



16th International Symposium on Soil and Plant Analyses

**Using tools to OPTIMIZE PLANT PRODUCTION
and QUALITY: exploring the SYSTEM APPROACH**





PROGRAM

17-20 June 2019

Wageningen, the Netherlands

www.isspa2019.com

MONDAY 17 JUNE 2019



08:30		Welcome coffee		Lobby
09.30		Welcome	Prof. Oene Oenema ISSPA co-chair Dr. Arjan Reijneveld ISSPA co-chair	Plenary
09:40		Tools to optimize the system approach in the Netherlands	Marjolijn Sonnema, Dutch Ministry of Agriculture (tbc)	Plenary
09.55		Tools to optimize plant production and crop quality, an FAO overview	Dr. Debra Turner, FAO and GPNM (tbc)	Plenary
10.20		More than 90 years of tools to optimize plant production and quality Case study The Netherlands	Dr. Arjan Reijneveld	Plenary
10:45		Coffee break		Lobby
11.05		Agricultural systems need accurate assessments of nutrients in soil, manure and plant material	SYSTEM Dr. Tom Schut (NL) Assistant Professor at the Plant Production Systems Group - WUR	Plenary
11:30		Soil testing as tool for optimal production	SOIL PhD Marta Alfaro (South America)	Plenary
12:00		Lunch		Lobby
13.00		SOIL sessions I chemistry 1. Extractable Phosphorus Movements in Soil Profile of Long-term Agronomic Fields 2. Phosphorus Sorption Index as an indicator of P availability in municipal biosolids 3. Improving water use efficiency via the use of wetting and water conservation agents 4. Managing alfalfa nutrition by soil analysis in the desert southwestern United-States	Session leader: Han van de Goor 1. G. Huluka (NL) 2. D. Sullivan (USA) 3. C. Terrones ICL (NL) 4. A. Quist (USA)	Plenary
13:00		SYSTEM sessions I 1. Benefits and trade-offs of replacing synthetic fertilizers by animal manures in crop production in China: a meta-analysis 2. Role of soil amendments in improving degraded medium to coarse-textured soils for upland crop practices in Northeast Thailand	Session leader: Ano Halonen 1. Y. Hou (China) 2. Thanachit (Thailand)	Subroom

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		<p>3. Nitrogen balance and yield to corn stalk nitrate test ratio as adaptive management tools for regulated dairy farms in New York</p> <p>4. Potassium in soil fertility, nutrient uptake and product quality, a case study in onions and potatoes</p>	<p>3. Q. Ketterings (USA)</p> <p>4. K. M Brolsma (NL)</p>	
14.20	Short break			Lobby
14.30		<p>SOIL sessions II physics</p> <p>1. Investigation of influence organic matter Compost on soil chemical and physical properties in silty clay field</p> <p>2. FieldScout: a tool that shows soil heterogeneity</p> <p>3. Laboratory and field calibration of buffer tests for evaluating lime requirement for Missouri soils</p>	<p>Session leader: Bob Miller</p> <p>1. S. Dadashi (Iran)</p> <p>2. P. C. J. van Vliet (NL)</p> <p>3. J. M. Nathan (USA)</p>	Plenary
14.30		<p>SYSTEM sessions II</p> <p>1. The study effect of lime on heavy metals recovery in Aqua régia media (method ISO 11466)</p> <p>2. Improving the quality of tropical fruit by an integrated system approach on fertilization, irrigation and post harvest practices</p> <p>3. Integrated Nutrition Management (INM) to improve soil and fruit quality under intensive horticultural systems</p> <p>4. Water quality and fertilization in high intensity horticulture</p> <p>5. Environmental Analysis Laboratory – a university research, teaching and consultancy analytical laboratory</p>	<p>Session leader: Joris van Benthum</p> <p>1. M. Behesti (Iran)</p> <p>2. P. Prins (NL)</p> <p>3. R. Ortega (Chile)</p> <p>4. T. Aanhane (NL)</p> <p>5. G. Lancaster (Australia)</p>	Subroom
16.05	Afternoon break			



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16.20		Site specific soil management in modern arable farming	SOIL Physics Prof. Ole Green (Denmark)	Plenary
16.50		<p>Poster session I 2-minute pitch SOIL Physics/ Chemistry</p> <ul style="list-style-type: none"> • R. Ortega Teaching soil testing by using simple and free resources for soil organic matter determination. • M. Symonenko Comparison of the main soil parameters by simple random and precision sampling • T. Krogstad An inter laboratory collaboration and comparison testing for available plant nutrients from Scandinavian soil samples - Why it is still important for non-accredited research laboratories • E. Najdenko Fitting laboratory methods to online soil analysis in the field • H. Venter Soil sampling practices in New Zealand: consequences and alternatives • D. Sawyer Fertility trends in 20 years of nutrient drawdown practices at the Wisconsin Integrated Cropping Systems Trial • D. Osmond Developing Fertilizer Recommendation Support Tool (FRST) for the United-States • H. Yuan The determination of soil physical and chemical properties in Quzhou County by dry spectroscopy methods • P. Yang How to estimate hidden soil degradation? • G. Ros Agronomic relevance of extracted organic nitrogen • P. Ehlert Phosphorus fertilizer recommendation for potato based on a combined soil phosphorus indicator 	Session leader: Hans-Werner Olf	Plenary

17.30

Opening reception & Poster walk







TUESDAY 18 JUNE 2019

08:30	Welcome coffee & registration			Lobby
09.00		Day start	Prof. Oene Oenema ISSPA co-chair	Plenary
09:15		Manure quality assessment and management decision support in integrated farming systems	MANURE Dr. Shamie Zingore (Kenia)	Plenary
09.45	 	<p>Poster session II - MANURE 2-minute pitch</p> <ul style="list-style-type: none"> M. Piepel On-farm quick tests for determination of nitrogen concentrations in liquid manures D. M. Sullivan Interpreting compost analyses S. Bhatta Effect of biochar and various sources of organic manures in soil properties and yield of cabbage (<i>Brassica oleracea</i> var <i>capitata</i>) H.-W. Olfs VDLUFA EU Fertilizer Ring Test – A European-wide interlaboratory comparison program <p>Poster session II - PLANT</p> <ul style="list-style-type: none"> Z. Spiak Different extraction methods for Phytoavailable Molybdenum Determination in Red Clover (<i>Trifolium Pratense</i> L.) N. Al-Ghumaiz Iron, manganese and copper concentrations of spring wheat genotypes under organic and inorganic fertilization E. Nagol Assessing spatial-temporal variability of input responses across agro-ecological zones in Tanzania 	Session leader: Rodrigo Ortega	Plenary
10.15	Coffeebreak			Lobby
10.40		<p>MANURE session</p> <ol style="list-style-type: none"> Development of a toolbox with on-farm quick tests for nutrient analysis in liquid manures Application of NIRS to determine the chemical composition of solid animal manure Economic and environmental assessment of using a near-infrared sensor to detect, control, and optimize liquid manure application Innovative laboratory techniques for added value manure 	<p>Session leader: Shamie Zingore</p> <ol style="list-style-type: none"> H.-W. Olfs (Germany) R.P. J. J. Rietra (NL) Y. N. Karatay (Germany) R. Wolf (NL) 	Subrooms






TUESDAY 18 JUNE 2019 (CONTINUATION)

10.40		SOIL sessions III chemistry 1. Assessment of LIBS for the determination of soil organic carbon 2. Potassium pool dynamics and soil texture 3. The impact of chelates on availability of micro nutrients Part 1 4. The impact of chelates on availability of micro nutrients Part 2	Session leader: Paul Kennelly 1. R. Miller (USA) 2. J. Rongen (NL) 3. M. Bugter (NL) Nouryon 4. M. Bugter (NL) Nouryon	Plenary
12.00	Lunch & Posterwalk II			Lobby
13.00		National scale nutrient management to realize food security and environmental sustainability	PLANT Dr Fusuo Zhang (China)	Plenary
13.30		Macroinvertebrates as indicators of soil quality in assessment and restoration programs	SOIL Biology Prof Patrick Lavelle	Plenary
14.00	Short break			Lobby
14.15		PLANT sessions I 1. Measuring P deficiency in maize leaves: comparing spectral and wet chemical measurements under tropical conditions 2. Mineral composition and symptoms of nutritional deficiencies in plants Mexican sunflower (<i>Tithonia diversifolia</i> .) (Hemsl.) A. Gray 3. Nutritional composition of sugarcane residues from fourteen commercial varieties in Zimbabwe 4. Space-time statistical analysis and modelling of nitrogen use efficiency indicators at provincial scale in China 5. Dry leaf tissue and plant sap analyses compared	Session leader: Jan-Roger Sorby 1. P. Ravensbergen (NL) 2. L. Gonzaga Sánchez Moreno (Columbia) 3. W. Mutatui (Zimbabwe) 4. L. Yingxia (China) 5. J. Hardeman (NL)	Subroom



TUESDAY 18 JUNE 2019 (CONTINUATION)

14.15		SOIL sessions IV biology <ol style="list-style-type: none"> 1. Implementation of routine soil life analyses for agricultural practices 2. Improvement of lateral flow assays for potato pathogens detection through DNA amplification 3. Biological soil quality indices for evaluation of land management practices-A case of bench terracing in Southern Rwanda 4. The role of soil mesoarthropods in controlling nutrient release on different agroforestry 5. Field specific mineralisation rate of SOC 	Session leader: Oene Oenema <ol style="list-style-type: none"> 1. N. Poot (NL) 2. I. V. Safenkova (Russia) 3. P. Rwibasari (Rwanda) 4. T. S. Syamsudin (Indonesia) 5. M. Hanegraaf (NL) 	Plenary
16.05		Afternoon break		Foyer
16.30		PLANT sessions II <ol style="list-style-type: none"> 1. Site specific fertilizer recommendation for maize in Ethiopia: analytical approach 2. The impact of field headlands on crop performance in Irish arable fields 3. Ecological intensification improves maize production and nitrogen efficiency with lower environmental costs 4. Biomass and nutrient stocks in cocoa 5. Tba 	Session leader: Tom Schut <ol style="list-style-type: none"> 1. W. Kenea (Ethiopia) 2. M. Ward (Ireland) 3. P. He (China) 4. L. Woittiez (Africa & South-America) 5. J. Shen 	Subroom
16.30		SOIL sessions V AgroCares Use of NIR, MIR and XRF sensor technology in routine soil testing <ol style="list-style-type: none"> 1. Analysing the effect of laboratory errors on soil amendment 2. Routine soil testing using sensor technology: which sensors fit best? 3. Relating soil sensor spectra to soil nutrient status via machine learning techniques 4. Soil spectroscopic applications dealing with within field soil variation – showcase for variable rate liming 5. From soil test to impact: a matter of adoption and scaling 	Sessionleader: Dr. M. Luleva <ol style="list-style-type: none"> 1. G.B.M. Heuvelink (NL) 2. H. Vedder (NL) 3. G. Holmes (New Zealand) 4. Terhoeven-Urselmans (Germany) 5. C. van Beek (NL) 	Subroom
18.00		Closing		Foyer
19.00		Diner Optional		



WEDNESDAY 19 JUNE 2019 | FIELDTRIP 1

On our field day we would like to introduce you to leading companies, initiatives and techniques. You can register for one of the three field trips from Monday. You will be transported by bus and accompanied by the ISSPA2019 working group. We will end the day together at a fantastic location for our conference dinner. Have a nice day!

Departure 08.30

Return to Wageningen Berg by bus at 22.30 and 23.00

Morning program | Aeres University of Applied Sciences, Dronten

The agri-food sector is innovative and growing. But we also know that steering on profit alone is a thing of the past. Companies are therefore paying more and more attention to Corporate Social Responsibility (CSR) and to the smart use of data (smart economy). The Vital agribusiness research line therefore focuses on themes such as big data, smart farming, the biobased economy and the circular economy. From the professorships we take serious steps in smart (digital) methods, technologies, the realization of green energy and the reuse of raw materials. This morning we will start with a welcome presentation followed by a tour in the soil physical laboratory, the greenhouse, and tours at the arable - and dairy farm.

Afternoon program | WUR Lelystad

The call for a circular, biobased economy is getting louder and louder. An increasing number of citizens, businesses, and politicians are realising that the reuse of products and reclaiming of natural resources is of great importance for ourselves and for the planet on which we live, if we want to move forward towards a sustainable future. Wageningen University & Research is working on solutions to make the circular, biobased economy a reality. This afternoon we will visit the agricultural production and trial fields in this reclaimed polder.

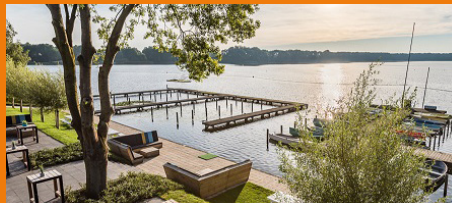


Conference dinner

Welcome & opening by Inez Sinia, local organizing committee

Introduction by Ruud Zantman, IBL director Eurofins Agro

Innstyle | Maarsseveenseplassen | Herenweg 55 | Maarssen



WEDNESDAY 19 JUNE 2019 | FIELDTRIP 2

On our field day we would like to introduce you to leading companies, initiatives and techniques. You can register for one of the three field trips from Monday. You will be transported by bus and accompanied by the ISSPA2019 working group. We will end the day together at a fantastic location for our conference dinner. Have a nice day!

Departure 08.40

Return to Wageningsche Berg by bus at 22.30 and 23.00

Morning program | WUR Wageningen

The fieldtrip to Wageningen University will include 4 short demonstrations with examples of the latest developments in use of sensors from various platforms to monitor functioning and status of plants and crops. The tentative program includes an applications to automatically quantify the functioning of the photosynthetic capacity of plants, spectral characterization and image-based detection of diseased plants in the field using artificial intelligence and monitoring of crop growth and condition in the field using various types of drones.



Afternoon program | Eijkkelkamp Giesbeek

This afternoon the state of art in solutions for soil and water research will be presented

Meet the difference! | Personal attention and a unique range of solutions: for more than 100 years, this has been our trademark at Royal Eijkkelkamp. Royal Eijkkelkamp has been devising, developing, producing and delivering smart solutions for soil and water projects worldwide since 1911. These innovative solutions, together with the existing knowledge and expertise of our soil and water specialists, have served to raise projects to a higher level. From old measurement equipment to smart sensing & sampling and from Edelman augers to sonic drilling machines, Royal Eijkkelkamp has quite a range on offer.



Conference dinner

Welcome & opening by Inez Sinia, local organizing committee

Introduction by Ruud Zantman, IBL director Eurofins Agro

Innstyle | Maarsseveenseplassen | Herenweg 55 | Maarssen



WEDNESDAY 19 JUNE 2019 | FIELDTRIP 3

On our field day we would like to introduce you to leading companies, initiatives and techniques. You can register for one of the three field trips from Monday. You will be transported by bus and accompanied by the ISSPA2019 working group. We will end the day together at a fantastic location for our conference dinner. Have a nice day!

Departure 08.30

Return to Wageningsche Berg by bus at 22.30 and 23.00

Morning program | Harry's Farm

We will visit the arable farm of Harry Schreuder, situated in the reclaimed polder nearby the towns Swifterbant and Lelystad. Harry and his wife manage this 49 hectare farm since 1995. The young calcareous marine soil has a soil organic matter content of 2.6%, and clay percentage of about 25%. Winter wheat, ware potato, sugar beets, and seed onions are part of the crop rotation. The farm has a field borders as part of several nature conservation project. The farmer is also part of the Dutch farmers group: Veldleeuwerik. Veldleeuwerik is part of the Skylark Foundation. Skylark Foundation is a knowledge platform of growers and partners. This morning we will visit the farm.



Afternoon program | Lelystad farmer

The arrival of the airport has unleashed entrepreneurship in us. We see opportunities that manifest themselves in the supply of healthy local food at the airport and in the city, CO²-saving initiatives, sustainable management of reserved land, green energy, recycling and composting, capacity in maintenance of the airport and the connection between the city and country. We have split all opportunities for ourselves into four tracks: - We want to encourage our own environment to eat locally; - Deploy us as steward of the area; - We stand for sustainable management of the environment; - And want to have social significance. This afternoon we will visit this arable farm.



Conference dinner





Welcome & opening by Inez Sinia, local organizing committee

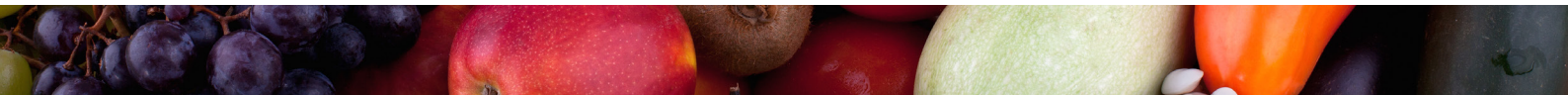
Introduction by Ruud Zantman, IBL director Eurofins Agro

Innstyle | Maarsseveenseplassen | Herenweg 55 | Maarssen



THURSDAY 20 JUNE 2019

08:30	Welcome coffee			Lobby
09:00		Day start	Dr. Arjan Reijneveld ISSPA co-chair	Plenary
09:10		The impact of low soil mineral density on human mental health	PRODUCT Bonnie J. Kaplan (USA)	Plenary
09:50		Improving the farming system with improved analytics of soils and plants in Australian context	SYSTEM PhD Lindsay Bell (Australia)	Plenary
10.30	 	<p>Poster session III - PRODUCT 2-minute pitch</p> <ul style="list-style-type: none"> D. Roy Production Strategy – plants need organic fertilizer to grow in a balanced way <p>Poster session III - SYSTEM</p> <ul style="list-style-type: none"> E. Pereira Andrade Comparison between three different approaches to estimate soil nitrogen emissions H. Bartlema A demonstration project on 4 R Nutrient Stewardship in circular agriculture and its certification M. Hoogsteen Towards an integrated agro-food policy with Big Data A. Schoonbergen Using pyrolysis GC-MS, POXC and PLFA to determine organic matter dynamics in brassica seed production O. Yüzügüllü Soil Zoning - The next level of precision agriculture M. M.Taboada-Castro Physicochemical properties of top soils under different land uses in Northwest Spain M. L. Rodríguez-Blanco Copper and zinc as potentially bioavailable micronutrients in agricultural soils of moderately acidic pH L. van Schöll Soil Index: evaluation tool for soil quality W. Dijkman Valuing and fostering soil quality by agricultural stakeholders G. Huluka Soil quality and agronomic yield of Alabama soils 	Session leader: Martin Vervoorn	Plenary




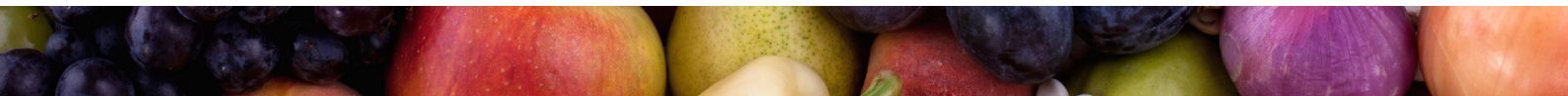
THURSDAY 20 JUNE 2019 (CONTINUATION)

11.00	Morning break			Lobby
11.30		PRODUCT sessions <ol style="list-style-type: none"> 1. Nitrogen uptake and yield response of corn (Zea mays L.) to Proximus®, a proprietary carbon-based substance used as nitrogen fertilizer additive 2. Agronomic biofortification using specialty plant nutrition to prevent iodine and other micronutrient deficiencies disorders in both plants and humans: examples from practice. 3. The relationship between N:S ratio, protein yield and protein quality of grass grown on sandy soils 4. Comparison of NIRS and wet chemistry methods for the nutritional analysis of haylages for horses 	Session leader: Nanna Holst Kjellingbro <ol style="list-style-type: none"> 1. L. Sonon (USA) 2. K. Hora (Belgium) 3. PG. Abbink (NL) 4. K. M. Brolsma (NL) 	Plenary
11.30		SYSTEM sessions III <ol style="list-style-type: none"> 1. Predictive Crop Growth Simulation Model; Used to predict the yield of starch potato fields in the Netherlands 2. A GIS based model for matching nutrient supply from human urine with demand of peri-urban agriculture 3. KringloopWijzer: a tool for the monitoring of the agronomic and environmental performances of grassland-based dairy farms 4. Exploring the demand for recycling-derived fertilizers in N.W. Europe 	Session leader: Pedro Magelhaes <ol style="list-style-type: none"> 1. A. Medema (NL) 2. J. Weijma (NL) 3. J. Oenema (NL) 4. R. Postma (NL) 	Subroom
12.45	Lunch & Posterwalk III			Lobby
13.30		SYSTEM sessions IV <ol style="list-style-type: none"> 1. Is soil analysis data of real value for smallholder farmers? 2. A time tested improvement to the traditional soil testing paradigm 3. Can we derive a proxy for the carbon stabilization potential of soils? 4. Exploring future food provision scenarios for China 	Session leader: Christian Guillaume Marchal <ol style="list-style-type: none"> 1. T. Schut (NL) 2. K. J. Greer (Canada) 3. M. Hoogsteen (NL) 4. L. Ma (China) 	Subroom



THURSDAY 20 JUNE 2019 (CONTINUATION)

13.30		SOIL sessions VI biology <ol style="list-style-type: none"> 1. Routine nematode screening through qPCR analysis 2. Effect of nitrogen-fixing bacteria under three levels of nitrogen fertilization on tomato <i>Solanum lycopersicum</i> crop physiology and production. 3. The effects of mycorrhizas on concentration and uptake of K, Ca, Mg and Na by grasses and legumes grown on soil treated with different levels of phosphorus. 4. Potential N mineralization rates in soil: an agronomic assessment 	Session leader: Daniel Robinson <ol style="list-style-type: none"> 1. N. Poot (NL) 2. A. Gómez Duque (Columbia) 3. Z. Mkile (South Africa) 4. G. Ros (NL) 	Subroom
14.50	Afternoon break			Lobby
15.15		Award session & closing remarks	Dr. Arjan Reijneveld Prof. Oene Oenema	Plenary
15.45	Welcome drinks Farewell reception Oene Oenema			Lobby
16.15		Welcome	J.A. (Bram) de Vos WUR	Plenary
16.20		Nutrient management tools and challenges in the Netherlands	G.L. (Gerard) Velthof WUR	Plenary
16.40		Towards International nutrient management	M.A. (Mark) Sutton	Plenary
17.00		Need for interactions between science practice - policy	F. (Frank) Kooiman Ministry of Economic Affairs	Plenary
17.10		Perspectives of nutrient management	Prof. Oene Oenema	Plenary
17.20		Farewell reception Oene Oenema		Lobby
20.00		Farewell & Goodbye		Lobby



FRIDAY 21 JUNE 2019 | LABTOUR (ONLY AFTER REGISTRATION)

Morning program | Eurofins

Eurofins Agro wants to provide farmers and their advisors insight into - among others - soil fertility, plant nutrition, crop health, feed value and food safety. As leading laboratory in the agricultural sector we supply innovative analyses and clear, case-specific recommendations, to optimize farm management. The Friday morning meeting at Eurofins Wageningen will start with a few presentations on i) our international network of laboratories, ii) NIR analyses for manure, feed, forage, and soil, and on iii) DNA and PLFA testing for nematodes and other soil life. We will also address innovations in iv) horticultural analyses and v) quality aspects of agricultural analyses. After the presentations the laboratory tours will show the production process.

- 08:15 Departure from hotel
- 08:45 Arrival at Eurofins Agro
- 09:10 Welcome, Introduction Eurofins – Han van de Goor (Manager International Sales)
- 09:20 Soil and forage analyses, NIRS – Han van de Goor (Manager International Sales)
- 09:50 Nematode analyses – Natasja Poot (Product Manager Nematodes)
- 10:10 Horticultural analyses – Theo Aanhane (Business Unit Manager Horticulture)
- 10:30 Agricultural analyses: reliability – Joris van Benthum (Business Unit Manager Agriculture)
- 10:50 Parallel laboratory tours: Horticulture & Soil/forage
- 12:15 Lunch & departure



Afternoon program | WUR

In the afternoon we will visit WEPAL and Wageningen Food Safety Research (WFSR). The mission of WEPAL is to organize proficiency testing schemes that contribute to maintaining and improving the quality of laboratories worldwide which specialize in soil quality and related fields.

Wageningen Food Safety Research is an organization with a unique combination of high-quality analyses, research and reference tasks. In this way the institute delivers an important contribution to safe and trustworthy food and feed. Wageningen Food Safety Research primarily works for government authorities and is specifically commissioned by the Netherlands Food and Consumer Product Safety Authority.

- 12:45 Welcom at WEPAL
- 13.00 Start WEPAL tour
- 14.15 Departure WEPAL
- 14.30 Arrival Wageningen Food Safety Research (WFSR)
- 14.45 Tour "Analyses of Food quality and safety"
- 16.00 Departure WFSR
- 16.15 Arrival Wageningsche Berg



Thank you for joining ISSPA2019!
Have a safe trip home