



ICAR-NRCP



Newsletter - संवादपत्र

January - June 2022

From the Director's Desk - निदेशक की कलम से



Dear Readers,
Greetings from ICAR-NRCP,
It is with great pleasure to introduce the latest edition of our Institute's Newsletter, showcasing the achievements and ongoing initiatives at ICAR-NRCP, Solapur. NRCP is dedicated towards pomegranate farmers' welfare and in this line our scientists have been carrying out planned scientific explorations and subsequent technology dissemination to the stakeholders **though outreach**

activities. Work on **genomics-assisted** breeding was initiated for desirable trait specific pomegranate varieties. This could contribute to the comprehensive characterization of allelic variation underlying for important fruit quality traits in the germplasm and their incorporation into cultivars to breed new pomegranate varieties. For the first time, NRCP has reported large-scale development of **gene-based and chromosome-specific PIP markers** by exploring pomegranate genome information. Few putatively associated SSR markers were also identified for fruit quality traits through association analysis. Malnutrition, a major issue in India, was addressed by development of fortified **pomegranate-karonda jam** which is not only superior in terms of taste but is rich in iron content. Jam has huge market and liked by one and all, particularly children, that will improve health of consumers.

Techniques such as hydroponics are being explored to reduce the time for propagation and enhance the multiplication process of pomegranate that will surely help pomegranate stakeholders in terms of saving time and cost. Recently under changing climatic conditions, there was sudden increase in infestation and severity of Shot Hole Borer (SHB) creating havoc in pomegranate orchards. With this preview, NRCP in collaboration with SARP organized the **brainstorming session with the participation of international experts to formulate an effective and holistic management strategy against SHB**.

Similarly to address the various issues of pomegranate cultivation, NRCP has organized various online/offline events such as webinar, workshops, trainings and field day for pomegranate stakeholders.

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Research achievements/ Highlights/ Technology developed

Exploration, Collection and Conservation of Pomegranate germplasm

In total 307 pomegranate germplasm accessions consists of 140 Indigenous and 167 Exotic collections have been maintained at the NRCP research farm. In addition, survey cum exploration has been made and collected 81 new accessions from Hamirpur, Shimla and Solan districts of

Himachal Pradesh. Out of 81, 40 accessions were successfully sprouted which will be evaluated for identification of resistance source for bacterial blight disease and other major biotic stresses after their proper growth and development.



Exploration and collection of pomegranate germplasm from Himachal Pradesh

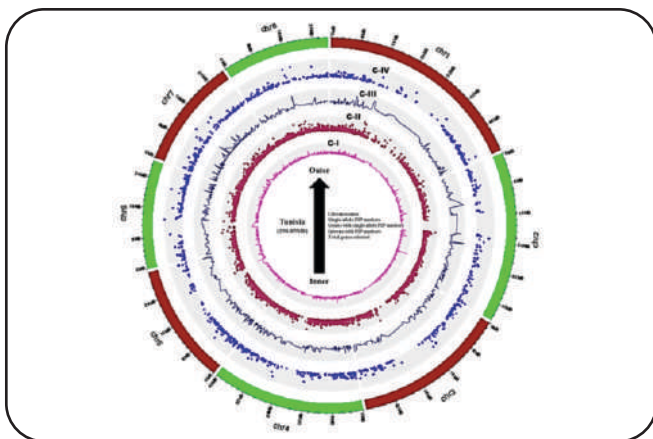
(Shilpa P., P. Roopa Sowjanya, N.V. Singh, K.D. Babu & R. A. Marathe)

Large Scale Development of Chromosome Specific Potential Intron Polymorphism (PIP) Markers for Trait Mapping

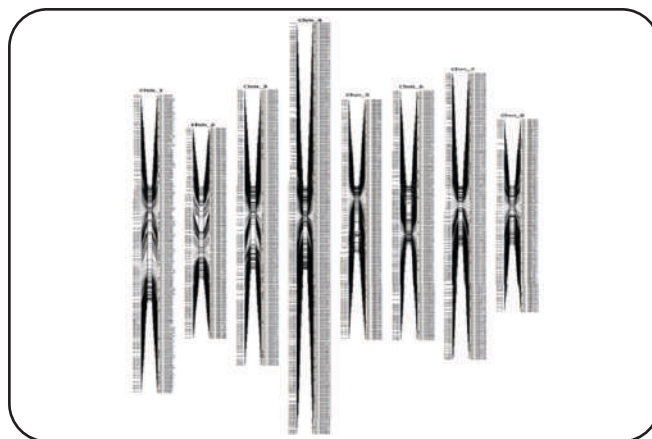
Despite the availability of whole genome assemblies, the identification and utilization of gene-based marker systems has been limited in pomegranate. In the present study, we performed a genome-wide survey of intron length (IL) markers in the 36,524 annotated genes of the Tunisia genome. We identified and designed a total of 8,812 potential intron polymorphism (PIP) markers specific to 3,445 (13.40%) gene models that span 8 Tunisia chromosomes. The ePCR validation of all these PIP markers on the Tunisia genome revealed single-locus amplification for 1,233 (14%) markers corresponding to 958 (27.80%) genes. The markers yielding single amplicons were then mapped onto Tunisia chromosomes to develop a saturated linkage map. The functional categorization of 958 genes revealed them to be a part of the nucleus and the cytoplasm having protein binding and catalytic activity, and these genes are mainly involved in the metabolic process, including photosynthesis.

Further, through ePCR, 1,233 PIP markers were assayed on multiple genomes, which resulted in the identification of 886 polymorphic markers with an average PIC value of 0.62. *In silico* comparative mapping based on physically mapped PIP markers indicates a higher synteny of Tunisia with the Dabenzi and Taishanhong genomes (>98%) in comparison with the AG2017 genome (95%). We then performed experimental validation of a subset of 100 PIP primers on eight pomegranate genotypes and identified 76 polymorphic markers, with 15 having PIC values ≥ 0.50 . We demonstrated the potential utility of the developed markers by analysing the genetic diversity of 31 pomegranate genotypes using 24 PIP markers. This study reports for the first time large-scale development of gene-based and chromosome-specific PIP markers, which would serve as a rich marker resource for genetic variation studies, functional gene discovery, and genomics-assisted breeding of pomegranate.

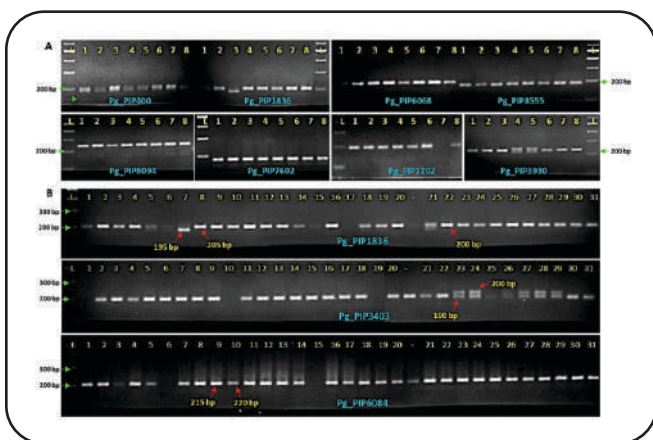




Circos graph depicting the physical location of genes, intron numbers and lengths targeted



Physical linkage map based on 1233 PIP markers of Tunisia genome



Allelic variations revealed by PIP markers

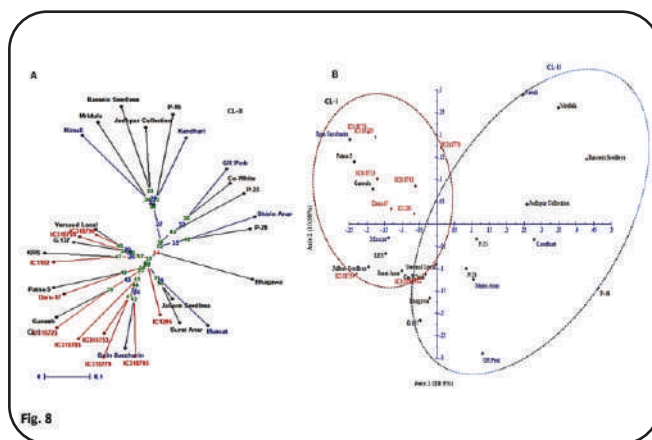


Fig. 8

Genetic relationships among 31 pomegranate genotypes based on twenty four PIP markers

(Prakash G. Patil, Manjunatha N., Pokhare, S. S., Dhinesh Babu & R. A. Marathe)

Standardization of *In-Vitro* Rearing Protocol for *Euwallacea fornicatus*, the Shot Hole Borer (SHB) Beetle, Using Modified Media Variants

Protocol for *in vitro* rearing of shot hole borer beetle (*Euwallacea fornicates*) was standardized using three media variants: Media-I (PDA + Symbiotic Fungi), Media-II (PDA + Pomegranate Bark Dust), and Media-III (Semisynthetic Medium). The modified semisynthetic medium, containing pomegranate bark sawdust, successfully supported the *in vitro* rearing of SHB beetles associated with pomegranate wilt, allowing for studies on their biology and aetiology. This study improves our understanding of the beetle's tunneling behavior and biology while demonstrating the feasibility of *in vitro* rearing.

The media were prepared using the Biederman method with minor modifications to meet the nutritional requirements of the pomegranate SHB. Adult females were transferred to media tubes and incubated for 40-55 days under dark conditions. The results showed that beetles survived for 27.75 and 28.0 days in Media I and II, respectively, without reproduction. However, in semisynthetic Media III, the beetles survived for 35 days and completed one life cycle. This modified medium has the potential for further refinement to enable mass rearing of the shot hole borer *in vitro*.





Preparation of bark and stem powder for media preparation

Treatment details	Total female released/6 Plate	No. of days survived (Avg.)	No. of life cycle completed	Media-III	
				Ingredient	Quantity (g/mg)
				Yeast	6
				Casein	15
Media-I (PDA + Fungi)	6	27.75	0	Pomegranate plant bark sawdust	100
Media-II PDA+ Bhagawa bark dust (100 g)	6	28.0	0	Sucrose	10
				Agar	15
Media-III Semisynthetic media	6	35	1	Wesson's salt mixture	1.5
				Sterile distilled water	600
				Streptomycin	350 mg

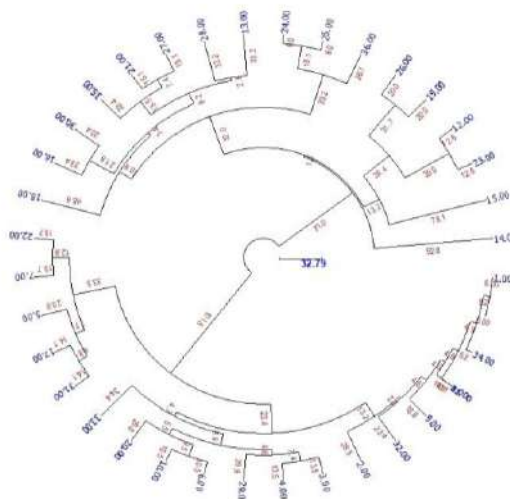
(Mallikarjun M. H., R. A. Marathe, Manjunatha N. & Somnath Pokhare)

Identification of Trait Specific Markers Through Association Mapping

Phenotyping has been carried out for 48 pomegranate germplasm lines which constituted both indigenous and exotic collections, and a set of 120 SSR markers has been screened. Out of 120 SSR markers, 35 were found polymorphic. Results of Analysis of Variance (ANOVA) of morphological data indicated statistical significance of genotypes chosen for the study. Analysis of Molecular variance (AMOVA) analysis of genotypic data found to be significant.

Hence, both phenotypic and genotypic data were subjected for trait association analysis, it has been carried out by using GAPPIT package of R software and also structure analysis was carried out by STRUCTURE software. From these results we are able to found out the markers which are associated with economically important fruit traits of pomegranate significantly. Hence those markers can be used for the selection in pomegranate improvement programmes.





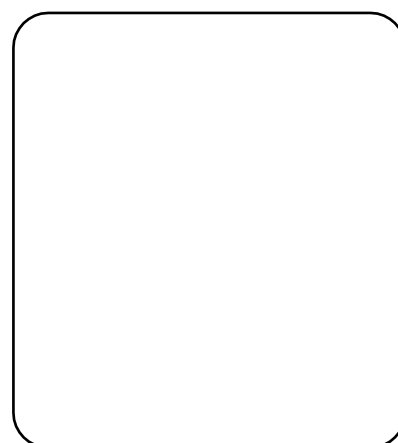
Cluster Analysis of 48 germplasm lines based on molecular diversity

(P. Roopa Sowjanya, Shilpa P., N.V. Singh, P.G. Patil, Manjunatha N. & R. A. Marathe)

A New Technique for Propagation and Heterosis Fixing in Pomegranate

Soil free method of propagating and fixing heterosis can be achieved through hydroponics. Hydroponics is the technique of growing plants using water based nutrient solution rather than soil. In general pomegranate propagation is carried out by hardwood cutting, air-layering and tissue culture. The media used for hardwood cutting and air layering is through soil substrate like cocopeat or a mixture of soil, FYM, sand, in case of tissue culture a special composed media consisting of nutrients, amino acids, vitamins, hormones is used in semi-solid condition. A total of 15 cuttings of pomegranate (pencil sized thickness having 2 nodes and about 10 cm height, treated with IBA (2gm/litre), placed in a thermocol sheet to act as

holding material for the cuttings in liquid phase media. Total setup was kept in a desiccator to provide controlled conditions. Leaf initiation was observed on 5th day and on 10th day we found callus formation in the bottom of the cutting, which further resulted in the formation of roots. In Hardwood cuttings the number of days required for leaf initiation is 7-8 days. Rooting will be induced after 30days of planting. Hence this technique will reduce the time of propagation. The large scale production/multiplication through hydroponics is under standardization, once it gets standardized surely it will help the farming community in reducing the cost and time involved in propagation.



Propagation of Pomegranate cuttings in soil less condition

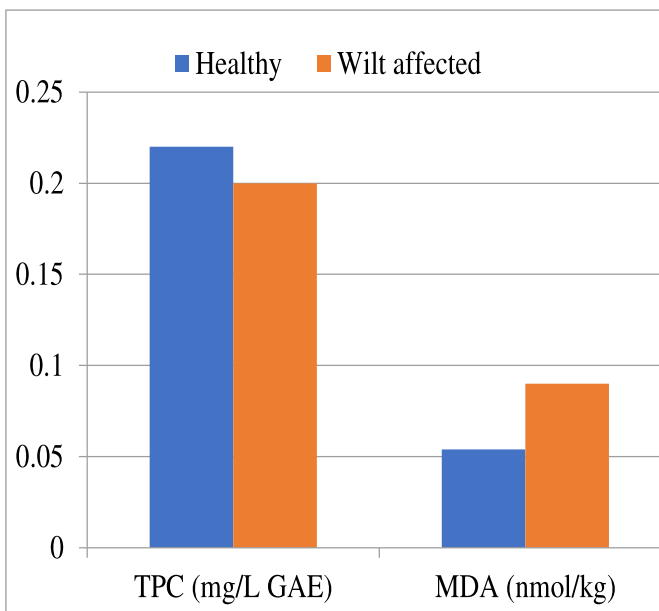
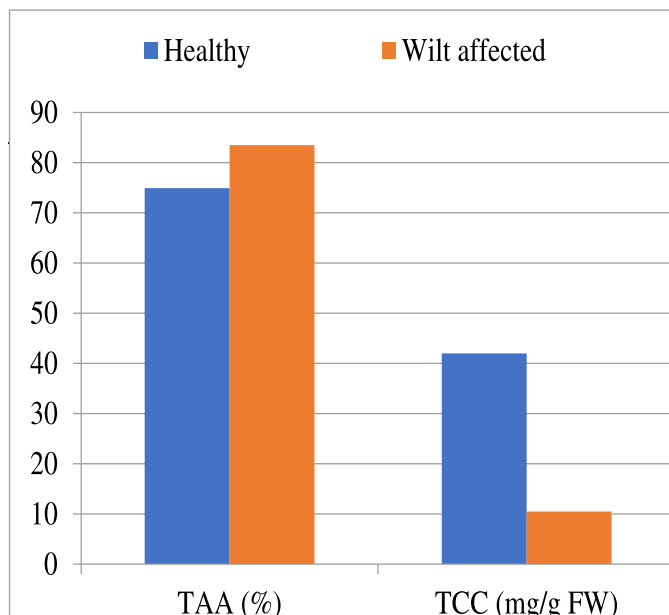
(P. Roopa Sowjanya, Shilpa P., N.V. Singh, Manjunatha N. & R. A. Marathe)



Wilt Stress Induced Biochemical & Enzymatic Changes in Pomegranate Leaves

Like any other biotic stress, wilt highly impacted plant metabolites including Malondialdehyde (MDA), Total Phenol Content (TPC), Total Chlorophyll Content (TCC) and Total Antioxidant Activity (TAA) in pomegranate leaves. In present study, leaves of wilted and healthy plants of

Bhagawa variety were used for biochemical analysis. Wilt has significantly affected the chlorophyll content and MDA. Wilted leaves showed increase in TAA by 12%, decrease in phenol content by 9%, increase in MDA by 66% and decrease in TCC by 75%.



Changes in the bio-chemical parameters in pomegranate during disease infection

(R. D. Damale, Shilpa P., Manjunath N., P. Raigond, Mallikarjun H., N. V. Singh, Dinesh K. Babu & R. A. Marathe)

Pomegranate- Karonda mix fruit Jam



Commercial jams often contain high amounts of sugar, artificial colour and flavours. The real taste of the seasonal, nutritious and underutilized fruits-Pomegranate & karonda can be enjoyed by processing into jam. The pomegranate-karonda mix fruit jam was developed with the purpose of the utilization of nutritional benefits of the highly underutilized karonda fruit (rich in iron content) along with pomegranate (rich in phenols and antioxidant). The best quality of jam with good spreadability and sensory properties was obtained by blending of 50% karonda fruit pulp with 50% pomegranate juice. The obtained pomegranate-karonda mix fruit jam had 65°BX TSS and provides 260 kcal/100g. The combination of pomegranate and karonda fruits in jam creates a unique flavour profile that is both tangy and sweet.

Pomegranate-karonda mix fruit jam can be made using fresh, natural ingredients without any artificial additives (colour and flavour). The processing of pomegranate and karonda fruit into mixed fruit jam created distinct and delicious product.

(Namrata A. Giri, Nilesh N. Gaikwad & R. A. Marathe)



Brainstorming session on “Roadmap for Shot Hole Borer management in Pomegranate (An International Event)”

The shot hole borer, which was a minor insect-pest of pomegranate, has suddenly become havoc for pomegranate growers during last two years. With this preview, the brainstorming session was organized to formulate an effective and holistic management strategy against shot hole borer. Brainstorming session on roadmap for shot hole borer management in pomegranate was organized jointly by ICAR-National Research Centre on Pomegranate and Society for Advancement of Research on Pomegranate on 20th May, 2022. The session was attended by pomegranate experts from India and Abroad. Four International delegates namely, **Dr. Beatriz Nobua-Behrmann** and **Dr. Shannon Lynch**, University of California Cooperative Extension, California USA; **Dr. Kobus Bothma**, Crop Nutrient Specialist, South Africa and **Dr. Mazahar Yousefi**, Pomegranate Scientist, Iran

along with more than 90 Indian delegates from different parts of the country participated in this scientific deliberation. The Panel discussion was presided over by **Dr. A.K. Singh**, Deputy Director General (Horticultural Science), ICAR, New Delhi. The inaugural session was chaired by the **Dr. R.A. Marathe**, Director, ICAR-NRCP and also had august presence of **Dr. D.P. Waskar**, Director of Research, VNMKV, Parbhani; **Dr. S. B. Jagginavar**, Professor of Agri. Entomology, CoA, Bijapur; **Shri. Prabhakar Chandane**, President, All India Pomegranate Growers Association; **Dr. K.B. Patil**, Vice-President, Jain Irrigation Systems Ltd. and subject matter experts, progressive growers, industry representatives, students and other stakeholders of pomegranate industry. **Dr. N.V. Singh** was the organizing secretary of the brainstorming session.



Dr. S. B. Jagginavar, Shri Prabhakar Chandane, Dr. D. P. Waskar, Dr. K. B. Patil, Dr. Jyotsana Sharma & Dr. R.A. Marathe during the inauguration of brainstorming session



Dr. A.K. Singh, Deputy Director General (Horticultural Science), ICAR, New Delhi addressing the gathering on the occasion of brainstorming session



Dignitaries releasing the proceedings of International webinar held at ICAR-NRCP, Solapur



Events organized (Seminar/ Webinar/ Symposia/ Conferences etc.)

Details of the event	Course Director/ Co-coordinators/ Team
Brainstorming session on roadmap for shot hole borer management in pomegranate organized by NRCP, Solapur and SARP on 20.05.2022	Convener: Dr. R. A. Marathe Joint Convener: Dr. Jyotsana Sharma Co-Convener: Dr. P. S. Shirgure & Dr. K. D. Babu Organizing Secretary: Dr. N. V. Singh Joint Organizing Secretary: Dr. Mallikarjun M. H.
Workshop on "Awareness and promotion of good agricultural practices for tribal farmers of Gadchiroli District" during 22-24 th March, 2022 in collaboration with KVK, Gadchiroli (under PDKV, Akola)	Coordinator: Dr. Somnath Pokhare, Co-Coordinator: Dr. Nilesh Gaikwad, Dr. Namrata Giri & Mr. Rahul Damale
One-day workshop on "Awareness for Protection of Farmer's Rights in Farm Innovations, Breeding and Protection of Varieties" at NRCP, Solapur and felicitation of pomegranate progressive farmer for developing 'Sharad King' variety on 03.06.2022 sponsored by PPV & FRA, New Delhi	Programme Director: Dr. R. A. Marathe Coordinator: Dr. Shilpa P., Dr. Roopa Sowjanya P. & Dr. Gaikwad N.N.
Organized webinar on "Hi-tech Pomegranate Cultivation for Higher Productivity and Income" under Azadi Ka Amrit Mahotsav on 06.01.2022.	Coordinator: Dr. Nilesh Gaikwad Co-Coordinator: Dr. S. S. Pokhare & Dr. N. A. Giri Speaker: Dr. N. V. Singh
Organized Webinar on "Smart Cities and Vertical Gardening" under Azadi Ka Amrit Mahotsav on 08.02.2022.	Coordinator: Dr. Nilesh Gaikwad Co-Coordinator: Dr. S. S. Pokhare & Dr. N. A. Giri Speaker: Dr. Ganesh Kadam, Scientist, ICAR-DFR, Pune



Felicitations of the farmer Shri Samadhan Bhosale inventor of the variety 'Sharad King' through DUS centre



Felicitations of the farmer Shri Narayana Chaugule inventor of the proposed variety 'Solapur Taporatna' through DUS centre



One day Workshop under DUS programme on 03.06.2022



Events attended by the NRCP staff (Seminar/ Webinar/ Symposia/ Conferences)				
Title of the event		Date	Organizers	Participants
Guest Speaker for 'V' International Symposium on “Pomegranate and Minor Mediterranean Fruits”		February 14-18, 2022	International Society for Horticultural Science (ISHS), Stellenbosch University, South Africa (Online)	Dr. R. A. Marathe
Patron and Chief Guest for the Valedictory function of International Conference on 'Emerging Perspectives in Biotechnology		January 6-7, 2022	Dept. of Biotechnology, V. G. Shivdhare College of Arts, Commerce & Science, Solapur	Dr. R. A. Marathe
National Webinar on 'Application of Nanotechnology in Crop Protection: Current Status and Future Prospects'		19.01.2022	Sri Sri University Faculty of Agriculture, Cuttack, Odisha	Dr. Mallikarjun M. H.
ICAR NBAIR-Webinar on Application of Genome Editing in Insect Pest Management		20.01.2022	ICAR-NBAIR, Bengaluru	Dr. Mallikarjun M. H.
International webinar on “Exchange of Post PVP Control Measures” - PPV& FRA		8.04.2022	ICAR- NRCP (Online)	Dr. P. Roopa Sowjanya
Brainstorming session on Roadmap for shot hole borer management in Pomegranate		20.05.2022	ICAR- NRCP and SARP, Solapur	All staff of NRCP
International webinar on “Prospects of varieties/crops developed through Genome editing (regulatory framework, technologies and experience) under Indo-German Cooperation on Seed Sector Development”		24.05 2022	PPV&FRA, New Delhi (Online)	Dr. Shilpa P.
Workshop on “Awareness for protection of farmer's rights in areas of farm innovations, breeding and protection of varieties”		03.06.2022	ICAR-NRCP, Solapur	Dr. Mallikarjun M. H.
Trainings/ FLDs/ OFTs organized for the farmers/ students/ entrepreneurs etc. by NRCP				
Title	Date	Sponsoring / collaborating agency	Course Director/ Co-coordinators/ Team	Participants and Venue
A collaborative training program on “Recent Advanced Practices for Export Quality Pomegranate Production and value addition”	06-10 June 2022	MANAGE, Hyderabad	Programme Director: Dr. R. A. Marathe, Director Coordinator: Dr. Mallikarjun M. H. Co-ordinator: Dr. Manjunatha N., Dr. B. Venkata Rao Coordinator (MANAGE)	104 ICAR-NRCP, Solapur (Virtual)



Collaborative training program on "Shot hole borer and disease management in Pomegranate"	05-06 April 2022	Department of Agriculture, Govt. Maharashtra	Programme Director : Dr. Rajiv Marathe, Director Coordinator: Dr. Mallikarjun M. H.	149
Quality pomegranate production and value addition for doubling Farmer's income	24-26 February 2022	Bayer Crop Sciences Ltd.	Program director: Dr. R.A. Marathe, Program coordinators: Dr. Somnath Pokhare & Dr. Manjunatha N.	25 Company officials of Team of Bayer Crop Sciences Ltd.
Training on "Good Agricultural Practices for Export Quality Pomegranate Production and Value Addition"	10-12 January 2022	NRCP, Solapur	Program coordinator: Dr. K. Dinesh Babu Program co-coordinator: Mr. Rahul Damale	30 ICAR-NRCP, Solapur
Workshop on "Awareness and promotion of good agricultural practices for tribal farmers of Gadchiroli District"	22-24 March, 2022	ICAR- NRC on Pomegranate, Kegaon, Solapur	Organizing Secretary: Dr. S. S. Pokhare; Co-Organizing Secretary: Dr. Namrata Giri, Dr. Nilesh Gaikwad and Mr. Rahul Damale	200 ICAR NRCP, Solapur
Field day of ICAR-NRCP released bio-fortified pomegranate variety 'Solapur Lal' at Jaloli village, Taluka-Pandharpur	06 January 2022	ICAR-NRC on Pomegranate, Kegaon, Solapur	Program Co-ordinators: Dr. Asis Maity, Dr. K. Dinesh Babu, Dr. S. S. Pokhare & Dr. C. Awachare	115 ICAR NRCP, Solapur
Farmer-Scientist Interface meet: On Shot / Pin hole borer management in Pomegranate at Ajnale Sangola, Solapur	15 February 2022	ICAR-NRC on Pomegranate, Kegaon, Solapur	Program Co-ordinators: Dr. Mallikarjun H., Dr. S. S. Pokhare & Dr. Manjunatha N.	77 ICAR NRCP, Solapur



Address by Dr. R.A. Marathe, Director, NRCP, Solapur and lectures during MANAGE, Sponsored collaborative training program from June, 6-10 2022





Inauguration of the training programme on "Shot hole borer and disease management in Pomegranate" from April, 5-6 2022



One-day training program cum field visit in Shot hole borer infected orchards in Ajnale village of Solapur district on 15.02.2022

Establishment of Technology Demonstration Block at ICAR-NRCP

Plantation of pomegranate plants was made on 17.01.2022 for the establishment of the demonstration block of NRCP. All the advanced technologies developed by NRCP are depicted in this block fulfilling long awaited demand of pomegranate growers. The demonstration block comprises of air layered and tissue cultured planting materials of Solapur Lal and Bhagawa, grafting of Solapur Lal and Bhagawa onto four different rootstocks (ACC-2; IC-318707; IC-318712 and IC- 798838).



Plantation of pomegranate plants by the Director and staff of NRCP



Training attended by NRCP staff			
Title of the training	Date	Organizers	Participants
Attended virtual training on "Analysis of Experimental data" organized by ICAR-NAARM, Hyderabad	17-22 January 2022	ICAR-NAARM, Hyderabad	Dr. Chandrakant Awachare
Advances in application of Phenomics tools for assessment of abiotic stress responses of crop plants	28 February to 09 March 2022	ICAR - NIASM, Baramati	Dr. P. Roopa Sowjanya
Production Protocol for Bio control agents (Predators, parasitoids, microbial bio pesticides and Bio fertilizers)	29 June 2022 to 19 July 2022	NIPHM Rajendranagar Hyderabad	Dr. S. S. Pokhare
Competency Enhancement programme for Effective Implementation of Training Functions by HRD Nodal Officers of ICAR.	21-23 February 2022	ICAR-NAARM, Hyderabad (online)	Dr. Mallikarjun M. H.
Resource person in training programmes			
Program detail	Resource person	Title of the topic	
Training programme on "Recent advanced Practices for Export Quality Pomegranate Production and value addition" during 6-10 June, 2022 by MANAGE, Hyderabad and ICAR-NRCP, Solapur	Dr. Namrata A. Giri	Nutritional importance and health benefits of pomegranate in functional foods	
	Dr. Shilpa Parashuram	Different pomegranate varieties and their geographical suitability for quality pomegranate production	
Good Agricultural Practices for Export Quality pomegranate Production and Value Addition ICAR-NRCP, Solapur 10-12 January 2022	Dr. Shilpa Parashuram	Varieties of pomegranate	
Training programme on "Extension: From TOT to Value Chain Extension" organized by MANAGE on 10 February 2022	Dr. Nilesh Gaikwad	Value Chain Intervention in Horticulture Sector: A Case Study of Pomegranate	
Training programme on Quality pomegranate production and value addition for doubling farmer's income on 25 February 2022	Dr. Nilesh Gaikwad	Pomegranate processing and value addition for entrepreneurship development	
Workshop on Awareness for protection of farmer's rights in areas of farm innovations, breeding and protection of varieties on 3 June 2022	Dr. Nilesh Gaikwad	Intellectual Property Rights with respect to farm innovations	



Agricultural Exhibitions/ Farmers fair attended/ Technology displayed/ Demonstrated

Team of scientists from ICAR-NRCP, Solapur involving Dr. Somnath Pokhare, Dr. Nilesh Gaikwad, Dr. Namrata Giri and Mr. Rahul Damale demonstrated ICAR-NRCP Technologies particularly on pomegranate juice and RTS beverages, minimally processed arils, pomegranate wine, quality pomegranate production etc. during three days' workshop on

'Awareness and Promotion of Good Agricultural Practices to Tribal Farmers of Gadchiroli District' on 22nd and 23rd March 2022. A meeting with women self-help group from Burkamalpalli was conducted. Demonstration of value added products from pomegranate was conducted by Dr. Namrata Giri and Dr. Nilesh Gaikwad at Bolepalli and Burkamalpalli, Dist. Gadchiroli.



Displaying and demonstration of NRCP value added pomegranate and technologies at Bolepalli and Burkamalpalli, Dist. Gadchiroli

International Day of Yoga

ICAR-NRCP, Solapur has observed 8th International Day of Yoga (IDY) on 21st June, 2022 under the guidance of Director, ICAR-NRCP, Solapur. As part of Yoga day celebration and to create awareness about importance of Yoga among scientific and non-scientific staffs of the centre, we invited Mrs. Snehal S. Pendse, Yoga Teacher, from Solapur as a chief guest for our program. Total 55 participants attended this program. Mrs. Pendse, delivered the lecture on 'Importance and Benefits of Yoga in Modern Life'. Then we had mass yoga demonstrations of yoga asana to all the participants, during which very important asana like Vrikshasana, Bhadrasana, Vajrasana, Bhujangasana, Balasana, Ardha-Matsyendrasana, Uttanasana etc. were demonstrated. The program was very successful and all the NRCP staff got benefited from the lecture on Yoga and Yoga asana in view of International Day of Yoga 2022.



Staff of NRCP performing Yoga asana on the day of International day of Yoga

Peer recognitions / Awards / Honours received by the NRCP staff

- Dr. P. Roopa Sowjanya received Young Scientist Research Award-2022 by DAE-BRNS, BARC, GOI, India



- Dr. Mallikarjun M. H. received Young Entomologist Award-2022 by Agricultural and Environmental Technology Development Society (AETDS) U.S. Nagar Uttarakhand, India
- Mr. Rahul Devidas Damale received Young Scientist Award-2022 by Society for Scientific Development in Agriculture & Technology (SSDAT), Meerut, India (National Conference)



Dr. R. A. Marathe, EC Member, VNMKV attended 24th Convocation Ceremony of VNMKV, Parbhani. Shri Dadaji Bhuse, Honble Agril Minister Maharashtra was Guest of Honour of the Ceremony

Technology Commercialization / Linkages / Collaborations / MoU signed

- MoU was signed between ICAR-NRCP, Solapur and M/s. Jain Irrigation Systems Pvt. Ltd. Jalgaon for transfer of technology on "Propagation of pomegranate variety Solapur Lal through micropropagation" on 20th May 2022
- MoU was signed between ICAR-NRCP, Solapur and Punyashlok Ahilyadevi Holkar Solapur University, Solapur for Training and Research work for student on 16th May 2022
- MoU was signed between ICAR-NRCP, Solapur and School of Biotechnology and Bioinformatics DY Patil Deemed to be University, Navi Mumbai for Training and Research work for student on 09th February 2022
- MoU was signed between ICAR-NRCP, Solapur and School of Biotechnology and Progressive Educations Society Modern College of Pharmacy, Pune, Maharashtra for Training and Research work for student on 09th February 2022



MoU was signed between ICAR-NRCP, Solapur and M/s. Jain Irrigation Systems Pvt. Ltd. Jalgaon





MoU signed between ICAR-NRRCP, Solapur and PAHSU, Solapur

Publications

Research papers

1. Patil P.G., Jamma S., Manjunatha N., Bohra A., Pokhare S.S., Dhinesh Babu K., Murkute A.A. and Marathe R.A. (2022). Chromosome specific potential intron polymorphism markers for large-scale genotyping applications in pomegranate. *Frontiers in Plant Science*. doi: 10.3389/fpls.2022.943959. **(NAAS rating: 12.63)**.
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New Projects sanctioned

- A project on "Induced Mutagenesis in pomegranate for biotic stress resistance" was sanctioned on June 2022 funded by Department of Atomic Energy – Board of Research in Nuclear Sciences, GOI for 3 years of total budget RS.27,76,600 (PI: Dr. P. Roopa Sowjanya)

Institutional Activities

Quinquennial Review Team (QRT) Meeting

The second review meeting of the QRT was convened on January 5, 2022 at NRCP, Solapur. Director ICAR-NRCP, Dr. R. A. Marathe welcomed the Chairman Dr. K.P. Viswanatha, former VC, MPKV, Rahuri; and other member of the QRT team including Dr. D.P. Waskar, Director of Research, VNMKV, Parbhani; Dr. S.D. Gorantiwar, Head, AE, MPKV, Rahuri, Dr. Indu S. Sawant, Ex. Director (Acting), NRCG, Pune; Dr. C. K. Narayana, Pr. Scientist, PHT & AE, IIHR, Bengaluru; Dr. Rajesh P. Kadam, Head, EE, VNMKV, Parbhani, Maharashtra. The team visited research fields, laboratories, polyhouses and water harvesting structures. The action taken report on recommendations of previous QRT were

presented in the meeting. The QRT interacted with the scientists and suggested several recommendations for improvement of the ongoing research programmes. On 6th January, 2022, a 'Pomegranate Field day' at village Jaloli Taluka: Pandharpur was organized for promotion of Solapur Lal variety released by NRCP, Solapur. In the field itself interactive meeting was organized with various pomegranate stakeholders viz. Progressive farmers, Nursery growers, Exporters, Entrepreneurs, State Govt. Agricultural and Extension officials. Various problems faced by the stakeholders and review of the NRCP's technologies dissemination was discussed by the QRT members.





Dr. R.A. Marathe, Director, NRCP welcomed Chairman Dr. K.P. Viswanatha during QRT meeting



Dr. Rajesh P. Kadam, Dr. S.D. Gorantiwar, Dr. K.P. Viswanatha, Dr. D.P. Waskar and Dr. Indu S. Sawant during QRT meeting at NRCP auditorium



Field Visit of QRT team members to pomegranate orchards at Jaloli on 6.1.2022



Republic day celebration

ICAR-NRCP, Solapur celebrated 73th Republic Day on 26th January, 2022 by unfurling of the Indian National flag by Dr. R. A. Marathe, Director, ICAR-NRCP in presence of all the scientific, technical, administrative, contractual etc. staff of the centre. The gathering was addressed by the speech of the Director followed by the felicitation of the farm labour and children of the staff who scored highest in academics. Different event and competition such as musical chair, lemon-spoon etc. was conducted on this occasion and prize were given to the winners.



Celebration of Republic day at ICAR-NRCP, Solapur



Outreach activities

Garib Kalyan Sammelan organized under PM-KISAN programme

Garib Kalyan Sammelan was organized at KVK Solapur in collaboration with ICAR-NRCP, Solapur on 31st May 2022. Hon'ble Shri. Ramdas Athawale ji, Union Minister of State for Social Justice and Empowerment GoI, Hon'ble Shri. Jai Sidheshwar Mahaswami ji, Member of Parliament, Solapur grace the occasion. Dr. R. A. Marathe, Director NRCP addressed the gathering on the occasion of Garib Kalyan Sammelan.



Hon'ble Shri. Ramdas Athawale ji, Union Minister of State for Social Justice and Empowerment; Hon'ble Shri. Jai Sidheshwar Mahaswami ji, Member of parliament, Solapur grace the occasion

Events organized under SCSP

ICAR-NRCP, Solapur conducted 3 days training Programme and Farmers's Fair Cum Field Day at Tikamgarh, M.P from 12 to 14 March, 2022.



Training Programme and Farmers' Fair Cum Field Day (SCSP) Tikamgarh, M.P

Events organized under STC (TSP)

A team of scientist from NRCP, Solapur consisting of Dr. Nilesh N. Gaikwad; Dr. Somnath Suresh Pokhare; Dr. Namrata Ankush Giri and Mr. Rahul Damale, in collaboration with KVK, Gadchiroli (under PDKV, Akola) organized three days' workshop on "Awareness and promotion of good agricultural practices for tribal farmers of Gadchiroli District" during 22-24th March, 2022 at Gadchiroli, Maharashtra. During this three days' workshop, various lectures were delivered and demonstrations were conducted. The lectures were mainly on effective utilization of agricultural inputs distributed, processing and value addition of locally grown fruits and vegetables. During this workshop, the demonstration of ICAR-NRCP technologies (especially processing of pomegranate in to juice and RTS beverage) has been arranged.



Venue	Agri. Inputs Distributed	No. of Participants
Bolepalli Tal. Mulchera, Dist. Gadchiroli	Summer Mung seeds; Vegetable seed kit; PDKV-diary; PDKV-Calendar; PDKV Micrograde II; Trichoderma based bioformulation, Mango and Sapota saplings	100
Gattepalli, Mendatola, Dist. Gadchiroli.	PDKV-Diary, PDKV-Calendar, Mango & sapota saplings, Battery & Bicycle (30)	100
Bhamragarh, Dist. Gadchiroli.	PDKV-Diary, PDKV-Calendar, Mango saplings, Sapota saplings, Battery and Knapsack Sprayer (50)	70



Distribution of agri-inputs and Bicycles to Tribal farmers of Gadchiroli



Distribution of Knapsack Sprayer to Tribal farmers of Gadchiroli

Radio / TV talk

Dr. Nilesh Gaikwad has participated as subject specialist in the Hello Kisan—Phone in programme entitled "Pomegranate farming and value addition" on 22nd June 2022.

Exhibitions

Participated in the Kisan Mela and Agricultural Exhibition organized by KVK, Solapur in association with ATMA, Solapur at KVK, Solapur on 26th April 2022.



Exhibition of NRCP technologies at Kisan Mela and Agricultural Exhibition organized by KVK, Solapur





International year of millets Kisan exhibition on March 23-27, 2022



Exhibition at Phaltan during March 25-27, 2022



Krushi Udyan Mahotsav Pitrakothi on 15-17 April 2022



Sh. Dinkar Chaudhary, staff of NRCP received Best Stall Award in Exhibition

Farmers Visit

- Farmers of Vanaparthi, with Staff of Department of Horticulture, Telanganna (50 Nos.) visited NRCP on 09.02.2022.
- Farmers of Nagarkurnool, AP with Staff of Department of Horticulture, AP (50 Nos) visited NRCP on 22.02.2022.
- Farmers' exposure visit to ICAR-NRCP, Solapur coordinated by KVK, Bidar, Karnataka (50 Nos.) on 26.03.2022.
- Farmers from Bhartiya Kisan Sangh, Solapur (50 Nos) visited NRCP on 24.04.2022
- Exposure visit cum training for farmers from AURA social cum bahuddeshiya santha on 8.2.2022 (30 Nos.)



Farmers of Vanaparthi, visited ICAR –NRCP, Solapur through Dept. of Horticulture, on 9.02.2022





Farmers of Nagarkurnool, AP visited ICAR –NRCP, Solapur through Dept. of Horticulture, AP on 22.02.2022



Exposure visit cum training for farmers from AURA social cum bahuddeshiya santha on 8.2.2022

Distinguished Visitors to ICAR-NRCP, Solapur

- Visit of Dr. M. Angamuthu, IAS, Chairman APEDA, New Delhi on 28.01.2022
- Padmashri Dr. Vikas Mahatme, Member of Rajya Sabha visited NRCP, Solapur on 05.03.2022 and held interactive meeting with Scientists and pomegranate growers of the region specially to assess damage caused by shot hole borer pest on pomegranate.
- Dr. N. K Krishnakumar, Ex-DDG (HS) visited NRCP on 30.03.2022
- Shri G.P. Sharma, Joint Secretary (Finance), ICAR, New Delhi visited NRCP on 26.04.2022
- Dr. Prashant Kumar Patil, VC, MPKV Rahuri visited NRCP, Solapur on 22.06.2022



Visit of Dr. M. Angamuthu, IAS, Chairman APEDA, New Delhi



Director NRCP welcoming Padmashri Dr. Vikas Mahatme at NRCP





*Dr. N. K Krishnakumar, Ex-DDG (HS)
visited NRCP*



*Shri G.P. Sharma, Joint Secretary (Finance),
ICAR, New Delhi visited NRCP*



*Dr. Prashant Kumar Patil, VC, MPKV Rahuri visited NRCP, Solapur
and had interaction with the scientific staff of NRCP*



Field Visit of Dr. M. Angamuthu, IAS, Chairman APEDA, New Delhi

Students Visit

- Students from CoA, Hanumanmatti UAS, Dwd (54 Nos) visited ICAR–NRCP, Solapur on 17.04.2022
- Students from CoA, Bijapur, UAS DWD (35 Nos) visited ICAR–NRCP, Solapur on 20.04.2022
- Students from Punyashlok Ahilyadevi Holkar Solapur University, Solapur visited NRCP on 25.06.2022
- Students from Vasundhara Kala Mahavidyalaya, Jule solapur (50 Nos) visited NRCP on 12.05.2022
- Students from Sri Sant Damaji Mahavidyalaya, Mangalwedha (50 Nos) visited NRCP on 31.05.2022
- Students from DBF Dayanand College, Solapur (59 Nos) visited NRCP on 2.06.2022





Students from CoA, Hanumanmatti UAS, Dharwad during the interaction with NRCP scientist



CoA, Bijapur, UAS, Dharwad Students during their visit to ICAR –NRCP, Solapur

Meetings attended by the NRCP staff

1. Dr. Mallikarjun, Dr. Jyotsana Sharma and Dr. Manjunatha, N. attended HORTSAP meeting on modification of the pomegranate survey proforma for pest scouts and monitors at Sakhar Sankul Shivajinagar, Pune, Maharashtra on 11.03.2022
2. Dr. Mallikarjun, Dr. R.A. Marathe Dr. Somnath Pokhare and DR. Manjunatha N. attended Farmer-Scientist- interaction meet on diagnosis and management of shot hole borer in pomegranate at Ajnale-Sangola, Maharashtra on 15.02.2022
3. Dr. Mallikarjun attended Farmer- Scientist- interaction meet on diagnosis and management of shot hole borer in pomegranate and Agrowon Anniversary Event at Pandharpur- Maharashtra on 20.04.2022
4. Dr. R.A. Marathe, Dr. Mallikarjun, Dr. Manjunatha N., Dr. Somnath Pokhare and Dr. Nilesh Gaikwad attended Farmer- Scientist- interaction meet on diagnosis and management of shot hole borer and diseases in pomegranate at Sangola, Maharashtra on 07.06.2022
5. Dr. Mallikarjun attended Farmer- Scientist- interaction meet on diagnosis and management of shot hole borer in pomegranate at Daund, Maharashtra on 17.06.2022
6. Dr. Mallikarjun attended Agriculture Research Management System (ARMS) meeting (online) on 8.02.2022
7. Dr. Mallikarjun attended Meeting with Bayer India Pvt. Ltd. (online) on 7.02.2022
8. Dr. Mallikarjun attended HORTSAP project meeting on 28.01.2022
9. Dr. P.Roopa Sowjanya attended Project presentation review meeting of BARC on 29th March 2022 at ICAR –NRCP, Solapur (Online)

Infrastructure created

New Molecular Breeding Lab

Molecular Breeding lab to carry out molecular breeding oriented works like marker assisted selection, germplasm characterization by using molecular markers like SSR, RAPD, ISSR and SRAPs. Identification of trait specific markers through genotyping tools. Designing and development of genomic resources like primers development. Linkage map, QTLs mappings. The development of new breeding lines will be evaluated by using identified markers. Lab working tables has been installed in the lab. The instruments like Spectrophotometer, Deep freezer, Electronic Balance, freezers, Refrigerated Centrifuge, Autoclave has been procured to functionalize the lab through Institution and SERB Projects.





Electrical Connection to Hiraj Research Farm

New electrical connections were provided in Research Farm, Located in Hiraj. Four transformers were installed in four farm ponds located in four corners of the 100-acre research filed. This will help to ensure proper irrigation to all experimental blocks of the centre and lighting facility on the farm.



Electronic and Print Media coverage

राष्ट्रीय डाळिंब संशोधन केंद्र : शेतकऱ्यांसाठी मार्गदर्शक ठरतेय



दोन दाणा विकसित



संशोधन केंद्रात डाळिंबाच्या पंढरपूरच्या कृषी विभागाच्या वतीने जोडली (ता. पंढरपूर)

येथे प्रक्षेत्र भेटीचे आणि डाळिंब पिकावरील खोड- भुंगरा निदान आणि व्यवस्थापन या विषयावर यावेळी चर्चासत्राचे आयोजन करण्यात आले होते.

जळोलीतील हेमंतकुमार नरसाळे यांच्या शेतात हे चर्चासत्र घेण्यात आले. अध्यक्षस्थानी महात्मा फुले कृषी विद्यापीठाचे माजी कुलगुरू डॉ. के. पी. विश्वनाथ होते. प्रस्ताविकात डॉ. राजीव मराठे यांनी चर्चासत्राचा हेतू सांगितला. शेतकरी हेमंतकुमार नरसाळे, रावसाहेब गोड यांचा या वेळी सन्मान करण्यात आला. डॉ.

जळोलीमध्ये डाळिंबावरील खोडकिडीवर चर्चासत्र

सोलापूर : सोलापूरच्या राष्ट्रीय डाळिंब संशोधन केंद्र आणि पंढरपूरच्या कृषी विभागाच्या वतीने जोडली (ता. पंढरपूर) येथे प्रक्षेत्र भेटीचे आणि डाळिंब पिकावरील खोड- भुंगरा निदान आणि व्यवस्थापन या विषयावर यावेळी चर्चासत्राचे आयोजन करण्यात आले होते.

जळोलीतील हेमंतकुमार नरसाळे यांच्या शेतात हे चर्चासत्र घेण्यात आले. अध्यक्षस्थानी महात्मा फुले कृषी विद्यापीठाचे माजी कुलगुरू डॉ. के. पी. विश्वनाथ होते. प्रस्ताविकात डॉ. राजीव मराठे यांनी चर्चासत्राचा हेतू सांगितला. शेतकरी हेमंतकुमार नरसाळे, रावसाहेब गोड यांचा या वेळी सन्मान करण्यात आला. डॉ.

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