Agroecology in the EU

What is agroecology? Why do we need it? How does agroecology support the transition towards sustainable agriculture in the EU? Where is agroecology today in Europe and who is practicing it? How is it different from organic farming, conservation agriculture or climate-smart agriculture? What are the socio-economic impacts of agroecological transition? How can agroecology support the EU on a path towards Sustainable Development Goals?

Join us at the lunchtime conference and find out answers to these and other questions. Speakers include researchers and practitioners from Agroecology Europe, the first European association for agroecology:

Alain PEETERS, Director RHEA Research Centre, Belgium
Paolo BARBERI, Assoc. Prof. Agronomy, Sant'Anna School of Advances Studies,
Italy Paola MIGLIORINI, Assist. Prof. Agronomy, University of Gastronomic Science,
Italy Alexander WEZEL, Prof. Agroecology and Landscape Ecology, ISARA Lyon,
France Vincent DELOBEL, organic farmer, Belgium

LUNCHTIME CONFERENCE

Thursday 11 January 2018, 12h30-14h30

Brussels & Ispra via videoconference

Room 11 Auditorium - Building: 58c

A Brief Introduction to Agroecology (by Marco Bertaglia, Land Resources Unit, JRC)

Agroecology has remarkably grown over the last two decades as a significant field in both science and practice (Pretty, 2008; Wezel et al, 2009). It sets the basic ecological principles to design and manage agroecosystems that are both productive and conserve natural resource.

The reference definition of agroecology is the one given by Altieri (2002). Agroecology is the holistic study of agroecosystems, including all environmental and human elements. It favours natural processes and biological interactions that enhance synergies. By assembling crops, animals, trees, and other factors in spatial/temporal diversified systems, it optimises several processes. Diversified farms support their own soil fertility, crop protection and productivity.

Agroecology designs agricultural systems in ways that mimic natural functioning of the ecosystems. It is farming in harmony with natural cycles and the ecology of trophic chains, creating or enhancing pest-predator equilibria in a way that does away with the need for pesticides. It combines no-till with soil cover, mulching, plant associations, and other key techniques that annihilate the need for weed killers.

Agroecology is an approach to agricultural production (and to the whole food system) that is in line with the European Commission definition of 'nature-based solutions'. These are "solutions … inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience".

Agriculture must face the challenge to produce sufficient food, fibres and other materials, including bioenergy, while maintaining or improving ecosystem conditions. Today, agriculture has many impacts on the environment and contribute to, e.g., climate change and biodiversity loss (Stoate et al, 2009), while livelihoods in rural areas are affected and the economics of farming is often strained (United Nations Convention to Combat Desertification, 2017). Agroecology can bring a positive solution.

Agroecology jointly applies several principles that include diversification, polycultures, permanent soil cover, no tillage and generally very limited or inexistent soil disturbance, complete avoidance of pesticides and synthetic fertilisers, use of natural soil fertility, etc. (Wezel et al, 2014). It is the joint application of all ecological principles in complex systems that bring about the large benefits of agroecology.

Agroecological practices must be applied jointly, not 'cherry-picked' at will. Pittelkow et al (2015) have analysed 5,643 coupled observations, assessing yield comparison from 610 academic studies in 48 different crops in 63 different countries. It is remarkable that, for instance, no-till cultivation – when applied alone without the other practices – generally reduces yields, albeit results were quite varied. In some cases, yields were comparable.

If the three 'conservation agriculture' techniques (no till, residue retention and crop rotation) are applied together, yields were comparable or only very slightly lower in all crops across all climates already in the first two years after conversion from conventional farming, and always better in the longer term.

Plant consociations and intercropping are examples of nature mimicry that provide enormous advantages to both yields and ecosystem services. There is overwhelming evidence that we can design systems that increase all flows of all provisioning and regulating services from agriculture and more broadly from land use.

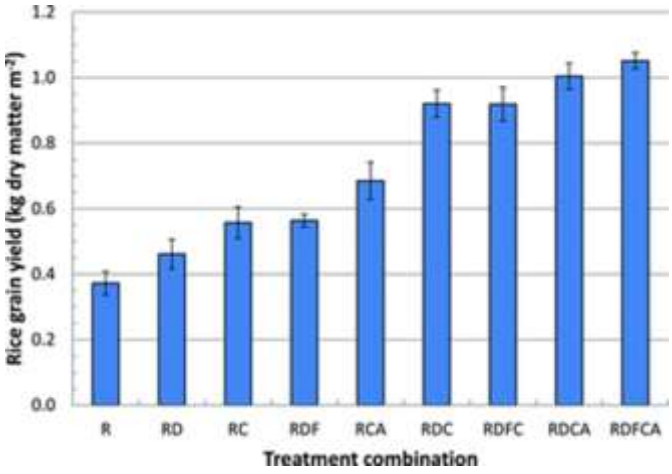

Figure 1- Yield of rice grain for increasingly complex rice cultivation systems (± standard error of mean). R = rice; D = with ducks; C = with compost; F = with fish; A = with Azolla sp. Error bars represent standard error of the mean (n= 10). From Khumairoh et al 2012, published under CC Creative Commons.

Khumairoh et al (2012) have shown that the yield of rice increases in parallel with an increase in the complexity of the agroecosystem. Two-and-a-half times more rice is produced when – eliminating completely any pesticide, herbicide, or other external input – ducks, fish, and nitrogen-fixing Azolla sp. are added to the system, with the use of compost as sole nutrient / soil improvement / organic matter management strategy. (see figure). Only rice yields are quantified here, but in the more complex system, proteins and calories are also produced from ducks and fish, which can also provide additional revenues.