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Professor Christine Beveridge elected fellow of the Australian Academy of Sciences

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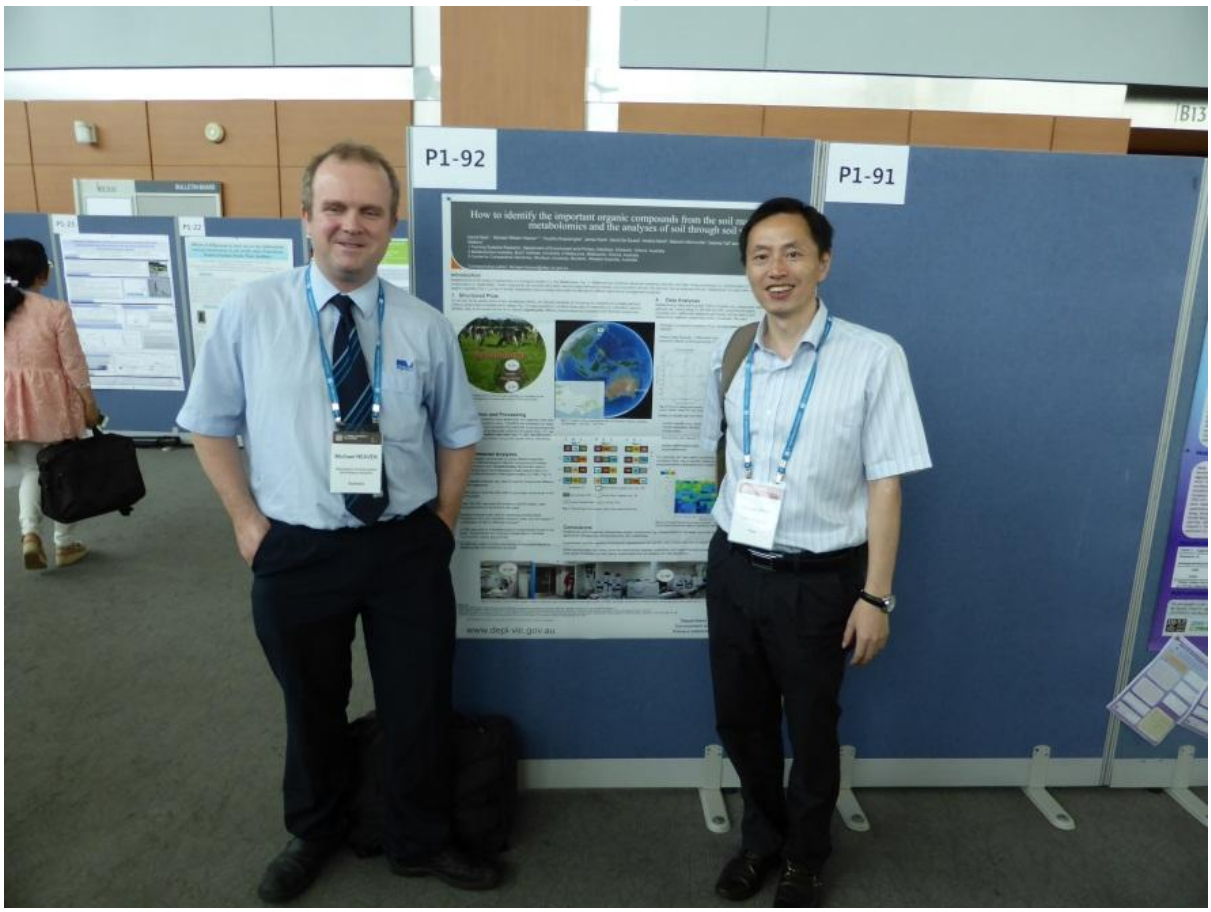
I would like to congratulate Professor Christine Beveridge on being elected to the Australian Academy of Sciences this week. Her research has overturned the dogma on apical dominance and introduced both sugar and strigalactones into the picture through her innovative experimental approaches and determination. Challenging long held beliefs is not easy, but elegant experimental results eventually could not be ignored. Not often does one see the text book representation getting this sort of update.
Professor John Evans,
President, Australian Society of Plant Scientists.

2014 Plant Nutrition Trust Travel Scholarship Report- Dr Michael Heaven

24 May 2015

Plant Nutrition Trust Travel Scholarship

2014 Plant Nutrition Trust Travel Scholarship Report Michael Heaven



Dr Michael Heaven Agriculture Research Division Agriculture Group Department of Environment and Primary Industries (DEPI) Victoria, Australia

Recipient of Plant Nutrition Trust Travel Scholarship to attend World Congress of Soil Science 2014, Jeju, South Korea

The World Congress of Soil Science is like the Olympics of soil. It happens once every four years, in different countries around the world, and the location voted on by members of the soil societies based in various countries. Bribery was evident from the candidates of the next congress – being chocolates, bookmarks and from the winner of the next Congress, little balloon creatures! Thanks in large part to the Plant Nutrition Trust, in June 2014 I was afforded the opportunity to attend the World Congress in balmy Jeju Island, South Korea. Jeju Island, a dormant volcano off the south coast of the Korean peninsula, was certainly an excellent choice for a conference exploring and explaining about all things growing on top of and under the ground, as well as the ground itself. The volcanic rocks presented themselves in various fashion, from the black sand of the beaches to the spiky, stone like formations of Jusangjeolli, the lava remnant of Sanbang-ro sticking abruptly out of otherwise flat ground, and finally the towering, almost 2 km high volcano, Mt. Halla, that disappeared into low cloud that permeates Korea in June.



About 2000 scientists from around the world swamped the International Convention Centre (ICC) Jeju to discuss and present the latest results of their research. The morning sessions were for keynote speakers, who presented weighty issues of global significance, with session titles such as Soil for Peace, Soil Security, Soil-Plant Welfares for Human, and Global Soils: Future Nexus. I was struck by how these keynote speakers could connect the big picture with the paddocks and pastures we use for research. For instance, Prof. Rattan Lal of Ohio State University showed how historically and today civilisations live and die depending on how they treat their soil, be it for things such as crops, forests or carbon sequestration. He presented a bold claim that all wars are connected to soil degradation. Closer to our conference destination, I was surprised to find from speaker Dr. Ho-Seung Yang that World Vision, whose first programme began with helping Korean orphans after the Korean War, were sponsoring programmes of joint research and collaboration between North and South Korean scientists using agriculture as a means to bridge the distrust between the two warring states. It was heart-

warming to know that research to improve pasture and crop quality, research we all do, was being used to break down barriers between two disparate ideologies, and hopefully feed people who often don't have enough to eat. However, more dire predictions were made by the keynote speakers of the Soil Security and Soil-Plant Welfares for Human sessions, who warned of the challenges of the human created "Anthropocene" (8000BC to present). The take home message was that agricultural scientists had a great responsibility to feed a growing world that is likely to have an increased variability in climate, using soils that are being increasingly degraded. As Prof. Donald Sparks of the University of Delaware pointed out, there is a knowledge gap between the research we do and how it is applied in the field, and interdisciplinary groups are a key to resolve the problems of increasing the productivity of the soil without degrading the environment.

These keynote speakers led the way for a plethora of talks and presentations on soil science. My own research, using metabolomics to understand biogeochemical processes in soil and leachate, appeared to be a relative newcomer to soil science – nothing like being on the cutting edge! Our research at DEPI, which detailed how organic phosphorus compounds found in soil water extracts from a dairy farm were related to pasture type (ryegrass or a ryegrass/clover mix), cultivation or annual phosphorus application, was presented to a wide variety of people. I discussed with various scientists from Australia, Germany, USA and elsewhere, how metabolomics could be combined with traditional agricultural analyses to help understand why certain agricultural practices are affecting nutrient concentrations in soil. In particular, I was questioned how we can make sense of the massive amounts of data collected when using metabolomic techniques. As with most agricultural scientists, statistics, in particular, multivariate statistics, provided a guide and a visually arresting description of what was occurring in soil. The ICC is a huge convention centre, and with 2000 delegates it was impossible to see everything. And there were many interesting things to hear about. German scientists from the University of Gottingen discussed the progradation of land, where I was surprised to find that Australia has the second largest area of abandoned agricultural land after Russia. While progradation is leading to increases in soil carbon, it is projected that it would take 170 years to return Russian soils to their pre-agricultural state. Korean scientists from Kangwon National University discussed how they combined remote sensing technology with reports from Mongolian sheep and goat herders to get a better understanding of the processes linking climate, livestock rates and vegetation. Closer to my own research, Taiwanese scientists from National Chung Hsing University discussed how they determined interactions between phosphorous and iron in soil, and ways that this new knowledge may be used to increase nutrients available to plants. It was also good to see a fellow DEPI scientist, Dr Abdur Rab, show how using standard X-ray computed tomography technology can provide insight into soil macroporosity in Australian farms. The overall message I took from the conference presentations was that Australian research into agriculture is as advanced as anywhere in the world, and that combining our skills with others from other scientific disciplines will provide insights that we couldn't find on our own. The World Congress was an excellent chance to see the latest in agricultural research from around the globe. It was good to meet up with fellow scientists, see new ways of doing research, and to take home ideas for future projects to help the farmers of Victoria. I thank both the Plant Nutrition Trust and DEPI for giving me the opportunity to see how fellow scientists are tackling the same questions we have in Australia, and to present our own leading research.



2015 Goldacre medallist – Mark Waters

01 May 2015

Once again we received a strong field of nominations for the Goldacre award which recognises excellence in an early career researcher. I am pleased to announce that this year the Goldacre medal will be awarded to Mark Waters during ComBio 2015 where he will delivery a plenary lecture on the genetics of a hormone that was discovered in bushfire smoke, so this will have an Australian flavour.

Originating from the UK, Dr Mark Waters joined the University of Western Australia in 2010 to work on the genetics of karrikin responses in Arabidopsis. Derived from burnt plant matter, karrikins are seed germination stimulants that resemble strigolactone hormones. Dr Waters' research has elucidated early events in karrikin and strigolactone signalling, specifically involving the karrikin receptor protein KAI2. His work has established that KAI2 regulates diverse aspects of the plant life cycle, and may be a receptor for an unknown plant hormone. Evolutionary conservation of KAI2 suggests that KAI2-dependent signalling is a fundamental and ancient process common to all plants.

I congratulate Mark for his research achievements. I would also like to applaud the other nominees, who sadly missed out, but whose research was also of very high calibre.

John Evans

President, ASPS