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Mechanical weed control on an organic arable farm in southern Sweden. Photo: Pelle Fredriksson, SLU/EPOK. Small photo: Maria Wivstad.

Organic agriculture and research in Sweden

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National objective: 20 % organic by 2020

National objectives for the development of organic farming have existed in Sweden in 20 years and the current objective is that 20 % of total agricultural land should be certified organic by 2020. The aims of the national objectives and the related public subsidies are the environmental and societal benefits of organic production.

Recently, the Swedish Board of Agriculture concluded that organic production contributes to increased biodiversity, and decreased use of chemical plant protection products which reduces accompanied environmental and human health risks.

In addition, it was concluded that organic production is for the benefit of animal welfare and rural development[1]. Societal and environmental benefits of organic agriculture have scientific support[2], although there are drawbacks and a need for improved performance[3,4].

In Sweden there are currently 480 000 hectares of certified organic land, which comprises close to 16 % of the total agricultural area. In some Swedish counties, the goal of 20 % organic farmland has already been reached, but in the most fertile plains with intensive agricultural production in the south of Sweden only about 6 % is farmed organically. Public subsidies for organic farming have been in place since the mid-1990s, which has been an important driver for organic farming growth.

Integration of organic agricultural research

For the past 15 years, Swedish research on organic food and farming has to a large extent been funded by directed calls for research in organic food systems. Public funding dominates, but there are also a few private funding bodies that have had designated organic research calls, e.g. the Swedish Farmers' Association for Agricultural Research.

Current funding of research on organic food systems in Sweden amounts to 3.3 million Euros per year, including national funding of new projects in 2015 within CORE Organic Plus. Research relevant for organic farming is also funded by open national research calls and by international funding bodies, e.g. the EU framework programs.

There are no specific research institutes or departments that conduct organic agricultural research in Sweden. Instead this research is integrated within many different

departments at universities and research institutes. The main part of agricultural research is conducted at the Swedish University of Agricultural Sciences (SLU), the only agricultural university in Sweden.

Present and recent research activities cover a wide range of topics within organic crop and animal production as well as food quality and marketing of organic products, even though research within primary organic production dominates[5].

Animal health and welfare issues in organic pig, poultry, dairy and meat production systems are high research priorities in Sweden. Optimizing the production of protein feed crops is also a central issue.

Production of high quality forage and grazing are crucial for organic dairy production. Research on crop and animal breeding has attained increased interest to meet the need of specific traits and breeding goals in organic farming systems. This is important to build robust farming systems.

Effective weed control, both direct weed regulation and preventive measures, not least of perennial weeds, is central in both agricultural and horticultural cropping systems. Pest and disease control with biological and preventive methods is another strong research area in Sweden.

On landscape level, the potential for biological control linked to conservation measures such as vegetation strips to decrease pests and diseases is of high relevance. The general effects of organic farming on biological diversity and ecosystem services on landscape level are also studied. A number of research projects are conducted on how to achieve high nutrient use efficiency of organic fertilisers, manure as well as a wide range of rest-products from society. Timing of fertiliser nutrient release in relation to crop nutrient needs to avoid environmental harmful emissions is also a challenging problem that needs research.

2013: New research agenda

During 2012, EPOK developed a research agenda for organic agriculture by an open process with stakeholders in the food chain[6]. The main aim was to provide an overview of knowledge needs of different stakeholders, which will facilitate prioritizing for decision makers and funding bodies in future research calls.

The agenda addresses future challenges of the organic food chain as well as challenges for our food system as a whole, to increase knowledge of farming and food systems that enhances sustainability, efficiency and environmental and societal benefits.

The main agricultural research funders in Sweden welcomed the research agenda, which has been used as a steering document in several national calls for organic farming research during 2013 and 2014.

Cross-cutting topics

Three cross-cutting themes were identified in the agenda:

- Robust systems
- Added value for the environment and society
- Competitiveness and rural development

Five focal areas

Further, five focal areas were described, including examples of specific research questions[6]:

- High productivity with maintained sustainability
- Innovative production systems with many functions
- Closed-loop cycles and renewable resources
- Sustainable enterprises and market development
- Healthy food with added value

The need to strengthen stakeholder cooperation was strongly addressed. Stakeholder involvement has the potential to promote innovation and implementation of research results, which significantly increases the benefits of research to the society. Also the need for larger interdisciplinary projects was stressed, to solve problems on a higher system level to better achieve long-term sustainable solutions.

More international research cooperation is one option to make better use of research resources and strengthen interdisciplinary research. Hence, in cooperation with a large number of Swedish researchers, EPOK currently emphasizes international cooperation within organic research, not the least to build consortia for projects within Horizon 2020 including upcoming ERA-nets.