

Capacity Development of Citrus Growers of Nagpur
NABARD-Sponsored Training Program on
'Advanced Production Technologies of Citrus'
12 -14 July 2022



Sangeeta Bhattacharyya and R K Sonkar coordinated the capacity development program for citrus growers organized by ICAR-CCRI, Nagpur, from 12 to 14 July 2022, and they share their experiences here.

CONTEXT

Citrus fruits are cultivated worldwide and is loved by consumers for its unique taste, aroma and nutritional value. In India, citrus is the third most-grown crop after mango and banana, and is cultivated on 10.86 lakh hectares with an annual production of 142.62 lakh tons (NHB 2022). There exists a wide range of species in the citrus genus worldwide but commercially important ones cultivated in India are: mandarins (*santra/narangi*), sweet oranges (*mosambi, sathgudi*), acid limes (*nimbu*), lemons, grapefruits and pummelos. Amongst all cultivars, mandarins (*Citrus reticulata* Blanco) are produced in the highest quantity in India. Different varieties of mandarins exist but the very popular *Nagpuri santra* is quite a delight for fruit lovers all over the world. Nagpur mandarin is widely cultivated in Vidarbha region (Nagpur and Amravati Divisions) of Maharashtra and also some parts of Madhya Pradesh.



Trainees with Dr Dilip Ghosh, Director, ICAR-CCRI, and Training Coordinators

But of late, citrus growers of Vidarbha are facing bouts of severe fruit drop due to extremely high temperatures, untimely rain and hailstorms and other effects of climate change, which have become frequent and severe in recent years. In 2022, Vidarbha region of Maharashtra witnessed temperatures of 40-42 degree Celsius in March itself resulting in dropping of fruitlets (pea-sized citrus fruits) from trees causing much loss to farmers. Insect pests and diseases have also changed their time of incidence and severity. Considering these challenges, the ICAR-Central Citrus Research Institute (CCRI), Nagpur, has been organizing capacity building programs to sensitize citrus growers of the region. A training program on 'Advanced Production Technologies of Citrus' was organized from 12-14 July 2022, under the aegis of 'Capacity building for Adoption of Technology (CAT) Programmes' sponsored by NABARD.

Participants in the program

A total of 25 citrus growers from all over Nagpur district received training for three days. The motto behind targeting farmers for this program was to develop these farmers as master trainers who can reach out to their villages and disseminate the knowledge gained to fellow farmers. ICAR-CCRI not only conducts trainings for farmers but also for all categories of stakeholders in the citrus industry in large numbers. But this particular program was organized in collaboration with NABARD to target citrus growers.

CONTENT AND METHODOLOGY

Looking into the concerns of the citrus industry of the region, topics were carefully planned and a three-day schedule was laid out by the training coordinators. The theory lectures were accompanied by practical sessions so that trainees had first-hand experience of whatever they learnt in theory sessions. Two exposure visits were also planned to the orchards of progressive citrus farmers so that trainees can gain experience from 'Seeing is believing'. The topics covered in the training are described below.

The lectures related to production technologies of citrus was all about introducing the trainees on the practice of shoot tip grafting and micro budding to produce disease-free planting materials of citrus. Trainees learnt about the cost-effective technique of producing disease-free planting material which is lot more profitable than the conventional budding procedure followed in most nurseries.

A detailed lecture on insect pest management in citrus talked of the various insect pests that attack citrus crops throughout the year and their control measures. A practical session was organized soon after on identification of insect pests and controlling them through bio-control measures.

A lecture on orchard establishment, *bahar* management, and control of fruit drop problem of citrus was organized in which the trainees' queries relating to the menace of fruit drop were answered.



Demonstration of raised bed planting system

Detailed information about the irrigation management aspect to be followed in citrus orchards was delivered. Water is the most important component in citrus cultivation and hence trainees interacted and learnt a lot from this lecture.

A lecture on nutrient management to be followed in citrus orchards was organized. Identification of nutrient deficiency symptoms in citrus plants, ways to tackle it and the importance of soil testing, soil health card, and integrated nutrient management was discussed in detail. Consecutively a practical session on soil sample collection for soil testing was also conducted.

Day 2 of the program started with the trainees getting the details of soil testing and leaf analysis of citrus for determining the various nutrient deficiency symptoms.

A practical demonstration session was conducted on the raised bed citrus plantation of ICAR-CCRI. Trainees learnt about the benefits of raised bed system and how to prepare a bed, together with precautions to be followed. Trainees were also made aware of the economic benefits of raised bed system of citrus cultivation, which includes intercropping in between the beds.

Another demonstration was conducted to practically display the method of conventional budding and also micro budding of citrus.



Demonstration of conventional budding and micro budding of citrus

The trainees were taken for a tour around the CCRI campus to see the experimental orchards and learn about the newly-introduced exotic cultivars of lemons, limes, sweet oranges and mandarins.

After the tour, a practical session for identification of different rootstocks of citrus was conducted. Distinguishing features of Rangpur lime, rough lemon, Alemow and Galgal were shown to trainees.

As the menace of fungal disease Phytophthora is very common in the citrus orchards of the region, a detailed session on disease management of citrus was conducted. The biocontrol measures were also discussed in detail along with chemical and mechanical measures.



Tour of ICAR-CCRI campus to view the experimental citrus plots

A post-lunch exposure visit was conducted to the commercial farm of Mr. Akhil Junghare, a progressive farmer of Hatla village, Katol taluka, Nagpur. The scientifically managed orchard, farm ponds with automatic irrigation system, water pumps, etc., were shown to the trainees. It was an enriching experience for the trainees.



Exposure visit to the commercial farm of Mr Akhil Junghare, a progressive farmer of Hatla village, Katol taluka, Nagpur

After that the trainees were taken by the coordinators to the citrus orchard of Mr. Dadarao Kale, a progressive farmer of Zilpa village, Katol taluka, Nagpur. Mr. Kale had managed his orchard scientifically by adopting the technologies of ICAR-CCRI and had cultivated Nagpur mandarin on raised beds. Trainees observed the scientific practices closely and also visited the automatic fertigation unit of the farm. Trainees were keen to learn every aspect of the scientific management practices followed by Mr. Kale.

Day 3 started with a lecture providing an overview of the citrus industry in India. The broad picture of citrus industry and contribution of CCRI to this sector was discussed in detail.

Trainees were introduced to the whole biodiversity of citrus cultivars present throughout India in the next session. This session was new and quite interesting to the trainees.

The problem of decline in citrus orchards is a major issue all over India. ICAR-CCRI has standardized recommendations for rejuvenating declined and semi-declined citrus orchards. Hence knowledge was imparted to trainees on citrus rejuvenation technologies. Trainees learnt about the calendar of operations to be followed for rejuvenating declined citrus orchards and thereby improve production and productivity. The trainees were taken for a visit to the mechanized packing line facility of ICAR-CCRI prior to attending a theoretical lecture on post-harvest management of citrus. As packaging is an important component in marketing of quality citrus fruits, the mechanized packing facility was a great learning for the trainees.

The practical session was followed by a lecture on the post-harvest management aspects of citrus. Trainees were excited to learn about this aspect after witnessing the packing line system.

Then they were educated on the process of Bordeaux paste and mixture preparation and its application in detail. Bordeaux paste is an anti-fungal chemical formulation which is painted around the citrus plants to control *Phytophthora* incidence.



Demonstration of the process of Bordeaux paste preparation and application

Trainers also instructed the participants on the theoretical aspects of raised bed planting system in citrus and the promising rootstocks present in citrus which the institute has developed after years of research.

Post-training feedback collection

On Day 3 of the training, after completion of all lectures and practical sessions, the trainees were asked to fill up the feedback form. The feedback was collected on a 3-point continuum scale: not satisfactory, satisfactory, and extremely satisfactory. Additionally, there was a column to express the topics or areas which needs improvement from the side of the host institute. Any other remarks were also welcome. Even scope was given for trainees to express the adequacy of study materials provided during training. Furthermore, they were also asked to list what knowledge they had gained over three days, in what ways they would implement this knowledge back in their orchards and even recommend to their fellow farmers. Verbal feedbacks were also welcomed and a special session on verbal feedback was arranged during the valedictory program. Hence all efforts were made by the coordinators to evaluate the 3-day capacity building program – as seen through the eyes of the trainees themselves.

Tracking outcomes as per NABARD format

NABARD has a well-defined format for tracking the outcomes of their sponsored training programs, and above all, there is a separate budget for it. The period given for measuring impact is six months after completion of a training program. Hence coordinators of this training will also start collecting data for measuring impact of this capacity building program after six months.

Lokmat Times	
<h1>ICAR-CCRI holds workshop on advanced citrus production</h1>	
LOKMAT NEWS NETWORK NAGPUR, JULY 17	
<p>ICAR-Central Citrus Research Institute (CCRI), Nagpur, organised a training programme on "Advanced Production Technologies of Citrus" under the aegis of "Capacity Building for Adoption of Technology (CAT) Programmes" sponsored by NABARD. The programme was held at the CCRI training hall from July 12 to 14.</p> <p>Total 25 citrus growers participated in the programme. Director ICAR-CCRI and course director of the training programme, Dr Dilip Ghosh and AGM (DD), NABARD, Nagpur, Sachin Sonone conceived the idea of organising the training programme for dissemination of advanced scientific production technologies to citrus growers of the district.</p> <p>Dr Ghosh addressed the trainee farmers and gave an overall idea of the current scenario of citrus industry in India and the need for citrus growers to be proactively following the scientific management practices for earning more profits from their crop. Principal scientist (horticulture) Dr R K Sonkar and scientist (agricultural</p>	<p>ICAR-CCRI organises NABARD-sponsored training programme</p> <p>ICAR-Central Citrus Research Institute (CCRI), Nagpur, organised a training programme on 'Advanced Production Technologies of Citrus' under the aegis of "Capacity Building for Adoption of Technology (CAT) Programmes" sponsored by NABARD at Training Hall of CCRI from July 12 to 14.</p> <p>A total of 25 citrus growers participated in the programme. Dr Dilip Ghosh, Director ICAR-CCRI and Course Director and Sachin Sonone, AGM (DD), NABARD, Nagpur conceived the idea of the programme for dissemination of advanced scientific production technologies to citrus growers.</p> <p>Dr R K Sonkar, Principal Scientist, Horticulture and Dr Sangeeta Bhattacharyya (Scientist, Agricultural Extension) were coordinators of the training programme.</p>
	
<p>ICAR-CCRI director Dr Dilip Ghosh and training coordinators on the stage during opening of the training programme.</p>	
<p>Nagpur First Page No. 3 Jul 18, 2022 Powered by: erelego.com</p>	

Local newspapers reported on this program

OUR TAKEAWAYS

The CAT training programs of NABARD have a defined format which is rigorous and strict, not only with the budget of the training but also with the safety of trainees during exposure visits. The proposal for training gets approved by NABARD only after submission of full details of prospective trainees and also a signed consent from trainees accepting that the risks of exposure visit/off-campus tours is fully their responsibility. When we, as extension professionals, organise off-campus visits, we are not mindful of the associated risks of travel (accidental injuries etc during bus tours or any other harm on fields or industries). But after working in collaboration with NABARD on this particular training program, we gained insight into this aspect of caution. Submission of feedback and impact are also essential. Building rapport with trainees, enquiring about their needs, structuring the courses with theories and practicals, collecting feedback and measuring impact after six months from the Master Trainers developed, is all part of the integrated approach which we as trainers and extension professionals should always follow for every capacity building program.

CONCLUSION

The capacity development program covering all aspects of citrus cultivation – right from nursery and production to post-harvest – was completed successfully. The organisation of the training program was

also reported by local newspapers. Indeed the need to organize such capacity building programs for farmers is critical. Such initiatives enhance the knowledge, skill, and attitude of farmers and improve their confidence in ICAR's research and extension wings.

References

National Horticulture Board. Area production statistics for horticulture crops – 2018-19 (Final). Accessed on 12 August 2022.

Sangeeta Bhattacharyya, Scientist, Agricultural Extension, ICAR-Central Citrus Research Institute, Nagpur, India. She can be reached at Email: sangeeta.bhattacharyya2012@gmail.com

RK Sonkar, Principal Scientist, Horticulture, ICAR-Central Citrus Research Institute, Nagpur, India. He can be reached at Email: sonkarrk@yahoo.com

**AESA Secretariat: Centre for Research on Innovation and Science Policy (CRISP),
Road No.10, Banjara Hills, Hyderabad- India -500034
www.aesanetwork.org Email: aesanetwork@gmail.com**