

DOGR

PROFILE



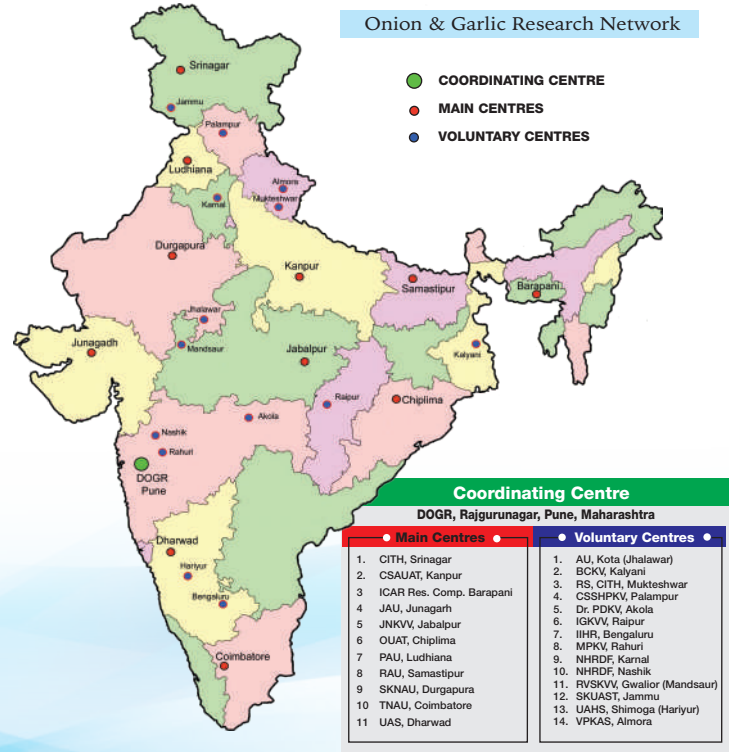
ICAR-Directorate of Onion and Garlic Research
Rajgurunagar, Pune – 410 505, Maharashtra, India





Onion and garlic are the two most important vegetable commodities used in culinary preparations. They have health promoting properties. India is the second largest producer of onion and garlic after China and second largest exporter of onion in the world next to Netherlands, contributing 12% of the global market.

Realizing the importance of onion and garlic in the country, Indian Council of Agricultural Research (ICAR) established National Research Centre for Onion and Garlic in VIII Plan at Nasik in 1994. Later, the centre was shifted to Rajgurunagar, Pune on 16th June 1998. Due to expansion of research and development activities of onion and garlic, the centre was upgraded to Directorate of Onion and Garlic Research (DOGR) in December 2008. DOGR also has All India Network Research Project on Onion and Garlic (AINRPOG) with 11 main centres and 14 voluntary centres across the country, with DOGR as the coordinating centre.



The DOGR logo

The DOGR logo symbolizes 'onion and garlic'. The large petal in red color represents 'onion' and small petal represents 'garlic'. The bottom arch indicates earth and the green color of the arch indicates the Agriculture. Green background with text प्या ल अनु नि represents the name of the institute in Hindi प्याज एवं लहसुन अनुसंधान निदेशालय. DOGR is acronym for Directorate of Onion and Garlic Research.



Mandate

- To act as a repository of genetic resources and scientific information of onion and garlic
- To undertake basic and applied research for enhancing production and productivity of onion and garlic
- To undertake strategic research for technology development and production of quality seed of onion and garlic
- To promote utilization and development of value added products through processing and post-harvest management practices
- To disseminate technology, provide advisory and consultancy services and promote entrepreneurship
- To develop linkages with national, international and private organizations in network mode for collaborative research programmes

Infrastructure

Farm

The centre has 55 acres of research farm at Rajgurunagar, 55 acres at Kalus and 10 acres at Manjri with perennial irrigation facilities.

Laboratories

DOGR has well equipped laboratories for work on Biotechnology, Soil Science, Plant Protection, Post Harvest Technology, Seed Technology *etc.*

Agricultural Knowledge Management Unit (AKMU)

DOGR is having a well established AKMU with 43 computers interlinked with LAN and two servers for high speed

broadband internet connectivity with firewall protection. AKMU is having most advanced research software like SAS, data management system, application packages, word processing software *etc.* DOGR is having its own website www.dogr.res.in, which is regularly updated.

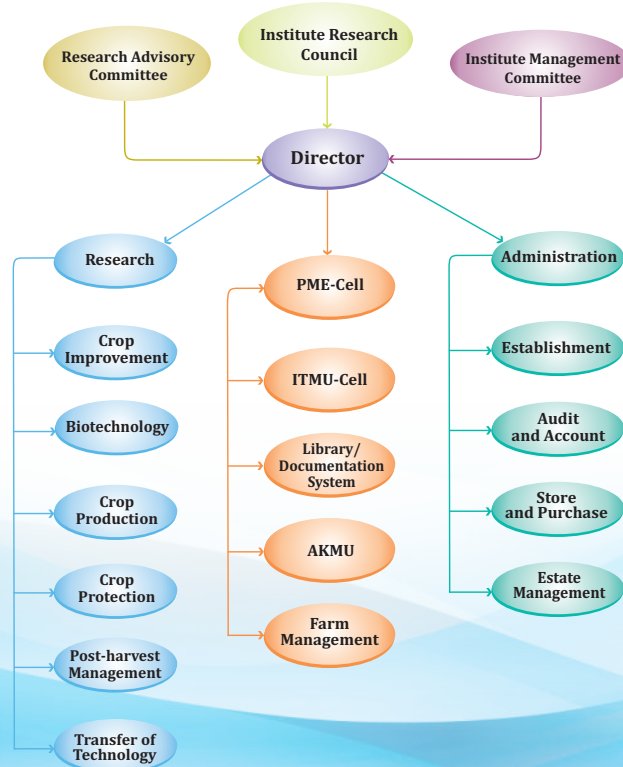
Library

DOGR has library facility to support research and extension activities. Library as on today has a total collection of 798 books and 1416 Annual Reports and subscribes major foreign and Indian journals. The library also has online access to premier journals (Hort. Database 1972-2013).

Other

Administrative block, museum, storage structures, cold storage, guest house, farmers hostel, stores, poly and net houses, conference room, committee room *etc.*

Organogram



Major Research Activities

Crop Improvement

Germplasm

- Collection, conservation and documentation of *Allium* germplasm
- Evaluation of germplasm for abiotic and biotic stresses and other economic characters
- Development and registration of unique genetic stocks

Breeding

- Breeding improved onion varieties for table, processing and export
- Development of improved garlic varieties through conventional and non-conventional approaches
- Development of onion hybrids
- Development of inbred lines through haploid production
- Development of QTLs for bolting and sprouting
- Development of markers for diseases and pest resistance

Crop Production

- Integrated Nutrient Management
- Water management
- Weed management
- Cropping sequence
- Fertigation
- Onion seed production
- Virus-free garlic propagules (cloves) production

Crop Protection

- Development of highly sensitive serological and nucleic acid based diagnostic kits
- Refinement of IPM/IDM modules
- Development of transgenics for disease resistance

Post-Harvest

- Enhancement of storage life of onion and garlic
- Exploitation of functional food value of onion and garlic

Extension

- Dissemination of onion and garlic production technology
- Impact analysis of the technology developed

Institute Projects

- Conservation, characterization and utilization of genetic resources of *Allium* species
- Devising efficient breeding techniques and genetic improvement of onion and garlic through conventional breeding and biotechnological approaches
- Integrated water and nutrient management and physiological manipulation for improving productivity of onion and garlic
- Integrated pest and disease management for minimization of losses and improving productivity of onion and garlic

- Development and refinement of postharvest handling, storage and processing techniques for minimization of losses and improving productivity of onion and garlic
- Improving knowledge and skill of stakeholders for increasing production of onion and garlic
- National Innovation on Climate Resilient Agriculture (NICRA)
- CRP on Agrobiodiversity
- Intellectual Property Management and Transfer /Commercialization of Agricultural Technology Scheme (IPMT-CATS), ICAR
- DUS testing through ICAR-SAU's system

Externally Funded Projects

- Mega Seed Project “Seed production in agricultural crops and fisheries”
- Outreach Research Programme on sucking pests
- Development of hybrids in onion: A joint venture with Beejo-Sheetal
- Formulation, Validation and Promotion of Adaptable IPM Technology for Bulb (Onion) Vegetable Crops
- Studies on Male sterility systems to increase the efficiency of F_1 hybrids in horticultural crops

Achievements

Crop Improvement and Biotechnology

- Six red and three white onion varieties, and two garlic varieties have been developed. Varieties Bhima Super and Bhima Red have been licensed to M/S Jindal Crop Sciences Pvt. Ltd. and M/S Safalmantra Agro Farms Pvt. Ltd., respectively, for seed production and marketing.



Bhima Raj



Bhima Super



Bhima Shakti



Bhima Dark Red



Bhima Red



Bhima Kiran



Bhima Shubhra



Bhima Shweta



Bhima Safed

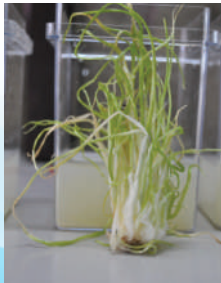


Bhima Omkar



Bhima Purple

- DOGR is the national active germplasm site for onion and garlic germplasm and presently holds more than 1700 accessions including 25 *Allium* species
- Early maturing elite line “DOGR-1203-DR” has been registered with NBPGR, New Delhi with national identity, **IC0598327** and Registration No. **INGR 14057**
- Identified Molecular markers (RAPD, ISSR and SSR) for estimating genetic diversity in onion, garlic and related wild *Alliums*
- Meristem- tip culture and multiple shoot/bulbil production protocols developed for virus-free seed production in garlic



Garlic Mericlones



Mericlones in seedling trays

- Developed haploids through gynogenesis
- Developed double haploids for production of inbred lines and their possible use in hybrid breeding

Crop Protection

- Developed IPM and IDM modules for the management of pests and diseases
- Highly sensitive Serological and Nucleic acid based diagnostics system has been developed for the detection of major onion and garlic viruses
- Forecasting Model for thrips prediction has been developed

Crop Production

- *Kharif* onion production technology standardized.

Nursery raising in *Kharif*

Drip irrigation in onion

- Micro-irrigation like drip and sprinkler for closely spaced onion and garlic crops have been successfully developed by this Directorate. There was around 30 percent water saving in drip irrigation system as compared to surface system
- Fertigation for higher input use efficiency has been developed. By this method, there is saving of water by 40%, fertilizers by 30%, labour by 30% and yield increase by 15-20%
- Developed Integrated Nutrient Management (INM) for sustainable *Rabi* onion production
- Efficient weed management method in onion and garlic has been developed
- Legume based cropping sequence like soybean in *Kharif* followed by onion or garlic in *Rabi* for higher bulb yield and improved soil health has been recommended
- A method for onion-sugarcane intercropping with paired row planting of sugarcane (November-December planting) under drip irrigation system has been developed

Post-Harvest Management

Hand operated as well as motorized onion graders have been developed by this centre. These have increased efficiency of 5 and 20 times, respectively, over hand grading. The precision of grading achieved by graders is 98% as against 50% in hand grading. Both the graders have become popular with the onion growers as well as traders. MoU has been signed with M/S R.K. Engineering Works for manufacturing and sale of motorized onion grader.

Hand operated
onion grader



Motorized onion
grader

Low cost storage model of 5 to 10 tonnes capacity and high cost model of 25 to 50 tonnes capacity with bottom and side ventilation designed and tested by DOGR have become popular among the farmers.



High volume onion storage structure



Low volume low cost onion storage structure

Seed Production

- DOGR disseminates its varieties by producing and distributing breeder and quality seed of onion and garlic. During past 10 years about 200 quintal of onion seed and 300 quintal of garlic cloves have been distributed to state seed agencies, seed companies, KVK's and farmers.

Dissemination of Technology

- DOGR organizes trainings for farmers, extension workers and other stakeholders regularly. Exhibitions are held at DOGR and other places throughout the country.
- DOGR has published 25 technical and extension bulletins in Hindi, Marathi and English. CDs with information on various agro techniques developed by DOGR have been launched. These are sold on no profit-no loss basis.

Future Thrust Areas

Onion

- Augmentation and characterization of onion and garlic germplasm
- Development of varieties /F₁ hybrids in short day onion for different seasons (a) *Kharif* (b) Late *Kharif* (*Rangda*) (c) *Rabi* suitable for domestic as well as export markets
- Development of high T.S.S. white onion varieties suitable for processing
- Sustenance of productivity through Integrated nutrient and water management & Integrated disease and pest management
- Improvement in storage quality of onion
- Mechanization for direct seeding and transplanting

Garlic

- Development of big cloved garlic varieties
- Generation of genetic variability in garlic
- Sustenance of productivity through integrated nutrient management, water management and disease-pest management
- Production of virus-free planting material

Services

Directorate offers consultancy services on crop production and post-harvest technology. We also undertake contract research and disseminate technology through public-private partnership. R&D activities are undertaken under MoU with stakeholders for the benefit of farmers. Seed supply and know-how is provided to farmers, extension agencies and KVKs and state govt. officials.



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Phone: 02135- 222026 Fax: 02135- 224056 E-mail : director.dogr@icar.gov.in Website: www.dogr.res.in

Compiled by: Jai Gopal & Kalyani Gorrepati