ETH zürich

WFSC Newsletter Issue 3 | June 2015

World Food System Center News

WFSC News & Upcoming Events

Annual Report 2014 The WFSC's second Annual Report is now available. The report highlights some of the key activities and achievements from our second full-year of operations. With 37 members representing seven departments at ETH Zurich and three groups at Eawag, the Center brings together researchers and partners to collaborate on projects that span the food system. The report can be downloaded at www.worldfoodsystem.ethz.ch/the-center.

New Member The WFSC welcomes Prof. Stephan Wagner and the chair of Logistics Management from the Department of Management, Technology and Economics as our newest member. We look forward to adding his group's expertise on food supply chains and networks to our activities.

WFSC @Expo Milano With the theme, "Feeding the Planet, Energy for Life," the Expo Milano 2015 is expected to attract over 20 million visitors and has 140 participating countries. In June, the WFSC and eight researchers will partner with ETH Global and the City of Zurich to hold an event that marks the kickoff of Zurich week at the Swiss Pavilion. Several WFSC members are participating in other events where they will discuss their research and findings. **Prof. Nina Buchmann** spoke at an event on "Enhancing food security and rural livelihoods through collaboration and partnerships", organized by Syngenta at the Swiss Pavilion.

UPCOMING EVENTS

WFS Conference (June 21-26) *Tackling World Food System Challenges: Across disciplines, sectors and scales* at Monte Verità, Ascona, Switzerland.

WFS Summer School (August 1-15) *Organic Agriculture and Food* in Rheinau, Switzerland.

ETH Week (Sept. 6-11) *The Story of Food* at ETH Zurich.

Zürich isst (Sept. 2015) *Erlebnismonat rund um Ernährung, Umwelt, und Genuss* in Zurich.

» **WFSC will host Films and Podium Discussions** on Sept. 16 and 30, at Riffraff Cinema in Zurich

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Prof. Emmanuel Frossard joined a "Grand Debate on Nutrition Security" in a joint FACCE-JPI event at the Pavilion of the European Commission. During Basel Week at the Expo, **Prof. Hong Yang** talked in an event on "Sustainability and energy research" about water availability and human demand for it. In June, **Prof. Wilhelm Gruissem** will discuss "The Food Security Challenge: Improving Crop Yield and Nutritional Quality" as part of an event organized by Aquae Venezia 2015 and take part in a conference on "Feeding the planet: plant science and breeding for the future of agriculture," which is being organized in September by the Società italiana di Genetica Agraria as part of the Expo.

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Research

New WFS Grants Awarded Five new research projects were funded through the WFS competitive grants platform this year. This round of funding provides support to early career scientists whose interdisciplinary research proposals covered a wide range of food system activities. In May, four new postdoctoral research projects in the Sustainability in Food Value Chains program (supported by the WFSC Coop Research Program) and one new PhD project in the program on Organic Production Systems for Global Food Security (supported by the WFSC Mercator Research Program) will start. Further information about each of these, and the ongoing projects, can be found at www.worldfoodsystem.ethz.ch/research. The next call for proposals will open in July and close on November 1, 2015.

Large Collaborative Projects The WFSC is participating in two international, multi-year research projects that are kicking off this spring. **Yams in West Africa:** As a partner in the six-year R4D/SNF/SDC project, "Biophysical, institutional, and economic drivers of sustainable soil use in yam systems for improved food security in West Africa", the WFSC will work with lead-investigator Prof. Emmanuel Frossard's team and project partners in Ivory Coast and Burkina Faso to develop a summer school course around this topic in 2017. **Modeling Food Security and Land Use Change:** In the context of the five-year FACCE-JPI project, "Delivering Food Security on Limited Land" on which Prof.

Nina Buchmann is a co-investigator, the WFSC will be a lead partner on the knowledge exchange and stakeholder engagement for the project. This will include two summer school courses on the topic in South Africa and Brazil.

Flagship: Resilience in Food Systems The advisory board for the Resilience in Food Systems research project met for the first time in January. The board's membership brings cross-sector expertise to the project, with representation from industry (Coop, Migros, Bühler, Syngenta, Nestlé), governmental (FOAG, Agroscope), civil society (Helvetas, Club of Rome), and international organizations (FAO). Two Master's thesis projects are now underway, applying the resilience framework to the tef and cocoa value chains in Ethopia and Ghana, respectively. The project team will lead conference participants in a multi-part workshop on food system resilience during the upcoming WFS conference in Ascona.

Education

ETH Week: The Story of Food This September 6-11, ETH Zurich will offer an interdisciplinary course in a new learning format in the framework of the ETH Critical Thinking Initiative. With a focus on the topic of food, 150 students from across all departments will come together for a week-long program designed to foster critical and independent thinking, innovative learning and real-world problem solving. As part of the core project team, the WFSC involved in developing the program and course content, and many of the WFSC members will teach parts of the course.

WFS Summer School in Rheinau In August, we will welcome 25 students from 17 countries to our summer school program on the world food system, organic agriculture and food. Through these courses, we connect motivated students, researchers and practitioners who are committed to building sustainable food systems. During the two-week immersion program, we integrate lectures, group work, case studies, excursions, farm work, art, and more.

Final event of the Our Common Food program for food entrepreneurs at the ETH Zurich Dozentenfoyer. (Photo: Our Common Food)

ETH Students at the FAO Headquarters during their study trip on agroecology in spring 2015.

Sustainable Catering and the Living Lab at ETH Zurich This project aims to identify the pivotal factors for sustainability in on-campus catering and, using a "living lab", it does so by working on real-world dynamics and providing students an opportunity for solution-oriented and research-based learning. The WFSC collaborates with the ETH Seed Sustainability program and the Catering Commission to support five Master's student theses. More information including an interim report from the first phase is available at www.worldfoodsystem.ethz.ch/education/student-theses/seed-sustainability.

ETH @FAO for Study Trip on Agroecology A group of 20 agriculture and food science students, had the chance to follow a three-day seminar in April at the Rome headquarters of the UN Food and Agriculture Organization. The course introduced students to the activities of FAO and the role of Swiss representatives at FAO, the World Food Program, and the International Fund for Agricultural Development. The course focused on the topic of "Food security in the context of agroecology" and included inputs from representatives of these organizations and the Swiss Federal Office for Agriculture. This popular course was organized by WFSC members Martijn Sonnevelt and Dominique Barjolle and supported by the WFSC.

Outreach

Agro-Food Innovation Park In February, the WFSC started a new collaboration with the Agro Food Innovation Park, which is being developed in the canton of Thurgau. We hosted a first joint event on Digital Transformation in the Agro-Food Sector in May, and will explore further collaboration opportunities in the future.

Start Up Program for Food System Entrepreneurs: Our Common Food The WFSC hosted in March the final event of the Our Common Food Start Up Program food system entrepreneurs. Eight start-ups gave 2-minute pitches and competed for awards presented by OGG (Ökonomische und Gemeinnützige Gesellschaft des Kantons Bern).The evening offered an opportunity for representatives from across the food sustainability and entrepreneurship sectors to come together and discuss the innovations that will be shaping tomorrow's food systems. The winner of the OGG Start Up Award for 2015 was Mirko Buri's, Mein Küchenchef, which offers high quality, sustainable and locally sourced, pre-prepared meals which minimize food waste. The Audience Award went to Essento and Matthias Grawehr, who are working to bring edible insects to Swiss plates. The WFSC is a knowledge partner of OCF.

Public Lecture: Resilience and Organic Agriculture The WFSC was pleased to welcome nearly 200 people to our spring event, which highlighted some of the Center's flagship research on food systems resilience and a project involving the ETH Zurich's Sustainable Agroecosystem group and HELVETAS Swiss Intercooperation. The lecture, "Food systems resilience in theory and practice: Organic agriculture as a prototype?" featured Dr. Frank Eyhorn of HELVETAS and Prof. Johan Six, WFSC member and chair of Sustainable Agroecosystens. It was held in collaboration with the Annual Conference of the Society for Tropical Ecology and supported by the Mercator Foundation Switzerland.

Member Highlights

MSc student **Elena Guyer**, of Shana Sturla's Toxicology Lab, was awarded the Hochdorf-Nutritec Prize for her excellent Masters Thesis titled "Nanoscaled iron compounds intended for food fortification do not induce intracellular reactive oxygen species or oxidative DNA damage In human colon cells." **Shana Sturla** is a co-investigator on the EU Horizon 2020 9M EUR grant awarded to the "EuroMix" team for developing testing and risk assessment strategies for exposure to mixtures of chemicals in food.

Dörte Bachmann, former PhD student of Prof. Buchmann, receives the Hans Vontobel Award 2015 for her excellent PhD thesis on the topic, "Does complementary resource use explain biodiversityecosystem functioning relationships in grassland?"

Red clover in pasture in Switzerland. (Photo: Michael Ruckle)

Q&A with Michael Ruckle, Postdoctoral student working on the project "Advanced breeding of high energy red clover for sustainable ruminant livestock production."

Q. What is red clover?

A. Red clover is quite common in natural grassland environments and is easily recognized by its purple flowers. Red clover is the most widely planted forage legume in Europe, and is popular with farmers as a livestock feed because it has a high protein content and it improves soil quality with very little input of synthetic fertilizers or other chemicals.

Q. Why is red clover important for sustainable agriculture?

A. Unlike corn and soy, which are increasing being used to supplement livestock diets, red clover maintains the natural nutrient, water, and carbon cycles that exist between plants and animals. Ultimately this means less soil erosion, less water pollution, and less greenhouse gas emissions. A field of red clover supplies flowers from spring to fall, which is important for maintaining pollinating insect populations.

Q. Why breed a high energy red clover variety?

A. Corn and soy are popular with farmers because of their energy content, we feel we can use modern breeding techniques to significantly increase red clover›s energy content. The hope is a high energy red clover variety will need little grain supplementation to maintain livestock productivity.

Q. Who are the envisioned beneficiary of this project?

A. For local farmers we envision lower feed costs. For Switzerland and Europe we envision importing less grains from GMO or unsustainable sources

Dr. Michael Ruckle is a postdoctoral researcher working with Prof. Bruno Studer on a research project funded by the WFSC's Research Program, Sustainability in Food Value Chains, which is supported by Coop.

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Q&A with Thijs Defraeye, postdoctoral researcher on the project "Eco-smart ventilated packaging for fresh fruit using virtual cold chains"

Q. How can improved ventilated packaging technology help reduce postharvest food losses?

A. By enabling faster and more uniform cooling of packaged fruit and vegetables, packaging can help to extend shelf life and to reduce quality variations between individual products. This means that every customer gets the same quality, and also better fruit.

Q. What do you mean by a "virtual cold chain"?

A. In a virtual cold chain, the temperature behavior of fresh produce throughout precooling, transport and storage is predicted by means of computational simulations. We can directly use this thermal history to quantify fruit decay and losses, and to propose packaging design changes. This new approach is a promising alternative to costly, labour-intensive field experiments and allows us to probe deep into the cargo, in locations which are otherwise not accessible.

Q. What is unique about your research approach?

A. We look at how individual fruit behave inside ventilated packaging all the way from farm to consumer, using virtual cold chains, but also integrate this information into life cycle assessment models to predict the environmental footprint of different supply chains. This unique combination should give new insights on how to tailor ventilated packaging for a specific fruit and for a specific market.

Dr. Thijs Defraeye is a research fellow from the Chair of Building Physics. His research project is funded by the WFSC's Research Program, Sustainability in Food Value Chains, which is supported by Coop.

Fresh fruit in ventilated packaging can reduce losses during transportation and storage. (Photo: Paul Cronje)

Dr. Frank Eyhorn of HELVETAS Swiss Intercooperation at WFSC public lecture during the conference of the Society for Tropical Ecology in April.

Christian Andres, Andreas Gattinger, and **Johan Six** (Sustainable Agroecosystems) secured funding for Christian's PhD project on the Cocoa Swollen Shoot Virus Disease in Ghana through the Engineering for Development Programme of ETH Global. The transdisciplinary project aims at developing a novel holistic concept for reducing the spread and impact of CSSVD in West Africa.

Congratulations to **Andreas Lüscher**'s Grassland Systems research group, which for the past 10 years has been a key partner in the SDC Green Gold project on sustainable rangeland management in Mongolia. The project was elected from nearly 800 applications as the winner of the Best Sustainable Development Practices on Food Security competition in an international competition held in collaboration with the Expo Milano 2015. The work from Lüscher's group was also recognized by the French government when it selected the MultiSward project as one of the best 12 projects of the year for the Les Etoiles de L'Europe award.

Susanne E. Ulbrich (Animal Physiology) received SNF funding for a project to model of embryonic growth arrest in the roe deer in which she aims to decipher general mechanisms regulating embryonic growth velocity in other species including livestock.

Opportunities

Open positions Please visit our website for more information about open research positions with our members. Current openings include a postdoc position with the Building Physics group and MSc and BSc thesis opportunities with the Sustainable Agroecosystems group on integrated organic farming systems. See www.worldfoodsystem.ethz.ch/opportunities.

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