<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>12.00 – 13.30</td>
<td>Arrival/Registration</td>
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<td>13.30 – 14.30</td>
<td>Welcome addresses</td>
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<td></td>
<td>• Organizing committee</td>
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<td></td>
<td>• Nina Buchmann, ETH Zurich, Switzerland</td>
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<td>• Janet Hering, Eawag, Switzerland</td>
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<td>• Michael Zimmermann, Federal Office for Agriculture, Switzerland</td>
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<tr>
<td>14.30 – 15.10</td>
<td>Keynote Lecture</td>
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<tr>
<td></td>
<td>Andrea Ulrich, ETH Zurich / PhosAgro Trading SA, Switzerland</td>
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<tr>
<td></td>
<td>The importance of adequate phosphate rock quantity and fertilizer</td>
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<td>quality in the 21st century</td>
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<tr>
<td>15.10 – 15.50</td>
<td>Keynote Lecture</td>
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<td></td>
<td>Geneviève Metson, Linköping University, Sweden</td>
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<td></td>
<td>A need to better integrate substance flow analyses in to transdisci-</td>
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<td>plinary spaces for transformative change in phosphorus recycling</td>
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<tr>
<td>15.50 – 16.20</td>
<td>Coffee break</td>
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<td>16.20 – 17.00</td>
<td>Keynote Lecture</td>
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<td>Anders Nättorp, University of Applied Sciences and Arts</td>
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<td>Northwestern Switzerland, Switzerland</td>
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<td>How to transform a phosphorus waste stream into a fertilizer?</td>
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<td>17.15 – 18.00</td>
<td>Parallel sessions</td>
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<td></td>
<td>1.1 – Optimizing regional and national P cycles – Manure/Soil</td>
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<td>1.2 – Sourcing P fertilizers – Precipitates from wastewater</td>
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<tr>
<td>18.00 – 19.00</td>
<td>Welcome reception at the Dozentenfoyer, ETH Zurich</td>
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Tuesday, 9. July, 2019

9.00 – 9.40  Keynote Lecture
Therese McBeath, CSIRO Agriculture and Food, Australia
Strategies for efficient phosphorus use in crop and pasture systems

9.40 – 10.20  Keynote Lecture
Helen Jarvie, NERC Centre for Ecology & Hydrology, Wallingford, UK
350 years after phosphorus discovery: Addressing environmental challenges of phosphorus deficiencies and excesses

10.20 – 10.45  Coffee break

10.45 – 12.00  Parallel sessions
2.1 – Efficient P use in agroecosystems – P utilization by plants
2.2 – Environmental P problems – Soil

12.00 – 13.30  Lunch

13.30 – 14.45  Parallel sessions
3.1 – Optimizing regional and national P cycles – Governance
3.2 – Sourcing P fertilizers – Sewage sludge

14.45 – 16.30  Poster session 1 (incl. coffee break)

16.30 – 18.00  Parallel sessions
4.1 – Efficient P use in agroecosystems - Fertilizer, fertilization and long term effects
4.2 – Environmental P problems – Atmosphere and forest

18.00 – 19.30  Get together with free beers at the bQm bar
Wednesday, 10. July, 2019

9.00 – 10.30  Workshops (10 groups)
10.30 – 11.00  Coffee break – lunch bags pick up
11.30 – 18.00  Excursions on case studies

1. Options to mitigate phosphorus losses from land to waters in an area with high livestock density (Midland Lakes/P losses)
2. Nutrient recovery from source-separated waste streams (Eawag/On-site sanitation)
   Supported by Laufen
3. Phosphorus, a limiting nutrient in Swiss forests (WSL/Swiss forest)
4. Producing biomass from wastewater (Wädenswil/Aquaponics)
   Supported by Hach
5. Mitigation measures for soil erosion - a successful story in the Canton of Bern (Bern region/Erosion)
   Supported by BGS
6. Phosphorus in Swiss agriculture: Sources, rates, and fertilization guidelines (Reckenholz/P fertilization)
   Supported by Hauert
Thursday, 11. July, 2019

9.00 – 10.30 Workshops (10 groups)

10.30 – 11.00 Coffee break

11.00 – 12.00 Parallel sessions
   5.1 – Sourcing P fertilizers – Alternative wastewater treatment
   5.2 – Efficient P use in agroecosystems – P utilization by animals

12.00 – 13.30 Lunch

13.30 – 14.45 Parallel sessions
   6.1 – Efficient P use in agroecosystems - Soil P dynamics, forms and processes
   6.2 – Environmental P problems – Land management

14.45 – 16.30 Poster session 2 (incl. coffee break)
   Coffee break supported by Landor

16.30 – 18.00 Parallel sessions
   7.1 – Efficient P use in agroecosystems – P use in cropping and farming systems
   7.2 – Environmental P problems – Aquatic Systems

19.00 Conference dinner at the restaurant “Lake Side” by Lake Zurich
Friday, 12. July, 2019

9.00 – 10.00  Presentation of workshops results in plenary

10.00 – 10.30  Chris Thornton, European Sustainable Phosphorus Platform, Belgium
P-research in Horizon Europe (FP9)

10.30 – 11.00  Coffee break

11.00 – 11.30  Keynote Lecture
Hansjörg Grützmacher, ETH Zurich, Switzerland
Building blocks containing phosphorus for atom efficient syntheses

11.30 – 12.00  Keynote Lecture
Christophe Lasseur, European Space Agency
TBA

12.00 – 12.30  Closing remarks and end of IPW9
Parallel sessions – details

Monday 8. July, 2019

Parallel 1.1

Optimizing regional and national P cycles – Manure/Soil
Chair: TBA

17.15 – 17.30  **Amery Fien**, ILVO, Belgium
Environmentally and economically sustainable phosphorus use in Flanders

17.30 – 17.45  **Silvia Renata Motta**, ERSAF, Italy
Phosphorus: evaluation of P surplus in Lombardy agricultural soil

17.45 – 18.00  **Raniero Della Peruta**, Agroscope, Switzerland
Can manure trade make an effective contribution towards sustainable P cycles in Swiss agroecosystems?

Parallel 1.2

Sourcing P fertilizers – Precipitates from wastewater
Chair: TBA

17.15 – 17.30  **Alex Veltman**, Waternet, The Netherlands
Phosphorus recovery at WWTP Amsterdam West

17.30 – 17.45  **Conor Watson**, Rhine-Waal University of Applied Sciences, Germany
Assessment of nutrient provision by the secondary fertilizers hazenite and struvite

17.45 – 18.00  **Mark Spiller**, University of Antwerp, Belgium
A comparative analysis of European struvite: production volume, quality and P release in soil
Parallel 2.1

Efficient P use in agroecosystems – P utilization by plants
Chair: Sokrat Sinaj

10.45 – 11.00  **Mohamed El Mazlouzi**, ISPA Bordeaux, France
Phosphorus partitioning and accumulation in durum wheat plants as affected by post-anthesis phosphorus supply

11.00 – 11.15  **Marina Azzaroli Bleken**, Norwegian University of Life Sciences, Norway
Critical phosphorus concentration in cereals – dilution with growth

11.15 – 11.30  **Beverly Agesa**, Bangor University, UK
Phosphorus efficient cereals: Is genetic engineering of plant phosphorus the answer?

11.30 – 11.45  **Corina Carranca**, INIAV, Portugal
Annual pasture legume species differ in response to phosphorus fertilizer input

11.45 – 12.00  **Nicolas Honvault**, Unilasalle Beauvais, France
Highlighting phosphorus-acquisition strategies in intermediate crops, a functional approach

Parallel 2.2

Environmental P problems – Soil
Chair: Federica Tamburini

10.45 – 11.00  **Jolanda Reusser**, ETH Zurich, Switzerland
Structural composition of organic phosphorus in hypobromite oxidised soil extracts determined by NMR spin-echo analysis

11.00 – 11.15  **Ruben Warrinnier**, KU Leuven, Belgium
Redox cycling in unsaturated agricultural soil explains the release of phosphorus and colloids

11.15 – 11.30  **Hao Chen**, Chinese Academy of Sciences, China
Effect of quickly repeated drying and rewetting on soil microbial P turnover

11.30 – 11.45  **Meike Widdig**, University of Bayreuth, Germany
Phosphorus-solubilizing bacteria and phosphatase activity show deviating responses towards nitrogen and phosphorus addition in grassland soils

11.45 – 12.00  **Hakan Wallander**, Lund University, Sweden
Ectomycorrhizal utilization of different phosphorus sources in a glacier forefront in the Italian Alps
Tuesday 9. July, 2019

Parallel 3.1

Optimizing regional and national P cycles – Governance
Chair: Armin Keller

13.30 – 13.45
**Felix Ekardt**, Leipzig/Berlin & Universität Rostock, Germany
Animal Food, Land-Use Governance, and Phosphorus Governance

13.45 – 14.00
**Claudia Binder**, EPFL, Switzerland
Transition of the Swiss phosphorus system towards a circular economy

14.00 – 14.15
**Oscar Schoumans**, Wageningen University and Research, The Netherlands
SYSTEMIC large scale eco-innovation to advance circular economy and mineral recovery from organic waste in Europe

14.15 – 14.30
**Jessica Stubenrauch**, University of Rostock, Germany
Phosphorus Governance from a Cross-National Perspective

14.30 – 14.45
**Bernou van der Wiel**, Rhine-Waal University of Applied Sciences, Germany
Towards restoring nutrient circularity in local agro-food-waste systems

Parallel 3.2

Sourcing P fertilizers – Sewage sludge
Chair: TBA

13.30 – 13.45
**Daniel Klein**, Emschergenossenschaft, Germany
Phosphorus recovery by a two stage incineration process – first results of the EuPhoRe pilot plant

13.45 – 14.00
**Else Bünemann**, FiBL, Switzerland
Alkaline pyrolysis as an energy-efficient approach to recover phosphorus from sewage sludge

14.00 – 14.15
**Marie-Line Daumer**, Irstea, France
Bio-acidification, an innovative approach to increase nutrients and energy recovery from sewage sludge

14.15 – 14.30
**Tobias Hartmann**, University of Hohenheim, Germany
Partial replacement of rock phosphate by sewage sludge ash for the production of superphosphate fertilisers

14.30 – 14.45
**Emmanuel Frossard**, ETH Zurich, Switzerland
Predicting phosphate release from sewage sludge ash using an ion sink assay
Parallel 4.1

**Efficient P use in agroecosystems - Fertilizer, fertilization and long term effects**

**Chair:** Lars Stouman-Jensen

16.30 – 16.45  **Peter Sørensen**, Aarhus University, Denmark
Replacement of mineral phosphorus starter fertilizers with cattle slurry in maize cropping

16.45 – 17.00  **Mario Fontana**, Agroscope, Switzerland
Effect of calcium phosphate on soil properties and plant productivity of two subsequent crops: green manure and maize

17.00 – 17.15  **Stany Vandermoere**, Ghent University, Belgium
Soil phosphorus (P) mining in agriculture: impacts on P availability and soil organic carbon stocks

17.15 – 17.30  **Heide Spiegel**, Austrian Agency for Health and Food Safety, Austria
Trace elements in soils and crops after long-term mineral P fertilization

17.30 – 17.45  **Juliane Hirte**, Agroscope, Switzerland
Non-linear multilevel models for crop response to soil P and pedoclimatic conditions

17.45 – 18.00  **Mart Ross**, Cornell University, USA
The effectivity of phosphorus fertilization on grasslands across the world

Parallel 4.2

**Environmental P problems – Atmosphere and forest**

**Chair:** Gitte Rubæk

16.30 – 16.45  **Avner Gross**, Ben Gurion University, Israel
Dust as a natural phosphorus fertilizer: from deserts to lakes to tropical rainforests

16.45 – 17.00  **Malte Pallentin**, Leibniz Institute for Baltic Sea Research Warnemünde, Germany
Determination of atmospheric phosphorus deposition in the German part of the Baltic Sea

17.00 – 17.15  **Maja Siegenthaler**, ETH Zurich, Switzerland
Tracing the fate of phosphorus fertilizer into soil phosphorus pools in a temperate beech forest

17.15 – 17.30  **Anna Missong**, Forschungszentrum Jülich, Germany
P associated to natural colloids in forest topsoil leachates

17.30 – 17.45  **Simon Hauenstein**, Eberhard Karls Universität, Germany
Organic layers favor phosphorus storage and uptake by young beech trees (Fagus sylvatica L.) at nutrient poor ecosystems

17.45 – 18.00  **Cornelia Herschbach**, Albert-Ludwigs-University Freiburg, Germany
The different P nutrition strategies of Fagus sylvatica and Populus canescens can be related to their habitats and growth behaviour
**Thursday 11. July, 2019**

**Parallel 5.1**

**Sourcing P fertilizers – Alternative wastewater treatment**
*Chair: Tove Larsen*

11.00 – 11.15  **Ariane Krause**, Leibniz Institute of Vegetable and Ornamental Crops, Germany
Valuing wastes – P-Recycling from energy and sanitation to the agroecosystem in smallholder farming in Karagwe, Tanzania

11.15 – 11.30  **Michel Elia Riechmann**, Eawag, Switzerland
Recovery of phosphorus and other nutrients from source-separated urine by stabilization of the urine and evaporation of the water

11.30 – 11.45  **Kris Dox**, KU Leuven, Belgium
Phosphorus recycling from urine using layered double hydroxides

11.45 – 12.00  **Lu Gao**, Forschungszentrum Jülich, Germany
Phosphorous storage pools in microalgae

**Parallel 5.2**

**Efficient P use in agroecosystems - P utilization by animals**
*Chair: Michael Kreuzer*

11.00 – 11.15  **Michael Oster**, Leibniz Institute for Farm Animal Biology (FBN), Germany
Molecular determinants of phosphorus utilization in pigs

11.15 – 11.30  **Solveig Vollmar**, University of Hohenheim, Germany
Livestock breeding for improved phosphorus utilization? Results from genomic analysis in the model species Japanese quail

11.30 – 11.45  **Brad Harrison**, University of Reading, UK
A pilot survey aimed at dairy farmers and nutritionists to identify current phosphorus feeding practices on UK dairy farms and the barriers and motivators to reducing phosphorus overfeeding

11.45 – 12.00  **Uri Yogev**, Ben Gurion University, Israel
Chemical and biological processes governing the phosphorous cycle in a near-zero discharge recirculating aquaculture
**Thursday 11. July, 2019**

### Parallel 6.1

**Efficient P use in agroecosystems - Soil P dynamics, forms and processes**  
*Chair: Tim McLaren*

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<tr>
<td>13.30 – 13.45</td>
<td><strong>Yaqi Zhang</strong>, University of Queensland, Australia</td>
<td>Understanding phosphorus behaviour in soils: The key to increasing its agronomic efficiency</td>
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<td>13.45 – 14.00</td>
<td><strong>Silke Ruppel</strong>, Leibniz Institute of Vegetable and Ornamental Crops, Germany</td>
<td>Kosakonia radicincitans – bacteria’s secret of improving phosphorus utilization efficiency in crop production</td>
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<tr>
<td>14.00 – 14.15</td>
<td><strong>Asgeir Almas</strong>, Norwegian University of Life Sciences, Norway</td>
<td>The partitioning of P in soil determines the fluxes and deliveries of labile P in soil solution</td>
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<td>14.15 – 14.30</td>
<td><strong>Gylaine Vanissa Tchuisseu Tchakounté</strong>, Leibniz Institute of Vegetable and Ornamental Crops, Germany</td>
<td>Selected rhizosphere bacteria help tomato plants to cope with combined phosphorus and salt stresses</td>
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<tr>
<td>14.30 – 14.45</td>
<td><strong>Klara Cecilia Gunnarsen</strong>, University of Copenhagen, Denmark</td>
<td>Silicon fertilizers increase phosphorus uptake by plants</td>
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### Parallel 6.2

**Environmental P problems – Land management**  
*Chair: Chiara Pistocchi*

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<td>13.30 – 13.45</td>
<td><strong>Biao Huang</strong>, Chinese Academy of Sciences, China</td>
<td>Phosphorus accumulation under intensive greenhouse vegetable soils in China and its potential loss risk: A meta-analysis</td>
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<td>13.45 – 14.00</td>
<td><strong>Samia Richards</strong>, James Hutton Institute, UK</td>
<td>Phosphorus transfer from septic tank effluent and the associated impact on soakaway soils and receiving waters</td>
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<td>14.00 – 14.15</td>
<td><strong>Merin Macrae</strong>, University of Waterloo, Canada</td>
<td>Managing phosphorus losses from agricultural fields in regions with cold climates</td>
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<td>14.15 – 14.30</td>
<td><strong>Mark Tibbett</strong>, University of Reading, UK</td>
<td>Too much of a good thing: are we over-fertilising restored landscapes of high biodiversity value?</td>
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Thursday 11. July, 2019

Parallel 7.1
Efficient P use in agroecosystems - P use in cropping and farming systems
Chair: Else K. Bünemann

16.30 – 16.45 Chunjie Li, Wageningen University, The Netherlands
Do rhizosphere modifications lead to complementary phosphorus uptake by species mixtures?

16.45 – 17.00 Julie Therese Christensen, Aarhus University, Denmark
Is it possible to enhance the utilisation of soil phosphorus in a main crop by adapting species and management of the preceding cover crop?

17.00 – 17.15 Bettina Eichler-Löbermann, University of Rostock, Germany
Phosphorus pools in the soil profile – results of different fertilizer practices over 20 years

17.15 – 17.30 Klaus Jarosch, University of Bern, Switzerland
Soil P budgets, P availability and P use efficiencies in conventional and organic cropping systems

17.30 – 17.45 Cathal Buckley, Teagasc, Ireland
Phosphorus demand and supply at farm scale – How big is the gap?

17.45 – 18.00 Michele McCormack, Teagasc, Ireland
Linking environmental attitudes and motivations to trends in soil fertility

Parallel 7.2
Environmental P problems – Aquatic Systems
Chair: Merrin Macrae

16.30 – 16.45 Nina Gottseling, University of Bonn, Germany
Cross-scale analysis of natural colloids in forested headwater catchments

16.45 – 17.00 Toon van Dael, KU Leuven, Belgium
The effect of dissolved oxygen and sediment iron on phosphate fluxes in lowland streams

17.00 – 17.15 Tallent Dadi, UFZ-Helmholtz Centre for Environmental Research, Germany
Trajectories of sediment water interactions in reservoirs as a result of temperature and redox conditions

17.15 – 17.30 Michael Rode, Helmholtz Centre for Environmental Research-UFZ, Germany
Major controls of base flow soluble reactive phosphorus losses in humid temperate headwater streams

17.30 – 17.45 Mark Stutter, The James Hutton Institute, UK
Riparian and channel processes affecting P mitigation in a Scottish headwater: on the case of the disappearing and re-appearing P

17.45 – 18.00 Sandra Poikane, European Commission Joint Research Centre, Italy
Phosphorus criteria in lakes and rivers of Europe under the EU Water Framework Directive: current state, challenges and way forward