



# CITRUS NEWSLETTER



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



### *Dear Readers,*

World orange festivals have been arranged in the major mandarin growing region of India i.e. central India at Nagpur during 17-20 December 2017 and also 18-21 January, 2019 with a theme to globalize this fruit, popularize it, promote agro-tourism, create awareness about its nutritive value, promote marketing, processing and export, provide national and international information and technical knowhow to farmers and boost market of fertilizer, pesticide, irrigation, equipments and postharvest management products. ICAR-CCRI was the major knowledge partner in organizing these

events in collaboration with Orange Growers Association of India. Lokmat Group, media corporate group in Maharashtra, UPL group, Ministry of Tourism, Government of Maharashtra were the major sponsors. The events were inaugurated by Shri. Nitin Gadkari, Union Minister in presence of Shri. Devendra Fadanvis, CM, Maharashtra, Shri. Vijay Darda, Lokmat group and other dignitaries. Union Minister for Agriculture Shri. Radhamohan Singh and Hon'ble DDG, Hort Sci. Dr. A.K. Singh graced the occasion in December 2017. ICAR-CCRI arranged citrus fruit diversity show on both the occasions. Exhibitions were arranged in which hundreds of stalls were put up. It is estimated that more than one lakh farmers and general public visited this grand programme during 2017 and 2019. There were 12 Citrus experts from Brazil, USA, South Korea, Vietnam, Kambodia, Nepal, Bhutan and Sri Lanka who delivered talks on respective citrus industries. Progressive citrus growers from all over India were felicitated. Panel discussions and seminars were arranged. Road shows and cooking practical by well-known chefs depicted various desserts and dishes based on citrus fruits. Music nights, tiger safaris and other events were arranged to also make it tourism event. These provided very good platform to all stakeholders related to citrus/ orange industry in the country and all stakeholders got a wide view of rich citrus diversity, its scale of operation and potential for further expansion of this industry which has turnover of Rs. 26,000 to 30,000 crores every year in India. Such festivals are necessary with certain time interval to remove slackness, provide new lease to citrus industry.

### **CITRUS SECTOR**

The global citrus production in 2001-02 was 97.28 million tonnes. During 2003-04, India with 5.7 million tonne annual production stood at 6<sup>th</sup> position after Brazil, USA, China, Mexico and Spain. In, 2017-18, India jumped to 3<sup>rd</sup> position

with 12.5 million tonne production while China with 39 million tonne production stood at 1st position. The Citrus production in USA especially Florida faced considerable threat due to citrus greening and occasional cyclones that devastated citrus industry. In 2017-18, citrus production in USA was around 8 million tonnes as against 10.56 million tonnes in 2011-12 and 14.1 million tonnes during 2003-04. In world citrus industry, sweet oranges (tight jacket oranges) contribute almost 56%, mandarins constitute 25%, limes and lemons 10%, grapefruit and pummelo 7% and other citrus 2%. This substantial production increase during last 5-10 years in the India was mainly due to increase in area and due to increase in productivity. Presently (year 2017-18), citrus fruits constitute nearly 12.15% of the total fruit production (99 million tonnes) in the country. In 2018 with 130 crore population and production of 125 lakh tonne, per capita per year citrus fruit availability was 9.61 kg which is very impressive achievement keeping in view citrus fruit availability of 1.05 kg/capita/year during 1960s. Even though population increased, per capita citrus fruit availability also increased many fold.

### FROM THE INSTITUTE

#### Research Highlight

For efficient use of water and nutrients as a part of precision farming, geo-spatial variability was utilized in the orchard. In Nagpur mandarin orchard base map was developed using



Fig 1. Plant canopy-based variogram for identifying different production management zones with view of fruit yield in high production management

GPS and GIS as decision support to delineate 3 production zones i.e. High, Medium and Low with 48 plants each. (Fig. 1.) and delineated through soil fertility and tree canopy volume – based variograms using 144 geo-referenced sampling grid points. Three variable rates of irrigation (Irrigation as 80% water requirement per plant based  $ET_{crop}$ ) and fertigation (RDF as 480g N- 240g  $P_2O_5$ -160g  $K_2O$ /plant) viz.,  $T_1$  (High production management zone: Irrigation with 80% water requirement on  $ET_{crop}$  plus 60% recommended dose of fertilizer as fertigation),  $T_2$  (Medium production management zone: Irrigation with 90% water requirement plus 80% (RDF as fertigation) and  $T_3$  (Low production management zone: Irrigation with 100% water requirement plus 100% (RDF as fertigation) were imposed with 46,671, 52,505 and 58,338 litres, respectively.

The plant available nutrients in soil within each management zone were ascertained. Pooled data analysis showed significant variation in canopy volume of the Nagpur mandarin as 10.61  $m^3$ , 10.00  $m^3$  and 8.55  $m^3$  under high, medium and low production zones, respectively, corresponding to fruit yield of 9.15 tons/ha, 7.30 tons/ha and 5.82 tons/ha. The coefficient variation across these three production management zones continued to reduce for each of the three soil-plant health, fruit yield and fruit quality parameters kept under investigation, thereby, facilitating the development of an advance production system in years to come.

#### Institute Activities / Events Organized

**Pradhan Mantri Kisan Samman Nidhi Yojana** : ICAR-CCRI, Nagpur organized "Pradhan Mantri Kisan Samman Nidhi Yojana" programme on 24<sup>th</sup> February, 2019. Hon'ble Shri. Nitinji Gadkari, Minister for Road Transport & Highways, Shipping and Water Resources, River Development & Ganga Rejuvenation, Government of India launched the programme at Nagpur. Mr. Gadkari said it is a historic scheme and Govt. has provided direct financial assistance to the farmers by depositing amount in their



Shri Nitin Gadkari delivering the inaugural address

accounts. Rs. 75,000 crore were allocated under this scheme for the farmers across the country. Dr. Anil Bonde, MLA and Dr. M.S. Ladaniya, Director, CCRI were also presented. More than 200 farmers from Nagpur and Wardha participated in the programme. Live telecast of the launch of the scheme by Prime Minister Narendra Modi from Gorakhpur UP was also shown in this occasion.

**World Orange Festival 2019 :** This was the second edition of World Orange Festival organized at Nagpur in January, 2019. ICAR-CCRI was the knowledge partner and given main input for technical seminars and symposia. Institute also provided help in inviting foreign delegates. These foreign delegates also visited institute on 19<sup>th</sup> January, 2019. The event was inaugurated on 18<sup>th</sup> January, 2019 by Shri. Nitinji Gadkari, Union Minister in presence of Shri. Devendra Fadanvis, Chief Minister, Maharashtra. Dignitaries also inaugurated the “Citrus fruit show” put up by ICAR-CCRI and Agro-exhibition. More than 68 different citrus varieties and germplasm were displayed. On 19<sup>th</sup> and 20<sup>th</sup> January, panel discussion and a Seminar, were organized. On 21<sup>st</sup> January in a Seminar entitled “World Orange industry” 8 Scientists from across the world namely Dr. Gilberto Tozati from Brazil, Dr. Siddharam Gowda from Florida, USA, Dr. Sang from South Korea, Dr. Goen Hoa from Vietnam, Dr. Kong from Cambodia, Dr. Shanta Karki from Nepal, Dr. Shering Penjor from Bhutan and Dr. Lesly from Sri Lanka delivered talk about citrus industry of their respective countries. There were 12 foreign delegate participants. The valedictory session on 21<sup>st</sup> January was chaired by Hon'ble Energy Minister, Maharashtra, Shri. Chandrashekhar Bawankule in presence of Shri. Vijay Darda, Chairman Lokmat group, Shri Brijesh Dixit, M.D. Maha Metro, office bearers of OGAI and Dr. S. A. Nimbalkar. OGAI Awards for Best Citrus Scientist were given on the

occasion.

**International Women's Day:** ICAR-CCRI, Nagpur celebrated International Women's Day on the theme “*Think Equal, Build Smart, Innovate for Change*” on 8<sup>th</sup> March, 2019. Dr. Kavita Bakshi, Head, Women Technical Education and Research Institute, Nagpur along with 30 students and Dr. Asha Gedam, Head R&D, Cummins College of Engineering for Women, Nagpur alongwith 16 students participated. Dr. M. S. Ladaniya, Director welcomed the teachers and students and highlighted the importance of the day and the contribution of women in the society. Dr. Dinesh Kumar conducted the programme and Dr. D. K. Ghosh



Dr. M. S. Ladaniya, Director addressing the participants during International Women's Day

proposed vote of thanks.

**Kisan Mela at Parsoni, Bihar :** CCRI participated in Farmers' fair (Kisan Kalyan Mela) organized by Krushak Bharti Co-operative Ltd., Patna (Bihar), (Chief Patron : Shri. Radha Mohan Singh, Union Agric. Minister) on 03.02.2019 at Krushi farm, Parsoni, Dist. Purvi Champaran, Bihar. Hon'ble Minister released publication (Hindi) entitled : “*Nimbu ki Unnat Bagwani*” on the occasion. Dr. M. S.



Shri Radha Mohan Singh, Union Agriculture & Farmers Welfare Minister addressing the farmers



Shri Devendra Fadanvis, Chief Minister, Maharashtra and Shri. Nitinji Gadkari, Union Cabinet Minister and dignitaries inaugurating the “Citrus fruit show”

Ladaniya, Director, and Dr. I.P. Singh Pr. Scientist and Sh. Bandu Awari Tech. Officer participated. Dr. M.S. Ladaniya addressed the farmers and gave information about citrus planting techniques. Stall of ICAR-CCRI was arranged on the occasion.

### Training Programmes

#### On-Campus

#### International

- ✓ Training programme on “Molecular diagnosis of virus and virus-like Pathogens including citrus Greening (HLB) and Advanced Techniques of Citrus nursery plant propagation system” was organized for ten Agriculture and Horticulture officers of Royal Government of Bhutan at the CCRI, Nagpur during 25<sup>th</sup> March – 6<sup>th</sup> April,



Participants of the International training programme

2019. Dr. D. K. Ghosh co-ordinated the training.

### Memorandum of Understanding (MoU)

- A contract research project “Evaluation of membrane assisted controlled atmosphere storage for enhancing shelf life of Nagpur mandarin fruits” has been signed on 7<sup>th</sup> March, 2019 with M/s. Yashasvi Enterprises, Airoli, Mumbai.



Signing of MoU with M/s. Yashasvi Enterprises, Airoli, Mumbai

### Meetings organised

**QRT meeting :** First meeting of the QRT for the period of 2013-18 was organized at ICAR-CCRI, Nagpur during 7-9<sup>th</sup> February, 2019 under the Chairmanship of Dr. B. S. Chundawat, Ex-VC, GAU, Gujarat to review the progress of the institute. Members Dr. A.M. Goswami, Dr. T. B. S. Rajput, Dr. S.R. Bhat, Dr. Y. S. Ahlawat and Dr. P. C. Sharma, Dr. A. K. Srivastava, Pr. Scientist (Soil Sci.), ICAR-CCRI, Nagpur Member Secretary and Dr. M.S. Ladaniya, Director, CCRI were present.



Quinquennial Review Team meeting in progress

**IMC meeting :** The XXXV meeting of IMC of ICAR-CCRI, Nagpur was held on 08.02.2019 under the Chairmanship of Dr. M. S. Ladaniya, Director, CCRI, Nagpur. Dr. P. S. Tiwari, Dr. Pradnya Golghate, Dr. Archana Kadu, Sh. Y.V. Sorte, AF&AO, CCRI, Nagpur-Invitee and Sh. A. P. Chaitupune, Administrative Officer, CCRI, Nagpur-Member Secretary were present.



Joint committee meeting of IMC with QRT members

**IJSC :** The 89<sup>th</sup> IJSC Meeting held on 5<sup>th</sup> February, 2019 under the Chairmanship of Dr. M.S. Ladaniya, Director, CCRI, Nagpur and various issues concerning staff were discussed/sorted out.

**Rajbhasha meeting :** The Rajbhasha meeting were held on 14<sup>th</sup> March, 2019 under the Chairmanship of Dr. M.S. Ladaniya, Director, ICAR-Central Citrus Research Institute, Nagpur.

#### Institute Capacity Building of Staff

- Dr. J. P. Tej Kumar, Scientist (Biotech.) : Management Development programme for HRD Nodal Officers of ICAR for effective implementation of training functions” at ICAR-NAARM, Hyderabad, 14-16 March, 2019.

#### Academic/Educational collaboration with other organisations

- Dr. A. K. Das, Pr. Sci. (Pl. Path.) Evaluation of thesis and External Examiner for Ph.D. Viva-voce of Ms. Vinitha, K.B. on 25.01.2019. Mangalore University, Mangalagangothri, Karnataka.
- Dr. D. K. Ghosh, Pr. Sci. (Pl. Patho.) was Co-guide for Ph.D. students of SHIATS, Allahabad
  - ✓ Miss. Manali Motghare, 2013-2019.
  - ✓ Mr. Sunil Kokane, since 2016.
  - ✓ Mr. Amol Kokne, since 2017.
- Dr. A. K. Das, Pr. Sci. (Pl. Path.) Co-Guide for M.Sc. student Sh. S. M. Isokar 2017-April, 2019, College of Agriculture, Nagpur.
- Dr. A. D. Huchche, Pr. Sci. (Hort.) Examiner of Ph.D. thesis of Sh. V. N. Shinde, College of Agriculture VNMKV, Parbhani.
- Dr. J. Prasanth Tej Kumar, Sci.(Biotech.), internship guide of Mr. D. D. Salame from 09.01.2019 to 30.05.2019 CoA & Biotech., Baramati.

#### Publications

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

##### International

- Kumar D., Ladaniya, M.S., Gurjar, M., Mendke S. and Kumar, S. (2019). Osmotic Membrane Distillation for retention of antioxidant potential in Nagpur Mandarin (*Citrus reticulata* Blanco) fruit juice concentrate. *J.Fd. Engg.* <https://doi.org/10.1111/jfpe.13096>
- Kumar D., Ladaniya, M.S., Gurjar, M. (2019). Underutilized Citrus sp. Pomelo (*Citrus grandis*) and Kachai Lemon (*Citrus jambhiri*) exhale in phytochemicals and antioxidant potential. *J.FdSci. Tech.*, 56(1):217-223

##### National

- Bhattacharyya, S., Burman, R.R. and Paul, S. (2019). The concept of measuring happiness and how India can go the

Nordic way. *Curr. Sci.*, 116(1)p.26.

- George Anjitha, Rao, C.N., Ghike, Sonali and Dhengre, V.N. (2019). Impact of weather on seasonality of phytophagous mites and their natural enemies associated with citrus in Vidarbha region of Maharashtra, India. *IOSR J. Agric. Vet. Sci.*, 12(2):75-83.
- Thirugnanavel A., Deka. B.C. and Rangnamei Lily (2019). Effect of different growing media on gerbera varieties under low altitude conditions of Nagaland. *Green Farming.* 10(2) : 195 : 198.
- Vijaya kumari, N. (2019). Micro budding of indigenous and exotic citrus cultivars : A boon to Indian farmers to shorten the Citrus nursery phase. *Int. J. Rec. Sci. Res.*, 10(1) : 30389-30392.

#### Books / Book chapters

- Ladaniya M.S., Marathe, R.A., Das A.K., Rao, C.N. and Huchche A.D. (2019). : High density planting with hedge row and pruning for early and higher production in citrus. *In: Shaping the future of Horticulture* (Editor : Chadha K.L., S.K. Singh, Jai Prakash and V.B. Patel). 8<sup>th</sup> Indian Horticulture Congress-2018, IGKV, Raipur, 16-19<sup>th</sup> January, 2019.
- Shirgure P. S. (2019). Soil and Water Conservation Engineering Research in Citrus (book). *Lambert Academic Publishers, LAP, Germany.* Pp-161 ISBN – 9783659891465.

#### Extension Bulletins/Folders

- Das A. K. (2019) : Integrated management of *Phytophthora* diseases of citrus. Extension bulletin No. 61. ICAR-CCRI, Nagpur, Maharashtra. 30p.
- Ladaniya, M.S., Srivastava, A.K., Huchche, A.D., Singh, I.P., Sonkar, R.K., Das, A.K., Anavrat V., Rao C.N., Shirgure, P.S. and K.T. VenkatRamana (2019). Improved cultivation of Acid Lime (in Hindi). Extension Bulletin No. 62, ICAR-CCRI, Nagpur, Maharashtra. p60.

#### AICRP (Fruits) : Citrus research

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

1. Submission of Research Report on Citrus through crop co-ordinator (Citrus) Director, CCRI to PC-AICRP.
2. Participation of Dr. M. S. Ladaniya, Director, Dr. A. K. Srivastava, Dr. I. P. Singh, Dr. R. K. Sonkar, Dr. P. S. Shirgure, Dr. A.K. Das and Dr. Anjitha George in the Sixth Group Discussion of the ICAR-AICRP (Fruits) at Assam Agricultural University, Jorhat, Assam during 14-16<sup>th</sup> February, 2019.

3. Dr. M.S. Ladaniya chaired the Technical Session on Growth, development and value addition.
4. Dr. A. K. Srivastava Co-chaired session III A (Nutrition) and Presented the progress report of experiments as Lead Presenter.
5. Dr. P.S. Shingure Convened the session on 'Agro Techniques' and on 'Water management, weed control and orchard management' (Session IIIB).
6. Audio-conference with the Project Coordinator (Fruits) on 10<sup>th</sup> January, 2019.

### Other Extension Activities

#### Exhibition

The Institute along with TMC participated in Agricultural/Krishi exhibitions and disseminated technologies through sale of publications and display of exhibits in the following events :

- “Science Expo-2019”, Raman Science Centre, Nagpur 16-20<sup>th</sup> Jan., 2019.
- World Orange Festival-2019, Nagpur 18 – 21 Jan., 2019.
- 8<sup>th</sup> Science Expo– 2019, National Council of Science Museum, Kolkata, 16-20<sup>th</sup> Jan., 2019.
- Kisan Kalyan Mela, Parsauni, East Champaran, Bihar 2-3 February, 2019.
- National Krishi Vikas Parishad, Warud 8-11 Feb., 2019.
- Krishi Kumbh– 2019, ICAR-MGIFRI, Motihari, Bihar 9-11<sup>th</sup> Feb., 2019.
- Technology & Machinery Demonstration Mela GTC, ICAR-CIRCOT, Nagpur 15<sup>th</sup> Feb., 2019.



Shri Radha Mohan Singh, Union Agric. Minister visiting CCRI stall at Kisan Kalyan Mela, Parsauni, Pahadpur, Champaran, Bihar

#### Visit to CCRI

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

- Farmers from different states visited the institute during this quarter. In all 255 farmers from Maharashtra, M.P., Gujarat and Telangana were benefitted by watching field experiments, new technologies and nursery. Similarly, 456 students pursuing their B.Sc, B.Tech and Mechanical Engineering degrees in various collages in Maharashtra and M.P., visited the institute. Trainee officials who visited the institute during the quarter were 70 and undergoing training in various organizations in M.P. and Maharashtra.

#### Survey/Field Day/Visit to citrus growers orchard

- Dr. A. D. Huchche, Pr. Scientist (Hort.) and Dr. A.A. Murkute, Pr. Scientist (Hort.) visited as a Citrus Expert to assess problems of flowering and fruiting in Pummelo cv. Honey and grapefruit, plantation at Gorasiya farm Bhuj, Gujarat (during 13-15<sup>th</sup> February, 2019).

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

##### Training under Tribal Sub-Plan (TSP)

RRCC organized one-day training programme under Tribal Sub Plan (TSP) on “Production technology of Citrus” at KVK, Lakhimpur, Assam on 26-03-2019. A total of 60 farmers from Lakhimpur and Dhemaji districts attended the training programme. During technical session Dr. M.S. Ladaniya, Director and Scientists delivered technical presentations.



Trainees along with Dr. M.S. Ladaniya, Director, CCRI and other scientists at KVK, Lakhimpur, Assam

#### Good Governance / Swachh Bharat Mission

- Cleanliness was observed in the office campus and residential quarters.

#### Celebration

- Republic day celebrated on 26<sup>th</sup> January, 2019.

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

A total of 2,917 disease free planting material of citrus rootstocks, fruits and seed distributed and revenue of Rs.1,59,337/- generated.

### Awards

- Dr. M.S.Ladaniya, Director received Shri. Mohan Totey Memorial Best Citrus Scientist Award – 2018 for outstanding contribution in citrus research during “World Orange Festival” on 21.01.2019. Award was instituted in memory of Late Shri. Mohan Totey, a well-known progressive citrus grower from Morshi, Dist. Amravati, Maharashtra.
- Dr. A. K. Srivastava, Pr. Scientist (Soil Science) received Best Citrus Scientist Award – 2018 for outstanding contribution in citrus research during “World Orange Festival” on 21.01.2019.
- Anjitha George, C N Rao, V N Dhengre and Suchitra Roy



Dr. M. S. Ladaniya receiving Best Citrus Scientist Award – 2018  
Shri Chandrashekhhar Bawankule, Minister (Energy) M.S.



Dr. A. K. Srivastava receiving Best Citrus Scientist Award – 2018

received Best poster award for the paper Bio-efficacy of Cyantranilprole 100D against *Phyllocnistis citrella* Stainton and *Scirtothrips dorsalis* Hood during 8<sup>th</sup> Horticulture Congress at IGKV, Raipur during 17-21, January 2019.

### Honours and Recognition

- Dr. A. A. Murkute (Hort.) deputed as an expert on citrus domestication and improvement at Directorate of Horticulture, Republic of Senegal during 18-27 January, 2019.
- Dr. Sunil Kumar U.T., ACTO was awarded Ph.D. for thesis entitled “Investigation and identification of critical success factors for quality management in post-harvest processing of citrus fruits mainly Nagpur mandarin” by Faculty of Science and Technology, Mech. Engineering RTM Nagpur University, Nagpur on 19.01.2019.

### Distinguished Visitors

- Dr. Ashok S. Dhawan, Vice Chancellor, Vasant Rao Naik Marathwada Krishi Vidyapeeth, Parbhani visited CCRI on 7<sup>th</sup> January, 2019 to have a first-hand knowledge about some of the recent professional activities of CCRI, Nagpur.
- Sh. Manoj Kumar, ACTO (Hindi), ICAR, New Delhi visited to review the Rajbhasha work in the Institute on 7<sup>th</sup> March, 2019.



Dr. Ashok S. Dhawan, VC, VNMKV visiting Institute nurseries

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

Technology Mission on Citrus (TMC) 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.



Dr. Sunil Kumar U.T., ACTO explaining functions of mechanical packing line operations to trainees

## Skill Development

### Vidarbha

- TMC for Vidarbha organized a training programme on “Citrus Nursery Management and Production Technology” during 25-28 February, 2019 in collaboration with ICAR-CCRI, Nagpur in which 18 State Officials participated. The programme was coordinated by Dr. A. K. Das, Pr. Scientist (Pl. Patho.).
- TMC for Vidarbha organized a skill development training programme of 200 hrs. on 'Citrus Nursery Management, Production and Post-harvest Technology' in collaboration with ICAR-CCRI, Nagpur from 1- 30 March, 2019. A total 9 citrus growers participated.

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

**Vidarbha:** A total of 8,232 disease-free planting material of citrus distributed and revenue of Rs.3,29,897/- generated.

### Personnel

#### Permanent Staff

- Sh. A.P. Chaitupune, Administrative Officer joined ICAR-CCRI, Nagpur on 30<sup>th</sup> January, 2019 on the transfer from NBSS&LUP, Nagpur.

#### Contractual Staff

- Sh. DevendraUpadhyay, YP-II w.e.f. 02.01.2019 in Plant Breeding Laboratory.

- Sh. Ashish Dhongade, SRF w.e.f. 06.03.2019 under CHAMAN Project.

### MACP

- Sh. A. Shaneshwar, SSS w.e.f.27.02.2018
- Sh. N.Thakre, SSS w.e.f.27.02.2018
- Sh. D.H.Raut, SSS w.e.f. 27.02.2018
- Sh. S. W. Ambekar, I/c, AAO w.e.f. 21.09.2018.
- Sh. P.M. Khobragade, Jr. Clerk w.e.f. 01.07.2016.
- Sh. M.S. Utane, Jr. Clerk w.e.f. 04.11.2018
- Sh. A. N. Mahanande, SSS w.e.f. 23.07.2018.
- Sh. D. N. Sambhare, SSS w.e.f. 22.11.2018.

### Resignation/relieving

- Sh. Ashish Warghane, YP-II relieved on 27.03.2019.
- Sh. AnupTatewar, SRF relieved on 30.03.2019.

### Transfer

- Sh. Yogesh Kadian, Administrative Officer transferred to IASRI, New Delhi from ICAR-Central Citrus Research Institute, Nagpur on 11<sup>th</sup> January, 2019.

### FEEDBACK

Oblongation of Nagpur mandarin fruit is a physiological disorder and such affected fruit is called “Wai-Var” fruit which actually means “worthless or useless or wasteful” in Marathi language because fruit loses its appearance due to oblong shape, taste (reduced TSS, TSS: acid ratio and ascorbic acid) and becomes unmarketable. This disorder is seen more in fruit of 'Ambia' (Spring blossom) crop and in certain talukas like Chandur bazar and Achalpur/Paratwada to large extent (up to 60% fruit affected in an orchard) and Warud and Morshi talukas to lesser extent (20%) in Amravati district. There are very few reports or complains of growers from other districts of Vidarbha in Maharashtra or Madhya Pradesh. Role of citrus greening (Huanglongbing) is suspected in development of this disorder but only 13.6 - 50.0% affected fruit were HLB +ve indicating there could be other causal factors also. Nagpur mandarin fruit on Galgal rootstock had tendency of oblongation as compared to Rangpur lime and Rough lemon. It was observed that excess moisture stress in soil during fruit growth phase in rainy season recorded higher abscisic acid (ABA) content and oblongation in fruit. Excess soil moisture (50-55%) and higher RH resulted in significantly high fruit oblongation.

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