

Importance of organic farming research in Sweden for innovations and increased sustainability in agriculture

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Overall implications of organic farming research

Organic farming is known to be a knowledge intensive production system and there is a strong need for new knowledge and innovations to achieve increased sustainability. Furthermore, many of the research goals defined in national and international research strategies for organic agriculture are addressing questions relating to the development of more sustainable food and farming systems in general. Organic systems can thus be seen as a fore-runner and an innovation system to sustainable food and farming (TP Organics, 2009; EPOK, 2013).

Organic research in Sweden during 15 years

Swedish research in organic food and farming has for the last 15 years been mainly financed through specially designated funding. About 30-35 million SEK per year have been put into organic research in a variety of subject areas. Applied research projects dominate and among these, projects within crop and soil science have taken the largest part leaving one quarter of the projects during the first decade of the organic programs (1997-2006) to animal sciences (Formas, 2006). Furthermore, recently prioritized research areas have been biodiversity and provision of ecosystem services in organic systems and systems analyses of environmental impacts.

Organic farming projects addressing new research topics

Research on organic agriculture has early focussed on new topics that are highly relevant today, meeting future challenges of our food systems, e.g. to develop productive farming systems for a growing population and at the same time utilize resources in a sustainable way and maintain ecosystem services in the agricultural landscape. As a result a large amount of knowledge has been produced that has been very important to agriculture as a whole. We will here describe some examples of organic research in Sweden financed by the targeted research programmes on organic agriculture. The research has implied new innovations and knowledge, contributing to the development of organic farming and also for agriculture in general.

Non-chemical crop protection methods

A bottle-neck for stable crop production levels in organic farming are different crop protection problems. A number of research projects have focussed on basic knowledge on weed ecology together with resource efficient weed control technology (Lundkvist, 2009). Furthermore, knowledge about the complex interactions between natural enemies and pest organisms have been developed within the organic research programmes resulting in preventive measures aimed to strengthen the biological control by natural enemies (Nilsson et al., 2012). Innovative research has also been conducted on chemical interactions between cereal varieties as a preventive measure against aphid attacks (Ninkovic et al., 2011).

Locally produced feed and new protein feed sources

In the development of sustainable animal production systems, the feed protein supply is a key issue. Mussel meal has proven to have great potential as protein source for poultry (Jönsson, 2009) and pigs, and thereby also recycling nutrients from the sea or from lakes back to the agro-ecosystem. Research on organic farming has also been a fore-runner in

the search for effective use of locally produced feed and the use of high proportions of roughages in dairy production (Johansson and Nadeau, 2006).

Outdoor animal production systems

A number of projects on animal production systems have been innovative by having a multidisciplinary approach for developing systems solutions with the aim to identify synergy effects and handle possible goal conflicts between animal welfare, environmental impact, working environment, and profitability. One example is research on developing outdoor organic pig systems (Salomon et al., 2012).

Agricultural systems producing renewable energy

Before efforts to move towards a fossil-free agriculture was on the general agriculture research agenda's, this was a prioritized topic within organic agriculture and several research projects have been conducted to analysed possibilities for e.g. on-farm production of bioenergy (Kimming et al., 2011).

A new Swedish research agenda for organic agriculture

EPOK has developed a research agenda in an open process together with interested parties in the food chain to provide a well-supported document which will enable research funding bodies to prioritize future research ventures on organic agriculture (EPOK, 2013). According to an evaluation of organic research in Sweden (Formas, 2006) a continued public support to research in this area is recommended, which could be justified by the public goods that organic farming provide; increased biodiversity, decreased use of chemical plant protection products and benefits for animal welfare (Jordbruksverket, 2012). Five prioritized focal areas are pointed out in the research agenda: 1) High productivity with maintained sustainability, 2) Innovative production systems with many functions, 3) Closed-loop cycles and renewable resources, 4) Sustainable businesses and developments of markets and 5) Healthy food with added valued.

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