



# CITRUS NEWSLETTER



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Maharashtra, 6 x3 m and 5.4 x 5.4 m spacings have been considered eligible for subsidies and financial assistance. Too close spacings require pruning relatively early (within 3-4 years) thus increases cost of cultivation. At 6 x 3m spacing with fertigation and plantation on 30-45 cm high raised bed, crop can be harvested within 3 years with good nutrient, water and health management practices. This technology not only saves resources but increases income with increased production and reduces mortality of plants due to *Phytophthora* caused root rot and gummosis.

## CITRUS SECTOR

Citrus industry in Madhya Pradesh has recorded significant growth in last twenty years in terms of area and production. Mainly Agar Malwa, Shajapur, Mandasaur and Rajgarh districts have recorded impressive expansion in Nagpur mandarin cultivation. Agro-climatically this region is similar to Vidarbha region of Maharashtra and huge quantity of planting material of Nagpur mandarin has gone to that region through private nursery. At present, area in Agar Malwa, Chhindwara, Shajapur, Mandasaur and Rajgarh under Nagpur mandarin is 42433, 23618, 12600, 11800 and 15580 ha with production of 364499, 472348, 282240, 118000 and 221236 tonnes, respectively. During 2016-17, Nagpur mandarin production in Madhya Pradesh was 15,79,768 tonnes compared to 7,64,048 tonnes in Maharashtra. This shows that Nagpur mandarin fruit from Madhya Pradesh is giving tough competition to fruit from Vidarbha (Maharashtra) in various national markets. The survey of Agar Malwa region indicated that this district receives good rainfall (1000-1200 mm) and temperatures are similar to that of Amravati district of Maharashtra. In coming years it will not be the surprise if Madhya Pradesh is considered as main Nagpur mandarin producing belt in the country. It is interesting to note that fruit produced in Vidarbha and nearby areas of M.P. only has been given GI Certification No.385, as a true Nagpur mandarin.

## From the Director's Desk.....



## Dear Readers,

High-density plantation (HDP) in citrus is becoming a reality albeit slowly but steadily. HDP is going to be a buzz word with citrus growers in coming years due to high and early returns on investment. Further it is going to increase productivity and income of the growers in same piece of land. There are several spacings but too close spacings are not advisable in citrus. The present planting distance of 6 x 6m provides density of 277 / ha which can be doubled (555 / ha in 6 x 3 m) comfortably. In

## FROM THE INSTITUTE

### Deputy Director General (Hort. Sci.), ICAR visits ICAR-CCRI

Dr. A. K. Singh, Deputy Director General (Hort. Sci.), ICAR, New Delhi visited ICAR-CCRI Nagpur on 15.9.2017. A meeting was organized wherein all the staff was introduced. In the beginning Dr. M. S. Ladaniya, Director welcomed Dr. A. K. Singh and explained the achievements of the Institute and informed about opening of the Regional Research Centre for Citrus at Biswanath Chariali, Assam. Thereafter, Dr. A. K. Singh addressed all the staff of the Institute. He gave various suggestions regarding new research programmes to be taken up and emphasized on issues like updating the institute website,



Dr. A. K. Singh, Deputy Director General (Hort. Sci.), ICAR addressing the staff

preparation of master file of all the activities, doubling farmer's income, intercropping in citrus orchards, Agriculture programme under *Mera Gaon Mera Gaurav*, etc.

Thereafter, he was shown demonstration block and the experimental blocks where High Density Planting for increasing the productivity and high income to the growers are in progress.

### Governing Body Member visits CCRI

Shri Ratneshwari Prasad Singh, Governing Body member of ICAR Society, New Delhi visited ICAR-CCRI Nagpur on 29<sup>th</sup> August 2017. Dr. M.S.Ladaniya, Director welcomed Sh.R.P.Singh and explained the achievements of the Institute and informed about opening of the Regional Research Centre for Citrus at Biswanath Chariali, Assam.



Shri R. P. Singh at CCRI and TMC nursery

Thereafter he was shown various experimental blocks and the nursery of CCRI and TMC where disease-free planting material is being produced. During his visit he emphasized on rainwater harvesting ponds and intercrops between raised beds, so as to increase the revenue of the Institute and also utilization of the land. Later he had an interaction exclusively with the Farm staff at the farm house. Mr. Singh also visited the laboratories and discussed with the scientists about their research programme. In the afternoon, Sh. R.P.Singh interacted with the staff of CCRI and trainees of the Agricultural Skill Council of India. Later in the evening he was taken to Mohpa and shown the Citrus Processing unit of M/s. Paliwal Udyog Ltd., where ICAR-CCRI has licensed the technology of citrus beverage production.

## Research Highlights

### *In vitro* propagation of seedless Assam lemon (*Citrus limon* L. Burmf)) from mature nodal segments

Studies on the micro propagation of lemon explants are very rare in comparison with other Citrus species. The aim of this study is to see the response of lemon shoots from adult material, cultured for *in vitro* proliferation and for an efficient rooting and acclimatisation of the plantlets. The micro propagated explants might be used as an ideal source of aseptic and homogeneous material in different transformation experiments.



*In vitro* shoot proliferation of seedless Assam lemon

Complete *In vitro* plantlet regeneration of seedless Assam lemon

Lab to greenhouse transfer

Simple and efficient protocol for obtaining direct organogenesis from mature nodal explants of Assam lemon has been developed by optimizing the concentration of plant growth regulators in basal mediacomposition. Explants were cultured in regeneration media - MS media amended with Benzyl Amino Purine (BAP) & kinetin. The presence of BAP was found essential for adventitious bud. The best results were obtained by using 2 ppm BAP & 0.5 ppm kinetin. The repetitive subculture of initial mother nodal explants on MS media yields further cropping of shoots. The above composition of media gives 2-3 shoots from each subculture. 90% of cloned shoots rooted *in vitro* on half strength of MS supplemented with IBA (5mg/l) and NAA 1mg/l. The survival percentage was 60 - 70% during the

pre-acclimatization, plants survived hardening and transplanting from lab to land condition. As seed propagation is restricted in the seedless Assam lemon cultivar, *in vitro* tissue culture propagation has great potential, for fast and early retrieval of complete plants.

### Institute Activities / Events Organized

**Foundation Day Celebration :** ICAR-CCRI, Nagpur celebrated 33<sup>rd</sup> Foundation day on 28<sup>th</sup> July, 2017. During fortnight long celebration various events like Sports, essays, quiz etc. were organized in which all employees participated. Prof. Dr. S. P. Kane, Vice-Chancellor, Nagpur University was the Chief Guest during concluding event on 28<sup>th</sup> July, 2017. Dr. M. S. Ladaniya, Director informed that first time Horticultural production in the country has touched 290 million tonnes while food grain production was 274 million tonnes. He gave brief outline of achievements and services provided by the Institute. Dr. Kane spoke about the status of higher education in the country and stressed the need for quality education from the school level itself. He later distributed prizes and trophies for the winners of various events. Students of College of Agriculture, Nagpur also participated in the concluding event.



**Prof. Dr. S. P. Kane, Vice-Chancellor, RTM Nagpur University addressing the staff**

**Hindi Pakhwada:** Hindi Pakhwada was celebrated during 14-28<sup>th</sup> September, 2017. Various competitions like essay, quiz and



**Dr. Pramod Sharma addressing the CCRI staff while Dr. Sagar Khadiwala, Dr. M. S. Ladaniya and Dr. R.K. Sonkar seen on the dias**

translation etc. were organized in which the staff participated enthusiastically. The concluding programme was held on 28<sup>th</sup> September, 2017. Chief Guest of the programme, Dr. Pramod Sharma, HOD, RTM Nagpur University and well-known writer Dr. Sagar Khadiwala were invited for their poetry on this occasion. Dr. M. S. Ladaniya, Director gave detailed Rajbhasha activities conducted during 2016-17. The prizes to the winners of competitions were distributed by the Guests and the Director.

### Training Programmes Organized

#### On-Campus

- ICAR-CCRI, Nagpur conducted one-day training programme for Citrus growers in collaboration with Technology Mission on Citrus, Vidarbha held at Susundari, Tal. Kalmeshwar, Dist. Nagpur on 10 July, 2017 in which 118 citrus growers and nurserymen participated.



**Dr. M. S. Ladaniya, Director addressing the Citrus growers at Susundari, Taluka – Kalmeshwar (Nagpur)**

### Meetings organized

- **RAC meeting :** The 21<sup>st</sup> Research Advisory Committee meeting was held under the Chairmanship of Dr. S. P. Ghosh, Ex. DDG (Hort.), ICAR, New Delhi on 11<sup>th</sup> Sept. 2017 at ICAR-CCRI, Nagpur. The Committee members present



**Dr. A. K. Das, Secretary, RAC presenting the Action Taken Report**

were Dr. R. D. Rawal, Pr. Scientist (Retd.) IIHR, Bengaluru; Dr. B. K. Singh, Pr. Scientist (Agril. Ext.) (Retd.), Centre for Agricultural Technology Assessment and Transfer (CATAT) IARI, New Delhi; Dr. M. S. Ladaniya, Director and Dr. A. K. Das, Pr. Scientist (Pl.Path.). The RAC team visited the research farm at CCRI. Activities related to production of quality planting material, budwood certification programme, germplasm collection, evaluation of varieties, standardization of rootstocks, crop regulation and others were shown to the committee members. All the staff also attended the meeting.



RAC team visiting the germplasm block

- **Bankers and entrepreneurs meet:** Twenty five bankers representing various banks visited the institute to understand the latest developments in the field of citrus cultivation and scope for bank finance therein on September 21, 2017 as per programme organized by (CAB)RBI, Pune State focused Programme on Financing Agriculture in Nagpur (September 20 - 22, 2017). The entrepreneurs Mr. Paliwal and Mr. Chaurasia also participated.
- **Rajbhasha Meeting :** Meeting was held on 22/09/2017

#### Skill development and Capacity Building of CCRI Staff :

- Shri Yogesh Kadian, AO : Training on GFR-2017 at ISTM, New Delhi during 8-12 August, 2017
- Sh. Rupendra Kumar Jhade, SRF(NICRA Project) : Training on 'Advanced instrumentation methods' at M.P. Council of Science and Technology, VigyanBhawan, Bhopal during 23-26 August, 2017.
- Sh. M. P. Gorle, Sr. Tech. Asstt. : Training on 'Automobile maintenance, Road Safety and Behavioral Skills' at ICAR-CIAE, Bhopal during 19-23 September, 2017.

#### Linkages and collaboration

##### Memorandum of Understanding (MoU)

- Technology of Shoot-Tip-Grafting Technology of Citrus & establishment of disease-free nursery were commercialized and MoU agreement was signed on 11<sup>th</sup> July, 2017 with upfront value of Rs.6,13,521/- as a onetime license fees with M/s. Seven Star Fruits Pvt. Ltd., Mumbai. This nursery will produce 50,000 plants in the beginning.



MoU agreement signing with Ms. Seven Star Fruits Pvt. Ltd., Mumbai for licensing of technology

- MoU signed between ICAR-CCRI, Nagpur and Dr. Ambedkar College, under RTMNagpur University on 19<sup>th</sup> July, 2017 for recognizing ICAR-CCRI, Nagpur for M.Sc./Ph.D. thesis research of the University students.



MoU signed with Dr. Ambedkar College (DACN), Nagpur

- Dr. D. K. Ghosh, Pr. Scientist visited CIH, Nagaland during 8-9 August, 2017 to extend technical support in their Citrus Bud wood certification program.

#### Publications :

##### Research Papers (In peer Reviewed Journals)

- Agegnehu, Getachew, Srivastava, A.K and Bird, Micheal, I. (2017). The role of biochar and biochar- compost in improving soil quality and crop performance: A review. *Applied Soil Ecology*. 119: 156-170 (Review)
- Anavrat Vinod (2017). Production and marketing constraints of Nagpur mandarin growers in Madhya Pradesh. *Agric. Update*, 12(3) Aug., : 443-447.
- Das, A. K., Nerkar, S., Thakre, N. and Kumar, A. (2017). First report of a typical strain of *Phytophthora inundata* causing Kinnow mandarin decline in India *Canadian Journal of Plant Pathology*. [https://doi.org/ 10.1080/07060661.2017.1364296](https://doi.org/10.1080/07060661.2017.1364296).

- Gorreapti K, Thangasamy A, Bhagat Y, Murkute AA (2017). Curing of Onion: A Review. *Indian Horticulture* 7: 08-14.
- Qiang-Sheng Wu, Srivastava, A.K, Zou, Ying-Ning and Malhotra, S.K. (2017) Mycorrhizas in citrus: Beyond soil fertility and plant nutrition. *Indian Journal of Agriculture Sciences* S7: 427-443 (Review)

#### Papers Presented (Oral) in Seminar/Symposia/Conferences etc.

- Srivastava, A.K. (2017): "Climate Smart soil fertility management in perennial crops : Developments and Challenges" (Keynote Speaker) in National Seminar on 'Water and Soil Management for Agriculture and Livelihood Security Under Climate Change' held during 8-9 September, 2017 at Varanasi, Uttar Pradesh.
- Following scientists participated and presented oral papers in International Symposium on "Horticulture Priorities and Emerging Trends" at ICAR-IIHR, Bengaluru during 5-8 Sept., 2017.
  - ✓ Kumar Dinesh (2017). "Hesperidin : A promising bioflavonoid in Indian citrus fruits".
  - ✓ Ladaniya M. S. (2017). Post-harvest handling & Processing in Citrus.
  - ✓ Marathe R A, Murkute AA, Ladaniya MS, Shirgure PS, Kolwadkar J, (2017). Physiological response of different Citrus rootstocks to drought stress.
  - ✓ Murkute AA, Singh IP, Tejkumar JP, Ladaniya MS (2017). Paradigms of Indian Citrus Improvement Programme.
  - ✓ Singh IP, Ladaniya MS, Das AK, Rao CN, Kumar D, Murkute AA (2017). A new pummelo cultivar NRCC Pummelo – 5 released for cultivation.
  - ✓ Singh I.P., Ladaniya M.S., Murkute A.A., Das A.K., Rao C.N., Kumar D. (2017). A new promising lemon type seedless citron mutant identified.
  - ✓ Tej Kumar JP, Murkute AA, Singh IP (2017). Screening of SSR Markers in Acid lime (*Citrus aurantifolia* Swingle) accessions in India.
  - ✓ Vijayakumari N. (2017). Production of triploids and tetraploids in Sweet orange by innovative *in-vitro* and *ex-vitro* propagation techniques.

Poster Papers presented in International Symposium on "Horticulture Priorities and Emerging Trends" at ICAR-IIHR, Bengaluru during 5-8 Sept., 2017.

- Huchche, A.D., Shirgure, P. S., and Kommu Kiran Kumar and Jhade, R.K.(2017). Efficacy of defoliating chemicals in Nagpur mandarin (*Citrus reticulata* Blanco).
- Kommu, K.K. (2017). "RNAi induced gene silencing - a novel approach for plant parasitic nematode management".
- Shirgure, P.S. and Srivastava, A.K. (2017). "Precision citriculture through fertigation on black clay soil".
- Shirgure, P.S. and Srivastava, A.K. (2017). Response of

Nagpur mandarin to fertigation versus soil application of iron on black clay soil".

- **Participation in conferences/ workshop/ symposia/ meeting etc.**
- Dr. C.N. Rao, Pr. Scientist (Ento.) and Sh. V.Y. Sorte, AF&AO: Review meeting of Vigilance officers under the chairmanship of Secretary, ICAR-CIFE, Mumbai on 8<sup>th</sup> July, 2017.
- Dr. A. K. Das, Pr. Scientist (Pl. Patho.) : First Group Meeting of DBT Twinning Project on "Molecular Diagnostics, Transcriptomics and Cisgenic Approaches to Combat Greening (Huanglongbing) Disease of Citrus" held on 11<sup>th</sup> July, 2017 in the Department of Agricultural Biotechnology, Assam Agricultural University, Jorhat.
- Dr. M.S. Ladaniya, Director attended ICAR Foundation Day and Directors Conference at ICAR, New Delhi during 15-16 July, 2017.
- Dr. A. D. Huchche, Pr. Scientist (Hort.), Dr. A. K. Das, Pr. Scientist (Pl. Patho.) and Dr. C.N. Rao, Pr. Scientist (Ento.) : Workshop on "Citrus Plantation and Post-harvest handling" organized by ATMA, Solapur on 24 July, 2017. Scientists invited as experts and also delivered lectures in the workshop.
- Dr. Dinesh Kumar, Pr. Scientist (Hort.) : Meeting on Food, Agro Processing & Agriculture allied activities organized by Department of Industries, Govt. of Maharashtra on 29<sup>th</sup> July, 2017 at Vidarbha Industries Association, Nagpur.
- Dr. Ashutosh Murkute, Sr. Scientist (Hort.) National Intellectual Convention on 'Resurrection of Agricultural Education and Research in India' during 9-10 August, 2017 at the Institute of Agricultural Sciences, Banaras Hindu University, Varanasi.
- Dr. R. A. Marathe, Pr. Scientist (SSSP) : Brainstorming workshop on yield models for horticultural crops held on 18<sup>th</sup> August, 2017 at MNCFC, New Delhi.
- Dr. Dinesh Kumar, Pr. Scientist (Hort.) and Sh. U.T. Sunil Kumar, ACTO: Seminar of Agilent Technologies on "Analytical solutions for today's science" organized by Agilent Technologies at Hotel Centre point, Nagpur on 22<sup>nd</sup> August, 2017.
- Dr. Vinod Anavrat, Pr. Scientist (Extn.) : Rural Programme Advisory Committee meeting of All India Radio, Nagpur on 31<sup>st</sup> August, 2016.
- Dr. A. A. Murkute, Sr. Scientist (Hort.) : Advisory Council Members meeting on 1<sup>st</sup> September, 2017 to plan the agenda for 9<sup>th</sup> Agrovision.
- Dr. M.S. Ladaniya, Director, Dr. C.N. Rao, Pr. Scientist (Ento.) and Sh. V. Y. Sorte, AF&AO : SFC/EFC meeting at ICAR, Krishi Bhavan, New Delhi during 13-14 September, 2017.
- Dr. V. Anavrat, Pr. Scientist (Extn.) : Meeting to discuss modalities for organising 7<sup>th</sup> Science Expo at Raman Science

Centre on 22<sup>nd</sup> September, 2017.

- Dr. A. D. Huchche, Pr. Scientist (Hort.) :Brain Storming session on “Viability of cultivating different varieties of citrus as an intercrop to tea” in the tea growing region of Kerala organised by Association of planters of Kerala on 23<sup>rd</sup> September, 2017 at Kochi and gave a presentation on intercropping in citrus.
- Dr. (Mrs.) N. Vijayakumari, Pr. Scientist (Hort.). 46<sup>th</sup> meeting of the Institute Management Committee of ICAR-Directorate of Cashew Research on 25<sup>th</sup> September, 2017 as a member.

### AICRP (Fruits) : Citrus research

Following activities were undertaken during the quarter under the All India Coordinated Research Project (Fruits) at ICAR-CCRI, Nagpur.

- Submitted the success stories of the technologies recommended under ICAR-AICRP on Fruits related to citrus crop w.r.t. ICAR-CCRI, Nagpur on 29<sup>th</sup> July, 2017.
- Submitted the details of report on achievements for April to June, 2017 for ICAR-AICRP(F) Citrus w.r.t. ICAR-CCRI, Nagpur on 31<sup>st</sup> July, 2017.
- Submitted the details of PFMS which includes Registration number (Unique Code), Contact Details and Bank Details w.r.t. ICAR-CCRI, Nagpur to ensure the subsequent release of funds on 1<sup>st</sup> August, 2017
- Updated the slides pertaining to the EFC presentation with respect to citrus on 4<sup>th</sup> September, 2017
- Dr. C.N. Rao, Pr. Scientist (Ento.) participated in a meeting on Pre-QRT and follow up action on the future needs meet of ICAR-AICRP (F)organized at ICAR-IIHR, Bengaluru during 30-31 August, 2017.
- Audio Conference on 31<sup>st</sup> July, 2017.

### Lectures delivered in training at other Institute/ Organisation

- Dr. D. K Ghosh, Pr. Scientist (Pl. Patho.) delivered a lecture on 'Recent Advances in Plant Pathology' at Shri Mathuradas Mohota College of Science, Nagpur on 24<sup>th</sup> August 2017.
- Dr. D. K. Ghosh, Pr. Scientist (Pl. Patho.) delivered a lecture on Molecular diagnosis of citrus viruses and citrus greening at Hislop College, Nagpur on 25<sup>th</sup> September, 2017.
- Dr. C.N. Rao, Pr. Scientist (Ento.). Delivered a lecture on 'Citrus Insect Pest Management' in a one-day training programme on Citrus Production and Post-harvest Management on 24<sup>th</sup> July, 2017 at ATMA, Solapur.
- Dr. A. K. Srivastava, Pr. Scientist (Soil Science). Diagnosis and Management of Soil Fertility; Constrains in Citrus Orchards of India (two Lectures) as Adjunct faculty during August 28-29, 2017 at Deptt. of Soil Science and Agric. Chemistry, MPKV, Rahuri, Maharashtra.
- Dr. A. K. Srivastava, Pr. Scientist (Soil Science). Diagnosis

and Management of Nutrient Constraints In Citrus as Guest Lecture in Winter School organised by Department of Soil Science and Agriculture Chemistry, Centre of Advanced Faculty Training, JNKVV, Jabalpur during September 5-25, 2017

- Dr. R.A. Marathe, Pr. Scientist (SSSP) : “Yield prediction models in citrus” in the Brainstorming Workshop to Develop Yield Models for Horticultural Crop under CHAMAN project held on 18<sup>th</sup> August, 2017 at New Delhi.

### Other Extension Activities

#### Exhibitions

- International Symposium on 'Horticulture: Priorities & Emerging Trends' held at ICAR-IIHR, Bengaluru during 4-7 Sept., 2017.
- “State level Agri-Techniques Exhibition 2017” on the occasion of “Dhamma Chakra Pravartan Diwas” organised by Agriculture Department, Nagpur Division, Nagpur from 29<sup>th</sup> Sept., to 1<sup>st</sup> Oct., 2017.



Visit of Shri Rajkumar Badole, Social Justice Minister, GoM. at CCRI stall in Agri-Techniques Exhibition -2017

#### Visit to CCRI

During the quarter, the number of farmers, students and trainees visited CCRI, Nagpur as follows:

#### Farmer's

| States         | No. of Famers |
|----------------|---------------|
| Maharashtra    | 120           |
| Madhya Pradesh | 64            |
| <b>Total</b>   | <b>184</b>    |

#### Students

- Three (3) Mechanical Engineering students from Cummins College of Engineering for Women, Hingana, Nagpur on 11/07/2017.
- Fifteen (15) students from College of Agricultural Biotechnology, Madadgaon, Ahmednagar on 14/09/2017.

- Forty (40) students and staff of B.Sc. final year from Smt. RadhabaiSarda Arts, Commerce and Science College, Anjangaon Surji, Amravati on 29/09/2017.

## Trainees

- Agriculture Officers undergoing training on “Geo-tagging through mobile application for the assets created under PMKSY” at RRSC, Nagpur visited CCRI on 13<sup>th</sup> July, 2017 (30 Trainees).
- Farmers from Jalna, ATM Aundergoing training at CIRCOT visited, 19<sup>th</sup> July, 2017 (40 Trainees).
- Officers from NBSS&LUP undergoing training on Analytical tools and techniques for developing soil health card and its interpretation, 7<sup>th</sup> August, 2017 (22 Trainees).
- Farmers from Jalgaon, ATMA undergoing training at CIRCOT visited, 30<sup>th</sup> August, 2017 (31 Trainees).
- Farmers from Jalgaon, ATMA undergoing training at CIRCOT visited on 6<sup>th</sup> September, 2017 (26 Trainees).
- Farmers from JalgaonATMA undergoing training at CIRCOT visited on 21<sup>th</sup> September, 2017 (30 Trainees).

## Celebration

- ICAR-CCRI, Nagpur took the pledge “*Sankalp Se Siddhi*” on completion of 75 years launch of Quit India Movement. 42 staff administered the pledge on 9<sup>th</sup> August, 2017.
- Institute celebrated Independence Day on 15<sup>th</sup> August, 2017
- Sadbhavana Diwas on 20<sup>th</sup> August, 2017

## Good Governance/Swachh Bharat Mission

- A cleanliness campaign was organized at premises of ICAR-Central Citrus Research Institute, Nagpur during 15<sup>th</sup> September to 2<sup>nd</sup> October, 2017 as part of “Swachhata Hi Seva”. Director of the Institute administered the Swachhta pledge on 18<sup>th</sup> September 2017 and this was followed by an intensive cleaning campaign at the office premises, farm residential quarters, etc. by all the staff members of CCRI, Nagpur and TMC led by the Director.
- Disposed four RTI queries during the quarter.

## Distribution of disease-free planting material under ICAR-CCRI

A total of 37,377 disease free planting material of citrus rootstocks, fruits and seed distributed and revenue of Rs.20,19,084 generated.

## Distinguished Visitors

### National

- Dr. S. K. Malhotra, Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare, New Delhi visited on 1<sup>st</sup> September 2017. He was appraised of the overall review of the activities at TMC – Vidarbha, Marathwada and Chhindwara and was shown the nursery of CCRI and TMC where disease-free planting material was produced.



**Dr. S. K. Malhotra, Agriculture Commissioner, Ministry of Agriculture & Farmers Welfare, Govt. of India Visiting TMC Nursery**

## Survey / Visit to Citrus Growers' orchard

- A team of scientists Dr.(Mrs.) N. Vijayakumari, Dr. I.P. Singh and Dr. Dr.A.K. Das visited the MAHYCO, Dawalawadi, Jalna, Maharashtra during 22-24 August, 2017 in relation to Technology Lincensing project for transfer of technology on STG and establishment of citrus nursery for production of disease-free planting material of M/s. Seven Star fruits Ltd. (a subsidiary company of MAHYCO).
- Dr. A. D. Huchche, Dr. A. K. Das and Dr. C.N. Rao surveyed the areas of Warud during 16-17 August, 2017.

## Regional Research Centre for Citrus (RRCC), Biswanath Chariali, Assam

**Plantation of Citrus at RRCC:** The planting of 18 varieties of citrus commenced in the month of August, 2017 on both raised and flat bed blocks (50 x 50m) to observe the performance at RRCC, Biswanath Chariali. Totally, 16 plants of each variety were planted in each row at spacing of 5x3m. Simultaneously 41 germplasm accessions of citrus maintaining at ICAR-CCRI were also planted at the regional centre. Dr. M.S. Ladaniya, Director monitored the plantation. The list of different varieties of citrus is mentioned below:



**Dr. M.S. Ladaniya planting a citrus sapling at RRCC, Biswanath Chariali**

| Row | Variety                      |
|-----|------------------------------|
| 1   | Khasi mandarin budded plants |
| 2   | Khasi mandarin seedling      |
| 3   | Nagpur mandarin budded       |
| 4   | Nagpur mandarin STG derived  |
| 5   | Nagpur mandarin seedless-4   |
| 6   | Cutter Valencia              |
| 7   | Mosambi                      |
| 8   | Hamlin                       |
| 9   | Blood red                    |
| 10  | Pineapple                    |
| 11  | Flame grapefruit             |
| 12  | NRCC Grapefruit-6            |
| 13  | NRCC Pummelo-5               |
| 14  | US Pummelo-145               |
| 15  | Assam lemon                  |
| 16  | NRCC Acidlime-7              |
| 17  | NRCC Acidlime-8              |
| 18  | Citron mutant                |

Citrus for Vidarbha organized Skill Development Programme (200 hrs.) for citrus fruit growers as per qualification pack of ASCI from 1-30<sup>th</sup> August, 2017 in which 17 candidates participated. Dr. A. D. Huchche, Pr. Scientist (Hort.) was the Course Co-ordinator.



**Hands-on training of participants for Bordeaux paste preparation**

- Dr. M.S. Ladaniya, Director, Dr. I. P. Singh, Pr. Scientist (Hort.), Dr. R. A. Marathe, Pr. Scientist (SSSP), Dr. A. K. Das, Pr. Scientist (Pl. Patho.), Sh. V.P. Bhaladhare, Sr. Tech. Asstt and Sh. B.G. Awari, Sr. Tech. Asstt. : Visited Regional Research Centre for Citrus (RRCC), Biswanath Chariali on 12 - 14 August, 2017 to monitor the work related to land preparation for raised bed and the flat bed blocks, pit digging and for plantation work.

### **Technology Mission on Citrus (TMC) for Vidarbha, Marathwada and Chhindwara**

Technology Mission on Citrus was started in the year 2007 at Vidarbha, further extended to Marathwada region in 2009 and Chhindwara region of Madhya Pradesh in 2011 by the National Horticulture Mission (now Mission for Integrated Development of Horticulture MIDH) Ministry of Agriculture, Govt. of India, New Delhi. During the quarter following activities were undertaken:

#### **Skill development**

##### **Vidarbha**

- ICAR-CCRI in collaboration with Technology Mission on

#### **Distribution of disease free planting material under TMC**

**Vidarbha:** A total of 1,19,479 disease-free planting material of citrus distributed and revenue of Rs.65,39,600/-generated.

**Marathwada:** A total of 21368 disease-free planting material of citrus and rootstock seedlings were distributed and revenue of Rs. 8,42,410/-generated.

**Chhindwara:** A total of 5403 disease free planting material of citrus was distributed and revenue of Rs.3,31,480/-generated.

#### **FEEDBACK**

North-eastern states have potential of increasing citrus production as the climatic conditions are very favourable for citrus cultivation in the region. In fact NEH region is the home of citrus and hot spot of citrus biodiversity. During 2009-10, area was 1,03,000 ha which increased to 1,56,000 ha in 2016-17 and production increased from 5,06,000 to 9,54,000 tonnes during that period. Arunachal Pradesh, Manipur, Mizoram and to some extent Assam have recorded impressive increase in area and production. Khasi mandarin, the main citrus fruit of the region is exported to Bangladesh and sent up to Kolkata market.

**Edited by :** Dr. M. S. Ladaniya, Director, Dr. A. K. Das, Pr. Scientist (Pl.Path.), Dr. C. N. Rao, Pr. Scientist (Ento.) and Dr. A. A. Murkute, Pr. Scientist (Hort.)

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