian National Agricultural Research System (NARS). Further, the enactment of Protection of Plant Varieties and Farmers' Rights Act (PPV&FRA) 2001 provides for protection of the intellectual property rights of plants breeders and farmers involved in development of plant varieties.

The Indian Council of Agricultural Research (ICAR) operates the mechanism for evaluation, identification and recommendation for release of crop varieties. The Ministry of Agriculture under the Seed Act, 1966, Section 5 provides procedure for notification of released varieties through CVRC and ensures production and sale of seeds meeting the Minimum Seed Certification Standards.

Plant Genetic Resources for Food and Agriculture (PGRFA) form the basis for genetic improvement of crop species in development of new varieties. Hence, it was realized that due recognition should be accorded to the persons/institutions who are associated with the development and identification of improved or unique potentially valuable germplasm and genetic stocks. It is also desirable from the point of changed world scenario of Intellectual Property Rights (IPR) regimes to inventorize, document and bring all the important genetic resources into public domain, facilitating their safe and accelerated use in research and crop improvement. Recognizing the importance of the issue, a mechanism for "Registration of Plant Germplasm" was instituted at the ICAR-National Bureau of Plant Genetic Resources (ICAR-NBPGR), New Delhi by the ICAR to serve as a recognized tool for registration of PGRFA at national level.

In 1996, detailed guidelines and proforma for registration was formalized to facilitate the process of germplasm registration. Taking into consideration the upcoming developments in management of plant genetic resources (PGR) and related policies at global and national level, the guidelines and proforma continue to evolve and accommodate changes suggested by the experts. The guidelines were first published in 2005 and major revisions were incorporated in 2014. After the introduction of Germplasm Registration Information System (GRIS) in 2018

the entire process of PGRC was made online, however the changes in the proforma and new online links were not updated in the guidelines. In 2018, again the guidelines were revisited to incorporate changes in the data requirement with respect to registration of biennial andperennial crops. In 2023, based on suggestions from an expert committee (online meeting 23/12/22 dated) and recommendation of the PGRC meetings, revisions were made with respect to data and documentary proof requirement and submission of propagules in compliance to provisions required as per the changing scenario. The draft revised guidelines were circulated to all the Directors of ICAR-Crop based institutes/PC/PDs and SAUs for comments and suggestions. The third edition of the guidelines include all the recommendations received over the period of time. The details related to list of National Active germplasm Sites (NAGs) and important online links were also updated.

Since the institution of this mechanism, 49 meetings have been held and a total of 2074 germplasm belonging to 254 crop species have been registered. The present revision of the guidelines is an effort towards simplification and inclusion of provision required as per the changing scenario for submission of application and seed/genetic material, recommended by Plant Germplasm Registration Committee (PGRC).

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GUIDELINES FOR REGISTRATION OF PLANT GERMPLASM

1. Plant Germplasm Registration Committee

(i) The Plant Germplasm Registration Committee (PGRC) is constituted under the Chairmanship of Deputy Director General (Crop Science), Indian Council of Agricultural Research, New Delhi.

(ii) It includes Director, ICAR-National Bureau of Plant Genetic Resources (ICAR-NBPGR), New Delhi, as a permanent member and a senior level scientist from ICAR-NBPGR to function as Member Secretary, which would be identified by the Chairman, PGRC. The other members will be co-opted as per the advice of the Chairman.

(iii) It has provision for adoption of need-based crop specialists with reference to the material under consideration, with the approval of the Chairman. A three-year panel will be constituted to review the proposals for registration.

2. Nodal Agency

(i) ICAR-NBPGR, New Delhi, is the nodal agency for registration of germplasm. The application should be submitted online (http://www.nbpgr.ernet.in:8080/registration/) and one hard copy of the same addressed to the Director, ICAR-NBPGR, New Delhi-110 012, along with the seed sample or a certificate of submission and establishment of propagules with respective crop/plant-based National Active Germplasm Site (NAGS). (AnnexureI).

(ii) The Member Secretary, PGRC, will duly acknowledge with date, the receipt of the application and of the seed material (in case of vegetatively propagated crops after ensuring deposition and establishment of genetic material at the relevant NAGS), the acknowledgement would be issued, communicating application number and the national identity.

(iii) ICAR-NBPGR maintains a permanent record and database listing the germplasm materials approved by PGRC with details on unique trait(s) and other related information in soft and hard copy.

3. Application Form

Application shall be submitted online (http://www.nbpgr.ernet.in:8080/registration/). The PGRC shall meet quarterly (preferably last month of the quarter) a year, with the concurrence of the Chairman, for consideration of applications and related matters following the guidelines (Annexure II A) and description of codes (Annexure II B) Applicant should fill Annexure IV and submit with application.

4. Eligibility Criteria for Registration

Criteria

(i) Germplasm of field, horticultural and other economic crops, including agro-forestry species, spices, medicinal and aromatic plants *etc.*, ornamental plants, which is unique, uniform, stable and has potential attributes of academic, scientific or commercial value shall be eligible for registration.

(ii) Selection for unique traits from landraces (other than the trait, a landrace is known for) may be considered for registration.

(iii) Exotic germplasm registration (please see **Annexure X**).

Proof

All claims concerning the germplasm/genetic stocks/elite material/advanced material submitted for registration should accompany scientific evidence for uniqueness, reproducibility and value in the form of:

(i) Performance (yield contributing traits, adaptation traits, quality traits) data for **at least four environments (location and year combination)** under All India Co-Ordinated Research Project (AICRP) trial/nursery tests supported with relevant extracts of the documents (*e.g.* comparative data of all entries tested) or verification by concerned Project Director/Project Co-ordinator (PD/PC) or under any other relevant system verified by Competent Authority. For qualitative traits (*e.g.* flower colour, leaf venation, seed colour) data of two environments duly supported by documents.

(ii) For resistant/tolerance to biotic and abiotic stresses, data should be obtained **for at least four environments** along with stress-specific resistant / susceptible checks under established hot spot locations and under artificial screening (epiphytotic) conditions. For biotic stresses in annual/biennial crops inheritance of the trait should be worked out. All the proposers of the germplasm/genetic stock should sign declaration that standard procedures were followed for testing/screening.

(iii) Supporting biochemical evaluation data should be obtained from **at least four environments (seasons/year).**

(iv) The proposed genetic stock/germplasm should also be evaluated along with already registered genetic stock(s)/germplasm(s), if available.

(v) Supporting documentary evidence on (i), (ii) and (iii) either in **AICRP Report or peer reviewed journals with NAAS rating**.

AND

(vi) Recommendation of Institute Germplasm Identification Committee (IGIC) regarding the uniqueness of germplasm for trait (s) claimed is mandatory.

Proof for Biennial and Perennial Crops

All claims concerning the germplasm submitted for registration should accompany scientific evidence for uniqueness, reproducibility and value in the form of:

(i) Performance (yield contributing traits, adaptation traits, quality traits) **data for at least two environments/seasons** (location and year combination) under All India Co-Ordinated Research Project (AICRP) trial/nursery tests supported with relevant extracts of the documents (*e.g.* comparative data of all entries tested) or verification by concerned Project Director/Project Co-Ordinator (PD/PC) or under any other relevant system verified by Competent Authority. **For qualitative traits (*e.g.* flower colour, pulp colour, fruit/ pod colour and seed colour *etc*) data of two environments/ seasons duly supported by documents.**

(ii) For resistant/tolerance to biotic and abiotic stresses, data should be obtained **at least two environments/seasons** under established hot spot locations and under artificial screening (epiphytotic) conditions. For biotic stresses in annual/biennial crops inheritance of the trait should be worked out. All the proposers of the germplasm/genetic stock should sign declaration that standard procedures were followed for testing/screening.

(iii) Supporting biochemical evaluation data should be obtained from **at least two environments/seasons.**

(iv) The proposed genetic stock/germplasm should also be evaluated along with already registered genetic stock(s)/germplasm(s), if available.

(v) Supporting documentary evidence on (i), (ii) and (iii) either in **AICRP Report or peer reviewed journals with NAAS rating.**

AND

(vii) Recommendation of Institute Germplasm Identification Committee (IGIC) regarding the uniqueness of germplasm for trait(s) claimed is mandatory.

5. Germplasm Ineligible for Registration

(i) Germplasm or genetic stock without accompanying documentary evidence for the claim made in the application.

(ii) Germplasm or genetic stock that does not contain complete passport data (see Annexure III), including authenticated taxonomic identity, parentage, institutional or national identity, geographical location of origin and all such information relating to the development and contribution, if any, to the uniqueness of the germplasm.

(iii) Exotic material *per se*, with no evidence of human intervention in its improvement.

(iv) Released Varieties and their parents/hybrid/traditional or farmers' varieties of common knowledge.

(v) Germplasm/GMO which involves any technology, which is injurious to the life or health of human being, animals or plants.

(vi) Material for which any form of protection has been sought elsewhere (For e.g under PPVFRA).

6. Screening of Application(s) and their Consideration by the PGRC

(i) The Member Secretary, PGRC, will screen the proposal(s) submitted on prescribed Proforma (Form A, Annexure II), as per the guidelines of the checklist (Annexure IV) at ICAR-NBPGR. Applicant should fill the Annexure (IV).

(ii) Each proposal will be reviewed by the relevant Director, PD/PC, expert or head of organization for validation of information, particularly for uniqueness of the proposed germplasm (Annexure V). In case the proposals received from PC/PDs or Directors of the crop-based institutes, the proposals will be sent to concerned experts in the area.

(iii) After initial screening the incomplete applications would be advised for appropriate revision, if required.

(iv) The application in which the validation of the data is considered necessary, the applicant would be required to produce a validation report from an appropriate institute, as advised by the Member Secretary. The revised application should accompany such report duly endorsed by the Competent Authority of the institute, as advised for the validation.

(v) The proposals complete in all respects along with the comments of relevant Director, PD/PC or expert, will be put up to the PGRC for consideration.

(vi) The decision of the PGRC will be final.

7. Validity of Registration

The period for validity of registration shall be 18 years for trees and vines and 15 years for other plant species, after which the registered germplasm would be national sovereign property.

8. Publication of Registered Germplasm

All Germplasm approved for registration would be officially communicated to the applicants along with Registration Number. A certificate to this effect will also be issued to theapplicant. A brief description of not more than one page (see Annexure VI for instructions) would be published in the ensuing issue of Indian Journal of Plant Genetic Resources - official publication of the Indian Society of Plant Genetic Resources, C/o ICAR-NBPGR, New Delhi-110012 and updated on ICAR-NBPGR Internet Website http://www.nbpgr.ernet.in

9. Conservation, Maintenance and Sustainable Utilization of Registered Germplasm

(i) Registered germplasm will be conserved either in National Genebank (http://www.nbpgr.ernet.in:8080/registration/InventoryofGermplasm.aspx) or at designated crop/plant-based NAGS.

(ii) All the material registered with PGRC will also be sent by the developer to the relevant Director, PD/PC or NAGS with request for sowing/planting of registered germplasm in demonstration plots for annual field days and multiplication.

(iii) The institution associated with the development of the germplasm is also mandated with the maintenance of working stock of registered germplasm for supply to *bona fide* users.

10. De-registration

A registration may be repealed by the PGRC in case of false claim(s). Appeal for counter claim, if any, should reach to the Member Secretary, PGRC, within a period of three months of the publication of brief note in the Indian Journal of Plant Genetic Resources.

PROCEDURE FOR SUBMISSION OF PROPOSAL/ GERMPLASM MATERIAL

1. Submission of Application and Germplasm

(i) All plant germplasm proposed to be registered should be submitted online on http://www.nbpgr.ernet.in:8080/registration/ along with the recommendation of the IGIC and scanned signature of Head of the institution with official seal and documentary evidences. The germplasm accompanied with the hard copy of the online application along with relevant documents should be sent to:

The Director
ICAR-National Bureau of Plant Genetic Resources
Pusa Campus, New Delhi-110012
Phone: 011-25843697
FAX: 011-2584 2495
Email: director.nbpgr@icar.gov.in

(ii) The Form-A must be accompanied by complete description of the germplasm material using standard descriptors (as per concerned crop AICRP or ICAR- NBPGR descriptors). It may include photograph(s) of plant/plant parts/crop and preferably fingerprints (DNA or biochemical profile *etc.* using reproducible markers wherever reported/ published).

(iii) A declaration to the effect that working-stock for supply to users would be maintained by the institution associated with the development of the material. It may be ensured by the Director/PD/PC or Competent Authority of the concerned organization.

(iv) A declaration that such germplasm does not contain any gene or gene sequence involving terminator technology would also be mandatory.

2. Guidelines for Submitting the Orthodox Seed Germplasm*

Orthodox seed that can be dried to low moisture level without loss of seed viability.

(i) A minimum number of **5000 seeds in case of cross-pollinated** crop species, **4000 in case of self-pollinated** and **100-1000 in difficult species** (Annexure VII), such as some vegetables, medicinal and aromatic plants, wild relatives *etc.* should be submitted.

(ii) The seed should be supplied from a fresh harvest and should not be more than 60 days old.

(iii) The seeds supplied should be, healthy and physiologically mature and collected/ harvested from healthy plants.

(iv) For providing good quality healthy seeds, it is advised to dry the seed material in shade immediately after the harvest.

(v) The potential viability of seeds should be equal or more than 85% in most crop species except in special cases, such as cotton, forage grasses, sugarcane some vegetable crops *etc.* (Annexure VII).

(vi) Seed should not be treated or fumigated with any chemicals (pesticides, fungicides, naphthalene balls).

(vii) Seeds should be packed in good quality paper, muslin cloth or plastic packet(s) with proper identity label. If required, the packets should be packed in card-board boxes to minimize damage and moisture absorption during transit.

3. Guidelines for Submission of Recalcitrant/Intermediate Seed Germplasm

Recalcitrant Seeds (Annexure VIII) are characterized by large size and high moisture contents (20-80%) at the time of shedding. These can be supplied to ICAR-NBPGR, only in cases, where established protocols are available for their conservation using *in vitro* conservation methods technology (see Annexure IX) or cryopreservation method otherwise such material should be deposited to relevant NAGS (Annexure I).

Guidelines for deposition of recalcitrant seeds are mentioned below given below:

(i) At least 200-500 seeds should be supplied. However, recognizing the importance of the material, even small quantity will be acceptable.

(ii) To avoid any injury to the fruit surface they should be sent in aerated polythene bags/ cardboard boxes in the form of complete fruit.

(iii) If the fruits are bulky and difficult to transport, the seeds may be extracted without causing any injury to the embryo or embryonic axes and transported within 48 h, packed in saw dust/charcoal/peat moss *etc.*

(iv) Avoid transporting at high temperature (above 30 degree Centigrade). Store and transport preferably in moist conditions between 15-20 degree Centigrade temperature conditions.

(v) Extracted seeds may be treated with suitable fungicide (0.1% Captan or Thiram powder).

(vi) Avoid air-drying and washing of seeds.

(vii) In remaining cases the germplasm should be supplied to relevant NAGS (Annexure I) in the form of propagules for establishment in the field genebank following the guidelines given in subsequent section.

(viii) An acknowledgement for deposition and establishment of genetic material has to be obtained from the concerned NAGS and submitted along with application.

4. Guidelines for Submission of Propagules

In case of vegetatively propagated crop species, the germplasm material/propagules (**tubers, bulbs, rhizomes, cuttings** etc.) has to be supplied to the concerned crop-based designated NAGS (Annexure I) for initial establishment and conservation[1]. An acknowledgement to

[1]*The NAGS at the later stage may supply these materials to the ICAR-NBPGR for in vitro maintenance or cryopreservation as base collections. Vegetatively propagated germplasm material preferably should be supplied in vitro cultures (wherever possible). The NAGS will ensure establishment and supply of in vitro generated material to ICAR-NBPGR at least of those crops for which protocols are available at ICAR-NBPGR (Annexure IX).*

this effect has to be obtained from concerned NAGS to accompany the proposal. Additionally, following guidelines need to be followed for safe supply and conservation of germplasm:

(i) At least 10-25 propagules and for horticultural crops (10-20 propagules) (depending on crop)[1] should be supplied to the concerned NAGS for their maintenance in field genebank or *in vitro* genebank (if available) with a request for an acknowledgement. No compromise should be made by the depositor in the number of propagules to be supplied in NAGS for establishment.

(ii) The concerned NAGS should be informed in advance about the supply of material to facilitate processing and establishment of germplasm.

(iii) The genetic material, stocks, propagules of non-orthodox seed producing crops are generally being maintained in the form of grafts, slips, propagules, and plants.

While supplying this germplasm following steps and precautions should be followed depending on the crop:

(a) The **slips, grafts, propagules or plants** supplied to the NAGS should be free from insects, weeds and diseases as far as possible. The material should be well-labelled and packed properly in aerated polythene bags. During the dry summer the grafts of crafts should be wrapped in moist moss grass to retain the moisture.

(b) In case of crops like coconut and arecanut, the material should be sent either as seed nuts or seedlings (in case of hybrids). If the **embryos** need to be transferred from the field, the embryos embedded in the endosperm should be packed in the sterile plastic bag with sterile moist cotton. These should be kept in the refrigerator overnight and transferred in the same box with proper labels on it.

(c) The material should be packed in small wooden/card-board boxes with proper aeration. Also, these boxes should be well marked with labels at 3 or 4 places **"To be handled carefully: seedlings''** in order to avoid any damage during transit.

(d) The material should be sent to the NAGS immediately after harvest. To avoid any delay in transfer, use speed post or reliable courier services or air-freight**.**

[1]*The sample size of propagules and seed to be submitted may be revised in consultation with the Director, ICAR-NBPGR, New Delhi, or Head, Division of Germplasm Conservation, ICAR-NBPGR, New Delhi, in exceptional cases.*

Annexure I

National Active Germplasm Sites

S.No	Crop (s)	Institute	Address	Name of the Director	Email	Website
1.	Vegetables	G. B. Pant University of Agriculture and Technology	Pantnagar, Udham Singh Nagar, Uttarakhand-263145	Dr. Ajeet Singh Nain	desgbpuat@gmail.com;	https://www.gbpuat.ac.in/
2.	Cotton	ICAR-Central Institute for Cotton Research	Post Bag No.2, Shankar Nagar Post Office, Nagpur-440010, Maharashtra	Dr. YG Prasad	cicrnagpur@gmail.com; ygprasad@gmail.com;	https://www.cicr.org.in/
3.	Crops of North East ICAR RC NEH	ICAR-Research Complex for NEH Region	Umiam, Meghalaya-793103	Dr. V.K. Mishra	vk.mishra@icar.gov.in; director.icar-neh@icar.gov.in;	http://www.icarneh.ernet.in/
4.	Pulses	ICAR-Indian Institute of Pulses Research	Kanpur, Uttar Pradesh-208024	Dr. GP Dixit	director.iipr@icar.gov.in	https://iipr.icar.gov.in/
5.	Forages	ICAR-Indian Grassland and Fodder Research Institute	Jhansi, Uttar Pradesh 284003	Dr. Amaresh Chandra	director.igfri@icar.gov.in; amaresh.chandra@icar.gov.in;	https://www.igfri.res.in/
6.	Field Crops	ICAR-Vivekananda Parvatiya Krishi Anusandhan Sansthan	Almora, Uttarakhand-263601	Dr. Lakshmi Kant	director.vpkas@icar.gov.in; vpkas@nic.in;	https://vpkas.icar.gov.in/
7.	Groundnut	ICAR-Directorate of Groundnut Research	Junagadh, Gujarat-362001	Dr. SK Bera	director.dgr@icar.gov.in	https://www.dgr.org.in/
8.	Jute and Allied Fibers	ICAR-Central Research Institute for Jute & Allied Fibres	Barrackpore, Kolkata-700121 West Bengal	Dr. Gouranga Kar	director.crijaf@icar.gov.in	https://crijaf.icar.gov.in/
9.	Maize	ICAR-Indian Institute of Maize Research	PAU Campus, Ludhiana-141004, Punjab	Dr. Hanuman Sahay Jat	director.maize@icar.gov.in; pdmaize@gmail.com;	https://iimr.icar.gov.in/
10.	Oilseeds	ICAR-Indian Institute of Oilseeds Research	Rajendranagar, Hyderabad-500030, Talangana	Dr. RK Mathur	director.iior@icar.gov.in	https://icar-iior.org.in/
11.	Pearl millet	ICAR-AICRP on Pearl Millet (under IIMR), Hyderabad)	Mandor, Jodhpur-342304, Rajasthan	Dr. C Tara Satyavathi (PC-Acting)	aicrp.pearlmillet@icar.gov.in; aicpmip@gmail.com;	http://www.aicpmip.res.in/
12.	Rapeseed & Mustard	ICAR-Directorate of Rapeseed and Mustard Research	Sewar, Bharatpur-321303, Rajasthan	Dr. Pramod Kumar Rai	director.drmr@gmail.com	https://www.drmr.res.in/
13.	Rice	ICAR-National Rice Research Institute	Bidyadharpur, Cuttack-753006 Odisha	Dr. Amaresh Kumar Nayak	director.nrri@icar.gov.in; directorcrricuttack@gmail.com;	https://icar-nrri.in/
14.	Rice & Lathyrus	Indira Gandhi Krishi Vishwavidyalaya	Krishak Nagar, Raipur-492012, Chhattisgarh	Dr. Sanjay Kumar Patil (Dir of Res)	drs@igkv.ac.in	https://igkv.ac.in/
15.	Millets	ICAR-Indian Institute of Millets Research	Rajendranagar, Hyderabad -500030,	Dr. (Mrs) C TaraSatyavathi	director.millets@icar.gov.in	https://www.millets.res.in/

			Talangana			
16.	Soybean	ICAR-Indian Institute of Soybean Research	Near IT Park, Khandwa Rd, Indore-452001 Madhya Pradesh	Dr. KH Singh	director.soybean@icar.gov.in; dsrdirector@gmail.com;	https://iisrindore.icar.gov.in/
17.	Sugarcane	ICAR-Sugarcane Breeding Institute	Veerakeralam, Coimbatore-641007, Tamil Nadu	Dr. Rasappa Viswanathan	director.sbi@icar.gov.in;	https://iisr.icar.gov.in/
18.	Underutilized crops	ICAR-National Bureau of Plant Genetic Resources	Pusa Campus, New Delhi -110012	Dr. Gyanendra Pratap Singh	director.nbpgr@icar.gov.in; gp.singh@icar.gov.in;	http://www.nbpgr.ernet.in/AICRN_on_PC.aspx
19.	Wheat & Barley	ICAR-Indian Institute of Wheat and Barley Research	PB No. 158, Kunjpura Road, Karnal-132001 Haryana	Dr. Gyanendra Singh	director.iiwbr@icar.gov.in;	https://iiwbr.icar.gov.in/
20.	Agro-forestry Crops	ICAR-Central Agroforestry Research Institute	Jhansi, Near Pahuj Dam, Gwalior Rd, Jhansi-284003 Uttar Pradesh	Dr. Ayyanadar Arunachalam	director.cafri@icar.gov.in; director.cafri@gmail.com;	https://cafri.res.in/
21.	Arid fruits	ICAR-Central Institute for Arid Horticulture	Sri Ganganagar Highway, Beechwal Industrial, Area PO, Bikaner-334006, Rajasthan	Dr. Jagadish Sadanand Rane	director.ciah@icar.gov.in	https://ciah.icar.gov.in/
22.	Banana	ICAR-National Research Centre for Banana	Thogamalai Main Road, Thayanur Post, Tiruchirapalli-620102, Tamil Nadu	Dr. R Selvarajan	director.nrcb@icar.gov.in; nrcbdirector@gmail.com;	https://nrcb.icar.gov.in/
23.	Cashew	ICAR-Directorate of Cashew Research	Puttur, Karnataka-574202	Dr. J Dinakar Adiga	director.dcr@icar.gov.in; dircajures@gmail.com;	https://cashew.icar.gov.in/icar-dcr-puttur-2/
24.	Citrus Species	ICAR-Central Citrus Research Institute	Amravati Road, Nagpur-440033, Maharashtra	Dr Dilip Ghosh	Director.ccri@icar.gov.in; dirnrccngp@gmail.com;	https://icar.org.in/
25.	Ornamentals	ICAR-Directorate of Floricultural Research	Near Z Corner, Manjari Road, Mundhwa, Pune-411036, Maharashtra	Dr. KV Prasad	director.dfr@icar.gov.in; directordfr@gmail.com;	https://dfr.icar.gov.in/
26.	Grapes	ICAR-National Research Centre for Grapes	PB No.3, Manjri Farm Post, Solapur Road, Pune-412307 Maharashtra	Dr. Kaushik Banerjee	director.nrcg@icar.gov.in;	https://nrcgrapes.icar.gov.in/
27.	Leechi, Bael, Aonla & Jackfruit	ICAR-National Research Centre for Litchi	Mushahari Farm, Muzaffarpur-842002 Bihar	Dr. Vinod Kumar	director.nrcl@icar.gov.in; nrclitchi@yahoo.co.in;	https://nrclitchi.icar.gov.in/
28.	Medicinal & Aromatic plants	ICAR-Directorate of Medicinal and Aromatic Plants Research	Boriavi-387310, Anand, Gujarat	Dr. Manish Das	director.dmapr@icar.gov.in;	https://dmapr.icar.gov.in/
29.	Mango & Sub tropical fruits	ICAR-Central Institute for Subtropical Horticulture	Rehmankhera, PO Kakori, Lucknow-226101, Uttar Pradesh	Dr. Devendra Pandey	director.cish@icar.gov.in; devendra.panday@icar.gov.in;	http://www.cish.res.in/
30.	Mulberry	Central Sericultural	Hosur, Thally	Dr. BT	csgrchos.csb@nic.in;	http://csgrc.res.in/

		Germplasm Resources Centre	Rd, Hosur,Tamil Nadu- 635109	Sreenivasa		
31.	Oil Palm	ICAR-Indian Institute of Oil Palm Research	Pedavegi-534450 West Godavari Dist Andhra Pradesh	Dr. K Suresh	director.iiopr@icar.gov.in;	https://iiopr.icar.gov.in/
32.	Onion & Garlic	ICAR-Directorate of Onion and Garlic Research	Pune-Nasik Highway No.50, Rajgurunagar, Pune-410505 Maharashtra	Dr. Vijay Mahajan	director.dogr@icar.gov.in;	https://dogr.icar.gov.in/
33.	Orchids	ICAR-National Research Centre for Orchids	Pakyong, Gangtok-737106, East Sikkim	Dr. Sankar Prasad Das	director.nrco@icar.gov.in;	https://nrco.icar.gov.in/
34.	Ornamental & non-traditional crops	CSIR-National Botanical Research Institute	Lucknow, Uttar Pradesh-226001	Dr. PK Trivedi	director@nbri.res.in;	https://nbri.res.in/
35.	Plantation crops	ICAR-Central Plantation Crops Research Institute	Kudlu PO, Kasaragod-671124 Kerala	Dr. K. Balachandran Hebbar	director.cpcri@icar.gov.in; directorcpcri@gmail.com;	https://cpcri.icar.gov.in/
36.	Potato	ICAR-Central Potato Research Institute	Shimla-171001, Himachal Pradesh	Dr. Brajesh Singh	director.cpri@icar.gov.in; directorcpri@gmail.com;	https://cpri.icar.gov.in/
37.	Spices	ICAR-Indian Institute of Spices Research	Marikunnu, Kozhikode-673012, Kerala	Dr. R Dinesh	director.spices@icar.gov.in;	http://www.spices.res.in/
38.	Spices	ICAR-National Research Centre on Seed Spices	Beawar Road-305006, Ajmer, Rajasthan	Dr. Vinay Bhardwaj	director.nrcss@icar.gov.in; nrcss.director@gmail.com;	https://nrcss.icar.gov.in/
39.	Tea	UPASI Tea Research Foundation, Tea Research Institute	Nirar Dam (po), Valparai – 642 127, Coimbatore District, Tamil Nadu	Dr. R. Victor J Ilango	directorupasi@gmail.com; director@upasitearesearch.org;	http://www.upasitearesearch.org/
40.	Tea	Tocklai Tea Research Institute	Jorhat, Assam-785008	Dr. A Babu	director@tocklai.net;	https://www.tocklai.org/
41.	Temperate horticultural crops	ICAR-Central Institute of Temperate Horticulture	KD Farm, Old Air Field, PO Rangreth-190007 Srinagar, J&K	Dr. Om Chand Sharma	director.cith@icar.gov.in; dircithsgr@icar.org.in;	https://cith.icar.gov.in/
42.	Temperate horticultural crops	ICAR-NBPGR Regional Station	Shimla, Himachal Pradesh	Dr. Gyanendra Pratap Singh	director.nbpgr@icar.gov.in; gp.singh@icar.gov.in;	http://www.nbpgr.ernet.in/
43.	Tobacco	ICAR-Central Tobacco Research Institute	Bhaskar Nagar, Rajamundry-533105, Andhra Pradesh	Dr. Maganti Sheshu Madhav	directorctri@gmail.com; director.ctri@icar.gov.in;	https://ctri.icar.gov.in/
44.	Tropical fruits & Ornamental crops	ICAR-Indian Institute of Horticultural Research	Hessaraghatta Lake Post, Bengaluru -560089, Karnataka	Dr. Prakash Patil (Acting)	Director.iihr@icar.gov.in;	https://www.iihr.res.in/
45.	Tuber crops	ICAR-Central Tuber Crops Research Institute	Thiruvananthapuram, Kerala-695017	Dr. G Byju	director.ctcri@icar.gov.in;	https://www.ctcri.org/

46.	Vegetables	ICAR-Indian Institute of Vegetable Research	PB No.01, PO Jakhini, (Shahanshahpur), Varanasi-221305, Uttar Pradesh	Dr. TK Behera	director.iivr@icar.gov.in; directoriivr@gmail.com;	https://iivr.icar.gov.in/
47.	Vegetables	ICAR-IARI Regional Station	Katrain, Kullu Valley-175129, Himachal Pradesh	Dr. AK Singh	director@iari.res.in;	https://www.iari.res.in/
48.	Crops of coastal regions-	ICAR-Central Island Agricultural Research Institute	PB No. 181, Port Blair-744101, Andaman & Nicobar Islands	Dr. Eaknath B Chakurkar	director.ciari@icar.gov.in;	https://ciari.icar.gov.in/
49.	Rubber germplasm	Rubber Research Institute of India	Manganam, Kottayam, Kerala 686010	Director Research	resdir@rubberboard.org.in;	info@rubberboard.org.in

भाकृअप – राष्ट्रीय पादप आनुवंशिक संसाधन ब्यूरो
ICAR – National Bureau of Plant Genetic Resources
A nodal organization in India for the management of plant genetic resources
(An ISO 9001:2008 Certified Institute)
जननद्रव्य पंजीकरण सूचना प्रणाली
Germplasm Registration Information System (GRIS)

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Application Details of Plant Germplasm

Registration application | Attachment | Application check list

Annexure II

Form A
Application for Registration of Plant Germplasm
(To be submitted to The Director, ICAR-NBPGR, New Delhi-110012)
Please refer to guidelines for filling the application form and codes (Annexure II A, B)

Application no. Date of application

1. Application status
2. Crop name
3. Botanical name
4. Crop group
5. Biological status of the material to be registered
6. Identity
7. Criteria for registration [Unique feature(s) maximum three]
8. Nature of genetic material
9. Quantity deposited(Actual)
10. Value referred to
11. Basis of eligibility
12. Has it been registered/protected anywhere?
13. Manuscript (one-page note on proposed germplasm enclosed)
14. Particulars of the scientist(s)/person(s)/organisation/farmer/farming community who developed germplasm/genetic stock
15. Name and address of the corresponding person (Developer/Depositor)

Title	Name	Designation	Address	Telephone	Fax	Email	Mobile

16(A). Passport information of germplasm					
IC/EC	IC/EC No	Other Identity	Source	Place of Origin Tehsil/Distt/ State	Gene if any identified
Farmers/Community contribution, if any,					

(B) Pedigree of the genetic stock	
Pedigree	Breeding method

17. Salient charcteristics/chief botanical and morpho-agronomic description
18. Usefulness of identified germplasm/genetic stock
19. Year of seed production
20. Location of seed production
21. Quantity of seed available
22. Seed viability (%)
23. Additional information/Remarks
24. Recommendation of Institute's Germplasm Identification Committee
25. Season of seed production
26. Seed deposited in National Genebank
27. Material available at

UNDERTAKING

1. *I/We undertake to ensure deposition of seed/genetic matetrial for long term conservation of the aforesaid germplasm/genetic stock at the National Genbank, ICAR-NBPGR and also its sustainable use by maintaining appropriate quanitity of Active/Working Collection and providing access as appropriate on prior informed consent and on mutually agreed terms. I/We also agree to provide any further information or data pertaining to the description and unique characteristics to the ICAR/NBPGR in a transparent manner.*
2. *I/We assure genetic purity and truthfulness of seed material supplied with the application.*
3. *I/We assure that such germplasm does not contain any gene or gene sequence involving terminator technology.*

☑ I have read and agreed to the terms and conditions

SIGNATURE OF THE ASSOCIATES

SIGNATURE OF THE DEPOSITOR

COUNTERSIGNED BY HEAD OF THE INSTITUTE

Signature (SEAL)

Full Name:
Designation & Address:

SUBMIT

Guidelines for Filling Form A and Description of Codes

1. Use capital letters or write legibly. All items are self-explanatory. Give minimal explanation for particular item in "Remarks" (*Item 23*), wherever needed.
2. For *Item 7*, give maximum three most specific features, traits or alleles, considered suitable for consideration of registration.
3. Detailed description of traits and characteristics of the germplasm under *Item 17* can be given. Follow the format of variety release application or AICRP data sheets for respective crops. Use separate sheet, if needed.
4. Give main botanical and morpho-agronomic characteristics in description. Include isozyme or DNA profile or other chemical/biochemical characteristics, if available. (As per Form-A)

5.. Use codes for filling in *Item 1, 2, 5, 8, 9* [actual], *10, 11, 12, 13* and *16(b)* [Breeding Method]. In case of the code "Other" fill in specific details.

6. For filling crop name (*Item 2*) give English or Hindi name, if known. In case a local name is given then also specify in parenthesis the language or dialect in which this name is used.
7. Give name(s) of all persons associated with development of the material in *Item 14.* Use separate sheet and fill in additional names along with designation, address and phone/fax/email *etc.* beginning with S. No. 2 on new sheet, in the same format.
8. *Item 16* has two alternate parts, (a) and (b) to fill in :
   (a) In case nature of the material to be registered as given in *Item 16* is ''Germplasm'' then you must give its basic passport information (Annexure III), that should include National Identity (IC/ EC) given by NBPGR or other Identity Number allotted and maintained locally. In case of non-availability of national identity, NBPGR will provide a unique National Identity (IC), based on passport data provided by the applicant.
   (b) In case the nature of the germplasm to be registered is genetic stock, then clearly give its pedigree, including parentage, year of crossing or selection. Also give breeding method used in codes (Annexure II B).
9. Give particulars of developers in *Item 14* over and that of corresponding person in *Item 15* as the applicant and developer may not be always the same as the first person responsible for development of the material.
10. Undertaking to the effect ensuring long-term conservation and maintenance of active material for facilitating access and sustainable use has been given, which may be read and implied before signing the undertaking.

Codes for filling information in Col.1, 2, 5, 8, 9 [actual], 10, 11, 12, 13 and 16 (b) Breeding Method] of Form A

Item 1: Application Status	
N	New
R	Revised

Item 2: Crop Group	
CL	Cereals
PC	Pseudo cereals
ML	Millets
MM	Minor millets
GL	Grain legumes
OS	Oilseeds
FI	Fiber crops
FO	Forage
FT	Fruits
VG	Vegetable crops
SP	Spices
MP	Medicinal and aromatic plants
NC	Narcotics
OR	Ornamentals
FR	Forestry
CC	Commercial crops
OT	Other (Specify in Col.19)

Item 5: Biological status of material to be registered	
GP	Germplasm collection
GS	Genetic Stock
RE	Recombinant
MU	Mutant

Item 8: Nature of genetic material	
SD	Seed
TR	Tubers/Roots/Bulbs
VP	Vegetative cuttings
WP	Whole plant
OT	Other (Specify in Col.20)

Item 9: Quantity deposited with application	
	Actual

Item 10: Value referred to by applicant	
SC	Scientific
CM	Commercial
AC	Academic

Item 11: Basis of eligibility for registration	
PR	Published with peer review
CT	All India Co-ordinated trials data
AR	Institute annual report
OT	Any other report

Item 12: Has been registered /protected any where	
Y	Yes
N	No

Item 13: Manuscript (One Page Note) submitted	
Y	Yes
N	No

Item 16(b): Breeding method used	
IN	Introduction and selection
MS	Mass selection
PS	Pedigree selection
PL	Pure line selection
RS	Recurrent selection
BC	Backcross method
OT	Other (Specify in Item 19)

Furnish the form complete in all respects with requisite quantity of seed or propagules (propagules to the concerned NAGS) and send to The Director, ICAR-NBPGR, Pusa Campus, New Delhi-110 012

Annexure III

PROFORMA FOR PASSPORT INFORMATION

Supplying/co-operating Institute:

Date:

S. No.	National Identity	Collector No.	Donor Institute	Donor/ other Identity	Crop Name	Common Name	Taxonomic Code	Pedigree	Source	Biological Status	Country of Origin	Location	Latitude	Longitude	Altitude	Remarks

Source: In = Institute/NRC/IARCs; F= Famer; M= Market; NGO= Non-Govermmental organizations; OT= others

Biological status: W= wild; RC= Released cultivar; LR= Landraces; BL=Breeding line; Mu= Mutant; GS= Genetic stock; OT = others

Country of origin; Please provide ISO codes

CHECK-LIST FOR SCREENING OF APPLICATIONS

The Member Secretary, PGRC at NBPGR shall screen application along with annexure and make recommendations to the PGRC for *inter alia* the following points:

Sr. No.	Item	Yes/No			
1	Whether this is a new application?	Yes		No	
2	Whether this is a revised application?	Yes		No	
3	Whether same or similar material has been registered earlier?	Yes		No	
4	Whether unique or distinguishing characteristics of potential value merit consideration for registration?	Yes		No	
5	Whether documentary evidence or data (as per the guidelines) is provided in support of the claim on potential value of germplasm?	Yes		No	
6	State any other economic potential value of germplasm, if possible.	Yes		No	
7	Whether applicant, institution, university or centre has given a commitment for maintenance and supply of germplasm for use?	Yes		No	
8	Whether appropriate size of germplasm sample for long-term storage at National Genebank or for conservation and maintenance of active collections at the concerned NAGS has been sent?	Yes		No	
9	Whether the applicant has sent maintainer line of the CMS line to the National Genebank?	Yes		No	
10	Whether all the proposers signed the declaration regarding evaluation of the germplasm under hot spots/under artificial (epiphytotic) conditions?	Yes		No	
11	Whether acknowledgement receipt of germplasm from concerned NAGS for deposition and establishment is attached, wherever required?	Yes		No	
12	Whether detailed address of the corresponding person is given?	Yes		No	
13	Whether recommendations of IGIC (Institute Germplasm Identification Committee) attached?	Yes		No	
14	Whether competent Authority of the institute has duly endorsed the application?	Yes		No	

Signature of the Applicant

Annexure V

CHECK-LIST FOR REVIEWER/EXPERT FOR RECOMMENDATION

Recommendation

(i)	Importance of trait	: Scientific/Commercial/Academic
(ii)	Data sufficient as per guidelines (See Section 4 of eligibility criteria of guidelines)	: Yes/No
(iii)	Validation test required	: Yes/No
(iv)	Recommended for registration	: Yes/No

Signature of the Expert
(with seal)

Instructions to Authors
For
Organization of Manuscript of One-Page Note on Proposed Registered Germplasm

1. The manuscript should be typed in double-space leaving a margin of 3-4 cm on all sides
2. The total length of the manuscript should not be more than **one page.**
3. Format of Indian Journal of Plant Genetic Resources (IJPGR) should be followed.
4. Oxford English spelling should be followed and the consistency of spelling should be maintained Times new roman, font 12 for Title and 10 for authors name and affiliation, font 12 for text, font 10 for table title and table text, font 10 for references throughout the manuscript.

The manuscript should be structured as follows:

(a) **Introduction:** Introduce the importance of the trait and the availability of existing germplasm for this trait.

(b) **Specific traits for which registration is sought:** Data may be given in one table.

(c) **References:** References should be restricted to 3 in number. The following format may be followed:

(i) Chao CCT and RR Krueger (2007) The date palm (*Phoenix dactylifera*); an overview of biology, uses and cultivation. *Hort. Sci.* 42(5): 1077-82.

(ii) WOI (1985) Wealth of India – Raw Materials. A Dictionary of Indian Material and Industry Products – Raw Material Vol 1: A (Revised). Publication and Information Directorate, Council of Scientific and Industrial Research, New Delhi, 513 p.

(iii) Engels JMM and V Ramanatha Rao (eds) (1998) *Regeneration of seed crops and their wild relatives*. Proceedings of a Consultation Meeting, 4-7 December 1995, ICRISAT, Hyderabad and IPGRI, Rome, Italy, 167 p.

For Journal title and Abbreviations, in general, authors are advised to follow Elsevier System (https://legacyfileshare.elsevier.com/promis_misc/BMCL_Abbreviations.pdf).

5. A maximum of one good quality figure or line diagram displaying either the characteristic featuresor providing clear understanding of the uniqueness of the germplasm is acceptable.
6. Internationally accepted S.I. units should be used.

Minimum Standards of Seed Viability and Quantity in some species[1] for Long-term Conservation

Botanical Name	Minimum Germination (%)	Seed Quantity (No.)
Abelmoschus moschatus var. betulifolius (Mast.) Hocher.	50	500
Abelmoschus angulosus Wight & Arn.	50	500
Abelmoschus bitiliolius L.	50	500
Abelmoschus callei (A.Chev.) Stevels.	50	500
Abelmoschus crinitus Wall.	50	500
Abelmoschus ficulneus (L.) W. & A.ex Wight	50	500
Abelmoschus manihot (L.) Moench	50	500
Abelmoschus manihot spp. *manihot* (L.) Medik	30	1000
Abelmoschus manihot var. *pungens* (L.) Medik.	50	500
Abelmoschus manihot var. *tetraphyllus* (Hornem.) Borss.Waalk.	50	500
Abelmoschus moschatus Medik	50	500
Abelmoschus moschatus sspp. *tuberosus* (Span.) Borss	50	500
Abelmoschus pungens Wall.	50	500
Abelmoschus tetraphyllus Wall	30	1000
Abelmoschus tuberculatus Pal & Singh	30	1000
Abrus precatorius L.	30	500
Aegilops L. spp.	60	500
Ailanthus excelsa Roxb.	30	100
Allium L. spp.	30	500
Allium tuberosum Rottl. ex Spreng.	50	500
Alloteropsis cimicina (L.) Stapf.	30	100
Alysicarpus longifolius (Spreng.) Wight & Arn.	30	100
Alysicarpus vaginalis Wall	30	100
Andrographis paniculata Nees, *Andrographis echioides* Nees	30	500
Apluda mutica L.	30	500
Arachis appressipila Karpov.&W.C.Gerg	60	100-300
Arachis L. spp.	60	100-500
Aristida adscensionis L.	30	500
Aristolochia bracteata Retz. and speices	30	500
Arthraxon longifolius Henard	30	500
Arthraxon prionodes (Steud.) Dandy	30	500

[1] *Less seed producing species with low natural seed viability.*

Botanical Name	Minimum Germination (%)	Seed Quantity (No.)
Asparagus L.spp.	90	500
Atriplex hortensis L.	30	500
Avena byzantina K.Koch	30	500
Avena fatua L.	30	500
Avena sterilis L.	30	500
Boerhavia diffusa L.	30	500
Bothriochloa Kuntze. spp.	30	500
Brachypodium distachyon (L.) P.Beau	30	500
Brassica tournfortii Gouan	>75	2000
Bromus japonicus Thunb.	30	500
Calotropis gigantea (L.) W.T.Aiton	30	500
Calotropis procera (Aiton) W.T.Aiton	30	500
Canarium strictum Roxb.	30	500
Canavalia ensiformis (L.) DC.	30	100
Canna indica L.	30	500
Capillipedium hugelii Stapf.	30	100
Capillipedium parviflorum Stapf.	30	100
Cardiocrinum giganteum Makino	30	100
Cardiospermum haliccacabum L.	30	500
Carthamus L. spp.	75	500-1000
Cassia rotundifolia Pers.	30	100
Ceiba pentandra (L.) Gaertn.	30	100
Cenchrus biflorus Roxb.	30	500
Cenchrus ciliaris L.	30	500
Cenchrus prieurii (Kunth) Maire	30	500
Cenchrus setigerus Vahl.	30	500
Centaurea cyanus L.	65	500
Chloris barbata (L.) Nash	30	500
Chloris dolichostachya Lag.	30	500
Chloris gayana Kunth	30	500
Chloris virgata Sw.	30	500
Chrysanthemum coronarium L.	65	500
Chrysanthemum morifolium Ramat.	30	500
Chrysopogon fulvus (Spreng.) Chiov.	30	500
Chrysopogon montanus Trin.	30	500
Chrysopogon zeylanicus Thwaites	30	500
Cichorium intybus L.	30	500
Citrullus vulgaris var *citroide* L.H.Bailey	50	500
Costus speciosus (J.Koenig) Sm.	30	500
Crambe hispanica subspp.*abyssinica* (Hochst exR.E.Fr.)	>75	500-1000
Cymbopogon flexuosus Stapf.	30	500
Cymbopogon jwarancusa Boiss.	30	500

Botanical Name	Minimum Germination (%)	Seed Quantity (No.)
Cymbopogon martini (Roxb.) Wats.	30	500
Cymbopogon martinii var. motia (Roxb.) Wats.	30	500
Cynodon dactylon Pers	30	500
Dactylis glomerata L.	30	500
Dactyloctenium aegyptium (L.) K.Richt.	30	500
Dactyloctenium aristatum Link.	30	500
Dactyloctenium sindicum Boiss.	30	500
Descurainia sophia (L.) Webb ex Prantl	30	2000
Desmodium Desv. spp.	30	500
Desmostachya bipinatata Stapf.	30	500
Dianthus sinensis Link	65	500
Dichanthium annulatum stapf	30	500
Digitaria adscendens Kunth Henrard	30	500
Digitaria granularis (Trin.) Henrard	30	500
Digitaria pennata Chiov.	30	500
Dinebra retroflexa Panz.	30	500
Dipsacus mitis D. Don	30	500
Eleusine flagellifera Nees	30	500
Elionurus royleanus Nees ex A.Rich.	30	500
Enneapogon elegans Stapf	30	500
Entada Adans spp.	30	100
Eragrostiella bifaria (Vahl) Bor	30	500
Eruca sativa Mill.	>75	500-1000
Euryale ferox Salisb.	30	500
Glycine latifolia (Benth.) C.A.Newell & Hymowitz	60	500
Glycine curvata Tindale	60	500
Gossypium anomalum Wawr. & Peyr	30	500
Gossypium raimondii Ulbr.	30	500
Gossypium religiosum L	30	500
Gossypium triphyllum Hochr.	30	500
Gymnocladus assamicus Kanjilal ex P.C.Kanjilal	30	100
Hackelochloa granularis Kuntze	30	500
Helianthus L. spp.	65	500-700
Hemarthira R. Brown spp.	30	500
Heracleum candicans Wall	30	500
Heteropogon contortus (L.) Beauv. ex Roem. & Schult.	30	500
Hibiscus pungens Roxb.	30	500
Holarrhena antidysenterica (L.) Wall.	30	500
Hordeum L. spp.	50	300
Isachne disperma (Lam.) Döll	30	500
Ischaemum pilosum Trimen	30	500
Ischaemum rugosum Salisb.	30	500

Botanical Name	Minimum Germination (%)	Seed Quantity (No.)
Iseilema laxum Hack.	30	500
Jatropha curcas L.	65	100-500
Juncus L. spp.	30	500
Lasiurus hirsutus (forsk.) boiss.	30	500
Lasiurus scindicus Henrard	30	500
Lepidium sativum L.	>75	500-1000
Leptochloa chinensis Nees	30	500
Leucaena leucocephala (Lam.) de Wit	30	500
Lolium temulentum Bert. ex Steud.	30	500
Lonicera japonica Thunb.	65	500
Luffa echinata Roxb	50	500
Luffa pentandra Roxb	50	500
Mimosa pudica Mill	60	500
Momordica dioica Roxb. ex Willd	60	500
Momordica sahyadrica Kattuk. & V.T.Antony	30	500
Momordica subangulata ssp. *renigera*	30	500
Momordica tuberosa (Roxb.) Cogn..	30	500
Morinda citrifolia L.	90	500
Oroxylum indicum (L.) Benth. ex Kurz	50	250
Oryza L.spp.	50	250
Panicum maximum Jacq.	30	2000
Panicum repens Burm.f.	30	2000
Panicum turgidum Hochst. ex Steud.	30	2000
Paspalidium flavidum (Retz.) A.Camus	30	500
Paspalum dilatatum Poir	30	500
Pedalium murex L.	90	500
Perilla frutescens (L.) Britton	>75	500-1000
Perotis indica Schum	30	500
Phalaris minor Retz.	30	500
Phragmites australis (Cav) Steud.	30	500
Phragmites karka (Retz.) Steud.	30	500
Polypogon monspeliensis (L.) Desf.	30	500
Pongamia pinnata (L.)Pierre	65	100-500
Pseudoraphis spinescens (R.Br.) Vickery	30	500
Pseudosorghum fasciculare A.Camus	30	500
Rheum australe D.Don	30	500
Rhynchelytrum villosum chiov.	30	500
Ricinus communis L.	80	1000-1500
Rottboellia exaltata (Lour.) Clayton	30	500
Rumex vesicarius L.	30	2000
Saussurea DC. spp.	30	500
Schoenefeldia gracilis Kunth	30	500

Botanical Name	Minimum Germination (%)	Seed Quantity (No.)
Sehima nervosum (Rottl.) Stapf	30	2000
Selinum vaginatum C.B.Clarke	30	500
Sesamum L.spp.	60	500-1000
Sida ovata G.Don	30	2000
Solanum L. spp.	30	500
Spilanthes acmella Murr.	30	1000
Sporobolus diander P.Bboauv.	30	1000
Stylosanthes hamata (L.) Taub.	30	500
Teramnus labialis (L.f.) Spreng.	30	500
Terminalia chebula Willd. ex Flem.	30	500
Tetrapogon tenellus Chlov.	30	500
Themeda Forssk.spp.	30	500
Tribulus terrestris L.	30	500
Tricholepis glaberrima DC.	30	500
Trichosanthes bracteata (L.) Voigt	30	500
Trichosanthes cucumeriana L.	30	500
Trichosanthes cuspidata Lam.	30	500
Trichosanthes lobata Wall	30	500
Trichosanthes nervifolia L.	30	500
Trichosanthes palmata L.	30	500
Trichosanthes tricuspidata Lour.	50	500
Tripogon roxburghianus Bhide	20	2000
Triticum spp. (Wild)	60-70	500-1000
Typha angustifolia L.	30	2000
Typha elephantina Roxb.	30	2000
Uraria lagopodioides (L.) Desv. ex DC.	30	2000
Urena lobata subspp. *lobata* L.	30	500
Urena sinuata L.	30	500
Urochloa panicoides P. Beauv.	30	500
Wrightia tintoria R. Br., *Wrightia tomentosa* Roem. & Schult., *Wrightia arborea* (Dennst.) Mabb.	90	500
Zanthoxylum alatum Wall.	30	500
Zea mays L. (inbred lines)	85	500-1000

Note: Ideally in all species the seed number should be minimum 2000 for self-pollinated and 4000 for cross-pollinated crops but in wild species where it is not possible to get this number the minimum number of seeds should be 500 with atleast 30% germination. In case the seed size is >3-4 cm and in tree species the number can be reduced to 100. In wild species where seed formation is not a problem, the number can be elevated to 2000-4000, as the case may be.

List of the Plant Species with known or likely Recalcitrant or Intermediate seed Storage Behavior

Common Name	Botanical Name
Acer	*Acer platanoides* L.
Almond	*Prunus amygdalus* Bctsch.
Arecanut	*Areca catechu* L.
Bael	*Aegle marmelos* L.
Baher (myrobalan)	*Terminalia bellirica* Roxb., *T. chebula* Retz.
Banana (wild)	*Musa* spp.
Black pepper	*Piper nigrum* L.
Cardamon	*Elettaria cardamomum* Maton.
Cheura	*Diploknema butyraceae* (Roxb.) H.J.Lam
Citrus spp.	All *Citrus* spp
Cocoa	*Theobroma cacao* L.
Coffee	*Coffea arabica* L.
Coconut	*Cocos nucifera* L.
Hazel nut	*Corylus avellana* L.
Jamun	*Syzygium cuminii* (L.) Skeels
Karonda	*Carissa congesta* Wt.
Ker	*Capparis deciduas* (Forsk.) Edgew.
Khirni	*Manikara hexandra* (Roxb.)Dubard.
Jack fruit	*Artocarpus heterophyllus* Lamk.
Lac tree	*Schleichera oleosa* (Lour.) Oken
Lasora	*Cordia myxa* Roxb.
Litchi	*Litchi chinensis* (Gaertn.) Sonn.
Longan	*Dimocarpus logan* Lour.
Mahua	*Madhuca indica* J.F. Gmel.
Mango	*Mangifera indica* L.
Neem	*Azadirachta indica* A. Juss.
Nutmeg	*Myristica fragrans* Houtt.
Oil plam	*Elaeis guneensis* Jacq.
Papaya	*Carica papaya* L.
Pecan nut	*Carya illinoensis* (Wang.) Koch.
Pilu	*Salvadora oleoides* Decne. And other spp.
Poplar	*Populus deltoids* W. Bartam ex Marshall and other spp.
Rambutan	*Nephelium lappaceum* L.
Rice (wild)	*Zizania* spp.
Rubber	*Hevea brasiliensis* (Willd.ex A. Juss) Müll.Arg.
Sal	*Shorea robusta* Gaertn.
Sapota	*Achras zapota* L.
Trifoliate orange	*Poncirus trifoliata* (L.) Rafin.
Tea	*Camellia sinensis* (L.) O. Kuntze
Teak	*Tectona grandis* L. f.
Walnut	*Juglans regia* L.

Annexure IX

List of the Crop Species with Established Protocols for *In Vitro* Conservation at Tissue Culture and Cryopreservation Unit, NBPGR, New Delhi

Common Name	Botanical Name
Kiwi	*Actinidia chinensis* Planch
Strawberry	*Fragaria* x *ananassa* L. and *F. vesca*
Mulberry	*Morus* spp.
Banana and plantain	*Musa* L. spp. *AA, AB, AAA, AAB, ABB*
Blackberry, raspberry	*Rubus* L. hybrid and *Rubus idaeus* L.
Pear	*Pyrus* spp.
Garlic and other alliums	*Allium albidum* Fisch. ex M.Bieb., *A. chinense* G. Don, *A. fistulosum* L., *A. hookeri* Thw., *A. lineare* L., *A. ramosum* L., *A. sativum* L., *A. tuberosum* Rottl. ex Spreng.
Giant taro	*Alocasia* (L.) G. Don
Taro	*Colocasia esculenta* (L.) Schott.
Dahlia	*Dahlia* Thunb. sp.
Yams	*Dioscorea alata* L., *D. bulbifera* L., *D. floribunda* Martens et Galeotti, *D. rotundata* Poir., *D. deltoidea* Wall., *D. esculenta* (Lour.) Burk.
Gladiolus	*Gladiolus* L. sp.
Sweet potato	*Ipomoea batatas* (L.) Lam.
Tannia	*Xanthosoma sagittifolium* (L.) Schott
Turmeric	*Curcuma aeruginosa* Roxb., *C. aromatica* Salisb., *C. brog* Val., *C. caesia* Roxb., *C. longa* L., *C. latifolia* Rosc., *C. malabarica* Velayudhan *et al*., *C. manga* Val., *C. raktakanta* Mangaly and Sabu., and *C. soloensis* Vel.,
Cardamom	*Elettaria cardamomum* Maton.
Pepper *longum* L., *P. nigrum* L.	*Piper colubrinum* Link., *P. hapnium* Buch. Ham., *P.*
Vanilla	*Vanilla planifolia* Jacks ex Andrew
Ginger	*Zingiber* Mill. spp.
Brahmi	*Bacopa monnieri* (L.) Wettst.
Safed musali	*Chlorophytum borivilianum* Sant. et Fern.

Common Name	Botanical Name
Coleus	*Coleus* Lour. spp.
Kali musali	*Curculigo orchioides* Gaertn.
Foxglove	*Digitalis* L. spp.
Eremostachys	*Eremostachys superba* Royle ex Benth.
Kutki	*Gentiana kurroo* Royle
Chandermool	*Kaempferia* L. spp.
Mint	*Mentha* L. spp.
Kutki	*Picrorhiza kurroa* Royal ex Benth.
Chitrak	*Plumbago* L. spp.
Patchouli	*Pogostemon patchouli*
Sarpgandha	*Rauvolfia serpentina* (L.) Benth. ex Kurz.
Kuth	*Saussurea lappa* (Decne.) Sch.Bip.
Anantamul	*Tylophora indica* (Burm. f.) Merr.
Indian valerian	*Valeriana jatamansi* Jones.
Hops	*Humulus lupulus* L.
Jojoba	*Simmondsia chinensis* (Link) Schneider

For temperate fruits the material may also be sent to ICAR-NBPGR Regional Station, Bhowali or Shimla for initial establishment.

Annexure X

About Exotic germplasm registration:

(i) Entries with EC numbers will be considered if documentary proof is provided that the trait for which registration is applied is different from the trait for which the entry was imported, GEPU (NBPGR.Exchange@icar.gov.in) may be contacted for such purposes.

(ii) Entries included in imported Nurseries and Trials are eligible for registration excluding checks/exotic landraces/exotic varieties *etc*. included in the nursery/trial. Such entries will be given IC number if recommended for registration.

Guidelines updated for:

- **Submitting the Orthodox Seed Germplasm**
- **Instructions to Authors for One-Page Note on Proposed Registered Germplasm**
- **About Exotic material registration**

approved by Director, ICAR-NBPGR and Member Secretary, PGRC after discussion in the light of DDG (CS) comments in 51st PGRC meeting.

IMPORTANT LINKS

PLANT GERMPLASM REGISTRATION

✓ **Uploading new application in GRIS:**

http://www.nbpgr.ernet.in:8080/registration/

✓ **Germplasm reports/Inventory in GRIS:**

http://www.nbpgr.ernet.in:8080/registration/InventoryofGermplasm.aspx

✓ **GRIS help file**:

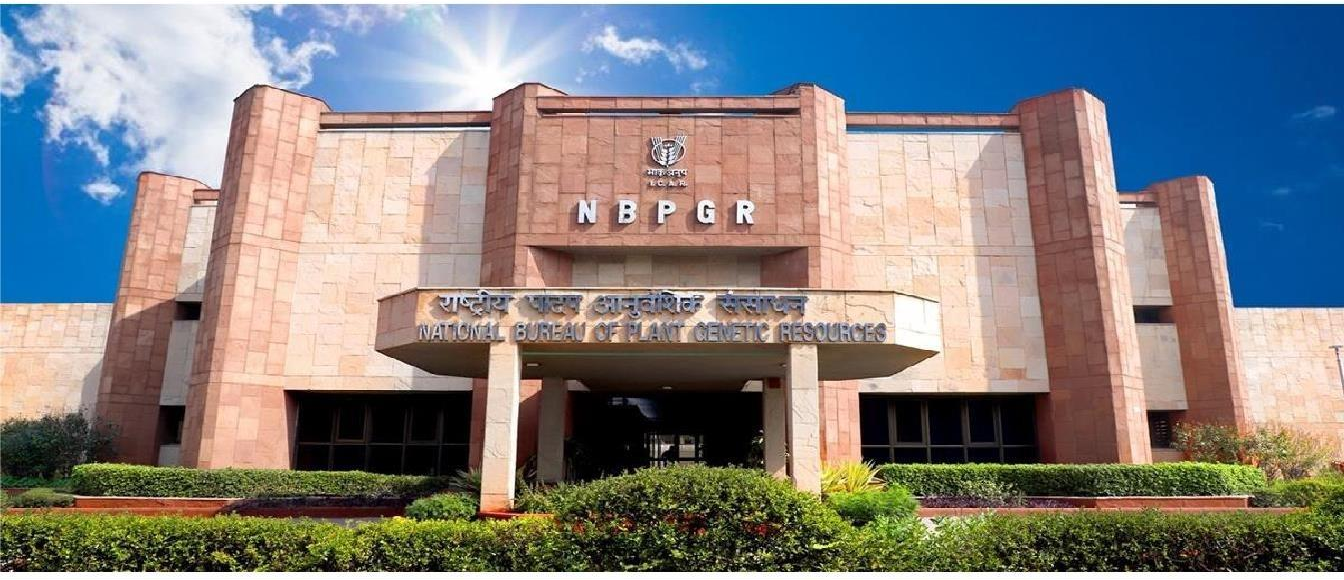
http://www.nbpgr.ernet.in:8080/registration/Help.aspx

✓ **Guidelines for Registration of Plant Germplasm:**

http://www.nbpgr.ernet.in:8080/registration/Guidelines.aspx

✓ **Compendium of Trait-Specific Germpalsm of Agricultural and Horticultural Crops: Registered and Conserved in the National Genebank, India (1996-2023)**

https://nbpgr.org.in/nbpgr2023/wp-content/uploads/2024/09/Compendium-of-Trait-Specific-Germpalsm-of-Agricultural-and-Horticultural-Crops.pdf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NATIONAL BUREAU OF PLANT GENETIC RESOURCES