



## Comparing organic and conventional agricultural cropping systems - What can be learned from the DOK and other long-term trials?

### “DOK-Monte Verità”

Congressi Stefano Franscini, Monte Verità, Ascona, Switzerland  
6-10 October, 2019

DOK Excursion Friday 11. October 2019, Therwil, Switzerland

## Program

### Sunday, 6 October

From 15.00           Arrival, registration

16.00 – 17.00       Welcome drink

#### Introductory session

Chair: Jochen Mayer

17.00               Welcome addresses  
**Bernard Lehmann**, Swiss Federal Office for Agriculture, Switzerland  
**Eva Reinhard**, Agroscope, Switzerland  
**Urs Niggli**, FiBL, Switzerland

17.30 – 18.15       **Keynote lecture**  
**Kate Scow**, University of California Davis, USA  
Longterm Impacts of Management on Soil Carbon, Soil Life, and  
Agricultural Resilience in Mediterranean Agroecosystems

18.15 – 19.00       **Keynote lecture**  
**Paul Mäder**, FiBL, Switzerland  
The DOK long-term experiment – lessons learned from 40 years of  
interdisciplinary research

19.15               *Dinner*

## Monday, 7 October

8.45 Congressi Stefano Franscini and Fondazione Monte Verità  
Welcome address

### Yield and yield development

Chair: TBA

- 9.00 – 9.30 **Keynote lecture**  
**Jochen Mayer**, Agroscope, Switzerland  
The performance of yields in organic and conventional cropping systems
- 9.30 – 9.45 **Andrew Macdonald**, Rothamsted Research, UK  
The Rothamsted Long-term Experiments
- 9.45 – 10.00 **Bettina Leschhorn**, Justus Liebig University Giessen, Germany  
Long-term effects of different farming and fertilization systems on biomass yields and nitrogen uptake of crops in the LTE “IOSDV” Rauschholzhausen
- 10.00 – 10.15 **Evelin Loit**, Estonian University of Life Sciences, Estonia  
Yield stability and nutrient use efficiency in wheat, barley, potato and field pea when comparing organic and conventional crop management from 2008-2017
- 10.15 – 10.30 **Jaroslav Stalenga**, State Research Institute, Poland  
Environmental and yield performance of organic and conventional crop production systems in long-term experiment in Puławy (Poland)
- 10.30 – 11.00 *Coffee break*

### Nutrient flows and nutrient use efficiency

Chair: TBA

- 11.00 – 11.30 **Keynote lecture**  
**Eric Steen Jensen**, Swedish University of Agricultural Sciences, Sweden  
Determining nutrient flows and nutrient use efficiency in long-term cropping systems experiments – Advantages and challenges
- 11.30 – 11.45 **Bettina Eichler-Löbermann**, University of Rostock, Germany  
Yield development and soil fertility – results of different phosphorus fertilizer practices over 20 years
- 11.45 – 12.00 **Klaus Jarosch**, University of Bern, Switzerland  
Soil phosphorus (P) budgets, P availability and P use efficiencies in conventional and organic cropping systems of the DOK trial
- 12.00 – 12.15 **Astrid Oberson**, ETH Zurich, Switzerland  
Nitrogen budgets and soil nitrogen stocks of organic and conventional cropping systems: how reconcile efficiency and sustainability of nitrogen use?
- 12.15 – 12.30 **TBA**
- 12.30 *Lunch*

## **Soil quality**

Chair: TBA

14.00 – 14.30	<b>Keynote lecture</b> <b>Else K. Bünemann</b> , FiBL, Switzerland Soil quality: a critical review and a look into the future
14.30 – 14.45	<b>Andreas Fließbach</b> , FiBL, Switzerland Soil organic matter dynamics over 40 years of organic or conventional farming in the DOK trial
14.45 – 15.00	<b>Noelia Garcia Franco</b> , Technische Universität München, Germany Beneficial effects of reduced tillage on soil aggregation and stabilization of organic carbon in an irrigated semiarid Mediterranean ecosystem
15.00 – 15.15	<b>Kyle Mason-Jones</b> , Netherlands Institute of Ecology, The Netherlands Vital Soils for Sustainable Intensification of Agriculture: A chronosequence approach to organic agricultural research
15.15 – 15.30	<b>Erin Silva</b> , University of Wisconsin-Madison, USA Influence of long-term organic and conventional cropping systems on soil microbial population size and structure
15.30 – 16.00	<i>Coffee break</i>
16.00 – 17.30	Workshops Themes 1-3
17.30 – 19.00	Poster session 1
19.00	<i>Dinner</i>

## Tuesday, 8 October

### Rhizosphere processes

Chair: TBA

- 9.00 – 9.30            **Keynote lecture**  
**Doris Vetterlein**, Helmholtz Center for Environmental Research,  
Germany  
TBA
- 9.30 – 9.45            **Maria Finckh**, University of Kassel, Germany  
Long-term root adaptation to organic and conventional farming in  
heterogeneous wheat populations
- 9.45 – 10.00          **Andreas Hammelehle**, Agroscope, Switzerland  
New insights in below ground nitrogen of clover-grass mixtures
- 10.00 – 10.15        **Juliane Hirte**, Agroscope, Switzerland  
Fertilization intensity and the fate of root carbon in soil within two years  
after harvest
- 10.15 – 10.30        **Fritz Oehl**, Agroscope, Switzerland  
Diversity of arbuscular mycorrhizal fungi in agricultural systems
- 10.30 – 11.00        *Coffee break*

### Climate change adaptation and mitigation

Chair: TBA

- 11.00 – 11.30        **Keynote lecture**  
**Jørgen Eivind Olesen**, Aarhus University, Denmark  
The role of cropping systems for climate change mitigation and  
adaptation
- 11.30 – 11.45        **Philipp Koal**, University of Rostock, Germany  
The role of agronomic management practices on greenhouse gas  
emissions in a long-term field trial
- 11.45 – 12.00        **Nicolas Beaudoin**, INRA Laon, France  
Can organic cropping systems mitigate nitrogen losses and improve  
GHG balance? Results from a 19-yr experiment in Northern France
- 12.00 – 12.15        **Andreas Gattinger**, University of Giessen, Germany  
Soil-derived greenhouse gas emissions as influenced by farming  
management
- 12.15 – 12.30        **Emily Miranda Oliveira**, Agroscope, Switzerland  
Resilience of organic and conventional cropping systems to drought and  
climate change
- 12.30                    *Lunch*
- 14.00 – 22.30        Excursion to two innovative farms in the Magadino plain and conference  
dinner at the [Restaurant Castel Grande](#) in Bellinzona (UNESCO World  
Heritage)

## Wednesday, 9 October

### Nutritional quality

Chair: TBA

- 9.00 – 9.30            **Keynote lecture**  
**Carlo Leifert**, Southern Cross University, Australia  
Effect of agronomic practices on food quality and human health –  
the need to understand complex interactions
- 9.30 – 9.45            **Emmanuel Frossard**, ETH Zurich, Switzerland  
Long-term organic matter application reduces cadmium but not zinc  
concentrations in wheat
- 9.45 – 10.00        **Juan Herrera**, Agroscope, Switzerland  
Genetic progress and genotype (G) × environment (E) interactions  
effects on winter wheat under organic, conventional low-inputs and  
conventional high-inputs production systems: insights from 20 years of  
studies
- 10.00 – 10.15       **Georg Langenkämper**, Max Rubner-Institut, Germany  
Profiling techniques and targeted analyses in the quest for  
differentiation of organic versus conventional DOK wheat
- 10.15 – 10.30       **Leonidas Rempelos**, University of Newcastle, UK  
Nafferton Factorial Systems Comparison trials: What we have learned  
from the first 18 years of experiments
- 10.30 – 11.00       *Coffee break*

### Sustainability assessment

Chair: TBA

- 11.00 – 11.30       **Keynote lecture**  
**Thomas Nemecek**, Agroscope, Switzerland  
Environmental impacts of cropping systems: lessons learnt from LCA  
studies
- 11.30 – 11.45       **Mariam Soma**, Institut de l'Environnement et de Recherches Agricoles,  
Burkina Faso  
History, lessons and challenges of the long term field trial of Saria
- 11.45 – 12.00       **Martin Entz**, University of Manitoba, Canada  
The Glenlea long-term study illuminates the ecosystem health – crop  
productivity nexus in Canadian Prairie organic production
- 12.00 – 12.15       **Long Li**, China Agricultural University, China  
Crop diversity enhances agroecosystem sustainability via improving soil  
fertility
- 12.15 – 12.30       **Andrew Mead**, Rothamsted Research, UK  
A meta-analysis approach for assessing the sustainability of cropping  
systems using data from multiple global LTEs
- 12.30                   *Lunch*

## **Biodiversity in agroecosystems**

Chair: TBA

14.00 – 14.30	<b>Keynote lecture</b> <b>Henrik G. Smith</b> , Lund University, Sweden TBA
14.30 – 14.45	<b>Klaus Birkhofer</b> , Brandenburg University of Technology, Germany Effects of farming system and simulated drought on biodiversity, food webs and ecosystem functions in the DOK trial
14.45 – 15.00	<b>Martina Lori</b> , FiBL, Switzerland Nitrogen transformations and its underlying microbial communities in differently managed soils under future projected rainfall variability
15.00 – 15.15	<b>Francisco Xavier Sans Serra</b> , Universitat de Barcelona, Spain Effects of farming system on weed seed bank and on invasibility in arable fields: evidences from the long-term DOK trial
15.15 – 15.30	<b>Marjetka Suhadolc</b> , University of Ljubljana, Slovenia Transition of long term Conservation Tillage experiment from Conventional to Organic system – effects on soil quality and weed infestation
15.30 – 16.00	<i>Coffee break</i>
16.00 – 17.30	Workshops Themes 4-6
17.30 – 19.00	Poster session 2
19.00	<i>Dinner</i>

## Thursday, 10 October

### Sustainable production within planetary boundaries

Chair: TBA

- 9.00 – 9.30           **Keynote lecture**  
**Hermann Lotze-Campen**, Potsdam Institute for Climate Impact Research (PIK), Germany  
Agricultural production in line with the Sustainable Development Goals and within Planetary Boundaries
- 9.30 – 9.45           **Gurbir Bhullar**, FiBL, Switzerland  
Can organic agriculture contribute to sustainable development in the tropics?
- 9.45 – 10.00       **Pietro Barbieri**, Bordeaux Sciences Agro, France  
Simulating the effects of nitrogen availability on organic production at the global scale
- 10.00 – 10.15      **Jan Bengtsson**, SLU, Sweden  
Long-term field trials are fine but insufficient for understanding landscape impacts of farming systems on ecosystem services and biodiversity
- 10.15 – 10.30      **Michael Mielewczik**, Rothamsted Research, UK  
TSARA (Targets for sustainable and resilient agriculture) – efficiency
- 10.30 – 11.00      *Coffee break*

### Research need and new perspectives of long-term experiments

Chair: TBA

- 11.00 – 11.30      **Keynote lecture**  
**Paolo Barberi**, Sant'Anna School of Advanced Studies, Italy  
Applying the Efficiency-Substitution-Redesign transitional framework to ensure the sustainability of long-term experiments
- 11.30 – 11.45      **Maike Krauss**, FiBL, Switzerland  
Organic conservation tillage – evidence from more than 15 years of research
- 11.45 – 12.00      **Janjo de Haan**, Wageningen University and Research, The Netherlands  
(What is) The best methodology to compare organic and conventional agricultural cropping systems
- 12.00 – 12.15      **Sara König**, Helmholtz-Zentrum für Umweltforschung GmbH, Germany  
The importance of long-term field experiments for modelling soil functions in agricultural systems
- 12.15 – 12.30      **Christine Watson**, SRUC Aberdeen, UK  
A comparison of four contrasting experimental rotations: reflections on an organically managed rotational LTE started in 1991
- 12.30 – 12.45      CSF Award ceremony and closing remarks
- 12.45                *Lunch and departure*

## Poster session 1

Monday, 17.30 – 19.00

**1. Amelie Carriere**, Arvalis, France

Fertility losses in organic agriculture systems

**2. Leo Condron**, Lincoln University, New Zealand

Impacts of long-term input cessation and biomass management on soil nutrient dynamics in a New Zealand grassland

**3. Anne-Laure de Cordoue**, ARVALIS Institute, France

Multi-performances of an organic cropping system led without external fertilizer, in the northern part of France, in arable crops: comparison with a conventional cropping system

**4. Keyvan Esmaeilzadeh Salestani**, Estonian University of Life Sciences, Estonia

Impact of long-term conventional and organic farming systems on barley

**5. Noelia Garcia Franco**, Technische Universität München, Germany

Seasonal climate conditions, pedogenic-topographic factors and management practices as main drivers of long-term carbon dynamics (1989-2016) in grassland soils of Bavaria

**6. Veronika Hansen**, Copenhagen University, Denmark

Green manure crops for low fertility soils

**7. Valentin Klaus**, ETH Zurich, Switzerland

The ServiceGrass project: Effects of organic farming on ecosystem services and grassland multifunctionality

**8. Hans Martin Krause**, FiBL, Switzerland

Carbon sequestration and stabilization in a 40-year agronomic long-term experiment

**9. Bärbel Kroschewski**, Humboldt-Universität zu Berlin, Germany

Analysis of a long-term nitrogen fertilization experiment on fen grassland and presentation of the results

**10. Tatiana Rittl**, Norwegian Centre for Organic Agriculture, Norway

Perennial leys for dairy cows: soil and plant attributes, yield and botanical composition with long-term low and high N input

**11. Francisco Xavier Sans Serra**, Universitat de Barcelona, Spain

The Gallecs trial, a mid-term experiment on reduced tillage, fertilisation and green manure in Mediterranean dryland arable cropping systems



**12. Liina Talgre**, Estonian University of Life Sciences, Estonia

Organic cropping systems with winter cover crops in combination with composted manure significantly improve soil properties

**13. Huyen Thai**, Leibniz Centre for Agricultural Landscape Research (ZALF) e.V., Germany

Effect of long-term fertilizer management on spring and winter cereals on sandy soil in Northeast Germany

**14. Yavar Vaziritabar**, Justus Liebig University Giessen, Germany

Long-term effects of different previous crops and NPK fertilization on soil parameters and biomass yields of subsequent crops in the LTE "BSG" Giessen

**15. Martin Wiesmeier**, Bavarian State Research Center for Agriculture, Germany

Soil carbon dynamics in croplands under conventional and organic management in Bavaria

## Poster session 2

**Wednesday, 17.30 – 19.00**

**16. Daniele Antichi**, University of Pisa, Italy

Building a network of long-term experiments on agroecology and organic farming

**17. Marion Casagrande**, ITAB, France

Improving arable crop systems in organic agriculture: lessons from a network of long-term experiments

**18. Gilles Gagné**, CETAB, Canada

Establishing a long-term experiment to study the effect of organic cropping systems on GHG emissions, carbon and nitrogen cycles and environmental efficiency

**19. Meike Grosse**, Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF) e.V., Germany

The BonaRes Repository: overview of long-term field experiments and provision of research data

**20. Dominika Kundel**, FiBL, Switzerland

Profiling soil microbial communities influenced by reduced summer precipitation and farming system history

**21. Frank Liebisch**, Agroscope, Switzerland

Phenotyping – a link between field experiments and agricultural practice?

**22. Chloe MacLaren**, Rothamsted Research, UK

Combining long-term experiments to quantify the contribution of crop diversity to sustainability

**23. Indrek Melts**, Estonian University of Life Sciences, Estonia

Estonian semi-natural grasslands in historical perspective

**24. Richard Ostler**, Rothamsted Research, UK  
The Global Long-term Experiments Network Metadata Portal

**25. Vladimir Romanenkov**, Lomonosov Moscow State University, Russia  
Long-term timescale for implementation 4per1000 initiative: comparison organic and mineral fertilization

**26. Colin Skinner**, FiBL/University of Basel, Switzerland  
Determination of greenhouse gas sources and sinks in Swiss arable soils under organic and non-organic management

**27. Xiaojin Zou**, Liaoning Academy of Agricultural Sciences, China  
Interspecific root interactions enhance nitrogen acquisition, symbiotic N<sub>2</sub> fixation, and N transfer in foxtail millet/peanut intercropping