

## Making crop rotations fit for the future?

Just before Christmas 2011 (Tuesday 20 – Wednesday 21 December), a collection of crop and soil scientists and agronomists gathered at the Great North Museum in Newcastle-upon-Tyne to discuss “Making Crop Rotations fit for the Future”. Forty-five delegates came from all over the UK and Europe and as far away as New Zealand and included research scientists, policy makers together with farmers and their advisors. The natives were friendly, the weather was relatively kind (a vast improvement on the snowdrifts of 2010) and the meeting rooms at the back of the museum rapidly filled with words of presentation, discussion and conversation. Through a series of presented papers and discussions we considered the scientific rationale for crop rotations then considered whether the evidence from practice supported the theory or whether crop rotation was a tool that was poorly understood and hence used less effectively than might be possible. We concluded that crop rotations are a tool that will be increasingly required to support sustainable agriculture in the future; rotations do not mean a return to the 1960s. Oral presentations described a variety of approaches to study rotations in the field and discussions clarified the integration between field experiments and modelling approaches needed to support the design of rotations for the future. The first day ended with a poster session and drinks session sponsored by the Food and Terrestrial themes of the Newcastle Institute for Research on Sustainability (NiRES). For the conference dinner we moved up to the front of the museum and found ourselves dining amongst the exhibits on tasty food (largely sourced locally). Our after-dinner speaker was a local farmer, Simon Henderson, who did well to draw our attention from the display cases, and focus our attention on the drivers and constraints faced by farmers when designing and managing their crop rotations. The next morning, the initial focus was on using legumes to drive crop rotations with a number of presentations of the work emerging from the European Legume Futures projects. Then presentations and discussion explored some wider issues for the management of crop rotations. Because of the attendees, there was little consideration of the role of rotations and management of pests and diseases and relatively little on weed management issues. So in our final discussion, we felt that we couldn’t fully answer the challenge set by the conference organisers. It was recognised that a number of key challenges remain; many of these require knowledge sharing and co-operation between researchers and farmers. So before we meet again to talk about rotations, we



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felt we needed to:

- Develop and share methods to integrate the value of nutrients in crop residues, green manures etc into fertiliser recommendation systems
- Draw on the best ecological and bioinformatics approaches to support robust interpretation of complex multi-functional rotational data
- Include integrated consideration of tillage systems within rotational experiments
- Improve assessment of additive effects that can build up through rotations e.g. soil structural improvements, disease suppression
- Develop methods that can provide financial analysis and full cost-benefit analysis over different timescales to compare rotations
- Include assessment of yield stability and risk management aspects
- Improve information on the opportunities to integrate legumes into conventional stockless cropping systems
- Increase the respect and value given to farmer-led innovation to develop scientific principles in practice and develop approaches to verify and transfer the lessons learned to other farmers and farming systems
- Identify the key drivers which determine the “fitness” of a rotation for a location – including climate, soil and market aspects

We hope that the rotational cycle will bring us together again – perhaps in a new place and with a wider group of stakeholders in the future – there are still plenty of questions to discuss and challenges to answer as we seek to make rotations fit for the future.

*-Elizabeth Stockdale  
AAB General Secretary*