


From the Director's Desk / निदेशक की कलम से		Contents
<div style="display: flex; align-items: flex-start;">  <div> <p>Dear Readers,</p> <p>It gives me immense pleasure to release the Newsletter of ICAR-NRCP for the period of January to June 2024. It's a matter of pride that NRCP's pomegranate variety 'Solapur Anardana' meant for <i>anardana</i> purpose is notified by State Variety Release Committee (SVRC -2024).</p> <p>During this period, an international assignment for export of irradiated pomegranate to USA was achieved due to combined efforts of NRCP, APEDA, MSAMB, DPP &amp; QS and INI Farms Pvt. Ltd., NRCP has developed sea protocol for export of the pomegranate fruits to USA through static trial at NRCP, Solapur.</p> <p>SSR marker based multiplex assays were developed for detection of promising Pomegranate varieties. Scientists have identified potential donors for bio-fortification purposes which will be useful for pomegranate breeders for selection of parental material for development of nutritionally superior bio-fortified varieties.</p> <p>Scientists of NRCP brought laurels by bagging several prestigious fellowships and awards. The centre has organised seventeen training programmes besides its participation in three agricultural exhibitions. During this period, NRCP has signed three MoU with different stakeholders. I extend my hearty congratulations to the dedicated efforts of scientists and other staff of ICAR-NRCP.</p> </div> </div>		<ul style="list-style-type: none"> <li>• <b>Director's Desk</b></li> <li>• <b>Research achievement</b></li> <li>• <b>Events organized</b> <ul style="list-style-type: none"> <li>Trainings</li> <li>National seminars/ workshops</li> <li>Resource person</li> </ul> </li> <li>• <b>Extension Activities</b> <ul style="list-style-type: none"> <li>Trainings</li> <li>Agri. Exhibitions / Melas</li> </ul> </li> <li>• <b>Technology</b> <ul style="list-style-type: none"> <li>Transferred/ MoU</li> </ul> </li> <li>• <b>Distinguished Visitors</b></li> <li>• <b>Farmers &amp; Students Visit</b></li> <li>• <b>Personnel</b> <ul style="list-style-type: none"> <li>➤ Awards</li> <li>➤ Promotions</li> <li>➤ Publications</li> <li>➤ New Projects sanctioned</li> <li>➤ Meetings attended</li> </ul> </li> </ul>
Produced & Published by		Compiled & Edited by
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## Dr. R. A. Marathe, Director, ICAR-NRCP Solapur received Prestigious Fellowship of “National Academy of Agricultural Sciences” New Delhi on January 1, 2024



*Dr. R. A. Marathe, Director, ICAR-NRCP Solapur receiving the prestigious award from President NAAS & DG, ICAR at NASC, New Delhi*

## Flagging off the first sea consignment of irradiated pomegranate fruits to United States of America

Under the leadership of Dr. R.A. Marathe, Director, team of Scientists including Dr. Nilesh Gaikwad, and Dr. Namrata Giri, contributed in the export of irradiated pomegranate fruits to USA. Sea protocol for export of the pomegranate fruits to USA through static trial at NRCP, Solapur has been developed. Detailed study report for the same has been sent to APEDA, New Delhi. On the basis of the study report first sea shipment of pomegranate has been exported to USA on 28<sup>th</sup> Feb. 2024. This activity was conducted by NRCP in collaboration with APEDA (Min. of Commerce and Industry, GOI), MSAMB (Govt. of Maharashtra), Directorate of plant protection, quarantine & storage (DAC, GOI), and INI Farms Pvt. Ltd., Mumbai. The development of sea protocol, static trial and sea shipment of the pomegranate to USA has opened up the economical export opportunity to pomegranate exporters from India and reduce the transportation cost of the pomegranate fruit by approximately 1/3<sup>rd</sup> and thereby making our farmers and exporters competitive in the international market.



## Research achievements/ Highlights/ Technology developed

### Pomegranate var. Solapur Anardana: SVRC -2024 notified

Pomegranate variety of the NRCP ‘Solapur Anardana’ meant for preparation of *anardana* is notified by State Variety Release Committee (SVRC -2024). It is a high yielding variety (22-23 tons/ha); rich in titrable acidity (4.8%); Anthocyanin (456 mg/100 g) with high anardana recovery from the arils (21.6%). This is red rind variety with red arils. It is notified by the State Variety Release Committee (SVRC) of 2024 through 53<sup>rd</sup> SSSC meeting, held on 08.02.2024, Mantralaya, Mumbai, for cultivation in the state of Maharashtra.







*Fresh fruits of Solapur anardana variety*



*Fresh arils of Solapur anardana*



*Dried arils of Solapur anardana*

(K. D. Babu)

### **Introduction and evaluation of pomegranate germplasm under humid and sub-humid regions of Uttarakhand, India**

Collaborative project on “Introduction and evaluation of pomegranate germplasm in Humid and Sub-humid regions of Uttarakhand, India” with VPKAS, Almora was initiated with the planting of temperate pomegranate cultivars (23 accessions) to evaluate their performance under Humid and Sub-humid regions of Uttarakhand.



*Planting of pomegranate germplasms at VPKAS, Almora*

(P. Shilpa, P. Roopa Sowjanya, C. Awachare, K. D. Babu, Rahul Dev, N K Hedau, Lakshmikant, & R. A. Marathe)

### **Survey cum exploration for collection of new pomegranate germplasm accessions**

Survey cum exploration has been made and collected 50 new pomegranate germplasm accessions from Jolikote, Garampani, Chhra, Kafliger, Bageshwar, Takula, Basoli, Katura, Patiya, Batgaon, Kasoon,





Mehatgaon, Pthalibagad, Kosi, Hawalbagh areas of Uttarakhand. Successfully established germplasm collections will be screened for various biotic and abiotic stresses to identify the resistance sources for utilizing in pomegranate breeding programmes.



*Collection of wild Pomegranate germplasm by NRCP scientists*

*(P. Shilpa; P. Roopa Sowjanya, C. Awachare & R. A. Marathe)*

### **Identification of polymorphic SNPs in 95 germplasm line of Pomegranate**

Sequencing of selected pomegranate lines has been completed using Illumina platform at Eurofins Genomics India Pvt. Ltd. Bengaluru. The sequenced raw data was processed to obtain high quality clean reads to remove adaptor sequences, ambiguous reads and low quality sequences using Trimmomatic v.038. The reads of the sample were aligned to the reference pomegranate genome using Burrows-Wheeler Aligner v0.7.17 and the read group information was added to the alignment files using Picard v2.27.5 and the duplicate read groups were marked. A total of 626.7 million raw reads were generated covering 173.8 Gb of sequence data with an average of 6.5 million reads per sample, the raw reads were trimmed to obtain 525.4 million clean high quality reads with an average of 5.5 million reads per sample. Subsequently, the clean reads of each sample that have been trimmed were mapped to the pomegranate reference genome (Genome length = 320.30Mb). Above 99% mapping percentage has been acquired in the study with the total number of mapped tags ranged from 1,44,298 to 1,85,10,279 across all samples. SNPs were identified from the sorted BAM file of the samples using FreeBayes (v1.0.2) and filtered based on minimum read depth of 10 and mapping quality threshold of 25 using. The SNPs were further filtered with VCFtools (v0.1.016) to retain sites with genotypes present in 80% of the sample which revealed 36,471 polymorphic SNP sites out of 9,56,531 total filtered SNPs across 95 genotypes (10,069 SNPs/sample).

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

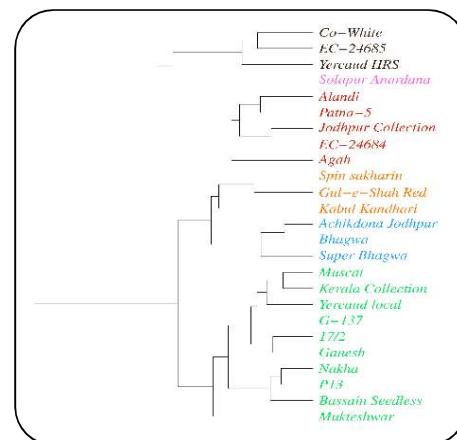
### **Expedition of nutritional diverseness of Pomegranate (*Punica granatum*) germplasm**

Twenty-five pomegranate germplasm lines comprising of commercial pomegranate varieties and exotic/indigenous cultivars were evaluated for nutritional quality viz. carbohydrates, antioxidants, and





minerals. Significant variability was reported in germplasm for parameters such as acidity (0.32-2.69), total soluble solids (9-16°Brix), ascorbic acid (12.5-19.2 mg/100ml), monomeric anthocyanin (0.7-46.9 mg/100ml), reducing sugars (1.1-32.3 g/100ml), total soluble sugar (3.6-22.9 g/100ml), total phenols (697-3854 mg/L), iron (25-193 mg/Kg), zinc (10-36 mg/kg), calcium (12-25 mg/100g), magnesium (6-16 mg/100g), potassium (564-1093 mg/100g) and phosphorus (0.062-0.118%). TSS showed significant negative correlation with manganese ( $r = -0.58$ ), potassium ( $r = -0.53$ ) and phosphorus ( $r = -0.66$ ), whereas correlated positively with calcium ( $r = 0.53$ ). Euclidean distance based on 17 parameters, 25 genotypes were classified into two major clusters consisting of 9 germplasm in sub cluster I and 16 germplasm in sub cluster II with two sub clusters. The highest inter class distance was found between Co-white and Mukteshwar. The lowest intra class distance was shared between co-white and EC-24685. Among tested germplasm, Solapur Anardana and EC-24684 contained highest concentration of iron and zinc hence can be used in breeding programmes for development of bio-fortified pomegranate varieties.

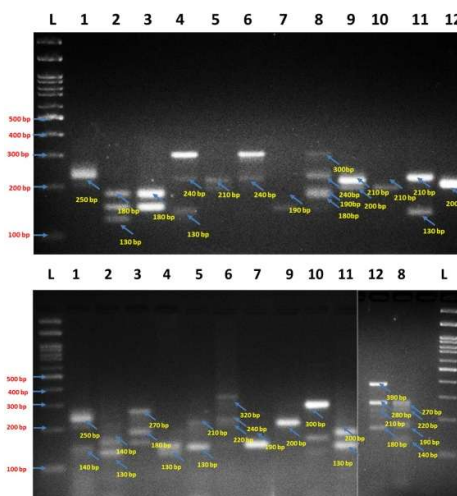


**Variability in fruit color and size in pomegranate germplasm used for analysis; cluster analysis based on nutritional quality**

(P. Raigond, Roopa Sowjanya P., Shilpa P., N. A. Giri, K. D. Babu, P. G. Patil & R. A. Marathe)

### Development of SSR marker based multiplex assays for detection of promising Pomegranate varieties

Microsatellite profiling usually amplifies more than two alleles per locus, making it challenging to analyse and compare different varieties. Therefore, in order to depict more clearly the examined pomegranate varieties. The SSRs with rare alleles, and combinations of rare and unique allele sizes were converted to barcodes. The allele size bars are drawn to a linear scale for all of the analysed 12 varieties i.e. Ganesh, Mridula, Arakta, Ruby, Super Bhagawa, Dholka, Kandhari, Solapur Lal, Jallore Seedless, Jyoti, Bhagawa and Yercaud-I to develop barcode representation for multiplex assays. As a result, we developed and confirmed the multiplex assays through wet lab experiments for eight core SSRs producing rare alleles with two to four primer combinations to identify pomegranate cultivars i.e. Mridula, Ruby, Solapur Lal, Jallore Seedless and Bhagawa. Twenty-two SSRs that are





producing both rare and unique alleles in specific cultivars *i.e.* Ganesh, Mridula, Arakta, Super Bhagawa, Dholka, Bhagawa, Yercaud-I and Solapur Lal. These profiles indicated maximum of four primer combinations can be used for multiplex assays based on rare alleles for Solapur Lal (NRCP\_SSR30, NRCP\_SSR97, HvSSRT\_605 and HvSSRT\_868), three for Bhagawa (NRCP\_SSR30, HvSSRT\_695 and HvSSRT\_437), and two each for Mridula (HvSSRT\_868 and HvSSRT\_437), Ruby (NRCP\_SSR97 and HvSSRT\_437) and Jalore Seedless (HvSSRT\_695 and HvSSRT\_348). Similarly, multiplex assays having both rare and unique alleles with four primer combinations for Solapur Lal (NRCP\_SSR34, HvSSRT\_463, NRCP\_SSR91 and HvSSRT\_826), Yercaud-I (NRCP\_SSR82, NRCP\_SSR28, HvSSRT\_504 and HvSSRT\_827), three for Dholka (NRCP\_SSR61, NRCP\_SSR97 and NRCP\_SSR20), and two each for Ganesh (HvSSRT\_81 and NRCP\_SSR62), Mridula (HvSSRT\_432 and HvSSRT\_437), Arakta (NRCP\_SSR11 and HvSSRT\_868), Super Bhagawa (HvSSRT\_695 and HvSSRT\_437) and Bhagawa (HvSSRT\_746 and HvSSRT\_437) were developed. We assume that the variety specific multiplex assays developed here could be highly useful for quick detection of pomegranate varieties.

*(P. G. Patil, D. S. Kulkarni, Shilpa P., C. Awachare, K. D. Babu K & R. A. Marathe)*

### **Efficacy evaluation of trap with ethanol and Lure and against shot hole borer**

The experiment was conducted to evaluate the efficacy of the trap with ethanol and Lure and against shot hole borer. The three different concentrations of ethanol (99% 70% and 50%) were evaluated against the Shot hole borer. However, no trapping of the beetle was observed in both in vitro and in vivo conditions using the Kisan X mini solar trap (Agshop) and funnel trap. The Pomotrap with Pomo lure from Green Revolution Pvt. Ltd., Sangli, was evaluated. However, under both in vitro and in vivo conditions, no trapping of the shot hole borer was observed. Fungus discs were prepared to assess their effectiveness as attractants. In the controlled setting of a Petri plate, the beetles were consistently drawn to the Fusarium disc, actively creating tunnels within it.



*Mini solar trap*



*Funnel trap*



*Pomotrap with Pomo lure*

*(Mallikarjun M.H.)*

### **Pomegranate based Iron rich RTS drinks**

The blended juices are superior to single fruit juice beverage with artificial colour and flavor. The mixing of fruit juices to beverages not only improves the nutrition but also the sensorial characteristics. The D-optimal mixture design of Response Surface Methodology was used with levels of factors such as Pomegranate Juice: 40 to 65%, Karonda Juice: 20 to 35% and Aonla Juice: 15 to 25% for preparation of iron rich RTS drink. The responses were considered as iron content (mg/100ml), ascorbic acid content (mg/100ml), total phenols (mg GAE/ 100ml), in-vitro antioxidant activity (%) and overall acceptability. The nutritional composition of pomegranate, karonda and aonla juice were evaluated and karonda juice was found rich in iron (20.87mg/L) as compared to pomegranate and aonla juice.





However, ascorbic acid content was found highest in aonla juice (185 mg/100ml). The nutritional evaluation of the optimized pomegranate iron rich drink showed that the iron content was increased by 31.91% and ascorbic acid content by 10.66% as compared to control (pomegranate RTS drink without blend of karonda and aonla juice). The prepared drink may fulfil the iron requirement of 32.63% (Men), 21.37% (women) & 22.96% (pregnant women) when consumed 100ml per day according to RDA.



*Pomegranate based Iron rich drinks prepared using Karonda and Aonla juice*

*(N. A. Giri, N. N. Gaikwad & R. A. Marathe)*

### **Foam Mat Drying of Pomegranate Juice for retention of Bioactive Compounds**

The effect of addition of whey protein isolate (WPI; 0, 5, 7.5 and 10 %) and carboxy methyl cellulose (CMC; 0, 0.25, 0.5 and 0.75 %) was studied for its foaming properties and stability in pomegranate juice (PJ). High-quality powders can be produced from fruit juices and heat-sensitive food items using foam mat drying (FMD). The PJ foam with 10 % WPI, a foaming agent, and 0.25 % CMC, a stabilizer had high foam expansion (FE) (455.28 %) and low foam density (FD) (0.2030 g/cc) and foam drainage volume (FDV) (20.10 ml). The PJ foam was subjected to different drying temperatures (50, 60 and 70 °C) and thickness (3 and 6 mm). The drying temperature of 60 °C and foam thickness of 3 mm were found to be the acceptable drying conditions based on drying time (180 minutes) and retention of bioactive compounds. At optimum drying conditions, the retention of phenols, anthocyanin, ascorbic acid, and antioxidant capacity was 97.86 %, 83.90 %, 77.29 %, and 87.11 % respectively. The sensory evaluation of the reconstituted foam-mat dried pomegranate juice powder (FPJP) showed lower overall acceptability scores than fresh juice (FJ), but the overall acceptability of the powder dried at optimum drying conditions was within liking limits (>6). FPJP has an amorphous nature with a particle size of 3564 nm and a porous and irregular structure. Bioactive compounds in FPJP were studied after eight months of storage, with higher retention of bioactive compounds in refrigerated conditions.



*(N. N. Gaikwad, N. A. Giri & R. A. Marathe)*

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

<b>Details of the event</b>	<b>Course Director/ Co-coordinators/ Team</b>
World IP Day 2024 seminar entitled "IP and the SDGs: Building our common future with innovation and creativity" on 30 <sup>th</sup> April 2024 at ICAR-NRCP, Solapur	Convenor: Dr. R. A. Marathe Organizing Secretary: Dr. Nilesh N. Gaikwad & Dr. Namrata A. Giri
International Plant Health Day with the theme "Plant Health, Safe Trade and Digital Health" on 12 May, 2024 at ICAR-NRCP, Solapur	Programme Chairman: Dr. R. A. Marathe Organizing Secretary: Dr. Roopa S. Speaker: Dr. Manjunatha N.





## Institute Research Council Meeting

The meeting of the 18<sup>th</sup> Institute Research Council (IRC) of ICAR- National Research Centre on Pomegranate was held on January 10, 2024 at NRCP under the guidance of Dr. R.A. Marathe, Hon'ble Chairman, IRC & Director, ICAR-NRCP, Solapur. The IRC meeting commenced on January 10, 2024 at 9.30 am in the Director's Board Room. At the outset, Dr. K. Dhinesh Babu, Principal Scientist & Member Secretary IRC extended a warm welcome to Dr. R.A. Marathe, Chairman, IRC & Director, ICAR-NRCP and all scientists of the institute. This was followed by individual presentations by PIs of respective project on salient achievements of 15 on-going research projects and future line of work besides three new research project proposals.



*Dr. K. Dhinesh Babu, Member Secretary welcomes Dr. R.A Marathe, Director & Chairman during 18<sup>th</sup> IRC meeting*

## Institute Management Committee (IMC)

Institute Management Committee meeting was held at NRCP, Solapur on 08.04.2024 through physical and online mode under the chairmanship of Dr. R. A. Marathe, Director, NRCP, Solapur. The committee has revived the on-going institutional activities and recommended to procure essential research requirements. The IMC members were Dr. V. B. Patel, ADG, HS-1, ICAR, New Delhi; Dr. P. G. Patil, Vice-Chancellor MPKV, Rahuri; Dr. Ashutosh Murkute, Director, MGIRI, Wardha; Dr. DV Sudhakar Rao, Principal Scientist, ICAR-IIHR, Bengaluru; Dr. Anuradha Upadhyay, Principal Scientist, ICAR-NRCG, Pune; Dr. T D S Prakash, SF & AO, ICAR-IIRR, Hyderabad; Dr. P.S. Shirkure, Principal Scientist, ICAR-NRCP, Solapur; Sh. Ramdas Patil, Progressive farmer from Satana, Nashik; Sh. Shankar Waghmare, Progressive farmer from Mohol, Solapur and Sh. R. B. Rai, AO, ICAR-NRCP, Solapur.



*IMC meeting under the chairmanship of Dr. R. A. Marathe, Director, NRCP*





## New Year Celebration - 2024

The Recreation Club of NRCP celebrated New Year 2024 with enthusiastic participation from all staff members in the esteemed presence of the Director. The programme commenced with a New Year address by Dr. R. A. Marathe, Director, followed by a ceremonial cake cutting. Staff members who made significant achievements during the previous year were felicitated by the Director in recognition of their contributions. On this occasion, the Director encouraged all employees to strive for excellence in research and to work towards the betterment of pomegranate farmers. The event was successfully coordinated by Dr. Namrata Giri.



*New Year 2024 celebration with institute staff*

## International Plant Health Day

International Plant Health Day was celebrated on May 12<sup>th</sup>, 2024 with the theme Plant Health, safe trade and Digital Health. Dr. R.A. Marathe, Director, ICAR - NRCP addressed all the gathering about importance of Plant Health and related issues in day to day life and its impact on agriculture sustainability. In this connection a lecture on “Plant Health is main driver of Environment & Economy” was also delivered by Dr. Manjunatha, N. Sr. Scientist (Plant Pathology). A total of 40 Participants witnessed this event and made the event successful. The program was coordinated by Dr. P. Roopa Sowjanya.



*Address by the Director and lecture by Dr. Manjunatha N. on the the occasion of Interanational plant health day.*

## Events attended by the NRCP staff (Seminar/ Webinar/ Symposia/ Conferences)

Title of the event	Date	Organizers	Participants
Relevance of Ideology of Swami Vivekanand and Sri Ram Krishna Paramhansa in man making and	12 January, 2024	ICAR (Virtual)	Dr. Mallikarjun M.H





Nation Building' by Dr P. S. Brahmanand, PD, WTC, IARI			
Progressive Horticulture Conclave (PHC) 2024 "Horticultural Technologies for Self-Reliant India" at Navsari Agricultural University, Gujarat	18-20 January, 2024	Progressive Horticulture-Society for Horticultural Research & Development (SHRD), Uttarakhand, India	Dr. Shilpa Parshuram
SVRC Meeting of 'Solapur Anardana'	08 February, 2024	At Mantralaya, Mumbai. (Virtual)	Dr. K.Dinesh Babu
One day webinar on "Value addition and Processing of Pomegranate: Scope and Opportunities" during "Pomo-Preneurship: Unleashing potential of processing and value addition of Pomegranate"	29 February, 2024	iNDEXT-a, an Agribusiness Extension Bureau, of GAIDC, Government of Gujarat. (Virtual)	Dr. Nilesh Gaikwad
District Investor Summit 2024	6 March, 2024	District Industries Centre, Solapur	Dr. Nilesh Gaikwad
ITU/FAO Workshop on "Cultivating tomorrow: Advancing digital agriculture through IoT and AI"	18-19 March, 2024	Telecommunication Engineering Centre (TEC) and ICAR at NASC, New Delhi	Dr. Ranjan K. Singh
Workshop on Digital Agriculture	20 March, 2024	ICAR, New Delhi at NASC, New Delhi	Dr. Ranjan K. Singh
IP and the SDGs: Building Our Common Future with Innovation and Creativity	26 April, 2024	NAAS Complex (Virtual)	Dr. Pinky Raigond
World IP Day	26 April, 2024	PPV & FRA, New Delhi (Virtual)	Dr. Shilpa P.
28 <sup>th</sup> AGM, AICRP on Arid Zone Fruits at SDAU, SK Nagar, Gujarat	21-23 June, 2024	AICRP-AZF, ICAR-CIAH, Bikaner	Dr. K. Dinesh Babu

**Trainings/ FLDs/ OFTs organized for the farmers/ students/ entrepreneurs etc. by NRCP (on campus/ off campus)**

Title	Date	Sponsoring / collaborating agency	Course Director / Co-coordinators/ Team	Participants and Venue
<b>3-4 days Residential training programs</b>				
Training Programme on "Quality Pomegranate Production and Value Addition for Doubling Farmers Income" for	1-4 January 2024	Govt. of Gujarat	Programme Director: Dr. R.A. Marathe Course Coordinators: Dr. S. S. Pokhare & Dr. N. N. Gaikwad	32 ICAR-NRCP, Solapur





the pomegranate farmers of Gujarat				
Training program on “Package of Practices for Pomegranate Cultivation”	7-9 February 2024	ICAR-NRCP in collaboration with ATMA, Dhule	Programme Director: Dr. R.A. Marathe, Coordinators: Dr. P. Raigond & Dr. S. S. Pokhare; Co-coordinator: Dr. N. A. Giri.	27 ICAR-NRCP, Solapur
Training program on “Harnessing Biocontrol Agents for Sustainable Pomegranate Pest Management”	12-14 February 2024	Bio-control project of RKVY, Govt. of Maharashtra	Programme Director: Dr. R.A. Marathe Coordinators: Dr. Mallikarjun M. H. & Dr. Manjunatha N., Co-coordinators: Dr. S. S. Pokhare & Dr. Shilpa P.	28 ICAR-NRCP, Solapur
Training program on “Diagnosis of Pomegranate pest & diseases & their integrated management”	21-23 February 2024	Plant Health Clinic Project of RKVY, Govt. of Maharashtra	Programme Director: Dr. R.A. Marathe Coordinator: Dr. Manjunatha N., Co-coordinators: Dr. S. S. Pokhare & Dr. Roopa Sowjanya	25 ICAR-NRCP, Solapur
Training Program on “Good Horticultural Practices for Quality Production in Pomegranate”	27-29 February 2024	ATMA, Dhule	Programme Director: Dr. R.A. Marathe Coordinator: Dr. Shilpa P.; Co-coordinators: Dr. S. S. Pokhare & Dr. Roopa S.	25 ICAR-NRCP, Solapur
Hands on training to pomegranate farmers on Training and pruning practices in Pomegranate for the farmers of Rajasthan	14-18 May 2024	NRCP and Shiv Kisan FPO, Budiwada, Rajasthan	Mr. Mahadev Gogaon	275 Budiwada, Asada, Chaudhari ki Dhani, Dhanva Kheda, Padru, Balotra & Jodhpur area.
<b>One day events</b>				
Agriculture Technology Festival	17 January 2024	KVK, Solapur	Dr. S. S. Pokhare	200 KVK, Solapur
Training Program on Awareness & Demonstration of NRCP Technologies for Insect, Pest &	01 February 2024	ICAR-NRCP in collaboration with ISHA foundation	Dr. R. A. Marathe, Dr. Manjunatha N., Dr. S. S. Pokhare & Dr. Mallikarjun M. H.	110 Tharad APMC, Banaskantha, Gujarat





Disease Management in Pomegranate				
Export Quality Pomegranate Production Technology	26 February 2024	ATMA, Solapur in collaboration with ICAR-NRCP	Dr. S. S. Pokhare, Dr. Mallikarjun H. & Dr. C. Awachare	120 Salgar Bk., Mangalvedha
One day workshop on Wilt management in Pomegranate	11 March 2024	KVK, Chintamani, Karnataka	Dr. Manjunatha N.	90 KVK, Chintamani
Educational Training & Agricultural awareness program	1 May 2024	Under SCSP scheme at NRCP	Dr. C. Awachare, Dr. Shilpa P. & Mr. Mahadev Gogaon	75 students
Field Day on Pomegranate	10 May 2024	Bayer Crop Science Ltd.	Organizer: Dr. R. A. Marathe; Co-organizer: Dr. C. Awachare & Dr. S. S. Pokhare	150 NRCP, Solapur
Training program on 'Residue Free Export Quality Pomegranate Production'	14 May 2024	ICAR-NRCP in collaboration with Coromandel & Gurukrupa Agri. Mart	Dr. R.A. Marathe Dr. R. K. Singh Dr. S. S. Pokhare Dr. N. A. Giri Dr. Shilpa P.	300 Goudwadi, Tal. Sangola, Dist. Solapur
Training cum interaction program on "Residue free export quality pomegranate production"	21 May 2024	jointly organised by ICAR-NRCP with Mann Deshi Foundation, Mhaswad	Programme Director: Dr. R. A. Marathe Coordinators: Dr. S. S. Pokhare; Dr. Manjunatha, N.; Dr. Mallikarjun M. H.; Dr. S. S. Dhumal & Dr. R. K. Singh	120 Mhaswad Dist: Satara
Kharif Aadhava Baithak under HORTSAP for Solapur District	29 May 2024	DSAO, Solapur	Resource Person: Dr. S. S. Pokhare	350 Agriculture Dept. staff of Solapur District
Nematode problem and their integrated Management in Pomegranate	1 June 2024	Bharti Green Tech, Satara	Resource Person: Dr. S. S. Pokhare	80 At Satara
Training program on Pest & Disease Management in Pomegranate	9 June 2024	Karnataka Pomegranate Growers Association (KPGA)	Resource Person: Dr. Manjunatha N.	250 Hagaribommana halli, Karnataka







*Field visit of trainee farmers from Gujarat*



*Pomegranate farmers training at Tharad, Gujarat*



*Farmer trainee participants of February 12-14, 2024 batch at NRCP*



*Farmer trainee participants of February 21-23, 2024 batch at NRCP*



*Farmers training program at Salgar (Bk) of Mangalvedha tehsil*



*Training program on Residue free Export quality pomegranate production at Mhaswad*



*Farmers Interaction meeting at Goudwadi, Sangola*





Training attended by NRCP staff			
Title of the training	Date	Organizers	Participants
Enhancing Pedagogical Competencies for Agricultural education	Jan 29- Feb 02, 2024	ICAR-IARI, New Delhi	Dr. Roopa S.
Massive open online course (MOOC) on Artificial Intelligence in Agriculture (Virtual)	1-31 March, 2024	ICAR-NAARM, Hyderabad	Dr. K. D. Babu
5 <sup>th</sup> Batch of Pedagogy Development Programme Enhancing Pedagogical Competencies for Agricultural Education	4-8 March, 2024	ICAR-IARI, New Delhi	Dr. Mallikarjun M.H.
Online short course on Patents in Agriculture 'AgriIP' jointly organized by IP&TM, New Delhi, and ICAR-CIFT, Kochi (Virtual)	5-15 February, 2024	IP & TM Unit, ICAR, & CIFT, Kochi, Kerala	Dr. Nilesh N. Gaikwad

Resource Persons in various in-house training programmes at ICAR-NRCP	
Resource person	Title of the topic
Dr. R. A. Marathe	Integrated nutrient management practices for Sustainable pomegranate production
Dr. K.D. Babu	Establishing new pomegranate orchards and their management at the initial stage
Dr. P. S. Shirgure	Water management in pomegranate
Dr. Sangram Dhumal	Establishment of pomegranate nurseries for the production of quality planting materials
Dr. Ranjan Kumar Singh	Natural and organic farming of Pomegranate
Dr. Nilesh Gaikwad	Opportunities in the Pomegranate Processing
Dr. Pinky Raigond	Abiotic stress management in Pomegranate
Dr. Manjunatha N.	Integrated Disease Management in Pomegranate
Dr. Somnath S. Pokhare	Integrated Nematode Management
Dr. Shilp Parshuram	Acquaintance with different varieties of Pomegranate and their characteristics
Dr. Namrata A. Giri	Pomegranate nutritional importance and development of functional foods
Dr. Chandrakant Awachare	Pomegranate canopy architecture management: Training and pruning system
Dr. Mallikarjun M.H.	Integrated insect-pest management in pomegranate

Agricultural Exhibitions/ Farmers fair attended/ Technology displayed
1. Shri. Mahadev Gogaon, participated in 53 <sup>rd</sup> State level Shri. Shiddeswar Agri. Exhibition, Solapur Krishi Mahotsav 2023-24 at Solapur from 1-4 <sup>th</sup> January 2024
2. Shri. Mahadev Gogaon, participated in Regional Agricultural Fair (RAF) North Zone to be held on 3-5 <sup>th</sup> February 2024 at ICAR-IIVR Varanasi (Uttar Pradesh)
3. Dr. Manjunath & Mr. Mahadev Gogaon participated in National Horticulture Fair 2024 at IIHR, Bengaluru, Karnataka from 05-07 <sup>th</sup> March 2024







*Visit of Dr. A. K. Singh, DDG (HS); Dr. S. Pandey, ADG (FVS & MP) and Dr. T. K. Behera, Director, ICAR-IIVR, Varanasi to NRCP exhibition stall in the RAF at Varanasi, Uttar Pradesh*



*NRCP exhibition stall at National Horticulture Fair (NHF), IIHR, Bengaluru, Karnataka*

### **Peer recognitions/ Awards/ Honours received by the NRCP staff**

- Dr. R.A. Marathe, Dr. Nilesh Gaikwad and Dr. Namrata Giri were honored with an “**Appreciation Certificate**” for the significant contribution in the Special International Assignment to export irradiated pomegranate to United States of America during year 2023 and 2024.
- Dr. Shilpa Parshuram received “**Best Oral Presentation**” award for the paper “DUS characteristic features of new pomegranate variety ‘Sharad King’ In: Progressive Horticulture Conclave-2024 on Horticultural technologies for a self-reliant India organized by Indian Society for Horticultural Research and Development Uttarakhand, UP and ASPEE college of Horticulture, NAU, Gujarat from 18-20<sup>th</sup> January, 2024.
- Dr. K. Dhinesh Babu received “**M. H. Marigowda Award**” for outstanding contribution in the field of Horticulture on the occasion of Agri Export & Award ceremony organized by RVSKVV Gwalior M.P & Agri Meet Foundation U.P. on 6<sup>th</sup> February 2024.
- Dr. R.A. Marathe nominated as Member of the Committee for reviewing the cases related to label expansion of Glyphosate on cotton and Grape, AD (WS), CIB&RC, Min. ACo & FW, GOI on 12<sup>th</sup> January 2024.
- Dr. R.A. Marathe nominated as Member of Selection Committee (1.1.2024 to 30.12.2024) for the recruitment or promotion of Asstt. Professor / Professor VNMKV, Parbhani (3.1.2024) to be held on 17-18<sup>th</sup> January 2024.
- Dr. R.A. Marathe honored as Chief Guest of National Seminar on ‘Cutting Edge Research in Life Sciences Methodology and Patents on 17.02.2024 organized by V.G. Shivdare College of Arts, Commerce and Science, Solapur.
- Dr. R.A. Marathe honoured as Chief Guest, AAVUSHKAR 23-24, Workshop for Selected Participants held on 09.01.2024 organized by PAH Solapur University, Solapur.
- Dr. Somnath S. Pokhare nominated as Expert for the selection of Subject Matter Specialist at Krishi Vigyan Kendra, Sagroli, Nanded Maharashtra on 1<sup>st</sup> April 2024





## Technology Commercialization/Linkages/Collaborations / MoU signed

- MoU signed on 22<sup>nd</sup> April 2024 with **ISHA Outreach** for the Promotion of Sustainable Pomegranate production with the emphasis on save soil at Banaskantha Region of Gujarat.
- MoU signed on 14<sup>th</sup> May 2024 with **M/s Tradecorp Rovensa India Private Limited** for Contract Research Project 'Evaluation of Bioefficacy of Calcium, Biostimulant & silicon based products on Pomegranate's quality, yield & ROI'.
- MoU signed on 21<sup>st</sup> May 2024 with **Mann Deshi Foundation, Mhaswad** for the Promoting Pomegranate cultivation with increased productivity and fruit quality with Climate resilience.



*MoU signed between ICAR-NRCP, Solapur and Mann Deshi Foundation, Mhaswad on 21<sup>st</sup> May 2024 at Mhaswad*

## Publications

S.N.	Title of the publications
<b>Research papers</b>	
1.	Giri, N. A., Bhangale, A., Gaikwad, N. N., Manjunatha, N., Raigond, P., & Marathe, R. A. (2024). Comparative study on effect of pomegranate peel powder as natural preservative and chemical preservatives on quality and shelf life of muffins. <i>Scientific Reports</i> , 14(1), 10307. (NAAS Score:10.60).
2.	Maity, A., Babu, K. D., Basak, B. B., & Marathe, R. A. (2024). Integrated use of NPK chemical fertilizers and bio-stimulants improved soil fertility, fruit yield, quality and net returns in pomegranate ( <i>Punica granatum</i> L.). <i>Journal of Plant Nutrition</i> , 47(8), 1287–1304. <a href="https://doi.org/10.1080/01904167.2024.2308187">https://doi.org/10.1080/01904167.2024.2308187</a> (NAAS Score:8.10).
3.	Gaikwad, N. N., Giri, N. A., Suryavanshi, S. S., & Marathe, R. A. (2024). Osmotic assisted convective drying of pomegranate arils: Process optimisation, structural characterisation, and bioactive compound evaluation. <i>International Food Research Journal</i> , 31(3), 624-636. (NAAS Score:7.10).
4.	Gaikwad N. N., Kadam, A. A., Giri N. A., Suryavanshi S. K., Marathe, R. A. (2024). Enhancing bioactive compounds retention in pomegranate juice powder through foam mat drying. <i>Journal of food Process Engineering</i> , 47(8), e14707, 1-14. <a href="https://doi.org/10.1111/jfpe.14707">https://doi.org/10.1111/jfpe.14707</a> (NAAS Score: 9.00)





Book Chapter	
1.	Pal, R.K., Gaikwad, N. & Babu, K. D. (2024). Pomegranate. In K. L. Chadha and R. K. Pal (Eds.), <i>Managing Postharvest Quality and Losses in Horticultural Crops</i> (Revised 2 <sup>nd</sup> ed., pp. 347-358) Daya Publishing House, New Delhi.
2.	Pokhare, S.S., Mhatre, P.H., Manjunatha, N., Patil, D., Agarrwal, R. (2024). Fungal Biocontrol Agents for Nematode Management in Organic Agriculture. In: Chaudhary, K.K., Meghvansi, M.K., Siddiqui, S. (eds) Sustainable Management of Nematodes in Agriculture, Vol.2: Role of Microbes-Assisted Strategies. Sustainability in Plant and Crop Protection, vol 19. Springer, Cham. <a href="https://doi.org/10.1007/978-3-031-52557-5_7">https://doi.org/10.1007/978-3-031-52557-5_7</a> .
Popular article	
1.	Namrata A. Giri, Nilesh N. Gaikwad and R.A. Marathe (2024). By-Products from pomegranate juice processing industries and its applications. <i>Agro India Magazine</i> , 15-16.
Extension folders	
1.	ज्योत्सना शर्मा, मंजूनाथा एन., सोमनाथ पोखरे, मल्लिकार्जुन एच., राजीव मराठे. तेलकट डाग रोग व्यवस्थापन प्रक्रियेचे सहा टप्पे विस्तार पत्रक/रा. डा. सं. के./२०२४/१. पाने १-८.
2.	सोमनाथ पोखरे, मंजूनाथा एन., ज्योत्सना शर्मा, मल्लिकार्जुन एच., राजीव मराठे. डाळिंबतील डाळिंबातील सुत्रकृमीचे एकात्मिक व्यवस्थापन विस्तार पत्रक/रा. डा. सं. के./२०२४/२. पाने १-८.
3.	मल्लिकार्जुन एच., राजीव मराठे, मंजूनाथा एन., सोमनाथ पोखरे, ज्योत्सना शर्मा. डाळिंब खोड भुंगेरा (पिन / शॉट होल बोरर) निदान आणि व्यवस्थापन. विस्तार पत्रक/रा. डा. सं. के./२०२४/३. पाने १-८.
4.	सोमनाथ पोखरे, ज्योत्सना शर्मा, मंजूनाथा एन., मल्लिकार्जुन एच., राजीव मराठे. डाळिंबतील मर रोग: ओळख आणि व्यवस्थापन विस्तार पत्रक/रा. डा. सं. के./२०२४/४. पाने १-८.
New Projects sanctioned	
Contract Research Project: “Evaluation of Bio-efficacy of Calcium, Bio stimulant & silicon based products on Pomegranate’s quality, yield & ROI” (Budget Rs. 15.96 Lakh) (PI: Dr. Pinky Raigond)	
Republic Day Celebration	
ICAR-NRCP, Solapur celebrated 75 <sup>th</sup> Republic Day on 26 <sup>th</sup> January, 2024 by unfurling of the Indian National flag by Dr. R. A. Marathe, Director, ICAR-NRCP in presence of all the scientific, technical, administrative, contractual 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.	
 	
Dr. R. A. Marathe, Director addressing to staff during Republic day	





## International Day of Yoga

ICAR-NRCP, Solapur has observed 10<sup>th</sup> International Day of Yoga (IDY) on 21<sup>st</sup> June, 2024 under the guidance of Director, ICAR-NRCP, Solapur. The day was celebrated to create awareness about importance of Yoga among scientific and non-scientific staff of ICAR-NRCP, Solapur. Mrs. Snehal S. Pendse, Yoga Teacher, Solapur was the chief guest. Total 50 participants attended this program. Mrs. Snehal S. Pendse delivered the lecture on 'Importance of Yoga in modern life'. It was followed by mass yoga demonstrations of yoga asana to all the participants by Yoga Teacher.



*NRCP staff performing Yoga asana*

## World IP day celebration

ICAR-National Research Centre on pomegranate, Solapur has organized a seminar entitled “IP and the SDGs: Building our common future with innovation and creativity” on 30<sup>th</sup> April 2024. The programme was chaired by Dr. R.A. Marathe, Director, ICAR-NRCP. During the guest lecture, Ms. Megha Agrawal, Founder & Designated Partner of Intellectual Coolie LLP, IP Firm, Nagpur, MS enlightened the audience on the topic of “IP Management in Agriculture” in virtual mode. She has covered the different types of intellectual properties, procedure to file a patent, priorities for the researchers in research organizations. She has also elaborated about the protection of plant varieties and discussed about the management of IP in agriculture. The programme ended with the vote of thanks by Dr. Namrata Giri, organizing secretary of the seminar. The programme was attended by 40 participants, including scientific staff, technical staff, young professional, SRF and students. The seminar was organized by the Dr. Nilesh N. Gaikwad and Dr. Namrata A. Giri ICAR-NRCP, Solapur.



*Celebration of World IP day at NRCP Solapur*





## Outreach activities

### Events organized under SCSP

One-day ‘**Educational Awareness cum Training Program on Agriculture**’ under SCSP Scheme’ was organized at ICAR – NRCP, Solapur on 1<sup>st</sup> May, 2024. During the programme, lectures were delivered on ‘Importance and Scope in Agriculture’ for the SC students of S.M. Shankarrao Mohite Patil School, Kegaon, Solapur. During the training, the educational materials like school uniforms, shoes and note books, *etc.* were distributed to 75 SC students.



One-day “**Farmer – Scientist Interaction and Input Distribution Program**” was organized at KVK, Kalaburagi on 10th June, 2024. During the training lectures were delivered on orchard establishment, commercial pomegranate varieties and management of disease, insects and pests. A group of 71 farmers from Gola B village, Aland Taluka in Kalaburagi, Karnataka actively participated in the training and 50 SC farmers got benefitted with the farm inputs like vegetable seeds and organic manures like vermi-compost. Farmers were also motivated to start pomegranate cultivation for up-liftment of their economic status.



### Research Collaboration

A team of scientists (Dr. Manjunatha N. and Dr. Somnath Pokhare) visited National Institute of Technology Karnataka (NITK), Surathkal near Mangalore Karnataka to discuss the ongoing work on use of AI for pomegranate disease identification, development of mobile based application for the farmers and other possible collaborations in the field of pomegranate protection, biochemical analysis.



### Meeting with Solapur District Collector at NRCP

Solapur District Collector Shri. Kumar Ashirwad visited ICAR-NRCP on 23<sup>rd</sup> May 2024 to know the ongoing research and extension activities of this national centre and to prepare the roadmap to increase the pomegranate area and production of the Solapur district. Dr. Rajiv Marathe, Director of the institute welcomed the district collector at the campus and briefed about the establishment of the institute and its role in pomegranate production and export at national level. Dr. Somnath Pokhare presented about the ongoing research and extension activities of the centre in the state of Maharashtra in general and Solapur district in particular. The District Superintendent Agriculture Officer, Shri. Dattatray Gavasane, Project Director ATMA Shri. Madan Mukane and other staff of the agriculture department were





present during the meeting. All the officials also visited the different laboratories and the demonstration block of the institute.



*Visit and interaction of Shri. Kumar Ashirwad , Solapur Distret Collector at ICAR-NRCP, Solapur*

### **Clean Plant Programme (CPP)**

In a pioneering initiative to revolutionize the horticulture sector in India, Govt. has approved nine world class state-of-the-art CPCs (Clean Plant Centres), equipped with advanced diagnostic therapeutics and tissue culture labs, to be established across India. CPP for the Pomegranate will be establsihed at NRCP, Solapur.

A team of experts from Asian Development Bank and National Horticultural Board visited ICAR-NRCP to inspect the site allotted for CPP and had a interaction with the scientific staff of the centre. CPP is set to significantly boost India's horticultural sector while aligning with Mission LiFE and the One Health initiatives. It will promote sustainable and eco-friendly agricultural practices and reduces dependence on imported planting materials. This programme will be a crucial step toward establishing India as a leading global exporter of fruits and driving transformative change across the sector. This programme will be implemented by the National Horticulture Board in association with Indian Council of Agricultural Research.



*Clean Plant Program consultation meeting at ICAR-NRCP with Experts*

### **Farmers Visitors**

- 40 DAESI, Participants from MVSS, Akkalkot visited NRCP for interaction meeting related to Pomegranate cultivation & Pest & Disease Management on 16<sup>th</sup> February 2024.
- 53 Farmers from Vidhisha, Madhya Pradesh visited ICAR-NRCP for getting information on Pomegranate cultivation on 16<sup>th</sup> March 2024.
- 25 Farmers from Indapur tehsil of Pune district visited ICAR-NRCP for interaction with expert regarding pomegranate cultivation & pest & disease management on 19<sup>th</sup> March 2024.





- About 20 pomegranate farmers from Karnataka visited NRCP and interacted with scientist to update their knowledge about the package of practices for export quality pomegranate production on 22<sup>nd</sup> March 2024.
- Directors of Yuva Mitra FPO, Sinnar Maharashtra visited NRCP on 27<sup>th</sup> June 2024.



*Farmers from Vidisha, Madhya Pradesh at NRCP*



*Directors of Yuva Mitra FPO, Sinnar at NRCP*

### Students Visit

S.N.	Date of visit	Name of College	No. of students
1.	27/02/2024	Walchand College of Arts and Science, Solapur	80
2.	07/03/2024	Department of Botany, D.B.F. Dayanand College of Arts & Science, Solapur	70
3.	12/03/2024	Department of Microbiology, D.B.F. Dayanand College of Arts & Science, Solapur	27
4.	14/03/2024	College of Horticulture, S.D. Agriculture University, Jagudan, Gujarat	54
5.	15/03/2024	Department of Microbiology, Dayanand Science College, Latur	27
6.	05/04/2024	College of Agriculture, Pathri, Dist. Parbhani	45
7.	08/04/2024	Lokmangal Agriculture Polytechnic College Wadala	31



*Student Visits at ICAR-NRCP, Solapur*







*NCC students of BMIT, Solapur at ICAR-NRCP, Solapur*

### Meetings attended by the NRCP staff

S.N.	Title of meeting
1.	Dr. R.A. Marathe attended Annual Conference of Vice Chancellors and ICAR Directors during February 26-27, 2024 at NASC Complex, New Delhi.
2.	Dr. R.A. Marathe attended Review meeting of DUS centres organized by PPV & FRA on 02.03.2024 at ICAR – DFR, Pune under the chairmanship of Dr. Trilochan Mohapatra, Chairperson PPV & FRA.
3.	Dr. R.A. Marathe attended Review meeting under the Chairmanship of Hon'ble Minister of Agriculture and Farmers Welfare, GoI at Krishi Bhawan in respect of ICAR-NRCP, Solapur held on 31 <sup>st</sup> May, 2023
4.	Dr. Mallikarjun M.H. attended online Interaction Meeting of AICRP on AZF, on 04.01.2024.
5.	Dr. Mallikarjun M.H. participated in the State-Level Project Approval Committee (SLSC) online meeting under the RKVY-DPR-based stream on 07.01. 2024.
6.	Dr. Nilesh Gaikwad Sr. Scientist (AS&PE) participated in BOS subcommittee meeting of Cosmetic Technology, PAHSU, Solapur for finalization of syllabus as per NEP on 6.03.2024.
7.	Dr. Roopa S. attended the BRNS Project Review on May 24, 2024 in online mode
8.	Dr. Somnath S. Pokhare attended ATMA DFAC meeting on 13 <sup>th</sup> February 2024 at ATMA office Solapur.

### Infrastructure/Facilities developed at NRCP



*Well digging at NRCP*



*Creation of Water source point in well*







*Semi-automated poly-house*



*Tractor Parking shed bhoomipoojan*



*Purchase of Office utility vehicle*



*Farm connecting Road development*

### **Bee keeping**

Five beehives were procured from the Maharashtra State Khadi and Village Industries and installed at five locations within the NRCP premises-two at Kegaon and three at the Hiraj-I and II blocks of NRCP, Solapur. These beehives were set up to provide pollination services and to facilitate training and demonstrations on beekeeping for pomegranate farmers and stakeholders.



### **Joining**

- **Dr. Ranjan Kumar Singh** joined as Principal Scientist (Fruit Science) at ICAR-NRC on Pomegranate, Solapur on 04 March 2024
- **Dr. Sangram S. Dhumal** joined as Principal Scientist (Fruit Science) at ICAR-NRC on Pomegranate, Solapur on 17 May 2024





## महाराष्ट्राचा 'भगवा' अमेरिकेत फडकला

महाराष्ट्रात २४ टन डाळिंबाची निर्यात

५० ते ५५ दिवस दिकावात डाळिंब

महाराष्ट्राचा 'भगवा' अमेरिकेत फडकला. महाराष्ट्रात २४ टन डाळिंबाची निर्यात झाली. ५० ते ५५ दिवस दिकावात डाळिंब. महाराष्ट्राचा 'भगवा' अमेरिकेत फडकला. महाराष्ट्रात २४ टन डाळिंबाची निर्यात झाली. ५० ते ५५ दिवस दिकावात डाळिंब.

## सलगममध्ये निर्यातक्षम डाळिंब उत्पादन तंत्रज्ञान विचारी शेतकरी कार्यशाळा

१०:२७

सलगममध्ये निर्यातक्षम डाळिंब उत्पादन तंत्रज्ञान विचारी शेतकरी कार्यशाळा. सलगममध्ये निर्यातक्षम डाळिंब उत्पादन तंत्रज्ञान विचारी शेतकरी कार्यशाळा.

## अमेरिकेला डाळिंबाची निर्यात पुन्हा सुरू

महाराष्ट्राचा 'भगवा' अमेरिकेत फडकला. महाराष्ट्रात २४ टन डाळिंबाची निर्यात झाली. ५० ते ५५ दिवस दिकावात डाळिंब.

## तरुण भारत राष्ट्रीय डाळिंब संशोधन केंद्रात योग दिवस साजरा

राष्ट्रीय डाळिंब संशोधन केंद्रात योग दिवस साजरा. तरुण भारत राष्ट्रीय डाळिंब संशोधन केंद्रात योग दिवस साजरा.

## निर्यातक्षम डाळिंब उत्पादनासाठी रोगमुक्त रोपे तसेच उत्तम एकात्मिक व्यवस्थापन आवश्यक

निर्यातक्षम डाळिंब उत्पादनासाठी रोगमुक्त रोपे तसेच उत्तम एकात्मिक व्यवस्थापन आवश्यक. निर्यातक्षम डाळिंब उत्पादनासाठी रोगमुक्त रोपे तसेच उत्तम एकात्मिक व्यवस्थापन आवश्यक.

## लोकमंथन डाळिंब उत्पादक शेतकऱ्यांना सहकार्य करणार : डॉ. राजीव मराठे

लोकमंथन डाळिंब उत्पादक शेतकऱ्यांना सहकार्य करणार : डॉ. राजीव मराठे. लोकमंथन डाळिंब उत्पादक शेतकऱ्यांना सहकार्य करणार : डॉ. राजीव मराठे.

## तरुण भारत राष्ट्रीय डाळिंब संशोधन केंद्र येथे डाळिंब शिवार फेरी व चर्चासत्राचे आयोजन

तरुण भारत राष्ट्रीय डाळिंब संशोधन केंद्र येथे डाळिंब शिवार फेरी व चर्चासत्राचे आयोजन. तरुण भारत राष्ट्रीय डाळिंब संशोधन केंद्र येथे डाळिंब शिवार फेरी व चर्चासत्राचे आयोजन.

## पुण्य नगरी माणदरी फोडेशनचा डाळिंब परिसंवाद कार्यक्रम उत्साहाने

पुण्य नगरी माणदरी फोडेशनचा डाळिंब परिसंवाद कार्यक्रम उत्साहाने. पुण्य नगरी माणदरी फोडेशनचा डाळिंब परिसंवाद कार्यक्रम उत्साहाने.

## सोलापूर जिल्हा पुल आउट २७-०२-२०२४ निर्यातक्षम डाळिंब उत्पादनासाठी रोगमुक्त रोपे निवडा

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