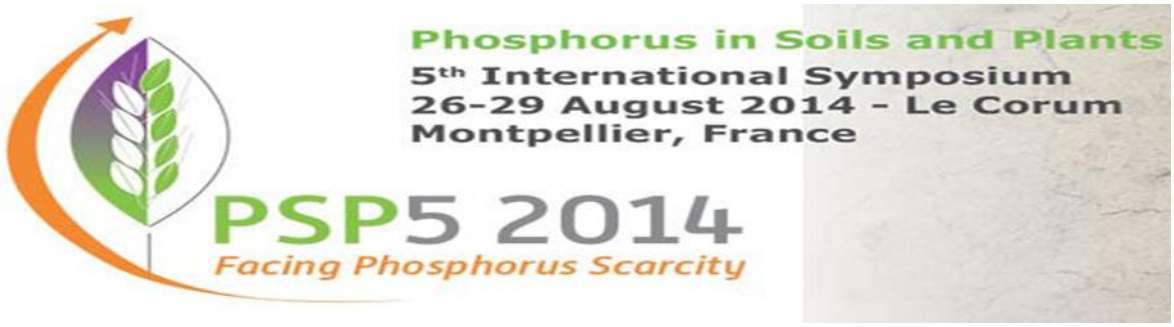
Report on Phosphorus Conferences held in Montpellier France

Phosphorus in Soils and Plants (PSP 2014) 26 – 29 August 2014



Theme: facing Phosphorus scarcity.

The conference was divided into five sessions sub-divided into themes covering a broad range of topics relating to Phosphorus (P).

Theme 1: Phosphorus forms, availability and cycling in soils.

Talks from **theme 1** were centred on new techniques and methods of measuring P, speciation and its interaction with the soil - plant system with phosphorus use or utilization efficiency the main issue. Methods which were of particular interest include:

- The use of a ^{33}P isotope tracing model for quantifying P transformations.
- The characterization of organic P by combined enzymatic addition assays and ^{31}P NMR given by Jarosch Klaus (both presenters came from the same research group in Zurich so I would be in contact with Jarosch to get the protocol and suppliers of the enzymes. Not sure about the isotope tracing method because that might involve pot trials which might not be feasible at the moment)

I also presented my poster in this two themes. Interest was on mostly the plant NMR and how I did it, there was also lots of encouragement to get it published due to the lack of literature on the topic. I also had a chat with Doolette Ashlea from the University of Adelaide in Australia, who works a lot on NMR.

Other talks in **theme 1** focussed on phosphatase activity and the contribution of microorganisms in increasing P utilization efficiency. For example there was a talk on the contribution of earthworm cast in increasing plant growth level and acid phosphatase activity in the rhizosphere.

Theme 2: focused on P acquisition by plants and microorganisms, most of the talks in this sessions were more biological and full of genetics. Talks were centred on P Utilization efficiency with emphasis on the below ground system's mostly roots.

Theme 3: Focused on P utilization and signalling, mostly genetics focusing on the functions of the various P transporters found in the roots caps and rhizosphere system. Ways of improving P utilization efficiency was also the point of interest.

Theme 4: Focused on ecosystem dynamics and environmental impacts of P. Most of the talks centred on the exports of P to the aquatic environments its effects and the P N C balance in the plant soil stoichemistry. A talk on Phytate mineralization and its effect in plant nutrition was also given.

Theme 5: Focused on sustainable P use in agroecosystems. The key note was on P deficiency in sub- Saharan Africa soils, to P accumulation in soils found in Europe and Asia most especially China, was main area of this theme.

Closing: at the end this conference I would say I gained a lot in terms of understanding what is currently trending in terms of P research.

Theme: Sustainable Phosphorus Summit (SPS 2014) 1- 3 September 2014.

The conference was divided into 5 sessions with different themes for discussions with the major issue of sustainable Phosphorus use.

Theme 1: Phosphorus in our world, talks were centred on the phosphorus cycle and long term sustainability, with special emphasis on **phosphate rocks**. Most talks were models to help us understand the effect of the past and present phosphorus use in global food and agricultural systems in countries in Europe, Asia (most especially china, japan and India), and Africa (Morocco which has the largest deposit of phosphate rock in the world).

Theme 2: Phosphorus in our resources and environment. Talks were centred on Phosphorus management and use in the environment, phosphate rock mining, fertilizer production, organic manure application and the threats from cadmium in fertilizers use on agricultural soils, loses to water (leading to algal blooms) and P bioavailability.

Theme 3: Phosphorus in our fields. Presentations were centred on phosphorus manures and other organic products and the implications of their application on agricultural soils. P deficiency, surplus, use efficiency of P reserves and legacy P and management on agricultural soil or fields were the major points of note. I presented my poster for this theme again.

Theme 4: P in our food. Most of the talks focussed on dietary intake of P its importance and the effect on human health with case studies from America, Europe and Asia. A talk on Phosphorus use in animal feed was also presented.

Theme 5: P in our waste as the name implies talks were focused on the various P recycling options and management in most European and some Asia countries (China, Japan and India). There was also talks on P recovery from waste water, sewage sludge ash, mineral fertilizer production and P removal potential from pollutants and the costs.

Closing: At the end of the conference I learnt a lot about P cycling, management, recovery, and Phosphate rock mining and fertilizer production. Issues discussed during the round table session include global P governance. As the name implies this session was mostly on polices and regulation of phosphorus use and management. We were also told to send papers to the **Nutrient cycling in agroecosystems** journal published by springer.

In summary there were plenty of opportunities for informal discussion with others working in fields related to mine, both within the UK and abroad, which have further increased my insight into phosphorus chemistry and cycle. As a biochemist by training whose research tends towards environmental chemistry, I find such conferences highly informative. I am extremely grateful to the Royal society of chemistry's NWR-AD for contributing towards my travel expenses for these meetings.

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