Learning in Future Farming and Food Systems: European Education in Organic Agriculture and Agroecology

Proceedings of ENOAT Workshop

Lyon, France: August 30 – September 1, 2012

Alexander Wezel, Ewa Rembiałkowska, and Charles Francis, Editors

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Editors' Introduction

Alexander Wezel, Ewa Rembiałkowska, and Charles Francis, Editors

The 2012 Annual Workshop of the European Network of Organic Agriculture and Agroecology Teachers [ENOAT] was held from 30 August to 1 September at the campus of ISARA in Lyon, France. Two days of meetings with presentations and workshops were held on Thursday and Friday, followed by an excellent excursion on a cold and windy Saturday to organic farms and a local farmers' market held on an organic dairy farm. There were 20-25 people [list on p 6] attending most of the sessions, and 15 people braved the weather for the excursion. We enjoyed an exciting evening of cheese, other food, and organic wine tasting hosted by Alex Wezel and his colleagues from ISARA on Thursday evening. Details of the programme and local arrangements are found on pages 7-10 of the proceedings.

Thursday morning we were welcomed by Dr. Christophe David, Executive Director of ISARA, followed by introductory reports from each new university that has joined the network including the University of Gastronomic Sciences, in Pollenzo, Italy; SLU in Alnarp, Sweden; University of Zagreb, Croatia; and Czech University of Life Sciences in Prague. There is a summary of these sessions starting on page 8, and the power points are listed in the table of contents; information on these topics may be requested from the authors. There is consensus that we should continue to request a brief written summary of recent advances in each country, to accompany a very brief oral update with power point if necessary that includes recent changes in programmes, without undue repetition of what has been reported in the past. In the afternoon, we had presentations from Corvinus University, ISARA Lyon, Warsaw University, and UMB in Norway. The afternoon ended with an interactive workshop on *Dialogue-Based Education: What are the Prerequisites*? The workshop is summarized on pages 29-32.

Friday we had presentations on specific programmes from BOKU, Austria; ISARA, France; University of Gastronomic Sciences, Italy; South Bohemia University, Czech Republic;, Latvian University of Agriculture; Warsaw University; and University of Maribor, Slovenia. Several of these are included in the written proceedings, and others accessible from the authors. Finally, there was a continuing discussion about future leadership and structure of ENOAT. Ewa Rembialkowska was chosen to continue as President for one year, and Sabine Zikeli and Susanne Kummer were chosen as two Vice-Presidents for the next year.

We thank Alexander Wezel and his colleagues in ISARA, especially Sigolene Verneret, for all of their organization of programme and facilities, and thank current officers of ENOAT.

The Editors

List of Participants ENOAT Workshop, Lyon, France Aug. 30 – 1 Sep 2012

[Note: List includes ENOAT Members who could not attend]

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ISARA, Lyon, France, 30 August – 1 September 2012

Program[1]

Wednesday 29: Arrival

19h00 Informal evening dinner near the Hotel for those who want participate (meeting point: Hôtel du Théâtre).

Thursday, 30 August (day 1)

9h00 Welcome by the Christophe David, Executive Director of ISARA and short presentation about ISARA
Research activities in Organic Farming and Agroecology at ISARA

9h30 Workshop 1: **Actual situation of Agroecology and Organic Farming teaching at member universities**
(*please prepare the 1-page description for your university before the meeting and bring with you sufficient copies*).*Please limit your information to 5 min presentations*. Here among others are the presentations of the new members:
- Paola Migliorini (Italy, University of Gastronomic Sciences, Pollenzo),
- Erik Steen Jensen (Sweden, Uppsala Univ. Alnarp - MSc programme in Agroecology and a new course in Alnarp on organic farming),
- DarijaBilandžija (Faculty of Agriculture University of Zagreb, Croatia),
- PerlaKuchtova (Faculty of Agrobiology, Food and Natural Resources, Czech Univ. of Life Sciences, Prague);
- or new activities of the old members e.g. Laszlo Radics Organic MSc program at the Corvinus University

11h00 Coffee and tea break

11h30 **Actual situation of Agroecology and Organic Farming teaching at member universities** – continuation

12h30 Lunch break (at the canteen of ISARA)

14h00 Workshop 2:**Teaching experiences in agroecology and organic agriculture**(*ENOAT members are invited to give a presentation of 10-15 min about different ways of teaching at their home university. This can be newly tested teaching methods or success and failure stories*).

14h00 Marion Casagrande (ISARA Lyon): A teaching module in organic agriculture: Territorial development and markets trends
14h25 KatarzynaKuciński (Warsaw): Organic agriculture online as new interactive study at WUSL.
14h50 Laszlo Radics (Corvenius, Budapest): Green Food project with main goal - online education of farmers in four topics of Organic Agriculture.
15h15 Chuck Francis "Teaching Tips" – agroecology: successful teaching methods.

15h50 Coffee and tea break

Workshop 2 continued

16h20 EwaRembialkowska(Warsaw):Innovative student internships in L.I.F.E. project
16h45 Geir Lieblein: "Dialogue-based education in agroecology and organic agriculture: What are the prerequisites?" (30 min presentation + discussion).

17h30 Final discussion workshop 2

18h30 Buffet-dinner at ISARA with wine and cheese tasting

Friday, 31 August (day 2)

9h00 Workshop 3 **Alternative food networks and food systems**
(workshop PhD students and ENOAT participants)
ENOAT members are invited to give a presentation of 10-15 min

9h00 Susanne Kummer (BOKU Vienna): Does growth hurt? The impact of growth/scaling-up of local organic food networks on participating farms/farmers.
9h25 PhilippeFleury (ISARA): Innovative local organic food networks in the Region of Rhône-Alpes, France
9h50 Paola Migliorini(University of Gastronomic Science): Slow Food Presidia: a sustainable alternative food systems?
10h15 Jan Moudry (South Bohemia University): project Sustainable Kitchen

10h40 coffee break

11h00 Workshop 3 continued

11h00 ElitaAplocina (ex Selegovska) (Latvian University of Agriculture): Certification of organic animal production
11h25 EwaRembiałkowska (Warsaw): Organic food – impact on animal and human health
11h50 FranciBavec(Univ. Maribor): Importance of alternative field crops in organic food supply

12h30 Lunch break (at the canteen of ISARA)

14h00 ENOAT matters:
- Summer courses 2012 and 2013
- Ceske Budejovice June 2012 – Magdalena Lacko-Bartosova and Jan Moudry
- Sweden - summer course 2012 Food for the Future & for a Clean Baltic and Sustainable Food Societies – JukkaKivelä

- Finland - summer course in English in University of Helsinki, JukkaKivelä
- Proceedings 2011 and 2012
- Common project activities
- Future initiatives
- Next ENOAT meeting 2013

15h00 coffee break

15h20 ENOAT matters - continuation

17h00 Final conclusions

17h30 visit of Fourriere hill and old Lyon center

19h30 Dinner in old Lyon

	Workshop planned for 2013 meeting in Bulgaria:**Searching solutions for teaching constraints**(*Alexander Wezel, Sabine Zikeli, Hohenheim).* *An interactive workshop about Language barriers in teaching as well as planning activities around the heterogeneous background of knowledge of students will be organized by Alex and Sabine.*

Saturday, 1 September (day 3)
Morning: farmers' market on a farm and visit of the farm (cattle farm with cheese production), St. Maurice surDargoire
Lunch: Picnic on the farm
Afternoon: AMAP horticulture farmer, Ampuis, Rhone valley (AMAP=Local solidary partnership between producers and consumers)

Conference fee
- We ask you a participation of 10 Euros per day (this includes coffee breaks, dinner with French wine and cheese tasting on Thursday evening, and excursion).
- Accommodation, travel, lunch at ISARA canteen, and dinner on Wednesday and Friday evenings is at your charge.

Hotel
Please reserve the Hotel before 15 July (better is before 15 June). Lyon old town center is a UNESCO Cultural World Heritage site, thus there are always a lot of tourists in Lyon!
The hotel has 23 rooms.
- single room with standard bathroom: 63 Euro per night (chambre simple de type standard avec bain)
- single room with higher standard bathroom: 83 Euro per night (chambre simple de type supérieur avec bain)
- Breakfast: 7 Euros

To reserve and guarantee the room you need to provide your credit card number and the date of expiration
Please indicate that you come for the ISARA Lyon conference (we pre-reserved rooms)

Hôtel du Théâtre**
Place des Célestins (Entrance: 10, rue de Savoie)
69002 LYON, France

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[1] **Note that papers presented are not necessarily the same as those listed in the preliminary programme [p 6-9] as some titles changed and additional speakers provided presentations and papers after this program was announced.**

Welcome and ISARA Introduction

Christophe David, Executive Director, ISARA

FESIA: includes four universities that are private (ISARA Lyon, ISA Lille, ESA Angers, IE Purpan).

ISARA Lyon – 50% go to agriculture and 50% to food system; some continue to PhD studies, especially those from double diploma and research careers. Every year there is a meeting for alumni, newsletter; one position dedicated to maintaining contact for job opportunities. After 6 months, 85% obtain jobs. Funding the private university is becoming complicated; federal funding has been reduced from 50% down to 35% in the last years. The second third of funding comes from tuition fee of students, the other 30% from research projects and consultancy activities. Students' tuition fees are about 4700 Euros/year. About one third of students obtain scholarships from ISARA and from Ministry [1000-3000/year scholarship from ISARA, from 20-80% of total cost covered by Ministry; new agreement with Bank so that loans are paid back after 5 years]. Thesis projects are paid by outside French organizations (French law for all contracts with 6 month duration).

Main research topics linked to Agroecology (AE)

- Organic Grain System and AE
- Ecology & Aquatic Resources
- AE Interpretation & Concepts

Other research topics at ISARA: agronomy, complex cropping systems, broadly interpreted to include social dimensions, landscape management issues, transition to OA: social, economic & political support, conservation and management of biodiversity, sustainable farming and food systems, food chain including farmers markets, CSAs, based on regional organic products

Courses: Some courses at MSc level are in English; the MSc Agroecology is completely in English an run cooperation with international partner universities; new MSc in sustainable food processing that will all be in English + French at the beginning then in a few years completely in English; ; ISARA is more active in English-run courses than most French universities.

Extension and Consultancy: Development & industrialization, incl. links with industry, eg. Bakeries, bio [organic labels] + local labels; 15 companies 'supervised' by ISARA

Publications in OA and AE: to promote practices and organizations; 28 papers on organic and agroecology over the past few years, plus popular activities; eg. Book Biological Agriculture and Environment.

For more details on ISARA Programmes, see power point *Department of Agroecology and Environment*, by Alexander Wezel, and *Teaching Activities in Agroecology and Organic Agriculture 2012*, also by Alexander Wezel.

Learning in Future Farming and Food Systems: European Education in Organic Agriculture and Agroecology

Introduction and Summary of Day 1 Morning Presentations & Discussions
Summary of Workshop 1

Alexander Wezel [ISARA], Ewa Rembialkowska [WUA], and Charles Francis [UMB]

ACTUAL SITUATION OF AGROECOLOGY & ORGANIC FARMING TEACHING AT MEMBER UNIVERSITIES, with focus on new members

Paola Migliorini, Univ. Gastronomic Sciences, Pollenzo, Italy: Power Point Introduction to university and programmes. Founded in 2003 in cooperation with Slow Food Institute. Paola is also the ERASMUS coordinator for their university. This is a private university, so there is tuition cost involved for students who attend or take a degree. Strong support comes from big companies, eg. Barilla, and from banks and other food organizations. Maximum of 75 students per year, 25 supported by grants, 10% are fully covered by scholarships, including some from international places.

Erik Steen Jensen, Swedish Agricultural University, Alnarp Campus, Southern Sweden, MSc programme in Agroecology. The new MSc started with 20 students in 2010, down to 6 in 2011 due to new fees for non-EU country students, now will have 15 students in 2012 with cooperative agreements and EU students. Meetings with teachers from Ethiopia and Uganda, much is based on case studies, and agricultural economists are fully involved in teaching. International workshops have promoted exchange of ideas about teaching; this included topics on what is involved in agroecology teaching and student supervision. Some student interaction to date, for example in thesis work, but this has been limited. Ugandan students only come to classes on weekends, since most have jobs during the week. Lennart Salomonsson has been instrumental in seeking funds from SIDA to support the initiative.

Darija Bilandzija, Faculty of Agriculture, University of Zagreb, Croatia, established 1669. Founded in 1919 as Faculty of Agriculture and Forestry, since 1959 it is only agriculture. [see ppt for details].

Perla Kuchtova, Faculty of Agrobiology, Food and Natural Resources, Czech Univ. Life Sciences, Prague. BSc and MSc programmes in various fields, including ecological agriculture; most courses are in Czech, with one in Alternative Agriculture in English [see ppt for details].

Laszlo Radics, Corvinus University, Hungary. Organics MSc in revised program [see ppt for details].

Magdalena Lacko-Bartosova, Slovak University of Agriculture, Nitra, Slovakia, provided an overview of current teaching programmes [no ppt available].

Elita Selegovska, Latvian Agricultural University, Jelgeva, Latvia, provided an overview of current teaching programmes [no ppt available].

Peter von Fragstein, Witzenhausen, Kassel University, Germany, provided an overview that will be in the proceedings [see ppt for details].

Jan Moudry, Slovenian Agricultural University, Maribor, Slovenia, provided an overview that will be in the proceedings [see ppt for details].

Ivan Manolov, Bulgarian Agricultural University, Plovdiv, Bulgaria, provided an overview that will be in the proceedings [see ppt for details].

Katarzyna Kucinska and Ewa Rembialkowska, Warsaw University, provided an overview of programs in agronomy and in nutrition [see ppt for details].

Franci Bavec, Slovenian University of Agriculture, Maribor, Slovenia, described an educational programme that runs from production to food system and is integrated [see ppt for details].

Cor Langeveld and Johannes Scholberg presented changes that have been made in organization of programmes at WUR Wageningen; there is a new professor named in this programme, Pablo Tittonell. There is a shift from microbial ecology towards farming system ecology so we aim to describe and explain processes and to explore and (re)design farming systems. We look at systems all the way from the field to the landscape level but we also look at socioeconomic aspects and engage in co-innovation in collaboration with stakeholder groups. Organic agricultural is seen as providing a unique context for learning, system design and innovation. There are about 35 students who enroll in the program each year. In terms of course the introductory course focuses on the entire production system, a course on organic production, another one on organic animal production, and integrated resource management and the capstone course is the one on the analysis and design of organic systems. .

Susanne Kummer, BOKU, Vienna, Austria described the current academic programmes in her university, with eight different masters programmes within agricultural studies (102 students in organic agriculture but only a small number of graduates); some master programmes may be closed. There may be a return to MSc in agriculture, with major in organic systems. The international master on organic agriculture and food systems (ELLS) will be fully established at BOKU, so that BOKU will act as host and home university (starting this autumn?). So the international master will then "substitute" for the Austrian OA master. Participatory programmes with farmers are difficult to realize in English, because many farmers are not fluent in English. Also the lower level of English speaking constrains the international degrees in BOKU. [For more information see documents attached to the proceedings].

Geir Lieblein, Agroecology Education, Norwegian University of Life Sciences, Norway described the courses, including the one-semester module *Agroecology of Farming and Food Systems*, and the two-year 120 ECTS MSc degree in agroecology; this is associated with the double degree programme with ISARA [for more detail, see the ppt in the proceedings].

Alexander Wezel, Agroecology in ISARA, Lyon, France described the academic programmes and the double degree programs with WUR (Netherlands) and UMB (Norway), and the increasing numbers of students [see ppt in proceedings].

Summary of Day 1 Afternoon Presentations & Discussions, Workshop 2

A. Wezel, E. Rembiałkowska, C. Francis [11]

Marion Casagrande, ISARA, Lyon discussed a teaching module in *Organic agriculture: territorial development and market trends*; more detail is shown in the ppt in the proceedings.

KatarzynaKucinska, Warsaw University, Poland presented an on-line cooperation in a new course, *Organic Online as New Interactive Study at WUSL*; details are found in the ppt.

Laszlo Radics, Corvenius University, Hungary, presented *Green Food Project* with goal of online education of farmers in four topics of organic agriculture; details are in ppt.

Charles Francis, UMB (Norway) summarized the written information in handouts about *Experiential Learning Tools Reported in NACTA Journal,* a special issue of the NACTA Journal on *Globalization: Implications for Teaching and Learning in Post-secondary Agricultural Education*, and a summary of an initiative for *Agroecology and Capacity Building: International Doctoral Programme* [Executive Summary 1 February 2012] . This is a planned program from SLU, UMB, and UNL [with collaboration of the Big-10 + universities in the U.S., other universities in Europe, Africa, and Latin America], and initial funding for planning from SIDA in Sweden.

Ewa Rembialkowska, Warsaw University reported on the L.I.F.E. project in Poland, an example of innovative didactics, coordinated by Netherlands and with a number of countries participating; details are given in the ppt.

Geir Lieblein and Charles Francis, UMB, Norway, presented a participatory module on *Dialogue-based Education in Agroecology and Organic Agriculture: What are the prerequisites?* This included a five-minute individual reflection on what needs to be developed on the part of teachers, and a 20-minute plenary discussion to share ideas in small groups of four people. A written summary of the presentation and discussion is presented in the proceedings, including a figure drawn from the mind map assembled during the plenary phase.

Workshop 3 and Summary of Day 2: Presentations & Discussions and ENOAT Matters

Alex Wezel [ISARA], Ewa Rembialkowska [WUA], and Charles Francis [UMB]

Workshop 3: **Alternative food networks and food systems.**

Susanne Kummer, BOKU, Vienna, Austria [and co-author Rebecka Milstad, SLU, Sweden]: Does Growth Hurt? *The Impact of Growth/Scaling Up of Local Organic Food Networks on :Participating Farms/Farmers* [see ppt presentation]. Description and typology of different channels for organic products: two axes from Participation to Delegation, and Global to Local. One real challenge is "How to expand production and consumption of organic products while retaining basic values of organic farming?" And "How can organic farms enhance their ability to adapt to change and build farm resilience?" Two case studies in Austria [Biohof ADAMAH, 4500 boxes/week, with purchase from 100 farmers] and Sweden [Uplands Bondens, organic beef producers, regional food chain, sold in supermarkets, 60-70 farmer members]. The survey included 28 farmers in the two networks, with twelve questions and self-reporting of resilience and sustainability. These are rather large operations … and they used different strategies to deal with this growth. The Austrian box scheme is increasingly dealing with fewer large farms, while maintaining the "aura" of buying from small farmers … this presents a dilemma, because efficiencies of scale come from the large farm model, while much of the image is that this is a grassroots, small farm type operation. Several challenges are emerging as a result of the scaling up process … legitimacy, food quality, greening of mainst ream, growth in scope as well as quantity and numbers. Important to legitimacy is to continue to differentiate the system and product; it is essential to maintain close contact among members, who must feel that their needs are met and they have an important part in the decision making.

Philippe Fleury, ISARA, Lyon, France, [and authors Carole Chazoule, Delphine Vitrolles] *Innovative local organic food networks in the Region of Rhone-Alpes*. Organic is now 2.4% of the food market in France (doubled between 2006 and 2011), and 3.5% of the area (end of 2011). See ppt for details. Supermarkets now have about half of all organic food sold. Important are identity of product, length of the supply chain, diversity of stakeholders, and involvement of consumers. Several models are shown of different complexity and length of supply chains, involving producers, collective platforms, food outlets including shops and restaurants, and consumers; there are diverse stakeholders and multiple paths, a truly operational and resilient food network. Local chains may not be short and could be fully industrials, and long chains could be non-industrial as well. "Local" is associated with "sustainable" in common understanding, while in fact this is a very ambiguous term.

Paola Migliorini, University of Gastronomic Science, Italy, *The Sustainability assessment of Agro-food Systems and Diets: Comparison of IFOAM and Slow Food Movement* (see ppt for details). Definition of sustainable food systems could be taken from American Public Health Association (2007). Presented was a matrix comparing IFOAM and Slow Food according to a number of criteria, including health, food safety, producer issues such as farm labor, membership, markets, and policies. Principles are very

similar, although there are differences in quality issues. In some ways, IFOAM started with soil issues and fertility, from the production side; Slow Food started with the food quality and consumers, then linked back to the farm. Slow Food started with local markets, but now is experimenting with larger market outlets. Organic is legally defined, while SF is self-defined: SF does not certify, but is a code of production, self-organization, and is socially controlled. Thus local producers set their own rules and the system is controlled within the system by the participants, and no third-party certification according to strict rules. Several goals for the future were presented, and are shown in the ppt in detail, and these show many of the common goals of the two movements. Some discussion involved definitions of terms and the difficulty to reach agreement. Sustainable is a term that has much ambiguity, because it has been co-opted by a number of other organizations such as Monsanto. In SF, local presidia can choose their own rules, and some indicate organic certified as well. Some discussion also involved Fair Trade and some of the

Jan Moudry, South Bohemia University, Czech Republic, presented *Project Sustainable Kitchen* [details are found in the ppt]. Discussion revolved around costs to the schools, what people are willing to pay, local versus imported food, kitchens are not certified organic. Differences in GHG emissions were very large, with conventional showing much higher levels than organic; discussion ensued over how this was calculated, since there were data presented from northern Europe that these systems were similar in GHG emissions. This is complicated by different LCA approaches, boundaries, and methods of analysis.

Elita Aplocina, Latvian University of Agriculture, Jelgeva, Latvia: *Certification of Organic Animal Production*; *Inspection of Organic Farms* [see details in powerpoint]. This summer Elita has visited and certified more than 150 farms; both EU and national regulations must be followed for certification, and this includes production, processing, and mass catering [includes deer, boars, rabbits, pheasants, pigeons, quail, snails, earthworms. Also forests, berries, mushrooms can be certified organic for export. Now there are 3500+ certified farms and 184,000 ha; farm numbers have dropped, but area has increased; average size now is 55 ha, while conventional are 35 ha on average. Most farms are 20-100 ha. Large farms are grassland and cereals. Now there are 143 processing companies (2011); this is growing and encouraged, and there is no charge for certification process. Main risks and non-compliance include parallel production or organic and non-organic on same farm, use of conventional feed, small farms have all kinds of production thus inspectors must be generalists, legislation and changes … thus farmers are operating in a complicated and non-predictable environment. Most farmers are educated, and 80% have attended workshops on organic production … but do not like paperwork. Many questions about details of certification, eg. horses used for traction, emerge from inspections.

Ewa Rembialkowska, Warsaw University, Poland: *Organic food – impact on animal and human health.* [details are shown in ppt]. Conclusions are that lacto-ovo-vegetarian diets plus anthroposophic lifestyle decrease risk of problems in childhood and later in development. Studies with humans are limited; some with Steiner School students, others with nuns in convent. Self- reporting indicates better health, satisfaction with organic food. Large Dutch study with >2000 infants up to 2 years … no large differences. Another Dutch study on breast milk quality between mothers with organic v conventional diets … CLA and TVA were higher in women with organic diets. Physical activity and smoking were the

two factors most important in human health. Limited studies are available, and much more research is needed.

Franci Bavec, University of Maribor, Slovenia: *Importance of Alternative Field Crops in Organic Food Supply.* Roberts, P. 2008. The End of Food. Houghton Mifflin Harcourt, is a key reference that has influenced thinking about alternative crops and nutrition … for example less meat, local food, more sustainable farming methods. Emphasis in the presentation was on alternative crops: neglected, underutilized, disregarded, and are so-called rare crops, alternative crops. There are many advantages to develop these crops for reducing pollution, protecting biodiversity, and diversifying the diet, but promotion is necessary. There should be a large organic market for these crops and products, with advantages in nutrition and for people with allergies to conventional. New book is *Alternative Crops* by Franci and Martina Bavec. Farmers have many ideas on diversification, but programs are needed to support them; also it is important to work with processors to deal with these "orphan crops".

ENOAT Matters

Proceedings: Geir described the access to Confolio, through the AGROASIS web site. All proceedings from ENOAT annual workshops since 2007 will be on this site; 2007-2010 are already there, and 2011 & 2012 will be entered and accessible to everyone within about one month. Please send any materials for 2012 to Charles Francis (charf@umb.no) if you have not done this already. [NOTE: C. Francis regrets very much the delay in posting the 2011 and 2012 proceedings; these are now available at the AGROASIS web site; he will try to do better in the future!]

Common Project Activities:

A number of potential projects were discussed, and partners requested for those still in the planning stage. A new EU publication will include reports on successful ERASMUS projects; this could be a place to summarize the network's activities and to provide a visible platform with potential for new funding.

ENOAT Membership:

Two years ago, the organization was opened to new members, and some have joined since then. This year we have representatives from University of Gastronomic Science (Italy), Faculty of Agriculture of University of Zagreb (Croatia), and Faculty of Agrobiology, Food and Natural Resources, Czech University of Life Sciences. The debate continues on whether to keep people on the mailing list when they do not respond for several years, and whether to expand to additional members within current participating countries? Potential additional expansion could include Montenegro, Serbia, Romania, Bosnia/Herzogovina, and other European countries in the former eastern block, since there is strong interest in organic education in these countries.

As we invite new members and encourage older ones to participate, we need a clear vision for the organization and to revisit this vision each year. Why is the network important? What do we do? What are the advantages of participating in the meetings and the organization?

Ecology and Farming: This is a publication from IFOAM, and there are current articles from Sabina and from Cor in this group. The journal is official from the IFOAM, and is planned for four issues per year.

Should we develop an article about ENOAT to describe the goals, history, and accomplishments of the network?

Next ENOAT Meeting: There is an invitation from Bulgaria and Ivan Manolov to host the meeting in 2013. The field tours will involve organic rose production for oils. Future sites could include BOKU, Vienna (2014) and Czech Republic (2015). Last week of August appears to be best for everyone, with tentative dates of August 28-30 for meetings and field trip.

Future initiatives for ENOAT:

- It could be useful to establish links with other organizations, exchange information, and seek common goals.
- Leadership changes are needed to get younger people involved and move in new and exciting directions. One initiative includes setting up a new home page; Laszlo volunteered his young colleagues to establish this site. What will this include? Ideas include the lists of degrees, lists of courses, and orientation of each national educational programme. If Confolio is used, each country can have their folder on the site and keep this up to date.

Summer Courses:

2012: course was held in Czech Republic from 10-22 June; Magda described the programme and the 23 students who attended the course. 14 modules were included, and these were delivered by 11 teachers, and there was a case study with teams of students with an elected leader of each. A field trip was held the first Saturday, and students used this experience to build their case studies. Details on the 2012 course are shown in the web site from the university in Nitra, Slovakia.

2013: course is planned for Nitra, Slovakia, with Magda as the major organizer.

2014: there is a February deadline to apply for funds for a summer course; this should be an application for 2014-2016 for three years of courses.

ENOAT Leadership:

A proposed model for leadership is Ewa as the chair, and Sabina and Susanne as the co-vice presidents to divide the duties for the next year.

Learning in Future Farming and Food Systems: European Education in Organic Agriculture and Agroecology

Written Papers

Research & Teaching Activities in Agroecology and Organic Agriculture 2012

Prepared by Perla Kuchtová (kuchtova@czu.cz)

Note: I'm very sorry, but I present to you the projects of my colleagues from Faculty of Agrobiology, Food and Natural Resources of Czech University of Life Sciences only. Currently, I do not have an overview of all projects. So, I am not able to specify all the projects connected (directly or indirectly) with Agroecology and/or Organic farming at our University.

Projects

1. Capouchová, Ivana: Safety of cereals bioproducts in light of occurence of Alternaria and Fusarium mycotoxins, 2011-2014, QI111B154, Czech Ministry of Agriculture, Dept. of Crop Production
2. Capouchová, Ivana: CSc. Specification of spring cereals seed growing in organic farming, 2009-2013, QI91C123, Czech Ministry of the Agriculture, Dept. of Crop Production
3. Capouchová, Ivana: Utilisation of biodiversity of wheat storage proteins with emphasis on low molecular glutenins in relation to production quality, 2009-2011, QH92155, Czech Ministry of Agriculture, Dept. of Crop Production
4. Capouchová, Ivana:Free ad bound forms of fusarium mycotoxins in cereals and processed products; strategy of control and minimisation, 2008-2011, 2B08049,Czech *Ministry of Education, Youth and Sports*, Dept. of Crop Production
5. Capouchová, Ivana:Utilization of spring forms of selected wheat varieties in organic farming,2008-2012, QH82272, Czech Ministry of Agriculture, Dept. of Crop Production
6. Dvořák, Petr: Soil Protecting Growing System in Potatoes with Focus on Quality Organic production at Arable Land, 2008-2012, QH82149, Czech Ministry of Agriculture, Dept. of Crop Production
7. Growing systems of Seed poppy Concerning to the Quality and Safety of Organic and Integrated Production,2009-2011, QH92106, Czech Ministry of Agriculture, Dept. of Crop Production
8. Petr, Jiří: New technological methods in organic farming on arable land used for obtaining a quality suitable for processing in food and feed industry,2005 – 2009, QG50034, Czech Ministry of Agriculture, Dept. of Crop Production
9. Expansion of organic farming on arable land, bioproduction for wider use in food and feed industry, 2004-2007, 1C/4/8/04, Czech Ministry of the Environment, Dept. of Crop Production
10. Barták, Miroslav: Interactions of insect biodiversity in an landscape with various methods of agricultural land use and technologies with respect to pests of grasses and alfalfa and their bioregulators, 2007 – 2011, QH72151, Czech Ministry of Agriculture, Dept. of Zoology and Fisheries

Organic Agriculture Teaching and Research at Wageningen University

Cor Langeveld

BSc Minor Sustainable Agriculture and Consumption (WUSAC) / BSc

Profile
Food production is under ever-increasing pressure, as population numbers rise, the climate changes and non-renewable resources are depleting. There is a strong need for a world agriculture paradigm shift towards 'working with nature'. Many alternatives are being explored towards sustainable solutions and secure future food production, while adopting principles and practices that counter depletion of non-renewable resources, degradation of soils, the fading of biodiversity and pressure on underprivileged populations. Special attention will also be paid to the use of renewable resources in order to replace the dwindling supply of fossil energy. The BSc Minor Sustainable Agriculture and Consumption touches upon all aspects of sustainability: ecological, social and economic. It takes a step back to assess current dominant production, marketing and consumption patterns, while exploring other approaches.
The BSc Minor Sustainable Agriculture and Consumption is tailored to prepare for the Master Organic Agriculture (MOA), and suits several other programs equally well, such as MDR, MBI, MID, MPS.

Learning Outcomes
After successful completion of this minor students are expected to be able to:
- understand the different approaches to sustainable food production and consumption, such as organic agriculture, conservation agriculture and community supported agriculture;
- understand how food production systems are organized, on a local as well as on a global level - outline the impediments to sustainable agriculture in a given societal context;
- integrate environmental, agronomical and social issues and propose alternative ways of production and consumption;
- apply the concept of sustainability and its main components to food production, marketing and consumption;
- evaluate different land use options, including non-food-production (e.g. biofuels).

BSc Minor Coordinator
Dr. C.A. Langeveld
Phone: 0317-(4)83571/82140
Email: cor.langeveld@wur.nl

Target Group: This minor is interesting for students of all BSc programmes. See courses available and requirements in WUR catalog.

Organic Agriculture (MOA) / MSc

Profile

With the expansion of markets for organic products as a result of increased environmental concern and consumer interest, organic agriculture has emerged globally as a recognizable sector. In order to meet the challenge of producing healthy, socially responsible and ecologically sound food, the MSc programme Organic Agriculture explores food production, food consumption and multi-functional land use using multiple disciplines (i.e. plant -, animal-, social - and environmental sciences), multiple perspectives (i.e. sustainability, health and ethics) and different geographical scales (local, regional and global). Therefore, a systems approach characterizes both research and education in organic agriculture. The programme highly values the integration of theory and practice by focusing on action learning and action research. The MSc- programme Organic Agriculture prepares students for a wide range of positions related to multiple land use, organic agriculture and the food production chain.

Learning Outcomes

After successful completion of this MSc programme graduates are expected to be able to:

- integrate knowledge of chain management, legislation and certification, consumer behaviour, marketing, economics, communication, education, plant and animal production, environmental sciences and social sciences to analyse the main components of complex farming systems and to explore the principles of food production, consumption, natural resource management, multi-functional land use and the social environment;
- describe the available research-orientations -from empirical analytical to interpretative to socially critical - and explain the merits of each orientation depending on the kind of purpose pursued and the kind of research question that is at stake;
- integrate and apply the knowledge of plant and animal production and soil and environmental science in the context of organic agriculture (Specialisation A Agro Ecology) ;
- explain the key differences between organic and conventional agricultural systems, as well as between other emerging agricultural systems (low input, sustainable agriculture), and analyse agro-ecological processes and management systems (Specialisation A - Agro Ecology) ;
- integrate basic knowledge of chain management, legislation, consumer behaviour, and economics in the development of healthy, socially responsible and ecologically sound food and other agricultural products (Specialisation B - Consumer and Market);
- apply a systems approach in analysing, evaluating and designing complex agricultural systems and (food) production chains by using suitable analytical measurements, surveys and mathematical end statistical methods;
- understand and criticize certification systems for organic products - design, independently, a research proposal in which the kind of research orientation used and details a corresponding methodology, research design and methods used are made explicit;
- execute a carefully chosen and publicly defensible research design ;
- translate (action) research data and scientific knowledge in organic agriculture into relevant solutions to complex problems, to play a pivotal role in international innovation networks and transition processes;
- contribute scientific knowledge and understanding in interactive multi-stakeholder change processes (e.g. action research) aimed at innovating and improving the organic sector, both strategically and practically;
- communicate effectively and with an open mind for new ideas about creative alternatives in organic agriculture with specialists and non-specialists, both verbally (in presentations and debates) and in writing, and act as an intermediary between science experts on the one hand and policy makers and the

wider public on the other hand;
- co-operate in a multi-disciplinary international team in different team roles, including the role of team leader, to design viable alternatives for conventional strategies;
- analyse and evaluate the ethical, environmental, societal and economic consequences of research and reflect upon the various roles of the scientist in agricultural transition processes ;
- design and plan personal learning processes based on continuous reflection and feedback on individual knowledge, skills, attitudes and performance;
- reflect on the consequences of one' s values, perspectives and actions for one-self (self-reflection), others (empathic understanding) and the larger systems of which one is a part, and navigate different perspectives in time (past, present and future), space (local, regional and global), culture and discipline.

Specializations
- Agro Ecology;
- Consumer and Market.

Programme Director
Dr G.J. Kuipers
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Study Adviser(s)
Dr C.A. Langeveld
Phone: 0317-(4)83571/ 82140
Email: cor.langeveld@wur.nl

Programme Committee
Chair: Prof.drir P.A. Tittonell
Secretary: Dr G.J. Kuipers

Internet
www.moa.wur.nl [See courses available and requirements in WUR catalog]

Study Association
StEL, Students Organic Agriculture
Email: stel@wur.nl
Internet: www.cheapsite.nl/stel/

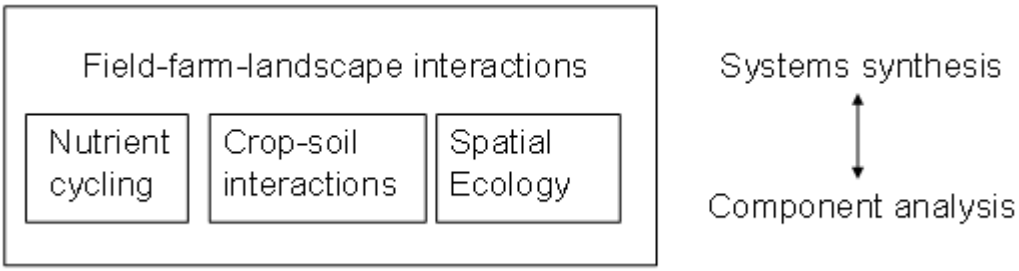
Research at the Farming Systems Ecology group (Pablo Tittonell)

Within Wageningen University, the Farming Systems Ecology group plays a pivotal role in organic research. An overview of it research is given below.

Our research aims to provide scientific support for continuous and sustainable development of agro-ecosystems with special reference to organic agriculture and reduced use of external inputs in both the Netherlands and abroad. Keywords are farming systems, recycling, and ecology. Our research program focuses on two complementary themes: component analysis and systems synthesis. The component-analysis theme includes three main research areas: nutrient cycling, crop-soil interactions, and spatial ecology. These areas provide building blocks for the systems-synthesis theme. The synthesis theme aims to

address field-farm-landscape interactions and integrates processes at different temporal and spatial scales by using results obtained in the component-analysis theme.

Cooperation with other research groups at Wageningen UR and elsewhere enables access to other relevant thematic fields. FSE has a track record in the development of modeling tools to synthesize component knowledge for systems design and optimization. The systems approach adopted in each of the research areas allows us to explain phenomena at one integration scale based on our understanding of processes at the next lower scale.



Research areas

Field-farm-landscape interactions

This more integrative research area includes analysis and design of farming systems, often in a landscape context. We continue to develop methodologies for exploration of trade-offs between different functions of agriculture and landscapes. This approach has been used for trade-off analysis of multifunctional agriculture systems in Western Europe and is extended and applied to participatory (co-innovation) research programs in Latin America. Collaboration with social scientists enables closer links to realities. Institutional economics help link farm outputs to societal demands, thus revealing the private (farmer) and public (society) benefits from alternative landscape configurations. New development areas will focus on testing integrative tools under different settings to expand and explore viable land use options that will satisfy future agro-ecological objectives with special reference to socio-technical networks modeling techniques.

- Combining simulation models and genetic algorithms to improve design of arable cropping systems
- Model evaluation of consequences of agronomic practices for ecological processes and biodiversity
- Model-based design and analysis of integrated and organic arable farming systems
- Modelling soil-borne pathogen dynamics in organic and conventional farming systems in Southern Uruguay, from a whole-farm perspective
- Multifunctional agriculture WUR-INRA (The Netherlands)
- European Latin-American Project for Co-Innovation of Agro-ecosystems
- Reinventing agro-ecological self-reliance in traditional farming systems in Costa Chica, Guerrero, Mexico
- Flows of matter, energy and information in social-ecological networks – the role of multi-scale governance in dairy agro-ecosystems

Nutrient cycling

In the area of nutrient cycling we focus on nutrient flows between soils, crops, animals and the environment. Organic and low-input systems rely heavily on ecological processes governing nutrient flows, for instance mineralization and immobilization. Since these ecological processes respond differently to fluctuating ambient circumstances (e.g. temperature and moisture), one of the major http://www.bfs.wur.nl/NR/rdonlyres/A4BFB9D4-8CF4-477E-B98B-509B8D21DD8E/168636/ConservationagricultureWEB.jpgchallenges is to synchronize the availability and requirement of nutrients. By combining monitoring and modeling approaches we aim to enhance soil quality, nutrient utilization and system performance, while reducing external inputs use and negative externalities. An example field of study concerns the production and utilization of animal manures to lower ammonia losses. We demonstrated that feeding cattle with grass silages with low protein and high fiber contents results in slurries with a relatively low ammonia content, which greatly reduces environmental impacts and could enable surface-application of manure to reduce costs and soil damage. We also

focus on the effective use of organic amendments as a key element for enhancing internal nutrient cycling. Re-introducing green manures and solid animal manures in low and medium input farming systems has been found to improve yields and to reduce soil degradation. Projects addressing these issues are also carried out in smallholder systems in Mexico and Uruguay.

- Capturing and exploring benefits of organic amendments on carbon accumulation and water supply capacity of degraded soils in Southern Uruguay
- Biology of decomposition and nitrogen mineralization of solid cattle manure in production grasslands
- Improving the agro-environmental value of solid cattle manure
- Strategies to improve the utilization of manure N on grassland

Crop-soil interactions

Physical, chemical and biological soil characteristics strongly influence the growth of crops, not only through nutrient supply, but also by providing a substrate for root growth, supply of water, and suppression of plant pathogens. In turn, crops can improve soils, for instance through root penetration of the soil and the addition of crop roots and residues after harvesting. This can improve water holding capacity and conditions for soil biota, and can reduce erosion. Measures that can improve crop-soil interactions include the use of crop residues, cover crops, and no or minimum tillage. These practices can enhance carbon sequestration, soil quality and the retention and utilization of both water and nutrients, which will become increasingly important in light of more extreme climatic conditions and rapid depletion of natural resources. Although such crop-soil interactions are critical in organic and low-input systems, the implementation of no tillage is hampered by the need for tillage to control weeds.

Our research focuses on improved use of agricultural systems with no or minimum tillage, cover crops and solid animal manure for reducing soil degradation and enhancing soil water infiltration, water retention capacity, and crop yields.

We aim to use our system analysis and design experience to facilitate the development of interdisciplinary research to address these issues in collaboration with other groups in a whole-farm perspective.

Spatial ecology

Above-ground dispersal results in spread of desirable (e.g., natural predators) and undesirable organisms (e.g., crop pests and diseases). We investigate which factors contribute to dispersal and their spatial dimensions, based on novel quantitative and experimental approaches. Thereby we provide a scientific basis for farm and landscapes design in which the ecosystem functions 'habitat' and 'regulation' can be maximized. We focus on structural and functional landscape connectivity indicators. Structural indicators are used to evaluate hedgerow landscapes. For Phytophthora infestans functional indicators have been developed based on detailed insights in epidemiology and atmospheric dispersal. Research on enhancing biological pest control by predator spread through landscapes shows opportunities for designing landscapes that maximize connectivity and opportunities for natural pest and plant pathogen control.

Projects will focus on more effective use of functional ecological indicators and pest-predator dispersal dynamics. Opportunities for linking agronomic studies and farm bird ecology will be further explored.

- Understanding success of biological pest control by predators based on their dispersal behaviour across habitat mosaics in ecological networks

Teaching within Agroecology and Organic Farming at SLU, LTJ Faculty in Alnarp: MSc in Agroecology

Erik Steen Jensen, SLU

http://www.slu.se/en/education/masters-studies/programmes/agroecology/

Background

Lennart Salomonsson and colleagues obtained SIDA funding for the Agroecoprac project (24 million SEK). Partner universities in Africa: Mekelle University in Ethiopia and Uganda Martyrs University.

One aim of project: joint development of MSc in Agroecology in the curriculum of the three universities focusing on agroecology of small-holder agriculture in developing countries (capacity building)

Core teacher team SLU:

Birgitta Rämert
CharlottGissén
Lena Ekelund
Christina L. Kolstrup
Lennart Salomonsson
Karin Eksvärd
Margarita Cuadra
Kristina Ascard
Erik Steen Jensen
+ teachers from other faculties and universities

Programme scope

2 years, 120 university credits (ECTS), full-time, Swedish and international students, tuition fees for non-EU citizens

Prerequisites

To be eligible for the Agroecology – Master´s Program, the requirements are Bachelor degree corresponding minimum 180 ECTS, including 90 ECTs specialization in one of the following educational areas:Natural sciences, economics/administration, ethnology, cultural geography, geography , human ecology, leadership and organization, political science, sociology, social anthropology - or equivalent overseas degree.
Furthermore, specific admission requirements including English B.

Qualification Awarded

Degree of Master (120 ECTS) of Agricultural Science with focus on Agroecology.
Started in August 2010 and situated in the Alnarp Campus.

The first batch August 2010 - June 2012:

First year 20 students (Sweden, Iran, Cameroun, Ethiopia, Syria, China, Nepal, Bangladesh and USA).18 student the second year, and 6 have already presented their final Master´s Thesis.

The second batch August 2011 - June 2013:

6 students from Greece, Italy, Sweden, Namibia, Egypt and Norway.

The third batch August 2012- June 2014:
We don´t know the exact number of students, but there are several more students who have applied and are eligible for the programme than the first two batches (c. 15-20)
All courses contains – lectures, farm case work, practical and written exercises, group assignments, seminars, individual tasks, examination and evaluation

Course components

Year 1 – compulsory courses

Autumn semester

- Agroecology Basics (15 ETCS)
- Ecology of Production Systems (15 ETCS)

Spring semester

- Project Management and Process Facilitation (15 ETCS)
- Scientific Methods, Tools & Thesis Writing (15 ETCS)

Year 2 – Master´s Thesis work/course compulsory

Autumn semester

- Project Based Research Training (15 or 30 ETCS)

Spring semester

- Master´s Thesis in Agricultural Science as a course (30 ETCS)

Examples of other courses to choose:

- Management of Pests, Diseases and Weeds (15 ETCS) - autumn
- Environmental Issues in Crop Production (15 ETCS) - autumn
- National and International Forest Policy (15 ETCS) - spring
- Landscape in transition – impacts of and adaption to climate change (15 ETCS

Some examples of current MSc thesis work:

- The impact of climate change and adaption through agroecological farming practices - a case study of Konso area, Ethiopia
- The role of institutions in natural resource management in the context of Agroecosystems sustainability
- Crop and species diversity in cropping system to enhance nitrogen fixation and nitrogen cycling for food system sustainability
- Comparison of soil carbon stocks in two cropping systems as affected by nitrogen application levels
- Effects of oil radish as cover crop as influences by cropping system fertilization level
- Enteric bacteria on fruit and vegetables – socio-economic effects of bacteria outbreak in food systems
- Responses to host and non-host plant volatiles in Spodopteralittoralis or Egyptian cotton leaf worm
- Participatory agricultural development in practice - the case of the Nnindye project
- Farmer´s opinions on organic farming in Uganda
- Evaluation of the sustainability of hemp reinforced wheat gluten plastics
- Quassia (Quassiaamara) extract application for the control of the apple sawfly, Hoplocampatestudinea in Swedish organic apple orchards

- Potential of crop´s diversification in North-east Syria, for enhanced sustainability in the farming systems
- Organically grown wheat: Carotenoid content; Health and socio-economic aspects

Organic Production in Agriculture and Horticulture, 15.0 credits

http://www.slu.se/en/education/courses/?kurskod=TD0006&version=1

Objective:

On completing the course, students will be able to:
- assess the effects of organic cropping systems on ecological, economical and social sustainability
- assess and demonstrate deeper knowledge in biological and economical consequences of organic crop production under different conditions
- plan a conversion to organic cropping and ensure long-term sustainable organic production.

Content

The course includes organic crop production within horticulture and agriculture. Small-scale production includes growing in domestic vegetable plots and allotment plots from and organic perspective.
The course includes:
- background to, and developments, in organic crop production
- important systems ecology principles as a basis for sustainable cropping systems
- energy consumption in sustainable cropping systems
- economics and markets
- effect of cropping system on product quality
- concepts of recycling between town and country and strategies for nutrient provision
- small-scale cropping systems
- biological diversity
- crop rotations and rotation effects incl. weed management
- conversion planning as project work
- principles and rules for development of ecological crop production

Time

2 Apr - 9 Jun 2013, 100%, Daytime

Responsible Departments

Plant Protection Biology, Agrosystems, Horticulture, Rural buildings

Norwegian University of Life Sciences

Teaching Activities in Agroecology and Organic Agriculture 2012

[Geir Lieblein, Tor Arvid Breland, Charles Francis, Suzanne Morse, UMB]

Education in agroecology continues to attract students to UMB at the bachelor and master level of study, and guest students participate in both distance and resident courses. Two professor positions at UMB (Dr. Breland & Dr. Lieblein) are responsible for courses and degree programmes, and two visiting professors assist in planning and teaching (Dr. Morse and Dr. Francis). One important distinction in the education programmes continues to be focus on evaluation of both process and content for the courses offered, and this is documented in the publication list attached to this report

Agroecology professors at UMB
Geir Lieblein (geir.lieblein@umb.no)
Tor Arvid Breland (tor.arvid.breland@umb.no)
Charles Francis (charles.francis@umb.no); also University of Nebraska (cfrancis2@unl.edu)
Suzanne Morse (suzmorse@yahoo.com); also College of the Atlantic, Bar Harbor, Maine
Bachelor Level:
Introductory course in organic agriculture, 5 ECTS. Tor Arvid Breland is responsible.
Taught in the spring parallel, in Norwegian.
http://www.umb.no/search/courses/pol100
Master Level:
MSc Agroecology
Language: English
Number of credits: 120 ECTS
This MSc program is carried out as a double degree programme in collaboration with
FESIA (ISARA-Lyon, ESA Angers; EI Purpan, ISA Lille) - France (www.agroecos.fr),
and as a single degree programme at UMB
(http://www.umb.no/study-options/article/master-of-science-in-agroecology)

Agroecology: Action learning in farming and food systems (30 ECTS)
The MSc Programme in Agroecology starts with the whole semester course "Agroecology: Action learning in farming and food systems" (Autumn).
Responsible teachers: Lieblein, Breland, Francis and Morse
http://www.umb.no/search/courses/pae302

Ecology of farming and food systems (5 ECTS)
The course "Ecology of farming and food systems" is offered in the spring semester, based on Nordic collaboration and participation by instructors from SLU, HU, and KU along with UMB.
Responsible teacher at UMB: Lieblein
http://www.umb.no/search/courses/pae301

Dialogue-Based Education in Agroecology and Organic Agriculture: What are the Prerequisites? [An Interactive Workshop]

Geir Lieblein and Charles Francis, Norwegian University of Life Sciences, Aas, Norway

Introduction

Over the past decade we have explored the process of experiential learning in agroecology, often building on examples from the complex and integrated systems used by organic and biodynamic farmers [called 'ecological agriculture' or *økologisklandbruk* in Norway]. To better describe the breadth of activities we have defined agroecology as *the ecology of food* systems (Francis et al., 2003). In this adventure, we have focused on student-centered learning, on the ways students learn as steps on two related *learning ladders* (Lieblein et al., 2007), and on learning for responsible action (Lieblein and Francis, 2007). Recently our emphasis has moved toward phenomenon-based learning (Østergaard et al., 2011), and extending the concept into research for action (Lieblein et al., 2012). One outcome of our conscious effort to evaluate and summarize the learning results by students in these programs and to publish these in reviewed technical journals has been the initiation of similar learning programmes in Iowa/Minnesota/Nebraska in the U.S. Midwest, in Washington/Idaho in the U.S. Northeast, in ISARA – Lyon in France, and in SLU – Alnarp in Sweden.

The limited impact and apparent infrequent adoption of these teaching methods in our own universities have led us to reflect on what prerequisites are essential to promoting dialogue-based education in agroecology? Assuming that change needs to start within ourselves, and that instructors in universities will be the major change agents to innovate with modified course content and learning methods, we conducted an interactive workshop among 24 attendees at the ENOAT annual workshop in ISARA – Lyon in France in August, 2012. All were currently instructors in European universities, teaching agroecology and organic agriculture; ages ranged from 30 to 72 years, and years of teaching experience from 2 to more than 40 years. One key question was provided to the group and two methods of response were facilitated. The methods and discussion from the workshop along with our conclusions are presented here.

Methods

A three-step process was introduced to explore the key question, *What will this change to participatory learning require of us as instructors*? The first step was for individuals to spend five minutes writing their own perceptions of what modifications to their teaching methods or overall attitudes toward education and their roles as instructors would be required. They were urged to reflect over the importance they see in this method of education, why they became involved in education to start with, and what changes would seem essential to introduction of new methods and content into current courses in agroecology. One example of an individual list of questions [by a workshop facilitator who had given thought to the topic beforehand] is provided in the results.

The second step was to discuss in small groups of four people the individual changes written down in the first step. The groups were instructed to share, avoid judgment to the extent possible, and to choose three of the most important changes to be shared in plenary session with the entire group. The third step was a general session followed where people at each table reported out on their findings, and these were recorded on a white board in a mind map of the group's ideas. The elements of the summary mind map were later rearranged to more logically represent the responses by the small groups and to put more thought into relationships between and among the ideas. This mind map is presented in results.

Results

Questions from individual thinking

1. Must we give up overt authority over the learning agenda in order to empower students?
2. How do we recognize prior experiences of students, and what they bring to the group?
3. Can we accept humility as a "learning leader" and give up the "sole source" mentality?
4. How do we provide safe space for new and creative ideas, and all suspend judgment on new ideas?
5. Can we design reward systems to encourage individual expression, to complement group learning?
6. How do we accept complexity and controversy in discussions, and moderate useful debates?
7. Is it possible to abandon the concept of certainty, and accept complexity and ambiguity?
8. Can students "own the agenda for learning", and how do we guide them in the process?
9. Is there a place for cultivating maximum diversity in class, discussion without reaching consensus?
10. How do we connect students with professionals, through lectures, groups, discussions?
11. Can we focus on process of problem identification, without jumping to conclusions and priorities?
12. How do we move the discussion toward exploring opportunities, & providing potential scenarios?

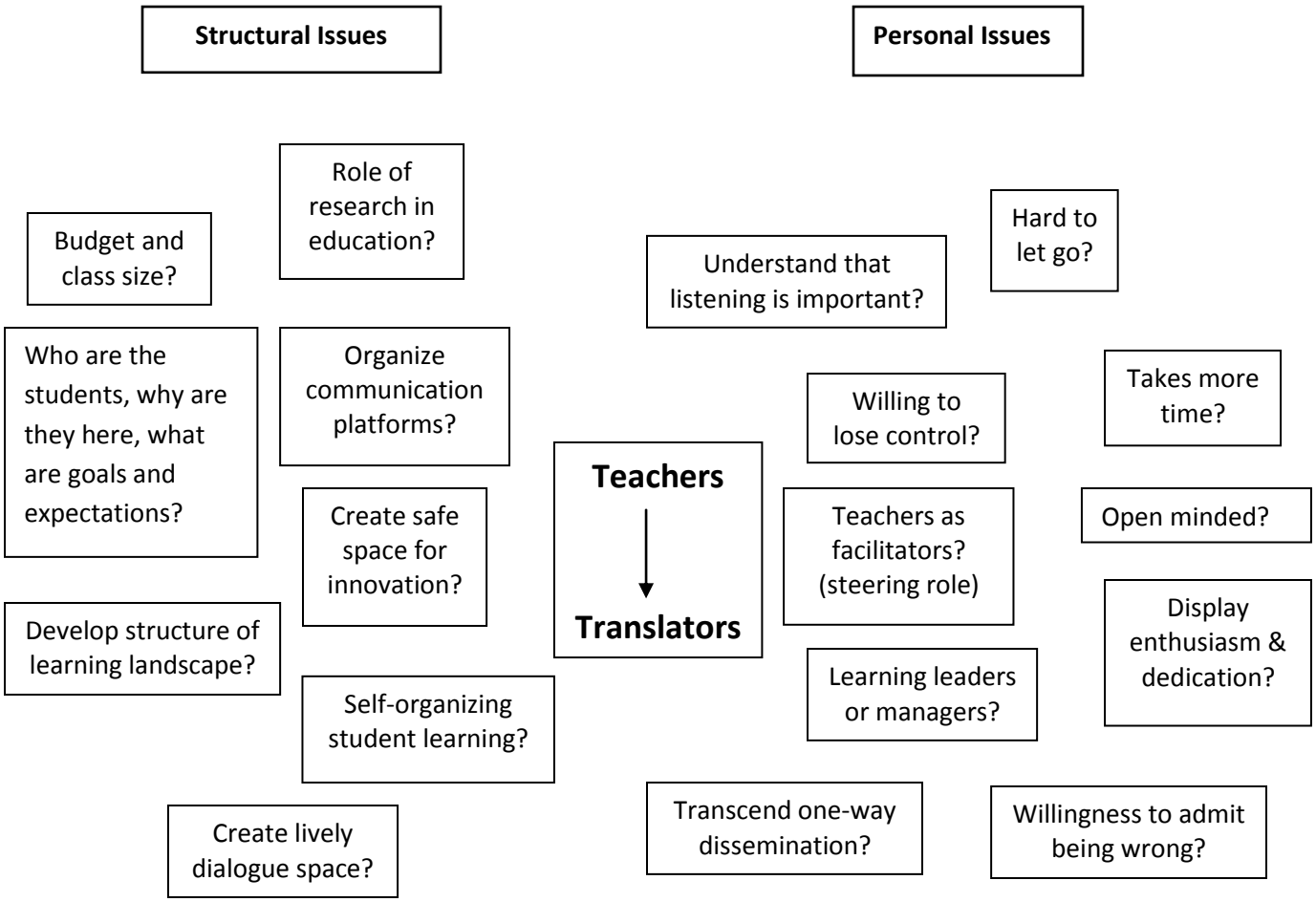
These questions were offered to one of the small groups, and considered along with those of the other three participants before reporting in to the large plenary session. In fact, it was difficult to reach consensus even in a group of four people. During the small group process, we observed that most people took the task seriously, immediately digging into their experience and writing down a list of possible questions. A few of the older people appeared to disengage at this point, and at least they were observed to not be writing down questions. We did not pursue the reasons for their lack of apparent involvement in the task.

Observations during the small group discussions

There was active discussion in most of the small groups, and apparent difficulty in some to arrive at consensus on which three questions were most relevant. A few of the older instructors appeared to disengage at this point, leaning back and showing limited interaction with the others. One experienced instructor immediately began to describe the importance of expert opinions in dealing with student and farmer questions, and seemed to miss the point of the discussion and exploration of need for change. We did not explore reasons for this disengagement by several of the older participants.

Key items from plenary session

Each group was asked to provide one or two key questions in a round robin of the room, then to add additional questions that had not already been posed in a second round. Finally, the discussion was thrown wide open for anyone to contribute ideas that had not been raised and recorded on the white board. Here is the result of recording ideas by the facilitators.


Structural Issues
Personal Issues
Role of research in education?
Budget and class size?
Hard to let go?
Understand that listening is important?
Who are the students, why are they here, what are goals and expectations?
Organize communication platforms?
Willing to lose control?
Takes more time?
Teachers
Translators
Create safe space for innovation?
Teachers as facilitators? (steering role)
Open minded?
Develop structure of learning landscape?
Display enthusiasm & dedication?
Learning leaders or managers?
Self-organizing student learning?
Transcend one-way dissemination?
Willingness to admit being wrong?
Create lively dialogue space?

In the figure, we have grouped the questions into two sections, those involving structural issues about organization and conduct of classes and those more involving personal traits or character issues displayed by instructors. These divisions are somewhat arbitrary, but we consider them somewhat different in terms of how to deal with change. The structural organization of a class and the activities may be more easily dealt with, and likely can be changed without people considering this a personal threat to their integrity or successful past performance as educators. On the other hand, such issues as willingness to let go or potentially even lose control, called by some a *pedagogy of no mercy*, and to see oneself as an effective facilitator rather than as an authority figure could be viewed as counter productive or even threatening to one's self image and perceived status in the classroom, and even in the academy in general. [need to expand]

Conclusions

The concept of dialogue-based communication as a foundation for creating an energetic and stimulating classroom and discussion learning environment has been advanced in the Norway MSc course in agroecology, as well as in a number of venues including ENOAT annual workshops. This included a full-day session in Mikkeli, Finland in 2003, and shorter sessions in Pieve Tesino, Italy (2007), Nitra, Slovakia (2008), Tartu, Estonia (2009), Madrid, Spain (2010), and Witzenhausen, Germany (2011). In each of the last five years, the results of the activity have been summarized and included in the proceedings of the workshops. There have been near-universal comments from participants about the value of dialogue-based interactions in the workshops, and projections about how these could be used to students' advantage in courses in agroecology and organic agriculture. Nevertheless, we have little evidence that this process has actually been implemented in other courses. We urge our colleagues to report on their successes and frustrations with these types of methods, and hope that ENOAT participants will become leaders in education using new and creative learning environments. We owe our students nothing less.

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Teaching Tips in NACTA Journal

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We continue to search for relevance in topics in agroecology and organic agriculture courses, and especially to find methods of encouraging student participation in classes, discussions, and related activities. Often it is difficult to move students – and ourselves as instructors – out of the proverbial box of lecture method. It is also a challenge, because this is the way most of us learned in the university, and even today this is the 'comfort zone' for many of us, both teachers and students. In this series of "Teaching Tips" we have summarized some of the methods that have been successful in the agroecology courses in Norway, Sweden and the U.S. Midwest. We hope that they can be used by others, and that you will also report on your results.

Experiential Learning Tools Reported in NACTA Journal

- Agroecology learning landscape requires new tools and methods for education
- Publication of these tools important to our programmes for recognition of new field
- Future changes needed in both content and process of learning
- Major focus on ***learning*** rather than traditional focus on ***teaching***

Our traditional focus has been on teaching and training; our emerging focus is on learning and educating! To make this change requires us to think creatively, and even to accomplish some type of personal transformation away from the single authority figure in the room to one who is a catalyst for learning. We feel that this transformation in education is essential for what students will face: uncertainty, complexity, and a changing future. We could say that "Business as usual is not sufficient for the future … we need new ideas for participatory learning that will lead to responsible action"

Titles of Teaching Tips to Date [All References are to NACTA Journal, Annex 1-6]

1.	Building a Social Learning Community	55(3):99-100. 2011
2.	Visioning Future Scenarios	55(4):109-110. 2011
3.	Adding Value to Graduate Education	55(4):106-107. 2011
4.	Interviews: Farming & Food Systems Experts	56(2):96-97. 2012
5.	Mind Mapping to Explore Farming/Food Syst.	56(1):90-91. 2012
6.	Transect Walks across Farms & Landscapes	56(1):92-93. 2012

Copies of these six teaching tips are reproduced in the following annexes, to provide ideas for other teachers as well as a model on how to publish them in an international, refereed journal. This way you can get academic credit for your creative teaching methods … something that is too often not rewarded.

How Do We Publish the Teaching Tips?

The editor of the NACTA Journal, Dr. Rick Parker, has agreed to consider any submissions to the journal for review and publication. Here is the web site for submitting new 'Teaching Tips', and if you have any questions please write to the editor of the journal: NACTAeditor@pmt.com, or to Chuck Francis: charf@umb.no, or cfrancis2@unl.edu.

Annex 1. NACTA Journal Teaching Tips

Building a Social Learning Community

Francis, C., S. Morse, G. Lieblein, and T.A. Breland. 2011. Building a social learning community. NACTA J. Teaching Tips 55(3):99-100.

Learning takes place inside and outside the classroom, most notably in social environments with stakeholders and other members of the local community. We recognize and foster this engagement of students with instructors, with those outside the immediate agroecology group on campus, and with each other through informal events that bring people together to get to know each other better.

Learning Objectives are to 1) promote communication and trust among students and with faculty and stakeholders, especially important in a learning group with people from different countries, native languages, and disciplines, 2) establish a nonhierarchical communication structure among members of the learning community to promote information exchange and trust, and 3) explore personal and cultural interests and promote improved understanding among diverse people through events in a social setting outside traditional classroom and field activities.

Methods that have proven especially effective to build social learning among the diverse students and instructors in the Norway MSc Programme in Agroecology include organized by faculty. We have taken advantage of the space and facilities available in the university guest house to sponsor two dinners each term where students prepare food and share with the group in an informal setting on a weekend night early in the semester. The first potluck includes dishes made by students to represent local foods from their countries, often a challenge to find needed ingredients if they come from a very different food culture. The second has been a meal prepared entirely with local ingredients, with “local” defined by the group in a short session in class a couple of days before. We debate whether this should be within the county, the agroecoregion of southern Norway, the country, or some larger food shed area. Most years the decision is to use only Norwegian ingredients, and this presents some challenges. Informal group dinners are organized by teams that work together in the field projects, by students in nearby living areas, or around celebrations of birthdays or other events. These are often held in the student dormitory area, and include friends of the current year agroecology students and from previous groups. Weekend waffle breakfasts faculty have been organized for several years by visiting faculty to bring small groups of 4-6 students together with people from the local community, and often five or more of these are held to include all students at least once during the term.

Outcomes we observe are based on informal observations and discussions with students, and not on any formal evaluation process. In general, the social events are a great surprise to many students who have never found this type of activity as a part of the learning environment. Some come from academic cultures where instructors just don't invite students to their homes, and instructors are not invited to student gatherings. Since the dormitories are not integrated into the local community, many students do not make the contacts in the Norwegian community that could enrich their cultural experience, and they spend all their time with fellow students. The potluck dinners and breakfasts help to bridge this

chasm between town and gown. There are always graduate students, visiting faculty, and other instructors who participate in the agroecology course who are invited to the dinners, and this further expands the student contacts.

In 2010, a student from Iran arrived an hour late, and informed us that he would be able to eat after sunset. He had prepared Persian food to share with the group. He later wrote in our small guest book, “Today is the first day of Ramadan, and I was just so lonely in my flat because this is the first time in my life that I have been outside my country and so far from family and close friends. I almost did not come to the dinner. But then I came and tonight you are my family.” What an incredible emergent property from the potluck dinner!

The informal dinners in the dormitories are sometimes organized around a celebration, or a group meeting in the evening, or at times for a seminar on a specific topic that people feel needs enrichment and more information from someone within the group. At times they appear to be spontaneous meals or dessert gatherings, sometimes with music or games, but usually just rich conversation. These often attract flat-mates and friends who are not agroecology students, and faculty are sometimes invited, and we find this a way to expand the ideas of holistic learning and importance of community.

The waffle breakfasts introduce students to a food new for many of them, and to people from the community. With a small group around one table, the simple fare of waffles, fruit, juice, coffee and tea appears to go over well, and we are sometimes joined by graduate students who live in the guest house. People from the community are especially popular, since they can answer many questions about Norway and cultural things that students have observed and not been able to ask about. These social events have been highly popular, and our informal evaluation affirms that all of them should be included each year in the agroecology activities.

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Annex 2. NACTA Journal Teaching Tips

Visioning Future Scenarios

Lieblein, G., T.A. Breland, S. Morse, and C. Francis. 2011. Visioning future scenarios. 'Teaching Tips', NACTA J. 55(4):109-110.

Practical agronomists and other applied specialists in agriculture become experts in their narrow disciplines through academic courses and research for advanced degrees. Fulfilling this role as experts, they often follow careers in research, education, public sector extension, or private advising where they are expected to provide appropriate advice to farmers based on their experience and training. Although this "expert-client" relationship is an established norm and comfort zone for both parties, it may not help them explore the range of potential solutions that could emerge from a more holistic, systems-oriented strategy that leads to future visions and scenarios (Barker, J., 2001; Parker, M., 1991).

Learning Objectives in agroecology courses are to: 1) examine multiple alternatives or "scenarios" that could be adopted by farmers to solve their production challenges, 2) evaluate the potential influence of any change in practices on total crop, animal, or crop/animal system performance, and 3) assess a priori the possible and likely production, economic, environmental, and social impacts of such changes. Our experience has led to development and refinement of visioning sessions as a robust method for reaching their objectives.

Methods we have used over several years have included virtually driving through or taking a balloon ride across the landscape, drawing rich pictures to illustrate major farming system components and connections, and discussing future goals and aspirations with clients who will be the ones to implement any effective change. Often we ask students to observe, to visualize, to imagine, and especially to suspend judgment as they think about what an ideal system could be, especially unencumbered by current constraints.

Observed Learning outcomes have been accumulated over the past decade of conducting visioning exercises in a number of educational venues. Evaluation of the visioning process puts this into context as one important step toward describing future scenarios. Students imagining a future desirable situation on the farm that will meet the farmer's and family's goals try to think beyond the current systems and constraints to consider what is possible in the future.

We have found that students who view the farm from a small distance are better able to focus on the entire operation, and not on the specific weeds, nutrient deficiencies, and fungus diseases on the leaves of the crop that often get in the way of observing the larger picture. From a position looking down on the farm, it is possible to see where the various crops and animal enterprises are located, and how major interactions may be possible because of the physical juxtaposition of the elements. From above, it is also possible to see how this farm fits into the surrounding rural landscape and how its key elements impact the farm. Also in this slightly detached mode, they can better envision possible changes or scenarios for the future that could help the client better meet his or her goals.

We do urge students to suspend judgment in their visioning, and not to jump to obvious solutions or recommendations, since these too often seem to represent their own disciplines or some pre-formed ideas

about what should be. Observing from a small distance it is possible to envision new elements, innovative connections, and potential emergent properties from a reorganized or more diversified system.

Finally, we insist that the student teams come up with a series of potential future scenarios to present to the clients, rather than specific recommendations. In this way, there are multiple and creative ideas presented, and the clients can pick and choose the elements that they consider most useful to help them meet their goals. As a part of the evaluation, student groups try to calculate or at least imagine the impacts that any change in one component or addition of an enterprise will have on whole system performance – in production, economics, environmental, and social dimensions – and not only in the short term. Sustainability is a long-term concept, and we need to imagine and project the impacts of changes in systems into at least the medium-term future.

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Submitted by:

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Citation:

Lieblein, G., T.A. Breland, S. Morse, and C. Francis. 2011. Visioning future scenarios. 'Teaching Tips', NACTA J. 55(4):109-110.

Annex 3. NACTA Journal Teaching Tips

Adding Value to Graduate Education: The Comprehensive Examination

Lindquist, J., S. Wortman, and C. Francis. 2011. Adding value to graduate education: the comprehensive examination. 'Teaching Tips', NACTA J. 55(4):106-107.

Virtually all graduate study requirements for M.S. or Ph.D. degrees include a written comprehensive and an oral exam, the latter most often a presentation of thesis or dissertation results. The written exam takes many forms, but the goals are to test the candidate for technical competence and affirm that the prior program course work has been effective in bringing the candidate to an acceptable level of understanding of the discipline in which she or he has been immersed. Although long accepted as a useful hurdle on the path to a degree, for some exceptional students who have already demonstrated competence in multiple ways, especially at the Ph.D. level, this has become an unnecessary chore for both students and supervisory committee members. All would rather devote quality time to something valuable for the student, rather than just busy work to re-validate what everyone already knows about the candidate. We have tested a new method of examination in a few situations, one that is focused on the student's ability to explain science to a lay audience.

Learning objectives are to 1) encourage the student to reflect on the broad importance of the courses and research project and how this can impact society, and 2) practice writing for a general audience about the topics of courses or research. With current skepticism about science and our research in many quarters, it is increasingly important to find effective ways to communicate with the public.

Methods include the framing of comprehensive exam questions that lend themselves to interpretation, clear articulation, and application to society's perceived challenges – quite a different challenge than writing for a journal. A recent comprehensive exam at University of Nebraska for a PhD student in practical applications of his research on use of diverse cover crop mixtures in sustainable farming systems included these five questions:

1. Select one important topic in soil microbiology relevant to organic agriculture and write an essay for a popular publication
2. What is a standard error? Explain this calculation and concept to a general audience outside of academia
3. Your research on mixtures of cover crops has potentially wide impacts on design of future farming systems; describe this practice to a general audience
4. Write an essay for the general public discussing the environmental benefits and drawbacks of agricultural intensification compared to organic agriculture
5. You have just been appointed to a farming systems and organic agriculture position at a major Land Grant University; using the advertised position description, prepare a draft of your first Hatch project

There were no further guidelines, nor time constraints put on the student to answer these questions, but rather he was urged to do as well as possible with the idea of submitting one or more of them for publication in a general interest journal in agriculture, natural sciences, or related area.

Observed impacts of this type of comprehensive exam were both immediate and striking. The student said up front in a meeting with the committee that this assignment "raised the stakes" of the exercise,

since he understood that some of the results would actually be published, and not just languish in the file of his supervisory committee. It was also said to be a new way of looking at science, and a challenge to write in a way and with language that was comprehensible to a lay audience. In fact, by the time of the oral exam over the questions, one had already been submitted and accepted for publication in Prairie Fire Newspaper, a publication from Lincoln, Nebraska that circulates across the Great Plains (Wortman and Francis, 2011)..

Another Ph. D student in Agricultural Leadership, Education and Communications was afforded the same opportunity as an alternative to the traditional comprehensive examination. She had two articles accepted and published in this same regional publication, in the June and July 2011 issues (Quinn and Francis, 2011a, 2011b). These follow on a theme of two previous student articles in Prairie Fire, one last August on the history of organic certification, and one early this year on the importance of introducing local and organic foods into schools.

Supervisory committee members for these students were equally pleased with the results. Since they already had the grad students in class and knew their technical capabilities, it was good to present a new type of challenge rather than revisit topics where the candidate's legitimacy had already been established. We do recognize that this approach is not necessarily for all students, and that the comprehensive written exam is an important way to assess technical knowledge. But for some students we feel that this is an innovative approach to broadening the capacities of a young professional to reach the general public.

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Annex 4. NACTA Journal Teaching Tips

Interviews with Farming and Food Systems Experts

Francis, C. 2012. Interviews with farming and food systems experts. 'Teaching Tips', NACTA J 56(2):96-97.

To gather additional resource information and broaden the scope of discussion in agroecology and other courses, we have implemented an exercise using interviews with experts outside the classroom. These activities introduce students first hand to farmers, consultants, input suppliers, and others directly involved in the production process, as well as with processors, distributors, marketers and nutritionists in the food system. Each student reports back providing an expanded picture of the farming and food system with perspectives and dimensions that enrich the topics presented and discussed during the lecture sessions. Through the questions posed to people interviewed, students move the content of the course and extend the discussion to a broader audience. The idea of "interview as outreach" is an innovative way to generate discourse in the community about issues related to the future of farming and food systems.

Objectives of the interviews in the community and reports back to class are to 1) expand the breadth of information resources and opinions about current and future food and farming systems, 2) explore new perspectives on content of agroecology or other courses through interactions with people in the community and 3) challenge key people in the farming and food system to think about issues central to future sustainability of the system and the long-term consequences of current practices and systems design.

Methods include: 1) an orientation about the interview process, 2) goals and conduct of interviews, 3) how to take notes or record results, 4) the format and value of a written report of the activity and 4) how this may be reported back to maximize the benefit of the interview for our class learning community. For the farming systems interview, students are urged to explore different opinions about the success of current systems and their limitations, and to ask about how their subjects view potential changes in the future of farming practices and design of systems. Most frequent interviewees include farmers, crop consultants, seed, fertilizer and chemical pesticide sales people, coop elevator managers, organic certifiers, and government officials involved in agriculture, including regulation and support programs. For the food systems interview, we again explore the successes and challenges in current systems, related issues such as nutrition, diet-related illness, and comparative advantages and disadvantages of local and global food systems. Those often chosen for interviews include food processors, wholesale and retail marketers, nutritionists, people involved in institutional food programs, health specialists, and others active in the food system. Students choose 1)who they will interview, 2) set up appointments, 3) conduct the interviews and 4) submit a maximum two-page report on the results. We then spend at least one class period summarizing the interviews and discussing the results. Substantial literature is available on the process of designing, conducting, and summarizing interviews; for example, Kvale and Brinkman (2009).

Outcomes include improved student understanding on practical applications of theory and information discussed in class, an appreciation of the range of opinions of people in farming and in the community about current and future systems. Classroom discussions often transcend those in the syllabus. Additionally, we speculate that an increase in community awareness and discourse about present and future food systems occurs as a result of the interviews.

Presentations in class have resulted in a rich array of facts about current systems, ideas about how they function as well as some of the shortcomings, and perspectives about the future. In farming systems reports, there is generally a satisfaction with current systems, a lack of concern about future resource scarcity, a concern about prices for commodities and the inputs needed to produce them, and a projection of future systems that closely resemble our current practices, rotations, and commodities. The results change to a broader concern about higher level issues and about the sustainability of future systems only if there is an interview with someone outside the mainstream, such as an organic or biodynamic farmer, a diversified crop/livestock farmer, or a vegetable producer who does direct marketing. One exception is a concern about farmer age, and who will inherit the land and farm in the future and topics that come from interviews with both conventional and alternative interviewees.

In food systems interviews, there is a wider range of opinions about current food and systems, the availability and cost of quality food, current diets and related health issues, and potential long-term alternatives. Although there are limited people with innovative opinions about how future food systems will differ from those today, there is a general appreciation that current foods and diets are detrimental to health. Although some favor regulation and government intervention in the marketing of fast food and other prepared foods, there is a general agreement that consumers must make their own decisions from the options available. There is little support for taxation of harmful foods, incentives for a more healthy diet, or regulation of any kind, although many of the reports include statements on the importance of nutritional education and future informed decisions by consumers. There is a concern about childhood diets, and the current epidemic of obesity and how this can be solved through education and better meals in schools. Budget concerns often come up in discussions about changes in school, hospital, and institutional building cafeterias and food systems. At times, there is discussion of how the university dormitories and cafeterias could provide a healthy model for future consumers.

In summary, the interviews provide an opportunity for students to interact with farming and food specialists outside the classroom, and to bring in ideas to enrich the discussion. Apparently, most of those interviewed support the status quo, although some do question current practices and systems, and provide some alternatives for the future. We speculate that even the process of asking questions about the future will cause some thought and discussion about present systems, and the long-term result will be a broader impact of class topics than is possible with only our internal discussions.

Reference

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Annex 5. NACTA Journal Teaching Tips

Mind Mapping to Explore Farming and Food Systems Interactions

Breland, T.A., G. Lieblein, S. Morse, and C. Francis. Mind Mapping to Explore Farming and Food Systems Interactions. 'Teaching Tips', NACTA J. 56(1): 90-91.

The process of mind mapping to illustrate complex systems has been described in great detail in the book by Buzan (2000) and by others, and there are multiple software programs available to organize the process. This method can be used for taking notes, for summarizing a meeting or seminar, or for making connections and bringing together key interacting elements on a white board or chalk board while a class is in session. We have found this activity especially valuable for students in agroecology who are studying complex farming and food systems, where much of the action results from key relationships and interactions that lead to emergent properties of the system.

Learning Objectives are for students to 1) capture and record key elements of a system during discussion or class, 2) explore principle interactions and duplications of these elements, 3) determine the importance of interactions and begin to uncover important emergent properties of current farming and food systems, and 4) reinforce the holistic nature of systems and their complexities. Although we have used mind maps primarily in class for recording and summarizing discussion, this method can also be used for taking notes in classes or seminars, for keeping key ideas together while reading, or for organizing important elements while searching on the web. The objectives and outcomes can be as varied as the imagination of the user can make them.

Methods for constructing mind maps are as varied and rich as the thinking of those who create them. Generally they are started with a major topic or word in the middle of the board, and this immediately distinguishes the method from more conventional, linear and orderly top to bottom notes from a meeting or class. As topics or themes or elements come up in the conversation, these are added to the diagram in logical places. As much as possible, mind maps made on the board during class should be written in the same words used by the one making the contribution, or reduced to a single or pair of meaningful words to represent the component or idea. The discussion leader can clarify or confirm a word by asking, "Did I hear you say….? Or "To be sure I have this right, did you mean ….? Or to buy time and to share responsibility, "How do you spell that word, and where do you think it should go on the diagram?" These are all ways to stimulate involvement, encourage ownership of the process, and broaden understanding of the topic. It is useful to plan ahead enough to be sure that most ideas will fit on the board, and that there is some provision for recording the results later on a flip chart or using a digital camera.

The moderator or the person making the mind map should seek the most logical place for each addition to the board. The advantage of a white board or chalk board is that words can easily be erased and moved to another position in the mind map. This is less easy when words are recorded permanently on flip chart paper, although

the permanence is useful to have as a record. Some white boards now have electronic potential to record and even to send images to other locations, increasing the flexibility and application of the method. The process can also be shared in an interactive video conference if the camera is capable of focusing on the screen and the moderator is careful to use large enough letters, write clearly, and ask for continuous feedback from a remote audience.

Another dimension of the method is the potential to connect the elements during or after recording them. There can be lines, arrows, circles or other shapes to connect, lines to unite or divide portions of the mind map, and simple drawings to depict relationships or ideas. Different colors can be used to indicate families of words or ideas, or words can be written at different angles on the board. One should be careful to not make too many connections in one figure, although it may be useful to illustrate the total complexity of a situation. When there are too many related elements in a certain area, an additional map could be drawn to one side or on another nearby board or flip chart. The potential options with this method are near limitless, and personal creativity can be brought in to best illustrate the key points in a conversation and their connectedness.

Outcomes of the construction of a mind map from a class, discussion, or reading exercise include a semi-orderly compilation of the elements, major ideas, and preliminary connections among these system components. At the very least, the method causes students to think “outside the box” and beyond the traditional method of taking conventional notes in class or seminar. More importantly, it is possible to draw some relationships, to recognize and illustrate relative importance of different themes, and to begin to establish a foundation for the emergent properties of systems.

The method is related to another strategy for learning, a rich picture of the farm or community, that can be developed buy groups through discussion. This is described in another fact sheet in the series.

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Submitted by:

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Annex 6. NACTA Journal Teaching Tips

Transect Walks across Farms and Landscapes

Francis, C., S. Morse, T.A. Breland, and G. Lieblein. 2012. Transect Walks across Farms and Landscapes. 'Teaching Tips', NACTA J. 56(1):92-93.

Learning to traverse and read the landscape is an essential capacity for agroecologists, and vital to the education of our MSc students. For students acquainted with farming and natural areas, it is important to learn to observe using all the senses and to put observations into the framework of prior experience. For those new to agroecosystems or the natural environment, it is essential to develop skills of observation to absorb details as well as view the macrocosm and context. For everyone in the field of agroecology – ecology of farming and food systems – it is an opportunity to acquire and practice observational skills that will help in later analysis and evaluation of current systems, as well as prepare them for envisioning improved and more sustainable systems for the future. The method has been especially valuable in Participatory Rural Appraisal as a tool for community leaders and citizens to assess their resources [FAO, n.d.], and there are many variations that are used in teaching and in research.

Learning Objectives are to 1) both open and hone the multiple senses to broaden observational skills to absorb as much as possible the complexity of farms and the rural landscape, 2) expose the details of these systems and learn how they are unique from other systems understood in other contexts, 3) provide a foundation for later discussion and analysis of farms and community food systems, 4) quickly orient the group to a new landscape and its features by sending people in different directions and later sharing observations, and 5) develop a capacity for social learning and interdependence as different people on a team observe unique details related to their prior study or experience that may be transparent to others, and share their experience with the group.

Methods that have proven useful in this activity early in a semester or short course have included two variations on "walking the landscape". We normally organize the class, course or workshop participants into pairs, with a goal of providing different perspectives on observations and to assure that each person will be a full and active participant in the exercise. Since people are often new to the immediate landscape and region where a course is held, we provide maps that include both topographic features and land use, as well as roads, trails, buildings, and other components of the built landscape. On these maps we designate a destination, with a distance from the classroom or other meeting venue depending on the time available; this is rarely less than one kilometer and may be up to three or four kilometers each way. We prepare for the exercise with key questions that are specific to the goals of the course. For example:

- What are the major observable consequences of geographic forces that have shaped the landscape?
- What are the most obvious human impacts on the natural resources and current land uses in the landscape?
- What features of the landscape appear especially valuable to provide ecosystem services?
- How is the landscape designed or managed to promote agricultural productivity? … to preserve biodiversity? … to provide resilience and stability to agriculture?

• Others unique to the goals of a course or workshop?

We normally discuss these learning goals and methods explicitly before people leave the class or meeting site, and ask in a general way what people are going to look for? The walks often provide an excellent venue for people to meet each other, discuss the landscape and its components, and compare the views and details with prior experiences. Another strategy we have employed on the walks is to urge people to walk quietly and not share observations on the outward bound trip, then to discuss their experiences on the return. We speculate that this will help each student enjoy a personal experience related to the landscape as well as a social learning situation on the return, but we have yet to decide which is best.

Outcomes that we have observed as well as gleaned from the subsequent discussions include an appreciation for the topography, principal land uses, and impacts of human development on the landscape. In Norway, one of our points in the orientation is that everyone in the country has access to the entire landscape, including tracts that are privately owned as well as those that are property of local or national government. This allemansreten policy guarantees everyone the right to follow trails or small roads, to pick berries or mushrooms (except in the vicinity of a dwelling), to cross forests or pastures, and to experience any area of the country as long as they are respectful of private property, close gates to keep livestock in or out, and refrain from walking cereal fields that are near harvest. It is also legal to go on skis, by cycling or jogging, and to camp without permission, as long as the owner's livestock and equipment is respected. This rule that goes back to Viking times is a welcome surprise to many students who come from cultures where the signs "keep out" or "no trespassing" are commonplace.

The observations on multiple routes across the landscape quickly bring a fuller understanding of the total landscape to the student community. This could require several days or weeks if each person were to explore the entire territory on their own. The experiences of some people encourage others in the group to pursue further study of areas of special importance, including farming and livestock systems, especially interesting forests or land forms, and particularly unique paths for walking or trails/roads for cycling. Listening to others recount their experiences, we have heard classmates exclaim, "Oh, I saw that too, but I really did not understand what it was." Or, "That is really different, and it reminds me of …." One variation on the same activity is for student teams to take shorter transect walks across their project farms without the farmer, observing crop and livestock enterprises and their integration and interactions. They begin to observe and assess the production potentials of the farm, its soils and biodiversity, and form ideas about intensity of land use and possible improvements for the future. This adds to their foundation of information when they later meet the farmer and learn in depth about the production, economic, and social strategies and connections that characterize the current situation.

In summary, we have found the transect walks to be a valuable form of orientation at the landscape and at the farm levels. We have used this activity to build and practice observational skills, and have received strong positive evaluations from students.

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AGRICULTURAL UNIVERSITY - PLOVDIV, BUGARIA

Teaching Activities in Organic Farming in Agricultural University (AU) 2009/2010

Prepared by Ivan Manolov (manolov_ig@yahoo.com)

1.1. Bachelor degree
Organic Agriculture

In 2011 curriculum for new BSc Programme in **"Organic Farming"** was developed in the University.

This new speciality started from 2011-2012 study year with 20 students enrolled.

Teaching of specialized subjects about Organic Farming

Students from specialties: "General Agronomy" and "Tropical and Subtropical Agriculture" have chosen to study optional subject:

"Introduction in Organic Farming" (30 hours, conducted in 5th semester February – May 2012). The course is carried out in Bulgarian language by Ivan Manolov.

Number of credits: 3 ECTS

For the period 2010 – 2012 three Erasmus students (2 from Poland and 1 from Czech Republic) study the same subject (30 hours, conducted between February – May 2012). The course is carried out in English by Ivan Manolov.

Number of credits: 3 ECTS

Students from Specialty "Animal Husbandry" have chosen to study optional subject:

"Introduction in Organic Animal Husbandry" (30 hours, conducted in 5th semester February – May 2012). The course is carried out in Bulgarian language by Vasil Nikolov.

Number of credits: 3 ECTS

Examinations for all courses: tests

Ecology

BSc programme **"Ecology and Environmental Protection"** has being taught in our university for several years.

1.2. Master degree "Organic Agriculture"

This master course is not studied last year.

Master degree **"Ecology of Settlement Systems"**

Seven students studded this M.Sc. course in study year 2011-2012.

1.3. Project activities about Organic Farming at Agricultural University, Plovdiv Bulgaria

1.3.1 Lifelong Learning Program Leonardo da Vinci

Action Type - Learning Partnerships

Project title: LLP-LdV project, Innovation-based organic farming through user-friendly training tools, No 2010-1-BG1-LEO05-03091, project abbreviation AGROTRAIN.

Project period: 2010 – 2012.

Partners involved in the project:

Agricultural University – Bulgaria
ERBIL – Turkey
CVT – Greece
AELV - Spain
FTT - Spain
Trebag - Hungry

1.3.2 Swiss program SCOPES (Scientific co-operation between Eastern Europe and Switzerland)

Project title: Advancing training and teaching of organic agriculture in South-East Europe (Albania, Bosnia and Herzegovina, Kosovo, Bulgaria, Hungary)

Project period: 2011 – 2014.

Partners involved in the project:

Research Institute of Organic Agriculture (FIBL), Switzerland
Agricultural University (AU) in Plovdiv, Bulgaria
Agricultural University of Tirana (AUT), Albania
Faculty of Agriculture and Food Sciences (FAFS) in Sarajevo, Bosnia and Herzegovina
University of Prishtina, Faculty of Agriculture and Veterinary Sciences (UPFAV), Kosovo
Department of Ecological and Sustainable Farming Systems of the Corvinus University of Budapest (CUB), Hungary

1.3.3 Project financed by Agricultural University

Project title: State and outlook in front of regional distribution systems for organic food products.

A Teaching Module in Organic Agriculture: Territorial Development and Market Trends. [a 3 weeks MSc Module at ISARA-Lyon]

M. Casagrande, P. Fleury and J. Peigné
Université Lyon, ISARA-Lyon, 23 rue Jean Baldassini, 69364 Lyon Cedex 07, France

Description of the course and target audience

This course is targeted to Msc students who are interested in organic farming. They should already have background in agronomy, sociology and economics. The maximum number of students is limited to 40 because of the case study project. This module yields 4 ECTS credit points and lasts for 3 weeks. The different types of learning activities and their related amount of hours are displayed in the following table.

Lectures	Intensive practical	Extensive practical	Visits	Personal/Group work	Examination
16 h	5 h	16 h	20 h	27 h	3 h

Rationale

Organic farming development is nowadays supported by French and European policies. Currently French organic production does not match the consumer demand and importations are increasing. In this context, the new objectives of organic farming in France are (i) to increase organic production, (ii) to provide environmentally friendly practices (iii) to contribute to local development and (iv) to participate to citizens' education.

Learning objectives

We identified 4 learning objectives in this module:

1. Have a general background on organic farming
2. Distinguish and analyze the main components of organic farming systems
3. Analyze and understand the social expectations towards organic farming
4. Carry out a diagnosis in order to assess the potential development of organic farming in a French case study area and the contribution of organic farming to local development.

Learning themes

In order to achieve the learning objectives we organized the learning activities according to different themes. We first introduced the basics of organic farming with lectures related to history of organic farming, regulations and policies and organic agroecosystem management. Learning activities were then focused on "core themes"

- social expectations towards organic farming: feeding the world? Preserving environment? Promoting smallholders agriculture? Improving farmers income? Providing healthy food?)
- economical analysis of organic agriculture: supply chain, market trends and consumers
- development of organic farming and supporting organizations
- territorial approach: land use and landscape analysis to assess the potentialities of a territory

Learning activities

We combined different types of learning activities in order to achieve the learning objectives. ISARA teachers as well as local advisors or stakeholders presented lectures and practical trainings.

We organized visits: one visit to an organic dairy farm and we carried out a landscape analysis together with the students. The objective of the farm visit was to make them aware of organic farming system management as well as they started reflecting on organic farming. During the landscape analysis we showed them how to observe, describe and analyze a landscape in order to understand past, present and future development of the territories (Deffontaines and Lardon, 1994) : This landscape analysis helps students to raise questions that were later discussed with the stakeholders and farmers.

We organized a debate on the future of organic farming. Three groups were identified (12 students per group) and each group had to defend a point of view:

- Organic farming has no future
- Organic farming is a niche market which is going to develop
- Organic farming is getting « conventionalized »

Students had been given bibliographic documents and had time to prepare the debate. In each group, all of the 12 students were in charge to prepare the debate. During the debate they had different roles: 4 of them participated in the debate as main experts. There was one speaker talking about organic farming in general, one specialist in agronomy, one expert in environmental issues and one in economics. They had to present data, arguments, facts and/or political views in order to defend their vision of the future of organic farming. Six other students had to take part to the debate as contradictors of the other groups by asking questions, expounding arguments and controversial matters. The debate was organized by a teacher, and finally 2 students per group were in charge to propose a recap, a short oral synthesis, of the main outputs of the debate.

We also proposed a case study work that was carried out within groups of 5 to 6 students. For each group, the generic question was: “How can organic farming contribute to local development?”. This question was then applied in the region of Beaujolais to different topics such as “How can quality labels (including OF) help to face the wine crisis in Beaujolais?” or “Is organic farming a suitable option for preserving water quality in this area?”. The objective was to see how the different themes that were presented during lectures, visits and practical trainings were combined at local scale. At local scale, at the end of the module they should be able (i) to identify the opportunity and constraints of organic farming in the case study area, (ii) to understand organic farmers’ practices and to identify the diversity of farming systems, (iii) to analyze transformation, commercialization and distribution systems, (iv) to identify local dynamics and networks supporting organic farming development and (v) to identify

improvement options for developing organic farming. We provided the students with bibliographic data as well as with a list of people to meet (farmers, advisors, stakeholders, etc.). They had to prepare and carry out interviews with those people. They also had to carry out a landscape analysis of the studied area and to relate their results to their topic. We expected each group to write a report and prepare an oral presentation.

Programme

The programme is summarized in the following table according to the learning themes. The case study group work is not presented I this table because it is related to all presented themes.

Theme	Learning activity	Description	Learning outcomes
Introductive themes	Lectures + farm visit (ISARA teachers)	History of Organic farming Regulations and Policies OF systems management	General background on OF Understand and analyze the effect of conversion on farming systems
Social expectations	Debate (ISARA teachers)	2 hours debate with 3 groups	General background on OF Bibliography work Explain and argue about OF
Economics	Lectures (ISARA teachers)	market trends organic consumers supply chain economics	Analyze french and European organic markets : from farm to table
Development	Lectures (advisors and stakeholders)	Local support policies and advising sytems, stakeholder network	Identify advising and supporting organisms at local scale Understand organic local policies
Territorial approach	Lectures Intensive practicals Case study visits (ISARA teachers)	Land use analysis (census) Landscape analysis	Use census data and GIS software to analyse land use Analysing a landscape to describe land use, agricultural management, urban development

Examination

Students had an individual written exam (50% of final mark) and each group had a mark for the case study work (oral + report, 50 % of the final mark). The objective of the examination was to check if students were able to get the big picture of organic farming development and its complexity (intertwinement of social, agricultural, environmental, economical and political stakes). Moreover, the

objective was to evaluate their ability to use methods and concepts to understand and analyze a case study (Beaujolais) and to propose improvement options, that is to say carrying out a diagnosis and proposing solutions)

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Teaching and Research Activities in Organic Farming, Department of Organic Farming, Faculty of Agriculture, University of South Bohemia in České Budějovice

Prepared by Jan Moudrý (moudry@zf.jcu.cz)

Taught Courses:

- *BSc Sustainable Farming Systems in Landscape* – this 3 year Bachelor Degree programme has been started since 09/10 Academic year in daily form of study. The main aims of this study programme are based on the integration of biological principes of farming, environment protection and sustainable farming in lanscape.
- *BSc Agroecology* – this 3 year Bachelor Degree programme. The main topics are of this study programme are agriculture, landscape protection, organic farming, fischery and hunting, agriculture landscape management, legal rules, planning and economy of environment.
- *MSc Agroecology* – this 2 year Master Degree programme is splited into two main specialization: Landscape Cultivation or Organic Farming.

Organic specific Modules:

Agroecology – this one semester module course is* acredited in english and ECTS credits. *Students can absolved next subjects:

- ***Developing of Sustainable Systems of Agriculture I.;***
- ***Developing of Sustainable Systems of Agriculture II.;***
- ***Sustainable development;***
- ***Organic plant growing;***
- ***Quality, processing and marketing of bioproduction***
- ***Ecosystems services.***

The extension of participation of students of Agroecology a Sustainable farming systems in landscape on the basis of Socrates/Erasmus programme at courses and summer schools of ENOAT. The contacts between teachers of University of South Bohemia and ENOAT network will be intensified on the basis of internships, exchange of PhD students, lectures and using of information sources.

Current Team - Department of Organic Farming

prof. Ing. Jan Moudrý, CSc. (co-ordinator)	Petra Kolářová (laboratorian)
Ing. Petr Konvalina, Ph.D.	Josef Šafář (technician)
Ing. Jan Moudrý, Ph.D.	Ing. Zuzana Jelínková (PhD student)
Mgr. Martin Šlachta, Ph.D.	Ing. Jan Šrámek (PhD student)

Overall principles of the organic research group:

- Sustainable farming systems
- Alternative crops growing
- Energetic crops growing
- Functional food, Food Safety and Quality
- Drought tolerance of cereals
- Genetic resources of wheat in organic farming (breeding, growing, processing)
- Modelling and planning of sustainable farming systems
- Local marketing of Bio food

Specific research within the international and national research projects:

- EULACIAS (Breaking the spiral of unsustainability in arid and semi-arid areas in Latin America using an ecosystems approach for co-innovation of farm livelihoods)
- SUKI The possibilities of big kitchen to cut the emisions of carbon dioxide down (disposal, conditions, borders) - Sustainable Kitchen
- SUFA (Sustainable farming systems in Czech-Austrian border region)
- NAZV QG50034 New technological aspects in organic farming on arable land leads to quality for food and feed use
- NAZV QH82272 (Utilization of spring forms of selected wheat varieties in organic farming)
- NAZV QI91C123 (Specification of spring cereals seed growing in organic farming)
- NAZV QH 81 060 (reasons and possibilities of minimalisation of risk connected with occurrence of mycotoxins and theirebounded form in cereals
- 2B06131 Nonfood use of phytomass in energetic industries

Globalization: Implications for Teaching and Learning in Post-Secondary Agricultural Education

Summarised by Charles Francis, UMB

NACTA Journal is one of the two most widely-read technical journals for teachers in crop science, farming systems, organic farming, and practical agriculture in the U.S. The editor Rick Parker [nactaeditor@pmt.org] has a broad perspective in animal science and agricultural education in general, and a sincere concern about increasing the communication about teaching and learning methods in the international education community. With this in mind, he has announced a special issue of the NACTA Journal for September, 2013 [see attached formal announcement].

Several unique features of our network could be of interest to the global educator community. Across Europe there is a wide range of ecoregions and unique local conditions that confront farmers. It is important to know how to teach agroecology and its applications in organic farming in ways that are relevant to this range of situations, to identify those unique to each location and which are more generalisable. In my experience, one of the most difficult lessons to explore in teaching is how to extrapolate from given experiences and examples to the general case. We could say this is the difference between *application of principles* to many situations as compared to *following a menu* or set of practices that has been successful in one location or in the past and expecting this to be successful in other locations or in future situations. It is the former that represents *education,* as distinguished from the latter that could represent *training*. ENOAT members have experience with the development and use of principles, as well as innovative teaching techniques.

With respect to teaching methods, we report each year on the new ideas and methods that have been successful in education … from the transect drives by car in southern France to the community polilogs created to build consensus among diverse stakeholders in the food systems projects in Norway. These are ideas that each of us takes home and considers for our own courses, and they could be shared with the wider educational community though a paper in this special issue.

Members of ENOAT have a number of interesting degree programmes, courses, educational materials, and teaching methods that would be of great interest to the wider educational community. We should mobilize our small teachers' community to write up information that could be useful to others, and to respond to this special call for papers for the NACTA Journal. In fact, this type of publicity about our European programmes could prove to be a useful recruiting method, first for informing instructors about innovative learning opportunities in our universities and second for actually attracting students to enroll. The MSc in agroecology that includes semesters in UMB in Norway and ISARA in France is an example of one of our programmes that can use more student applicants. An article from ENOAT members could help in recruiting.

If anyone in our group is interested in submitting an article for this special issue, but has concerns about the time and energy that it would take to write in English, I would be happy to participate in your writing project as a native speaker of the language. Just contact me any time this year or early in 2013. Two e-mail addresses are: UNL cfrancis2@unl.edu or UMB charf@umb.no.

NACTA Journal Special Issue for September, 2013: "Globalization: Implications for teaching and learning in post-secondary agricultural education"

Deadline for submissions: May 1, 2013

You are cordially invited to contribute to the Special Issue (September, 2013) on "Globalization: Implications for teaching and learning in post-secondary agricultural education". The special issue aims to make contributions to the scholarship of teaching and learning through the understanding of global/international experience impact on learning through the publication of vigorous original empirical research. The focus will be on innovative approaches to assessment, on campus & off campus global curriculum & experiences, utilization of educational technology to improve the instruction, faculty/staff development, international development, Extension methodologies, engaging strategic stakeholders in improving experiences and the identification of substantive conceptual issues that can help shape the field.

Recommended Topics:

We invite different types of contributions including empirical research, conceptual models, theory building, innovative methods and applications, case studies and innovative teaching tips. Topics to be discussed in this special issue include (but, are not limited to)

- Assessing outcomes of global experiences
- Pedagogy of facilitating effective study abroad experiences
- Developing learning outcomes/objectives of global experiences
- Internationalizing curriculum on campus
- Creating contextual relevance to global experiences.
- Utilizing social networking in global experiences
- Effective reflection in global experiences
- Involving strategic/global partners in global agricultural education

Guest Section Editors: Daniel Foster, The Pennsylvania State University ddf12@psu.edu & Mark Russell, Purdue University mrussell@purdue.edu
Journal Editor: Rick Parker, nactaeditor@pmt.org

Preparation of Manuscript

Instructions for authors can be found at:
http://www.nactateachers.org/images/NACTA/Instructions_for_Authors_Dec_10.pdf Page charges of $75.00 per manuscript are waived if one of the authors is a NACTA member at the time of publication.

Manuscript Submission

All manuscripts must be submitted through Manuscript Fasttrack site: http://nacta.expressacademic.org/login.php
The review process will follow the standard procedures of NACTA, but will be managed by the Guest Editors. Each submitted manuscript will undergo a double-blind review process involving at least two reviewers.
Deadline- Submissions are due May 1, 2013
Publication Date- The anticipated publication date of the special issue is September, 2013.
The NACTA Journal (ISSN 0149-4910) is published quarterly by the North American Colleges and Teachers of Agriculture (formerly the National Association of Colleges and Teachers of Agriculture). It is directed toward the scholarship of teaching and learning in agricultural, environmental, natural and life sciences by presenting articles covering topics that treat all aspects of teaching such as methods, problems, philosophy, and rewards at the college level. All manuscripts undergo double-blind peer review.
Journal Website- http://www.nactateachers.org/journal.html

Journal Articles and Book Chapters from the Nordic Group on Agroecology Learning

Charles Francis, Geir Lieblein, Tor Arvid Breland, Suzanne Morse, UMB, Norway

We present this updates list of publications as a model for colleagues to consider as they envision, plan, design, and implement courses in agroecology and then evaluate student learning. It is highly desirable to publish these evaluations to provide incentive to other instructors to improve their teaching and to try innovative approaches to education. These articles and chapters are available from the authors.

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Agroecology and Capacity Building International Doctoral Programme
Executive Summary

Lennart Salomonsson (SLU, Sweden), Charles Francis, Geir Lieblein and Tor Arvid Breland (UMB, Norway)

Overview

Holistic and systems-wide learning strategies are essential for tomorrow's education and research. Future challenges will transcend the skills, knowledge, and methods of single departments. Agroecology is an integrative and systemic study of farming and food systems, embracing complexity and change, with focus on education for responsible action. Capacity building for leaders in public, private, and non-profit organizations will help institutions contribute to meeting future food needs. We propose an **international doctoral programme in agroecology and capacity building**.

Most current agriculture in the industrialized countries was created and sustained with subsidies of global natural resources. We are now experiencing unintended emergent properties such as serious environmental loads resulting from intensification of food production: atmospheric levels of CO_2, non-point source pollution, and dead zones where chemicals reach the ocean. Global food needs must be addressed with production systems friendly to the environment that contribute to life support functions – ecosystem services. These demands from future agricultural systems present challenges in designing educational strategies to develop the next generation of researchers, teachers, and administrators, and their complexity leads us to think beyond present models of graduate education.

Agroecology and Systems Learning to Build Professional Capacities

Agroecology may be defined as the ecology of food systems. This includes integrated concerns for production and economics at farm and landscape levels, for designing environmentally sustainable systems, and for social impacts of systems on farm families, rural communities, and regional economies. Ecological approaches to agriculture can maintain productivity and reduce damage to the environment, plus preserve natural resources. Well-tested agroecological strategies, practices, and systems can improve natural and human capital in rural landscapes, and reduce the negative emergent properties of many conventional/industrial systems. Integrated nutrient and pest management, organic farming, agroforestry, integrated crop/aquaculture, permaculture, and crop/animal systems are among the strategies with proven potential. Research and education administrators need to embrace whole system philosophies.

Design of an International Programme

Expertise in agroecology is spread geographically in different universities, with need to coordinate a virtual network of experts who can contribute knowledge and experience as instructors and advisors to PhD candidates. Education and research will be organized through distance learning, 'blended courses', and existing resident courses that contribute to capacity building. Shared thesis supervision based on an international faculty network is one pillar of the program. Blended courses feature students in small functional groups at participating universities, and similar group work accomplished on line, as demonstrated over the past decade in an international agroecology course. Each faculty member will advise students, provide local facilitation, identify farm and community venues for systems studies, and serve on supervisory committees for students from other universities. Focus will be on local open-ended case studies. Each course will have a designated leader with responsibility for course content, student orientation, learning materials and guidelines for field work. Course leaders will meet each year to plan the curriculum and sharing of responsibilities.

To enhance communication and build a strong international core of cooperators in agroecology, annual workshops for faculty and graduate students will be convened for a series of farm and food system visits, in-depth discussions of principles and applications from agroecology, and exploring capacities needed for further capacity building. Doctoral students will present their thesis plans for scrutiny and feedback. These workshops may be held in conjunction with an international professional society meeting to add value to the educational event. Graduate students will enroll in a current department in their university of choice, and select courses from the network to supplement those in the present catalog. They will receive degrees from existing departments, meeting all the current requirements, with a certificate of completion in agroecology and capacity building.

Teaching Activities in Sustainable and Organic agriculture, University of Gastronomic Science

Paola Migliorini (p.migliorini@unisg.it), University of Gastronomic Science, Pollenzo, Italy

Taught Courses:

- **Three-year undergraduate degree in Gastronomic Sciences** taught in English and Italian (language courses provided)
  The three-year undergraduate degree in Gastronomic Sciences is designed for students seeking broad-based professional training in multidisciplinary food studies. Through an approach that merges both science and humanities, the program provides the necessary knowledge and skills for work in food production, processing, distribution and promotion of food and beverages, as well as functions within food and wine tourism.
  Courses fall within 20 disciplines (some of which are composed of multiple modules) and study trips (both thematic and regional), for a total of 180 university credits.
  The languages of instruction are Italian and English, and credited courses in English (for Italians) and Italian (for non-Italians) are provided. Students are required to attend both lessons and study trips.
  Study trips are regional (in Italy, in Europe, around the world) and thematic (I year: cured meat, coffee, pasta; II year: cheese, confectionery, rice; III year: olive oil, beer, fish).
  All courses have a strong focus in sustainability and students receive specific content in organic faming with in the following course:
  - Food (crop and animal) Production (10 CFU II year)
  - Food Economic and Policy (5 CFU III year)
  but also in 'history of agriculture and food', 'etnobothany', 'cultural anthropology',

- **Two-year graduate degree in Gastronomy and Food Communications** taught in Italian
  Specialization degree in management, operations, and promotion of gastronomic enterprises.
  Coursework covering economics, promotion, multiplatform communications, distribution, and consumer sciences.
  9 months work-study internship.
  All courses have a strong focus in sustainability and students receive specific content in organic faming with in the following course:
  - Food Economy (5 CFU III year)
  - Food communication (5 CFU III year)

- **One-year master's degree in Food Culture and Communications** taught in English
  Starting in 2012, the Master in Food Culture and Communications will be divided into two streams:
  Ø Human Ecology and Sustainability (starting on March 21, 2012)
  Ø Food, Place, and Identity (starting on May 30, 2012)
  Each stream of the master comprises 90 university credits and leads to a 1st level Master degree. The language of instruction is English. The program lasts 12 months and a minimum of 80% attendance is required.
  Each, however, is designed for international students seeking an innovative approach to the study of food and foodways and the ways in which they are discussed and represented today.
  The Program offers a wide mix of in-class lessons, exercises, guided tastings, projects, and study trips in Italy and abroad to provide a multiexperiential understanding of both high-quality artisanal and industrial food products, as well as the necessary knowledge and expertise for communicating the history, ecology, technology, and social and cultural meanings of the food phenomena.

Instructors include internationally recognized scholars, journalists, and other gastronomy experts, including: Carole Counihan, Barny Haughton, Eric Holt-Giménez, Corby Kummer, Stuart Franklin, Anne Noble, Fabio Parasecoli, Carlo Petrini, Colin Sage, and others.
Through an approach that merges anthropology, history, ecology, food policy, agronomy, economics, food and sensory sciences, tasting sessions, communications, and a wide range of other subjects, students acquire the tools for developing new conceptualisations, communications, and educational strategies within the realm of high-quality gastronomy. Graduates emerge ready for careers in community-based project management, education, marketing and public relations.
Internship A 6-to-8-week internship concludes the master, with each student working within a company or organization in Italy or abroad. Internships focus on food production and/or tourism, and are the basis for a final thesis presented to an academic committee. Over the course of the year, Master Program staff assist students in researching and identifying internships and hosts suited to their individual interests. While some internship hosts may occasionally provide room and board, students are responsible for all expenses related to their internships.
Final Thesis The final thesis is the culmination of the Master Program and offers the student the opportunity to synthesize both theoretical and practical coursework, including the internship. The thesis, including methodologies and a report on the internship work, is completed individually and is evaluated by an academic committee.

UNISG Method:

- Multidisciplinary:
  - § social sciences/humanities
  - § food production and technology
  - § complementary subjects: economics, communications, geography, logistics

- Multiexperiential:
  - § classroom, laboratory, excercises, guided tastings
  - § internships (at graduate level)
  - § extensive travel in Italy and abroad (study trips)
  - § partecipation of Slow Food event

Information on these and other course can be found on the following website: http://www.unisg.it

Research Activities in Organic and Sustainable Agro-food systems or Eco-gastronomy

Overall principles:

- systems approach
- Multi-disciplinary
- Territorial and local
- Whole food chain

Some projects:
FEEDING MILAN. Energy for change
Funder: Cariplo
Lead Partner: Slow Food
Partners involved: UNISG, Politecnico di Milano – Department Indigo.
Project Objectives and UNISG role: Purpose of the proposal is to design a system of services and infrastructure to redefine the spatial characteristics of the metropolitan area of Milan (city and South Milan Agricultural Park) in function of a food chain working efficiently and effectively, that gives shape to a scenario of sustainable and innovative metropolitan agriculture. The project wants to support best practices and existing resources (agriculture), activate the valued resources (processing) and create new services (distribution).The project will

deliver a new order to the city infrastructure and services to create direct relationships of exchange with the South Milan Agricultural Park and its resources, which will define a model of urban agri-food excellence, a true monument to exalt the territory and to represent the city , not only as a function of the Expo 2015.
Duration: 2010-2011-2012

POL.I.E.D.R.O - Pollenzo Index Environmental and Economic Design
Funder: Regione Piemonte – Bando Scienze Umane
Lead Partner: UNISG
Partners: Università degli Studi di Torino Dipartimento di Merceologia, Università degli Studi di Torino Dipartimento di Scienze Sociali, Università degli Studi di Torino SAA, Politecnico di Torino
Project Objectives and role UNISG: The project will exploit a multidisciplinary approach to create a virtuous circle in the local area, starting from the concept of the "sustainability", in the broadest sense of the term, of agri-food products. The idea is to bring together a series of areas of professional expertise, from knowledge and study of culinary traditions in a certain geographical area – where the project will then be tested, to a sociological approach exploring the consumer as the last link in the production chain, to the strictly environmental aspects of products and packaging, to the economic aspects of the entire certification process. The end result will be a multi-faceted index of "sustainability" designed to apply to agri-food products. The latter form the point of departure for the project, which aims to highlight a series of mechanisms and involve the whole of the area where the food products originate, raising overall awareness of broader environmental factors. The University is the project coordinator.
Duration: December 2009 – November 2012

FRULOGICO: a variety comparison of common wheat for the production of quality bread
Funder: Piedmont Region
Leader: C.R.A.B. Reference Centre for Organic Agriculture Scrl
Partner: UNISG, CRAB, CRA-SVC.
Project Objectives and role UNISG:
The restoration and enhancement of agronomic aspects (adaptability to hilly and mountains region of organic farms in Piedmont), healthy (high digestibility and low allergen) and nutrition of local varieties of ancient constitution of wheat falls towards the development of a sector for bread-making quality involving producers, processors and consumers.
The objectives of the project are:
- Recover the cultural heritage linked to the cultivation of wheat in Piedmont;
- Assess the adaptability to the cultivation of local cv adapted for hilly and mountain areas of Piedmont;
- Know and enhance the nutritional value of wheat products from local varieties grown in organic farms;
- Foster relations between producer, processor and consumer.
Duration: 2010 – 2013

Jan moudryAssessment of the sustainability of agro-food products in the farmer's market in Massa
Funder: Tuscany Region and the Province of Massa and Carrara
Leader: UNISG
Partners: Association of Tuscan Organic Producers (www.ctpb.it)
Project Objectives and role UNISG:
The issues are:
- Enhancement of agricultural and agro-food production and their connection with the short circuits of production / consumption
- Organic production and their connection with short chains of production / consumption
The objectives of the research are:
1. assess whether the farms that sell products to the market are sustainable from the point of view of the quality of production, environmental and socio-economic aspects. This will be done on a sample of farms for certain types of productions most representative of the province.
2. Investigate the current size of the farmer's market with the influx of consumers and the quantities sold and understand the market potential to improve some aspects of farms sustainability.
3. Promote the market through communication campaign to the consumer with the results obtained from the analysis of farms sustainability. The added value of local and fresh productions purchased at the farmers' market

can be in terms of economic, ecological and social benefit for both the consumers and the producers and thus the entire local community of the province.
In particular UNISG realize:
- Analysis of environmental sustainability
- Analysis of the socio-economic sustainability
- Analysis of the sensory quality of food
- SWOT analysis of the farmer's market in Massa
- Promotion of short chain and implementation of the farmer's market in Massa
Duration: November 2010 - June 2012

ENERGY FLOW IN THE PROJECT "Analysis of farming systems that enhance the "short chain" and reduce energy consumption in the production of organic vegetables. (ORT-BIO) "
Funder: Ministry of Agriculture, Food and Forestry (MIPAAF) - University of Perugia
Leader: University of Bologna
Partner: CRPV Cesena, Bologna PROBER, CRA CRA-NOW Monsampolo del Tronto, DSEEA University of Perugia.Jan Moudry
Project Objectives and role UNISG:
UNISG collaborates with the University of Perugia and in particular undertakes to carry out the energy analysis, the aim of which is to identify those models production and organization to greater energy efficiency through:
- The determination of the energy flows for each crop and operation practiced in different crop rotation in the farms analysed;
- The determination of the energy needs for each farm or activity observed in the phase of cultivation, processing, packaging and distribution
- The identification and proposal of strategies for optimizing the organization and management of energy flows, about all stages of the production chain, with the definition of scenarios with lower energy requirements, based on a short chain forms of marketing;
- Verification of the scenarios on specific companies, the object of experimentation.
Duration: November 2009 - July 2013

UNIVERSITÄT HOHENHEIM

Coordination for Organic Farming and
Consumer Protection

Organic Agriculture Teaching at University Hohenheim

Sabine Zikele, Univ. Hohenheim, Germany

1. Bachelor-Level

Two modules as electives for the students of the B.Sc. Programmes “Agricultural Sciences”, “Biobased Products and Bioenergy”, “Agricultural Biology” and “Nutritional Sciences” in their last study semester (6th semester)

1. Basics and Socioeconomics of Organic Farming (6 ECTS), around 30 students every year

2. Crop Production and Animal Husbandry in Organic Farming (6 ECTS), around 70 students every year

2. M.Sc. Level

M.Sc. Programme Organic Agriculture and Food Systems (Single degree or Double Degree)

Running since winter semester 2005/2006

Study language: English

Total number of students: 70

Duration of study: 4 semester

ECTS: 30 per semester

Application deadlines: For non EU-students: **15 March 2013,** for EU students **1 June 2013**

Compulsory modules (semester 1 and 2)

- Social Conditions of Organic and Sustainable Agriculture
- Processing and Quality of Organic Food
- Organic Plant Production
- Markets and Marketing of Organic Food
- Project in Organic Agriculture and Food Systems
- Organic Livestock Husbandry and Livestock Products
- Organic Food Systems and Concepts
- Basic Principles of Organic Farming (Start-Up-Module for the Double Degree)

Elective modules (semester 3)

- Soil Fertility and Fertilisation in Organic Farming
- Problems and Perspectives of Organic Farming
- Crop Protection in Organic Farming
- Organic Farming in the Tropics and Subtropics

Number of students: between 80 and 100 applications each year, about 30 students starting in the programme every year (maximum number of students allowed: 45 including the Double Degree students from the partner universities), 70 students in total in 2011

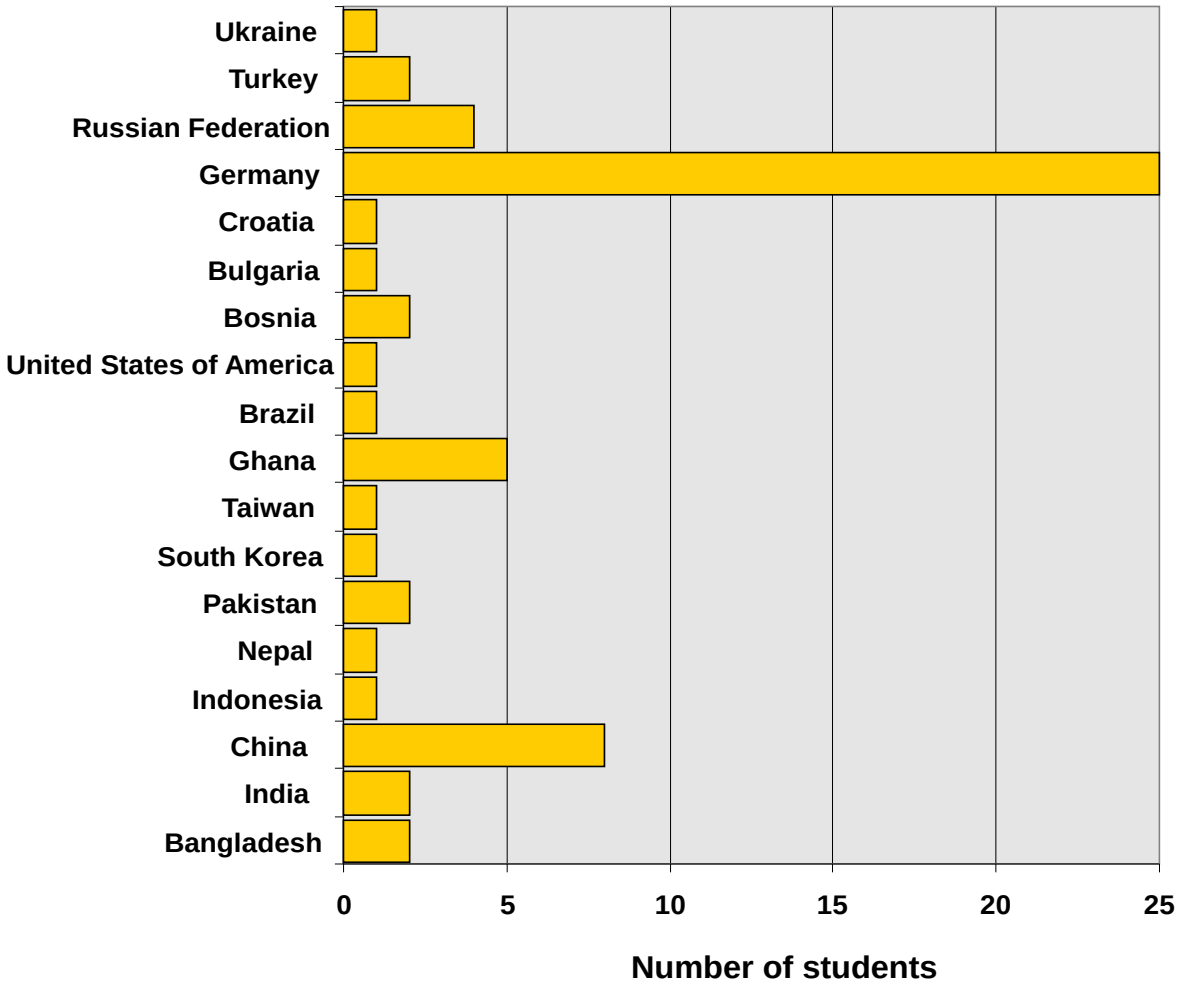

Fig. 1: Origin of students enrolled in the M.Sc. Programme „Organic Agriculture and Food Systems“ (single degree) at the University of Hohenheim in the summer semester 2011

Study structure for the Double Degree

Table 1**:** Overview of the study structure in the Double Degree programme

Home University	1. Semester	Modules (compulsory and elective)	Start-up module (6 ECTS) + 24 ECTS
	2. Semester	Modules (compulsory and elective)	30 ECTS
Host University	3. Semester	Modules or M.Sc. Thesis	Elective modules (profile) 30 ECTS/ M.Sc. Thesis 30 ECTS
	4. Semester	M.Sc. Thesis or modules	M.Sc. Thesis 30 ECTS / Elective modules (profile) 30 ECTS

Specialisations at the Partner Universities

Specialisations at UHOH

- Organic Crop Production
- Socioeconomics and Organic Farming
- Organic Farming in the Tropics and Subtropics

Specialisations at AU

- Organic livestock farming
- Organic production of fruits & vegetables in a temperate climate

Specialisations at WULS-SGGW

- Organic Food Quality and Marketing

Specialisations at BOKU

- Soil Fertility, Water Management and Ecology
- Organic Agricultural Production (Crop Production, Grassland, Horticulture, Orchard, Viticulture Systems)
- Organic Agriculture in Subtropical and Tropical Environments
- Systems, Scenarios, Sociology and Ethics
- Local Knowledge and Ethnobiology
- Socio-Economy and Marketing

Current students in the Double Degree programme

- 4 students (enrolled at UHOH):

  3 students directed to **BOKU**

  1 students directed to **Aarhus**

Organic Agriculture Research at University Hohenheim

1. Projects related to organic agriculture and to the organic sector in 2012

Faculty of Agricultural Sciences

Soil and Plant Sciences

Project	Contact person (Name, e-mail-address)	Duration
Microbial mediated phytoextraction of copper in organic vineyards	Prof. Dr. Ellen Kandeler, Institute of Soil Sciences (310b), kandeler@uni-hohenheim.de	2011 – 2014
Lentils under organic management (winter cultivation, seeding time, companion crops, on-farm trials etc.)	PD Dr. Sabine Gruber, Institute of Crop Sciences (340a), Sabine.Gruber@uni-hohenheim.de	2010 – 2012
Functions of hedges on neighbouring sites	PD Dr. Sabine Gruber, Institute of Crop Sciences (340a), Sabine.Gruber@uni-hohenheim.de	2010 – 2012
Impact of wood chips on yield, earth worm populations, weeds and soil parameters under organic management	PD Dr. Sabine Gruber, Institute of Crop Sciences (340a), Sabine.Gruber@uni-hohenheim.de	2001 – 2016
Influence of soil tillage on yield, weeds, earth worm populations and weeds under organic management	PD Dr. Sabine Gruber, Institute of Crop Sciences (340a), Sabine.Gruber@uni-hohenheim.de	1999 – 2014
Screening of soy genotypes under adverse climatic conditions	Dr. Sabine Zikeli, PD Dr. Sabine Gruber, Prof. Dr. Torsten Müller, Institute of Crop Sciences (340d), Sabine.Zikeli@uni-hohenheim.de	2010 – 2012
Genotype screening of Amaranthus accessions for organic farming	Dr. Sabine Zikeli, Prof. Graeff-Hönninger, Institute of Crop Sciences (340d),	2011 – 2012

	Sabine.Zikeli@uni-hohenheim.de	
Use of sensor technologies for optimising of yield and qualtity of broccoli (*Brassica oleracea convar. botrytis var. italica*)	Christine Veh, Prof. Dr. Simone Graeff-Hönninger, Institute for Crop Sciences (340a), Dr. Sabine Zikeli, Institute for Crop Sciences (340d), Sabine.Zikeli@uni-hohenheim.de	2011-2014
Improvement of open pollinating broccoli varieties for organic farming focusing on agronomic parameters, bioactive substances and sensorial traits	Stefanie Wolf, Prof. Dr. Simone Graeff-Hönninger, Institute of Crop Sciences (340a), Dr. Sabine Zikeli, Institute of Crop Sciences (340d), Sabine.Zikeli@uni-hohenheim.de	2011 – 2014
P-mobilisation in medium and high pH soils	Prof. Dr. Torsten Müller, Dr. Yonathan David Redel Hemberger, Dr. Rudolf Schulz, Institute of Crop Sciences (340i), Torsten.Mueller@uni-hohenheim.de	2009 – 2011
Weed management in onions	Dr. Gebhard Bufler, Institute of Crop Sciences (340g), g.bufler@uni-hohenheim.de	2009 – 2012
Quality of carrots and turnips	Dr. Gebhard Bufler, Institute of Crop Sciences (340g), g.bufler@uni-hohenheim.de	2009 – 2012

Project	**Contact person** **(Name, e-mail-address)**	**Duration**
Suitability of tomato genotypes for for out-door cultivation	Dr. Gebhard Bufler, Institute of Crop Sciences (340g), g.bufler@uni-hohenheim.de	2009 – 2012
Long term trial on S and P	Prof. Dr. Torsten Müller, Dr. Rudolf Schulz,	

fertilisation in organic farming	Institute of Crop Sciences (340i), Torsten.Mueller@uni-hohenheim.de	
Use of compost – long term trial	Prof. Dr. Torsten Müller, Dr. Rudolf Schulz, Institute of Crop Sciences (340i), Torsten.Mueller@uni-hohenheim.de	Since 1997
Control of *Puccinia graminis f. sp. secalis* by resistance breeding for organic farming	Prof. Dr. Thomas Miedaner, Dr. B. Klocke, Dr. K. Flath, Dr. H. Spieß, B. Schmiedchen, Dr. P. Wilde, State Institute of Plant Breeding (720), miedaner@uni-hohenheim.de	2011 – 2014
Developement of genotypes and breeding for Quality in Winter-Emmer (*Triticum diccoccum*) for organic farming in Germany	Dr. Friedrich Longin, State Institute of Plant Breeding (720), flongin@uni-hohenheim.de	2011 – 2014
Extension of soy cultivation in Germany by breeding and agronomic optimisation	Dr. Volker Hahn, State Institute of Plant Breeding (720), Volker.Hahn@uni-hohenheim.de	2011 – 2013

Socioeconomics

Project	**Contact person** **(Name, e-mail-address)**	**Duration**
Risikbased certification in organic farming	Prof. Dr. Stephan Dabbert, M.Sc. Alexander Zorn, Institute for Farm Management (410a), alexander.zorn@uni-hohenheim.de	2010-2012
Spatial distribution of organic farming in Germany	M. Sc. Eva Schmidtner, Institute for Farm Management (410a), Eva.Schmidtner@uni-hohenheim.de	2009 –2012

Analysis and optimisation of pasture systems in dairy farming in Southern Germany	Prof. Dr. Enno Bahrs, Dr. R. Over (LEL), M. Sc. L. Kiefer, Institute for Farm Management (410b), i410b@uni-hohenheim.de	2011-2013
Sustainability of a local organic food production and agricultural training programme – A South African case study.	Prof. Dr. Anne Bellows, Dr. Stefanie Lemke, Gabriel Laeis, Sozialwissenschaften des Agrarbereichs (430b), anne.bellows@uni-hohenheim.de	2011-2012

Animal Sciences

Project	**Contact person** **(Name, e-mail-address)**	**Duration**
Desinfection of semi-natural fish ponds	Prof. Dr. Ludwig Hölzle, Institute of Environmental and Animal Hygiene and Veterinary Medicine (460b), Ludwig.Hoelzle@uni-hohenheim.de	2010 – 2012
Determiantion of prececale coefficients of digestion in local feeds (energy, protein) in organic poultry keeping	apl. Prof. Dr. sc. agr. habil. Michael A. Grashorn, Institute of Animal Husbandry and Animal Breeding (470c) michael.grashorn@uni-hohenheim.de	01.04.2012-30.09.2014
Feed intake of laying hens and broilers in out-door runs	apl. Prof. Dr. sc. agr. habil. Michael A. Grashorn, Institute of Animal Husbandry and Animal Breeding (470c), michael.grashorn@uni-hohenheim.de	01.01.2011-31.12.2012
Optimisation of breeding management and breeding organisation for rare breeds for the e Rinderunion Baden-	Prof. Dr. Anne Valle Zárate, Dr. Pera Herold, Institute of Animal Production in the Tropics and	2009 – 2012

Württemberg e.V. (Braunvieh and Hinterwälder Rind)	Subtropics (480a), Pera.Herold@uni-hohenheim.de	
Lifetime performance of dairy goats on organic and conventional farms in Israel – reasons and economic impacts of short stayability	Prof. Dr. Anne Valle Zárate, Alois Elschner, Prof. Dr. Marcus Mergenthaler, Fachhochschule Südwestfalen/Soest, Dr. Haim Leibovich, Institute of Animal Production in the Tropics and Subtropics (480a), inst480a@uni-hohenheim.de	2011 – 2012

Faculty of Natural Sciences

Project	**Contact person** **(Name, e-mail-address)**	**Duration**
Methodological basics for the release of parasitic wasps to combat the corn weevil in cereal storage units	Prof. Dr. J. Steidle, Institute for Zoology (220c), jsteidle@uni-hohenheim.de Dipl. Biol. Steffi Niedermayer, steffini@uni-hohenheim.de	Since 2003

2. Information on the organic experimental research station Kleinhohenheim

Since 1994 the experimental station "Kleinhohenheim" is based on an organic crop production system according to the principles of biological-dynamic farming. The farm is a member of all three major organic growers associations in Germany: Demeter, Bioland and Naturland. Hence, no chemical fertilizers and pesticides are used. Biological-dynamic preparations are applied to improve crop growth and crop quality. Many field experiments and studies on animal production are carried out on the farm. Additionally, the farm is used for teaching students of the University of Hohenheim and for extension services for farmers of Baden-Württemberg.

1. Location, Climate

The experimental station Kleinhohenheim is situated 3 km north of the campus of the University of Hohenheim, between Degerloch and Schönberg. It is situated at 435 m above sea level. The annual rainfall ranges from 697 mm (1961 - 90) to 1025 mm (2002), temperature varies between 8.8 °C (1961 - 90) and 10.3 °C (2002). Soils are very heterogeneous, ranging from loam to clayey loam. The landscape is hilly.

2. Structure

The farm consists of 60 ha, of which 35.5 ha are arable land and 20.5 ha are grassland. 4 ha are used by farm buildings, roads, paths and wasteland. The arable land is divided into 14 fields with an average size of 3 ha. All fields are in close vicinity to the farm buildings. There are two people employed permanently: the farm manager and his representative. Both of them are fully trained farmers. Throughout the year, two trainees are employed as well as two to three students doing their internship work on the farm.

The farm was converted to organic farming in 1994. Since 1996 all products from the farm are certified as organic by Demeter, Bioland and Naturland. The farm is situated in a nature conservation area. Therefore, all changes in production have to be announced officially.

Formerly, the farm was run with livestock (sheep) since 2011 the farm is run without livestock.

3. Crop rotations

On the farm two rotations exist: A six field rotation including vegetables on a special area and an eight field rotation for arable crops on all remaining fields.

a) Arable rotation:
1. Clover grass
2. Winter wheat
3. Soya
4. Spelt
5. Clover grass
6. Root crop
7. Pea
8. Rye

b) Vegetable rotation:
1. Clover grass
2. Intensive vegetables (e.g. Brassica species)
3. Spring wheat
4. Winter rye, followed by a cover crop
5. Extensive vegetables (e.g. carrots) or potatoes
6. Spring wheat, with clover grass as a catch crop

4. Field trails

The experiments are integrated into the current crop rotation. Measures like basic soil tillage and weed management are conducted by the personnel of the experimental station. Other measures which are related to the specific requirements of the experiments have to be conducted by the researcher, e.g. harvesting with plot harvesters, plant rating, soil sampling etc.

All experiments have to be authorized by the board of the experimental station. For comparative studies between conventional and organic systems in Kleinhohenheim, special approval has to be given by the organic growers associations. Gaining the consent of the growers associations has always gone smoothly and without complications. The same holds true for the application of certain inputs such as seeds which do not originate from organic production.