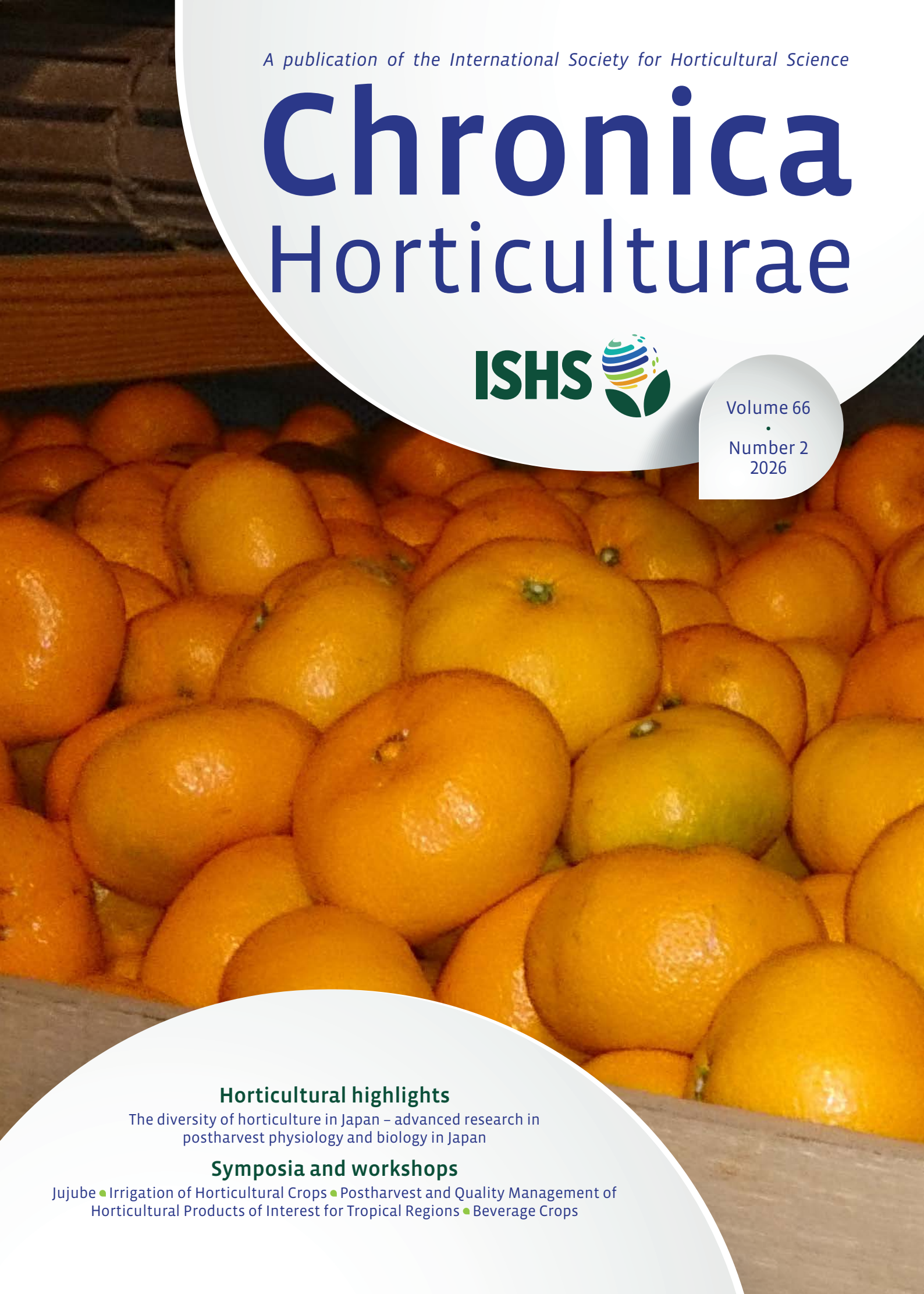
A publication of the International Society for Horticultural Science

Chronica Horticulturae

Volume 66
•
Number 2
2026



Horticultural highlights

The diversity of horticulture in Japan – advanced research in postharvest physiology and biology in Japan

Symposia and workshops

Jujube • Irrigation of Horticultural Crops • Postharvest and Quality Management of Horticultural Products of Interest for Tropical Regions • Beverage Crops

Chronica Horticulturae

A publication of the International Society for Horticultural Science, a society of individuals, organizations, and government agencies devoted to horticultural research, education, industry, and human well-being.

Chronica Horticulturae© Volume 66 – Number 2; June 2026; ISSN 2506-9772 (electronic).
Published quarterly by the International Society for Horticultural Science, Leuven, Belgium. Lay-out by Drukkerij Graphius, Gent, Belgium.

Editorial office and contact address:
ISHS Secretariat, PO Box 500, B-3001 Leuven 1, Belgium. Phone: (+32)16229427, E-mail: **info@ishs.org**, Web: **www.ishs.org** or **www.actahort.org**

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Acta Horticulturae
Acta Horticulturae is the series of proceedings of ISHS Scientific Meetings, Symposia or Congresses (ISSN 2406-6168 electronic). ISHS Members are entitled to a substantial discount on the price of *Acta Horticulturae*. A complete and accurate record of the entire *Acta Horticulturae* collection, including all abstracts and full text articles, is available online at **www.actahort.org**. ISHS Individual Membership includes credits to download 20 full text *Acta Horticulturae* articles. All *Acta Horticulturae* titles are available in the electronic e-*Acta Horticulturae* online format.

eJHS
eJHS (*European Journal of Horticultural Science*) is the official journal of the International Society for Horticultural Science. eJHS is an open access journal publishing significant plant science discoveries and new or modified methodologies and technologies with a broad international and cross-disciplinary interest in the scope of global horticulture. The journal scope covers both applied and fundamental aspects of the entire food value chain, including breeding, production, processing, trading and retailing of horticultural crops and commodities grown in temperate, Mediterranean, tropical and subtropical climates. Additional information can be found at **www.ishs.org/ejhs**

Scripta Horticulturae
Scripta Horticulturae is a series from ISHS devoted to specific horticultural issues such as position papers, crop or technology monographs and special workshops or conferences.

Contents

Cover photograph: Pre-storage conditioning (*yoso*) of Satsuma mandarins aimed at establishing a New Year shipping system in Yamaguchi Prefecture. This is a critical process designed to enhance storability by reducing peel moisture, thereby suppressing decay and rind puffing. The image illustrates management practices intended to stabilize fruit quality through natural ventilation on wooden shelving units. See article p.13.

› From the cockpit

Peter J. Batt, Editor, *Chronica Horticulturae*

› Peter J. Batt

IHC2026, our premier event, is now only a matter of weeks away. In this, our last edition before we all gather in Kyoto, we present the final paper from Team Japan which explores the impact of postharvest practices on quality. As many of the earlier articles on the diversity of horticulture in Japan have demonstrated, the quality standards Japanese consumers have come to expect are among the highest in the world. Not only must fresh produce look good and be free of blemishes, but it must also meet consumers' expectations for taste, texture and aroma. To satisfy these exacting standards for quality, postharvest research in Japan has focused on the precise control and preservation of quality from paddock to plate. In this article, Tateishi and colleagues dive into the fundamental biological and molecular breakthroughs that have been led by Japanese researchers. They describe some of the most recent advancements across three primary domains: vegetables, floricultural crops and tree fruits, highlighting new dimensions in ethylene physiology and senescence, and introducing innovative approaches in floriculture, including the implementation of deep-learning AI systems to objectively evaluate flower longevity. They also explore recent advances in packaging and transportation to minimize the losses inflicted by microbial infection, physical damage and senescence.

Among our Young Minds Award winners, Claudio Ponce looks at the impact of endogenous ethylene on fruit ripening in blueberries. Mahlatse Morena explores the antifungal activity and chemical composition of essential oils derived from *Eriocephalus* spp. to enhance the shelf life of tomatoes. With agriculture utilising more than 70% of the world's freshwater, Emanuele Dichio explores the development and field validation of an integrated feed forward and feedback irrigation decision support system for viticulture, while Harsimran Singh explores water relations in different rootstock-scion combinations in intensive pome and stone fruit orchards. Raesibe Kgaphola compares the ability of remote sensing using Landsat 8 images with ground-based measures to evaluate the leaf area index of pomegranate, while Priscilla Livhuwane Mukwevho looks at the development of a symbiotic product derived from *Opuntia* spp. for the management of gut health problems.

IHC2026 not only provides an opportunity for horticultural scientists from all around the world to share their research results and to exchange ideas, but it's also a time of transition for the Society. Elections recently took place for the Division Chairs and, with the meeting of the Council, the election of the President and Board members. In this edition, the current President and Board provide you with a brief report of our activities over the past two years. The most obvious outcomes have been the development of a new logo, a new website and the new monthly online newsletter. Other significant accomplishments include our partnership with CABI to publish our journal eJHS, the establishment of the Young Minds Committee, the launch of two new membership categories, two new corporate members, and our renewed partnership with FAO. However, behind the scenes, there is still much to do as we seek to improve our financial position and to enhance the range of services available to our members.

› Biennial report to members, June 2024 – June 2026

François Laurens, President

The past two years have been a period of intense activity and remarkable progress for our Society. The ISHS Board has met on multiple occasions, both online (once a month) and in person at key events such as the V European Horticultural Congress in Bucharest, Romania (2024), the African Food Systems Forum in Dakar, Senegal (2025), and most recently at UC Davis, USA (2026). I would like to extend my deepest gratitude to the ISHS Board for its exceptional dynamism and to the Secretariat for its outstanding professionalism.

During this period, we have continued to advance the priorities identified at the beginning of our term: to strengthen our scientific impact; enhance our publications; expand our membership; professionalize our communication; and consolidate the budget. Our overarching goal has been to revitalize and rejuvenate ISHS by opening it up to young minds and increasing its visibility through stronger engagement with the corporate sector. With only a few months remaining in our term, the Board is proud to present this report, outlining our key achievements, on-going initiatives, and our vision for the future.

Science is the cornerstone of our Society. It is with some relief that we finally see a significant recovery in our scientific programming following the challenges of the COVID-19 pandemic. Ted DeJong, our Vice-President in charge of Scientific Programs, has restructured our Divisions and Commissions, and led a number of new event formats, including the HortForums. While it is our objective to retain both oral and poster presentations during our symposia, we want to dedicate more time and space for open discussions and debates, especially those that deal with controversial issues.

One of our most significant accomplishments has seen ISHS enter into a long-term partnership with CABI to relaunch our journal, which will soon be renamed *Journal of the International Society for Horticultural Science*. This achievement is largely the result of the tireless efforts by Yao-Chien Alex Chang, the Board member in charge of Publications, and Renato Paiva, our Editor-in-Chief. We have also begun to optimize and improve the publication and dissemination of *Acta Horticulturae*, a project that will take more time to complete.

Patricia Paiva, our Vice-President in charge of Young Minds, has played a pivotal role in launching the ISHS Young Minds Committee (YMC) in 2024. Its mission is twofold: to support the career development of young members, and to harness their energy and fresh perspectives to benefit the Society. Scott Orr, a member of the YMC, will give you more details on the current and proposed activities of this committee.

In what is a rapidly changing world, Lukas Bertschinger, our Treasurer in charge of Strategy to Strengthen Membership and Outreach, has faced the critical challenge of developing a new business model to consolidate the Society, while attracting more individual and corporate members. With the support of professional consultants, we are making progress, but it is taking much longer than anticipated. Results will become visible in the coming months.

› François Laurens

Moctar Fall, in charge of Strategic Partnerships, has reinforced our collaboration with the FAO, but there is still much work to be done in engaging with NGOs and other stakeholders.

Under the leadership of Peter Batt, Board member in charge of Communication and ESG, we have modernized the ISHS brand with a new logo, launched a new website and enhanced our social media presence. At the same time, we have been actively promoting our premier event, the IHC2026, which promises to be a resounding success under the leadership of Ryutaro Tao.

Finally, Peter Vanderborght, our Executive Director, will share his perspectives and insights on the Secretariat's activities. Once again, for and on your behalf, I sincerely thank our Secretariat for all that they have done for the Society and for their dedication.

Ted DeJong, Vice-President in charge of Scientific Programs

Over the past two years, the ISHS Board and Executive Committee (Division Chairs) have regularly discussed how ISHS might better support the participation of our Young Minds in ISHS symposia and congresses; improve and strengthen communication among Division Chairs, Working Group Chairs, symposium conveners and the ISHS Secretariat to enhance the quality of ISHS meetings; and restructure our Divisions to adjust to changes in programmatic interests.

Fortuitously, ISHS programming has largely recovered from the issues that we had to deal with during the COVID-19 pandemic. Forty-nine symposia were held between June 2024 and May 2026 and 61 *Acta Horticulturae* have been published over that same period. The recently developed ISHS HortForums have also attracted a lot of interest from both ISHS members and non-members, with 5 held prior to June 2024 and 5 more held since June 2024.

In 2025, the ISHS Board established the Jens Wünsche ISHS Young Minds Travel Fellowship Fund in recognition of the outstanding contributions the late Professor Wünsche made to promoting Young Minds within our Society. All ISHS members are encouraged to

› Ted DeJong

consider donating to this fund to help support the contribution our young members make to ISHS symposia and congresses.

At the most recent meeting of the ISHS Board and Executive Committee in 2025, it was resolved that the current Commission Agroecology and Organic Farming Systems and Division Horticulture for Development will be merged into a new Division Sustaining Horticulture in a Changing World. This new Division will also become the home for emerging topics that don't fit cleanly into existing Divisions. The work of the Commission Cultivar Registration will be accommodated by a new Working Group within Division Plant Genetic Resources, Breeding and Biotechnology.

It was also resolved that we will establish a Special Division – Young Minds. Not only does this acknowledge the increasing role that young and emerging horticulturists have within our Society, but it also provides a means for the ISHS Young Minds Committee to directly participate in the strategy and planning of the Society through the annual meetings of the Executive Committee.

In conjunction with the development of the new ISHS website, Kelly Van Dijck from the ISHS Secretariat has been working with Working Group Chairs and Division Chairs to write or review the descriptions of the more than 100 ISHS Working Groups and Divisions. All of these have been edited and posted on the new ISHS website.

Yao-Chien Alex Chang, Publications, and Renato Paiva, Editor-in-Chief, eJHS

Over the past two years, the Board has made substantial progress in improving the publication efficiency and reducing the costs of the Society's scientific journal, *European Journal of Horticultural Science* (eJHS). Similar activities are currently underway to explore alternative arrangements for the publication of our symposia proceedings *Acta Horticulturae*.

Since 2025, eJHS has undergone a major structural, operational and strategic transformation, ultimately resulting in a long-term partnership with CABI to publish eJHS. During this transition, eJHS was integrated with *Fruits: The International Journal of Tropical and Subtropical Horticulture*. To preserve indexing continuity and maintain its Impact Factor, the journal retained the eJHS title, while *Fruits* ceased publication at the end of 2024. As part of this consolidation, the journal's scope was significantly broadened to include plant breeding, production systems, postharvest processing, and the trade and retail of horticultural commodities across temperate, Mediterranean, tropical and subtropical regions.

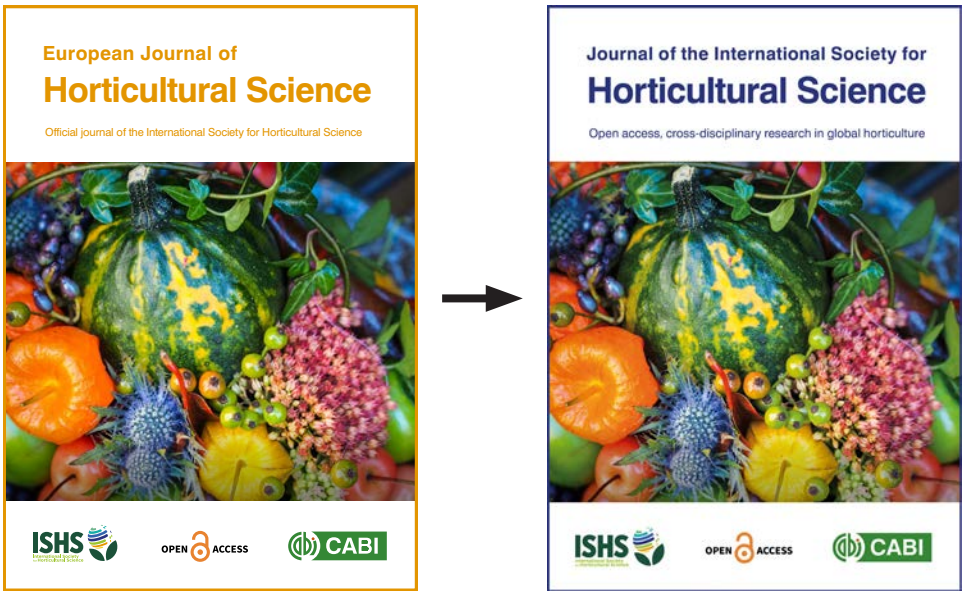
Operationally, the website for the journal was successfully transferred from ISHS to our publisher CABI, and targeted email campaigns were conducted to re-engage former authors and reviewers.

Editorial leadership has been strengthened with the appointment of Renato Paiva as Editor-in-Chief and the formation of a new Editorial Board. Under his leadership, both operational management and strategic development have progressed effectively.

In 2025, 100 manuscripts were received, of which 37 were accepted. The average time to first decision was 39 days, reflecting a much-improved peer-review process. Production timelines have also improved significantly, with the average publication time reduced to 40 days in 2025 and in the first two months of 2026, it was further shortened to 35 days. Additional initiatives including Web of Science Author Connect and increased engagement through ResearchGate resulted in over 57,000 article views on the CABI Digital Library alone, confirming the improved visibility following the migration of the journal's platform.

› Yao-Chien Alex Chang

› Renato Paiva



Looking ahead, marketing and visibility remain key priorities for 2026 and beyond. Strategic focus areas include strengthening our presence on research discovery platforms, increasing press coverage of selected articles, and preparing promotional activities for the XXXII International Horticultural Congress (IHC2026). Preparations are also underway for a journal title change to the *Journal of the International Society for Horticultural Science* (JISHS), reflecting its role as the Society's sole official scientific journal and a global platform for high-impact research. The title change is expected to take effect on 1 January 2027.

ISHS members will continue to play a vital role in strengthening the journal's reach and reputation. Members continue to receive a 25% discount on article processing charges (APCs). We warmly encourage all members to submit their latest research, contribute reviews or commentaries, read the articles and actively support their journal as it enters this exciting new phase.

Patricia Paiva, Vice-President in charge of Young Minds, and Scott Orr, ISHS Young Minds Committee

The newly established ISHS Young Minds Committee (YMC) has been hard at work over the past year laying the groundwork for several new initiatives. As we began setting priorities and planning projects, it became clear that the committee needed more structure and a formal governing document, especially since the YMC is relatively new and future members will benefit from clear guidance. This realization led to the group agreeing on a document that outlines its mission, composition and organizational structure.

We have begun to develop a *Mentorship Pilot Program*, an initiative designed to pair young researchers with senior professionals who can offer guidance and support in career development. As this program aims to be largely web-based, we look forward to collaborating with the web development team to effectively bring this program to life.

Another program that we believe will have a significant impact is the *Young Minds Research Forum*. This initiative aims to provide students and early-career professionals with opportunities to present their research, receive constructive feedback, and build connections across regions and disciplines. The live webinar format will mirror the ISHS HortForum but is distinct in that only Young Minds will present, and the feedback is intentionally structured to strengthen participants' professional communication skills and enhance the quality of their scientific presentations. We plan to offer these webinars several times a year, with the first tentatively scheduled for late 2026.

In conjunction with the IHC2026 in Kyoto, Japan, we are preparing a workshop titled "The perspectives of Young Minds in HortScience and the horticultural corporate world". The goal of this session is to strengthen early-career opportunities by highlighting industry perspectives, identify training and skill-development needs, and host a roundtable discussion focused on career guidance. The program will feature several lectures from both academia and industry, followed by a panel discussion, and an informal networking session. While the workshop details are still being finalized, updates will be added to the official IHC2026 program as they become available.

One of the most exciting projects we have been developing is called *Growing Green*, an initiative designed to cultivate and inspire the next generation of horticulture leaders. Through a blend of educational opportunities and handson experiences, youth will deepen their understanding of plant sciences and sustainability. A pilot program will launch soon in Australia, with plans to expand nationally and eventually internationally after we refine the model.

› Patricia Paiva

› Scott Orr

Lukas Bertschinger, Treasurer, in charge of Strategy to Strengthen Membership and Outreach

In a rapidly evolving environment, with declining membership and increasing costs, determined action is required to ensure the long-term sustainability and relevance of ISHS. Over the past two years, in parallel with the implementation of a new business model designed to strengthen the Society, we have been exploring multiple strategies to reduce cost and increase our income, and to increase the attractiveness of the Society to members and partners.

Expanding and strengthening membership remains a central priority. Building on the results of the membership survey conducted in 2023, new individual membership categories have been launched and promoted. These include professional, student and early-career, and retired membership options, with flexible fee structures and incentives such as a 5% discount for membership renewal prior to the renewal date and a 10% discount for multi-year memberships. These changes aim to make membership more attractive to a broader range of individuals at different stages of their careers.

Following several years of decline, individual membership numbers have shown some signs of recovery. However, continued

› Lukas Bertschinger

efforts in communication and marketing are needed to break this long-term trend and to ensure sustained growth. Particular attention has been given to expanding membership in underrepresented regions including Africa, Latin America and Asia.
Strengthening relationships with industry partners and expanding corporate membership has also been prioritised. ISHS has participated in a prominent fruit and vegetable fair, Macfrut 2025 in Rimini, Italy, in a joint booth with the Italian Society for Horticultural Science (SOI), increasing the Society's visibility and strengthening exchange with the industry. One new corporate member has signed up – Atelier Temenos – who are based in Miami, USA. In parallel, the development of a new science-industry dialogue is underway, aiming to foster closer collaboration and knowledge exchange between researchers and industry professionals.
The past year has been characterized by important structural progress and strategic investments. While some measures have temporarily affected the financial result, they represent necessary steps toward building a stronger, more resilient, and more dynamic Society. The Board considers these investments essential for securing a more sustainable future and remains confident that the implemented measures will generate positive financial results by 2027. Some encouraging progress has already been observed, where, through our new partnership with CABI to publish eJHS, some royalty income has already been received.

Moctar Fall, Strategic Partnerships

Significant efforts and initiatives have been undertaken at national, regional and international levels to engage with public institutions, private companies, non-governmental organizations and horticultural sector enterprises.
ISHS has approached, held discussions with, and in several cases signed Memoranda of Understanding (MoUs) with key organizations, including the Food and Agriculture Organization of the United Nations (FAO), the World Vegetable Center, and, more recently, the Senegalese Institute of Agricultural Research (ISRA). In addition, the Board has reached out to the Gates Foundation, the Mastercard Foundation, and development NGOs such as USA For Africa and Trust Africa, with requests for institutional partnership and targeted support for the Young Minds program.
Regarding the FAO, an MoU initiated and signed by the previous Board has been reactivated. Both parties reaffirmed their commitment to collaborate across various domains.
During the last Council meeting in Dakar, Senegal, an Ad Hoc Committee on Partnerships was established. Coordinated by Rémi Kahane, the committee oversees all these partnership efforts. ISHS extends its sincere thanks to the following members for their commitment and valuable contributions: Ferdinando Branca, Maria Claudia Dussi, Francesco Orsini and Rémi Kahane.


› Moctar Fall

Peter J. Batt, Communication and ESG, Editor-in-Chief *Chronica Horticulturae*

In September 2025, we finally launched the new logo for the Society. Drawing upon the design of the old logo, the new logo is both more colourful and more dynamic and is accompanied by our new headline statement *Advancing horticulture for a better tomorrow together*.
During the last few months, several projects have come to fruition. In February 2026, we successfully launched the completely redesigned ISHS website. Although the project experienced delays due to its complexity and the scale of the content migration, the new website provides a modern platform that will serve as the Society's principal communication channel for members and stakeholders. Almost every page was either revised or updated by the Secretariat, with contributions from many of the Division and Working Group Chairs.
As part of the new membership benefits package and as recommended by our consultants, *Chronica Horticulturae* has now become a members-only publication. Publication will continue to be on a quarterly basis, providing articles of interest to our members and highlighting the achievements of our symposia, honoured members and the winners of our Young Minds Awards. Over the last 18 months, we have featured 9 articles from Japan to promote IHC2026. Each of these articles has provided interesting insights into the diversity of horticulture within Japan. In the preparation of all of these articles, I wish to acknowledge the efforts of Masayoshi Shigyo, and as always, to acknowledge the role of my Co-Editor Kelly Van Dijck from the ISHS Secretariat.
To facilitate communication with past members and other stakeholders, we have launched a new monthly ISHS e-mail newsletter in a more attractive, visually appealing format. Articles within the newsletter are only of one or two short sentences, with the principal objective of driving traffic towards the website. We are also providing snapshots of our Young Minds Award winners, and newly published articles within both eJHS and *Chronica Horticulturae*.
To further strengthen communication, the Secretariat is currently working with a social media agency to improve our visibility and engagement across social media channels.


› Peter J. Batt

ESG remains a priority for the Society in attracting new corporate members. However, with the need to address financial issues, the development and launch of the new website, and the migration of eJHS to its new platform with our journal publisher CABI, little progress has been made. Conveners, however, will find some new information in the guidelines provided by the Secretariat, encouraging them to look at how they might seek to reduce their carbon footprint.

Ryutaro Tao, President IHC2026

With only two months remaining until IHC2026, preparations by the IHC2026 Organizing Committee are now in full swing. The abstract submission deadline closed on January 15 and Regular registrations closed on June 15. By the close of regular registration, over 2,300 abstracts had been submitted, with some 2,400 registered participants from over 70 countries and regions worldwide. Given the expected additional registrations and onsite registration, IHC2026 is anticipated to be a highly successful and well-attended congress.

At the Opening Ceremony, the 3MHT Competition will be held in collaboration with Green×Expo 2027 (in Yokohama, Japan). We warmly invite participants to enjoy the 3-minute presentations by our leading young horticultural researchers.

With regard to the plenary lectures, we are pleased to confirm the on-site participation of Dr. Qu Dongyu, Director General of FAO, and Dr. Lucia Lohmann, Director of the Missouri Botanical Garden, one of the largest botanical gardens in the world. FAO is scheduled to publish a book on fruit and vegetables in 2027, and a special event to introduce this publication is being planned. In addition, six internationally renowned horticultural scientists will deliver their plenary lectures on a diversity of topics.

› Ryutaro Tao

Peter Vanderborght, Executive Director

Over the past two years, the ISHS Secretariat has remained focused on continuity and dependable delivery. With a limited budget and human resources, in a global environment marked by geopolitical uncertainty, our priority has been to keep the Society's core activities running smoothly while at the same time, implementing many of the initiatives proposed by the Board. This usually requires careful prioritisation, disciplined planning and efficient day-to-day operations so that the Secretariat can continue to serve our valued members and the broader horticultural science community worldwide.

ISHS's non-profit, non-commercial character is an important strength in this respect. It has always been a great help for the Society to keep services accessible and reasonably priced, while staying focused on the Society's mission and core business to support scientific exchange through our meetings, publications and networks.

The Secretariat also continues to support governance and leadership processes led by the Board. Recently, the Board developed a proposal to update the ISHS Rules of Procedure, both to align them with the updated ISHS Statutes and to introduce an important change in the way the ISHS President and other Board members are elected. The proposed Rules of Procedure have been accepted by a majority of Council votes. In parallel, the election of new ISHS Division Chairs and Vice-Chairs has concluded. The new leadership team will take office after the XXXII International Horticultural Congress (IHC2026) in August 2026 in Kyoto, Japan.

Finally, while ISHS programming and services continue to develop, we need to remain attentive to the potential impact of global developments on the Society's operations. ISHS relies entirely on income derived from membership dues and the sales of its publications. If uncertainty, travel restrictions, rising inflation, institutional budget constraints, security concerns or other negative factors persist, they may eventually affect participation and revenue. In this context, it is a critical part of prudent leadership and careful financial management to safeguard an appropriate level of reserves so that when and if needed, the Society can confidently navigate more challenging periods.

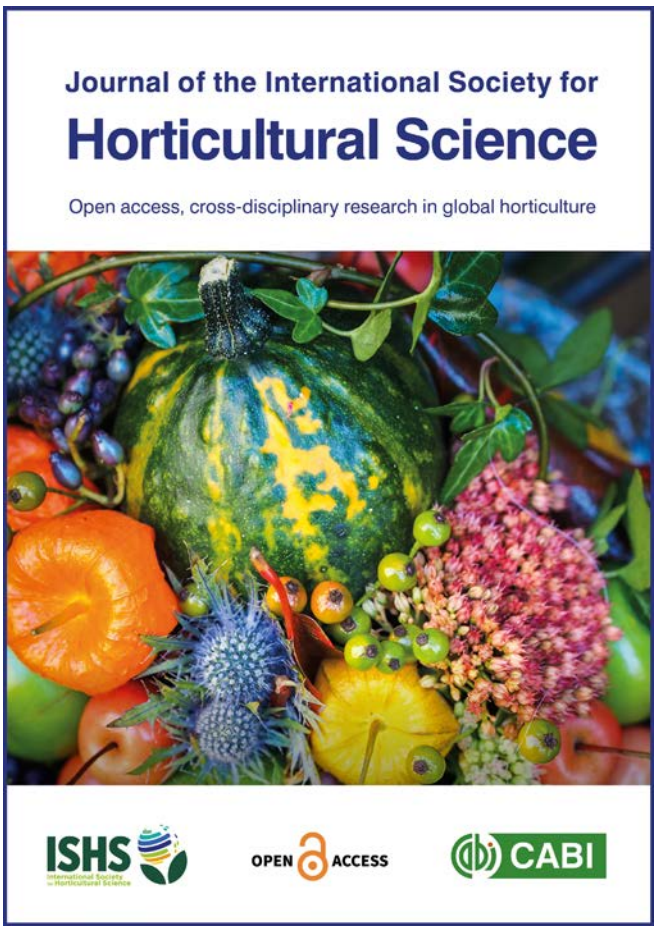
› Peter Vanderborght

Journal of the International Society for Horticultural Science (JISHS) – a new name for the European Journal of Horticultural Science (eJHS) from 2027

Yao-Chien Alex Chang [ISHS Board member – Publications] and Maria Campbell [CABI]

The International Society for Horticultural Science (ISHS) and CABI – our journal publishing partner – are pleased to announce a new title for the *European Journal of Horticultural Science* (eJHS), the official journal of the ISHS. From 1 January 2027, it will be known as the *Journal of the International Society for Horticultural Science* (JISHS).

"In 2024, we expanded the scope of eJHS to include all climates and to emphasize a broad, cross-disciplinary interest in global horticulture, and I'm delighted we attracted authors from a wide range of countries in 2025," commented Renato Paiva, Editor-in-Chief. "A journal's name should reflect its content, so renaming eJHS to *Journal of the International Society for Horticultural Science* feels like the natural, next step in the journal's development."



eJHS began, in 1929, as a German-language journal, "Die Gartenbauwissenschaft", which later became the official publication of the Deutsche Gartenbauwissenschaftliche Gesellschaft (German Society for Horticultural Science). In 2003, the title changed to "European Journal of Horticultural Science" and the journal was published in English from that time. In 2014, the journal was acquired by the ISHS and, so, eJHS completed its journey from a country-specific publication to the official journal at the heart of an international organization.

"ISHS is proud of being a global horticultural network with members throughout the world," observed Yao-Chien Alex Chang, ISHS Board member – Publications. "It is true, eJHS developed from European origins, but, as the official journal of the ISHS, I am delighted JISHS will now clearly represent the diverse nature of our Society and the horticulture community more widely."

All necessary steps are being taken to ensure relevant publishing services and platforms reflect the journal's new name while preserving the connection with the previous name. A new JISHS website is also in preparation on the CABI Digital Library.

Further announcements will follow when the new JISHS website is available and open for submissions. In the meantime, we encourage researchers to continue reading the eJHS and submitting their articles as normal. The journal will continue publishing throughout the transition process with articles published under the new title from 2027.

About European Journal of Horticultural Science / Journal of the International Society for Horticultural Science

European Journal of Horticultural Science / Journal of the International Society for Horticultural Science (eJHS / JISHS) is an international, open access journal publishing significant plant science discoveries and new or modified methodologies and technologies with a broad, cross-disciplinary interest in the scope of global horticulture. It is the official journal of the International Society for Horticultural Science and is led by Editor-in-Chief, Renato Paiva, Universidade Federal de Lavras, Brazil, with the support of an international editorial board.

Visit **www.ishs.org/jishs** to browse articles and special issues, sign up for free article alerts and read the author guidelines and submit online. A short history of the journal is also available.

Horticultural Science News

› ISHS Young Minds Award winner summaries

Below is a selection of research summaries from winners of ISHS Young Minds Awards for best oral and poster presentations at ISHS symposia. To view other exciting research summaries by other winners, please visit www.ishs.org/young-minds-award

Study on the role of endogenous ethylene in highbush blueberry (*V. corymbosum*) fruit ripening

› Claudio Ponce

Blueberries are an important soft fruit crop, valued for their nutritional properties. Global production is rapidly expanding with the United States leading the market. Achieving optimal market value depends heavily on precise harvest timing, which is often regulated through the use of plant bioregulators (PBRs). However, the effective use of these compounds requires a clear understanding of fruit ripening physiology, which at this point in time is not fully resolved. While some studies describe the species as climacteric, others describe blueberries as nonclimacteric. Most research on ethylene has relied on the postharvest application of ethephon (an ethylene-releasing compound), whereas the contribution of endogenous ethylene during preharvest ripening has not yet been evaluated. In this study, we investigated the role of endogenous ethylene in blueberry ripening to support production management. Gas chromatography measurements showed that the interspecific hybrid *Vaccinium corymbosum* 'O'Neal' produces low but detectable ethylene levels that rise at the onset of ripening. Preharvest application of 1MCP, an ethylene inhibitor, delayed color development by reducing anthocyanin accumulation and slowed the decline in acidity, yet did not alter ethylene emission either alone or when combined with an ethylene agonist. Additionally, conferring ethylene insensitivity through transient overexpression of *Arabidopsis etr11* mutant allele in berries produced effects similar to 1MCP treatment. Overall, our findings indicate that endogenous ethylene participates in blueberry fruit ripening but does not operate through a climacterictype autocatalytic system biosynthesis. These results offer valuable guidance for the strategic use of PBRs in blueberry fruit production.

Claudio Ponce won the ISHS Young Minds Award for the best oral presentation at the XV International Symposium on Plant Bioregulators in Fruit Production in USA in June 2025.

› Contact

Claudio Ponce, Laboratory of Pomology, Graduate School of Agriculture, Kyoto University, Kyoto, 606-8502, Japan, e-mail: ponce.miguel.77w@st.kyoto-u.ac.jp

Comparison of *Punica granatum* L. leaf area index determined using in situ and remote sensing techniques

› Raesibe Kgaphola

Leaf area index (LAI) is a crucial parameter for assessing vegetation health and canopy structure in pomegranate (*Punica granatum* L.) orchards. This study examined the application of remote sensing (PySEBAL) using Landsat 8 images and ground-based measurements (AccuPAR LP-80 ceptometer) to determine LAI and its influence on the fractional interception of light in Wellington, Western Cape Province, South Africa. The data collected was categorized by canopy development stages into seasonal trends, compared and validated across three periods (September 2022 to March 2023, April to May 2023, and July to October 2023) to assess model accuracy and reliability using Statgraphics Centurion Version XV for regression analysis. The relationship between remote sensing-derived LAI and in-situ AccuPAR LP-80 modelled LAI was linear and showed less complexity than polynomial trends at the start of the growing season, likely due to reduced variation in vegetative growth. In contrast, weaker linear patterns emerged in the late season, suggesting increased variability associated with the decline in LAI as the canopy transitioned from vegetative to reproductive stages. Overall, model performance demonstrated accurate LAI estimations over extended periods. However, weak to moderate correlations with in-situ measurements were observed, with the highest regression value of 78.9% during specific seasonal transitions. The research was supported and funded by the Water Research Commission and the National Research Foundation as part of the pomegranate orchard water use and productivity project.

Raesibe Kgaphola won the ISHS Young Minds Award for the best oral presentation at the VI International Symposium on Pomegranate and Minor Mediterranean Fruits in Italy in September 2025.

› Contact

Raesibe Kgaphola, University of the Free State, 205 Nelson Mandela Drive, 9300 Bloemfontein, South Africa, e-mail: raesibe.lebogang@gmail.com

A feedback and feedforward IDSS based on wireless sensor networks and 5G-satcom applied in precision viticulture

› Emanuele Dichio

This study details the development and field validation of an integrated feedback-feedforward irrigation decision support system (IDSS) for precision viticulture, based on a LoRa wireless sensor network (WSN) and a hybrid 5G-satellite communication framework. The system aims to provide reliable, real-time monitoring and autonomous irrigation management in rural areas with limited terrestrial connectivity.

The hardware was developed at the Agro-Hydrological Sensing and Modelling Laboratory (University of Pisa, Italy) and deployed in two commercial vineyards in Lucca (Tuscany, Italy). Custom ESP32-based nodes, integrated with LoRa (SX1276) modules on open-source PCBs, collect soil-plant-atmosphere data and control electrovalves. Sensors include FDR probes for soil water content (SWC), infrared thermometers for canopy temperature, atmometers for reference evapotranspiration, pressure and flow sensors, and water level/conductivity probes. Each node is solar-powered and arranged in a star-of-stars LoRa topology, with data transmitted to a gateway and then forwarded via Wi-Fi to a 5G customer premises equipment (CPE). A satellite backhaul connects local processing units to a centralised cloud platform.

The IDSS integrates both feedforward (FFc) and feedback (FBc) control methods. The feedforward part uses an FAO-56 soil water balance model with crop coefficient (Kc) and water stress coefficient (Ks). Meanwhile, the feedback part depends on real-time soil water content (SWC) thresholds and the crop water stress index (CWSI), which is obtained from canopy temperature data. An algorithm written in Python automatically detects the upper (field capacity) and lower (critical) soil moisture thresholds by smoothing signals and analyzing derivatives, supporting adaptive irrigation scheduling.

Data visualisation and system management are performed using a cloud-based Grafana platform. Field results from June 2025 showed a strong correlation between SWC and CWSI trends, confirming the system's capability to detect water stress and assess irrigation effectiveness.

This research was funded by the European Space Agency (ESA) under the 5G-HOSTS-SAT project "5G HUB Over-the-Air Vertical Segment Validations."

Emanuele Dichio won the ISHS Young Minds Award for the best oral presentation at the XI International Symposium on Irrigation of Horticultural Crops in Australia in January 2026.

› Contact

Emanuele Dichio, AgroHydrological Sensing and Modelling Laboratory (AgrHySMo), Department of Agriculture, Food and Environment (DAFE), University of Pisa, Via del Borghetto 80, 56124, Pisa (PI), Italy, e-mail: emanuele.dichio@phd.unipi.it

Water relations and growth of rootstock-scion combinations in pome and stone fruit trained as narrow orchard

› Harsimran Singh

Harsimran Singh is a first year PhD student working on the national project 'Narrow Orchard Systems for Future Climates' funded by Agriculture Victoria and Hort Innovation Australia and delivered via The University of Queensland (Australia). One of the components of his research focuses on evaluating water relations in different rootstock-scion combinations of pome and stone fruits planted as narrow orchard systems (NOS).

The Goulburn Valley is an important Australian fruit growing region, where labour shortages and high operational costs continue to be a major hurdle, pushing growers towards systems like NOS. The main characteristics of NOS are i) narrow canopies, with ii) multiple closely spaced upright leaders and iii) narrow inter-rows. These systems aim to create compact, highly productive canopies that can support automation of orchard tasks. Understanding the behaviour of rootstock-scion combinations can help in meeting the desired expectations in these systems.

In this study, cherries, nectarines, plums, apples and pears, grafted onto three rootstocks and spaced at 2×2 m, were evaluated for water relations [stomatal conductance (g_s), transpiration rate (*E*) and midday stem water potential (Ψ_{stem})], canopy light interception, upright length, trunk development, and chlorophyll concentration in spring and summer 2025-26.

The apple rootstock M9 showed a higher level of water stress compared to other rootstocks. CG202 had larger canopies and displayed reduced g_s and *E*. For cherry, Gisela 12 reduced growth during the stress period and recovered its g_s and *E* slower than both Stallion and Krymsk 5. Rootpac 40 maintained the best water status and strongest growth before and after stress for nectarine, while Rootpac 20 operated at very low g_s and *E* under drought. For plum, Myrobalan H29C produced the highest upright growth during stress and recovery phase, whereas Rootpac R exhibited better water status at peak stress. Pear rootstocks were less variable overall, though QA consistently maintained a higher Ψ_{stem} than other rootstocks.

Harsimran Singh won the ISHS Young Minds Award for the best poster presentation at the XI International Symposium on Irrigation of Horticultural Crops in Australia in January 2026.

› Contact

Harsimran Singh, Tatura SmartFarm, Agriculture Victoria, Queensland Alliance for Agriculture and Food Innovation, The University of Queensland, Australia, e-mail: harry.singh@agriculture.vic.gov.au or harsimran.singh@uq.edu.au

Chemical profiling of two *Eriocephalus* essential oils and their antifungal potential against *Diaporthe infecunda* and *Alternaria alstroemeriae*

› Mahlatse Morena

Mahlatse Morena is a Master's candidate at the University of Johannesburg, affiliated with the Postharvest and Agroprocessing Research Centre, South Africa. Her research focuses on the development of sustainable and plant-based strategies to reduce postharvest deterioration of fresh produce, with a focus on tomatoes. This study investigated the antifungal activity and chemical composition of essential oils derived from *Eriocephalus tenuipes* and *Eriocephalus punctulatus*, two species of highly aromatic shrubs with antimicrobial and antioxidant properties. However, despite their potential, these species remain underexplored. Therefore, this study specifically focused on their composition and efficacy against *Diaporthe infecunda* and *Alternaria alstroemeriae,* isolated from tomato fruits. Gas chromatography-mass spectrometry (GC-MS) was applied to determine the volatile composition of the two essential oils, which revealed distinct phytochemical profiles between the two species. Chemical composition analysis demonstrated various bioactive constituents, including compounds widely known for their antimicrobial activity. *Eriocephalus tenuipes* displayed a more diverse chemical composition with a higher proportion of oxygenated monoterpenes, including 1,8-cineole, artemisia ketone and artemisia alcohol. In contrast, *Eriocephalus punctulatus*' chemical profile was dominated by only a few major compounds such as p-cymene, linalyl acetate and butanoic acid. The antifungal activity of both essential oils was conducted in vitro at concentrations of 2000, 3000 and 4000 ppm. The antifungal test showed that the essential oils effectively reduced the mycelial growth of *Diaporthe infecunda* and *Alternaria alstroemeriae*. *Eriocephalus tenuipes* had inhibitory activity above 95%, whereas *Eriocephalus punctulatus* had 67.96% against *Diaporthe infecunda*. Regarding *Alternaria alstroemeriae, Eriocephalus tenuipes* still exhibited superior inhibition than *Eriocephalus punctulatus*. These findings highlight that *Eriocephalus* essential oils have great promise as natural alternatives to synthetic fungicides in postharvest disease management. The study contributes to advancing environmentally friendly preservation methods for reducing postharvest losses and maintaining produce quality. Future studies will examine optimising application strategies, such as vapour-phase distribution and integration into packaging systems, as well as efficacy under realistic storage conditions.

Mahlatse Morena won the ISHS Young Minds Award for the best oral presentation at the IV International Symposium on Beverage Crops in South Africa in March 2026.

› Contact

Mahlatse Morena, University of Johannesburg, Auckland Park, 2092 Gauteng Johannesburg, South Africa, e-mail: mahlatse.morena2001@gmail.com

Pectic polysaccharide from *Opuntia ficus-indica*: microwave extraction and comparison of cladode part

› Priscilla Livhuwane Mukwevho

Priscilla Livhuwane Mukwevho is a PhD candidate at the Postharvest and Agroprocessing Research Centre at the University of Johannesburg, South Africa. Her research is focused on the development of a synbiotic product utilizing pectic polysaccharide-rich *Opuntia ficus-indica* (OFI) for the management of gut health problems. Pectic polysaccharide (PP) is an important prebiotic in synbiotics, but a sustainable extraction method that produces high production yield and functional quality is required. This study investigated the impact of microwave pretreatment power levels (360, 450 and 900 W) on the yield and functional properties of citric acid acidified water-extracted pectin from various OFI cladode components (peel, mucilage and insoluble fibre), including yellowness, moisture content, solubility, degree of esterification (DE), and water holding capacity (WHC). Results showed that microwave power and OFI cladode parts significantly impacted the yield and quality of PP. Moisture content and the DE decreased with increasing microwave power, with fibre and mucilage exhibiting the lowest moisture content and highest DE, respectively. Conversely, production yield increased with higher microwave power, with mucilage achieving the highest yield across all power levels. Yellowness decreased as power increased from 360 to 450 W, before slightly increasing at 900 W, with mucilage maintaining the highest yellowness. Solubility and WHC increased between 360 and 450 W, followed by a slight decrease at 900 W. These results demonstrate that microwave pretreatment of mucilage at low-to-moderate power levels (360-450 W) can produce pectin polysaccharides with desirable quality and quantity for synbiotic product formulation.

Priscilla Livhuwane Mukwevho won the ISHS Young Minds Award for the best poster presentation at the IV International Symposium on Beverage Crops in South Africa in March 2026.

› Contact

Priscilla Livhuwane Mukwevho, Postharvest and Agroprocessing Research Centre & South African Research Chairs Initiative in Sustainable Preservation and Agroprocessing Research, Department of Botany and Plant Biotechnology, University of Johannesburg, P.O. Box 524, Auckland Park, Johannesburg 2006, South Africa, e-mail: priscillamukwevho@gmail.com

IHC 2026 Kyoto
www.ihc2026.org

The diversity of horticulture in Japan – advanced research in postharvest physiology and biology in Japan

Akira Tateishi, Mirai Azuma, Yusuke Kamiyoshihara, Yasunori Hamauzu, Yasuo Suzuki, Yoshihiro Imahori and Megumi Ishimaru

It is estimated that more than 44% of the fruit and vegetables produced globally are discarded before consumption (FAO, 2011). Food loss is particularly severe in developing countries, where insufficient distribution infrastructure is a major contributing factor. Since the 1970s, Japan has made significant advances in the development of cold chain systems enabling the maintenance of consistently low temperatures from production to consumption. As a result, food loss levels in Japan are relatively low. Nevertheless, disruptions in temperature control can still occur, for example, due to congestion at wholesale markets or during the loading and unloading of goods. Such interruptions may lead to quality degradation, reduced shelf life and ultimately increase postharvest losses.

Recent research trends in postharvest physiology of fruits and vegetables

In Japan, horticultural crops such as fresh produce and floriculture are subject to some of the strictest quality standards in the world. Consumers demand not only good taste – like sweetness and acidity in fruit and vegetables – but also expect highly complex "internal qualities," including rich aromas, optimal texture and the enhancement of functional components. Furthermore, highly standardized "external quality" in terms of shape, size, color and the absence of defects is strictly required, not only for flowers, but also for fresh fruit and vegetables. To satisfy these exacting standards for quality, postharvest research – focusing on the precise control and preservation of quality after harvest – plays a decisive role alongside preharvest cultivation and breeding technologies.

Japanese postharvest research extends beyond purely application-driven technology development: it is fundamentally integrated with the elucidation of underlying physiological mechanisms. A synergistic framework has been established wherein basic research validates the molecular theories of metabolism and senescence, thereby facilitating the development of next-generation control technologies. Historically, given the relatively short domestic supply chains in Japan, research focusing on long-term storage and long-distance transportation has been limited. Recently, however, this research trajectory has undergone a substantial transition. Driven by the strategic objective of exporting premium Japanese horticultural crops to global markets, the field of postharvest science is experiencing a dramatic paradigm shift (Ikegaya et al., 2021).

This article delves into the fundamental biological and molecular discoveries driven by Japanese researchers. It details these latest advancements across three primary domains: vegetables, floricultural crops, and fruit trees. To begin, we highlight new dimensions in fruit ripening physiology and introduce innovative approaches shaping modern floriculture. We then discuss recent breakthroughs in the postharvest field for horticultural crops, showcasing a diverse array of advanced treatments and packaging techniques.

Paradigm shift in fruit ripening physiology: multi-layered regulatory networks unveiled by Japanese researchers

In the distribution of horticultural crops, controlling ethylene action is the cornerstone of quality preservation. Since the 2000s, the commercial use of the ethylene receptor inhibitor 1-MCP (1-methylcyclopropene) has expanded significantly, yielding dramatic results in maintaining the freshness of apples and inhibiting the softening of persimmons. However, practical challenges have remained, such as cases where softening progresses despite 1-MCP treatment and ripening occurs under low-temperature storage where ethylene is theoretically absent. Furthermore, it has remained unclear whether the fundamental mechanisms of ethylene action identified in model plants like *Arabidopsis thaliana* are directly applicable to horticultural crops.

In recent years, Japanese researchers have utilized the latest techniques, including transcriptomics, proteomics and genome editing, to present new findings that rewrite conventional ripening models.

Redefining the master regulator: genome editing unveils the truth of the RIN gene

For over 30 years, the RIN transcription factor in tomatoes (*Solanum lycopersicum*) has been considered the master regulator governing fruit ripening. Because the traditional *rin* mutant (*ripening-inhibitor*) completely failed to ripen with ethylene depletion, RIN was long believed to be an essential accelerator for the process. However, Ito et al. (2017) analyzed individuals in which the RIN gene was completely removed using CRISPR/Cas9. Unlike the traditional *rin* mutant, these mutants showed partial fruit ripening and flesh softening with low levels of lycopene and ethylene production. Analysis revealed that the traditional *rin* mutant was not a mere loss-of-function mutation, rather, the partial deletion of the RIN gene produced a chimeric protein with the adjacent gene, resulting in an active repressor of ripening. Furthermore, by introducing a frameshift mutation into a specific region of RIN, Ito et

al. (2020) created the *rinG2* allele that lacked the C-terminal transcription activation domain. The fruit expressing this truncated RIN protein exhibited extended shelf life, but unlike the *rin* fruit, they accumulated lycopene. This marked a historical turning point where discussions on ripening control shifted away from the presence or absence of a gene to the qualitative control of its function. A subsequent study showed that the *rinG2* mutant is a promising breeding resource to extend tomato shelf life (Ito et al., 2021).

Complex control of ethylene perception by receptors

Ethylene receptors (ETR) act as negative regulators that suppress ripening in the absence of ethylene. Regarding the functional units of these receptors, research in the model plant *Arabidopsis thaliana* around 2010 proposed a model where different receptor homologs form high-order complexes. Kamiyoshihara et al. (2022) provided biochemical evidence that these receptors formed heteromeric high-order complexes in tomato fruit. Their work demonstrated that teamwork-based signal control observed in *Arabidopsis* was preserved in tomatoes. Their findings suggested that tomatoes might possess unique complex-forming rules distinct from those of *Arabidopsis*. The insight that receptors interact to integrate and amplify signals explains why the famous *Never-ripe* mutant (*Nr*) exhibited the non-ripening phenotype despite the single mutation in the *SlETR3* gene out of multiple ETR genes. Although the function of each ETR homologue in tomato ripening regulation had been proven, this work provided evidence that they act together in the same protein complex.

Discovery of low-temperature-induced ripening

Mworia and colleagues (2011) demonstrated that kiwifruit softening and ripening can be induced by low-temperature exposure (around 5°C) even in the absence of detectable ethylene production. Previously, it had been believed that kiwifruit ripening could not begin without ethylene. However, detailed RNA-seq analysis revealed that this low-temperature-induced ripening was controlled by a unique signaling network independent of the ethylene pathway.

This mechanism is observed not only in kiwifruit but also in the ripening of European pears (*Pyrus communis*) (Mitalo et al., 2019a, b), and the de-greening of citrus fruits (Mitalo et al., 2020, 2022). For temperate fruit trees, autumn's low temperature functions as an environmental signal to prepare for seed dispersal. It appears that plants possess a backup circuit that drives metabolism via environmental factors like cold, in addition to the main ethylene switch. This discovery theoretically explains why 1-MCP treatment is insufficient in certain scenarios and significantly broadens the potential to optimize fruit flavor and color through temperature management alone.

Recent research trends in postharvest physiology of floricultural crops

Flower distribution in Japan is characterized by a wide variety of species and many small-scale retailers. Because flowers are easily damaged and difficult to pack efficiently, their transport costs are higher than those for fruit and vegetables. To maintain freshness, two methods are used: "wet transport" (in water) and "dry transport." High-value flowers usually use wet transport, but the added weight increases costs, which is a burden for growers. Additionally, Japan faces a unique challenge where demand is concentrated

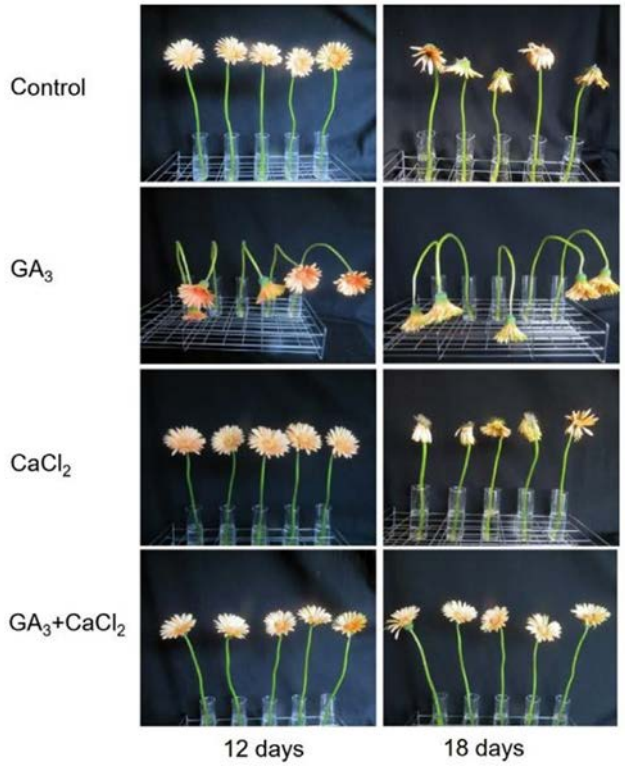


Figure 1. Cut flowers of the gerbera 'Minou' treated with GA_3, $CaCl_2$, and their combination. Upper panel: control; middle upper panel: 50 mg L^{-1} GA_3; middle lower panel: 5 g L^{-1} $CaCl_2$; lower panel: 50 mg L^{-1} GA_3 and 5 g L^{-1} $CaCl_2$. Left panel: 12 days after start of treatment; right panel: 18 days after start of treatment. Adopted from Tonooka et al. (2024).

Figure 2. A) Flowers of lines F182-10, F181-14 and F182-17 selected with a low degree of abscission; B) variations in the ethylene response of selected lines F181-14 (left) and 003-15 (right). 003-15 is a line with ultra-long vase life and a high degree of abscission (Onozaki and Fujimoto, 2023). The flowers were treated with 10 µL L^{-1} ethylene that was maintained in a 0.5 mL L^{-1} CMIT/MIT (isothiazolinone derivatives) solution at 23°C under a 12-h photoperiod. Adopted from Fujimoto and Onozaki (2025).

for specific traditional events (*monobi*), causing large price fluctuations. To address this, wholesale markets have improved efficiency through computer-controlled auctions and standardized digital data systems.

Research on cut flowers in Japan focuses on "fast distribution" and the "precise control of flowering time" rather than long-term storage. Based on years of experience in ethylene physiology, Japanese research is now moving into a new stage of "deepening and expansion" using advanced technology.

Environmental factors affecting flower quality

The quality of flowers during distribution is strongly affected by environmental factors both before and after harvest. Inamoto et al. (2024) quantified how sunlight and temperature affect the yield and quality of roses. This knowledge can be used to evaluate cultivar characteristics and to predict shipping dates based on the relationship between flowering peaks and temperature. Furthermore, Nakamura et al. (2024) discovered that "petal curling" (*Ben-sori*) in gerberas was caused by absorbing water at low temperatures (5°C) after dry transport. They showed that this problem can be prevented by keeping the water at 15°C, highlighting the importance of proper temperature control throughout the distribution process.

Mechanisms of senescence and chemical treatments

Kaneeda et al. (2024) found that flowering problems in fragrant roses are caused by a lack of jasmonic acid (JA). They successfully addressed this by treating roses with methyl jasmonate before harvest. For gerberas, Tonooka et al. (2024) developed a new treatment using gibberellin and calcium chloride. This method extends vase life while preventing the common side effect of excessive stem elongation (Figure 1). At the molecular level, Shibuya et al. (2014) identified a gene called *EPH1* in Japanese morning glory, which promotes flower senescence. More recently, Shibuya et al. (2024) discovered a new compound called "Everlastin". This compound inhibits the function of *EPH1*, providing a new way to extend flower longevity by directly targeting specific genes.

Breeding strategies and quality evaluation through deep learning

Onozaki and Fujimoto (2023) successfully developed long vase life dahlias through repeated crossing and selection. Furthermore, Fujimoto and Onozaki (2025) developed dahlia cultivars that are resistant to ethylene-induced petal abscission (Figure 2). This achieved both long life and resistance to transport damage.

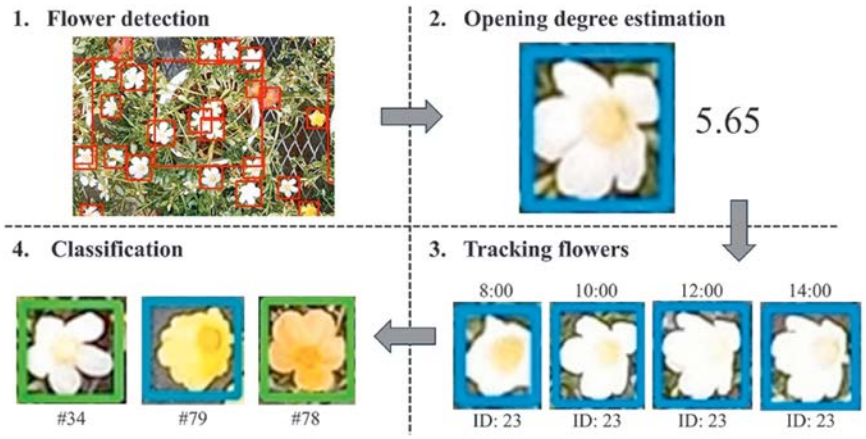


Figure 3. Procedure to quantify *P. umbraticola* flower longevity in the greenhouse using deep learning models for computer vision. In this study, different deep learning models were used in four steps (flower detection from images, opening degree estimation, tracking, and classification). In the first step, OD models (e.g., YOLO) trained for *P. umbraticola* flowers were used. Next, IC models modified to estimate the opening degree of flowers were applied to each detected flower image. In the third step, moving and changing flowers in a series of interval images were tracked and identified from other flowers. Finally, the VC model was used to classify flowers in the correct line. Adopted from Ishimori (2025).

While these new cultivars have been developed, it remains difficult to objectively measure the longevity of thousands of flowers in large-scale trials. To solve this, AI is now being utilized. Ishimori (2025) established a system using deep learning to automatically measure the longevity of thousands of flowers in a greenhouse (Figure 3). This technology allows for large-scale data collection and is expected to significantly accelerate the breeding process.

Research on the effects of storage conditions on fruit quality

Recent studies verifying the effects of storage conditions, including temperature and packaging, on fruit quality have been conducted for citrus (lemons and Satsuma mandarins), peaches, bananas, Japanese apricots, persimmons, acerola, fresh-cut avocados, and others. For example, Matsumoto et al. (2019) investigated the effects of storage temperature and duration on β-cryptoxanthin content in Satsuma mandarin fruit, as well as the effect of the maturation stage. In their study, fruits harvested while β-cryptoxanthin was still being accumulated on the tree continued to accumulate this carotenoid during storage at 8, 10 and 20°C, but not at 5°C. The physiological impacts of storage at 5 and 20°C were confirmed by changes in the expression of carotenoid biosynthesis-related genes before and after storage.

Suzuki et al. (2021) reported the effects of polyethylene packaging with a CO_2 absorbent on the long-term storage of persimmon 'Taishuu' fruit. Their study showed that fruits harvested at the end of October could be stored until mid-December without the occurrence of off-odors when individually packaged in PE60 film with a CO_2 absorbent (5 g, mainly calcium hydroxide) and stored at 0°C.

Research on the effects of various physicochemical treatments on fruit components and metabolism

Physicochemical treatments applied to postharvest fruit have also been described in recent studies that include treatments with plant hormones, 1-MCP, UV or NIR irradiation, high temperature, ozone, ethanol, and others. In addition, studies using edible coatings have also been reported (Chan et al., 2025).

In the case of plant hormone treatments, effects on pigment metabolism in citrus peel have been a major research theme. Ma et al. (2023b) examined the effects of postharvest auxin (1-naphthaleneacetic acid) treatment on chlorophyll and carotenoid metabolism in Satsuma mandarin. Treatment with 1-naphthaleneacetic acid effectively induced peel color change through chlorophyll degradation and carotenoid accumulation in 'Miyagawa-wase' fruit during storage. These effects were supported by decreased expression of chlorophyll biosynthetic genes, increased expression of chlorophyll degradation genes, and up-regulation of carotenoid biosynthetic genes.

The effects of 1-MCP treatment have recently been studied in Japanese apricots, persim-

mons, Japanese pears and apples. Sakamoto et al. (2021) investigated the effects of 1-MCP treatment on postharvest physiology (respiration rate and ethanol production) and fruit quality of Japanese pear 'Keisui' during storage.

Edible coating technology is also gaining attention as a plastic-reducing postharvest strategy (Tanaka and Tanaka, 2024). The effects of edible coating treatments have been studied in Japanese pear 'Kosui' (Hira et al., 2022a, b) and persimmon 'Fuyu' (Muqadas et al., 2025). In the study on 'Kosui' pear, chitosan/alginate-based layer-by-layer (LBL) coatings exhibited superior properties compared with monolayer coatings in terms of inhibiting ethylene production, respiration and overall fruit ripening, although they did not affect weight loss during storage. This treatment was associated with the simultaneous up-regulation of glycolysis-related genes and down-regulation of tricarboxylic acid (TCA) cycle genes, indicating regulation of the balance between aerobic and anaerobic metabolism.

In the study on 'Fuyu' persimmon (Muqadas et al., 2025), storage at ambient temperature (20-25°C) in combination with an edible sugar-ester coating effectively delayed fruit softening and maintained postharvest quality during the high-demand Christmas and New Year season in Japan (Figure 4). Moreover, the edible sugar-ester coating markedly mitigated chilling injury symptoms observed in uncoated fruit during prolonged storage at 0°C, suggesting that this treatment may be suitable for long-term low-temperature storage and international distribution.

Research using novel analytical and determination methods to obtain information on quality and physiological changes

Several newly developed analytical and determination technologies offer promising opportunities to obtain novel information on postharvest physiology and quality changes in fruit. In particular, non-destructive analysis systems have been increasingly developed. Recent advances in optical-based studies include the detection of internal disorders using deep learning applied to fruit surface images, acquisition of plant physiological information using compact spectroscopes equipped with photon sensors, and detection of postharvest changes using time-resolved transmittance spectroscopy. Ma et al. (2023a) reported that the reduced scattering coefficient (μ's) at 846 nm inside kiwifruit decreased steadily during postharvest storage, and that the correlation between μ's and storage duration was much stronger than that obtained using external color indices measured with a conventional colorimeter (Figure 5). The stages of kiwifruit softening could be classified using an effective mathematical model based on time-resolved profiles at this single wavelength.

Studies using acoustic vibration for non-destructive assessment of internal fruit disorders – originally derived from traditional hit-sound methods used for watermelons – have been developed over several decades. Recently, this technology has been applied to the assessment of internal disorders in persimmons, Japanese pears, peaches and other fruits, and has led to the development of downsized and user-friendly instruments, such as finger-ring-type firmness analyzers based on acoustic resonance determination.

The National Institute of Advanced Industrial Science and Technology (AIST) has developed a compact, highly sensitive ethylene sensor with high selectivity for continuous monitoring (Ishihara et al., 2020). This sensor can detect ethylene concentrations at the 0.1 ppm level as changes in electrical resistance through a sequence of chemical reactions.

Research on previously unclarified mechanisms of ripening or physiological disorders

Scientific studies on ripening physiology and physiological disorders address both long-standing and emerging issues. Recent studies include investigations into the chilling sensitivity of yellow-fleshed kiwifruit cultivars, evaluations of treatments to reduce chilling injury in bananas (through

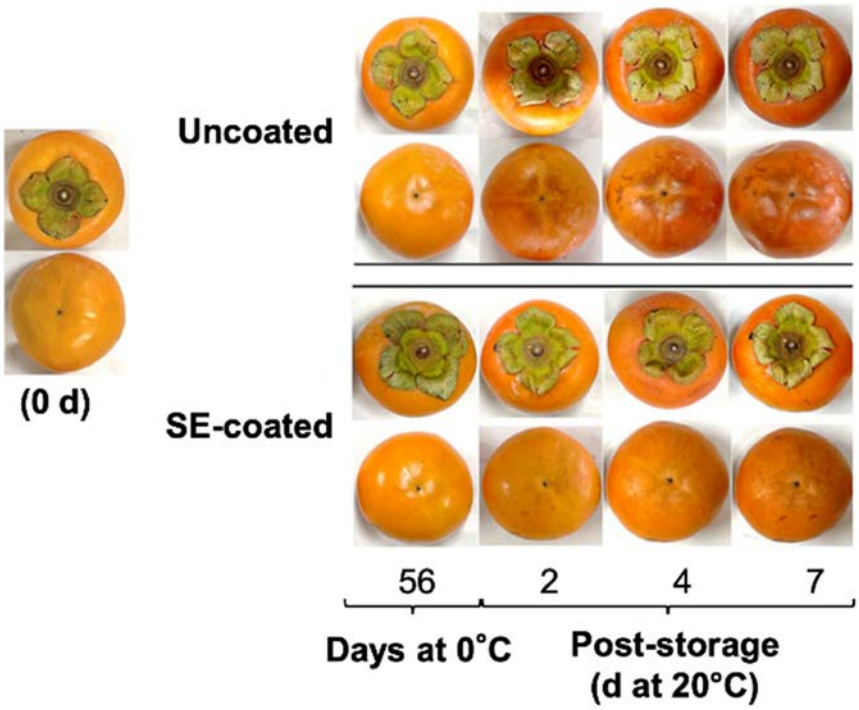


Figure 4. An example of recent research using edible-coating treatment that showed changes in external appearance of uncoated and sugar-ester (SE)-coated 'Fuyu' persimmons during storage at 0°C for 56 d followed by 7 d rewarming at 20°C. Adopted from Muqadas et al. (2025).

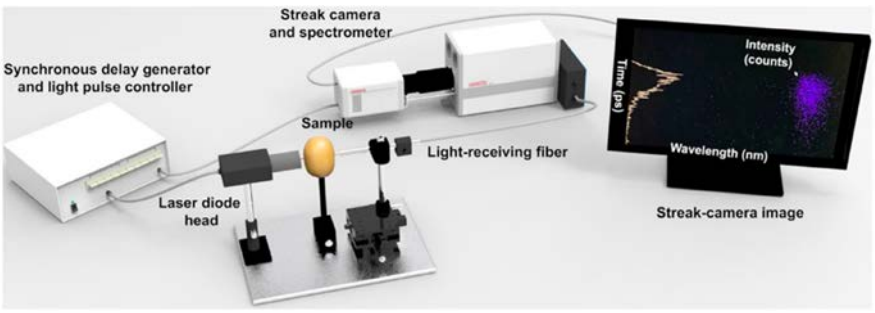


Figure 5. An example of research in a novel, non-destructive analytical system. Photograph shows main components of the developed time-resolved transmittance spectroscopy (TRTS) measurement system for analysis of postharvest quality changes in fruit. Adopted from Ma et al. (2023a).

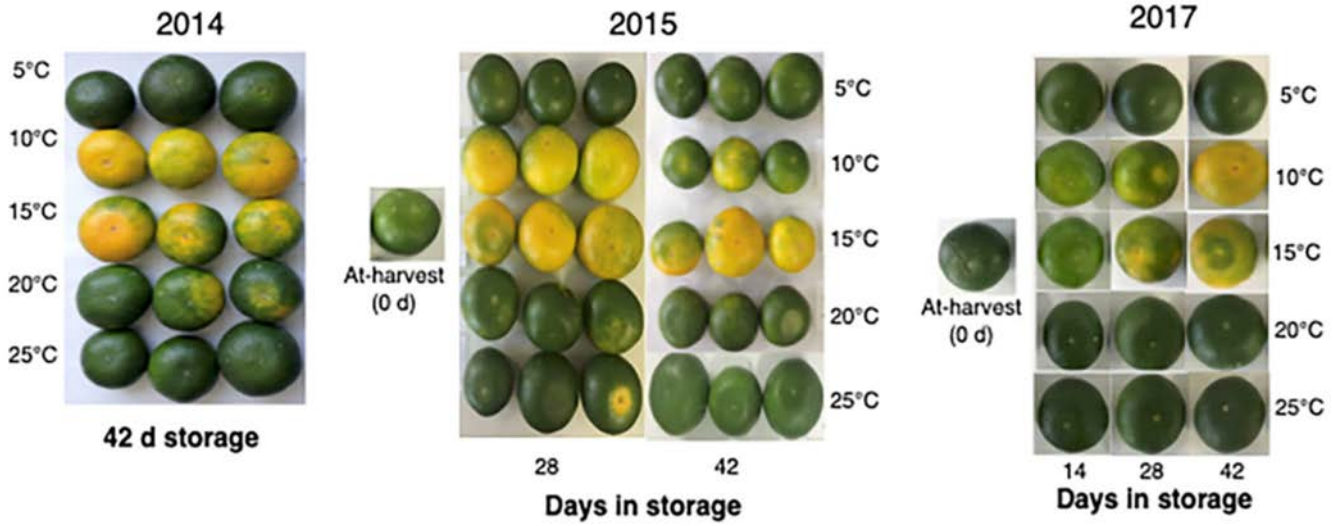


Figure 6. An example of research on "low-temperature-modulated ripening" that showed peel degreening behavior of Satsuma mandarin fruit at different storage temperatures. Adopted from Mitalo et al. (2022).

humidity control) and peaches (through high-temperature treatment), and the identification of biomarkers related to chilling injury using metabolomic analyses of primary metabolites.

Regarding ripening physiology, research on "low-temperature-modulated ripening" represents a novel perspective for elucidating fruit ripening mechanisms. The induction of ripening events by low temperature has been studied in kiwifruit, demonstrating that ripening processes – including the expression of ripening-related genes and associated transcription factors – can progress at low temperatures (5-10°C) independently of ethylene (Mitalo et al., 2018). More recently, low-temperature-modulated ripening has also been observed in citrus (lemons and Satsuma mandarins) as a de-greening phenomenon independent of internal ethylene production (Mitalo et al., 2020, 2022). In Satsuma mandarin fruit, peel de-greening accompanied by chlorophyll degradation was observed at 10 and 15°C after 28-42 days, whereas green coloration was retained at 5, 20, and 25°C (Mitalo et al., 2022) (Figure 6). Through this series of studies, ripening-related genes regulated by ethylene signaling and/or low temperature have been identified in lemons, Satsuma mandarins, Japanese apricots, European pears, persimmons and tomatoes.

Recent postharvest processing techniques

In Japan, postharvest processing techniques are based on technologies that are widely used internationally, while also incorporating practices that have been adapted to Japan's distribution system.

In the distribution of horticultural crops in Japan, a cold chain based on low-temperature management is widely established, and precooling is commonly practiced as an important initial postharvest step. Forced-air cooling is widely used, while vacuum cooling has been introduced in large-scale production areas for leafy vegetables. In broccoli production regions, facilities for package icing have also been adopted.

For Satsuma mandarin (*Citrus unshiu*), the very early-maturing cultivars produced in Kyushu often fail to develop sufficient peel coloration even when the flesh is mature. Therefore, as a postharvest processing technique, ethylene is applied prior to shipment to promote de-greening. For fruit distributed locally, however, there are cases where ethylene is not applied and the fruit is marketed while still green, because local consumers recognize that the fruit is already edible even with green peel. In addition, Satsuma mandarin is sometimes subjected to a drying pre-treatment, known in Japan as *kansō yoso*, after harvest. This is conducted not at high temperature but typically at 5-10°C, with drying for about two weeks to achieve a 3-4% weight loss. Subsequent storage in a low-temperature facility helps maintain high quality. This drying pre-treatment not only suppresses decay (mold development) but also reduces peel puffing, and it may improve eating quality as it increases the soluble solid content and decreases acidity. Because Satsuma mandarin is a non-climacteric fruit, these changes are explained not as ripening per se, but rather by organic acid consumption through respiration and concentration of constituents associated with water loss.

Treatment with 1-MCP, an inhibitor of ethylene action, represents one of the most notable recent postharvest technologies. In Japan, 1-MCP is registered for use in crops

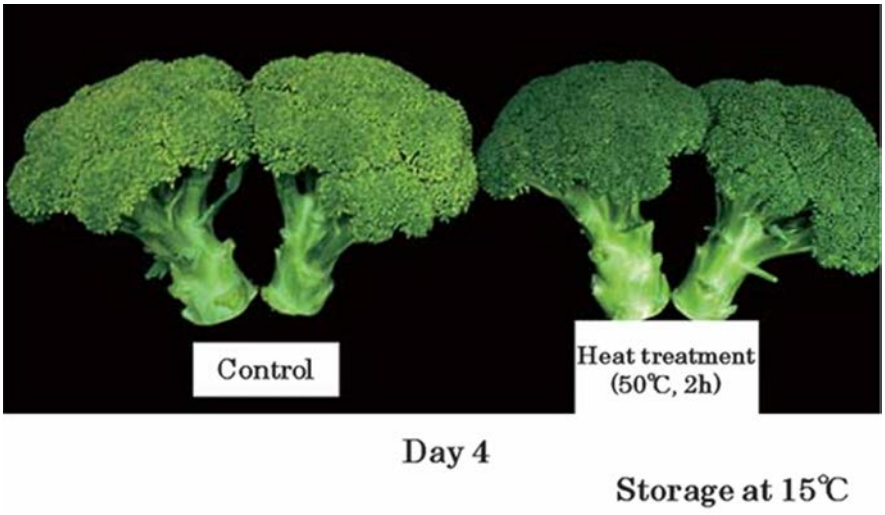


Figure 7. Effect of heat treatment on floret yellowing in stored broccoli. Broccoli heads were treated with hot air (50°C) for 2 h and then stored at 15°C in the dark. Adopted from Yamauchi (2013).

such as apple, Japanese pear, persimmon and banana, and its practical adoption is progressing. In apples, late-maturing cultivars such as 'Fuji' are supplied all-year-round in Japan, mainly through controlled-atmosphere (CA) storage (Imahori, 2025). Postharvest 1-MCP treatment further improves quality retention. Application protocols have also been examined according to cultivar characteristics to meet on-site needs. For example, for 'Fuji', which inherently has good storability and low ethylene production, 1-MCP treatment is considered effective even when applied up to 22 days after harvest. In contrast, cultivars with high ethylene production show reduced responsiveness to 1-MCP (Tatsuki et al., 2007). For the early-maturing cultivar 'Tsugaru', a low-temperature pre-treatment can enhance the efficacy of 1-MCP. This enhancement is attributed to reduced ethylene production under low temperature along with an increase in ethylene receptors (Tatsuki et al., 2011).

In general, postharvest abiotic stresses such as heat, low temperature, UV irradiation, and water deficit induce the generation of reactive oxygen species and, when excessive, can accelerate senescence during storage. Conversely, moderate stress may act as a beneficial signal – via hydrogen peroxide and related molecules – to induce antioxidant systems, thereby activating the ascorbate-glutathione (AsA-GSH) cycle and promoting the production of antioxidant compounds, which may contribute to suppressing senescence. Based on this concept, research has advanced on the use of controlled abiotic stress treatments as postharvest interventions. Specifically for crops in which discoloration due to chlorophyll degradation is a major cause of quality loss – such as leafy vegetables, broccoli and green-skinned acid citrus – treatments including heat and UV irradiation, as well as applications of ethanol or hydrogen peroxide, have been shown to suppress senescence and maintain quality during storage (Figure 7) (Yamauchi, 2013). Mechanistically, hydrogen peroxide induced by stress treatments is thought to contribute to maintaining antioxidant capacity and membrane integrity through activation of the AsA-GSH cycle, thereby suppressing the induction of chlorophyll-degradation-related enzymes and ultimately delaying yellowing/de-greening and senescence (Figure 8). Exogenous ethanol treatment can also delay senescence and ripening in several horticul-

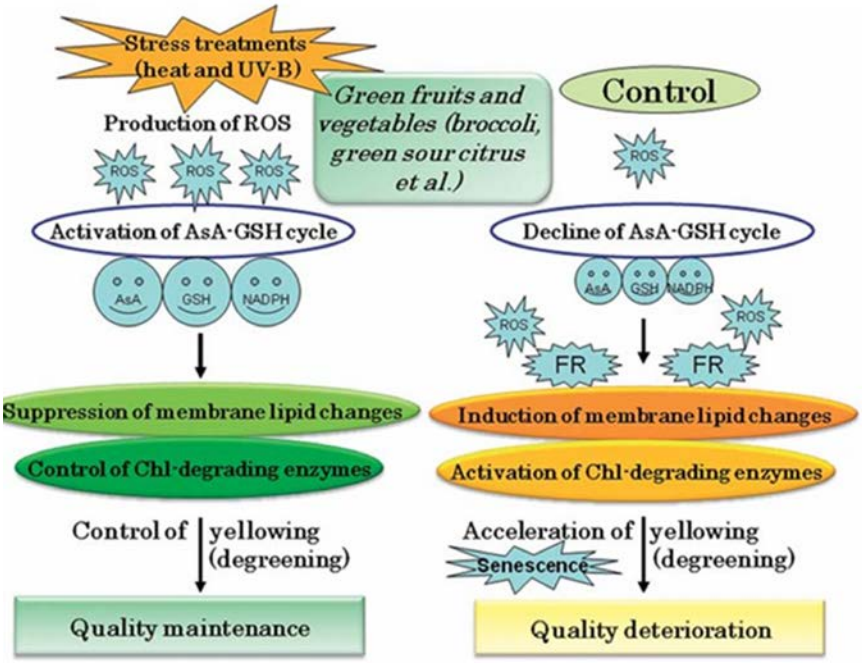


Figure 8. Physiological effect and its mechanism of stress treatments. Adopted from Yamauchi (2013).

Table 1. Some studies on the application of edible packaging in Japan.

Fruits and vegetables	Coating agents	Storage conditions	Results	Reference
Sudachi	Chitosan and alginate	10, 15, 20°C for 19 days	Edible coatings significantly lowered ethylene production and respiration rates, and noticeably maintained green peel color	Hira et al. (2022b)
Persimmon	Gelatin and frog skin oil	25±2°C for 9 days	Gelatin-based coating containing frog skin oil reduced weight loss and firmness decreasing of persimmon fruit and delayed the decay incidence of fruit during storage	Tanaka and Tanaka (2024)
Strawberry	*Aloe vera* gel and basil oil	20°C for 7 days	Combination of *Aloe vera* gel coating and basil oil preserved postharvest quality of strawberry fruit at ambient temperature	Tanaka and Tanaka (2024)
Satsuma mandarin	Chitosan, sandalwood oil and cellulose nanofiber	25°C for 5 days	The incorporation of cellulose nanofiber as a stabilizer agent into chitosan/sandalwood oil Pickering emulsion coating was found to improve the performance of antifungal activity	Tanaka and Tanaka (2024)
Tomato	Chitosan, lemongrass oil and cellulose nanofiber	20°C for 15 days	Coating solution of chitosan combined with lemongrass oil, using cellulose nanofibers showed better weight loss and color during storage	Tanaka and Tanaka (2024)

Table 2. Some studies on the application of active packaging system in Japan.

Active packaging system	Fruits and vegetables	Packaging and storage conditions	Active substance	Results	Reference
Ethylene scavengers	Mume	Polyethylene bag, 23±2°C for 6 days	Potassium permanganate	Ethylene absorbent in the bag delayed yellowing and softening of mume fruit	Zhang et al. (1991)
Ethanol emitters	Broccoli	Perforated polyethylene bag, 20°C for 5 days	Alcohol powder made from ethanol absorbed onto silica gel	Ethanol vapor treatment for broccoli delayed yellowing in florets	Suzuki (2011)
Carbon dioxide scavengers	Persimmon	Polyethylene bag, 0°C for 41 days	Calcium hydroxide	CO_2 absorbent in the bag suppressed off-odor production and maintained flesh crispness	Suzuki et al. (2021)

tural crops including broccoli, carnation and tomato (Suzuki, 2011).

Advanced packaging and transportation technology

Fresh fruit and vegetables are perishable and are therefore subject to widespread quality losses through microbial infection, physical damage and senescence. The losses in quality and quantity after postharvest significantly affect the relationship between harvest and consumption. In Japan, postharvest losses account for about 17% of the fruit and 11% of the vegetables harvested, and collectively account for about 70% of total food loss (Ministry of Agriculture, Forestry and Fisheries, 2025). Therefore, the maintenance of quality and improvement of shelf life is important for fruit and vegetables.

To enhance and prolong the shelf life of fruit and vegetables, a number of new innovations in packaging have been introduced and adopted.

Smart packaging

Smart packaging enables real-time monitoring and control of environmental changes such as temperature, humidity and gas concentration, thereby extending the shelf-life of fresh produce, reducing food waste, and improving product quality and safety (Drago et al., 2020; Vasuki et al., 2023). Recent advances in active, smart, and edible packaging technologies (Table 1) for postharvest produce have been comprehensively reviewed (Chan et al., 2025). Moreover, it offers benefits in terms of environmental sustainability and traceability, modernizing the horticultural industry (Drago et al., 2020; Ščetar et al., 2010; Du et al., 2025). Biodegradable materials are also increasingly explored as alternatives to conventional petroleum-based packaging (Cheng et al., 2024).

Smart packaging considers two categories: active packaging and intelligent packaging. Active packaging involves the incorporation of active substances into traditional packaging materials to augment the stability and quality of fruit and vegetables, or various gas absorbents and release agents within the packaging material that interact with the products or their surrounding environment to extend shelf life. Intelligent packaging is the integration of traditional packaging with modernized electronic sensing devices to detect changes in the quality of the products and monitor their safety before they reach consumers.

Active packaging is an advanced packaging technology. Compared with previous passive packaging, active packaging not only offers protection but also regulates the internal atmosphere of the package (Table 2). Active packaging technologies include oxygen scavengers (absorbers), carbon dioxide scavengers, carbon dioxide releasers (emitters), ethylene absorbers, humidity regulators and antimicrobial agents (Du et al., 2025). Recent studies have also explored bio-based active packaging systems using chitosan, essential oils, and cellulose nanofibers for tomato preservation (Nkeda et al., 2023). By controlling the gas composition and humidity levels within the packaging, active packaging can optimize the storage conditions of fruit and vegetables, minimize transpiration and slow the degradation of quality.

Intelligent packaging contains a number of indicators or sensors within the package to monitor and communicate information about the state of fruit and vegetables, such

Figure 9. Chinese chive packed by 'partial seal packaging'.

as quality and freshness, and provides traceability. This allows real-time tracking, thereby improving the ability to evaluate and assure the integrity of fruit and vegetables throughout its distribution. In parallel with smart packaging, biodegradable packaging materials are being increasingly explored to reduce environmental burdens associated with conventional plastics (Shaikh et al., 2021).

Modified atmosphere packaging

Modified atmosphere packaging (MAP) of fruit and vegetables is characterized by a dynamic process that alters the atmosphere inside the package (Mangaraj et al., 2009; Bodbodak and Rafiee, 2016; Oliveira et al., 2015; Yang et al., 2018). A desirable atmosphere condition is created using either active or passive MAP. Active MAP is based on the displacement or replacement of gases inside the package, or the usage of gas scavengers or absorbers to achieve a desirable mixture of gases (Bodbodak and Rafiee, 2016). Passive MAP is based on the usage of specific packaging materials, in which a desirable atmosphere is achieved naturally due to the respiration of produce and the diffusion of gases through the package materials (Charles et al., 2008).

Recent advances in polymer science and technology have made it possible to manufacture films with the desired and well-designed gas transmission rates. Alternative approaches to providing appropriate gas permeabilities have included films with holes or pores. P-Plus film, and 'partial seal packaging' are manufactured by perforating a polypropylene film with very tiny orifices using laser beams (Figure 9). The gas permeabilities are designed to balance the respiration rate of horticultural produce being packed (Nakata, 2001; Suzuki, 2007; Zhang et al., 1991).

Transportation technology

Transportation is a significant part of the distribution chain for fresh fruit and vegetables (Brecht et al., 2019; LeBlance and Hui, 2005). To improve refrigerated transportation systems to better maintain the quality of fresh fruits and vegetables, research has focused on improving refrigerated transport vehicles by optimizing the operation of refrigeration units, studying the air distribution in transport vehicles, minimizing physical damage due to vibration, resolving some of the challenges of transporting mixed loads, and addressing environmental issues related to the phasing-out of ozone depleting substances and the lowering of greenhouse gas emissions.

While the vibration damage during transport is still present, the appropriate design and use of protective packaging materials is important to reduce physical damage during transport and handling. Nakamura (2021) sought to reduce the degree of damage to cherry and strawberry fruit during transportation through buffer packaging. Individual fruit are pinched at the top and bottom in a plastic outer container with an elastic film sheet (Ishikawa, 2016).

When some products are mixed with other produce, retaining optimum temperatures in a mixed load is difficult. To resolve this problem, a multi-temperature reefer container has been developed to facilitate the transport of agricultural products by ship. The inside of a 20-ft reefer container is divided into two by a middle door, with a low temperature chamber (0°C) and on the door side, a high temperature chamber (10°C). A blast fan and a return port is provided in the bulkhead between the two chambers (Tanaka and Tanaka, 2021). This has already been utilized for the export of leafy vegetables, root vegetables and fresh legumes from Japan to Singapore (Ikegaya et al., 2023).

About the authors

Akira Tateishi

Mirai Azuma

Yusuke Kamiyoshihara

Yasunori Hamauzu

Yasuo Suzuki

Yoshihiro Imahori

Megumi Ishimaru

Dr. Akira Tateishi is a Professor at Nihon University, Japan. He specializes in postharvest technology research, focusing particularly on cell wall degradation related enzyme during fruit development and maturation. He also conducts basic research to elucidate the mechanisms of quality preservation from a horticultural physiological and biochemical perspective, investigating cell wall polysaccharides, and genes related to senescence and ripening of fruits. E-mail: tateishi.akira@nihon-u.ac.jp

Dr. Mirai Azuma is an Associate Professor at Nihon University, Japan. How do the flowers that brighten our lives bloom and eventually wilt? Dr. Azuma aims to uncover the mechanisms behind this process using biotechnology – such as plant hormone analysis and genetic engineering – with the goal of creating beautiful flowers that last longer. E-mail: azuma.mirai@nihon-u.ac.jp

Dr. Yusuke Kamiyoshihara is an Associate Professor at Nihon University, Japan. The "flavor" of fruits and vegetables is influenced not only by sweetness and acidity, but also significantly by aroma. Dr. Kamiyoshihara is conducting research to elucidate the mechanisms underlying the synthesis of key aromatic compounds in horticultural crops at the genetic level, with the aim of contributing to the development of fruits and vegetables with rich aromas. E-mail: kamiyoshihara.yuusuke@nihon-u.ac.jp

Dr. Yasunori Hamauzu is a Professor at Shinsyu University, Japan. Fruits and vegetables continue to live even after harvest. Depending on how they are handled, their metabolic activity changes, and their nutritional value and beneficial components also vary. Dr. Hamauzu uses local fruits and vegetables (particularly quince and Chinese quince) as research materials to investigate what beneficial components they contain and how they should be stored and processed to best preserve their characteristics and beneficial properties. E-mail: hamauzu@shinshu-u.ac.jp

Dr. Yasuo Suzuki is a Professor at Meijo University, Japan. He specializes in postharvest technology research, focusing particularly on the development of sustainable (energy-efficient and low-cost) storage technologies. His research aims to suppress senescence in horticultural crops stored at ambient or mildly low temperatures by utilizing abiotic stress such as ethanol treatment and temporary high-temperature treatment. He also conducts basic research to elucidate the mechanisms of quality preservation from a horticultural, physiological and biochemical perspective, investigating ethylene, metabolism of internal composition, and genes and transcription factors related to senescence and ripening. E-mail: yasuosuzuki@meijo-u.ac.jp

Dr. Yoshihiro Imahori is Professor Emeritus at Osaka Prefecture University, Japan. His research interests focus on ascorbate metabolism of postharvest fruits and vegetables, metabolic control during CA storage of fruits and vegetables, and postharvest treatment to prevent physiological disorder and to promote nutrition of fruits and vegetables. E-mail: imahori@omu.ac.jp

Dr. Megumi Ishimaru is a Professor at Kindai University, Japan. Fruit softening is caused by the degradation and reconstruction of cell walls. Dr. Ishimaru is conducting research focused on the characteristics and substrate specificity of the enzymes degrading cell walls. He is also conducting research to elucidate the internal structure of fruit using X-ray computed tomography (CT) imaging. E-mail: ishimaru@waka.kindai.ac.jp

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VII International Jujube Symposium

Division Horticulture for Human Health #ishs_dhea

The VII International Jujube Symposium "Bridging Tradition, Innovation and Climate Resilience" was held from 26 to 30 January 2026 in Kaohsiung, Taiwan, under the auspices of the International Society for Horticultural Science (ISHS). The symposium was jointly organized by the Taiwan Agricultural Research Institute, Ministry of Agriculture (TARI), the Kaohsiung City Government, and the Taiwan Society for Horticultural Science (TSHS). Dr. Wen-Li Lee, Mr. Kuo-Dung Chiou, Mr. Jhan-Hong Guo and Mr. Hsin-Liang Chen of TARI were the co-conveners.

The symposium took place at the Kaohsiung Main Public Library. A total of 188 participants from eight countries – Taiwan, China, USA, Romania, Thailand, India, Australia and Japan – attended the symposium. This international participation reflected the growing global interest in both Chinese jujube (*Ziziphus jujuba* Mill.) and Indian jujube (*Ziziphus mauritiana* Lam.) as traditional fruit crops with increasing modern horticultural value.

Bringing together scientists, extension specialists, growers, industry representatives and international stakeholders, the symposium provided an important platform for reviewing recent advances in jujube research and for discussing the future development of jujube production under changing environmental and market conditions.

The scientific program, held on 29 and 30 January, included 27 oral and 10 poster presentations. Major themes included industry trends and breeding, genetics and physiology, bioactive ingredients, pests and diseases, sustainable management, and postharvest processing. Keynote and invited lectures provided broad international perspectives. Prof. Meng-Jun Liu of Hebei Agricultural University, China, reviewed the history, germplasm diversity and global potential of Chinese jujube, emphasizing its drought tolerance and nutritional value. Prof. Florin Stănică of the University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania, shared three decades of jujube research in Romania, including cultivar introduction, phenology, fruit quality and processed products. Prof. Sheng-Rui Yao of New Mexico State University, USA, presented long-term performance data for jujube cultivars in the southwestern United States, while Prof. Zhi-Hui Zhao of Hebei Agricultural University, China, discussed the nutritional and functional value of *Ziziphus jujuba* var. *spinosa* seeds. Contributions from Thailand, India and Taiwan enriched discussion on Indian jujube production, breeding, postharvest handling, protected cultivation, pest management and emerging quality-assessment technologies.

Climate resilience was a central theme. In Taiwan, Indian jujube production has shifted from open-field orchards to net houses, rain shelters and greenhouses to reduce damage from birds, fruit flies, heavy rainfall, strong winds, cold fronts and unstable flowering conditions. Presentations and field observations showed that protected cultivation, combined with environmental monitoring, precision irrigation and improved orchard management, can reduce weather-related risks, improve fruit appearance and quality, and support export-oriented production.

A two-day technical tour on 27 and 28 January allowed participants to observe Taiwan's jujube industry during the peak production season. In Pingtung County, delegates visited a certified premium Indian jujube orchard in Ligang Township, where traceability-based

› Field tour dignitaries and keynote speakers at the opening ceremony, featuring representatives from the International Society for Horticultural Science (ISHS) and the Taiwan Agricultural Research Institute (TARI).

management, rain-shelter facilities, environmental monitoring and precision irrigation were demonstrated. At Baodao Southern Jujube in Gaoshu Township, participants observed cold-chain collection, grading, packing and export-oriented postharvest systems. These visits emphasized that fruit quality depends not only on orchard management, but also on careful sorting, cooling, packaging and distribution.

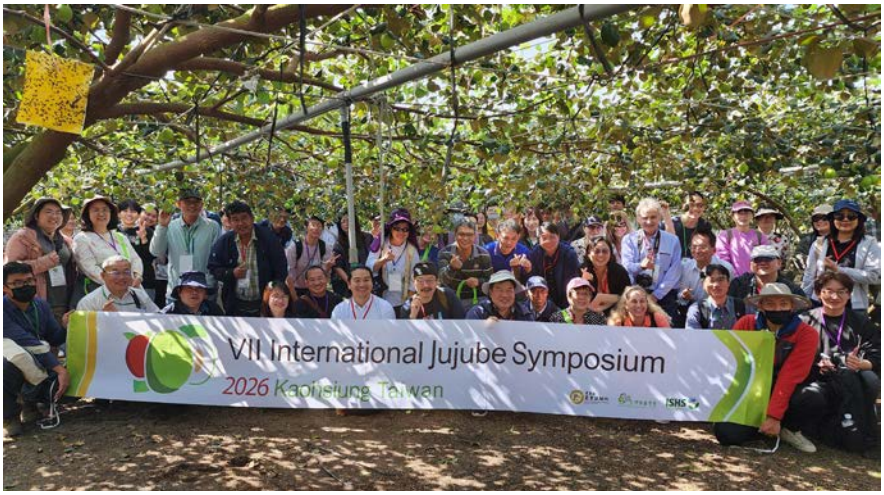
In Kaohsiung City, participants visited the Alian District Farmers' Association and Yuh-Tay Farm. The farmers' association demonstrated the role of local organizations in production support, food safety certification, regional branding, processing and marketing. Yuh-Tay Farm showcased facility-based cultivation using rain shelters, greenhouses, sensors, automated irrigation and misting systems to stabilize production under variable climatic conditions.

Beyond formal presentations and field visits, the symposium fostered valuable exchange among scientists, extension specialists, growers and industry partners. Discussions covered breeding objectives, cultivar adaptation, pest and disease problems, postharvest technologies, functional ingredients, processing opportunities and consumer preferences. For Taiwan, the symposium highlighted achievements in large-fruited, crisp and sweet Indian jujube cultivars, protected cultivation systems, traceability, food safety and postharvest innovation.

The VII International Jujube Symposium successfully linked traditional knowledge with modern innovation. It demonstrated the value of ISHS symposia in connecting science, production and international cooperation, and strengthened networks for future collaboration in cultivar development, climate-resilient production, postharvest technology and industry innovation. The symposium showed that both Chinese and Indian jujube can serve as bridges between tradition and modern horticulture, and between local production systems and global opportunities.

Wen-Li Lee, Kuo-Dung Chiou, Jhan-Hong Guo and Hsin-Liang Chen

› Delegates of the symposium at the opening ceremony.



› Participants visited a certified premium Indian jujube orchard in Ligang Township, Pingtung County, to observe traceability-based production and rain-shelter cultivation.

› The Alian District Farmers' Association introduced regional branding and value-added products, including dried Indian jujube and jujube blossom honey.

› Contact

Wen-Li Lee, Kuo-Dung Chiou, Jhan-Hong Guo and Hsin-Liang Chen, Fengshan Tropical Horticultural Experiment Branch, Taiwan Agricultural Research Institute, Ministry of Agriculture, Kaohsiung, Taiwan, e-mail: kuo@tari.gov.tw

› XI International Symposium on Irrigation of Horticultural Crops

Division Plant-Environment Interactions in Field Systems #ishs_dphy
Division Greenhouse and Indoor Production Horticulture #ishs_dgip
Division Temperate Tree Fruits #ishs_dfru
Division Vegetables, Roots and Tubers #ishs_dveg
Division Vine and Berry Fruits #ishs_dvin

Under the theme “Acting on water for climate change, environment and energy”, the XI International Symposium on Irrigation of Horticultural Crops brought together 163 researchers, practitioners and industry to confront the twin pressures of water scarcity and energy constraints. The symposium was organized by Dr. Alessio Scalisi, Dr. Ian Goodwin (Agriculture Victoria) and Dr. Pablo ZarcoTejada (IASCSIC) from 18-23 January 2026 at Tatura SmartFarm, Victoria, Australia. The scientific programme spanned sensordriven decision support, plant ecophysiology, remote sensing, protected cultivation, and management strategies for drought resilience – placing irrigation firmly at the nexus of climate adaptation, environmental stewardship and grower viability.

A strong theme throughout the week was the move from “measurement” to “management”: from ever-denser data streams to tools and rules that change irrigation decisions on farm. Keynote presentations set that tone – calling for water savings “beyond regulated deficit irrigation (RDI)” at basin scale; scrutinising nonconventional water sources and salinity tradeoffs; and reporting coordinated outcomes from the FruitCREWS network that link physiology, sensing and DSS into actionable scheduling.

Across the many oral and poster sessions, three developments stood out:

- The rise of AI and digital twins – tempered by practicality. Physicsinformed and machinelearning approaches were validated for greenhouse irrigation control, orchard evapotranspiration (ET) measurement, and waterstress classification.Equally,severalcontributions stressed return on investment (ROI), maintainability and the need to embed agronomy into models to avoid “all the gear and no idea”. Communitylevel digital twins were demonstrated to coordinate plotlevel prescriptions with district water forecasts – an adoption pathway when drought curtails allocation.

› Prof. Luca Corelli Grappadelli (left), Chair of ISHS Division Temperate Tree Fruits, and symposium conveners Alessio Scalisi (second from right) and Ian Goodwin (right) presenting the ISHS Young Minds Awards to Emanuele Dichio (center) for the best oral presentation and Harry Singh (second from left) for the best poster presentation.

- Plant based sensing is maturing. Continuous microtensiometer and dendrometer datasets were related to stem water potential and yield risk, supporting “survival signatures” that help growers minimise irrigation in low priority blocks during drought without crossing damage thresholds. Parallel work mapped hyperspectral signals against thermal (crop water stress index, CWSI) signals to track stress dynamics, including recovery lags in photosynthesis after re-watering.
- From tactics to systems. Studies integrated netting, substrate management, cover crops, pruning strategies, and even agrivoltaics to reduce evaporative demand, stabilise microclimate and lift water productivity – with cautions against over irrigating under nets and evidence that fruit load and canopy size should directly inform seasonal water requirement.

AI is no longer a novelty: physicsinformed controllers held drainage electrical conductivity (EC) on target in tomatoes with comparable yield to expert control; lowcost surface renewal ET sensors tracked eddy covariance closely, bringing “actual ET” within reach for commercial fields; and gradientboosting models classified almond stress reliably from weather, irrigation and soil tension. Together these results lower the barriers to adopting decision support tools that are specific to crop, block and day.

› Symposium participants in the Sundial Orchard during the Tatura SmartFarm tour.

Industry codevelopment was visible: sensor manufacturers and utilities presented side-by-side with researchers on traceability platforms, 2D soilwater visualisation, algae control for irrigation networks, and community-scale scheduling – providing evidence that research outputs are reaching the engineering and operational layers of organisations.

Multimodel ensembles projected higher irrigation demand in key Australian regions, while case studies showed that management gains (1.5-2.5 ML ha^{-1}) can offset part of that increase. Work on deficit irrigation timing, rootstock responses, and canopy and crop load adjustments provided growers with practical levers when water allocations were tightened.

The ISHS Young Minds Award for the best oral presentation was given to Emanuele Dichio (University of Pisa, Italy), "A feedback and feedforward irrigation decision support system based on wireless sensor networks and 5Gsatcom applied in precision viticulture."

The best poster was awarded to Harsimran (Harry) Singh (Agriculture Victoria & University of Queensland, Australia), "Water relations and growth of rootstockscion combinations in pome and stone fruit trained as narrow orchard systems."

Compared with previous irrigation symposia, the Tatura event placed markedly more emphasis on AI, continuous plant sensing and remote-sensing integration, alongside industry-led demonstrations. The discussion repeatedly linked plot-scale decisions to basin-scale outcomes, echoing keynote calls to couple on-farm efficiency with water governance and environmental limits.

We acknowledge the contribution of our sponsors: Hort Innovation; ICT International; CropX; GoulburnMurray Water; Sentek; Greater Shepparton; IASCSIC; FloraPulse; IXOM; Goulburn Broken; Victoria State Government; Go.Farm; ANFIC.

The XII International Symposium on Irrigation of Horticultural Crops will be held in Czech Republic in 2029.

Alessio Scalisi

› Contact

Alessio Scalisi, 255 Ferguson Road, Tatura VIC 3616, Australia, e-mail: alessio.scalisi@agriculture.vic.gov.au

› Panel of the Industry Workshop "Sustaining future orchard profitability in years with reduced access to irrigation water".

› Symposium participants listening to a sponsor (ICT International) demonstration in the agrivoltaics experiment at the Tatura SmartFarm.

VI International Conference on Postharvest and Quality Management of Horticultural Products of Interest for Tropical Regions

Division Postharvest and Quality Assurance #ishs_dphq
Division Ornamental Plants #ishs_dorn

Amidst the high-altitude vibrancy of the Colombian capital, the VI International Conference on Postharvest and Quality Management of Horticultural Products of Interest for Tropical Regions unfolded as a landmark event for the global horticultural community. Organized by the Amazonian Institute of Scientific Research (SINCHI) and the Universidad Nacional de Colombia, under the aegis of the International Society for Horticultural Science (ISHS) and with strategic support from the Bogotá Botanical Garden, the conference sought to bridge the gap between scientific rigor and the practical realities of tropical horticulture.

More than 160 participants from academia, government bodies, research centers and private enterprises attended the conference. While the majority (67%) were national delegates, the event boasted a significant international presence, with attendees from 13 different nations, including Italy, Mexico, France, Ecuador, Chile, Germany, Costa Rica, India, Benin, the United States, Peru, Brazil and Greece. This geographic diversity enriched the dialogue, bringing distinct perspectives to the challenges of logistics, the bioeconomy, and quality assurance in tropical agri-food chains.

The academic program was ambitious and comprehensive, structured around eleven central themes. Discussions ranged from the fundamentals of postharvest horticulture in the tropics and floral diversity to cutting-edge topics like artificial intelligence, emerging technologies, and the bioeconomy. Participants debated critical issues such as food security, natural ingredients, phytosanitary challenges and the complex logistics of foreign trade. The sessions seamlessly combined keynote lectures with oral presentations and spaces for discussion, all aimed at exploring integral solutions for agro-food sustainability.

The conference's scientific depth was underpinned by a number of high-level specialist presentations connecting the reality of the Colombian fruit and vegetable sector with global strategies for sustainability and innovation. These included:

- Daniela Idárraga Tunjo (National Coordinator, Food Systems for the Urban-Rural Continuum, FAO-UN);

› Dr. Nicolas Roux (right), ISHS representative, presenting the ISHS convener award to the conference conveners, Dr. Anibal Herrera (center) and María S. Hernández Gómez (left).

› Sunil Pareek, keynote speaker from India, expert in postharvest technology for tropical fruits.

› María S. Hernández Gómez (left), conference convener, presenting the ISHS Young Minds Award for the best oral presentation to Sandra Medina (right).

› Dr. Nicolas Roux (left), ISHS representative, presenting the ISHS Young Minds Award for the best poster presentation to Paola Esquivel (right).

- Luisa Fernanda Peña (Researcher, SINCHI);
- Juliana Cardona (Principal Researcher I, SINCHI);
- Rafael Aramendis (Director General, SURICATAS SAS);
- Cristian David Murcia (Policy Advisor for Food Systems, Universidad Nacional de Colombia);
- Jaime Alberto Barrera (Associate Researcher III, SINCHI);
- Claudia Betancourt (Executive Director, Biointropic);
- Joaquín Guillermo Ramírez Gil (Professor, Facultad de Ciencias Agrarias, Universidad Nacional de Colombia).

Complementing the local expertise, several world-renowned international keynote speakers spoke to the audience:

- Dr. Sunil Pareek (India): Associate Professor at the National Institute of Food Technology Entrepreneurship & Management;
- Dr. Romina Pedreschi (Chile): Professor at the Pontificia Universidad Católica de Valparaíso and Associate Editor of *Postharvest Biology and Technology*;
- Prof. Dennis del Castillo (Peru): An expert in forest management and Amazonian species;
- Prof. Sarana Rose Sommano (Thailand): Leader of the Plant Bioactive Compound Lab at Chiang Mai University;
- Dr. Rocio Díaz-Chávez (UK): Principal Research Fellow at the Centre for Environmental Policy, Imperial College London;
- Dr. María de Lourdes Arévalo (Mexico): Researcher at the Colegio de Postgraduados en Ciencias Agrícolas and Editor-in-Chief of *AgroDivulgación*;
- Prof. Zora Singh (Australia): Vice-Chair of ISHS Division Tropical and Subtropical Fruit and Nuts.

Beyond the lecture halls, the conference offered an immersive technical experience coordinated by professors Aníbal Orlando Herrera Arévalo and María Soledad Hernández Gómez. In the early hours of the morning, delegates traveled to the savannah of Bogotá to witness Colombian agriculture firsthand. The first stop was Sáenz Fety, a leader in technified agriculture with over three decades of experience. Here, participants analyzed greenhouse structures, fertigation systems,

› Participants at the end of the academic session.

and the crucial role of their Innovation and Development Center in validating sustainable practices.

The journey continued to Jardines de los Andes, a historic floriculture company with over half a century of export experience. Attendees were given a detailed tour of the postharvest processes – pre-cooling, grading and hydration – while learning about the company's robust sustainability programs, which include rainwater harvesting and composting. The day, sponsored by EXHCO, concluded with an integration lunch, allowing visitors from Europe and Latin America to network amidst the thriving agricultural landscape.

The conference culminated in a ceremony honoring the dedication and scientific rigor of its community. Special recognition was awarded to leaders and emerging talents who are shaping the future of the discipline:

- Dr. Luz Marina Mantilla (Director General, Instituto SINCHI), for her institutional leadership and contribution to the conference;
- Dr. Aníbal Herrera (Universidad Nacional de Colombia), for his academic contribution and organizational support;
- Sandra Medina (Universidad Nacional de Colombia), winner of the ISHS Young Minds Award for the best oral presentation entitled "Antioxidant and starch composition shifts in purple South American yams (*Dioscorea trifida* L.f.) during postharvest storage";
- Paola Esquivel (Universidad Nacional de Costa Rica), winner of the ISHS Young Minds Award for the best poster presentation entitled "Fungal pathogens associated with postharvest decay in the papaya 'Suerre' variety (*Carica papaya* L.) in Costa Rica".

These awards underscored ISHS's commitment to fostering the next generation of horticultural scientists. As the conference closed its doors, it left behind strengthened academic bonds and a renewed spirit of inter-institutional collaboration. Looking to the future, the torch was officially passed to Asia: the VII International Conference on Postharvest and Quality Management of Horticultural Products of Interest for Tropical Regions will take place in Chiang Mai, Thailand, in collaboration with Chiang Mai University.

María S. Hernández Gómez and Kimberly Lozano

Contact

María S. Hernández Gómez, Amazonic Research Institute – SINCHI, Calle 20, No 5-44, Bogota, D.C., Colombia, e-mail: shernandez@sinchi.org.co

› IV International Symposium on Beverage Crops

Division Postharvest and Quality Assurance	#ishs_dphq
Division Horticulture for Human Health	#ishs_dhea
Division Temperate Tree Fruits	#ishs_dfru
Division Tropical and Subtropical Fruit and Nuts	#ishs_dtro
Division Vegetables, Roots and Tubers	#ishs_dveg
Division Vine and Berry Fruits	#ishs_dvin

The IV International Symposium on Beverage Crops was held at Skukuza, Kruger National Park, South Africa from 15 to 20 March 2026, under the auspices of the International Society for Horticultural Science (ISHS). The symposium brought together researchers, industry stakeholders and students to explore the evolving role of beverage crops in addressing global challenges related to sustainability, human health and value addition within horticultural systems.

Guided by the theme "Beverage Crops: Sustainability and Scientific Advancements in the 21st Century," the scientific program featured plenary and parallel sessions addressing sustainable production, climate resilience, indigenous and underutilised crops, functional beverages, postharvest management, digitalization, and circular economy approaches. The symposium was supported by several ISHS Divisions, including Postharvest and Quality Assurance, Horticulture for Human Health, Temperate Tree Fruits, Tropical and Subtropical Fruit and Nuts, Vegetables, Roots and Tubers, and Vine and Berry Fruits, as well as the ISHS Working Group Beverage Crops. A total of 116 participants from 11 countries, including 38 students, attended this event, which was organized into a plenary and two parallel sessions to accommodate 60 oral and 31 poster presentations.

The symposium commenced with an Early Career and Student Development Workshop, which set a forward-looking tone for the meeting. The workshop focused on scientific publishing, research career development, innovation pathways and professional networking. Particular emphasis was placed on navigating the scientific landscape, including strategies for high-impact publishing, interdisciplinary collaboration, and translating research into practical and commercial outcomes. The workshop provided an interactive platform for engagement, mentorship and knowledge exchange, fostering confidence to contribute meaningfully to the evolving field of beverage crops. Importantly, it reinforced the role of emerging scientists as key drivers of innovation and sustainability within future food systems.

The keynote presentations provided a strong conceptual foundation for the symposium. Prof. Dr. Vladimir Jiranek (The University of Adelaide, Australia) presented on "Novel Australian ecological niches as sources of novel microbes for industry," highlighting the potential of microbial resources in fermentation. Prof. Dr. Francisco A. Tomás-Barberán (CEBAS-CSIC, Spain) addressed "Fruit beverage bioactives and healthy ageing," emphasizing the health-promoting properties of phytochemicals. Prof. Dr. Umezuruike Linus Opara (Stellenbosch University, South Africa) explored value chain integration in "Linking beverage crops to markets through research and innovation – lessons from the pomegran-

› Participants of the symposium.

ate as a model crop." Prof. Dr. George Manganaris (Cyprus University of Technology, Cyprus) concluded with "Utilizing discarded fruit crops for beverage production," highlighting sustainable approaches to waste valorisation.

Guest speakers further enriched the program through perspectives spanning academia, government and innovation systems. These included Prof. Letlhokwa Mpedi (Vice-Chancellor and Principal of the University of Johannesburg, South Africa); Dr. Phuti Chelopo Mgobozi (The Innovation Hub, South Africa); Dr. Sonja Venter (Agricultural Research Council, Department of Agriculture, South Africa); and Dr. Karin Hannweg (Chair of ISHS Division Tropical and Subtropical Fruit and Nuts). Their contributions emphasized the importance of cross-sector collaboration in advancing research, innovation and policy within beverage crop systems.

The symposium also facilitated engagement beyond formal sessions, with poster discussions and networking activities, including a game drive, supporting knowledge exchange and strengthening professional connections.

During the ISHS Business Meeting, Prof. Cristina García-Viguera (CEBAS-CSIC, Spain) was announced as the new Chair of ISHS Working Group Beverage Crops. In addition, Prof. Giuseppe Ferrara (University of Bari 'Aldo Moro', Italy) was confirmed as the convener of the next International Symposium on Beverage Crops, to be held in Italy in 2028.

Recognition of excellence and participation were important components of the symposium. The ISHS Young Minds Award for the best oral presentation was presented to Ms. Mahlatse Morena (University of Johannesburg | PARC, South Africa) for "Chemical profiling of *Eriocephalus* essential oils and antifungal potential against *Diaporthe infecunda* and *Alternaria alstroemeriae*." The ISHS Young Minds Award for the best poster presentation was awarded to Ms. Priscilla Livhuwane Mukwevho (University of Johannesburg | PARC, South Africa) for *"Opuntia ficus-indica* cladodes mucilage hidden treasures: optimizing ultrasound-assisted extraction of pectic polysaccharides."

› Keynote speaker Prof. Dr. Umezuruike Linus Opara.

› Professor Olaniyi Fawole (left), Convener, presenting the ISHS Young Minds Award for the best oral presentation to Ms. Mahlatse Morena (right).

› Dr. Karin Hannweg (right), Chair of ISHS Division Tropical and Subtropical Fruit and Nuts, presenting the ISHS Young Minds Award for the best poster presentation to Ms. Priscilla Livhuwane Mukwevho (left).

Additional recognitions highlighted engagement and commitment among participants. Mr. Benjamin Morris (University of Johannesburg, South Africa) was acknowledged for outstanding participation in the Early Career and Student Development Workshop, while Prof. Peter Jeranyama (University of Massachusetts Amherst, USA) was recognized for travelling the greatest distance to attend the symposium.

Overall, the symposium demonstrated significant progress in beverage crop research, particularly in integrating sustainability, innovation and health-oriented approaches. The strong emphasis on interdisciplinary collaboration and emerging research areas reflects a dynamic and evolving field positioned to address future global challenges.

We acknowledge the support of our partners and sponsors for making this symposium possible: the University of Johannesburg and the Department of Science, Technology and Innovation, South Africa. Special appreciation is extended to the organizing committee and all contributors whose efforts ensured the success of the event.

Olaniyi Fawole

› Contact

Prof. Olaniyi Fawole, Postharvest and Agroprocessing Research Centre, Department of Botany and Plant Biotechnology, University of Johannesburg, Auckland Park, Johannesburg, South Africa, e-mail: olaniyif@uj.ac.za

From the Secretariat

New ISHS members

ISHS is pleased to welcome the following new members:

New Individual Members

Australia: Mr. Stuart Ames, Dr. Rachael Bathgate, Ms. Rachel Brook, Mr. Sean Espinola, Dr. Mahmood Ul Hasan, Emma Warren; **Austria:** Johannes Gafriller, Johanna Jankowetz, Hannes Josef Mair; **Bangladesh:** Prof. Dr. Abul Hasnat Muhammad Solaiman; **Belgium:** An Ceustermans; **Canada:** Dr. Letitia Da Ros, Dr. Aime Messiga; **Chile:** Dr. Michelle Morales; **China:** Prof. Dr. Jinfeng Chen, Prof. Yi Song Chen, Jiayou Ding, Prof. Xiucai Fan, Prof. Dr. Honghui Gu, Dr. Yaqiong Hao, Suping Kong, Dr. Wei Li, Prof. Dr. Bingjiang Liu, Prof. Dr. Feishi Luan, Prof. Dr. Honghao Lv, Prof. Ju Min, Prof. Guozheng Qin, Prof. Dr. Yaxin Sang, Prof. Dr. Shuxing Shen, Assoc. Prof. Guifang Tian, Prof. Dr. Jiansheng Wang, Prof. Dr. Zhengyi Wang, Dr. Yu Wei, Mr. Jiawei Wen, Zongzhou Xie, Prof. Jf Xu, Yanyan Yang, Prof. Dr. Shuancang Yu, Assoc. Prof. Xuejiao Zhang, Assist. Prof. Caihong Zhong, Prof. Dr. Benzhong Zhu, Prof. Hongliang Zhu; **Chinese Taipei:** Hong-Hwa Chen, Hsia Li, Ms. Ping-Chen Li, XinJie Liao, Prof. Min-Hsiung Pan; **Colombia:** Jair Ortiz; **Czech Republic:** Dr. Jan Ponert; **Dominican Republic:** Marcela Isabel Angel Cerpa; **Estonia:** Kristiina Niilits; **Ethiopia:** Assist. Prof. Haile Ketema Assefa; **Finland:** Mr. Mianzhi Wang, Ms. Yuwen Zhang; **France:** Mr. Vincent Fernandez, Ms. Marie-Beatrice Roux; **Germany:** Prof. Dr. Nina Kloster, Prof. Dr. Lukasz Lopusiewicz; **Ghana:** Mildred Osei-Kwarteng; **Greece:** Assoc. Prof. Konstantinos Demestichas, S. Michailidou; **India:** Ms. Sudeepa Hore, Mr. Ajit Jain, Dr. Hemanth Kumar P, Prof. Dr. Jadeyegowda Madegowda, Prof. Dr. Nagesha Narayanappa, Mr. Puyam Tondonba Singh; **Italy:** Prof. Dr. Alessandra Bordoni, Dr. Pietro Di Benedetto, Ciro Gardi, Assoc. Prof. Stefano Pavan, Ms. Jimena Maria Pérez Brandán, Dr. Mauro Sbaraglia; **Japan:** Dr. Maria Stefanie Dwiyanti, Dr. Takayoshi Ishii, Prof. Hiroyoshi Iwata, Prof. Kenji Kato, Dr. Mai Kobayashi, Satoru Komagata, Yumika Mine, Assoc. Prof. Eiji Nitasaka, Prof. Yuki Ogura-Tsujita, Dr. Kento Rammitsu, Mr. Andres Ramos, Ms. Shin Shoji, Dr. Yasuyuki Yamaji, Assoc. Prof. Masaya Yamamoto, Dr. Yumi Yamashita, Prof. Kazufumi Yazaki; **Korea (Republic of):** Mr. Gyubin Hwang, Mr. Seonmin Kim, Ms. Han Na Lee, Mr. Yoongil Lee, Ms. Dajeung Song; **Lebanon:** Mr. Joe Merheb; **Nepal:** Pusp Raj Joshi, Ms. Samjhana Joshi, Dr. Tirtha Raj Pandey, Dr. Bhakta Bahadur Raskoti; **Netherlands:** Cristian Chelu; **New Zealand:** Mr. Patrick Malley, Dr. Hannah McCarthy, Dr. Hendrik Venter; **Nigeria:** Ms. Salome Arewa; **Norway:** Ms. Hilde Liland, Dr. Rodmar Isak Rivero; **Portugal:** Dr. Filipa Grilo; **Qatar:** Ms. Rupkatha Roy Chowdhury; **Romania:** Vladut Loredan Holt, Mr. Kevin Mansour, Robert Stanescu; **Russian Federation:** Dr. Ivan Timofeenko; **Saudi Arabia:** Ms. Limia Elzain Elamin; **Senegal:** Dr. Djibril Djigal, Dr. Pape Demba Kane, Dr. El Hadji Malick Leye; **Serbia:** Mr. Goran Pavlovic, Prof. Dr. Vladan Pesic; **South Africa:** Mr. Dawie du Toit, Mr. Craig Fulton, Ms. Leana Louw, Ms. Eulenda Mabunda, Mr. Manaka Makgato, Dr. Neliswa Matrose, Ms. Mahlatse Morena, Ms. Priscilla Mukwevho, Dr. Mduduzi Ngcobo; **Spain:** Dr. Nathan Clay, Mr. Hamza Bin Sajid; **Sweden:** Prof. Rishikesh Bhalerao; **Switzerland:** Ms. Icíar Giménez de Azcárate; **Tanzania:** Mr. Charei Munene; **Turkey:** Baver Firat Esmer; **United Kingdom:** Ms. Eleni Fellows, Eden Hoppe Tarr, Ms. Megan Willows, Dr. Yusra Zireeni; **United States of America:** Mahesh Sanjeewa Bamunusingha Arachchilage, John Paul Baugher, Ms. Srijana Bharati, Ms. Suzanne Bishop, Megan Burrit, Jim Cortese, Prof. Dr. Kevin Crosby, Srijana Dura, Mr. Alexander Engelsma, Ms. Leah Eubank, Dustin Faulkner, Ian Hammond, Trish Hanlon, Brad Hanson, Mr. Peter Hanson, David Horvath, Dr. Bizhen Hu, Dr. Deepak Kumar Jha, Dr. Amber Jolly, Dr. Josh Kardos, Ms. Carmen Ketron, Dr. Patricia Lazicki, Assist. Prof. Robert Leeds, Alexander Liu, Mr. John M Willis, Dr. Jonathan Magby, John Marshall, Prof. Ray Ming, Anjal Nainabasti, Dr. Eben Ogundiwin, Kevin Ong, Mr. Ryan Pande, Manisha Patil, Mike Patrick, Tanzeel Rehman, Sydney Richens, Mr. Chanz Robbins, Mr. Gabriel Sachter-Smith, Ryan Schwartz, Prof. Dr. Jyoti Sharma, Dr. Reza Shekasteband, Neil Short, Mr. Shawn T. Steed, Assist. Prof. Senay Ugur, Dr. Eric Ward, Nicole Waterland, Cameron Zuber; **Uzbekistan:** Dr. Abdulla Rakhimov; **Vietnam:** Mr. Tung Ngo Xuan; **Virgin Islands:** Mr. Daryl Richards.

› Calendar of ISHS events

For updates and more information, go to www.ishs.org › Symposia › Calendar. For a comprehensive list of meetings in each Division or Working Group use the "About us › Scientific Structure" option from the website navigation menu.
To claim reduced registration for ISHS members, your personal membership number is required when registering - ensure your ISHS membership is current before registering. When in doubt, sign in to your membership account and check/renew your membership status first: www.actahort.org or www.ishs.org

Year 2026

- August 23-28, 2026, Kyoto (Japan): **XXXII International Horticultural Congress: IHC2026.** Info: Prof. Dr. Ryutaro Tao, Lab. Pomology, Fac. Agric., Kyoto University, Kitashirakawa Oiwake-cho, Sakyo-ku Kyoto 606-8502, Japan. Phone: (81)757536053, Fax: (81)757536497, E-mail: tao.ryutaro.8c@kyoto-u.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/

Symposia at IHC2026

- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Horticultural Genetic Resources and their Usefulness for Breeding.** Info: Dr. Sandra Correia, Dept Life Sciences, University of Coimbra, Calcada Martim de Freitas, 3000-456 Coimbra, Portugal. E-mail: sandraimc@uc.pt or Dr. Nobuko Mase, Citrus Research Station, Institute of Fruit, Tree and Tea Science, NARO, 485-6 Okitsunaka-cho, Shimizu, Shizuoka City, Shizuoka 424-0292, Japan. E-mail: mase.nobuko909@naro.go.jp or Dr. Yoichi Kawazu, Inst. of Vegetable & Floriculture Sci. NARO, 360 Ano, Tsu, Mie, Japan. E-mail: kawazu.yoichi958@naro.go.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s01/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Challenges and Perspectives on Innovative Technologies for Breeding of Horticultural Crops.** Info: Prof. Byoung-Cheorl Kang, Seoul Natl. Univ., San 56-1, Sillim 9-dong, Gwanak-gu, Seoul 151-742, Korea (Republic of). E-mail: bk54@snu.ac.kr or Prof. Isobe Sachiko, University of Tokyo, Bunkyo 1-1-1, Yayoi, Tokyo, 113-8657, Japan. E-mail: sisobe@g.ecc.u-tokyo.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s02/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Innovative Technologies and Production Strategies for Smart Greenhouse.** Info: Prof. In-Bok Lee, Lab. of Aero-Environmental Engineering, College of Agric. and Life Science, Seoul National University, San 56-1, Silim-dong, Gwanak-Gu, Seoul, Korea (Republic of). E-mail: iblee@snu.ac.kr or Dr. Tadahisa Higashide, National Agric. & Food Res. Organization, 3-1-1, Kannondai, Tsukuba, Ibaraki, 305-8519, Japan. E-mail: higashide.tadahisa088@naro.go.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s03/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: II International Symposium on Advances in Vertical Farming.** Info: Prof. Dr. Qichang Yang, Institute of Urban Agriculture, CAAS, No. 36, Lazidong Street, Shuangliu District, Chengdu, Sichuan, China. E-mail: yangqichang@caas.cn or Prof. Dr. Eiji Goto, Graduate School of Hort.,Chiba University, 648 Matsudo, Matsudo, Chiba 271-8510, Japan. E-mail: goto@faculty.chiba-u.jp or Prof. Dr. Naoya Fukuda, Inst. Life Environ. Sci., T-PIRC, University of Tsukuba, Tennodai 1-1-1, Tsukuba city, Japan. E-mail: fukuda.naoya.ka@u.tsukuba.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s04/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Sustainable Plant Production in Greenhouse Horticulture and Protected Cultivation.** Info: Dr. Silke Hemming, Wageningen University & Research, Business Unit Greenhouse Horticulture, Droevendaalsesteeg 1, 6708 PB Wageningen, Netherlands. E-mail: silke.hemming@wur.nl or Dr. Yasunaga Iwasaki, 2060-1 Kurokawa Asao ward, Kawasaki city 2150035, Meiji University, Faculty of Agriculture, Japan. E-mail: iwasakiy@meiji.ac.jpE-mailsymposium:p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s05/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Modeling and Digital Approaches to Explore the Diversity of Crop Physiology and Management in Field Conditions.** Info: Dr. Evelyne Costes, INRA UMR AGAP, Avenue Agropolie, 34398 Montpellier Cedex 5, France. E-mail: evelyne.costes@inrae.fr or Takayoshi Yamane, 2-1 Fujimoto, Tsukuba 3058605, Japan. E-mail: yamane.takayoshi156@naro.go.jp or Dr. Koji Sugahara, 3-1-1 Kannondai, Tsukuba 3058519, Japan. E-mail: sugahara.koji783@naro.go.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s06/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Developmental and Molecular Responses of Horticultural Plants to Abiotic Stress, including Temperature.** Info: Dr. Erika Varkonyi-Gasic, PFR, Private Bag 92169, Auckland mail Centre, 1142 Auckland, New Zealand. E-mail: erika.varkonyi-gasic@plantandfood.co.nz or Prof. Dr. Nobuhiro Kotoda, Fruit Science lab, Saga University, 1 Honjo-machi, Saga 840-8502, Japan. E-mail: koto@cc.saga-u.ac.jpE-mailsymposium:p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s07/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Advances in Postharvest Biology and Technology of Horticultural Crops.** Info: Assoc. Prof. Kietsuda Luengwilai, Dept. Horticulture, Fac. Agriculture at Kamphang Saen, Kasetsart University, Kamphang Saen campus, Kamphang Saen 73140, Thailand. E-mail: kietsuda.l@ku.ac.th or Prof. Eriko Yasunaga, 3-5-8 Saiwai-cho, Tokyo University of Agriculture and Technol, Fuchu 183-8509, Japan. E-mail: erikoy@go.tuat.ac.jp or Dr. Yasuo Suzuki, Faculty of Agriculture, Meijo University, Shiogamaguchi 1-501, Tenpaku-ku, Nagoya 468-8502, Japan. E-mail: yasuosuzuki@meijo-u.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s08/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: XI International Symposium on Human Health Effects of Fruits and Vegetables - FAVHEALTH2026.** Info: Prof. Mariusz Piskula, Wadowskiego 15, 10-761 Olsztyn, Poland. E-mail: m.piskula@pan.olsztyn.pl or Prof. Kaeko Murota, 1-1 Gakuen-cho, Naka-ku, Sakai, Osaka 599-8531, Japan. E-mail: murota@omu.ac.jp or Dr. Kentaro Matsumiya, Graduate School of Agriculture, Kyoto University, Kitashirakawa-Oiwakecho, Sakyo, Kyoto 606-8502, Japan. E-mail: matsumiya.kentaro.6w@kyoto-u.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s09/

- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Medicinal, Aromatic Plants and Natural Colorants - incl. ISSBT2026.** Info: Prof. Dr. Mahmoud A. Sharafeldin, National Research Centre, Egypt. E-mail: sharafeldin99@yahoo.com or Dr. Po-An Chen, No. 3, Aly. 35, Ln. 191, Jiannan Rd., Pingtung City, Pingtung County 900, Taiwan, 900 Pingtung, Chinese Taipei. E-mail: chenpoan@mail.atri.org.tw or Assist. Prof. Ryosuke Munakata, Lab. Plant Gene Expression, RISH, Kyoto Uni, Uji, Japan. E-mail: munakata.ryosuke.3z@kyoto-u.ac.jp or Assist. Prof. Toshiyuki Waki, Aramaki Aza Aoba, Aoba-ku, Tohoku University, Sendai 9808579, Japan. E-mail: waki@tohoku.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s10/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: XVII International People Plant Symposium and IV International Symposium on Horticultural Therapies (HortTherapy2026).** Info: Prof. Dr. Sin-Ae Park, Konkuk University, 225 Life and Environment Science building, 05029 Seoul, Korea (Republic of). E-mail: sapark42@konkuk.ac.kr or Takuya Kenmochi, Awaji Campus, University of Hyogo, 954-2 Nojimatokiwa, Awaji 656-1726, Japan. E-mail: takuya_kenmochi@awaji.ac.jp or Assoc. Prof. Fumie Tazaki, Awaji campus, University of Hyogo, 954-2 Nojimatokiwa, Awaji 656-1726, Japan. E-mail: fumie_tazaki@awaji.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s11/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: II International Symposium on Urban Horticulture for Sustainable Food Security: Toward Food-Secure Cities (UrbanFood2026).** Info: Dr. Giuseppina Pennisi, University of Bologna, Viale Giuseppe Fanin 44, 40127 Bologna, Italy. E-mail: giuseppina.pennisi@unibo.it or Mr. Masakazu Yamada, 1-1 Owashi, Tukuba 3058686, Japan. E-mail: yamadam0172@jircas.go.jp or Dr. Sayuri Teramoto, University of the Ryukyus, 1 Senbaru, Nishihara, Okinawa, 9030213, Japan. E-mail: teramoto@cs.u-ryukyu.ac.jp or Yasuhiko Koike, Tokyo University of Agriculture, 1737 Funako Atsugi, Kanagawa 243-0034, Japan. Phone: (81)462706527, E-mail: koike@nodai.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s12/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: IV International Symposium on Greener Cities: Re-imagining Urban Landscapes (GreenCities2026).** Info: Prof. Dr. Luis Pérez-Urrestarazu, Agro-Forestry Engineering, Universidad de Sevilla, ETSIA Ctra. Utrera km.1, 41013 Sevilla, Spain. E-mail: lperez@us.es or Assoc. Prof. Tomoko Takeuchi, 648 Matsudo, Matsudo-shi, Chiba, 271-8510, Japan. E-mail: tomoko_takeuchi@chiba-u.jp or Assoc. Prof. Shoko Hikosaka, 648 Matsudo, Matsudo city 271-8510, Japan. E-mail: s-hikosaka@faculty.chiba-u.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s13/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Evaluating the Impact and Scaling of Innovations for Sustainable Horticulture.** Info: Dr. Melinda Knuth, NC State University, 2721 Sullivan Drive, Campus Box 7212, Raleigh, NC 27695, United States of America. E-mail: mjknuth@ncsu.edu or Prof. Dr. Shusuke Matsushita, Kitashirakawa Oiwake-cho, Sakyo-ku, Kyoto, Japan. E-mail: matsushita.shusuke.7z@kyoto-u.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s14/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: II International Symposium on Agroecology and Systems Approaches for Sustainable and Resilient Horticultural Production.** Info: Prof. Dr. Maria Claudia Dussi, Universidad Nacional del Comahue, Facultad de Ciencias Agrarias, CC 85 (8303) Cinco Saltos, Rio Negro-Patagonia, Argentina. E-mail: mcdussi@yahoo.com or Prof. Rachel Bezner Kerr, 262 Warren Hall, Department of Global Development, Cornell University, Ithaca, NY 14853, United States of America. E-mail: rbeznerkerr@cornell.edu or Prof. Dr. Rie Miyaura, Tokyo University of Agriculture, 1-1-1 Sakuragaoka, Setagaya 156-8502, Japan. E-mail: mia@nodai.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s15/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: II International Symposium on Innovations in Ornamentals: From Breeding to Market.** Info: Prof. Junping Gao, China Agricultural University, Beijing, 100193, China. E-mail: gaojp@cau.edu.cn or Dr. Kenichi Shibuya, 2-1 Fujimoto, Tsukuba 305-0852, Japan. E-mail: shibuya.kenichi573@naro.go.jp or Dr. Masafumi Yagi, Ins. of Vegetable and Floriculture Science, NARO, 2-1 Fujimoto, Tsukuba, Japan. E-mail: yagi.masafumi967@naro.go.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s16/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Innovative Use of Diverse Traits (Color, Shape and Fragrance) in Ornamentals.** Info: Prof. Dr. Zhanao Deng, University of Florida, IFAS, Gulf Coast Research and Education Center, 14625 County Road 672, Wimauma, FL 33598, United States of America. E-mail: zdeng@ufl.edu or Dr. Ayumi Deguchi, 648, Matsudo, Matsudo-shi 271-8510, Japan. E-mail: deguchia@chiba-u.jp or Prof. Dr. Munetaka Hosokawa, Nakamachi, Nara-shi, Nara 631-0052, Japan. E-mail: mune@nara.kindai.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s17/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Vegetable Breeding for Sustainable Field and Greenhouse Production through Modern Selection Techniques and Molecular Tools (BreedVegs2026).** Info: Prof. Dr. Yuling Bai, WUR, Drovendaalsesteeg 1, 6700 AJ Wageningen, Netherlands. E-mail: bai.yuling@wur.nl or Dr. Pasquale Tripodi, Via Cavalleggeri 25, 84098 Pontecagnano Faiano, Italy. E-mail: pasquale.tripodi@crea.gov.it or Prof. Dr. Masayoshi Shigyo, Faculty of Agriculture, Yamaguchi University, Yoshida 1677-1, Yamaguchi 753-8515, Japan. E-mail: shigyo@yamaguchi-u.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s18/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Diversification of Vegetable Production and New Growing Techniques for Sustainable Farming Systems (GreenVegs2026).** Info: Assoc. Prof. Francesco Di Gioia, The Pennsylvania State University, Shortlidge Road, Tyson Building 207, University Park PA 16802, United States of America. E-mail: fxd92@psu.edu or Dr. Megumu Takahashi, 3-1-1, Kannondai, Tsukuba 3058519, Japan. E-mail: takahashi.megumu000@naro.go.jp or Dr. Fumio Sato, Kannondai 3-1-1, Tukuba 3058519, Japan. E-mail: sato.fumio525@naro.go.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s19/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Berries: New Tools for Crop Improvement.** Info: Prof. Lisa DeVetter, WSU, 16650 Washington 536, Mount Vernon, WA 98273, United States of America. E-mail: lisa.devetter@wsu.edu or Dr. Simona Nardozza, The New Zealand Institute for Plant, & Food Research, 120 Mt Albert Road, Auckland Sandringham, New Zealand. E-mail: simona.nardozza@plantandfood.co.nz or Dr. Takeshi Kurokura, 350 Mine, Faculty of Agriculture, University of Utsunomiya, Utsunomiya 321-8505, Japan. E-mail: kurokura@cc.utsunomiya-u.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s20/

- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Advances in Grapevine Genetics and Physiology: Innovation and Adaptation for the Next-Generation Resilient Viticulture.** Info: Prof. Giovanni Battista Tornielli, DAFNAE, University of Padova, Viale dell'Università, 16, 35020 Legnaro (PD), Italy. E-mail: giovannibattista.tornielli@unipd.it or Prof. Dr. Jinggui Fang, No. 666, Binjiang Avenue, Jiangbei New Area, Nanjing, Jiangsu, P.R.China, 211800, China. E-mail: fanggg@njau.edu.cn or Dr. Akifumi Azuma, Institute of Fruit Tree and Tea Science, NARO, Akitsu Mitsu 301-2, Higashi-Hiroshima Hiroshima 739-2494, Japan. E-mail: azuma.akifumi128@naro.go.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s21/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Sustainable Production Systems in Temperate Tree Crops.** Info: Prof. George Manganaris, Anexartisias 57, PAREAS Building, P.O. Box 50329, 3603 Lemesos, Cyprus. E-mail: george.manganaris@cut.ac.cy or Hideki Murayama, Faculty of Agriculture, Yamagata University, 1-23 Wakabamachi Tsuruoka, Yamagata 997-8555, Japan. E-mail: mhideki@tds1.tr.yamagata-u.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s22/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Application of Genetics and Breeding Approaches to Improve Temperate Tree Crops.** Info: Prof. Dr. Fabrizio Costa, Via Mach 1, 38098 San Michele all"Adige, Trento, Italy. E-mail: fabrizio.costa@unitn.it or Dr. Atsushi Kono, 2-1, Fujimoto, Tsukuba, Ibaraki 305-8605, Japan. E-mail: kono.atsushi993@naro.go.jp or Dr. Miyuki Kunihisa, Fujimoto 2-1, Tsukuba, Japan. E-mail: kunihisa.miyuki700@naro.go.jp or Dr. Norio Takada, Institute of FruitTree and TeaScience, NARO, Fujimoto 1-2, Tsukuba, Ibaraki 305-8606, Japan. Phone: (81)298386464, E-mail: takada.norio513@naro.go.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s23/ NEW
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Bridging Science and Practice for Tropical and Subtropical Fruits and Nuts.** Info: Prof. Dr. Zora Singh, Edith Cowan University, Horticulture, School of Science, 270 Joondalup Drive, Joondalup 6027, Western Australia, Australia. E-mail: z.singh@ecu.edu.au or Assoc. Prof. Shu-Yen Lin, 1, 4th sec., Roosevelt Road, Da-an district, Dept. of Horticulture, National Taiwan University, Chinese Taipei. E-mail: sylin@ntu.edu.tw or Dr. Naoko Kozai, Kagoshima University, Korimoto 1-21-24, Kagoshima, Kagoshima 890-0065, Japan. E-mail: nkozai@agri.kagoshima-u.ac.jp or Dr. Shingo Goto, 2-1 Fujimoto, Tsukuba, Ibaraki 305-8605, Japan. Phone: (81)29-838-6474, E-mail: goto.shingo184@naro.go.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s24/ NEW
- August 23-28, 2026, Kyoto (Japan): **IHC2026: XIII International Symposium on Banana: Exploring Banana Diversity for Improved Livelihoods.** Info: Dr. Sebastien Carpentier, Bioversity International, Willem de Croylaan 42 - bus 2455, 3001 Heverlee, Belgium. E-mail: sebastien.carpentier@biw.kuleuven.be or Assoc. Prof. Yasuaki Sato, Global Humanities and Social Sciences, Nagasaki University, 1-14 Bunkyo, Nagasaki 852-8521, Japan. E-mail: y-sato@nagasaki-u.ac.jpE-mailsymposium:p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s25/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Recent Advances in Horticulture in East Asia, Southeast Asia and the Pacific.** Info: Prof. Dr. Roderick A. Drew, Griffith Sciences, Griffith University, Kessels Road, Nathan, QLD 4111, Australia. E-mail: roderick.drew646@gmail.com or Prof. Dr. Zhen-Hai Han, Institute for Horticultural Plants, China Agricultural University, No. 2 Yuanmingyuanxilu, 100193 Beijing, China. or Dr. Sota Koeda, Lab. Horticultural Science, Kindai University, 3327-204 Nara 631-8505, Japan. E-mail: 818sota@nara.kindai.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s26/
- August 23-28, 2026, Kyoto (Japan): **IHC2026: International Symposium on Innovation in Horticulture, via Fundamental Science on Reproductive Biology of Annuals and Perennials.** Info: Prof. Avi Sadka, ARO, The Volcani Center, Department of Fruit Trees Sciences, 68 HaMaccabim Rd., P.O. Box 15159, Rishon LeZion 7528809, Israel. E-mail: vhasadka@volcani.agri.gov.il or Prof. Hisayo Yamane, Laboratory of Pomology, Graduate School of Agriculture, Kyoto University, Kyoto 606-8502, Japan. E-mail: yamane.hisayo.6n@kyoto-u.ac.jp or Prof. Dr. Masahiro Kanaoka, Prefectural University of Hiroshima, Nanatsuka5562 Shobara 7270023, Japan. E-mail: mkanaoka@pu-hiroshima.ac.jp E-mail symposium: p-ihc2026@convention.co.jp Web: https://www.ihc2026.org/symposia/s27/
- October 29 - November 1, 2026, Antalya (Turkey): **IV International Symposium on Fruit Culture along Silk Road Countries.** Info: Prof. Dr. Sezai Ercisli, Ataturk University Agricultural Faculty, Department of Horticulture, 25240 Erzurum, Turkey. Phone: (90) 442-2312599, Fax: (90) 442 2360958, E-mail: sercisli@gmail.com Web: http://www.silkroad2026.com
- November 17-19, 2026, Bastia, Corsica (France): **V International Symposium on Citrus Biotechnology.** Info: Dr. Francois Luro, AGAP Corse Equipe SEAPAG, station INRAE, 20230 San Giuliano, France. Phone: (33)495595946, E-mail: francois.luro@inrae.fr E-mail symposium: contact-iscb26@inrae.fr Web: https://citrusbiotech2026.symposium.inrae.fr/
- November 18-20, 2026, Kathmandu (Nepal): **V International Orchid Symposium.** Info: Prof. Dr. Bijaya Pant, Central Department of Botany, Tribhuvan University, Kathmandu Nepal, Research Director, Annapurna Research Center, Kathmandu, Nepal. Phone: (977)9801203357, E-mail: b.pant@cdbtu.edu.np E-mail symposium: orchidsymposiumnepal@gmail.com Web: https://www.annapurnaresearch.org/internationalorchidsymposium
- November 22-27, 2026, Montagu, Western Cape (South Africa): **XIII International Workshop on Sap Flow.** Info: Dr. Phumudzo Charle Tharaga, office 1.220 Agriculture Building, University of the Free State, 205 Nelson Mandela Drive, 9300 FS Bloemfontein, South Africa. Phone: (27)514012882, E-mail: tharagac@arc.agric.za or Assoc. Prof. Robert Skelton, 1 Jan Smuts Avenue, Braamfontein, 2000 Gauteng Johannesburg, South Africa. Phone: (27)711109778, E-mail: rob.skelton@wits.ac.za or Dr. Muthianzhele Ravuluma, ARC - Agricultural Research Council, 20 Lelie Street, Idasvallei, 7609 Western Cape, Stellenbosch, South Africa. E-mail: ravulumam@arc.agric.za Web: https://sapflow.co.za/
- November 24-27, 2026, Udon Thani (Thailand): **International Symposium on Utilization and Cultivation of Medicinal and Aromatic Plants & VII International Symposium on Plant Genetic Resources and Breeding Research on Medicinal and Aromatic Plants.** Info: Mr. Rapibhat Chandarasrivongs, Department of Agriculture, 50 Phaholyothin Rd., Chatuchak 10900, Thailand. Phone: (66)25790583, E-mail: interudonexpo2026@gmail.com E-mail symposium: info.map2026@gmail.com Web: https://www.doa.go.th/MAP2026/

Year 2027

- January 19-22, 2027, Udon Thani (Thailand): **IV International Symposium on Tropical and Subtropical Ornamentals.** Info: Mr. Rapibhat Chandarasrivongs, Department of Agriculture, 50 Phaholyothin Rd., Chatuchak 10900, Thailand. Phone: (66)25790583, E-mail: interudonexpo2026@gmail.com E-mail symposium: info.tso2027@gmail.com Web: https://www.doa.go.th/TSO2027/ NEW
- January 31 - February 4, 2027, Ghent (Belgium): **VertiFarm2027: IV International Workshop on Vertical Farming.** Info: Dr. Bruno Gobin, Schaessestraat 18, 9070 Destelbergen, Belgium. Phone: (32)93539480, Fax: (32)3539495, E-mail: bruno.gobin@viaverda.be or Annelies Christiaens, Viaverda vzw, Schaessestraat 18, 9070 Destelbergen, Belgium. E-mail: annelies.christiaens@viaverda.be E-mail symposium: info@vertifarm2027.com Web: http://www.vertifarm2027.com
- March 8-11, 2027, Cartagena (Spain): **VI International Conference on Fresh-Cut and Minimally Processed Produce.** Info: Prof. Francisco Artés-Hernández, Postharvest & Refrigeration Group, Universidad Politécnica de Cartagena, Paseo Alfonso XIII, 48, 30203 Cartagena, Murcia, Spain. E-mail: fr.artes-hdez@upct.es or Dr. Ginés Benito Martínez Hernández, Universidad Politecnica de Cartagena, Paseo Alfonso XIII, 48, 30203 Murcia Cartagena, Spain. Phone: (34)968325754, E-mail: ginesbenito.martinez@upct.es E-mail symposium: freshcut@upct.es Web: https://freshcut2027.org/

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