

OECD Fellowship Summary Report

Name: Christine Watson

Subject: Assessing the sustainability of farming systems in practice: effects of scale and farm diversification.

Theme No: II Sustainability in Practice

Host Institution: Future Agriculture, Dep. Crop Production Ecology, Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden

Host Supervisor: Professor Ingrid Öborn

Dates of fellowship: 30 April to 23 July 2012

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1. Relevance

- The aim of the Research Fellowships within the OECD Cooperative Research Programmes is to strengthen the international exchange of ideas and increase international mobility and cooperation among scientists working in these areas. A period working within SLU provided an opportunity to develop new working relationships for future publications, funding applications, educational initiatives and long lasting institutional cooperation. There will be staff exchanges and return visits as a result of this fellowship.
- This fellowship tackled assessment of sustainability in farming systems which is a key objective of Theme 2. One important aspect of the work was developing ideas for methodology suitable for assessing the environmental, social and economic value of integration of crops and livestock. In many European countries crop and livestock production has become geographically separated resulting in some adverse environmental impacts. It also addressed how systems with different levels of crop and livestock integration might adapt to climate change. Nutrient balances are a key method for evaluating the sustainability of farming systems at field, farm and regional levels.
- Food Security and Sustainable Development are high up the policy agenda at the present time. Improved use of resources (e.g. nutrients) is one of the keys to sustainable intensification. Improved interdisciplinary approaches to evaluating farming systems and how well they can adapt to climate change is a key step in moving agriculture towards these goals.

2. Objectives

- a) To address using nutrient budgets (including nitrogen and phosphorus) whether complex farm systems which integrate different types of production, for example, crops and livestock, are more nutrient use efficient than simpler, less diverse production systems.
- b) To understand the impact of scale of measurement on nutrient use efficiency using nutrient budgets.
- c) To link nutrient budgets to wider sustainability assessments by applying criteria being developed by an inter disciplinary project " Effects of land use change on multifunctionality in agroecosystems: Biodiversity and ecosystem services after transition to organic production" within the SLU Future Agriculture Programme
- d) To develop ongoing collaboration between SAC farming systems research and the SLU Future Agriculture programme through joint applications for research funding and staff and student exchanges.

3. Major achievements

- Working together on data collected by SLU on field and farm level element flows to quantify uncertainties and annual variations in trace elements and macronutrient. This will be submitted as a publication in the near future. Additionally a review was completed on managing micronutrients in food and feed by optimising the use of soil, plant and local nutrient resources.

- As a result of the fellowship the holder has become involved in a new Swedish project within Future Agriculture developing methodology for valuing the integration of crops and livestock within farms and landscapes. The holder is also a co-supervisor for an SLU based PhD student working on farm systems modelling based on understanding farmer decision making and adaptation.
- New collaboration related to the SLU Future Agriculture programme and across SLU campuses (Ultuna, Umea, Alnarp). New possibilities for collaboration have been identified and one funding application is already underway.

4. Follow-up

Two further publications are anticipated, one dealing with element balances in organic and conventional dairy systems and one with assessment of the environmental, social and economic value of greater integration of crop and livestock systems. Both will appear in refereed journals.

Planned high level meeting between senior staff from SAC and SLU staff (13-15 November 2012 Uppsala, Sweden).

5. Satisfaction

The fellowship conformed to my expectations. The opportunities for joint publication and new funding applications provided by the fellowship will in time improve my career opportunities as both are a measure of performance. Holding an OECD Fellowship is regarded as a measure of esteem.

6. Advertising the Co-operative Research Programme

I first heard of the scheme through Wilf Legg but an SAC colleague recently also held an OECD Fellowship. The scheme could be made more visible by links on the websites of organisations who have hosted fellowships or from the home institutions of fellows.