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ICAR-NRCP Newsletter

An ISO 9001:2015 Certified Institute

Contents

Editorial Team

Dr. Jyotsana Sharma
Director (Acting)
Miss. P Roopa Sowjanya
Scientist
Dr. NN Gaikwad
Sr. Scientist

Technical Assistance

Sh. Yuvraj R Shinde
Tech. Assistant

From the Director's Desk

Dear Readers,

It's our pleasure to celebrate 15th Foundation day of ICAR-NRCP on 25th September, 2019. During this journey, the Center has made commendable achievements and released several technologies for the betterment of farmers and entrepreneurs. This center has released a two hybrid varieties for table and anardana purpose, management practices for pest and diseases, nutrient management, water management, quality planting material and value addition of pomegranate. The pomegranate variety released for anardana purpose is 'Solapur Anardana'. This variety recorded higher fruit weight, acidity, anthocyanin, ascorbic acid and T.S.S in comparison with Amlidana. The Center has also developed the management practices for shot hole borer. The advisory developed for management of shot hole borer will be helpful for the pomegranate farmers. The centre has also developed the process for utilization of the pomegranate seeds in to mouth freshener. This will be certainly a healthy alternative for the *gutakha* and *supari.* In the domain of technology extension ICAR-NRCP has organized different training programs in collaboration with ATARI Pune, IMD Pune, Manage Hyderabad and state govt. of Gujarat for KVK staff, farmers, scientist, and entrepreneurs etc. The Scientist of the centre took part in different government initiatives, such as swachha Bharat Abhiyan, Vigilance awareness week, Hindi Pakhawada, etc. Many farmer groups visted the centre during the period which included group from Gangavathi, Chitradurga and Bellary. Mr. Suhas Divase, Agriculture Commissioner, GOM, visited the centre. I took the opportunity to congratulate Dr. Prakash Patil, Dr. Shilpa Parashuram, and Dr. D T Meshram for receiving different awards.

Research Achievements

Solapur Anardana

Anardana is generally prepared from the wild pomegranate cultivars of Jammu and Kashmir, Himachal Pradesh and Uttarakhand. There is longstanding demand for the variety with high acidity, higher yield and suitable for the arid regions. ICAR-NRCP has identified and released anardana variety with superior paramaters. Pomegranate variety Solapur Anardana in comparison to Amlidana during the fifth year of planting in *mrig bahar* recorded 4.8% titrable acidity and 462.5 mg/100g anthocyanin.

Comparative evaluation of Solapur Anardana and Amlidana

Characters	Solapur Anardana	Amlidana
Plant height (m)	1.90	1.50
Fruit maturity (days)	148.0	150.0
Fruit weight (g)	260.0	228.0
No. of fruits /tree	95.0	68.0
Yield (kg/plant)	24.70	15.50
Yield (t/ha)	18.27	11.47
Aril colour	Red	Light pink
Fruit colour	Red	Yellow
Seed texture	Medium	Medium
Juice (%)	42.5	41.0
TSS (°Brix)	16.6	15.6
Ascorbic acid (mg/100g)	18.0	14.2
Anthocyanin (mg/100g)	462.5	65.5
Titrable acidity (%)	4.80	4.20

Solapur Anardana

Solapur Amalidana

Pomegranate Seed based Mouth freshener

-Nilesh N. Gaikwad and Ashis Maity

Pomegranate seeds are the byproduct of the juice processing industry and can also be extracted from unmarketable fruits. Pomegranate seeds are rich in conjugated linolenic acid, protein, fiber etc. Pomegranate seeds were extracted by cleaning marc (leftover portion of arils after juice extraction). The seeds were dried, blended with mix of sugar syrup and spices followed by heat treatment in microwave oven, cooling and vacuum packaging. The crunchy mouth freshener developed had crude fiber (3.89%), total phenols (158.24 mg/L GAE). It's also rich in micronutrients Calcium (2.4 g/kg), Magnesium (1.92 g/kg), Ferrous (222 mg/kg), Manganese (14 mg/kg), Zinc (47 mg/kg) and copper (57 mg/kg). The high value mouth freshener can be replacement for *Gutkha, tobacco, panmasala etc.* owing to good chewability and high sensory acceptability. The process can utilize the seed waste and is capable of employment generation in the production catchment of the pomegranate.

Pome seed Mouth freshener

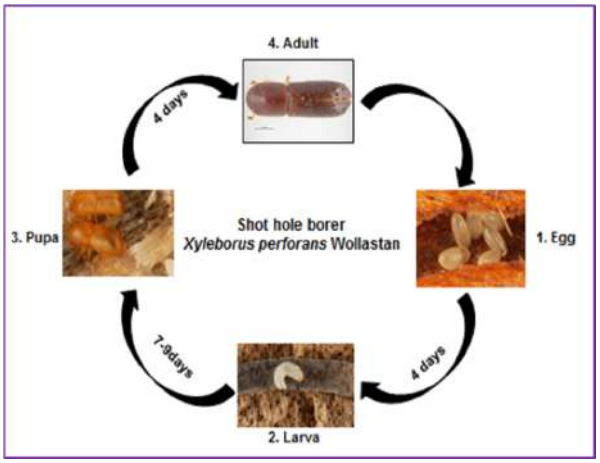
Shot hole borer Xyleborus perforans (Wollastan) - incidence and management in pomegranate symptoms and nature of damage.

-Mallikarjun H.

Shot hole borer *Xyleborus perforans* (Wollastan) have become major pest infesting in the collar region of the plant by making innumerable pin or shot holes causing discontinuity in the conducting vessels affecting movement of water to the upper portion of the plant. Consequently, the drying of the twigs becomes imminent. The drying progressed from the tip towards the base and in severe cases, the entire plant gets dried up.

Seasonal incidence and life cycle

Seasonal activity of Shot hole borer *Xyleborus perforans* is active throughout the year with higher activity during monsoon period (September to December).



शॉट होल बोरर का जीवन चक्र

Life cycle of the Shot hole borer *Xyleborus perforans*

Symptoms of damage

- Adult females bore into the basal part of the stem and roots.
- Infestations are most easily detected by the presence of entry holes made by the attacking beetles, and the presence of frass produced during gallery construction.
- Causes small shot holes on roots, main trunk, wilting and finally leads to death of the tree.

अनार में शॉट होल बोरर– प्रादुर्भाव, लक्षण, नुकसान और प्रबंधन।

अनार में शॉट होल बोरर पौधे के जमीन के पास वाले तनो के क्षेत्र में नुकसान करने वाली प्रमुख कीट है। यह तनों पर असंख्य पिन यानि छेद बनाकर पौधे के ऊपरी हिस्से मे जाने वाली पानी वाहक नलिकाओं को प्रभावित करती है, नतीजन, टहनियों का सूखना प्रारंभ हो जाता है। क्षति ग्रस्त पेड की टहनिया उपर से निचे की ओर सुखती है और गंभीर मामलों में पूरा पौधा सूख कर मर जाता है।

शॉट होल बोरर का जीवन चक्र

शॉट होल बोरर की गतिविधि पूरे वर्ष सक्रिय रहती है, परंतु मान्सून के मौसम यानि सितंबर से दिसंबर महीनों मै इसकी गतिविधिया उच्च स्तर पर सक्रिय होती है।

नुकसान के लक्षण

१. प्रौढ़ मादाएं तनों और जड़ों के मुख्य भाग में छेद करती हैं।

२. आक्रमण करने वाले भृंगों द्वारा बनाए गए प्रवेश छिद्रों के कारण तनो के अन्दर सुरंगे निर्माण होती है इस दौरान उत्पन्न होने वाले बुरादे (भूसे) और कीटमल से संक्रमण का आसानी से पता लगाया जाता सकता है।

३. जड़ोंपर और मुख्य तनों पर छोटे छोटे छेद के कारण पौधा मुरझा जाता है और अंत में पौधा सुख जाता है।

४. अनार के पौधों की क्षति की उन्नत अवस्था और पूर्ण रूप से मुरझाने की अवस्था

प्रबंधन के तरीके

प्रतिबंधात्मक उपाय

१. जमीन में आवश्यक नमी रखे और बगीचे को जल-जमाव से बचाये। समय-समय पर बगीचे का मुआइना करे और सूखने वाली शाखाओं की तलाश करके प्रारंभिक संक्रमण का पता लगाएं।

२. पीड़ित युवा पौधों और पेड़ों को उखाड़कर जला दे। विशेष रूप से जड़ोको जलाकर नष्ट कर दे।

३. अनार बगीचे के आस-पास से वैकल्पिक मेजबान फसल जैसे एरंडि को हटाए जिससे शॉट होल बोरर की आबादी को काम किया जा सकता हैं।

४. बगीचों के भीतर या आसपास मृत या उखाड़ी हुई पौधों का ढेर न लगाएं, क्योंकि उस पर यह किट प्रजनन करती हैं और पास के अनार के बाग पर हमला करती हैं।

युवा पौधे पर क्षति के प्रारंभिक लक्षण
Early symptoms of damage on young plant

पुराने पौधों में शॉट होल बोरर द्वारा क्षति के लक्षण
Symptoms of damage by shot hole borer in old plant

अनार में मुरझन (वील्ट) के बढ़ते लक्षण
Progressive symptoms of wilting in pomegranate

लेपन

१. बहार लेने से पहले और बाद में दूसरे साल से पौधों की तनों को जमीन से २ फीट ऊपर तक अच्छी तरह से लेपन करें।

२. निम्न लिखित विधि से लेपन मिश्रण तैयार करे -
- पानी - १० लीटर
- लाल मिट्टी - ४ कि ग्रा
- क्लोरोफाईरोफोस - २० मिली
- कॉपर ऑक्सी क्लोराइड - २५ ग्राम

ड्रेन्चिंग :

1. ड्रेचिंग करेने के लिये क्लोरोफाईरोफोस २० इसी (२ मिली/ली) + कार्बेन्डाजिम ५० डब्लू पी (१ ग्राम/ली) अथवा इमीडाक्लोप्रीड १७.८% मिली (१मिली/ली) + कार्बेन्डाजिम ५० डब्लू पी (१ ग्राम/ली) को गोलाकार पद्धति में प्रति पेड़ २ से ३ लीटर घोल का उपयोग करें। इस प्रक्रिया को कीट/क्षति के लक्षणों की व्यापकता के आधार पर ७ से १०दिनों के बाद दोहराए।
2. रोग निरोधक छिडकाव के तौर पर छह महीने में एक बार क्लोरोपाइरीफॉस २० ईसी @ १ मिली/लीटर और उसके बाद एज़ाडिरिक्तिन १५०० पीपीएम @ ३ मिली/लीटर की मात्रा का छिडकाव करे।

अनार के पौधों का भारी नुकसान और पूरी तरह से मुरझन
Advanced stage of damage and complete wilting

Management practices:

Preventive Measures:

- Avoid water logging, rake the soil and detect early infestation by periodically looking out for drying branches.
- Infested young plants and trees should be uprooted and burnt, especially the root zone.
- Pruning and destruction of infested branches by burning.
- Removal of alternate host crop like castor from vicinity of orchard checks the *X. fornicatus* populations.
- Do not pile dead or uprooted wood within or near orchards as beetles breed on it and attack nearby pomegranate orchards.

Stem Pasting on Pomegranate trees

Pasting

- Apply the paste from 2nd year onwards before and after taking the *bahar* and it need to be applied on up to 2 ft from the base of the plant.
- For 10 liters water mix
  - Red Soil 4kg
  - Chloropyriphos 20ml
  - COC 25 g

Drenching

- Drenching with Chlorpyriphos 20 EC + Carbendazim 50 WP (2ml+1g/l) or Imidacloprid 17.8 % SL + Carbendazim 50 WP (1ml+1g/l) in a circular fashion and use 2-3 l solution per tree and it can be repeated 7-10 days after the first treatment based on prevalence of the pest/ damage symptoms.
- Prophylactic sprays can be taken once in six months with Chlorpyriphos 20 EC @ 1 ml/l followed by Azadirachtin1500ppm@3 ml/l.

Drenching in pomegranate

Events

Trainings/Workshop/Seminars

ICAR-NRCP has organized a number of training for stakeholders like farmers, extension officers, horticulture department officers and scientists etc. Different need based trainings were also conducted by the center in collaboration with other government institutes like KVKs & SAU. The participants from Maharashtra and other states were present for training programme and gained knowledge about pomegranate production, water management and disease, insect and pest management and value addition.

Short Term Training on "Preparation and Dissemination of Agromet Advisories at Block level" for newly recruited SMS, observers and technical officers from 19-24 August 2019. ICAR-NRCP co-organized the programme with ATARI Pune & IMD, Pune.

MANAGE, Sponsored Five days Collaborative Training Programme on "Model Production and Protection Practices in Pomegranate" For the extension officers of State Agri. /Hort. Department and subject matter specialists of KVK's & SAU's from 04-08th November 2019

Imparting training to the farmers of Ahmedabad district, Gujarat from 18-20th December, 2019 on Quality pomegranate production and value addition for doubling farmers' income

Foundation Day

ICAR-NRCP celebrated 15th Foundation Day on 25th September, 2019. The programme of Kisan Goshti on problems and prospects in pomegranate production was arranged. This programme was chaired by Chandrika Chauhan, Women commission member, Sheetal vadavle, Police training centre and Prabhakar Chandane, President MPGA and different subject experts were present to discuss about the farmers problem. Total of 150 participants graced the occasion.

15th Foundation Day Ceremony of ICAR-NRCP Kisan Goshti on Problems and Prospects in Pomegranate Production on 25th Sept, 2019

Promoting Govt. Initiatives

ICAR–NRCP is always at forefront in promotion of government initiatives. These programmes were usually organized very enthusiastically by the scientist and other staffs of the centre. Few of those were listed below with details.

हिंदी सप्ताह

भारतीय कृषी अनुसंधान परिषद, नई दिल्ली व्दारा जारी किए गए परिपत्र के अनुसार राष्ट्रीय अनार अनुसंधान केन्द्र, सोलापुर मे दिनांक १४ से २३ सितंबर २०१९ तक हिन्दी पखवाड़ा मनाया गया। इस अवसर पर विभिन्न प्रतियोगीताओका (भाषण, सामान्यज्ञान, पत्रलेखन, सुलेखन, अनुवाद, वादविवाद, टंकण, कहानी लेखन, निबंध लेखन) आयोजन भी किया गया।

हिन्दी सप्ताह का समापन समारोह

Swachha Bharat Abhiyan

ICAR-NRCP, Solapur observed Swachha Bharat Abhiyan during Dec. 16-31, 2019. Several programmes were conducted as part of initiative viz., Swachhata Pledge, Awareness Campaign, elocution competition, tree plantation and waste management etc. in different schools of nearby village like Sahakar Maharshi Mohite Patil High school, Zilla Parishad Primary School etc. for creating awareness among students, farmers and citizens about swachhata.

Elocution competition 'Swacchata Hi Seva' at Sahakar Maharshi Mohite Patil High school, Kegaon, Solapur.

Awareness campaign on Swachhata Hi seva at Zila Parishad Primary School, Kegaon, Solapur

Vigilance Awareness Week

This centre has observed Vigilance Awareness Week from 28.10.2019 to 02.11.2019 under the guidance of the Director, ICAR-NRCP, Solapur. As part of program various activities were carried out at the institute *i.e.* displayed posters related to eradicating corruption in the office premises, took e- pledge by the all ICAR-NRCP staffs, and was publicised through website of centre and social media to spread the message of importance of being vigilant citizens.

Inaugural of Vigilance Awareness Week

Drawing message on corruption free India was also spread through Whatsapp

Closing ceremony of Vigilance Awareness Week

Activities under tribal sub-plan

The scientific staff of center also engaged to promote the technology of ICAR-NRCP for betterment of tribal communities. The center has adopted tribal village of Maharashtra state and conducted programme to promote pomegranate intercropping with beans and cultivation of pomegranate with poultry in Gadchiroli.

Promoted Pomegranate intercropping (Beans) in adopted village (Gadchiroli)

Pomegranate cultivation with poultry farming at Mukalliguta, Gadchiroli district (Initiation of IFS)

Academia

- Mou with Walchand College of Arts, Science and Commerce, Solapur with respect to PG Training Programme and PG Research on 1 Aug, 2019 .
- MoU with MIT Art, Design and Technology University, Pune on 21 Sept. 2019.
- MoU with Shriram College of Agricultural Engineer, Paniv, Ta-Malshiras, Dsit-Solapur for providing services to B. Tech. (Agril. Engg.) Students.

MoU with Lokmangal College of Agricultural Biotechnology, Wadala

MoU for propagation of pomegranate variety Solapur Lal through air layer/HWC, 05th July 2019

MoU for technology licensing for development of pomegranate juice and RTS beverage with M/S. Vardayini Farmers Producer Co. on 30.12.2019.

SARP NEWS

Workshop on Practices and Technologies for Climate Resilient Pomegranate Production on 24.12.2019

Awards

Dr. DT Meshram

- SCSI Leadership Award, 2019 at SCSI, New Delhi
- Vasantrao Naik Krishi Prerana Purshakar, 2019 at Agrocare Krishi Manch, Nashik.
- Secured Best oral presentation Award, 2019 at SCSI, New Delhi.

New initiative

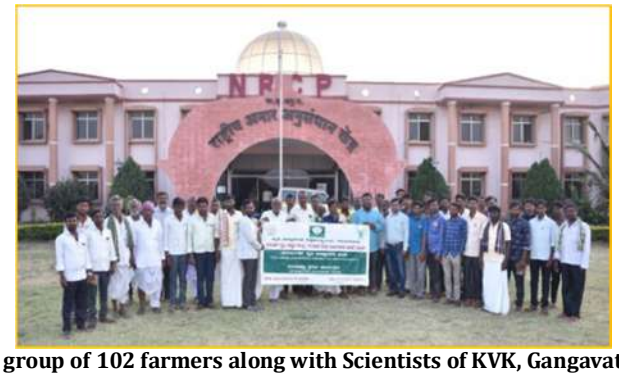
Scientific Agro Advisories

In response to queries of farmers, information on pomegranate was provided to the farmers through e-mail and phone. Scientific agro-advisories were sent to more than 2015 pomegranate growers through the "m-Kisan portal" during the period under report.

Dignitaries/Visitors

Mr. Suhas Divase, Commissioner of Agriculture, Govt. of Maharashtra has visited the institute on 11 October, 2019 and appreciated the research achievements of the centre.

Mr Sahas Divse Commissioner Agriculture, Govt. of Maharashtra



A group of 102 farmers along with Scientists of KVK, Gangavathi visited ICAR-NRCP on 10 February 2020

Chitradurga, Karnataka farmer's exposures visit to ICAR-NRCP, Solapur on 11 September 2019

Farmers and officials of Department of Horticulture, Bellary Karnataka visited ICAR –NRCP on 30 September 19

Publications

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2. Krishnendu Manna, Snehasis Mishra, Moumita Saha, Supratim Mahapatra, Chirag Saha, Govind Yenge, Nilesh Gaikwad, Ramkrishna Pal, Dasharath Oulkar, Kaushik Banerjee, Krishna Das Saha, 2019. Amelioration of diabetic nephropathy using pomegranate peel extract-stabilized gold nanoparticles: assessment of NF-κB and Nrf2 signaling system. International Journal of Nanomedicine, 14:1753-1777.
3. Sukhvinder Pal Singh, Ram Krishna Pal, Manpreet Kaur Saini , Jagdeep Singh, Nilesh Gaikwad, Shilpa Parashuram and Charanjit Kaur, 2019. Targeted metabolite profiling to gain chemometric insight into Indian pomegranate cultivars and elite germplasm. The Journal of the Science of Food and Agriculture, 99 (11):5073-5082. doi: 10.1002/jsfa.9751.
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5. Sweeti Kumari, Tania Seth, Kailash Prajapat, B Rajasekhar Reddy, Mallikarjun M Harsur and Dhiraj Kumar, 2019. Indigenous traditional knowledge on folk medicinal plants. Journal of Pharmacognosy and Phytochemistry, 8(5): 2409-2412.
6. Mallikarjun M. Harsur, B. Rajasekhar Reddy and Dhiraj Kumar, 2019. *A Case Study*-Participatory rural APPRAISAL: An approach for identification of the problems and solution for the problems. Multilogic in Science 9 (20)
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8. Marathe, R.A., Sharma J. and Chaudhari, D.T. 2019. Evaluation of micro irrigation

methods in pomegranate under semi- arid tropical climate of India. Journal of Environmental Biology, 40 (5):1029-1035.

9. Marathe, R.A., Chaudhari, D.T. and Murali, S. 2019. Feasibility of micro-sprinklers in pomegranate (*Punica granatum* L.) orchards grown on light textured soils of central India. Indian Journal of Soil Conservation 47(2): 180-185.

Book Chapters

1. Meshram, DT**.,** Gorantiwar, SD., Wadne, S.S. and Arun Kumar K.C. 2019. Planning, Designing and Construction of Series of Check Dams for Soil and Water Conservation in a Micro-Watershed of Gujarat, India. *Springer Publication*. 337-343.
2. Meshram, DT., Jyostana Sharma and Wadne, S.S. 2019. Novel ways to Use Water for "Per Drop More Pomegranates (*Punica granatum* L.). Soil and Water Conservation Bulletin. Dehradun. 4:49-51.

Popular articles

1. Sharma, J., Gharate, R. and Lokhande, V. 2019. *Dalimb phal pikatil mar rog lakshane, karane aani vyavasthapan*, Baliraja. Aug. 54-59.
2. Sharma, J., and Gharate, R. 2019. *Dalimb pikatil mar rogache vyavasthapan*, Shetkari, Aug. 49&52 p.

E-publications

1. TV show: Video capsule entitled *"Atirikta aay ke liye anar ka prasanskaran"* was aired under programme Khet Khalihan on DD Kisan also been uploaded on youtube channel of DD Kisan.

   URL https://www.youtube.com/watch?v=3TkNcEy8B4&list=TLPQMTcwMzIwMjB388YRKKcL6w&index=2

भा.कृ.अनु.प. – राष्ट्रीय अनार अनुसंधान केन्द्र, सोलापुर

ICAR- National Research Centre on Pomegranate, Solapur

(An ISO 9001:2015 Certified Institute)

Phone – (0217)-2354330, 2350074, **Fax**-(0217)-2353533
Email – nrcpomegranate@gmail.com
www.nrcpomegranate.icar.gov.in