Phytogen January 2019

January opportunities

24 January 2019

Hello ASPS members,

Welcome to 2019!

Already for 2019 we have;

- new employment opportunities on the ASPS job board which you can see **here.**
- Jan Anderson award and lecture applications are still open. Know of someone who should apply? then let them know. More information on our ASPS web site which you can see **here.**
- The 2019 Science meets Parliament meeting will be in August rather than February this year. Nominations for ASPS delegates will be called for later this year.
- The January edition of Phytogen has been published and available **here.**

- And the International Congress on Plant Molecular Biology (ICPMB) is holding a competition to design the 2021 meeting logo. See the Phytogen story **here** or the e-mail attachment. Please print a copy of the IPMB poster for your department notice board.

January GPC e-bulletin

22 January 2019

Global Plant Council E-Bulletin January 2019|

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E-Bulletin /
January 2019Welcome to another month (and year!) of plant science!

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If you have news you would like us to share on our website, please contact isabel@globalplantcouncil.org

This month 31 new breaking news stories were posted on the GPC website including...

Inactivating genes can boost crop genetic diversity
Researchers recently showed that inactivating a gene, *RECQ4*, leads to a three-fold increase in recombination in crops such as rice, pea and tomato. The gene inhibits the exchange of genetic material via recombination (crossover) during the sexual reproduction process in crops. This discovery could speed up plant breeding and development of varieties better suited to specific environmental conditions (disease resistance, adaptation to climate change).

The African Orphan Crops Consortium bears its first fruits: the release of the first five orphan crop genomes
New research published describes and releases the first 5 orphan crop genomes from an international project to boost the productivity of traditional African food supplies.

Research finds ethical sourcing of seeds required for global restoration
Hundreds of thousands of tonnes of wild seeds are needed to restore plant ecosystems globally but overharvesting risks their depletion unless ethical seed-sourcing regulations are developed, research has found.

New Phytologist Trust
People and plants: Working together for the planet
Plants, People, Planet, a cross-disciplinary Open Access journal by the New Phytologist Trust, launches its first issue, that will publish peer-reviewed articles, opinion and review that focuses on the connections between plant science and society.

>

Events /
View more...

If you have a conference, meeting, workshop, training course or other event coming up, we can include it in our Events calendar! Please email isabel@globalplantcouncil.org

International Plant & Animal Genome XXVII
12–16 January 2019. San Diego, USA.

International graduate course Ecophysiology of the rhizosphere
14–20 January 2019. Parque Katalapi, Chile.

Indian Plant Science Congress 2019
23–25 January 2019. Kattankulathur, India.

EMPHASIS on the International Year of Plant Health
12 February 2019. Torino, Italy.

Policy /

Lots of new reports, and an archive of useful documents from the last few years, are available on our website. Head to the Resources page and click 'Reports'.

Members /

Click here for details of the GPC Member Societies and their representatives.

Please contact us (isabel@globalplantcouncil.org) to find out how your organization can join the Global Plant Council.

The GPC is a coalition of plant and crop science societies and institutions from across the globe. The GPC seeks to bring plant scientists together to work synergistically toward solving the pressing problems we face.

Please click here to make a donation via PayPal to help support the GPC.

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International Society for Plant Pathology (ISPP) December newsletter includes a code of ethics on plant health The International Society for Plant Pathology (ISPP) is developing and publicising a code of ethics to help promote high standards of behaviour and practice whenever we face new plant disease outbreaks. The code has the following aims: – to foster ethical conduct – to support communication and collaboration – to ensure that decisions are based on the best available evidence Any comments or feedback related to the said Code of	**Job Opportunities /** Do you know of a job opportunity we've missed? Please tell us about it by emailing isabel@globalplantcouncil.org	GPC is gathering job opportunies and posting them in our social media accounts, either on our devoted Facebook group with over 300 members or using the #plantscijobs hashtag on a Twitterstorm one Friday a month from our principal Twitter account. Please, join either to be informed. Next Twitterstorm will take place on the **25th January** between 3 and 4 pm CEST.

Ethics can be sent to PPcode@isppweb.org		

January 2019 Phytogen – Plant Nutrition Trust Awardees reports from 2018, IPMB2021 Competition, Cairns, Australia, ComBio2018 photos & Jan Anderson

15 January 2019



Welcome to 2019. In this issue, enjoy reading 2018 travel reports from The Plant Nutrition Trust awardees. We hope you will be inspired to travel in 2019.

ASPS is also promoting an exciting competition, to design 2 logos for IPMB2021, Cairns, Australia. Entries close 11th March 2019, read details below.

Lastly, click the link to see photos from Combio 2018 in

Sydney; http://www.combio.org.au/combio2018/ and deadline for the Jan Anderson Award 🏆 is 28th February 2019.

IPMB2021 Competition



Background: The International Congress on Plant Molecular Biology (IPMB) is a triennial meeting gathering 1200 – 2000 plant molecular biologists from all over the world since 1984. The meeting's science demonstrates the importance of developing multidisciplinary approaches to face climate changes and population increase. The scientific program highlights the major impact on recent discoveries from basic molecular biology to crop biotechnology. The sessions demonstrate the importance of plant molecular biology to fulfill the need for the development of ecologically intensive farming. In 2021, the 13th International Congress on Plant Molecular Biology will be in Cairns, Australia.

Tweets by IPMBcongress

The Brief: The International Congress on Plant Molecular Biology is on the hunt for two new logos, one for IPMB in perpetuity and a second for the 13th Congress in Cairns 2021 (i.e. IPMB2021). Specifically, the IPMB Board want a logo that is: (i) more colourful, (ii) more eye-catching and (iii) conveys 'molecular biology' better than the current monochrome leaf logo.

1. Logos can be submitted for IPMB2021 and/or IPMB. Although we envision the logos to be visually related, this is not essential.
2. This is about imagination, creativity and message - not graphical design skills. The winning logos will be converted to line art by a graphic designer.
3. The winner or winners (if different IPMB and IPMB2021 logos are chosen) will receive free registration at IPMB2021, a $AUD300 prize and public recognition of their design being chosen.
4. By submitting the artist acknowledges that, if their logo is chosen to become the IPMB or IPMB2021 logo, the artist won't hold any copyright over the logo.
5. Files submitted can be in PNG, TIF, JPG, PDF or EPS formats and files should be less than 1 MB
6. Filename should be "IPMB_logo_ArtistFirstLastName" or "IPMB2021_logo_ArtistFirstLastName" e.g. IPMB_logo_SallyJones.jpg or IPMB2021_logo_JingjingQin.eps
7. Submit the logo by e-mail to IPMBlogoComp@asps.org.au by **Monday 11 March 2019**
8. All entries will be acknowledged (not automatically) by an e-mail in which an entry number will be included

Any *queries* about the competition (i.e. not entries or files) can be directed to the IPMB2021 Secretariat at secretariat@ipmb2021.org

The Plant Nutrition Trust 2018 awardee reports

Daihua Ye, School of Biological Sciences, University of Western Australia.

The ISRR10 Conference Trip Report by Daihua Ye

It was really an honour to be awarded the 2018 Plant Nutrition Trust (PNT) Award and I attended the 10th meeting of International Society of Root Research (ISRR10) with this award.

The ISRR10 was held in Jerusalem, Israel from 8 to 12 July 2018. I have to say, this was really a professionally fantastic experience. The theme of this international conference is "Exploring the hidden half-Root research at the forefront of Science". Around the theme, there were lots of interesting topics including root structure & function (cellular, physiological and developmental responses to edaphic conditions; mechanisms controlling root development), rhizosphere (biotic interactions; abiotic interactions), modern techniques (modelling of root-system architecture/soil processes/coupled processes/structure and function; upscaling optimization; phenotyping), agricultural applications (crop roots; root crops). There were more than 300 participants from 36 countries attending this big conference. Lots of wonderful talks had been given, especially those from the eighteen invited speakers. The speakers informed us of what has been studied and is being studied in root research areas, as well as pointing out what might happen in the future. I have also learned some research details which are really hard to get just by reading; for example, how to use CT scanning technique to get 3D-images of roots in a pot experiment. Besides, it's worth mentioning that my supervisor Prof. Hans Lambers was awarded the Lifetime Achievement Award of ISRR.

And it definitely gave me the great opportunity to meet and network with other international partners working on plant root and rhizosphere processes. I tried to introduce myself to some scientists and scholars, communicate about their talks or my works during the coffee break and lunch time even though I did have language barriers sometimes. This helped me to overcome my barriers in the first step as I definitely know that I must master English for my future career. It also provided me with some new ideas to be used in my future research. Most importantly, I showed a poster at this conference, and communicated with people what I have discovered and what I will continue to study.

In addition, it was my first time to attend an international conference out of China and the first time to travel more than one week almost by myself. It was a great experience for me to test my organizational coordination ability and open my eyes. I am very lucky that everything was well-organized. At last but not the least, I had a field trip with Hans Lambers, Efrat Sheffer and Wenli Ding in Haifa to see the research sites about plant ecology, particularly the legumes to fix nitrogen. It was really an excellent trip for me to learn about plant ecology and some interesting physiological and morphological responses to the environment.

In summary, as a young researcher, it was really an eye-opening opportunity for me to attend ISRR10. I acquired lots of knowledge related to my research and from talking with professors in root research areas. I have also learned how to convince and explain myself to others. These experiences do benefit my future career when I return to China to work as an agricultural and environmental young scholar. Finally, many thanks to my supervisors Dr. Megan Ryan and Prof. Hans Lambers to recommend and support me with their most passion. Sincere thanks to the staff in the School of Biological Sciences in UWA including Lindie, Jax, Barbara, Pauline and Linda. Special thanks to the Plant Nutrition Trust committee for supporting me to attend to this amazing conference.

Hoang Han Nugyen, Graham Centre for Agricultural Innovation, Charles Sturt University, New

Report_Plant Nutrition Trust _Hoang Han Nugyen attended the 10th PSILPH2018

The Plant Nutrition Trust Award gave me an opportunity to present a paper at the 10th international symposium on plant-soil interactions at low pH.

The International Symposium on Plant-Soil Interactions at Low pH (PSILPH) happens once every three years in different countries around the world. This year, 2018 the 10th PSILPH was organised by Universiti Putra Malaysia (UPM) at Palm Garden Hotel IOI Resort, Putrajaya, Malaysia from 25th to 28th June 2018.

Approximately 200 participants attended the 10th PSILPH2018. The symposium had a total of 44 speakers including 4 plenaries, 7 keynotes and 33 oral presentations. There were 67 posters displayed during the conference. The presentations were divided into sessions such as Genetics and breeding of crops for agriculture in low pH soils; Soil-microbe-plant interaction at low pH; Physical and chemical properties of low pH soil; Soil fertility, chemistry, amelioration and remediation of low pH soils; Physiological and molecular mechanisms of plant adaptation to low pH soils; Sustainable management of plantation and other crops on low pH soils; and Environmental monitoring of low pH soil.

I was selected to present my paper titled "Increase subsoil pH through addition of lucerne (*Medicago sativa* L.) pellets in the surface layer of an acidic soil within Soil fertility, chemistry, amelioration and remediation of low pH soils session. I presented my paper on the second day of the symposium. This was a very superior opportunity for me to share my research to a number of soil and plant scientists.

Thanks for the Plant Nutrition Trust Award and by attending the 10th PSILPH in Malaysia 2018, it gave me opportunities to learn further about the issues of low pH and plant interactions, especially the issues that are arising in South East Asia. I had opportunities to:

1. Listen to the latest research on plant-soil interactions at low pH. The 10th PSILPH was a very good chance for me to listen to many international researches not only in soil amelioration but also in plant breeding for adapting crops to low pH soils.
2. Met and discussed with many professors working on low pH soils that I have known from literatures such as Prof Leon V. Kochian, the chairman of international steering committee; Prof Lynette K. Abbott from The University of Western Australia; Prof Jian Feng Ma from Okayama University, Japan; Prof Kazuyuki Inubushi from Chiba University, Japan.
3. Shared my PhD research at the conference. It was a first time for me to present my research at an international symposium. I learned how to control my talk and time to finish the presentation on time and answer the questions from the audiences.
4. Discussed with other researchers on liming acidic soils. After my presentation I had a good time to discuss with other researchers and other students on amelioration soil acidity, especially discussions with Prof Osumanu Haruna Ahmed, UPM who has more than 30 years research on lime ameliorate soil acidity and Prof M. Jahirudin, Bangladesh Agricultural University who strongly support the amelioration strategy over breeding strategy to manage soil acidity.
5. Investigated a Malaysian soil profile. By observing soil profile in Malaysia I can compare soil profile in different countries such as Australia, Malaysia and Vietnam.

At the end of the symposium the committee announced the next symposium, the 11th PSILPH will be organised in Nanjing, China in 2021.

Plant Nutrition Trust Award report - Hoang Han Nguyen

Some photos at the 10th PSILPH2018



Assoc. Prof Dr. Radziah Othman, Chairman of the 10th PSILPH 2018 openned the symposium



My presentation



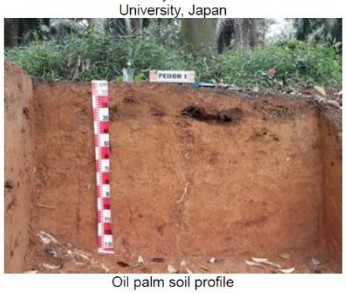
Photo with Prof Lynette K. Abbott from The University of Western Australia



Photo with Prof Kazuyuki Inubushi from Chiba University, Japan



Observation soil profile at Ladang Kempas Jasin, Melaka



Oil palm soil profile

South Wales, Australia.

Akitomo Kawasaki, CSIRO Agriculture and Food, Canberra, Australia.

Report from the "10th International Symposium on Plant-Soil Interactions at Low pH" 25th to 29th June 2018 Putrajaya, Malaysia.

Akitomo Kawasaki, OCE Postdoctoral Fellow, CSIRO Agriculture and Food, Canberra

I attended the 10th International Symposium on Plant-Soil Interactions at Low pH (PSILPH), which was held in Putrajaya, Malaysia on 25-28 June, 2018. The conference covered a wide range of topics from the physical and chemical properties of acid soils, management of crops, to the molecular mechanism and genetics of plant adaptation to low pH. I was particularly interested in the talks on aluminium tolerance mechanisms in plant roots, which are relevant to my work. Prof. Leon Kochian from Canada gave an excellent plenary talk on how membrane transporters, which were previously thought to be solely responsible for aluminium tolerance, can also assist plants in uptaking P in acid soils. I also learned various new things from outside of my area of expertise, and of particular interest was the talk given by Prof. Prakash Nagabovanalli from India about the amelioration of Al-toxicity in acid soil by the application of biochar.

In the conference, I was given an opportunity to be one of the keynote speakers. I presented my research work on organic anion exudation from the roots of aluminium tolerant wheat and how it impacts the root microbiome and the root development in acid soils. Initially, I was very nervous and thought a young scientist like me would be inadequate to deliver a keynote speech, but I received many positive feedbacks on my talk, which gave me a lot of confidence in myself and also my work.

I also joined the mid symposium tour to the historic Malacca city, which used to be colonized by the Portuguese, Dutch, British and Japanese. On the way to the city, we also stopped by a palm oil plantation, and observed the soil profile. Prof. Shamshuddin Jusop, one of the organisers of the conference, gave a brief lecture on the spot, and it was very interesting to learn how they manage the plantation.

The biggest benefit that I gained from attending this conference was the networking opportunities with other researchers from all over the world in the field, especially with the Japanese researchers. I have left Japan for more than 10 years since I obtained my undergraduate degree, and have lost contact with Japanese scientific communities. In the conference, I came to know some of the top Japanese researchers and had opportunities to discuss with them not only about my research work and scientific topics, but also got advice on general research life and the possible career prospects in Japan.

I would like to thank the Plant Nutrition Trust for providing me with the award, which gave me this wonderful opportunity to present my work at an international conference, to learn the latest developments in my research field, and also to sample the delicious Malaysian food! The experience that I gained is surely beneficial for my current research and also for my future career.

Jing Cui, Research School of Biology, ANU College of Science, Canberra, Australia.

2018 IOPC Conference Report_by Jing Cui

The Indonesian Oil Palm Research Institute (IOPRI) held the 6th quadrennial international oil palm conference (IOPC 2018) from the 17th – 19th July in Medan, North Sumatra, Indonesia. Among other globally recognized oil palm science conferences, the IOPC general meeting is unique in that it represents a broad spectrum of the oil palm sciences: the conference hosts over 80 scientific symposia with topics ranging from innovation to technology to global marketing to policy.

I participated in this conference as a poster presenter and my travel was funded by a Plant Nutrition Trust Travel Grant. During the conference, I could present my research to other attendees, and scientists from many different fields provided feedback and advice. I was asked interesting questions regarding my research, which have ultimately benefited my current findings in the lab. By presenting at a conference, I can gain skills that will be valuable for my academic career.

IOPC is by no means unique in providing educational opportunities to graduate students. During academic conferences, where researchers present their projects, discuss their findings, network with potential collaborators, and socialize with their peers. Other sort of interactions occur during meetings as well; graduate students look for post-doc positions, post-docs look for post-post-doc opportunities, principal investigators look for ideas to take back to their lab, science reporters look for interesting scoops, and vendors look for attendees to hawk their services and convention tchotchkes (trinket). Seeing these exchanges first-hand will help students like me to get a feel for a component of scientific research that is not readily observable in the laboratory.

I also have the opportunity to explore the leading edge of the discipline, and making connections in the scientific community can be of huge benefit for graduates interested in embarking on a scientific career. Walking around the general poster session and attending oral presentations will allow me to get acquainted with the most important recent discoveries circulating in the field. This can help me to identify potential projects, laboratories, and institutions that they would like to work at in the future.

The IOPC conference reminded me that I'm not alone and that there were lots of other people who were interested in oil palm research and industry. I've kept pursuing research opportunities and I'll be participating in Malaysian Palm Oil Board (MPOB) conference in November 2019. Science is a cooperative endeavour, and conferences allow graduate researchers a chance to explore their field outside of their laboratories and to gain skills early in their scientific training.

Representing my field of interest allows researchers in other disciplines, policy-makers, and the public to become aware of the innovative research being generated in my particular subfield. As scientists, it is important that we share our research findings with people outside our specific discipline to increase the visibility of our research and provide interested individuals with more information. Here I want to thank Plant Nutrition Trust Travel Grant for giving me this opportunity to explore oil palm research and industry in Indonesia.

Jinlong Dong, La Trobe University, Melbourne, Australia and Chinese Academy of Sciences, Department of Soil-Plant Nutrition and Fertilizers.

Travel Report of Jinlong Dong

To Plant Nutrition Trust commission,

I attended the Ambassadors Program specifically for students held on 3-7 July, 2018 and the international conference-"10th Symposium of the International Society of Root Research (ISRR10)" held on 8-12 July, 2018, Yearim Hotel, Jerusalem, Israel.

The Ambassador Program was a workshop aiming at developing and refining the skills for promising young scientists required for root zone research which is my research interest. During the 4 days' workshop, our 18 students or early-career researchers attended lectures mainly focusing on root water uptake, root exudates, root modeling, P nutrition of plant etc. Although I was unfamiliar with some of the research fields, all these lectures broadened my knowledge and deepened my understanding of my own PhD project in general. For example, I did not have a good background of root water uptake before. However, via the lectures, I understood that the deep roots could mainly be used for water uptake, which helped me understand the results of my FACE study. I realized that eCO_2 possibly promoted water uptake or prepared for drought season by increased primary and nodal root growth. We also participated in using several methods to study roots, such as measuring root morphology using minirhizotron, in-growth cores or Winrhizo, how to measure secondary metabolites using GC-MS and HPLC, and how to visualize the stress from reactive oxygen species. All these methods were potentially used for my future study.

During the conference, there were numerous nice talks on root anatomy, root biology, nitrogen uptake and mineral uptake. There were also several talks I was very interested in. For example, Prof. Bingru Huang gave a talk on reactive oxygen species, which improved my understanding of that eCO_2 could also alleviate acid-soil tolerance besides possibly increased root exudates which I had not attached enough importance on by myself before. The talks presented by Ricardo Giehl involved some interactions of Fe and P on root architecture via organic anion efflux. This talk strengthened my confidence of believing that eCO_2 possibly improved deeper root elongation via increased root citrate efflux, which can be a research aim for me in the future. More importantly, I gave an oral presentation entitled "wheat (*Triticum aestivum* L.) genotypes differing in malate or citrate efflux have differing growth responses to eCO_2 (FACE) in an acid soil" in the third day of the symposium, which was a great opportunity for me to practice my skills on oral presentation and also granted me much confidence to show and explain my work to other researchers. The questions I got were very helpful. Prof. Sergey Shabala questioned that it appeared that it was a long way for eCO_2 to affect root exudates via its impact on leaf photosynthesis, which made me think more about the mechanisms behind our hypothesis-eCO_2 can increase Al^{3+}-tolerance through increased malate or citrate efflux.

The field tour I attended included a salinity stress experiment, some greenhouse experiments, an olive farm, a vineyard, a flood water collection systems, a system used for waste water collection used in a date farm. I was very happy to gain plenty of knowledge of the real crop cultivation in water limited condition and how the knowledge from the lectures was applied into agricultural production as well as to enjoy the sunlight and free air in Israel.

In conclusion, it was a great chance for me as a PhD student to interact with scientists and students from around the world, which deepened my understanding of my PhD study now and in my future work on acid-soil tolerance via the very latest studies on the topic. I was very happy to meet and to develop a very good relationship with 17 early-career researches like me as well as with the lecturers. I am very appreciative to the "Plant Nutrition Trust Awards" which made this travel achievable. Thanks again to the commission and the awards for your kind support.

Chana Borjigin, School of Agriculture, Food and Wine, University of Adelaide, Australia.

The Plant Nutrition Trust Awards - 2018

Report

I am a PhD student at the University of Adelaide. My research interest is in abiotic stress tolerance of cereal crops, particularly in salinity tolerance of bread wheat. With financial support from the Plant Nutrition Trust, I was able to participate and present a poster at one of the cutting-edge scientific conferences in my research field – the Gordon Research Conference (GRC) on Salt and Water Stress in Plants and its satellite seminar – the Gordon Research Seminar (GRS) held during 2nd ~ 8th June 2018 in Waterville Valley, NH, USA.

The conference is recognized as one of the most important international conferences in my study area and the main focus of the conference is on shoot and root adaptations to abiotic stress, crop productivity, and food security. Listening to over 70 talks from both GRS and GRC within a consecutive five days was challenging for me but fruitful, particularly the talks that were given at the sessions *Root Responses to Abiotic Stress, Shoot Responses to Abiotic Stress* and *Making Use of Natural and Engineered Variation* are directly relevant to what I am doing in my PhD.

I presented my poster entitled *Understanding sodium tissue tolerance of a Bread Wheat Landrace Mocho de Espiga Branca (Mocho)* both at the GRS and GRC. Presenting the poster at the conference in front of experts and peers from all over the world working in the same research field offered me with a great opportunity to get constructive comments and feedbacks on my current research. Professor Mark Tester from the King Abdullah University of Science and Technology (KAUST) got very interested in my work and encouraged me to continue on my Quantitative Traits Loci (QTL) analysis to identify the causal loci responsible for sodium tissue tolerance of the landrace Mocho. Professor Sergey Shabala from the University of Tasmania suggested me to do a couple more Microelectrode Ion Flux Estimation (MIFE) experiments at different root zones to investigate if the ion fluxes are differed in the landrace Mocho compared to local bread wheat cultivars, which turned out to be my first experiment conducted on my return from the conference.

As the conference brought together researchers from academia, government, and industry focusing on improving salinity tolerance of cereals, I was also able to reach many senior academics, postdocs and PhD students with different career paths and get some advice from them for my future career after graduation. I met Dr. Sandra Schmöckel, who I would call as one of my role models. She is originally from Germany, and did her PhD with my current principle supervisor. After her graduation, she worked as a postdoctoral fellow in the Salt Lab at the KAUST, and is now moving back to Germany as a junior Professor at the University of Hohenheim. As a third year PhD student, I really liked her career path and hope I could have a smooth career path in near future.

After the conference trip, I got back to my study with a fresh mind and look forward to making use of what I have learnt at the conference in my future studies! I am truly grateful for the financial support from the Plant Nutrition Trust to enable me to participate and present at such a great conference!

Chana Borjigin (the University of Adelaide)



Waterville Valley Conference & Event Center.

Sijia Guo, School of Agriculture, Food and Wine, University of Adelaide, Australia.

Travel report

30th July – 3rd August, 2018 American Society for Horticultural Science Annual Conference
Washington DC, USA

Sijia Guo
The University of Adelaide

"Two roads diverged in a wood and I
– I took the one less travelled by,
And that has made all the difference."

— "The road not taken", Robert Frost

Overview

The American Society for Horticultural Science was founded in 1903, and since then, the ASHS Annual Conference has been the most prestigious event for horticultural scientists to attend. In 2018, the conference was held in Washington DC, USA. During the conference, there were approximately 1000 attendees including academics, horticultural specialists, industrial representatives, and also approximately 500 students (PhD, Masters and undergraduate students). The topics covered a wide range of disciplines and crops in horticulture from molecular biology (e.g. genetic markers in breeding programs) to applied practices (e.g. controlled environment, field management), marketing and economics. It had copious amounts of parallel sessions/workshops, the breadth of which may serve to attract people back next year. The science and technology being discussed during the conference offered a platform to accommodate different needs at all different career stages. There were special sessions for horticultural educators, students seeking jobs and professionals accumulating continuing education units (CEU) for further certifications. The format of the current conference program was also discussed and improved through working groups in their specialized areas (e.g.: postharvest, controlled environment or plant biotechnology).

It is a great event for anyone who is new to horticulture, being able to learn the most recent advancements in science and technology in horticulture, but to also develop their future career network. However, it is a real challenge for PhD students being trained in Australia to attend due to the total expenses. I have been extremely fortunate to attend such conference along with my poster presentation, titled "The impact of altering source-sink dynamics on non-climacteric pepper ripening on- and off-plant". After asking people from my area of interest to view my poster, they provided some thoughtful feedback for future research directions (e.g.: transcriptome profiling, validations for cultivar-specific responses, transgenic tissue cultures). It was great to have opportunities to communicate science with other scientists in my area. Besides further enhancing my scientific communication skills, my understandings in postharvest science and controlled environment, two main areas of my study interest, were also deepened – conceptualize research ideas and commercialize them eventually. In the following report, I am going to share some brief notes from the ASHS conference with the Plant Nutrition Trust committee, exposing some excellent elements of this particular event.

Brief notes from the ASHS conference

The official conference program started on the second day, 31st July, which left the first day, 30th July with more possibilities. This year, the first day of conference had a heavy focus to ensure both horticultural undergraduates and graduates become highly employable. Professor Curt Rom from the University of Arkansas organized a whole afternoon seminar, "Strategic Career Planning Forum" to tackle issues such as further education choices, private or public sector career pathways with possible directions and resume preparations. It was followed up with a Career and Graduate School Fair, including 15 employers on display such as Driscoll's, Syngenta Flowers, Cornell University, and the University of Florida. I learned that I have many options in horticulture to consider after PhD, but I might have to move overseas. It does raise a big question mark in my thoughts about what R&D I could do for Australian horticultural industry. Certainly, there are opportunities due to the requirement for the diversity of diets and nutritional values provided by horticultural products.

Unlike many other conferences that have a few plenary talks, the ASHS conference only had one plenary talk that combined with an awards ceremony on the second day. In 2018, Dr. Randy Woodson, Chancellor of North Carolina State University addressed the importance of *Morrill Land-Grant Act (1862)* for securing the establishment of land-grant (publicly-funded) universities with a strong focus on agriculture and mechanical arts, therefore prioritizing agricultural research and development. The agricultural research can be more tailored to different land conditions or environment, collectively becoming national assets.

For the remainder of the week, I tried to select sessions that were highly relevant to my areas, regardless how interesting some of the other talks sounded (e.g. market trends in sustainability for horticulture, undergraduate commodity judging). There were often five sessions or more at the same timeslot.

As a postharvest scientist in training and working in greenhouse capsicum ripening mechanisms, there were two major areas most of interest to me – postharvest science and controlled environment. Some excellent post-harvest apple studies were discussed during the conference. Dr. Jun Song and his research group from Agriculture and Agri-Food Canada correlated the phenotypic traits, phenolic compounds and anthocyanins level with genetic variations after screening 144 apple cultivars, indicating strong genetic regulation mechanisms in phenolic metabolisms. This work not only provided valuable breeding information for more nutritious apples but also overlapped with some physiological disorders caused by phenolic compounds during storage. Dr. Loren Hnaas from the Tree Fruit Research Laboratory of USDA in Washington State University suggested that early detections of certain metabolites from sugars, quercetin glycosides and vinyl aldehydes might be an alternative method to reduce the sunscald incidence during apple storage. Apple sunscald is a physiological disorder developed during storage, which is generally due to over sun exposure prior to harvest. To date, there are no known methods to delay/repress this process. Her colleague, Dr. Christine McTavish also further elucidated that these compounds had been accumulated in fruit peels by using a non-targeted metabolomics. I also learnt some creative practical approaches in postharvest management in Southeast Asia. Professor. Elizabeth Mitchell from UC Davis and her fellow scientists presented their work done in Southeast Asia as part of a national research initiative – the Horticulture Innovation Lab. Briefly, they engineered some simple equipment with low maintenance to solve local cold storage problems (CoolBot®) for fresh produce and sun-drying problems for dry products (Chimney Solar Dryer). In doing so, they have managed to increase the food availability by extending its shelf life, which had been an issue that led to micronutrient deficiencies. As a result, they conceptualized and commercialized their research by designing some reusable test strips for dry food moisture level, DryCard™. They not only help many local farmers with their dry products' quality assured at very low cost but also boost economic gains for UC Davis.

For the controlled environment sessions, on one aspect, I was very impressed by some studies, where they built their own matrix of different single units of LEDs (e.g.: blue, green, red, far-red) from scratch, to investigate different light ratios in optimizing leafy green production. On the other hand, most of the work had only focused on the yield and certain nutritional values in leafy greens in fully-controlled indoor environments. There was a lack of work conducted in vine crops for ripening or quality parameters especially in capsicums. After having conversations with some renowned US LED manufactures (e.g.: LumiGrow), I suddenly realized that there had not been many studies done in investigating LEDs and fruit ripening processes (e.g.: wavelengths, ratio of spectrum mix, length of lighting), especially for non-climacteric capsicums. As far as I know from my experiments' findings from investigating light spectrum/intensity on the non-climacteric capsicum ripening process on- and off-plant, I believe there is highly likely to be a Pandora's Box in light spectrum in LED for fruit quality to be opened.

Concluding remarks

I would like to express my deepest gratitude and appreciation to the Plant Nutrition Trust who has valued my determination to make a difference in Australian horticulture, but also for your generosity to enable this fruitful trip.

About the Plant Nutrition Trust: The Trust was established from a combination of surpluses collected after previous international conferences held in Australia, donations from The Sulphur Institute, the Australasian Soil and Plant Analysis Council (ASPAC) and other individuals. Further donations are welcome**.** The Management Committee has included people associated with the Fertiliser Industry Federation of Australia, the Australian Institute of Agricultural Science and Technology, the Australian Society of Soil Science, the Australian Society of Plant Scientists, the Australian Soil and Plant Analysis Council and CSIRO Agriculture and Food.

Applicants must be currently working in Australia and linked with a recognised university or relevant institution.

Applications usually close in February/March each year (see application form)

Further details and application forms can be obtained from:

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