

## Early Experiences of Participatory Learning and Action Research with Organic Farmers in Sweden

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### Abstract

This paper seeks to trace some new developments in Swedish agricultural research: in the approach and methods of conducting research and within the growing organic farming research community. The basis of these developments has been the recognition that a change in form, substance and method was needed; from a rather narrow, researcher-driven, reductionist approach to problem solving, towards a farmer-participatory, systemic approach *which seeks* to improve farming systems and livelihoods of organic farmers. Farmers, extensionists and researchers are all partners in this process. This new approach is illustrated with an account of the experiences of a number of farmer-driven researcher groups. These have evolved over the past 4 years together with the facilitated changes in institutional research and donor support which have enabled this to happen. The key elements in the approach have been: the participation of many stakeholders in the research, a systemic learning and action process and the willingness of both an institution and research donors to support these initiatives.

### Introduction

The organic movement recognises that each and every farm has a unique, productive system that involves highly complex, and partly unknown or poorly understood, interactions. It follows that a conventional, reductionistic scientific approach alone will not solve the problems that farmers experience in practice (Röling and Wagemakers, 1998).. Until very recently, much research into organic farming systems followed a conventional research approach, dominated by a positivist-reductionist scientific paradigm, and a transfer of technology process in which farmers are recipients of technologies primarily devised by researchers (Biggs, 1989). While this might have been appropriate for a range of specific problem areas, it was inadequate in dealing with the real complexities of organic farming systems which rely heavily on interaction, diversity, managed ecosystems and the emergent properties of these systems.

#### *The need for a new understanding of systems*

In order to understand and research these complex situations, there is a need for an holistic approach, in which research is conducted within a farming systems context. These systems, in turn, sit within livelihood, community, water catchment and regional systems. These approaches are now very common in different developing and developed country research systems and have been evolving over the past 40 years within what is widely known as farming and livelihood systems research (Collinson, 2000). These ideas have been firmly based on ideas of hard and soft systems thinking, first developed by Checkland

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(Checkland, 1981; Checkland and Scholes, 1990) and later developed and applied by many others (eg. Bawden, 2003).

One initial aim of agricultural and development research is to describe and understand the world in a way that contributes to both practical changes and long-term theories of development, (Svensson, 2002). Research that has started with an holistic approach within a system may then generate research questions that can be studied in other environments, but initially such research is designed to address the situation within the system itself.

Today the Swedish farmer is subjected to many different pressures which derive from policy directives and from farmer organisations. These are often designed to meet political goals and involve rules and regulations from local, national and European agencies. These directives are intended to create change towards a more sustainable agriculture. For the farmers to implement these goals fully often involves an adaptation of the whole system with adjustments to family or hired labour use and responses to changing, economic, climate, soils and environmental conditions. Developing a relevant research programme in such a context calls for new skills from researchers, extensionists and farmers.

Changes in agriculture and food production worldwide (over-production and food quality and health scares in the West and North, and poverty and food shortages in the developing countries) have prompted a significant change in the focus and manner of conducting research towards a more sustainable approach to resource management and rural livelihood systems. In this process, much experience from years of working in the developing economies with farming systems development, interdisciplinarity and farmer-participatory research, has been recognised as being relevant to the developed economies. Many of the principles behind these approaches are relevant to the organic movement but few have been adopted so far. (Gibbon, 2002).

The approach described here starts from very different assumptions about the nature of the world and about the nature of farming systems. Essentially, it accepts that all the stakeholders in the process have valid perceptions and ideas about how farm systems work and how they might be “improved”. The key to the approach is that farmers, and resource users generally, have an equal voice in the process of understanding the nature of the “problem” and the development of ways of either “solving the problem” or in developing ways of improving the situation to create more sustainable systems. (Röling and Wagemakers, 1998).

### *Bringing farmers into the process*

This research focuses, both on the subsystems within farm systems, and on the wider community or area-based systems in which farm systems are embedded. An effective research process cannot evolve without the intimate knowledge of these systems and the skills and experience of farmers or the farming community. Their participation in the process is crucial for a sustainable development of agriculture and connected systems not only to identify and work with relevant questions but also to initiate action and learning, which will bring about practical change. The key problem that we face in developing more sustainable development is to not only to understand the nature of the problems but how to implement new knowledge effectively in society. For people to make new choices that will create sustainable development they require knowledge based on power of insight, experience and comprehension (Jönsson, 1996) as well as self-confidence. This may be gained in participatory projects based on the participants’ own creativity, experiences and participation and use of abductive logic. (Scoones and Thompson, 1994)

In Sweden, farmer participation in research has normally been limited to a contractual or consultative mode or by contributing with resources such as land and labour at the most. (Biggs, 1991). Introducing a form of participatory research in which farmers are regarded as partners is a part of meeting Swedish agriculture's need for new knowledge and competence and is an example of the multi-scientific and developmental research proposed by Tydén (2002).

#### *An initiative at the Centre for Sustainable Agriculture, SLU*

In 1998, the Center of Sustainable Agriculture (CUL) at the Swedish University of Agricultural Sciences (SLU) initiated a participatory research programme with organic farmers in Sweden. The aims of this initiative were to:

- begin a dialogue on what participatory research might contribute to Swedish agriculture
- initiate participatory systems research with Swedish farmers
- contribute to the ongoing process of building up knowledge and organisation and introducing participatory learning and action research at SLU
- facilitate the work of several farmers' groups and monitor the varied and distinctive development of them
- explore the interests and roles of different stakeholders within the participatory research groups

The rest of this paper will be an account of the progress so far in the achievement of these aims.

### **The Development of organisation and knowledge**

#### *Getting started 1998 & 1999*

In spring 1998 the first participatory group started through the project "Participatory research on ecological farms in Sweden – systems analysis, priority settings and research development in the field of legumes/leys/green manuring." (**the Cereal group**) led by one of the authors<sup>1</sup>. After having worked with this group for a year a workshop on participatory methods, two days long, was given for interested advisers, farmers and researchers. The participants were introduced to the ideas and goals of participatory research, worked with different tools and methods and discussed the pros and cons of this way of working. During the course, five new groups were initiated: - 1. Organic **Greenhouse tomato** production, 2. **Poultry** production, 3. **Vegetable** production, 4. **Energy** production and 5. **Pork** production. Of these, the first four began and most included farmers, advisors and researchers, except for the energy group that did not include a researcher. In the organic greenhouse tomato production group, one person<sup>2</sup>, who had more formal education in participatory research, joined in order to get further practical experience and to contribute to the process. She was given the role of facilitator in that group.

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### *Progress from 1999 to 2002*

All the initial groups had some financial support from the Center of Sustainable Agriculture. This support was used to either pay a researchers salary, pay for participants travel costs or for needed analysis. This money was not enough to support the groups' work fully so the groups, with active advisors or a researcher that had the know-how to find and apply for money are the ones that are still working together. These advisors and the researchers have also been crucial for the groups in supporting them in administrative matters and writing up reports.

The facilitation of the **Greenhouse tomato** group turned out to be a key success story. This group has analysed their situation and worked with their priorities (Eksvärd, 2001). The group began with a group contract, discussing why there were different opinions and the reasons for group participation. In 2000 CUL asked the facilitator of the group to write a report about the learning, results and experiences from their work. This report focused on describing the process in the group and the results of their work to other farmers, advisers and researchers. After this, resources were found to write a description of participatory learning and action in Sweden. Resources were also found to support the facilitation of the working groups. Two other groups, the **Cereal** group and the **Vegetable** group, invited the facilitator to assist with planning, evaluation and group dynamics. The **Energy** group did at not show much interest and were difficult to contact. This group used the financial support for study tours and waited for one of their members to build a biogas digester. They never got a research process started and did not experience any need for facilitation. The **Poultry** group was based on an experience exchange group that added a conventional researcher that had not taken part of the original training workshop. There was some confusion in the group about how to work and who was in charge. The extensionist that had been part of the workshop worked less than halftime.

During 1999 a new program for ecological and organic agricultural research was used by the Swedish Research Council for Environment, Agricultural Sciences and Spatial planning. The Deputy Director of CUL at the time had the task of putting the programme together and managed to add one line in the end of the program saying that projects including participatory research were of extra interest. Some time after the programme started, CUL arranged a seminar at the University describing how participatory research had been evolving. These two events, in part, raised interest and resulted in four research applications that included ideas for participatory groups connected to the research. Only one of these was granted. This resulted in the **Cultivation system ecology** group which started work in 2002.

Funding for the groups has been found from different sources. The **Cultivation system ecology** group has been financed through a larger research grant. The **cereal** group started out on a one year research grant and has after that had a smaller grants on yearly basis and the **Greenhouse** group and the **Poultry** group has repeatedly applied for KULM-support i.e. money given for raising competence of ecological farmers by the Swedish Board of Agriculture (JBV). During the years an advisor in the **Greenhouse** group and the deputy director at CUL has repeatedly talked with enthusiasm about this way of working with people working at JBV.

At the beginning of 2002 CUL employed the facilitator half time, for a period of three years to enable a stabilisation of participatory research in Sweden and to develop an organisation and academic base for this kind of work within the University. When the facilitator started, all the groups connected and with financial support from CUL were asked for a short description of what they had done once a year. The

**Energy** group never progressed further than a study tour and ended their connection with CUL and the **Poultry** group began documenting some of their work.

### *Getting closer during 2002 & 2003*

In 2002 it became clear that to be able to start new groups this work needed to be more attractive to researchers and creditable to the researchers involved. Even though this kind of work can very well be seen as the task of spreading the findings and results from research to society which is officially an important part of the University's assignment it is not something that is seen as giving credit points or merits for a University career<sup>3</sup>. At this point attention was given to begin scientific writing that would include the group process of both how the questions had been raised and dealt with as well as the results of the work.

In 2002 and 2003 the participatory research work was presented in a poster session at a conference, advertised on CUL:s website and in the Ecological farmers weekly mail information. Parts of the work of the **Greenhouse** group and the **Cereal** group were also given attention in magazines for farmers.

During 2003 CUL had decided that their aim for the future was to support participatory research by giving institutional support, training facilitators, arranging meetings for group members and facilitators to share information and experiences, inform about funding possibilities and help spreading information. To do this, money was requested from the Swedish board of agriculture to hold a training course for facilitators.

During 2003, the programme for ecological and organic agricultural research, which is the guide for government and private funding bodies, was rewritten. In this programme participatory research was not only mentioned but described as one of the major approaches requested for future research.

## **Cases**

### *Activities of the Greenhouse group*

The group with organic **Greenhouse tomato growers** was formed in February 1999. Since then, new members have joined and a few have left, but several growers active today have been present since the beginning. From the start this group contained 9 tomato growers, 2 advisers, 1 researcher and a facilitator. The greenhouse group has been productive and its members have achieved much during these years. The reasons for this group's success are: - interested and active growers, active advisers willing to adopt to the approach and active in finding finance, good communications, regular written reports and the access to facilitation. When the group first met they all had one urgent problem in common, that of the corky root disease (*Phyrenochaeta lycopersici*), that needed addressing. This work began immediately and went on in parallel to the building up of group confidence, understanding participation, drawing the larger picture, finding questions, problems and possibilities to work on in the future. The documentation of every meeting from the start has also been important, the reports showing progress every year, the practical changes by the growers and the practical "hour" of every meeting spent in the greenhouse of the host – grower.

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<sup>3</sup> Like many Universities, SLU recognises publication in key academic journals as the primary measure of achievement.

The group has worked with corky root disease and compared yields and development of grafted tomato plants on wild tomato roots resistant to root disease and not grafted plants as means to deal with cork root disease. As using grafted plants is not a final solution to this problem the group decided to go on with the question and they obtained a research grant covering 4 years of experimentation to find ways to live with the disease. This is the first research grant that has been awarded to a group primarily made up of farmers.

The group has also worked systematically for 3 years with plant nutrition questions. Their results have drastically changed the view on how to fertilize organically grown tomatoes, and this was presented in an article in "Ekologiskt lantbruk", the paper of the organic farmers. This work has led to discussions with the KRAV, the Swedish member organization of IFOAM, about their rules for fertilizer use as the group's work shows that the current recommendations results in an overuse of phosphorous. A report presenting this work was used as part of the background material by the in preparing new rules for organic greenhouse production in the EU. The final report is written in Swedish (Ögren et.al. 2003)

Another question raised by the group is "what is organic/ecological tomato production?". This question has followed the group from the initial feeling unease about heating greenhouses with oil, but it was not until spring 2002 that the group was ready to formulate their questions around the subject and starting to work with them. At this time the question had been brought up again, through the work with plant nutrition, which drastically challenges the conventional view on what are to be considered organically sound production methods. In this work a researcher working in sustainability questions and with experience of organic tomato growing joined the group. This work will be presented in a coming report.

The group has also carried out a comparison of energy consumption, compared taste of tomatoes with different treatments, taken courses, taken part in conferences, analyzed their business situations, checked their water quality and conducted several smaller informal experiments such as growing tomatoes in sacks and the use of silage as a fertilizer source.

### *The Vegetable group*

The vegetable group started in 1999 after the workshop that one of the growers attended. Members of this group were five growers, one researcher and one advisor. The group's first meeting was facilitated and began with mapping members' farms and production systems. This group had problems from the start as there was no financial support for the advisor, the growers were few and the group lacked facilitation and support. There were plenty of ideas but they needed prioritization and a structure. During 1999 the group visited two of the growers' farms and in 2000 there were three pieces of work done by three different growers. At the end of 2000 an evaluation and replanning was carried out with facilitation. This revealed that the growers liked to meet fellow growers, enjoyed the sharing of experiences, enjoyed getting away from everyday labour and had an interest in the fieldtrips that had taken place. But the group was still confused about what they were actually doing, what was expected from each of them, how to get started and some farmers found it stressful to be away from work on the farm. During this meeting the group decided that their main goal was to exchange experiences, develop their enterprises and to share time and intellectual fellowship together. They decided to divide their meeting into two parts, one "specialised" and one common. The specialised time was to be used for a theme to be worked on for a longer period of time and the common time for regular exchange of experiences, inviting people with interesting information or ideas. They agreed on trying to finance the advisor through making the group a "farmers' circle", to extend the group and to meet 3-4 times a year. They also decided to divide and share tasks such as; applying for money, documentation, arranging

meetings and developing meeting agendas. After this they decided to work with plant nutrition and began four field trials. However, they were not successful in finding financial support, nor in extending the group, partly due to being keen on finding someone with experience. Before the 2002 season one grower and the researcher left the group. The farmer, due to too much work, and the researcher got involved in another group. The group has not met since.

### *Cultivation system ecology group*

This group began with a researcher designed idea which was based on expressed problems from farmers. An application was made for the funding of five work packages and four were granted. These were: - plant nutrition, plant protection, food quality and participatory research, and they were all joined together in the project “The ecology of the cultivation system: green manure as a multifunctional tool in ecological vegetable production.” As this group started off knowing they were a part of a research programme with defined goals they were clearer on what the group was to be about. Most of the farmers (from 6 farms) expressed that their goals were to “get rid of Binadan”. (Binadan is an organic fertilizer imported from Denmark). One of the two researchers wanted to develop an optimal system, but did not specify in what way it would be optimal. The goals were well adjusted to the hard systems plan of the research project. Neither of the two researchers had taken part in any participatory training but one had been part of the **Vegetable group**.

In the first two meetings there was some unease within the group about doing participatory exercises such as a “team contract” and “rope square”. Some members wished to “get on with the real work” and the facilitator deliberately used some of her power to enable the group think about their goals, expectations, responsibilities and questions about decision-making. With the variety of people involved there have been surprisingly few conflicts, although a few disagreements have occurred. The extensionist was also part of the greenhouse group and was responsible for the participatory work package in this project. The facilitator and the extensionist had to remind themselves that this group was developing in a different way from the greenhouse group and that the form of participation was different from the start.

At the group’s third meeting things began to be more relaxed. This meeting was held at one of the farmer’s farms. As the group members come from over the country, most meetings have to be in Stockholm due to practical travelling reasons. On the farm, the farmers began to talk more openly. The shift in engagement and ideas was very clear. After having watched and talked about the farm enterprises, fields, machinery and buildings the group joined to do a participatory exercise moving from the farmers goals to what questions they would like the project to answer. A large table was constructed with the questions and how, if and by who they would be answered. The exercise went very well and revealed to the whole group the potential and understandings held by farmers as well as the potential value of participatory tools. This group is working on questions connected to the defined research program and shows little intention so far to discuss any other matters.

## **Discussion**

### *Differences in group and process development*

The **Greenhouse** group has clearly stated that they are “...working with organic tomato production, using everybody’s experiences to reach a higher level of competence through experiments, systematic

work and analysis.” They are driven by wanting to improve their own situation by finding better ways of production and reducing the immense lack of knowledge suitable for organic growing they experience. This is different from the **Cultivation system ecology** group that focuses on a project which searches for more technically sustainable plant nutrition solutions that also should work practically. The **Vegetable** group started out not knowing what they were working for and attended for the intellectual fellowship to begin with. These differences show in rates of development of the groups.

The **Greenhouse** group has clearly moved through to new experiences and knowledge which has raised new questions. The group started out with a focus on finding solutions to their corky root problem which the academic world knew little about. Knowing that they by themselves could not describe the fungus, or show the control spots, they aimed to find ways of living with the disease. The first idea of using grafted plants revealed difficulties in the nutrition balances, followed by new experiments which showed that some analysis levels used were not compatible for organic production. This led to new analyses to find suitable levels, which revealed the extremely high phosphorous levels (about 10x the lower limit of the highest classification level) that had developed in the greenhouse soils over the years. This called for the need for new strategies for manuring, including the use of easily soluble fertilizers and bringing into question the basis of organic production. The process this group has gone through is also clearly a product of social learning and dynamics within in the group. At first the group began with “secure” questions within production, but after having worked together for a year the rough financial situation for growers led into questions of economic cooperation and common homepage advertisements. Differences in interest and long distances between farms made the group settle for discussing the pros and cons of their production systems. This could not have been done without the open atmosphere created by the group. Also the question of “what is actually organic” had its roots from the very first methods used which looked at what interfered with organic tomato production. The levels of oil consumption became a question everybody agreed on as important but saw as a more or less indisputable. They agreed to compare consumption levels but never really wanted to look at the fact that this did not make their production sustainable. After three years the question had matured and developed for the group to decide to look into how they define what is organic, which choices they need to take and what they make those choices from. This group is working within an ongoing process raising questions which have relevance for several different projects.

The **Cultivation system ecology** group is more or less working within a technically defined project. Learning continues to adjust the project to the experience. When the farmers decide on how to deal with the questions the project is fitted into live systems. It is interesting how differently the farmers choose to work depending on what solutions fit their production and interest. The farmers have also clearly shown the low value of calculating financial costs at this time as was first planned in the research application. The initial set project framework and the given time frame does not give rise to a flowing process as in the **Greenhouse group**. Farmers in this project are paid by the University to do research. The group has not worked for more than two years and it could be that when the project is finished that new ideas will emerge for the future. The group has managed to become participatory to a high degree with the farmers deciding on how to do field trials. They are also affecting the larger project through the seminars that the whole project has together and meetings between the people responsible for the different work packages.

The **Vegetable** group carried out smaller individual projects, sharing experiences but never got into a learning cycle process. This group would have probably benefited from more facilitation from the start, particularly as neither the researcher nor the advisor had attended the workshop in 1998.

Starting a participatory group or project does not necessarily guarantee a process that will develop and raise new questions. Under the circumstances here this has not been the case when effort was not put into early group development and when restrictions on the aims of the group were decided on in beforehand.

Some key lessons and outputs from the different group activities are summarised in Table 1 in Appendix 1.

### *Participatory research as part of Swedish agriculture*

Participatory Learning and Action is a complementary approach to “conventional” research approaches and a way to meet agricultural society’s need for new knowledge and competence. It creates space for bottom-up development and a possibility to adopt solutions to place and situation. For sustainable agricultural development in Sweden it would seem to be essential that the actors are able to observe and predict changes, take in and use new knowledge and learn from their experiences.

### **Learning from:**

#### **1. The Farmers’ perspective**

The farmers taking part in the groups are all eager to learn and work with their situation, even though they at times have difficulties in finding time to do the tasks they have decided upon. The approach is appreciated as described by a producer saying: *“It is the wholeness of it that is the most important. That we are a very broad group working together to find what’s best for organic tomato production”*. The group meetings are important for sharing experiences and socialising with fellow growers but there is a need for the development of the research questions to keep the engagement going. After 4 years of PLA a producer states *“It is better now, but it was easier before”* referring to all the new knowledge that he now takes in when deciding on measurements in his production process.

#### **2. The Extensionists’ perspective**

*“To meet people and the group in a more focused way than before has been important and raised new questions”*. The extensionists in the **Greenhouse** group point out how much they think that the growers have received through group work and that the group’s documented reports are valuable material for extension. An advisor points out the importance of working with the growers and taking part of their reality for her as an advisor. Understanding and taking part in the grower’s situations and their problems has been as important to her as finding solutions to some of the problems. The advisors also underline how much fun they have had during the work with the groups.

#### **3. The Researchers’ perspective**

An active researcher, formerly trained in systems thinking and approaches, claims that the important part is to through the contribution of scientific knowledge be part of creating real change for more sustainable farming systems. Participatory methods are seen as the only means of working with research and development in complex situations such as farming systems. Two researchers, trained in reductionist science, describe the importance to them of getting a fuller picture of the farmers’ situations and that this gives them inputs to their research. Still one says *“As a researcher the corky root project was wonderful. There was a possibility of working with this question in practice, research and in the education. We learned a lot and it would be very stimulating to go on.”* A researcher asked for a deeper discussion on the theoretical base of this kind of research under Swedish conditions. Researchers used to traditional research are expressing difficulties in understanding their role as contributing with scientific

knowledge but not being “the researcher”. Other problems seen by researchers are time planning and new demands on what they are to do.

## **Conclusions and key issues for future research and development**

Some key issues for future development of participatory learning and action research in Sweden are to maintain real participation, where the power of the research process is given to the actors to find and work with the key questions in creating sustainable development through new knowledge and practical change. This may well involve a learning process based on the Kolb learning cycle: Abstract conceptualisation – Active Experimentation – Concrete Experience – Reflective Observation – New Abstract Conceptualisation (Kolb 1984) without being restricted by rigid project ideas and limitations. Funding for participatory research is planned for in the new programme for ecological research but how bound that money is to pre-stated projects is not clear. In this there is also a challenge in finding the researchers and advisors who will facilitate groups, trust the group process and relax control. Finding financing for CUL to support and create possibilities for the facilitators to support and develop their facilitation skills will be crucial. This is a main goal for CUL for 2004.

As both the **Greenhouse** group and the **Cultivation system ecology** group are successfully using the approach within their own limits and differences, their progress shows both quality and richness. The approach is based on trust when groups are given the freedom to find their own issues that need to be addressed, group dynamics are improved and factors that usually interfere with communication are reduced. This has also shown that the groups are fully capable of setting and implementing their own research agendas.

Crucial to the development at CUL and in the groups has been the patience to let things develop, starting small and to give time for everybody to learn. The development of groups has been the base for development at CUL and for everybody involved. That the facilitator has trusted the process, working carefully to develop participatory research in Sweden, sharing the learning and experience and letting go of ownership have also been important elements. The slow process of development, critical thinking about learning and future needs and “sensing” the next step, have been important in the development of PLA at CUL.

A key issue for future development of PLA research in Sweden, when the number of people involved are expanding, is to maintain a constructivist, systemic paradigm. This is not always easily understood by advisors and researchers who have been trained in positivist- reductionist science. Also crucial is the need to impress on researchers that there is an important contribution to a research process here and that what is happening is not a development process divorced from “real” research.

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**Appendix 1.**

<b>TABLE 1. Lessons and outputs from the Group activities</b>						
<b>Group</b>	<b>Composition</b>	<b>Institutional linkages</b>	<b>Group learning</b>	<b>Research outputs</b>	<b>Future action</b>	<b>Practical change on farms</b>
Glasshouse tomatoes	1 researcher 2 advisors 13 farmers 1 facilitator	CUL, SLU 2 County Administrations	Choosing to define what is organic to them, asking specified questions, daring and deciding to scrutinize their own situation.	1. <u>Plant nutrition</u> Knowledge about combining store manuring and top dressing for higher produce. Identified and specified questions of the plants needs of nutrition over time. Discussions with KRAV about need to change rules. 2. <u>Corky root disease.</u> Knowledge about needed changed production methods and effects on taste when growing engrafted plants 3. <u>What is organic?</u> Clarification that the lower limit for what they consider organic has lessened over time.	1. Identifying nutrition needs over time for better nutrition utilization. 2. Trying new ways to live with corky root disease. 3. Calculate environmental impact and discuss ethics	Changed manuring strategies by farmers. Changes from sharing experiences such as changed watering strategies, new technical device and plant tending.
Vegetable	1 researcher 1 advisor 5 farmers	EVP, SLU County administration	Need of structure and work with group dynamics	1. Tried different levels of compost from local fungus production as fertilization to cabbage (1 farmer) 2. Planned planting and sowing time to suit the farm shop selling own produce (1). 3. Developing carrot production on ridges for better products and labour saving (1)	-	?
Energy/Biogas	1 advisor 12 farmers	The Rural economy and Agricultural Societies	Study tours to biogas energy production digesters.		-	?
Cultivation system Ecology	2 researchers 1 advisor 6 farmers 1 facilitator	EVP, SLU County administration CUL, SLU		The research questions have been adjusted to the different farm systems and farmers to fit into real systems.	Continued work with digested biomass, cover crops and composted ley as nutrition source for organic vegetable production.	