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Multicriterial assessments and communication of effects of organic food systems, 25-26 November

International Symposium on Organic Agriculture in the Mediterranean region and products with designation of origin, December 2-4, 2013

Well attended NJF seminar on Organic Farming Systems as a Driver for Change

Your input to ICROFS news

We listen to our readers' response with pleasure, as we are here for you!

Therefore, any response are more than welcome, be it about the format, suggestions to improvements, changes, content or anything you can think of.

Contact us at: LindaS.Sorensen@icrofs.org

Well attended NJF seminar on Organic Farming Systems as a Driver for Change

By Camilla Mathiesen, ICROFS

120 researchers from more than 20 countries attended the NJF seminar Organic Farming Systems as a Driver for Change held in Vingsted, Denmark on 21-23 August. The program boasted more than 75 presentations covering the 4 main topics: Societal and economic viability, transition to renewable resources, nutrient sufficiency and management and productivity and sustainable production levels in animal and crop production.

The afternoon of the second day was devoted to field trips to different organic farms nearby. Here the owners presented their farms and the systems and challenges to their specific type of organic

production. This brought lively discussion and a lot of questions. The last day of the seminar included yet more oral presentations under the headlines: Supporting development of robust and holistic farming systems, Shaping resource efficient management strategies for green manure crops, Changes towards improved productivity and animal welfare and finally: New methods and designs for organic vegetable production.

The seminar ended with a plenary discussion of the challenges, conclusions and future research needs. The seminar was co-arranged by NJF, EPOK and ICROFS. To get an overview of all presentations from the seminar, the proceedings can be downloaded [here](#). Read more about NJF in the article included in this newsletter.



NjF participants on a field trip to one of the organic farms



Agriculture can save 1.1 million tonnes CO₂ per year.

A report from DCA, Aarhus University lists a number of measures that may be used by farmers to reduce greenhouse gas emissions and increase soil carbon storage.

The report describes and assesses the effects of the measures that agriculture may employ to reduce greenhouse gas emissions.

The list of available options concentrates, in particular, on methane and nitrous oxide emissions and also on changes in soil carbon contents. Some of the measures can also provide biomass for the energy sector. These effects are also included in the report.

Further information: Professor Jørgen E. Olesen, Department of Agroecology, e-mail: JorgenE.Olesen@agrsci.dk.

Organic Eprints – new: Screenshot manual, Agrovoc keywords, Spanish features

By Ilse A. Ramsussen, ICROFS

Organic Eprints now contains close to 14000 publications. Most of them are from Europe, but there are registered users from the whole world – 25000 of them! This means, that when you search publications about organic farming and food systems, you get a lot of relevant hits. And when you use Organic Eprints for depositing your own publications, they are seen by a lot of people. Actually, many users find papers in Organic Eprints through Google – try searching for papers on research in organic agriculture within your own field on Google, and see, how many hits are actually in Organic Eprints.

A new screenshot manual can be found [here](#). It describes how to

Organic eprints

me about browse search **latest**

use the system – both well-known functionalities and new, after Organic Eprints has been through some changes. In collaboration with IFOAM and others, we have had this manual translated to Spanish, you can find the Spanish version [here](#). Even if you feel you know Organic Eprints well, it might be an idea to look through the manual – you might get information that you can use, or hints of how to utilize Organic Eprints more and better.

You can also use Organic Eprints to keep an eye on new publications – either by using "Latest" in the top menu (see screenshot

above) to view the papers that were entered into the archive within the last week, or by making a specific search within your own field, and have updates sent regularly. You can find instructions on how to do this in the screenshot manual.

Agrovoc keywords

We have incorporated the possibility to use Agrovoc keywords when uploading a document in Organic Eprints. In addition to freely chosen keywords, which is still possible, you can start to type a word in the agrovoc field, and after 3-4 letters, the system will suggest relevant agrovoc terms (see screenshot). This can make the keywords used more uniform, so that when searching, you do not have to think of all the possible keywords someone

Agrovoc keywords

Language	Value	URI
1. English	agroe	x
2. false	Agroecosystems	
3.	agroecology	

agroecology at AGROVOC Thesaurus
http://aims.fao.org/aos/agrovoc/c_92381

Property	Value
altLabel	<ul style="list-style-type: none"> Agroökologie (de)
broader	<ul style="list-style-type: none"> <http://aims.fao.org/aos/agrovoc/c_2467>
closeMatch	<ul style="list-style-type: none"> <http://dbpedia.org/resource/Agroecology>
created	<ul style="list-style-type: none"> 2007-11-21T00:00:00Z (dateTime)
exactMatch	<ul style="list-style-type: none"> <http://lod.nal.usda.gov/nalt/5505>
hasStatus	<ul style="list-style-type: none"> Published (string)
hasTheme	<ul style="list-style-type: none"> <http://aims.fao.org/aos/agrovoc/c_36669>
modified	<ul style="list-style-type: none"> 2013-01-15T18:29:35Z (dateTime)
prefLabel	<ul style="list-style-type: none"> Agrarökologie (de) agroecology (en) agroecologia (es) agroekologie (cs) agroécologie (fr) ecologia agraria (it) агроэкология (ru) 재배생태학 (ko)

might have used for a relevant subject, e.g. instead of searching for "Agroecology", "Agro-ecology" and "Agroecologic", you can limit your search to the agrovoc term "agroecology". In addition, the agrovoc terms are translated to a number of different languages. At present, you can choose agrovoc terms in English, German and Spanish, but eventually, we will add more languages. For one thing, this means that by following the link (not active at present) for the keyword, you will find the translation of that term into up to 20 languages.

Productivity and Growth in Organic Value-chains (ProGrOV)



3rd Project Training Workshop and Project Meeting 8-15 September 2013



Stakeholders and ProgrOV team

Research results and activities from the ProGrOV project

In this issue - and in forthcoming issues - *ICROFS news* will bring a number of articles with activities and results from the ProGrOV project presented by the MSc students from Uganda, Kenya, Tanzania and Denmark.

The ProGrOV project is about improving productivity and growth in existing organic value-chains in Uganda, Kenya and Tanzania by way of developing agro-ecological methods governance and management of chains, and by capacity development regarding research focussed on organic and interdisciplinary approaches.



Productivity and Growth in Organic Value Chains (ProGrOV)

- 3rd Project Training Workshop and Project Meeting 8-15 September 2013



By Esther Waweru, Assistant International coordinator, ICROFS

'Development is a conversation!' This is one of the illuminating quotes given during a presentation on 'rural development from a practitioner's point of view' to challenge the ProGrOV team at the 3rd Project Training Workshop and Project Meeting.

The presenter's notion was that to achieve successful development, participation and communication between all key actors is pertinent.

The ProGrOV project aims through research at supporting the development of organic value chains and will eventually contribute to the strengthening of communities, and stimulate rural development in a sustainable way. The concepts of rural development and communication are thus important for ProGrOV to consider and understand. It can, however, be a challenge for researchers to see their work in a larger perspective and to see how it can contribute

to rural development. How does research in integrated livestock management contribute to rural development? How can the results of an analysis of the governance of organic value chain or knowledge on improved methods to manage mealy bugs in pineapple be linked to improving the livelihood of smallholder farmers? Therefore, the main focus of the training that took place at the recent ProGrOV workshop was 'rural development and dissemination.

Linking agricultural research with rural development

ProGrOV had called upon three experts to provide food for thoughts. Rural development was explained and discussed from the theoretical point of view as well as from the points of view of extension and rural development practitioners. Some of the key messages that were put across by the three presenters were:

Household well-being versus farm economics:

Traditional agricultural economics is typically concerned with measures such as yields per hectare or prices per kg of a produce in order to get a measure for farm income. However, a farmers decision-making in order to improve the situation for the family depends on a range of other values which may related to security of the household, risk minimization, access to various resources, status in society, cultural values, etc. Therefore, farm income is not the primary measure for rural development.

Communication between researchers and stakeholders:

Research has an important role to play in the development of organic and other sustainable agricultural production. However, scientist need to engage in a two-way communication with the farmers and other stakeholders instead of taking a top-down/one way communication approach – sometimes referred to as 'ivory towerism' – for the dual purpose of ensuring that the research addresses the felt needs within the rural setting as well as to get mes-



Paul Mbole NCA Kenya. 'Rural development from a practitioners point of view'.

About ProGrOV

ProGrOV is a research, development and capacity strengthening project funded by the Danish Ministry of Foreign Affairs. This 5-year project commenced in 2011 and takes place in Uganda, Kenya and Tanzania. This year the annual project training workshop and project meeting was held in Nairobi, Kenya at the Oak Place Hotel. The main items on the agenda included

- Training for students and monitoring the progress of the studies
- Stakeholders workshop - feedback and interaction with different organisations and stakeholders from the organic sector,
- Field trip - visit to organic farmers.



Farm manager from Kalimoni Farm explains on how he controls pests in the farm

Kalimoni Greens Shoppe in the shopping area



sages across and understood by stakeholders.

Participation of stakeholders: a participatory approach where stakeholders are engaged in developing, testing or giving feed-back to research is necessary not only to target the rights problems, but also to make sure that the solutions that are being developed are applicable and feasible for the farmers to use. A participatory approach will furthermore help researchers in packaging the message in a way that is mainstream and easily understood by practitioners.

Thoughts from Kenya's stakeholders within the organic sector

The ProGrOV research projects in Kenya address domestic high value organic chains and several of the MSc studies in ProGrOV are related to the market and consumer preferences. Therefore, the project had invited different stakeholders from the domestic chains to a workshop to give feed-back and inputs specifically to the Kenyan

research projects, as well as to the project in general. The objectives of the workshop were:

- to create strategy and foundation for dissemination of the study findings of the ProGrOV project and
- to stimulate feedback that will identify gaps in organic value chains that will inform further research

The forum brought together different actors related to the organic value chains. The floor was opened by the representative from the Danish embassy who put the workshop into perspective linking the development of value chains with development. Thereafter both stakeholders and students had a chance to present their work and it was evident that most of their work was complementary, although it was also noted from the stakeholders' presentations that there were many research gaps related to issues such as health benefits of organic produce, chain development, and the organic production systems. The presentations by stakehol-

ders included Green Health Innovations (GHI) an NGO involved with addressing the lack of awareness and knowledge gap felt by consumers on value of organic produce and providing the group with views on nutrition and health as part of value addition to organic value chains; a small business enterprise providing organic inputs shared knowledge on Kenyan soil its conservation and amendments; the head of Organic Foods, a supplier to the supermarket chain Nakumatt, shared information and experience in matching supply and demand of organic products; and finally a representative from the Ministry of Agriculture informed on the progress regarding the policy on organic agriculture.

Fieldtrip: Organic production in Kiambu

To get a real life perspective of the organic production for local high value markets and to get a first-hand impression on the challenges that farmer are facing in accessing the market the ProGrOV visited orga-

nic producers in Kiambu County in the outskirts of Nairobi. Stops were made at two production sites:

Kalimoni Farm and Kalimoni Organic Shop

The enthusiastic farm manager Mr. Mwangi took the group on a guided tour explaining how the farm is run and showing the diverse cropping system with a variety of crops as well as animals. Of interest was also the recycling of organic waste for compost making collected from their customers. Upon questions on how he tackled pests, the manager demonstrated the different intercropping methods and mulching used for pest control. However, he did mention that certain pests were still a challenge. Following that was a visit to the Kalimoni Organic Shop



A farmer from the Muhuri Road Organic Group showing his crops on the farm



Group discussions with stakeholders

located in the nearby shopping area. In addition to the shop, Kalimoni also sell their produce through a basket scheme, as well as they organise organic farmers markets together with other farmers.

Muhuri Road Organic Group - an organic farmers group
The group comprised of men and women as well as young and old farmers. The Muhuri Road Organic group was formed in 2010 initially getting support

from the NGO RODI Kenya. The group became interested in organic farming and they approached the ProGrOV partner Kenya Organic Agriculture Network (KOAN) for training in organic agriculture practices, certification and marketing. The group started off with 25 members but it currently has 16 members. The members expressed that knowledge/information on issues such as pest control, soil amendments etc. is a main challenge. For their produce,

the members usually market their products through organic farmers markets and organic outlets in Nairobi. However with surplus produce their products are also sold in the conventional markets.

‘Development is a conversation’ was the message given on the first day of the workshop, i.e. communication and interactions with stakeholders in the organic value chain are essential for making research contribute

to development. This was experienced at first hand through the stakeholder workshop and visits to the farmers’ fields. The group experienced that sharing knowledge with stakeholders in the various steps of the value chain was inspiring and helped ensuring that the work of the students was on the right track.



ProgrOV team 2013

More information

The gathering included 37 project participants – students and their supervisors from Sokoine University of Agriculture in Tanzania, Makerere University in Uganda, University of Nairobi in Kenya; supervisors from Aarhus University and University of Copenhagen, the Organic Movements from Tanzania, Uganda and Kenya; and the coordinators from ICROFS. The annual workshop and project meeting is an essential event for all the participants as this is where all the participants meet and share their work, findings and challenges and review progress.



Read more about ProGrOV: <http://www.icrofs.org/Pages/Research/progrOV.html>

Hay production in North Europa

By Troels Kristensen & Karen Søgaard, Department of Agroecology, Aarhus University



Hay feeding might have some advantaged in relation to herd health and reduces the risk for contamination of the milk with spores. Hay production compared to silage is more resource intensive – like use of energy for drying.

Hay from two types of herb enriched grass swards and the traditional grassland showed no difference in intake or milk production when compared at three organic farms. Feed efficiency tended to be lower than standards based on silage feeding.



Hay feeding compared to silage can reduce the risk for contamination of the milk with spores, which is a risk for malformation in cheese production. Hay is also associated with a higher animal welfare. Hay might on the other hand compared to silage reduce the digestible energy intake due to a lower digestibility if cutting frequency is reduced. Feed ration high in hay, compared to maize, will therefore increase the proportion of grassland in the crop production related to dairy farming and might, compared to use of grassland for silage, affect the milk quality positive when used for cheese. A disadvantage for hay compared to silage is the longer period needed for wilting before ready for cutting. At North European climatic condition large scale hay production is only realistic in combination with indoor drying, which add additional cost, and, from an environmental point of view, also emission

of GHG from energy used in the drying process.

This paper gives data about production of hay and feeding, while the overall objective of the experiment was to study the effect of different type of hay on cheese quality and the impact on GHG emission from production of cheese in a life cycle approach at the consumer disk.

Hay production

At three organic dairy farms, two fields with herb enriched grass sward, together with the traditional grassland at the farm, was used for hay production.

Data for hay production (table 1 and 2) at each farm is from the total area and amount of hay made during 2012, as the aim was to collect data of large scale production. The three farms are

working together using the same equipment in the field. Therefore, data in table 1 is an average for the three farms and three cuts at each farm. In average there were 73 hours from mowing to collecting and during this period the herbage was inverted 3.5 times before raking immediately before cutting. During this period the dry matter content increased from 21 to 65% and

Operation	Hour	Time per ha, min	Times per operation	Machinery	Diesel, l/ha	% DM	DM, kg per ha
Mowing	0	9	1	Tractor 200 HP - 9 m cut	3,3	21	3268
Inverting	3	9	3,5	tractor 130 HP - 10.5 m 13 km/hour	2,3		
Raking	70	12	1	Tractor 130 HP - 12-5 m 8 km/hour	11,7		
Cutting	73	16	1	Tractor 200 HP - 500 m to barn	25,4	65	
Total fiels		68					
Loading box		18	1				
To storage		12	1			90	2418
Total barn		30					

Table 1. Haymaking timescedule and energy use per cut – average of three farms and three cuts during the summer



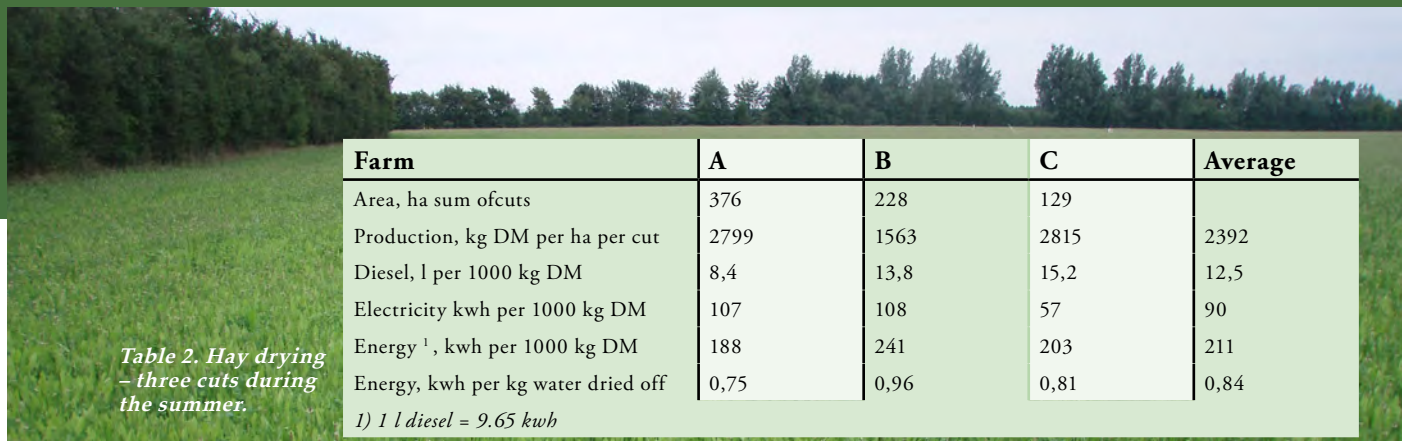


Table 2. Hay drying – three cuts during the summer.

Farm	A	B	C	Average
Area, ha sum of cuts	376	228	129	
Production, kg DM per ha per cut	2799	1563	2815	2392
Diesel, l per 1000 kg DM	8,4	13,8	15,2	12,5
Electricity kwh per 1000 kg DM	107	108	57	90
Energy ¹ , kwh per 1000 kg DM	188	241	203	211
Energy, kwh per kg water dried off	0,75	0,96	0,81	0,84

1) 1 l diesel = 9.65 kwh

there was an estimated loss of dry matter of 26 %.

Table 1

At each farm the hay was dried in a box system to about 90% drymatter. The use of energy for drying was diesel used to the generator to run the combined dehumidifier and heater, while electricity was used to run the blower. In order to reduce the need for use of

diesel the storage building was with double roof. The air in between the two roofs was heated by the sun shine and used for drying. The use of energy was therefore affected by hours with sunshine, air temperature and moisture, besides to dry matter content of the roughage.

Feeding

In November-December,

three weeks after end of the grazing season, hay were fed ad libitum to all lactating cows (for two weeks each per type of hay) starting with different types of hay on each farm.

Intake of hay, of all types, was high with up to 75% of total dry matter intake at both farm A and C representing two cattle breeds, Holstein Frisian and Jersey.

There was no effect of proportion of herbs on intake of hay or milk yield and composition.

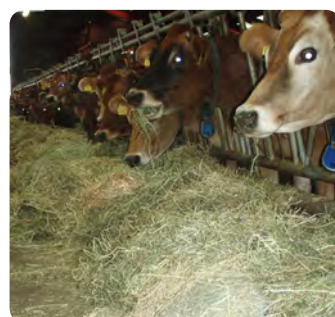
Compared to standard, feed efficiency was low, especially in herd A and B with around 1 kg ECM per kg DMI, while the efficiency was higher 1.25 kg ECM per kg DMI in herd C.

More information

Read more about the Organic RDD project EcoServe at: http://www.icrofs.org/Pages/Research/organic-rdd_ecoserve.html



Organic RDD is financed by the Ministry of Food, Agriculture and Fisheries and coordinated by ICROFS.



Farm	A			B			C		
Breed	Holstein Frisian			Holstein Frisian			Jersey		
Type of hay	Normal	Low	High	Normal	Low	High	Normal	Low	High
- herbs, % of DM ¹		20	29		23	37		15	16
Feeding, kg DM									
- hay (ad libitum)	18,3	18,5	18,3	12,8	13,6	13,2	15,6	14,5	14,3
- cereals	4,9	4,9	4,8	4,6	4,6	4,6			
- concentrates	0,7	0,7	0,7	2,2	2,2	2,3	5,1	4,8	5,0
- straw				0,1	0,1	0,2			
- refusal	1,0	1,1	0,8	0,4	0,3	0,1	0,7	0,8	0,3
19,0Intale, kg DM	22,8	23,0	23,0	19,3	20,2	20,2	20,2	20,0	18,5
- NEL, MJ	162	150	161	141	143	143	143	132	134
Production									
- Milk, kg	21,4	21,1	21,8	18,9	19,0	17,8	16,4	15,5	15,7
- Fat, %	3,97	3,94	3,99	4,01	4,05	4,03	6,48	6,52	6,39
- Protein, %	3,44	3,38	3,38	3,46	3,45	3,51	4,30	4,30	4,22
- Energy corrected milk, kg	21,4	21,1	21,7	18,0	19,2	18,1	22,5	21,3	21,3

1) Botanical composition at harvest

Table 3. Daily feeding of hay and other feedstuffs, intake and production of milk.



Improving the phosphorus efficiency of organic farming systems

By Kurt Möller, Institute of Crop Science, Fertilisation and Soil Matter Dynamics, Universität Hohenheim, Germany

Organic farming systems rely on the efficient use and recycling of resources. Currently, nutrients like phosphorus (P) are used only once to produce food and subsequently, lost due to poor recycling. Current regulations concerning the use of alternative P fertilizers are strict, restricting e.g. the use of municipal organic wastes and hampering e.g. the use of sewage sludge due to concerns about heavy metals and other pollutants.

However, there is an urgent need to improve the recycling of P from urban areas back to cropland, as the worldwide P reserves are very limited. Furthermore, improvement of agronomic P efficiency due to the choice of P efficient cultivars and agronomic methods (e.g. P mobilization by cover cropping, application of microorganisms suited to enhance plant P uptake) is the second pillar of improved P efficiency.

Over the past decades, mainstream phosphorus (P) management in organic farming has focused on the use of already available soil P, on an efficient recycling of farmyard organic wastes and the use of rock phosphates and other mined P fertilizers to balance P losses via sold products. Often, P balances calculated for organic farming (OF) indicate that more P is removed with the products than applied as fertilizer. Consequently, this leads to decreasing amounts of plant available soil P. Moreover, P deficiencies may also feed-back through the system limiting other processes which indirectly impact on yield like symbiotic nitrogen (N₂) fixation.

Necessary to recycle P

Mineable high-quality P deposits are limited making it necessary to recycle P from waste streams as well as to increase the P-fertilizer efficiency in agriculture. Strategies to address the problem

of negative P balances in OF systems include:

- a) Enhanced use of permitted mineral P fertilizers (e.g. mined rock phosphates) or by-products of the steel industry.
- b) Increased use of recycled P fertilizers as alternative P fertilizers by
 - (i) improved recycling of organic wastes from con-

sumer/urban areas back to the farm, and
(ii) increased use of fertilizers derived from residues of the food processing industry.

The largest potential for P recycling

Sewage sludge-P recovery currently represents the largest potential for P recycling, followed by P in food industry residues. In the past few years

many different techniques to clean sewage were tested and implemented (e.g. incineration, slag production, crystallization). There is little data available on the characteristics of alternative P fertilizers in terms of chemical bonding of P and plant P bioavailability. There is a need to study the characteristics of alternative P fertilizers to determine their potential for use in OF systems, also in comparison to already allowed recycling P fertilizers, without compromising food quality, the environment and long-term soil fertility. The challenge in OF is to reduce the risk of pollution while utilizing as many P fertilizers as possible.

How to improve P-uptake

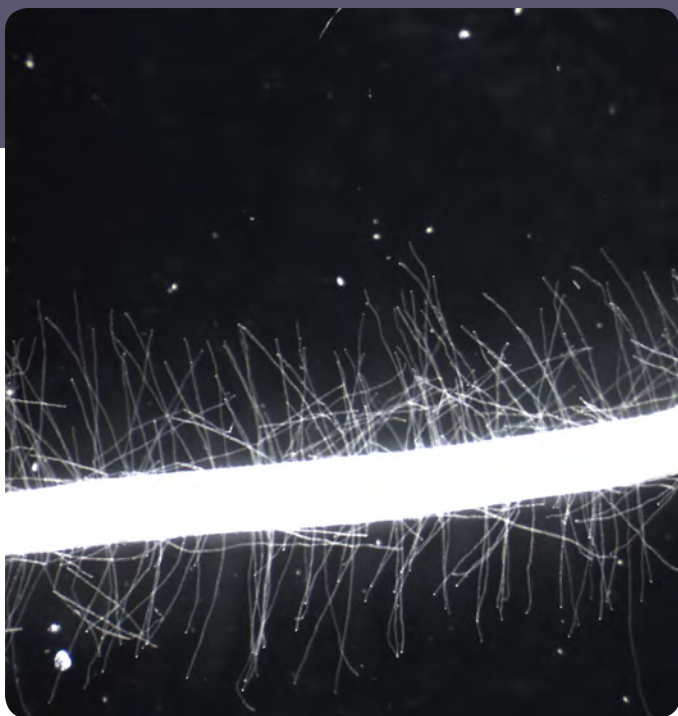
The agronomic P efficiency can be improved through manipulation of biotic factors which improve P uptake. For example, there is strong evidence that different crop species have a different capability to mobilize and take up P, as plant species differ considerably in the exuda-



MAP-Phosphorus fertilizer (struvite) recovered from sewage sludge



Pot experiments on P availability of P fertilizers



Fine roots of wheat cultivars



Root system of different wheat cultivars

tion of organic acids such as citrate, malate and oxalate, which solubilize P in soil and fertilizers. Furthermore, differences in root architecture, such as root length, branching type, root hair length etc. can also influence crop P uptake efficiency.

Further possible measures to enhance P availability are green manuring with cover crops and the application of specialized Plant Growth Promoting Rhizobacteria (PGPRs) which are able to mobilize

immobile soil and fertilizer P. Inoculation of crop plants with certain strains of PGPRs may improve biomass production through direct effects on root growth (and indirect effects as mycorrhizal helper bacteria) and may result in multiple effects on plant growth such as an improved P uptake.

Strategies for increased recycling of P

The overall aim of the IMPROVE-P project is to develop

and evaluate sustainable strategies for increased recycling of P and other nutrients, combined with the development of measures to enhance plant P availability due to agronomic innovations (cover cropping, P efficient cultivars). Moreover, the challenge of soil P mobilization will be addressed by application of PGPRs. Furthermore, environmental burdens related to APF production and appropriate management of the risk of soil and plant pollution

is a major challenge when introducing alternative P fertilizers, and the development of appropriate assessment tools to define high quality P fertilizers will therefore be a major target.



The improve-p research consortium

More information

Read more about the CORE Organic project ImproveP at: <http://http://www.coreorganic2.org/>



CORE Organic II is a European transnational research cooperation project supported by the European Commission and coordinated by ICROFS.

Species competition in multispecies grass swards



By Karen Søgaard, Jørgen Eriksen and Tine B. Mortensen, Department of Agroecology, Aarhus University

There is growing interest in establishing highly biodiverse grasslands that are also capable of maintaining high yields. In order to design successful multispecies mixtures it is necessary to know the competitiveness of individual species and how different management regimes affect this. Some species can survive in highly productive pastures, while others need nursing in special mixtures if they are to make a significant contribution to the forage.

This is investigated in the ECOSERVE project and has also been studied in the earlier ORGGRASS project.

When several plant species share the same area there is fierce competition for resources. Above ground the competition is for light and in the soil the battle is over water and nutrients. Grass is a monocot with a fibrous root system that gives better soil infiltration than the tap root of, for example, clover. Grass also has longer and more abundant root hairs. Herbs are dicots like clover and are also tap-rooted. Some species are plentiful in the sward – they are called dominant species – while others do less well. All our traditional grassland species are dominant species, although their dominance

depends on growth conditions. The herbs chicory, ribwort plantain and caraway are also dominant. The reason that we do not usually find them to be so is because they are seeded in only small amounts and are not able to spread. We can influence the competitive relationship between species through our management systems. This we know from, for example, red clover, which can dominate strongly in fields cut for silage, but has problems surviving in grazed fields.

The dominant herbs

Ribwort plantain has a leaf rosette and should therefore

find it more difficult to compete for light. Although the leaves become more upright in a system with silage cuts, they tend to stay close to the ground. This is probably also the reason why the proportion of plantain decreased from 17% in the first year of use to 5% in the fourth year in the ORGGRASS experiment. Plantain flowers stick their heads up above the grass canopy but have little photosynthetic activity. Chicory also has a leaf rosette, but its taller stem with leaves means it is better able to catch the sunlight. This was reflected in the proportion of chicory in the experiments, which

remained constant at approx. 10% of dry matter in the four years of the experiment.

In experiments on competition between plants, one of the findings is usually that if a species initially spends its resources on establishing a large root system, it does not compete so well later on against the dominant species. This is a lesson that caraway obviously did not learn. Caraway starts off with small leaves but they grow larger with time so that in the third and fourth year it has made up as much as 25% of the dry matter in the spring cut. We also found



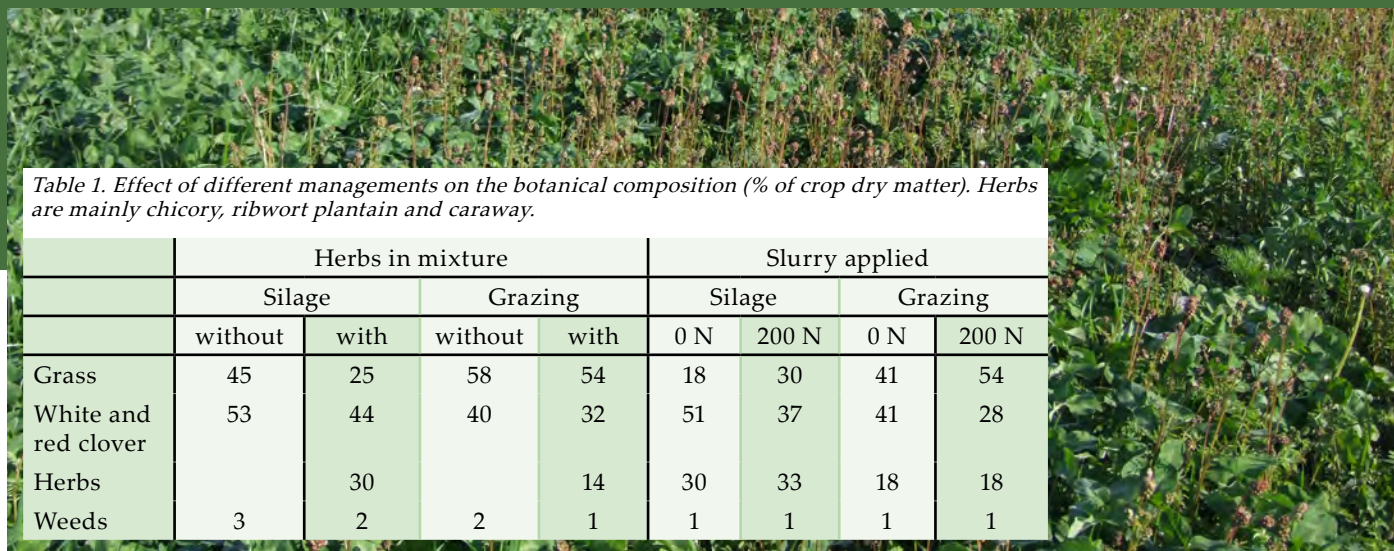


Table 1. Effect of different managements on the botanical composition (% of crop dry matter). Herbs are mainly chicory, ribwort plantain and caraway.

	Herbs in mixture				Slurry applied			
	Silage		Grazing		Silage		Grazing	
	without	with	without	with	0 N	200 N	0 N	200 N
Grass	45	25	58	54	18	30	41	54
White and red clover	53	44	40	32	51	37	41	28
Herbs		30		14	30	33	18	18
Weeds	3	2	2	1	1	1	1	1

caraway to have a very large root mass, which suggests that it uses the first year to consolidate itself before growing really strong. Caraway is described as a facultative biennial. It adapts to the conditions – perhaps because it is harvested regularly – and therefore continues to grow. How well it would do beyond four years we do not know.

Who are the competitors to herbs?

This depends entirely on whether the field is used for silage cuts or for grazing! When used for silage cuts, the crop may grow quite tall and competition for light will be strong. Here grass is often outcompeted by the herbs. A large percentage of herbs in the experiment of 30% of dry matter reduced the grass content from 45 to 25% of DM, whereas white and red clover only fell from 53 to 44% (Table 1). Grazing with heifers in a large paddock gave a different result. Here the grass content only decreased by 4

percentage points (Table 1). As the competition for light is less intense with grazing, this would indicate that the herbs compete particularly with grass for light. The herbs do not cope quite so well with frequent browsing by cattle, and with grazing the herb content was only half as large as with cutting (Table 1).

Slurry injection

In an ordinary grass-clover field, the clover content will decrease when fertilised with nitrogen. This is mainly due to the different rooting systems. It is simply easier for the grass to absorb the nitrogen. When we fertilised with 200 kg N in cattle manure this resulted, as expected, in significantly more grass and less clover. But the herbs were actually unaffected (Table 1), and the effect was the same for the cutting and grazing regimes. The proportion of grass increased by 12-13 and clover fell by 13-14 percentage points. This would suggest that slurry affected particularly the

competition below ground, and that herbs cannot be compared with clover. They fall somewhere in between grass and clover, although their rooting system mostly resembles that of clover.

The weak competitors

Salad burnet, dandelion, yarrow and birdsfoot trefoil are weak species that can handle being cut several times a year, but find it difficult to compete with the dominant grassland species. There may be different reasons for wanting a larger share of these species: they increase appetite, contain various beneficial components, or there may be other reasons such as dandelion being good for pollinators in the spring when there are few other food sources around. A method of promoting such species is to establish them in small areas in the field where the competitive pressure from the dominant species can be restricted. As model plants, we use, respectively, burnet and dandelion together with a nitrogen-supplying

legume. Red clover and lucern are seeded in very small amounts of 0.5 and 1.5 kg/ha in order to depress competition. The yield in the first year of use was highest in mixtures with red clover where it dominated plots (Table 2) – despite the low seed rate. In combination with lucern the herbs did better, but they also let in more weeds than with red clover. In combination with birdsfoot trefoil there was heavy weed pressure, especially late in the season.

Our experiments have given us better insight into the growth and competitiveness of the species which will ultimately be used to purpose-design multispecies swards.

Table 2. Mixtures with a less competitive herb plus a legume. Seed rate of red clover was 0.5 kg/ha, 1.5 kg for lucern and 12.5 kg for birdsfoot trefoil. Total seed rate was 25 kg/ha. DM: dry matter.

Herb	Burnet			Dandelion		
	Birdsfoot	Lucern	Red	Birdsfoot	Lucern	Red
Annual yield (hkg DM/ha)	83	94	105	79	85	114
Herb (% of DM)	22	25	21	29	23	13
Legume (% of DM)	55	53	70	54	65	83
Weeds (% of DM)	23	12	9	17	12	3

More information

Read more about the Organic RDD project EcoServe at: http://www.icrofs.org/Pages/Research/organic-rdd_ecoserve.html



Organic RDD is financed by the Ministry of Food, Agriculture and Fisheries and coordinated by ICROFS.

Organic farming systems: Driving for change, or digging in the same old dirt?



By Anne-Kristin Løes, Bioforsk Organic Food and Farming, chair of the seminar committee.

A recent seminar arranged by the Nordic Association of Agricultural Scientists (NJF) in Denmark discussed this question over three days. 47 oral presentations, 33 actively discussed posters and visits to productive and inspiring organic farms made the conclusion easy: Research contributes to innovation, and farmers believe in an organic future.



All posters were presented by the first author and discussed in poster workshops. This innovative way of working was much appreciated by the seminar participants.

The seminar was organised on four tracks, called Societal and economic viability; Transition to renewable resources; Nutrient sufficiency and management in farming systems; and Productivity and sustainable production levels in animal and crop production systems. Within each track, an invited expert contributed in all sessions to keep the overview, bring up central topics in the discussions, and summarize the tracks in the final plenary session.

Twin perspectives of research in organic farming systems

Niels Halberg, director of ICROFS, led the final plenary discussion, and presented

the twin perspectives of research in organic farming systems. Researchers may either

- Develop organic agriculture as a laboratory for general agriculture, or
- Develop organic agriculture solving inherent challenges, and in relation to the four basic principles of health, ecology, fairness and care (IFOAM).

As an example of the first perspective, Halberg mentioned the success of significantly decreasing the use of antibiotics in organic dairy cows in Denmark, to a level being only 10 % of the conventional use.

Perma-culture inspired organic egg production, where laying hens are combined

with orchards, or coppiced willow as energy crop, is an example of the second perspective. Both enterprises benefit from the other, since the trees or willows utilize the manure and weeding capacity of the animals, who enjoy shading and protection from the vegetation.

Halberg then asked whether the seminar had proved that organic farming systems are in fact a driver for change.

The role of research

The four invited experts summarized some of the most inspiring and relevant results from the tracks and sessions that they followed. Important "take home"-messages were derived, and

are shown from each track (text boxes).

Susanne Padel from the Organic Research Center in UK pointed out that research has a different role for different actors, although the boundaries are fuzzy. Farmers and advisors need demonstrations and knowledge generation, whereas policy makers need an evidence base.

Susanne left open the question what is the role of research for researchers. She further pointed out a very important question to the researchers: Have we kept up with the extremely rapid development of agricultural structure, or are we too much bound by romantic images of small-scale far-

Excursions to organic Danish farms completed the indoor scientific program.



ming? Specialization is now a reality and farmers need to respond to dynamically evolving markets if they want to stay in business.

Susanne proposed to emphasize research into evidence of positive long-term effects of organic farming such as soil carbon stock and biodiversity. Farmers need good arguments to

understand how they can invest in sustainability.

Promising approaches among the contributions

Tommy Dalgaard from Aarhus University, Denmark found many promising approaches among the contributions. He suggested more research into the effect of (bio)diverse systems, e.g. with respect to resilience towards climatic changes, and how to cover the temporal variations in energy and resource needs when renewable resources and energy get more common. Methods should be developed to assess trade-offs between services (e.g. producing energy) and multifunctionality.

The balance between cropping and stock densities

Elizabeth Stockdale from Newcastle University, UK challenged us to consider whether true "stockless" organic farming in the long-term was possible or even desirable. Many of the presentations in the track had linked cropping and



The track experts during the final plenary discussion, from left Tommy Dalgaard, Susanne Padel, Elizabeth Stockdale and Paolo Barberi.

livestock systems through manure; more innovations are needed to optimize the balance between cropping and stock densities often at regional, rather than farm scales.

Management of nutrients cannot be considered alone, and raises issues covered in the other Tracks such as dinitrous oxide emissions, soil physical conditions and consequences for plant nutrient uptake, and links between nutrient management strategies and selection of specific crops/varieties. Issues such as the proportion of home produced versus purchased feed, demand for protein feed and costs for fertilizers have recently become concerns for conventional farming too, and

organic farms and farmers have been frontrunners in inventing solutions such as integration of legumes in carefully designed crop rotations.

However, organic farming may need to innovate further and find appropriate ways to sustainably integrate the use of human wastes into farming systems to fully integrate the nutrient cycle.

Trends that threaten the diversity of organic farming

Important advice was given by Paolo Barberi, who suggested that future studies should compare environmental performances of organic farming systems over



NJF president Svein Skøien participated in the seminar, and gave a speech during the seminar dinner.

Track 1, Societal and economic viability - "take home" messages

- Overall, organic farming represents a good opportunity to maintain a living for small-scale farmers in developing countries.
- Organic farming contributes to empowerment of small scale producers
- The whole value chain can also drive growth. Eating is part of agriculture
- Organisations supporting organic farming are very important
- Promising new management practises are being developed, e.g. combining trees and livestock
- Interesting new tools to work with farmers are developed, such as a picture tool to discuss weed management
- The various customers, from consumers to retailers, research funders and policy-makers, all want value(s) for money. Values can be externalities, documentation is required!

Track 2, Transition to renewable resources - "take home" messages

- Organic regulations may in fact foster innovations, because creativity is used to cope with the restrictions. This may support development of more resource-efficient organic farming systems.
- Linking livestock to crop production, and recycling nutrients back to agriculture, is crucial. Biogas may be a useful measure!
- Present organic farming systems demonstrate high variation: From very good, to very bad resource efficiency and sustainability impact
- Organic farming systems foster whole system-thinking, and aims at reducing the input of non-renewable resources

Track 3, Nutrient sufficiency and management in farming systems - "take home" messages

- Are stockless organic production systems really possible, or even desirable?
- For all innovations proposed for better nutrient management, the authors should consider whether they are economically viable, practically possible within a farming system, and whether the framework and regulations are supportive (for instance, with respect to sewage sludge).

Track 4, Productivity and sustainable production levels in animal and crop production systems - "take home" messages

- Track 4, Productivity and sustainable production levels in animal and crop production systems - "take home" messages
- We still need a lot of basic bio/ecological knowledge! Focus should be on interactions between taxa for instance clover fatigue, where nematodes, fungi, plants and bacteria are all involved
- Future research should be allowed to be visionary!
- There is still a significant need to communicate the importance of long-term experiments, interdisciplinarity and system approaches to funding bodies and other stakeholders
- Long-term experiments should be designed flexible enough to allow for short-term testing of technical innovations
- National research evaluations should be de-centralized, looking for innovations, not only publishing activities.

time, instead of comparing conventional and organic systems.

Barberi was worried by several trends that threaten the diversity of organic farming, such as reduced diversity of habitats, species and varieties in specialized vegetable production, and increased use of concentrates and silage, reduced grazing, synchronization of calving season and suboptimal working/living environment for workers and animals in specialized dairy farming.

On the positive side, it was reported during the seminar that milk yields can be high even with "only" 30 % concentrates in the fodder ration, and new fodder sources as well as breeding approaches emphasizing diversity are under way.

The seminar participants were generally very satisfied, and mentioned especially inspiring farm visits and engaged discussions during poster workshops as very good elements of the

seminar. All posters had a short oral presentation during sessions organized along the four tracks.

Another organic NJF seminar in 4 years was unanimously welcomed, and the

Finnish institute of organic farming offered to host the next seminar.



The hard-working seminar committee comprised (from the left): Kirsi Partanen, Eva Salomon, Sirli Pehme, Kajsa Ullvén, Maria Wiøstad, Vibeke Langer, Peter Sørensen, Margrethe Askegaard, Ilse Rasmussen and Anne-Kristin Løes.

Publications

The VOA3R-platform

The VOA3R-platform, which is a common entrance to publications in archives like Organic Eprints, Epsilon (the archive of the Swedish Agricultural University), ProDINRA (the archive of INRA, France) and many more with relevance for agriculture, aquaculture and environment, is still growing. It now comprises more than 2.5 million articles from 32 institutions, including the AGRIS-collection of FAO. In addition to being able to search publications in different ways – some of which are not fully developed yet – it is also possible to communicate about the papers you find, or other relevant matters. Try e.g. to visit the group "Organic Agriculture".

**Films and short videos**

Films and short videos are a powerful way of increasing awareness of and interest in the food system.

With equal parts technology and artistry, filmmakers can bring an audience to a vegetable garden in Uganda, a fast food workers' rights protest in New York City, or an urban farm in Singapore. And animation can help paint a picture of what a sustainable, just, and fair food system might look like. Film is an incredible tool for effecting change through transforming behaviors and ways of thinking. Take a look at "26 films every food activist must watch" here: http://foodtank.org/news/2013/09/twenty-six-films-every-food-activist-must-watch?utm_source=Food+Tank&utm_campaign=a84de42588-Twitter&utm_medium=email&utm_term=0_c6d5c4b977-a84de42588-6091689



Conferences

International Conference on Organic Agriculture Sciences (ICOAS) 9-13th October 2013; Hungary

The 4th Scientific Conference on Organic Agriculture in Central and Eastern Europe will be held 9-13th October 2013 in Hungary. Previously held in the Czech Republic, ICOAS provides an opportunity for researchers, non-governmental organizations, practitioners and policy makers around the globe to meet and discuss current results of organic agriculture sciences.

From 2013 ICOAS will be a bi-annual event organized every second year in a different Central and Eastern European country with a special emphasis on selected topics of organic agriculture research for each conference.

The theme for ICOAS 2013 is Targeting Global Sustainability – Food Security, Biodiversity and Climate Change.

ICOAS 2013 is hosted by the Hungarian Research Institute of Organic Agriculture (ÖMKi), partner institute of FiBL Switzerland. Check here for calls for [symposia](#) and [papers](#).

Organic World Congress, held in Istanbul, Turkey, 13 - 15 October

Call for papers for the Organic World Congress, held in Istanbul, Turkey, 13 - 15 October is still open. The congress is gathering the global Organic Movement every three years. 2000 people from all continents debate issues, inspire each other, learn altogether and take strategic decisions. Submission deadline is 30 September, 2013.

Read more at: <http://www.owc2014.org/>

Conferences

Seminar on integrated pest management in Nordic berry crops

NJF organizes this seminar taking place 12-13 November in Denmark. The seminar focuses on integrated pest management in Nordic berry production. Some of the main topics are: New pests and diseases in Nordic-Baltic berry crops, trade-offs between inhibiting pests and promoting pollinators in berry crops, effects of organic growing systems on pests and diseases in berry crops, biological control in berry crops and weed management. Among others, results and experiences from the CORE Organic II project Softpest Multitrap, that focuses on management of pest insects in organic strawberry and raspberry fields will be presented. Read more at: <http://www.njf.nu/site/seminarRedirect.asp?p=1004&intSeminarID=465&strSemInfoType=inf>

**Multicriteria assessment and communication of effects of organic food systems**

International Conference, Aarhus University, Denmark 25th – 26th November, 2013.

The goal of the interdisciplinary MultiTrust project (<http://multitrust.org/>) has been to analyze and test how new methods of multicriteria assessment can help document and communicate balanced overall assessments of effects of organic food systems on society and nature. Read more at: <http://bcom.au.dk/research/conferencesandlectures/multitrust/>

International Symposium on Organic Agriculture in the Mediterranean region and products with designation of origin, December 2-4, 2013.

The international conference on organic agriculture in the Mediterranean will be held in Agadir, Morocco. A further important topic of the conference is distinguishing the quality of agricultural products by guarantees of their origin. *Proposals for posters or oral presentations can be submitted until June 30, 2013.* Read more at: <http://www.organic-world.net/news-organic-world.html>

