ASIAN CITRUS CONGRESS 2023 NAGPUR, INDIA

Asian Citrus Congress - 2023

Advancing Citriculture for Agro-economic Prosperity

Organized by

28-30 October, 2023
Nagpur, Maharashtra, India

Indian Society of Citriculture
Nagpur, Maharashtra, India

In Association with

ICAR - Central Citrus Research Institute
Nagpur, Maharashtra, India

Asia-Pacific Association of Agricultural Research Institutions
Bangkok, Thailand

Korean Society for Citrus and Subtropical Climate Fruits
Jeju City, Republic of Korea

Proceedings

https://accindia2023.iscindia.org.in

Background

Citrus plants, one of the world's most important fruit crops grown in more than 150 countries, are regarded native to subtropical and tropical parts of Asia, Island southeast Asia, near Oceania and northeast Australia, inhabiting the planet earth well before the birth of human civilization. The history of citrus in Asia, one of the top three fruits in the continent, is highly fascinating and offers many opportunities for learning for citrus scholars. A genomic, phylogenic, and biogeographical analysis has established the southeast foothills of the Himalayas, which extend from eastern Assam, northern Myanmar, and western Yunnan, as the centre of origin for the genus Citrus, branching from a shared ancestor with the trifoliate orange Poncirus trifoliata. According to FAO, the production of various citrus fruits in Asian continent during 2021 was 83.59 million tones from a cultivated area of 5.42 million hectares, sharing 52% area and 53% production of citrus in the world. During last decade (2012 to 2021), the area and production of citrus in Asian countries has been increased 25.5% and 42.5%, respectively.

India, known for genetic diversity of citrus covering 27 native species, is third major producers of citrus in the world, contributing 10.76% area under citrus and 8.84% citrus production in the world. Among various citrus fruits grown in India, mandarins share the maximum area and production (both 42%), followed by lemons and limes (31% and 26%, respectively), sweet orange (19% and 27%, respectively) and other citrus fruits (8% and 5%, respectively) in 2022. Nagpur mandarin is the most famous cultivar in mandarin group in India. This cultivar is mainly cultivated in the Vidarbha region of Maharashtra state, where the ACC-2023 is being organized.

Given this wealth of citrus diversity, the ACC-2023 has been organized to reframe the priorities of Asian citrus industry and put forward a roadmap to combat the growing problems of citrus industry of Asia. The event brought together scientists, researchers, academicians, students, processors, exporters, citripreneurs, industry experts, and policymakers to discuss and exchange information on the latest developments in citriculture and to explore possible solutions to address the multipronged challenges faced by the citrus industry. It is an important event that provided a platform for knowledge exchange, addressing challenges, networking and promoting the citrus industry in Asia. ACC-2023 has given an opportunity to the researchers and industry

experts to share their knowledge and expertise in the field of citrus improvement, production, protection, processing, and marketing. Participants could learn about the latest research findings on new technologies, innovative products, services and best practices which can lead to new research alliances, business opportunities and innovation. Overall, the ACC-2023 intented to promote the citrus industry in Asia by showcasing the latest developments, innovations and successes in the field of citriculture. This can help to shape the future of the citrus industry in Asia, attract investment, stimulate economic growth and support farmers and businesses. We also believe that by bringing together the best and brightest in the Asian citrus industry, we can unleash the full potential of this vital sector and drive growth, sustainability and prosperity across Asia.

Indian Society of Citriculture (ISC) was established on 24th August, 1983 in New Delhi (Registration No. S/13760 of 1983). The broader aim and objectives of the Society is to advance the cause of Citriculture, encourage and promote citrus research, disseminate the knowledge and facilitate closer association among the stakeholders. The Headquarter of the Society was shifted from IARI, New Delhi to ICAR- Central Citrus Research Institute, Nagpur, Maharashtra (Formerly known as National Research Centre for Citrus) in November 1997 to boost its activities and pursue the objectives more effectively, being placed in hub of citrus industry.

Since its inception, the ISC brings together researchers, academics, citrus growers, industry experts and policymakers from across India and works closely with the government and other stakeholders to address the challenges faced by the industry. Society also aims to disseminate information on the latest research, technology and best practices in citriculture and to encourage the exchange of ideas and experiences among its members. Overall, the ISC plays a crucial role in advancing the citrus industry in India and ensuring its long-term sustainability and profitability. Its efforts are helping to promote citrus cultivation as a significant contributor to India's horticultural sector and to the country's economy as a whole.

ISC has organized several National and International seminars, workshops and conferences on various aspects of citrus cultivation, such as production, protection, processing and marketing. Few landmark events organized by the society are National Symposium on Citriculture (17-19 Nov., 1997) , International Symposium on

Citriculture (23-17 Nov., 1999), National Symposium on Citriculture: A Road Map (22-24 Feb., 2006); National Symposium on Citriculture: Emerging Trends (24-26 July, 2008), National Seminar on Citrus Biodiversity for Livelihood and Nutritional Security (4-5 Oct., 2010), National Dialogue on Citrus Improvement, Production and Utilization (27-29 Feb., 2012), National Citrus Meet (12-13 Aug., 2013) and National Symposium on Citrus industry of India: Way forward (27-29 Nov., 2015). More details are available on ISC website (https://iscindia.org.in).

The ISC has organized this mega event in association withICAR-Central Citrus Research Institute, India (ICAR-CCRI); Asia-Pacific Association of Agricultural Research Institutions, Bangkok, Thailand (APAARI) and Korean Korean Society for Citrus and Subtropical Climate Fruits, Jeju City, South Korea (KSCSCF).

Theme of ACC-2023

"Advancing Citriculture for Agro-economic Prosperity"

Citrus is a major horticultural commodity in many Asian countries, providing a significant source of income and employment for farmers, processors, traders, and other actors in the value chain. To further unleash the potential of this industry, it is essential to connect innovators from different fields and expertise towards a common goal of advancing the sector. This can be achieved through our initiatives Asian Citrus Congress 2023, which provides a platform for researchers, extension personnel, policymakers, citripreneurs, and industry experts to share their ideas, innovations, and experiences. By promoting innovation, exchanging knowledge, and collaboration among stakeholders, the Asian Citrus Congress aims to act as a catalyst in enhancing the productivity, quality, and sustainability of citrus production and trade in Asia, as well as in capturing the growing demand for citrus products in domestic and international markets. The congress will also highlight the importance of addressing the social, environmental, and economic challenges facing the citrus industry. The overarching theme of the ACC-2023 is to broaden the citrus industry in Asia in order to achieve inclusive and equitable development in citrus growing areas, support food and nutritional security, and contribute to the overall economic growth, sustainability, and prosperity of all involved in the Asian citrus industry.

Logo of ACC-2023

The near-round graphic on the left symbolizes citrus biodiversity in terms of size, shape and color; while Asian continent is represented by the white map at the centre. The typography represents the event title. The citrus fruit with green leaves at the upper right side of the logo reflects the freshness of the citrus industry and the power of mother nature. Overall, the logo uses a minimalistic approach to underline that the Asian Citrus Congress 2023 is an international event, while also suggesting a brighter future with its use of warm and vibrant citrus hues.

Thematic Areas

The deliberations and discussions were made under the following thematic areas.

Theme 1: Recent Trends in Improvement, Genetic Diversity, Conservation and Utilization in Citrus

Theme 2: Advances in Citrus Production Technology, Smart Citriculture and Application of Cutting-edge Technologies

Theme 3: Current Approaches in Citrus Health Management, Insect-Pest & Disease Surveillance and Diagnostic Tools

Theme 4: Innovations in Post-harvest Management, Valorization and Bioprospecting of Citrus

Theme 5: Latest Developments in Technology Outreach, Citriprineurship, Trade & Export, Value Chain, Group Dynamics and Policy Formulation in Citrus Sector

CITRI Summit

The citrus industry is one of the most important horticultural sectors in many countries around the world. However, like any other industry, it faces a range of challenges and opportunities that require creative and strategic solutions to drive growth and success. To address these issues, a special session "CITRI Summit" was organized as an integral part of ACC-2023 to bring together industry professionals, processors, exporter, startups, researchers, policymakers, and other stakeholders to share ideas, strategies and business models for transforming the citrus industry. By sharing knowledge, resources, and ideas, the experts suggested new solutions to address the challenges facing the citrus industry.

Proceedings

A. Special Plenary Session

Chairman : **Dr. Michael E. Rogers**, CREC, Florida, USA

Co-Chairman : **Dr. V. B. Patel**, ICAR, New Delhi, India

Convenor : **Dr. A. K. Sharma**, IIT-Roorkee, India

Rapporteurs : **Dr. Ali Ozcan**, KaramanogluMehmetbey University, Turkey

Dr. S. Priya Devi, ICAR-IIHR, Bangalore, India

Plenary Lectures :

1. Evolution of Citrus Improvement in the 21st Century: From Conventional Breeding to Genome Editing

   Dr. Manjul Dutt, CREC, Florida, USA

2. A Comprehensive Strategy for Fast Breeding in Citrus

   Dr. Kwan Jeong SONG, Jeju National University, Republic of Korea

3. Citrus Huanglongbing Research in Florida: Past, Present and Future Prospects

   Dr. Michael E. Rogers, CREC, Florida, USA

4. Nanotechnology for managing important citrus diseases

   Dr. Swadeshmukul Santra, University of Central Florida, USA

5. Potential management strategies to combat HLB disease of citrus plants

   Dr. Ashwani Kumar Sharma, IIT-Roorkee, India

6. Navigating the Citrus Landscape in India: Growth Avenues, Potential Roadblocks and Action Points

   Dr. Dilip Ghosh, ICAR-CCRI, Nagpur, India

Recommendations

1. An online platform (global database) should be created for real time exchange of research information while protecting the IP. For this, the organizations/institutions working on citrus should be identified and an official network at ministry level of respective countries should be established. The reports and recommendations of seminars/conferences/ workshops on citrus in different countries should be made available to all citrus related organizations/institutions.
2. Citriculture research should be made more international. For example, a product for disease management developed in one country should be made available to other citrus growing countries.

3. Use of genome editing tools such as CRISPR/Cas should be intensified as it holds a great promise in developing target specific varieties in citrus breeding programmes.
4. Consistent macro- and micro- nutrient availability throughout active growth periods and optimized water uptake by HLB diseased trees should be ensured for managing the better tree health and yield.
5. Injection of antimicrobial products such as Oxytetracycline to HLB diseased trees demonstrated improved tree health and yield, though phytotoxicity concerns require continued work.
6. Research and development of nanotechnology-enabled alternatives such as nano-Zn, Nano-Mg, and Nano-metal-nonmetal hybrids should be emphasized. This approach aims to improve the efficiency of copper use while mitigating environmental impact and reducing the risk of resistance development.
7. Strategies such as development of effective potential inhibitor molecules, use of plant defensive proteins and developing transgenic varieties expressing antimicrobial proteins should pave the way in the management of HLB in citrus.

B. Technical Session 1 – Recent Trends in Improvement, Genetic Diversity, Conservation and Utilization in Citrus

Chairman	:	**Dr. Manjul Dutt**, CREC, Florida, USA
Co-Chairman	:	**Dr. Harsh Chauhan**, IIT-Roorkee, India
		Dr. A. K. Dubey, ICAR-CSRRI RRS, Lucknow, India
Convenor	:	**Dr. S. K. Malik**, ICAR-NPBGR, New Delhi, India
Rapporteurs	:	**Dr. Bal Krishna**
		Dr. Gurupkar Singh Sidhu
Keynote Lecture	:	Towards development of multi-stress resilient Citrus
		Harsh Chauhan
Lead Lecture	:	Aspirations in new commercial citrus cultivars for Indian Context: Opportunities
		Ashutosh A. Murkute

Invited Lectures : 1. Breeding of Citrus for Nutraceutical Properties and Environmental Stress Tolerance: Challenges and Prospects

A. K. Dubey

2. Trifoliate orange- a buffer gene source for citrus improvement

R. M. Sharma

3. Management Strategy for Citrus Genetic Resources in India: Accomplishments and Challenges

S. K. Malik

4. Three decades of need based Citrus improvement works at Tissue Culture laboratory of CCRI (ICAR), Nagpur

N. Vijayakumari

5. Diversity of Citrus in North Eastern Region of India

B. N. Hazarika

Oral Presentations : 17

Poster Presentations : 15

Recommendations

1. Further development of biotechnological approaches, including gene editing and transgenic citrus lines is necessary to create disease-resistant varieties. Prioritize the evaluation and potential release of promising mandarin transgenic lines expressing proteins like Arabidopsis NPR1, which have demonstrated robust tolerance to HLB in field conditions.
2. To expedite the breeding cycle, Marker Assisted Selection (MAS) and single-stem training for seedlings grafted on dwarfing rootstock should be employed. Subsequently, genomic and transcriptomic techniques should be leveraged after the successful application of MAS on hybrid populations to create DNA markers associated with phenotypic traits.
3. More land resources should be devoted for screening citrus accessions for tolerance to biotic and abiotic stresses.
4. A National Citrus Breeding Program and regional germplasm repositories should be established to enhance long-term citrus improvement through collaborative efforts and optimized utilization of genetic resources.
5. Mini workshops should be organized involving all citrus breeders across the globe.

C. Technical Session 2 – Advances in Citrus Production Technology, Smart Citriculture and Application of Cutting-edge Technologies

Chairman : **Dr. Tripti Vashist**, CREC, Florida, USA

Co-Chairman : **Dr. Prakash Patil**, ICAR-IIHR, Bengaluru, India

Dr. S. Hazarika, ICAR-RC-NEHR, Umiam, India

Convenor : **Dr. D. M. Panchbhai**, Dr.PDKV, Akola, India

Rapporteurs : **Dr. Benukar Biswas**

Plenary Lecture : Good horticultural practices are critical for maintaining productivity of HLB-affected sweet orange trees

Dr. Tripti Vashist

Lead Lecture : Doubling the Farmers Income through Indo-Israel Citrus Production Technology

D. M. Panchbhai*, R. P.Gajbhiye, Y. R. Khobragade, S. S. Moon, V. U. Raut and S. A. Badge*

Invited Lectures :

1. Efficient use of potassium through balanced fertilization for sustaining productivity and quality of Nagpur Mandarin on swell- shrink soils of Central India

   P. R. Kadu*, B. A. Sonune, N. M. Konde, S. M. Jadhao, S.D.Jadhao and V. K. Kharche*

2. Optimizing Citrus Farming: Tailored Nutrient and Water Management Strategies in India

   Prakash Patil

3. An Appraisal: Intercropping of Vegetable in Citrus Orchards

   K. D. Ameta*, Monu Kumari, K. K.Sharma and Piyusha Sharma*

4. Citrus based agroforestry offers ecosystem servicesincluding arsenic-phytoremediation in contaminated rice field in Bengal basin

   Benukar Biswas*, Udayan Rudra Bhowmick, Mousumi Mondal, Saju Adhikary and Kiranmay Patra*

5. Deciphering the wild citrus seed microbiome of India

   Dwipendra Thakuria, *Sarma PVSRN, Danteswari Chalasani, Sakshi Sinha and Appa Rao Podile*

6. Deployment of Internet of Things for Citrus Plant Grafting and Real-Time Internal Microclimate Regulation of the Storage House

   Ritu Raj Lamsal*, Umesh Acharya and Pablo Otero*

7. Status of Citrus rootstocks in Asia

   R. K. Sonkar *and Esmaeil Fallahi*

Oral Presentations	**:**	15
Poster Presentations	**:**	12

Recommendations

1. A worldwide survey should be undertaken to identify and document innovative orchard management practices and their effect on production efficiency.
2. Climate action in citriculture in addition to vulnerability studiesis the need of the hour. Research should be undertaken to assess the carbon & water footprint and ecosystem services of different citrus plantations at various locations along with impact of weather variables on citrus and development of forecasting models through collaborative approach.
3. The research and development of advanced sensor-based irrigation and fertigation schedule in citrus production should be emphasized. This approach aims to improve the real time monitoring of environmental factors, soil moisture and plant growth. It leads to more effective resource management, thus improving the yield and quality.
4. The research on precision nutrient management strategies including micronutrient management should be intensified for effective management of Citrus greening affected orchards. This approach promotes tree health and alsocontributes to the long-term sustainability of citrus production in greening affected orchards.
5. The efficient and cost-effective mechanization system for citrus tree pruning, spraying and harvesting should be promoted. These innovations improve the orchard performance, reduce the input costs, time labour dependency, thereby, improves the yield and quality of fruits.
6. High density (6m x 3m) planting of disease-free planting material on raised bed and drip fertigation should be adopted to enhance the productivity and profitability of Nagpur Mandarin in Vidarbha region of Central India.
7. Citrus based agroforestry system shouldbe recommended for ecosystem services.
8. Pneumatic based plucking system should be popularized for a partial-automated fruit picking in citrus.

D. Technical Session 3 – Current Approaches in Citrus Health Management, Insect-Pest & Disease Surveillance and Diagnostic Tools

Technical Session 3A

Chairman : **Dr. Swadeshmukul Santra**, University of Central Florida, USA

Co-Chairman : **Dr. Franklin Behlau**, Fundecitrus, Brazil

Dr. M. Krishna Reddy, Asian Development Bank, India

Convenor : **Dr. V. K. Baranwal**, ICAR-IARI, New Delhi, India

Rapporteurs : **Dr. Susheel Kumar Sharma**

Dr. Ashish Warghane

Plenary Lecture : The effects of new tools for citrus (Citrus spp.) plantings on citrus diseases in a multi-year comparison

***Megan M. Dewdney**, Angela Chuang, Tracey N. Hobbs, Etelvina Aguilar, and Lauren M. Diepenbrock*

(Lecture was delivered by Dr. Michael E. Rogers, CREC, Florida, USA)

Keynote Lectures :

1. Citrus huanglongbing: strategies to develop disease resistant varieties through breeding

   Chandrika Ramadugu

2. An overview of the Turkish citrus industry and existing challenges

   Ali Ozcan

Lead Lectures :

1. Citrus Clean Plant Programme: a way forward

   ***M. Krishna Reddy** and Sunae Kim*

2. Characterization and Detection of Emerging Viruses in Citrus using Modern Tools

   Virendra K. Baranwal

Invited Lectures :

1. Investigation of the presence of citrus tristeza virus and in- vitro sanitation trials of local citrus cultivars in Chlef valley (Algeria)

   ***Meziane Malika**, Ali-Arous Samir, Hamdani F/Z*

2. The Citrus-Phytoplasma pathosystem: The state-of-the-art

   ***Mehdi Azadvar** and Akbar Hosseinipour*

3. A review of citrus greening disease in the coastal region of Kenya

   Henry Wambua

4. Huanglongbing (HLB): The Citrus Disease of Greatest Devastation – Obstacles and Approaches for Control

   Sheo Shankar Pandey

5. Biodiversity and Eco-friendly management of Insect, Mite and Snail Pests of Citrus in India

   Sandeep Singh,*Rajwinder Kaur Sandhu, P. Venkata Rami Reddy, Poonam Srivastava, D. Srinivasa Reddy, Anamika Kar, R.V. Kadu, Suganya Vijayakumar and Prakash Patil*

Oral Presentation : 7

Technical Session 3B

Chairman : **Dr. Chandrika Ramadugu,** University of California, USA

Co-Chairman : **Dr. Dong Soon Kim,** Jeju National University, Republic of Korea

Dr. S. S. Pandey, IASST, Guwahati, India

Convenor : **Alvin Kah-Wei Hee**, Universiti Putra Malaysia, Malaysia

Rapporteurs : **Dr. Lourdes Pérez Cordero**

Dr. Mehdi Azadehvar

Plenary Lecture : Past and present of pest management in Jeju citrus, and threatening pests in the future

Dong-Soon Kim

Keynote Lecture : Battling against citrus canker and huanglongbing in the São Paulo citrus belt, Brazil

Franklin Behlau *and Renato B. Bassanezi*

Invited Lectures :

1. Semiochemical control of tephritid fruit fly pests in citrus cultivation

   Alvin Kah-Wei Hee

2. Multi-year comparison of new tools to support establishment of young groves

   L. Pérez Cordero*, A. Chuang, M. Dewdney, C. Vincent, D. Kadyampakeni, and L. Diepenbrock*

3. Emerging Fungicides to Promulgate Horticultural Crops: Spotlight Citrus

   Sujoy Saha *and Ratna U. Thosar*

4. Advancing India's Citrus Industry: A Multifaceted Approach to Address *Phytophthora* Challenges

   R. M. Gade, *Mrunalini R. Badnakhe and R. J. Choudhari, Panjabrao Deshmukh*

5. Characterization of *Candidatus*Liberibacter asiaticus and development of simplified method for its rapid detection using recombinase polymerase amplification assay

Susheel Kumar Sharma, *Nitika Gupta, Damini Diksha, Baby Wangkhem, S. S. Roy, A. RatankumarSingh and V. K. Baranwal*

6. Ten years of research on citrus decline disease in Iran: etiology and sustainable management

   Najafiniya M. *and Azadvar M.*

7. Citrus diseases caused by oomycete, fungal and bacterial pathogens in India: diversity, diagnostics and combat strategies

   A. K. Das

8. *Trichoderma* spp. in citrus health management, their commercialization for sustainable citriculture and rural prosperity

   R. N. Pandey

Oral Presentations : 8

Technical Session 3A and 3B

Poster Presentation : 18

Recommendations

1. Identification of quantitative trait loci associated with HLB resistance trait will greatly facilitate the selection of promising hybrids in breeding programme aimed at developing disease resistance in citrus.
2. Incorporation of various resistance genes through breeding programmes, along with gene editing tools, CRISPR/Cas technologies, holds great promise in developing virus resistant plants.
3. New generation fungicides with novel modes of action should be introduced and utilized to manage resistance to the existing fungicides and to provide more effective options for control of devastating diseases in citrus is necessary.
4. The use of semiochemicals coupled with insecticides of low mammalian toxicity offers effective tools for the surveillance, detection, delimiting and management of tephritid fruit fly populations in citrus.
5. The potential biological control agents need to be multiplied in large numbers for their field evaluation and should be incorporated in integrated pest management (IPM) programmes of pests of citrus.

6. Establishment of Clean Plant Centres(CPC) and certification programmes will aid in the production of disease-free planting material which will eventually benefit the citrus sector towards enhanced productivity and sustainability in the near future.

E. Technical Session 4 – Innovations in Post-harvest Management, Valorization and Bioprospecting of Citrus

Chairman	:	**Dr. Bhimanagouda S Patil,** Texas A & M University, USA
Co-Chairman	:	**Dr. M. S. Ladaniya,** Jain Irrigation Systems Ltd., India
Convenor	:	**Dr. Sunil Pareekh,** NIFTEM, India
Rapporteurs	:	**Dr. Ranjit Pal** **Dr. Gurteg Singh** **Dr. P. K. Nimbolkar**
Plenary Lecture	:	Beyond Vitamin C: A Deep Dive into the Health-promoting Components of Citrus Fruits ***Bhimanagouda S Patil*** *,Vikas Dadwal andKotamballi N. Chidambara Murthy*
Keynote Lecture	:	Advances in Handling and Marketing of Fresh Citrus Fruits ***M. S. Ladaniya***
Lead Lectures	:	1. Citrus fruits: A treasure trove of Phytochemicals and Antioxidants for Nutritional security ***Dinesh Kumar,*** *Manju Gurjar, Sachin Mendke, Sunil Kumar and Dilip Ghosh* 2. Strategies to mitigate chilling injury in citrus fruits ***Sunil Pareek***
Oral Presentations	:	8
Poster Presentations	:	11

Recommendations

1. Citrus fruits contain much health promoting bioactive compounds like flavonoids, limonoids, pectin, vitamins and carotenoids. These compounds have medicinal properties and clinical research has indicated that these compounds have anti-cancer activity and are useful to prevent heart diseases. Therefore, more research should be undertaken on bioprospecting of citrus to increase theconsumption of fresh citrus like oranges, grapefruit, etc.
2. Dropped oranges, mandarin and grapefruit can be collected and sold to the industries which are engaged in production of flavonoids, limonoids and other bioactive compounds for pharmaceutical purposes.

3. Processed products like peel powder, blended juices of mandarin and sweet orange need to be fine-tuned and up scaled into pilot project to utilize small sized and matured dropped fruit.
4. To reduce the post-harvest losses and chilling injuries in citrus fruits, eco-friendly, non-hazardous alternative treatments using relatively safe chemicals, edible coatings and microbial antagonists should be developed, especially for export.
5. Solar powered portable citrus fruits sorting machine should be popularized among the small farmers at farm levels.
6. FPOs/FPCs or growers' associations should be promoted to increase the efficiency of the citrus value chain and ensure better returns to the growers.

F. Technical Session 5 – Latest Developments in Technology Outreach, Citriprineurship, Trade & Export, Value Chain, Group Dynamics and Policy Formulation in Citrus Sector

Chairman	:	**Dr. Umesh Kumar Acharya,** NCRP,Nepal
Co-Chairman	:	**Dr Nguyen Van Hoa,** SOFRI, Vietnam
Convenor	:	**Dr. Shiv Datt,** New Delhi, India
Rapporteurs	:	**Dr. Karunakaran G.** **Dr. K. R. Rajadurai**
Lead Lectures	:	1. *Citriculture in Nepal—Status, Prospectus, Constraints and Strategies* ***Umesh Kumar Acharya**, Mohan Bahadur hapa and Debraj Adhikari* 2. *Reinforcing the Citrus Sector in North-eastern Region of India – Prospects, Challenges and Strategies* ***S. Hazarika**, H. Rymbai, Tasvina R. Borah and Subhra Saikat Roy*
Invited Lectures	:	1. Agri-preneurship Development in India: 'The ICAR's Perspectives' ***Shiv Datt**, Vikram Singh and Neeru Bhooshan* 2. Uplifting the Citrus Sector in Southern Region of India – Opportunities, Constraints and Roadmap ***Karunakaran G**, Ravishankar H, Sakthivel T, Raghupathi H.B, Tripathi P. C, Samuel D.K, Thirugnanavel A,Kavino M and Ruchitha T.* 3. Elevating the Citrus Sector in North-western Region of India – Needs and Focus ***Krishan Kumar**, Subhash Chander, Parshotam Kumar Arora and H. S.Rattanpal*
Oral Presentations	:	7

Recommendations

1. Multidisciplinary, output/action oriented, collaborative research is needed on field level problems of citrus growers of Asian countries.
2. Research institutes and extension system of the countries should work hand in hand for effective and efficient transfer of technology. Research institutes can play the role as knowledge hub.
3. Emphasis should be given technology backstopping to the entrepreneurs / startups in citrus industry.
4. Artificial Intelligence (AI) based support system should be developed to increase the productivity, trade, and export of citrus.
5. The gender dynamics in citrus industry should be explored and women citripreneurs should be promoted.
6. Consumer preference and nutrition related research should be emphasized to develop citrus-based value added products and functional foods in alignment with demographic needs and preferences.

Citri Summit 1.0

Theme-1

Clean Planting Materials of Improved Citrus Varieties

Convenor

Dr. A. A. Murkute
MGIRI, Wardha, India

Panelists

Dr. Chandrika Ramadugu
UC, USA

Dr. Manjul Dutt
CREC, USA

Dr. M. Krishna Reddy
ADB, India

Dr. Anil Dhake
Jain Irrigation Systems Ltd., India

Shri Sachin Walunj
Sahyadri Farm, India

Shri Pravin Chawda
CB Nursery, India

Rapporteurs

Dr. N. A. Deshmukh
ICAR-NRCG, India

Dr. Kishan Kumar
PAU, India

Theme-2

Innovative Technologies and Inputs for Sustainable Citrus Production

Convenor

Dr. R. A. Marathe
ICAR-NRCP, Solapur, India

Panelists

Dr. Tripti Vashisth
UF/IFAS CREC, USA

Dr. Franklin Behlau
Fundecitrus, Brazil

Dr. D. Thakuria
CAU, India

Dr. R. N. Pandey
AAU, India

Dr. Ajit Tomar
DhanukaAgritech Ltd., India

Shri Prasad Parekh
Indofil Industries Ltd., India

Rapporteurs

Dr. L. Mukunda Laxmi
Dr.YSRHU-CRS, India

Dr. Yogesh Ingle
Dr. PDKV, India

Theme-3

Processing, Bioprospecting and Export of Citrus Fruits

Convenor

Dr. Dinesh Kumar
ICAR-IARI, New Delhi, India

Panelists

Dr.Bhimanagouda Patil
Texas A&M University, USA

Dr. M.S. Ladaniya
Jain Irrigation Systems Ltd., India

Dr. Mahavishnan Karuppan
ITC, India

Shri Sachin Walunj
Sahyadri Farm, India

Rapporteurs

Dr. P. K. Nimbolkar
CAU-CoHF, India

Dr. Darshan M. Kadam,
ICAR-IISWC, India

Post-ACC Field Trip: On 30 October 2023, a field trip was organized for the participants to Green ValleyCitrus Farms, where they experienced first-hand how the industry operates in the region.

Inaugural and Valedictory Programme

Inaugural Function

ICAR Geet	
Lighting of Auspicious Lamp	
Invocation Song	
Welcome and Felicitation of Dignitaries	
Welcome Address	**Dr. Dilip Ghosh** *Convenor, ACC-2023; President, ISC & Director, ICAR-CCRI*
Address by Guest of Honour	**Dr. C. D. Mayee** *Former Chairman, ASRB, New Delhi*
Release of Publications	
Address by Guest of Honour	**Dr. T. R. Sharma** *Deputy Director General (Crop Sci. & Hort. Sci.), ICAR, New Delhi*
Felicitation of ISC Fellows	
Address by President	**Dr. Himanshu Pathak** *Secretary, DARE and Director General, ICAR, New Delhi*
Felicitation of Honorary Fellows	
Address by Chief Guest	**Shri Nitin Gadkari-Ji** *Hon'ble Minister for Road Transport and Highways Government of India*
Vote of Thanks	**Dr. S. S. Roy** *Organizing Secretary, ACC-2023*
National Anthem	

Valedictory Function

Welcome and Felicitation of Dignitaries	
Welcome Address	**Dr. Dilip Ghosh** *Convenor, ACC-2023; President, ISC & Director, ICAR-CCRI*
Address by Guest of Honour	**Dr. K. P. Mote** *Director (Horticulture), Government of Maharashtra*
Feedback from Delegates	
Recognition of Sponsors	
Address by Guest of Honour	**Sh. Sandeep Kadam, IAS** *Director (Horticulture), Government of Himachal Pradesh*
Rapporteurs' Report	
Address by President	**Dr. R. A. Marathe** *Director, NRC on Pomegranate, Solapur*
Best Presentation Award Ceremony	
Address by Chief Guest	**Dr. Sharad R. Gadakh** *Hon'ble Vice Chancellor, Dr. PDKV, Akola*
Vote of Thanks	**Dr. S. S. Roy** *Organizing Secretary, ACC-2023*
National Anthem	

NOTES

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