**GCRI Trust Report**

**17th the International Plant Nutrition Colloquium (IPNC): "Plant nutrition for nutrient and food security"**

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The 17th the International Plant Nutrition Colloquium (IPNC) held in Istanbul focused on research topics dealing with agro-ecological, environmental, physiological, genetic and molecular aspects of plant mineral nutrition. A majority of the submitted abstracts were related to i) root biology and microbe interactions, ii) nutrient dynamics in soils and nutrient uptake and transport, iii) nutrient management and use of fertilizers, iv) ion toxicity and remediation, v) nutrient functions and signalling vi) mitigating impacts of mineral nutrition on various environmental stress factors, vii) nutrient cycling, ecosystems and climate change, and viii) food quality and human nutrition. A special session on potassium dealing with roles of potassium in nutrition and physiology of crop plants was also incorporated to the program.

During the conference I presented a poster entitled “Using catch crops to enhance nutrient concentration in vegetables”. The poster was well received and the comments and feedback from the attendees were very positive and extremely useful. There was a wide range of presentations covering a lot of interesting topics both of basic and applied science. The conference's major themes and selected session highlights are summarized below:

* Micronutrient malnutrition (“Hidden Hunger”) and food security were two aspects that have widely discussed during the conference
  + A review of the so far results of the HarvestPlus program was presented
  + Methods to increase the essential element accumulation on edible tissue were discussed
  + There were only few reports on biofortification of fruit crops e.g. Foliar Zn application prior to bud break or at three weeks after bloom increased Zn concentration in apples and improve fruit quality, while Zn application four weeks before harvest was only improved the fruit quality
* A paper described the development and use of two types of real-time radioisotope imaging systems which can be used to study the real time movement of different elements. The method can be used to improve our understanding on uptake manner of the nutrients in the root i.e. speed, distribution and translocation manner, as well as distribution, translocation or accumulation in aboveground part
* Dr Brown reviewed the factors affecting the efficacy of foliar nutrient sprays and highlighted that there are opportunities to improve it. There is a potential to use supplemental foliar fertilisers with root-applied fertiliser to provide more environmentally friendly nutrient management. However, more research is needed to understand the influence of foliar fertilisers on shoot-to-root signalling and subsequent root growth and nutrient uptake from the soil
* Concerns over perceived problems associated with increased substrate EC is limiting growers’ uptake of the new water- and fertiliser-saving techniques developed. There is an opportunity to improve tolerance to high EC by manipulating nutrients
  + A study showed that damage resulting from the salt application in basil has been reduced under the conditions of increasing levels of Zn application
  + Elevating N concentration from 2.6 to 8.3 mM increased pepper yield grown under different salinity levels
  + Exogenous proline application significantly improved growth and yield of maize in response to salt stress
* It is possible to integrate nutrient management with pest control strategy in managing to reduce the possibility of disease infections
  + A study showed that both foliar and root fertilisation of sweet basil, which increased K, was effective in reducing severity of both *Botrytis cinerea* and *Sclerotinia sclerotiorum*, the driving mechanism apparently occurs in the shoots
  + B application decreased the infestation level by soil pathogens in Chinese cabbage and pea
  + The fertilization of cotton with balanced rates of nitrogen and potassium in a low fertility soil improved the nutritional status of plants, reduced the severity of leaf spots caused by *Ramularia areola* and *Alternaria macrospora*, and increased cotton yield
* An interesting paper described the effects of P and Fe deficiencies on root exudate pattern of apple trees. It showed that apple trees grown under P deficiency released a significantly higher amount of oxalate which suggests a potential involvement of oxalate in P mobilising. Little information is available about root exudates of apple trees and further research is needed to understand the process as well as to examine the genotypic variation

Moreover, I attended a tour at the Department of Biological Science and Engineering at Sabanci University. The [Plant Molecular Biology and Genetics](http://fens.sabanciuniv.edu/bio/eng/?Arastirma/ArastirmaAlanlari.php?s=mems) and Plant Nutrition and Physiology groups were particular interesting as their research focus on investigating the genetic and molecular basis of biotic (diseases and insects) and abiotic (drought, cold, salt, heat, mineral deficiency) stress response mechanisms and micronutrient deficiencies and heavy metal toxicities in crop plants, respectively.

The conference was an excellent avenue for discussion, exchange and transfer of knowledge, and creating new and fostering existing collaborations with over 630 participants registered. It provided to me an excellent opportunity to meet up with colleagues working on protected crops, and facilitate the exchange of ideas and information. I have had a number of interesting discussions with various people and a possible collaboration may occur as a result. Currently, we are discussing with Dr Margit Olle (Estonia) the possibility to develop a project proposal for the Horizon2020. The proposed project will deal with LED lights and crop management. I am very grateful to the CGRI Trust for contributing to the cost of the trip.