EWRS Webinar Series 2021

Moderators

WG Education and Training

Lena Ulber
Julius Kühn-Institut
Germany

lena.ulber@julius-kuehn.de

Maor Matzrafi
Agricultural Research Organization
Israel

maorm@volcani.agri.gov.il

Communication Officers

Camilla Moonen
Sant'Anna School of Advanced Studies
Italy

camilla.moonen@gmail.com

Sabine Gennai-Schott
Freelance
Italy

sabine.gennaischott@gmail.com

Introduction to the EWRS Webinar Series 2021

The European Weed Research Society (EWRS) is an international organization which promotes and co-ordinates scientific research into all aspects of weed science. This year, EWRS members got together to develop a webinar series covering up-to-date topics that are of interest to everyone involved in weed science and management. Join this webinar to learn about the latest science, tools and management practices for a sustainable weed management.
All the webinars in this series are in English and will be broadcasted in Central European time. Each webinar will have two weed scientists giving presentations for about 35 minutes and there is opportunity for viewers to ask questions via the web portal.
For more information on each webinar or to register for free, please visit the EWRS website at ewrs.org/en/info/Upcoming-events. Recorded webinars can be viewed at a later date by visiting the EWRS website.

Programme

25 FEBRUARY **THE FUTURE OF WEED SCIENCE IN EUROPE**	
14.00-14.45	**Prof. Paolo Barberi:** ***Weed Science in a changing world: Perspectives for academic research and curricula.***
14.45-15.30	**Dr. Hansjörg Krähmer:** ***Challenges and Opportunities for Weed Science in the EU.***
3 MARCH **INNOVATIONS IN SITE-SPECIFIC WEED MANAGEMENT**	
14.00-14.45	**Prof. Roland Gerhards:** ***Site-specific weed management, automization and robotics.***
14.45-15.30	**Dr. Ran Lati:** ***Hyperspectral Imaging- New Opportunities for Precise Weed Management and Phenotyping.***
10 MARCH **NOVEL RESEARCH AND APPLICATIONS FOR INTEGRATED WEED MANAGEMENT**	
14.00-14.45	**Prof. Per Kudsk:** ***IPM legislation and implementation in the European Union.***
14.45-15.30	**Dr. Marleen Riemens:** ***An IWM framework to support design and adoption of IWM strategies at farm level.***
24 MARCH **HERBICIDE RESISTANCE IN EUROPE: MANAGEMENT AND MOLECULAR APPROACHES**	
14.00-14.45	**Dr. Stephen Moss:** ***Herbicide resistance: does the practice differ from the theory?***
14.45-15.30	**Dr. Deepak Kaundun:** ***DNA and OMICS technologies in herbicide resistance research.***
31 MARCH **INVASIVE WEEDS AND CLIMATE CHANGE**	
14.00-14.45	**Dr. Guillaume Fried:** ***Pest Risk Analysis or how to avoid introduction and spread of new invasive alien plants. A case-study with*** **Ambrosia trifida** ***in Europe.***
14.45-15.30	**Dr. Yan Sun:** ***Rapid evolution of a plant invader in response to biocontrol and climate change.***

25 February 2021 – The future of Weed Science in Europe

Prof Paolo Bàrberi – Sant'Anna School of Advanced Studies, Italy

Weed Science in a changing world: perspectives for academic research and curricula

Short CV

Paolo Bàrberi is Professor in Agronomy and Field Crops at the Sant'Anna School of Advances Studies in Pisa. His research is focused on Functional Agrobiodiversity, Weed Ecology and Integrated Weed Management, and the design of agroecological low-input and organic cropping/farming systems. He collaborates with the FAO, the European Commission, and EFSA. He has served as Scientific Secretary and President of the EWRS from 2002 to 2015. He is Vice-President and co-founder of Agroecology Europe as well as Board member and co-founder of the Italian Association of Agroecology (AIDA). www.santannapisa.it/en/personale/paolo-barberi

Content

More than ever, the present pandemics is highlighting the fact that we are living in an interconnected world, where both positive and negative dynamics are accelerated. This calls for a system approach to sustainable economy and agriculture, which is clearly advocated by the EU Green Deal and the related strategies. How is this going to affect European agriculture? What will be the place of weed management and weed science in such new perspective? Can we envisage a radically new approach to weed research and teaching in academic curricula? The webinar will highlight the challenges and opportunities for weed science of emerging paradigms aimed to foster sustainability.

Dr. Hansjörg Krähmer – Bayer AG, Germany

Challenges and Opportunities for Weed Science in the EU

Short CV

- PhD degree in Biology, Chemistry and Physics
- 40 years in Herbicide and Plant Growth Regulator Research
- 2 years in Market Development, Wilmington DE;
- 2 years in Marketing: Liberty in corn
- Former EWRS and WPG board member
- More than 50 publications, 3 books, several book chapters and more than 30 patents
- Presently consultant for several institutions

Content

My presentation will be structured along the following agenda:

- What makes weeds interesting?
- Weed control as an essential tool of crop production
- Why is agriculture so efficient today?
- Long-term global and regional trends
- Which factors play a major role in weed infestation?
- Chemical weed control research
- Outlook and perspectives

3 MARCH 2021 – Innovations in Site-specific Weed Management

Prof. Roland Gerhards – University of Hohenheim, Germany
Site-specific weed management, automization and robotics

Short CV
Prof. Gerhards is full professor of Weed Science at the Agricultural Faculty of the University of Hohenheim. He obtained a Ph.D. in Agricultural Sciences at the University of Bonn in 1993. He teaches Weed Biology, Weed Control, Precision Farming and Integrated Crop Protection. Within the Erasmus Sokrates Program he gives invited lectures at the Czech University of Life Sciences in Prague. Currently, his research focusses on IWM Systems, Precision Farming in Weed Management, Sensor- and application technologies in Crop Protection. He is a member of the German Phytomedicine Society and the EWRS. He has a (co-)authored 146 papers in peer-reviewed journals.

Content
In Precision Weed Management, sensor technologies, decision algorithms and precise application technologies are integrated and they communicate with each other. Five examples are presented for successful Precision Weed Management: Online patch spraying in maize; Offline site-specific weed control in cereals, maize and sugar beet; Online camera-controlled inter-row hoeing; Online camera-controlled harrowing; Weed scouting based on neural networks. The five systems have been integrated in farming systems because they are robust and easy to handle for the end-users.

Dr. Ran Lati – Agricultural Research Organization (ARO)- Volcani Center, Israel
Hyperspectral Imaging- New Opportunities for Precise Weed Management and Phenotyping

Short CV
Dr. Ran Lati studied Crop Protection at The Hebrew University of Jerusalem and received his PhD from the Department of Mapping and Geo-Information Engineering in The Technion, at 2012. He completed a postdoctoral fellowship at the Plant Sciences Department, UC Davis. Since 2015, he works as a research scientist in the Department of Plant Pathology and Weed Research in Newe Ya'ar Research Center (ARO). He is currently focusing on different aspects of precision weed management and development and integration of non-chemical weed control methods.

Content
Hyperspectral imaging detects signals in a series of continuous channels with a narrow bandwidth. These sensors can monitor slight changes in various biochemical, biophysical and physiological plant properties, detect plants stress and provide detailed plant phenotyping. Hyperspectral cameras are not widely used for precision agriculture purposes due to their high costs. In recent years, different mini-sized and low-cost airborne hyperspectral sensors have been introduced. Advanced space-borne hyperspectral sensors have also been or will be launched in the near future, making hyperspectral imaging widely available for agricultural applications. This talk aims to demonstrate some of the potential contribution that hyperspectral imaging has to offer for the field of precise weed management and phenotyping.

10 MARCH 2021 – Novel research and applications for Integrated Weed Management

Prof. Per Kudsk – Aarhus University, Denmark

IPM legislation and implementation in the European Union

Short CV

Per Kudsk is Professor and Head of the Crop Health Section at the Department of Agroecology at Aarhus University in Denmark. He has done research on various aspects of weed management but recently he has become increasingly involved in research focusing on Integrated Pest Management. He has co-ordinated several (inter)national research projects. Currently he is coordinating the EU H2020 project IWMPRAISE. He served as President of the EWRS from 2008 to 2009. In 2014, he was appointed Honorary Member of the Weed Science Society of America. He is regularly involved in research based policy support on IPM and other crop protection issues

Content

Pesticide legislation in the European Union (EU) is generally considered the most comprehensive and stringent in the world. Directive 2009/118, the so-called Sustainable Use Directive (SUD), provides a framework to achieve sustainable pesticide use and to promote low-pesticide farming in the EU. The SUD introduced the term IPM into the EU legislation. In the webinar, some of the initiatives taken to develop and promote the implementation of IPM will be presented and the perspectives for future weed management in the EU

Dr. Marleen Riemens – Wageningen University and Research, Plant Research International B.V., The Netherlands

An IWM framework to support design and adoption of IWM strategies at farm level

Short CV

Dr. Ir. Marleen Riemens studied Plant Breeding and Crop Protection at Wageningen University and obtained a PhD from the Crop and Weed Ecology group in 2009. Since 2003 she works at Wageningen University and Research Centre (WUR) at different groups in different positions. She is currently head of the scientific research team Crop protection that focusses on IPM (Integrated Pest Management) in an ICM (Integrated Crop Management) context in arable and vegetable production systems at WUR. https://www.wur.nl/en/Persons/Marleen-dr.ir.-MM-Marleen-Riemens-PhD.htm

Content

IWM is a part of integrated crop management (ICM) and adoption of IWM is an important driver for ICM. Within the project IWMPRAISE we developed a novel framework for integrating and implementing existing and novel approaches to IWM. One of the barriers to the uptake of IWM is that it requires the replacement of a simple system based on herbicides with a more complex, knowledge intensive system. During this webinar the framework for IWM, current perspectives of farmers and experts on IWM and practical examples of IWM integration in a broader ICM context in demonstration and farmer fields are presented and discussed.

24 MARCH 2021 – Herbicide resistance in Europe: management and molecular approaches

---

Dr. Stephen Moss – Stephen Moss Consulting, UK

Herbicide resistance: does the practice differ from the theory?

Short CV

Retired from Rothamsted Research in 2015 and now operates independently. His research includes the agro-ecology of grass-weeds, factors affecting herbicide performance, herbicide resistance and IWM strategies. Has published over 250 research papers, book chapters and technical reports, contributed to over 350 articles in the popular farming press and given hundreds of talks, demonstrating the importance he attaches to active knowledge transfer.

Content

Herbicide resistance has evolved in 263 weed species in 71 countries (weedscience.org). Theoretical concepts considered important in resistance evolution include: the background incidence of resistance; characteristics of affected species and herbicides; and fitness and dose rate studies. The presentation will question their value in practice and suggest novel studies and approaches aimed at improving practical resistance prevention and management.

Dr. Deepak Kaundun – Syngenta, UK

DNA and OMICS technologies in herbicide resistance research.

Short CV

Deepak Kaundun is a Syngenta Fellow and has lead herbicide resistance research for the company for the last 16 years. His work includes 1) development and local implementation of simple assays for the proactive detection of resistance, 2) elucidation of resistance mechanisms, 3) assessment of resistance-breaking compounds in research and development, 4) computer-based modelling of herbicide resistance and 5) dissemination of research results and promotion of good management practices.

Content

Recent advances in DNA and 'omics' technologies have greatly enhanced our understanding of evolved herbicide resistance in weeds. Here we describe their use in the unambiguous confirmation of resistance especially when the resistance level is low, in determining the evolutionary dynamics of resistance, in unravelling complex non-target-site based resistance mechanisms and in assessing the pleiotropic effects associated with resistance traits. We also highlight the challenges posed by the high genetic variability of weed species.

---

31 MARCH 2021 – Invasive Weeds and climate change

Dr. Guillaume Fried, ANSES, France

Pest Risk Analysis or how to avoid the introduction and spread of new invasive alien plants. A case-study with* Ambrosia trifida *in Europe.

Short CV

I am a botanist and weed ecologist working at Anses (French Plant Health Laboratory). My research work is aimed at assessing the impact of human activities on the environment. I study two main models: 1) the effects of alien plants introduction and their impact on wild vegetation or crops, and 2) the impact of agricultural practices on the flora of cultivated fields and field borders. I use and test hypotheses of community ecology with functional approaches.

Content

Phytosanitary regulations are part of the preventive strategies that can help to avoid the introduction of new invasive alien weeds and/or to organise an official and coordinated control of recently introduced weeds that are still localised. The case of *Ambrosia trifida* will be developed on the basis of the recent pest risk analysis carried out on this species by the European and Mediterranean Plant Protection Organisation (EPPO).

Dr. Yan Sun – University of Fribourg, Switzerland

Rapid evolution of a plant invader in response to biocontrol and climate change

Short CV

2017-present	University of Fribourg, Switzerland, Postdoc
2016-2017	University of Tübingen, Germany, Postdoc
2014-2015	University of California, Berkeley, USA, Postdoc
2009-2013	University of Fribourg, Switzerland, PhD

Content

In 2016, we started an experimental evolution study to get insights into the evolvability to a biocontrol insect and global warming of the European plant invader, *Ambrosia artemisiifolia*. I will present the genomic and metabolomic differentiations, some of our phenotyping results of the offspring plant performance and resistance in common environment, and preliminary results of soil abiotic property and microbial differences among different field selection treatments.