Study trip - Attending VI Asia Symposium on Quality Management in Postharvest Systems at Shizuoka Convention & Arts Centre "GRANSHIP", Shizuoka City, Japan (11-13th November 2025), Laboratory Visit to Tokyo University of Agriculture (7th November 2025), and National Agricultural High School Harvest Festival (3rd November 2025)

Grant recipient:

Hazwan Yahya
PhD Student
Department of Food and Nutritional Sciences
University of Reading

Headline

- Research showed that postharvest storage factors especially temperature management and edible coatings significantly influence fruit softening and lignification, with findings in persimmons and loquats offering growers clearer strategies to protect marketability and shelf-life.
- Studies identified transcriptional and epigenetic regulators linked to postharvest physiologies in horticultural crops, pointing to future opportunities in breeding or targeted postharvest treatments to maintain fruit quality.
- Growers aiming for export markets must weigh the practical trade-offs of different phytosanitary treatments (cold/heat treatment, methyl-bromide, irradiation), considering their effectiveness, economic cost, regulatory needs, and consumer attitudes.
- Bioregulators such as 1-MCP, NAA, methyl jasmonate, and commercial products like Kelpak® showed strong potential to delay ripening, slow deterioration, and improve crop storage reliability providing actionable tools for growers and packers.
- Field visits and observations discovering tea operations, farmers' market pricing, and mandarin production and heavy focus on produce quality, to the student-run agricultural festival highlighted both the challenges of aging grower populations and the encouraging potential of youth engagement and educational programs in sustaining future agricultural industries in Japan.

Background

The 6th Asia Symposium on Quality Management in Postharvest Systems (ASQP2025) is a symposium that is focused on displaying new findings of postharvest research findings within the Asian academic community.

It was organised by the International Society for Horticultural Science (ISHS); The Japanese Society for Horticultural Science (JSHS); The United Graduate School of Agricultural Science, Gifu University; and the host Shizuoka University.

The symposium was held from 11th to 13th November 2025 at GRANSHIP, Shizuoka City, Shizuoka Prefecture, Japan and was attended by 131 participants from 18 countries mainly from Asia but also from Europe, North America, and Oceania who presented 2 keynote addresses, 8 invited speaker talks, 55 oral presentations, and 66 posters under the themes of:

1. Plant Bioregulation
2. Pathology and Disorder

3. Edible Coating
4. Physiology
5. Technology and Equipment
6. Functional Compounds and Aroma.

On 13th November 2025, an excursion was conducted to showcase Japanese agricultural activities in Shizuoka prefecture to the participants by visiting the Shizuoka Tea Museum, the Kadode Ooigawa Farmer's Market, and a local mandarin farm.

I also presented my research on the discrepancies of pinking discolouration of baby-leaf forms of Romaine lettuce across contrasting cultivars in the oral presentation.

Conference Findings

The opening ceremony was conducted by the Chair of ISHS Postharvest Group, Giancarlo Colelli who gave the latest report of ISHS and the upcoming International Horticultural Congress, Kyoto in 2026.

Next, two keynote addresses were given by Yasutaka Kubo (Okayama University, Japan) and Kunsong Chen (Zhejiang University, P.R. of China) which highlighted the effects of storage conditions (temperature, edible coating) on the ripening and lignification physiology of Asian horticultural products including persimmons and loquats. The study by Kubo presented the role of low temperature as a plant signal for its adaption to the environment rather than the commonly accepted hypothesis of it reducing metabolic activity. The lignification and softening of fruits during maturation in postharvest affected marketability across various quality traits. In loquats, a series of transcription regulators and epigenetic modifications such as EjMYB1, EjMYB2 directly upregulate and downregulate fruit lignification process respectively, which controls the formation of stone cells, juice sac granulation, and flesh leatheriness.

I attended a talk by an invited speaker (John Golding, NSW Department of Primary Industries and Regional Development, Australia) who discussed about end-point phytosanitary treatment required for market access into heavily-protected import markets in Australia. He listed the advantages and disadvantages of various types of treatments (cold and heat treatments, methyl bromide fumigation, and phytosanitary irradiation) in terms of actual fruit fly-defeating effectiveness, possible side-affects such as chilling injury and general public attitudes towards chemical treatments such as methyl bromide and alternative end point-treatments that could maintain fruit quality i.e. controlled atmosphere treatment.

Numerous studies were focused on trying to control the physiological factors to extend the postharvest shelf-life of horticultural crops though exogenous applications of bioregulators including commonly used 1-MCP, 1-napthaleneacitic acid, and methyl-jasmonate that delays postharvest ripening and degradation of fruit crops. Applications of industry-grade products such as biostimulant Kelpak® used for regulating sugar contents in cold-stored potatoes affecting taste and acrylamide-producing capabilities were presented by a research group from the University of Limpopo, South Africa. The application of Kelpak® resulted in reduced soluble sugars, which reduces acrylamide formation in cold-stored potatoes.

On the second day, I attended another keynote speaker session by Giancarlo Colelli (University of Foggia, Italy) talking about the use of postharvest specialisation and diversification of horticultural products in attempts to increase value of value-added

products. In this talk, the increase of a health-conscious but still overworked society has led to the rise of high-convenience freshly-cut fruit and vegetable products such as ready-to-eat fruits and vegetables. These products would provide a significant amount of added-value to the product. However, challenges exist such as lack of industrial competitiveness, decline of added value due to increasing overhead costs even for grading and minimal-processing, and issues of sustainability and low product shelf-life. Non-destructive solutions for waste loss have been applied such as mathematical modelling of product compositions, discrimination based on freshness, and pre-harvest techniques and their sustainability to maximise shelf-life capabilities.

During the poster session, I have discovered a new detection technique related to my research (pinking discolouration). Arturo Duarte-Sierra (Universite Laval, Canada) presented his group's efforts in *in vivo* imaging of reactive oxygen species (ROS) dynamics in harvested lettuce under abiotic stress using fluorogenic probe H_2DCF-DA that could monitor ROS accumulation in real time allowing for non-invasive, spatiotemporal profiling of ROS and other types of oxidative stress, which can be linked to pinking. He demonstrated the contrast of different types UV treatments and their affects of mechanical wounding and ROS. UV-A and UV-B triggered rapid but temporary spikes of ROS but UV-C causes more gradual but ultimately higher intensity of ROS.

On the third day, an excursion was conducted where we visited the Shizuoka Tea Museum which showcased the traditional and modern techniques of tea cultivation and processing into steamed green tea (*sencha*) and grounded shade-grown tea leaves (*matcha*) and the current challenges faced by an aging population of tea farmers and climate change. Next, we went to the Kadode Ooigawa Farmer's Market run by Japan Agriculture Cooperation (JA) where we observed the prices and speciality agricultural products of the Shizuoka prefecture including green tea leaves, mandarins, and wasabi roots. Finally, we ended the excursion at a mandarin farm where we were taught by the farmer on mandarin cultivation in the region and quality parameters that were observed and selected.

Non-conference activities

On 3rd November 2025, I attended the National Agricultural High School HANASAKA Harvest Festival organised by Mainichi Newspapers and National Association of Agricultural High School Principals at Daimaru Tokyo Store, Chiyoda City, Tokyo Prefecture. It was participated by 45 agricultural schools from across Japan who conducted sales of food products made from agricultural produces grown by the students. Products sold included *Japonica* rice, ice cream, mandarin oranges, jams, and seaweed seasonings. It was inspiring to see the high-quality products made by the students from farm-to-fork and their independence and resourcefulness. I believe this level of interest in agriculture amongst schoolchildren should be more encouraged in the UK. Special thanks to Ms. Sato for inviting me to the event to see her students' products made from school-grown chillies.

On the 7th November 2025, I have also visited a postharvest horticultural laboratory group of Professor Kaihei Koshio of Tokyo University of Agriculture, Setagaya City, Tokyo Prefecture. Initially, I came to discuss about possibilities of becoming a visiting researcher at the university. In his laboratory, the research conducted involves the study of postharvest parameters such as nitrite and nitrate, flavonoid and phenolic acid determination of vegetables that also involves the use of pre-harvest treatments

such as seed priming. We concluded that my current research on the aspects of phenolic acids research on the postharvest discolouration of vegetables during my PhD could be continued, with an addition of other aspects i.e. volatile compounds and transcriptional work.

Personal Statement

It was a very fruitful trip in terms of my personal development and knowledge regarding the different agricultural systems in Japan. I was impressed the high levels of passion and dedication towards agriculture by different age groups of society from seeing elderly farmers and young agricultural high school students. The emphasis on sustainability, produce quality, and integration with its tourism industry was also enviable and should be replicated by the UK horticultural system. During the conference, I have met potential collaborators and built personal connections. During the laboratory visit, I have also seen the level of research done at an agriculture-focused research institute.

Contact Details

Hazwan Yahya
Department of Food and Nutritional Sciences
University of Reading

Title of Oral Presentation:

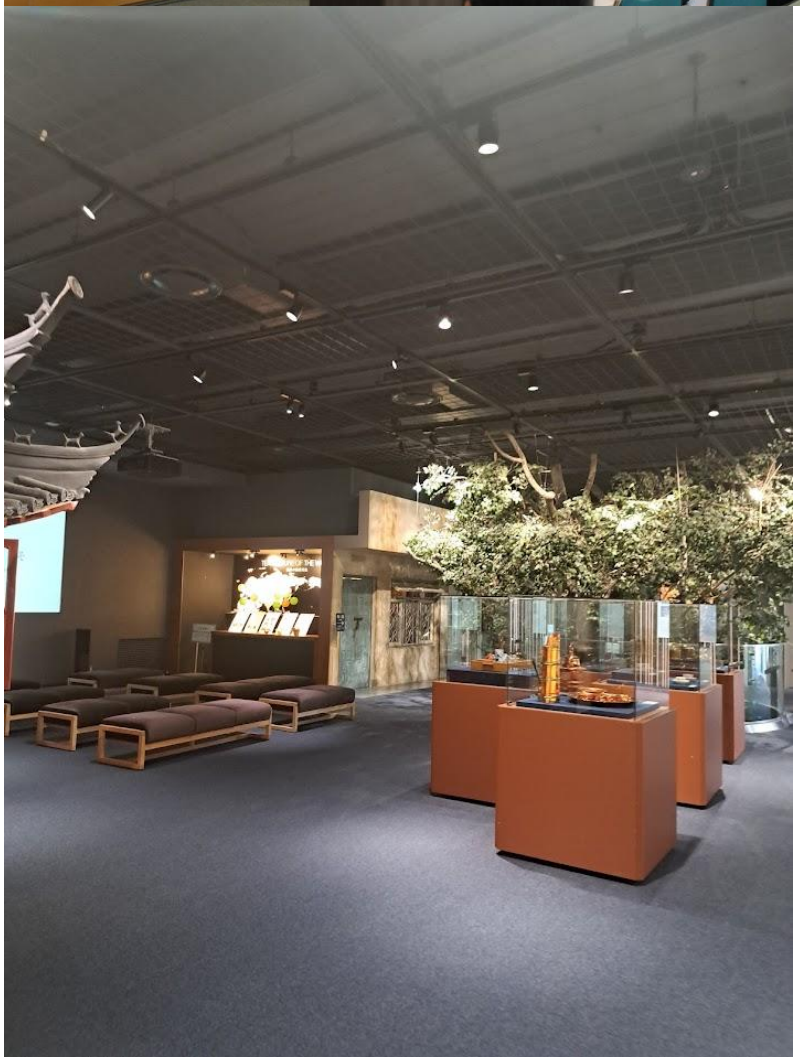
Is pinking discolouration a problem in fresh-cut baby-leaves of Romaine lettuce (Lactuca sativa L. var. longifolia)? - A phenotypic and metabolic comparison of two contrasting cultivars

E-mail: m.h.b.yahya@pgr.reading.ac.uk

Acknowledgements

I would like to thank my PhD supervisor Professor Carol Wagstaff for support to attend the conference and the laboratory visit and to the Glasshouse Crops Research Institute (GCRI) Trust Travel Grant for providing the means to attend the conference and explore the agricultural industry in Japan.

Presenting my research at the VI ASQP Symposium, Shizuoka City



Tea Museum, Shizuoka Prefecture

Wasabi roots,
Kadode Ooigawa
Farmer’s Market,
Shizuoka Prefecture

Mandarin Farm,
Shimizu City,
Shizuoka
Prefecture

Japanese agricultural high school's students selling strawberry and apple jams at the HANASAKA Harvest Festival, Chiyoda City, Tokyo.

Photo with Professor Kaihei Koshio during laboratory visit at the Tokyo University of Agriculture, Setagaya City, Tokyo.