

# 14th European Conference on Precision Agriculture

## Bologna - Italy, 2-6 July 2023

Congress Center - Hotel Savoia Regency



UNLEASHING THE POTENTIAL OF PRECISION AGRICULTURE

## PROGRAM

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(Leibniz-Institut für Agrartechnik und Bioökonomie, Germany)

## SUNDAY 2 JULY 2023

17.00 – 18.00 Participants' Registration  
18.00 – 19.30 Welcome Cocktail

## MONDAY 3 JULY 2023

### ROOM 1

09.00 -10.30

#### PLENARY SESSION

09.00

WELCOME ADDRESS

09.45

**The Future Of Precision Agriculture**  
Raj Khosla (Kansas State University, USA)

10.30

COFFEE BREAK

### ROOM 1

11.00 – 12.00

#### GENERAL PERSPECTIVES

11.00

*Precision Agriculture: Addressing Adoption Gaps with Open-Source System Design*  
M. L. Everett (University of Idaho, USA)

11.15

*What is the adoption of Precision Agriculture over Europe? A case study on remote sensing*  
T. Pavlenko (Hochschule Geisenheim University, Germany)

11.30

*A monitoring system to track adoption of digital technologies in agriculture over time*  
A. Gabriel (Technische Universität München, Germany)

11.45

*Impact of public policy strategies on the adoption of precision agriculture: the case of the Greek potato agricultural system*  
G. V. Vlontzos (University of Thessaly, Greece)

### ROOM 1

12.00 – 13.00

#### EDUCATION AND TRAINING

12.00

*Towards a digital twin for optimal field management*  
M. Pastell (Natural Resources Institute Finland, Finland)

12.15

*How to teach precision agriculture through reverse engineering pedagogy?*  
B. Ploteau (Institut Agro Montpellier, France)

### ROOM 1

12.30 *Gamification for communicating the advantages of precision farming: The Farming Simulator case*

D. S. Paraforos (Hochschule Geisenheim University, Germany)

12.45 *How to design relevant PA training courses for technical advisors*

L. Pichon (Institut Agro Montpellier, France)

13.00

LUNCH

### ROOM 1

14.30 – 16.15

#### AUTONOMOUS VEHICLES

14.30 *Drivers for robot use in field crop farming: farmers' perspectives from four case areas in Europe*

T. W. Tamirat (University of Copenhagen, Denmark)

14.45 *Economics of autonomous machines for regenerative agriculture*

A. Al Amin (Harper Adams University, UK)

15.00 *Optimal use of an agricultural robot in an arable crop rotation: a case study in the Netherlands*

J. E. Ørum (University of Copenhagen, Denmark)

15.15 *Collaborative Smart-Robot for Yield Mapping and Harvesting Assistance*

M. N. Conejero (Consejo Superior Investigaciones Científicas, Spain)

15.30 *Enhancing navigation benchmarking and perception data generation for row-based crops in simulation*

M. Martini (Università di Torino, Italy)

15.45 *Fields2Cover open-source library: A modular approach to agricultural coverage path planning*

G. Mier (Wageningen University and Research, Netherlands)

16.00 *Follow the leader: A trajectory generator and controller for precision tree scanning*

C. Grimm (Oregon State University, USA)

16.15

COFFEE BREAK

### POSTER AREA

POSTER PRESENTATION AND POSTER SESSIONS

17.30 – 19.00

GROUP & SOCIETY MEETINGS

### ROOM 2

09.00 -10.30

#### PLENARY SESSION - (ROOM 1)

10.30

COFFEE BREAK

### ROOM 2

11.00 – 13.00

#### SURFACE CHARACTERISATION

11.00

*Unleashing precision agriculture data for improve soil carbon accounting*  
T. Bishop (The University of Sydney, Australia)

11.15

*Crop recognition at orchard level in Mediterranean conditions using time series of spectral indexes*  
H. Izquierdo (Instituto Valenciano de Investigaciones Agrarias, Spain)

11.30

*Impact of changing attributes on the management zones for integrated crop-livestock system*  
H. Oldoni (University of Campinas, Brasil)

11.45

*Technological approach to evaluate the livestock trampling effect on soil compaction*  
J. M. Serrano (Universidade de Évora, Portugal)

12.00

*Long-term evaluation of the Grassmaster II probe used to estimate productivity of dryland pastures*  
J. R. Marques da Silva (Universidade de Évora, Portugal)

12.15

*Quantifying real-time opening disk load to assess compaction and potential for planter control*  
A. Sharda (Kansas State University, USA)

12.30

*Can the spatial structure of soil health indicators aid in Soil Health assessment?*  
E. M. Pena-Yewtukhiw (West Virginia University, USA)

13.00

LUNCH

### ROOM 2

14.30 – 16.00

#### NUTRIENTS MANAGEMENT

14.30

*Variable rate nitrogen in a potato-wheat-wheat cropping system*  
E. A. Flint (Utah State University, USA)

14.45

*Implementation of variable rate of inputs in winter crops under rainfed conditions*  
M. Videgain (Universidad de Zaragoza, Spain)

15.00

*Variable-rate fertiliser application to manage spatial variability in hilly vineyard of Prosecco PDO*  
M. Sozzi (Università di Padova, Italy)

15.15

*A Novel Approach of Map-Sensor-based Site-specific Nitrogen Fertilization in Winter Wheat*  
M. A. Munnaf (Ghent University, Ghent, Belgium)



### ROOM 2

15.30

*Using cover crops as reflectors of the spatial variation in soil nutrient availability*  
S. I. Futeran (Hebrew University of Jerusalem, Israel)

15.45

*Potential of the dark green color index for dynamic monitoring of N requirements in wheat crop*  
A. S. Voisin (INRAE; France)

16.00

COFFEE BREAK

### POSTER AREA

POSTER PRESENTATION AND POSTER SESSIONS

17.30 – 19.00

GROUP & SOCIETY MEETINGS

### ROOM 3

09.00 -11.00

PLENARY SESSION – (ROOM 1)

10.30

COFFEE BREAK

### ROOM 3

11.00 - 13.00

GENERAL METHODOLOGY 1

11.00

*Limits of Grain Yield Monitor Data to Evaluate Treatment Differences within On-farm Experimentation*  
J. P. Fulton (The Ohio State University, USA)

11.15

*Farmer-led on-farm experimentation enhanced with digital agronomy*  
L. Longchamps (Cornell University, USA)

11.30

*Introducing Bayesian priors to semi-variogram parameter estimation using fewer observations*  
Y. L. Zhang (Institut Agro Montpellier, France)

11.45

*A Bayesian Network approach for grain protein content prediction of winter wheat*  
M. Karampoiki (University of Hohenheim, German)

12.00

*A novel approach for field sampling optimization incorporating a generic operational cost constraint*  
M. Dumont (Institut Agro Montpellier, France)

12.15

*Changing How Agronomic Trials are Conducted: Modulated On Farm Response Surface Experiments (MORSE)*  
S. J. Shirtliffe (University of Saskatchewan, Canada)

13.00

LUNCH

**MONDAY 3 JULY 2023****ROOM 3**

14.30 - 16.00

**GENERAL METHODOLOGY 2**

14.30

*A new metric to evaluate spatialized crop model performances*

D. Pasquel (INRAE, France)

14.45

*Comparative Study of Interpolation Methods for Low-Density Sampling*

F. Hoffmann Silva Karp (McGill University, Canada)

15.00

*A statistical test to evaluate the relevance of auxiliary time-series to predict another time series*

B. Oger (Institut Agro Montpellier, France)

15.15

*Predicting grapevine harvest yield variables: application of a multivariate multiblock modelling*

A. Cheraiet (INRAE, France)

15.30

*Redesigning spatial On-Farm Precision Experiments for innovative vineyard crop protection*

O. Naud (INRAE, France)

16.00

**COFFEE BREAK****POSTER AREA****POSTER PRESENTATION AND POSTER SESSIONS**

Session: General Methodology

17.30 – 19.00

**GROUP & SOCIETY MEETINGS****TUESDAY 4 JULY 2023****ROOM 1**

09.00 – 11.00

**WEED & PEST MANAGEMENT 1**

09.00

*Trends and beliefs of precision farming technologies to reduce pesticide use and risks*

S. Fountas (Agricultural University of Athens, Greece)

09.30

*How can Precision Agriculture contribute to the 50 % pesticide reduction of Farm-to-Fork strategy?*

A. Escolà (Universitat de Lleida, Spain)

09.45

*Plant health assessment with thermal and multi-spectral UAV imagery in winter rye crops*

M. Schirrmann (Leibniz Inst. Agricultural Engineering and Bioeconomy, Germany)

**TUESDAY 4 JULY 2023****ROOM 1**

- 10.00 *Sugar beet disease detection based on remote sensing data and artificial intelligence*  
Y. Lebrini (UniLaSalle, France)
- 10.15 *Potato plant disease classification by using deep learning and sparse sensing*  
A. Vončina (Agricultural Institute of Slovenia, Slovenija)
- 10.30 *Detection of Fusarium oxysporum by hyperspectral imaging in strawberry plants*  
M. Perez-Ruiz (University of Seville, Spain)
- 11.00 COFFEE BREAK

**ROOM 1****11.30 – 13.00****WEED & PEST MANAGEMENT 2**

- 11.30 *Almond orchards pest management using remote sensing for targeted pest control and sanitation*  
A. Chen (The Hebrew University of Jerusalem, Israel)
- 11.45 *Establishment of a UAV-based phenotyping method for European Pear Rust in fruit orchards*  
S. Reim (Julius Kuhn Institute, Germany)
- 12.00 *Comparing satellite and high-resolution imagery for freeze damage detection in California vineyard*  
B. Sams (E&J Gallo Winery, USA)
- 12.15 *Evaluation of the competition between barley and different weed species from RGB images*  
C. Gée (INRAE, France)
- 13.00 LUNCH

**ROOM 1****14.30 – 16.00****PESTICIDE SPRAYING**

- 14.30 *Second-generation ultrasonic sensor in precision spraying: testing and actuation range refinement*  
A. Pagliai (Università di Firenze, Italy)
- 14.45 *Studying the pneumatic system of an air-assisted sprayer for adjusting pesticide dose rate variations and optimal sprayer adjustment.*  
A. Vigo-Morancho (Universidad de Zaragoza, Spain)

**TUESDAY 4 JULY 2023****ROOM 1**

- 15.00 *Efficient and safe spraying applications with UAVs in viticulture: The experimental field DIWAKOPTER*  
B. Poss (Hochschule Geisenheim University, Germany)
- 15.15 *Effects of canopy density-based airblast fan airflow adjustment on vines spray deposit*  
M. Grella (Università di Torino, Italy)
- 15.30 *Comparison between 60° and 30° hollow cone nozzles for targeted UAV-spray applications in vineyards*  
A. Biglia (Università di Torino, Italy)
- 15.45 *Adapting a conventional sprayer for real-time volume adjustment in vineyards*  
M. Gatti (Università Cattolica del Sacro Cuore di Piacenza, Italy)
- 16.00 **COFFEE BREAK**

**POSTER AREA****POSTER PRESENTATION AND POSTER SESSIONS**

17.30 – 19.00 **GROUP & SOCIETY MEETINGS**

**ROOM 2**

- 09.00 – 11.00 **CROP SENSING 1**
- 09.00 *Modeling the canopy reflectance to forecast tomato biomass for the precise nitrogen management*  
V. A. Cerasola (Università di Bologna, Italy)
- 09.15 *Field-scale winter wheat growth monitoring and yield forecasting using SAR and optical data fusion.*  
B. Buszke (Wasat Sp., Poland)
- 09.30 *Sensing management from space: predicting harvest dates*  
S. Y. Han (The University of Sydney, Australia)
- 09.45 *Evaluating the spectral response of cotton and corn to different cover crops using UAV imagery*  
J.M.P. Czarnecki (Mississippi State University, USA)
- 10.00 *Estimation of agronomic soil properties from multitemporal PRISMA satellite imaging spectroscopy*  
R. Casa (Università della Tuscia, Italy)

**TUESDAY 4 JULY 2023****ROOM 2**

10.15 *Hyperspectral sensing and mapping of soil fertility for amending within-field heterogeneity*  
Y. Inoue (University of Tokyo, Japan)

11.00 COFFEE BREAK

**ROOM 2****11.30 – 13.00 CROP SENSING 2**

11.30 *Visible-Near Infrared Diffuse Reflectance Spectra for Predicting Soil Nitrogen Mineralization Rate*  
F. Y. Ruma (Ghent University, Belgium)

11.45 *Vegetation indices from Sentinel-2 and PlanetScope images and their relationship with soybean yield*  
L. R. Amaral (University of Campinas, Brazil)

12.00 *Assessing the effectiveness of UAV-based multispectral imaging for detecting high-yielding varieties*  
M. P. Camenzind (Technische Universität München, Germany)

12.15 *After harvest yield mapping of winter wheat using data from satellites and combines*  
O. Alshihabi (Swedish University of Agricultural Sciences, Sweden)

12.30 *How accurate is straw cereal plant density estimation from spectral measurements at early stages*  
T. Yang (INRAE, France)

12.45 *Per-parcel high-resolution mapping of critical crop-growth parameters with proximal & remote sensing*  
Z. Kandylakis (National Technical University of Athens, Greece)

13.00 LUNCH

**ROOM 2****14.30 - 16.30 CROP SENSING 3**

14.30 *Assessing within-field soybean yield variability using textures over Sentinel images*  
R. G. Freitas (University of Campinas, Brazil)



## TUESDAY 4 JULY 2023

**ROOM 2**

- 14.45 *Dynamic tracking of wheat senescence based on UAV multispectral imaging and leaf spectroscopy*  
K. Yu (Technical University of Munich, Germany)
- 15.00 *UAV remote sensing of agronomic parameters and yield in chickpea and lentil*  
D. Marusig (Università di Trieste, Italy)
- 15.15 *Proximal and remote sensing to define different management zone and site-specific management of durum wheat crops*  
E. Romano (CREA, Italy)
- 15.30 *How to best compare remote sensing data versus proximal sensing data*  
Y. Valloo (Institut Agro Montpellier, France)
- 15.45 *Target-N: Sentinel-2 based nitrogen optimisation in Swedish winter wheat production*  
K. Persson (Swedish University of Agricultural Sciences, Sweden)
- 16.00 *Satellite-based analysis of biomass yields in heterogeneous fields*  
L. Hagn (Technische Universität München, Germany)
- 16.15 *Practical methods for aerial image acquisition and reflectance conversion using consumer cameras*  
C. Yang (USDA-ARS, USA)
- 16.30 COFFEE BREAK

**POSTER AREA**

## POSTER PRESENTATION AND POSTER SESSIONS

17.30 – 19.00 GROUP & SOCIETY MEETINGS

**ROOM 3**

- 09.00 – 11.00 MACHINE LEARNING 1
- 09.00 *Integrating neural networks, clustering analysis, and remote sensing for peanut maturity prediction*  
B. V. Ortiz (Auburn University, USA)

## TUESDAY 4 JULY 2023

## ROOM 3

- 09.30 *A novel machine learning approach to map 3D soil constraint variability*  
P. Filippi (The University of Sidney, Australia)
- 09.45 *Early prediction of durum wheat yield in Italy using a machine learning modelling framework*  
M. Fiorentini (Università Politecnica delle Marche, Italy)
- 10.00 *Use of unsupervised algorithms and auxiliary information to improve potato yield estimation*  
A. Uribeetxebarria (NEIKER, Spain)
- 10.15 *Automatic diagnosis of a multi-symptom grapevine disease by decision trees and graph neural network*  
A. Tardif (Laboratoire IMS, France)
- 10.30 *Grape counting in RGB videos – comparing two instance segmentation models*  
M. Ariza-Sentís (Wageningen University and Research, Netherlands)
- 11.00 COFFEE BREAK

## ROOM 3

- 11.30 – 13.00 **MACHINE LEARNING 2**
- 11.30 *Generalization of deep learning models to the semantic segmentation of natural images in vineyards*  
R. Marani (Università di Bari, Italy)
- 11.45 *Data augmentation techniques for grape bunch segmentation in natural images*  
R. Escobedo (Universidad de La Rioja, Spain)
- 12.00 *Cassava Detection under Real Field Conditions using YOLOv5*  
E. C. Nnadozie (Technische Universität München, Germany)
- 12.15 *Quantifying Wheat Spikes through Smartphone Camera and YOLOv5 under open field conditions*  
F. Marinello (Università di Padova, Italy)
- 12.30 *Apple fruit sizing through low-cost depth camera and neural network application*  
G. Bortolotti (Università di Bologna, Italy)
- 12.45 *Improving the Generalization Ability of Random Forest for Potato Chlorophyll Estimation*  
Y. Haibo (Technische Universität München, Germany)
- 13.00 LUNCH

## TUESDAY 4 JULY 2023

**ROOM 3**

14.30 -16.00

**MACHINE LEARNING 3**

14.30

*Novel chestnut tree crowns segmentation method by UAV oblique photogrammetry*

L. Comba (Università di Torino, Italy)

14.45

*SiaPy – user friendly software for hyperspectral image segmentation of hyperspectral images*

J. Lapajne (Agricultural Institute of Slovenia, Slovenija)

15.00

*Weed25: a weed database for machine learning*

P. Wang (Southwest University, China)

15.15

*Wheat weeds recognition using AI architecture, an open plant phenotype database and field conditions*

R. Dainelli (Università di Firenze, Italy)

15.30

*Real-time Detection and Counting of Weeds in Winter Wheat Using YOLOv4 with Attention Module from UA*

P. Alirezazadeh (Leibniz Inst. Agricultural Engineering and Bioeconomy, Germany)

15.45

*Detecting and localizing mushroom clusters by a Mask R-CNN model in farm environment*

C. Charisis (University College Dublin, Greece)

16.00

**COFFEE BREAK****POSTER AREA****POSTERS PRESENTATION AND POSTER SESSION**

17.30 – 19.00

**GROUP & SOCIETY MEETINGS****ACCOMPANYING PERSONS TOUR**

9.30

*Meeting point at PIAZZA MAGGIORE – NETTUNO STATUE*

**Walking Guided Tour to the historical and artistic Monuments of the Town.**

12.00

End of the Guided Tour and Free Time

## WEDNESDAY 5 JULY 2023

**ROOM 1**

09.00 – 09.45

**PLENARY SESSION**

09.00- 09.30

**The Italian [AGRITECH](#) research center for precision and sustainable agriculture**

Attilio Toscano (Università di Bologna, Italy)

09.30 – 09.45

**Interoperability: a key for the future of agriculture**

Alessio Bolognesi (FederUnacoma, Italy)

**ROOM 1**

09.45 – 11.00

**WATER MANAGEMENT 1**

9.45

*On-Farm Evaluation of Variable Rate Irrigation for Winter Wheat in Semi-arid Western U.S.A.*

N. C. Hansen (Brigham Young University, USA)

10.00

*Defining Temporally Variable Urban Turfgrass Irrigation Zones with Thermal IR or ECa data*

R. Kerry (Brigham Young University, USA)

10.15

*Using digital soil mapping tools to assess the soil spatial variability impact on irrigated cotton*

L. N. Lacerda (University of Georgia, USA)

10.30

*Using a vegetation index to define homogeneous zones for variable rate irrigation in vineyard*

M. Bolognini (Università di Milano, Italy)

10.45

*Precision monitoring of vine water stress using UAVs and open-source processing chains*

V. Burchard-Levine (CSIC, Spain)

11.00

COFFEE BREAK

**ROOM 1**

11.30 – 13.00

**WATER MANAGEMENT 2**

11.30

*Stay-green monitoring for maize drought tolerance under field environments using hyperspectral data*

H. El Sharawy (Technische Universität München, Germany)

11.45

*Estimating Crop evapotranspiration for small plots via data fusion of spectral and SAR data*

T. Shilo (Manna Irrigation, Israel)

**WEDNESDAY 5 JULY 2023****ROOM 1**

- 12.00 *Monitoring chickpea physiological traits by Sentinel-2 imagery to support irrigation management*  
O. Perach (The Hebrew University of Jerusalem, Israel)
- 12.15 *Assessment of indices calculated from remote and proximal sensing to discriminate irrigation levels*  
A. Matese (Università di Firenze, Italy)
- 12.30 *Grapevine water status in a variably irrigated vineyard with NIR hyperspectral imaging from UAV*  
L. Brillante (Department of Viniculture and Enology, USA)
- 12.45 *Water status estimation using thermal imagery at different scales in the vineyard*  
I. Bahat (ARO, Israel)
- 13.00 LUNCH

**ROOM 2**

09.00 -09.45 **PLENARY SESSION – (ROOM 1)**

**ROOM 2**

09.45 – 11.00

**CROP CHARACTERISATION (WOODY CROPS)**

- 09.45 *UAV photogrammetry vs mobile terrestrial laser scanning for woody crops characterization*  
J. Torres-Sánchez (Institute for Sustainable Agriculture, Spain)
- 10.00 *An online fruit counting application in apple orchards*  
D. Mengoli (Università di Bologna, Italy)
- 10.15 *Forecasting tree crop yield with limited data - a macadamia case study*  
J. Brinkhoff (University of New England, Australia)
- 10.30 *Automatic estimation of trunk cross sectional area using deep learning*  
C. Grimm (Oregon State University, USA)
- 10.15 *Delimiting VRI management zones in an olive grove under complex soil and terrain variability*  
Vanderlinden, K. (IFAPA Centro Alameda del Obispo, Spain)
- 10.30 *A new Leafiness-LiDAR index to estimate light interception in intensive olive orchards*  
L. Sardonís-Pozo (Universitat de Lleida, Spain)



## WEDNESDAY 5 JULY 2023

**ROOM 2**

10.45 *Multitemporal validation of remote and proximal sensing for vineyard management zone identification*  
A. Deidda (Università di Sassari, Italy)

11.00 COFFEE BREAK

**ROOM 2**

11.30 – 13.00

**CROP CHARACTERISATION (VINEYARDS)**

11.30 *Evaluating the application of multispectral proximal sensing on Ground Vehicle in an olive orchard*  
C. Perna (Università di Firenze, Italy)

11.45 *PRECISIONPOP: a multi-scale integrated system for poplar plantation monitoring*  
M. Brambilla (CREA, Italy)

12.00 *Does sensor choice matter for assessment of vineyard spatial variability?*  
S. F. Di Gennaro (Università di Firenze, Italy)

12.15 *Mapping grape yield with low-cost vehicle tracking devices*  
J. P. Gras (Institut Agro Montpellier, France)

12.35 *Investigating factors influencing within-vineyard variability under different pedological contexts*  
F. Graziosi (Università Cattolica del Sacro Cuore, Italy)

12.45 *Grape yield prediction based on vine canopy morphology obtained by 3D point clouds from UAV images*  
A. Šupčík (Comenius University, Slovakia)

13.00 LUNCH

**ROOM 3**

09.00 -09.45

**PLENARY SESSION – (ROOM 1)****ROOM 3**

09.45 – 11.00

**INTEGRATED APPROACHES**

09.45 *Combining crop growth modelling, active sensing and machine learning for precision N management*  
K. Kusnierek (Norwegian Institute of Bioeconomy Research, Norway)

## WEDNESDAY 5 JULY 2023

**ROOM 3**

- 10.00 *Yield prediction in winter wheat using machine learning; improving implemented farm management tool*  
M. K. Langgaard (SEGES Innovation P/S, Danmark)
- 10.15 *A generalised approach to downscale areal-averaged yield data: a use-case in cotton quality*  
M. Tilse (The University of Sydney, Australia)
- 10.30 *Testing Irrigation Management Based on an Unoccupied Aerial Vehicle and an Artificial Neural Network*  
O. Rozenstein (Agricultural Research Organization - Volcani Institute, Israel)
- 10.45 *Strawberry flower and fruit detection based on an autonomous imaging robot and deep learning*  
W. S. Lee (University of Florida, USA)
- 11.00 COFFEE BREAK
- 11:30 – 13:00 **SIDE EVENT BY AGRITECH**
- P.Agritech 1 Enabling variable rate sprinkler irrigation of open field crops  
S. Caselli (Università di Parma, Italy)
- P.Agritech 2 Hyperspectral proximal sensing and machine learning techniques to estimate wheat nutritional status for digital agriculture application  
A. Crema (CNR, Italy)
- P.Agritech 3 Analysis of consumers and farmers' behaviour related to the newly developed technologies  
G. Maesano (Università di Bologna, Italy)
- P.Agritech 4 Improving water quality and availability for a sustainable agricultural management within the AGRITECH project  
G. Mancuso (Università di Bologna, Italy)
- P.Agritech 5 Effect of land preparation on border irrigation performance  
D. Masseroni (Università di Milano, Italy)
- P.Agritech 6 What lessons can be learned from smart farming to set up the agroecology of tomorrow?  
M. Medici (UniLaSalle, France)
- 13.00 - 14.00 LUNCH

WEDNESDAY 5 JULY 2023

## SIDE EVENTS

15.00 – 17.30

SIDE EVENT by AGRITECH  
AGRITECH FIELD TOUR

## ROOM 1

14.30 – 18.00

SIDE EVENT by CONFAGRICOLTURA  
EU R&I PROJECTS ON PRECISION AGRICULTURE: THE  
CONFAGRICOLTURA PARTNERSHIP  Confagricoltura

Opening: The Pact for Skills and the P.A.  
*Dr. Daniele Rossi – Delegate R&I Confagricoltura*

- Valpropath (Teagasc – Ireland 07020)
- Eco-Ready (CZU – Czech University of Prague 07027)
- Life Future Farming (AguroTech BV – The Netherlands 07026)
- H-Alo (CNR – Italy 07066)
- Waste4Soil (CERTH – Greece 07030)

Final Remarks  
*Francesca Marino – EU Projects Area Confagricoltura*

## ROOM 2

14.30 – 18.00

SIDE EVENT by CREA  **POSTER SESSION**

*Future scenarios on climate change and increased demand for food suggest that optimizing inputs in agriculture (including water) is essential to achieve the ambitious environmental, economic and food security objectives defined by European policies. Precision agriculture is a key management strategy in this context. However, knowledge on sustainable crop management technologies and practices is essential, along with public policies aimed at support innovation. As part of the 14th European Conference on Precision Agriculture, CREA - Research Centre for Agricultural Policies and Bioeconomy organized a Side Event to illustrate, through the presentation of posters, the scientific and institutional research activity of the CREA Research Centers for the development, dissemination and application of precision irrigation technologies, also within supporting policy programming.*

**Scientific Committee:** Alessandra Pesce, Raffaella Pergamo, Marianna Ferrigno, Veronica Manganiello e Lucia Briamonte

WEDNESDAY 5 JULY 2023

## ROOM 2

- P. CREA 1 *SIGRIAN and DANIA to support water related policies for efficient and sustainable irrigation*  
M. Ferrigno ( Council for Agricultural Research and Economics, Research Centre for Agricultural Policies and Bioeconomy, Italy )
- P. CREA 2 *The Rural Development Policy for precision irrigation*  
M. Ruberto (Council for Agricultural Research and Economics, Research Centre for Agricultural Policies and Bioeconomy, Italy)
- P. CREA 3 *Precision farming's Operational Groups*  
M.A. D'Oronzio (Council for Agricultural Research and Economics, Research Centre for Agricultural Policies and Bioeconomy, Italy)
- P. CREA 4 *Analysis and implementation of a predictive model for sustainable water management*  
P.La Sala\_(University of Foggia, Department of Economics, Italy)
- P. CREA 5 *Tools for managing and analyzing agricultural data for integrated and sustainable production*  
R. Sardaro\_(University of Foggia, Department of Economics, Italy)
- P. CREA 6 *Enhancing the medicinal plant supply chain using smart agriculture: a Lucanian experience*  
M.A. D'Oronzio (Council for Agricultural Research and Economics, Research Centre for Agricultural Policies and Bioeconomy, Italy)
- P. CREA 7 *Increasing agricultural sustainability by combining remote sensing and agro-ecological techniques*  
M. Bascietto (Council for Agricultural Research and Economics - CREA, Italy)
- P. CREA 8 *Precision Irrigation based on data processing from informative sources*  
E. Romano\_(Council for Agricultural Research and Economics - CREA, Italy)
- P. CREA 9 *Low-cost sensors for greenhouse environment monitoring*  
M. Brambilla\_(Council for Agricultural Research and Economics - CREA, Italy )
- P. CREA 10 *Automatic feeding systems for Ruminants: the farmers' Point of view*  
M. Brambilla\_(Council for Agricultural Research and Economics - CREA, Italy )

20.00

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*Gala Dinner**At Hotel Savoia Regency*

**THURSDAY 6 JULY 2023****ROOM 1**

09.30 – 10.30

**SMART WATER MANAGEMENT**

9.30

*A scalable approach to nowcasting soil water at the within-field scale*  
N. S. Wimalathunge (The University of Sydney, Australia)

09.45

*Smart irrigation system for precision irrigation in yellow fleshed kiwifruit*  
E. Baldi (Università di Bologna, Italy)

10.00

*An optical trapezoid model for actual evapotranspiration based on SWIR portion of the spectrum*  
A. Mokhtari (Technische Universität München, Germany)

10.15

*Smart Irrigation Approach to Stimulate Agro-Forestation of Native Trees in Dry Mediterranean Ecosyst*  
I. Litaor (LITAOR, Israel)

10.30

**COFFEE BREAK**

11.00 – 12.30

**PLENARY SESSION**

11.00

**Precision farming for animal production: what does the future hold?**  
Tomas Norton (KU Leuven, Belgium)

11.30

Awards &amp; Conclusion

**ROOM 2**

09.00 – 10.30

**CROP MODELS**

09.00

*Integration of mechanistic model outputs as inputs into data-driven models for yield prediction*  
D. Al-Shammari (The University of Sydney, Australia)

09.15

*Synthetic data for site-specific crop response model using WOFOST and geostatistical simulation*  
T. Tanaka (Gifu University, Japan)

09.30

*Predicting plant-level cabbage yield using the assimilation of UAV-derived LAI into WOFOST*  
Y. Yokoyama (Gifu University, Japan)

9.45

*Evaluation of the PROMET model in on-farm research at the "Experimental Field BeSt-SH"*  
B. Brandenburg (FuE Zentrum FH Kiel GmbH, Germany)

10.00

*Determining Site-Specific Corn Nitrogen Rate and Timing using APSIM Model*  
L. Thompson (UNL Extension, USA)



## THURSDAY 6 JULY 2023

**ROOM 2**

10.15 *Evaluation of crop model based MNR maximizing N application rates on site-specific level in maize*  
E. Memic (University of Hohenheim, Germany)

10.30 COFFEE BREAK

11.00 – 12.30 **PLENARY SESSION – (ROOM 1)**

**ROOM 3**

09.00 – 10.45 **SENSING TECHNIQUES**

09.00 *Evaluation of portable tools for fast field assessment of winter wheat grain quality*  
B. Morandin Figueiredo (Swedish University of Agricultural Sciences, Sweden)

09.15 *Instrumentation for On-the-Spot Measurement of Soil Health Indicators*  
V. Adamchuk (McGill University, Canada)

09.30 *Evaluation of the Soil Quality of Chilean Orchards using SoilOptix Technology*  
R. A. Ortega (Universidad Tecnica Federico Santa Maria, Chile)

09.45 *Assessment of new non-invasive roving techniques for mapping soil spatial variabilities*  
S. Gianessi (Università di Bologna, Italy)

10.00 *Parameters to increase LiDAR mounted UAV efficiency on agricultural field elevation measurements*  
L. Bernabe Santos (Louisiana State University, USA)

10.15 *A Low cost sensor to improve surface irrigation management*  
S. Moinard (Institut Agro Montpellier, France)

10.30 COFFEE BREAK

11.00– 12.30 **PLENARY SESSION – (ROOM 1)**

**POSTERS' LIST****Poster Session: General perspective**

- P.1 *Future Crop Farming*  
O. Spykman (Bavarian State Research Center for Agriculture, Germany)

**Poster Session: Education and training**

- P.2 *Data and Connectivity to Foster Smallholder and Urban Farming. Farmer Charlie*  
B. Bonnardel (Farmer Charlie, UK)
- P.3 *Developing a continuum of education and training pathways in integrative precision agriculture*  
T. Bourlai (University of Georgia, USA)
- P.4 *Extended Classroom in Precision Agriculture as a Tool for Engineering Education*  
J. A. Cardona-Gil (Universidad Pontificia Bolivariana, Colombia)
- P.5 *Resilient Smart Farming a conceptual and technological opportunity to strengthen resilience*  
D. Eberz-Eder (Dienstleistungszentrum Ländlicher Raum Rheinhessen-Nahe-Hunsrück, Germany)
- P.6 *Enhancing Production Efficiency and Farm Profitability through Participatory Research*  
D. Rudnick (University of Nebraska-Lincoln, USA)

**Poster Session: Autonomous Vehicles**

- P.7 *Tractor Guidance Improves Environmental and Economic Gains for Pasture and Smallholder Farmers*  
A. Ashworth (USDA ARS PPPSR Un. Of Arkansas, USA)
- P.8 *Legal challenges about the use of drones in PA*  
B. Baldoni (Università di Macerata, Italy)
- P.9 *Small robot for localized spraying using ISOBUS protocol*  
J. M. Bengochea-Guevara (CSIC, Spain)
- P.10 *Autonomous coordination between UAVs and UGVs for weed detection and removal*  
S. Bhandari (California State Polytechnic University, USA)
- P.11 *Allometric relationships for biomass estimation of persimmon trees using a field robot, LiDAR and photogrammetry*  
J. Blasco (Instituto Valenciano de Investigaciones Agrarias, Spain)
- P.12 *Evaluation of a low-cost drone sensor to discriminate water stress levels in ornamental plants*  
I. Borra-Serrano (Institute of Agricultural Sciences, Spain)

**POSTERS' LIST**

- P.13 *The aerial application of pesticides by drones: challenges and regulatory issues*  
P. Lattanzi (Università di Macerata, Italy)
- P.14 *Uncertainty analysis of a LiDAR-based MTLs point clouds using a high-resolution ground-truth*  
B. Lavaquiol (Universidad de Lleida, Spain)
- P.15 *Performance of a Smart Autonomous Vehicle in vineyard pesticide application*  
G. Piovaccari (Università di Bologna, Italy)
- P.16 *Is it possible to use current auto steering system in viticulture?*  
B. Tisseyre (Institut Agro Montpellier, France)
- P.17 *An AI-empowered, Autonomous Weed Removal Robotic Platform for Precision Agriculture*  
F. Visentin (Università di Verona, Italy)
- P.18 *An IoT electronic fence for agri-robots*  
G. Vitali (Università di Bologna, Italy)
- P.19 *Laser safety during laser-based weed control with autonomous vehicles*  
M. Wollweber (LZH, Germany)

**Poster Session: Sensing Techniques**

- P.20 *Farmers Friendly Digital Portable Soil Testing Device*  
A. Araf (IDEB Research & Technological Institute, Dhaka, Bangladesh)
- P.21 *Multichannel LiDAR supported Simultaneous Localization and Mapping in Complex Natural Environment*  
E. Rihter (University of Maribor, Slovenija)

**Poster Session: Remote & Proximal Sensing**

- P.22 *Multispectral camera system performing real-time VRA applications toward sustainable wheat production*  
N. Georgiadis (Augmenta Agriculture Technologies, Greece)

**Poster Session: Surface Characterisation**

- P.23 *Soil prospection and aerial imagery in management zone delineation in a hazelnut grove in Italy*  
L. Barbanti (Università di Bologna, Italy)
- P.24 *Utilizing functional soil maps for precision management for Smallholder Farmers*  
P. Owens (USDA-ARS-SEA Dale Bumpers Small Farms Research Center, Booneville, USA)
- P.25 *Evaluating management, environment and spectrometer type impacts on soil texture prediction via gamma spectrometry*  
S. Pätzold (University of Bonn, Germany)

**POSTERS' LIST**

- P.26 *Multilayer data and artificial intelligence for the delineation of corn management zones*  
M. Pérez-Ruiz (University of Seville, Spain)
- P.27 *Satellite Remote Sensing Detects the Legacy Effects of Crop Rotation on Subsequent Crops*  
J. Wang (Technical University of Munich, Germany)
- P.28 *Comparing machine learning approaches for the prediction of clay content via proximal gamma spectrometry under varying geopedological conditions*  
R. Wehrle (Universität Bonn, INRES Soil Science and soil ecology, Germany)
- Poster Session: Crop Characterisation & Management**
- P.29 *Inoculation with biostimulants for improved plant performance under stress conditions*  
K. Bradacova (University Hohenheim, Germany)
- P.30 *Quantifying within-field spatial variability in Canola Flowering for Yield Estimation*  
H. Fernando (University of Saskatchewan, Canada)
- P.31 *Assessment of high cadence remote sensing data for providing phenology of key crops in Germany*  
M. Grady (Planet Labs Germany GBMH, Germany)
- P.32 *Ongoing Qualitative Observations and Field Scale Maize Yield Prediction*  
J. Grove (University of Kentucky, USA)
- P.33 *New methods for rapidly measuring the effect of agronomic treatments on grass growth*  
E. Guest (ADAS, UK)
- P.34 *Efficient site-specific management approach using multispectral, soil, and rice based cropping data*  
C. I. Jaramillo Barrios (AGROSAVIA Colombian Agricultural Research Corporation, Colombia)
- P.35 *Eco-innovative weeding with laser. New opportunities for improving sustainability in agriculture*  
J. Krupanek (Instytut Ekologii Terenów Uprzemysłowych, Poland)
- P.36 *Determining What Counts: Applying UAV imagery to estimate canola emergence*  
K. Kryś (University of Saskatchewan, Canada)
- P.37 *Application of precision farming technologies in organic farming*  
M. Mittermayer (Technische Universität München, Germany)

**POSTERS' LIST**

- P.38 *UAV multi-temporal thermal imaging to evaluate wheat drought resistance*  
W. Qin (Technische Universität München, Germany)
- P.39 *High-throughput spectral phenotyping of drought response in spring wheat*  
R. Sadeh (Hebrew University, Israel)
- P.40 *Precision agricultural management of rice terraces using UAV in Japan*  
H. Umeda (College of Bioresource Sciences, Nihon University, The Netherlands)
- P.41 *Identification of potato cultivars using multispectral imaging*  
A. Vojnović (Agricultural Institute of Slovenia, Slovenia)
- P.42 *Predicting maize grain yield using UAV-based remote sensing across varieties, row spacings, and irrigation*  
H. Zhang (USDA, USA)
- Poster Session: General Methodology**
- P.43 *E-Crops DSS: software architecture, technologies, main functions and examples of application*  
B. Vito (Sysman Progetti & Servizi srl, Italy)
- P.44 *Stakeholders' needs and barriers to adoption of advanced digital tracking tools*  
R. Addorisio (Università di Bologna, Italy)
- P.45 *Does the use of multi-year data improve wheat yield prediction?*  
A. Aizpurua (NEIKER, Spain)
- P.46 *Working times classification through CAN-BUS data analysis*  
F. Bettucci (Università di Padova, Italy)
- P.47 *Preliminary Study for the Development of Variable-Tillage Implements for Precision Farming*  
A. Biglia (Università di Torino, Italy)
- P.48 *Blockchain Implementations in Precision Agriculture*  
L. Camanzi (Università di Bologna, Italy)
- P.49 *Data Models in Precision Agriculture: From IoT to Big Data Analytics*  
M. Francia (Università di Bologna, Italy)
- P.50 *Assessing the environmental footprint of digital agriculture: research perspectives*  
C. Huck (INRAE, France)
- P.51 *On the use of the driver-in-the-loop simulator approach to demonstrate the benefits of precision agriculture*  
E. Leo (Soluzioni Ingegneria, Italy)



**POSTERS' LIST**

- P.52 *Low-cost terrestrial photogrammetry for orchard sideways 3D reconstruction*  
J. A. Martínez-Casasnovas (Universidad de Lleida, Spain)
- P.53 *Facilitating Economic Analyses of Digital Agriculture: The Role of National Statistical Offices (NSOs) and Data Collection at Scale*  
J. McFadden (USDA Economic Research Service, Usa)
- P.54 *Data fusion for the decision-making process for a digitized experimental farm in Hungary*  
G. Milics (Magyar Precizios Gazdalkodasi Egyesulet, Hungary)
- P.55 *Development of depth-of-tillage control system with data linkage*  
E. Morimoto (Kobe University, Japan)
- P.56 *Data to Decisions: Efficient Implementation of Eco- Schemes, a Use Case for AI in Agriculture*  
S. Ramm (FuE Zentrum FH Kiel GmbH, Germany)
- P.57 *Low-cost 3D modelling of crop-weed interactions*  
V. Rueda-Ayala (Agroscope, Switzerland)
- P.58 *Farmwissen an innovative concept and platform for competence enhancement in Smart Farming*  
E. Wölbart (Dienstleistungszentrum Ländlicher Raum Rheinhessen-Nahe-Hunsrück, Germany)
- P.59 *Site-Specific Yield Prediction of Red Fescue (Festuca rubra L.)*  
C. Andreasen (University of Copenhagen, Denmark)
- P.60 *Yield and texture based management zones in a heterogeneous Old Morainic landscape*  
E. Bönecke (Leibniz institute of vegetable and ornamental crops, Germany)
- P.61 *Cropland Reference Ecological Unit for Comparative Soil Studies*  
B. Maharjan (University of Nebraska – Lincoln, USA)
- Poster Session: Weed & Pest Management**
- P.62 *Monitoring of insect pests and their interactions with the environmental conditions in vineyards*  
V. Beranová (Comenius University, Slovakia)
- P.63 *DIGINVASIVE: a digital system to map invasive weed plants*  
A. I. de Castro Megías (Spanish National Institute for Agricultural and Food Research and Technology, Spain)
- P.64 *A Processing Method for Adhesive Droplets on Images of Water-sensitive Papers*  
Q. Gao (Università di Padova, Italy)

**POSTERS' LIST**

- P.65 *Early assessment of tomato bacterial spot through proximal hyperspectral sensing*  
M. Reis Pereira (Campus da FEUP, Portugal)
- P.66 *High power 2 μm wavelength fiber laser for precision weeding*  
P. Fuhrberg (Futonics, Germany)
- P.67 *How do farmers prefer laser-weeding? A pan-European survey*  
D. Tran (Ghent University, Belgium)
- P.68 *Development and validation of a method for detection of four NTX-related pesticides in plant foods*  
J. Zhang (Technische Universität München, Germany)
- Poster Session: Pesticide Spraying**
- P.69 *Importance of Unmanned Aerial Vehicles Settings for Spray Bait Treatments on Citrus Orchards*  
P. Chueca (Instituto Valenciano de Investigaciones Agrarias, Spain)
- P.70 *Efficiency of a smart spraying technology in a fodder crop production*  
L. Conceição (Polytechnic Institute of Portalegre, Portugal)
- P.71 *Development of a new Cotton Defoliation Sprayer using Unmanned Ground Vehicle*  
J. M. Maja (Clemson University, USA)
- P.72 *Can UAV spraying system assist in precision crop protection?*  
L. Sánchez-Fernández (Universidad de Sevilla, Spain)
- Poster Session: Nutrients Management**
- P.73 *Enhancing nitrogen management through remote sensing and self-driving robots for precise nitrogen application to reduce leaching*  
V. Antoniuk (University College Dublin, Ireland)
- P.74 *Site-specific nitrogen management in winter wheat*  
S. Heshmati (University of Hohenheim, Germany)
- P.75 *Optimal input efficiency in cotton using multispectral camera system performing real-time VRA*  
V. Maggidis (Augmenta, Greece)
- P.76 *Application of model-based dynamic prescription maps for optimizing variable rate irrigation*  
F. Morari (Università di Padova, Italy)
- P.77 *Improving estimates of plant-available phosphorus through sensor data fusion at field scale*  
S. Post (Eberswalde University of Sustainable Development, Germany)

**POSTERS' LIST**

- P.78 *Investigations of spatial nitrate leaching, the basis of innovative approaches in groundwater protection*  
J. Schuster (Technische Universität München, Germany)
- Poster Session: Water Management**
- P.79 *Innovative proximal soil moisture sensor for supporting irrigation scheduling in a walnut orchard*  
R. Mazzoleni (Università di Bologna, Italy)
- P.80 *Variable rate drip irrigation in vineyard: a case of study in Franciacorta area*  
D. Modena (Università di Milano, Italy)
- P.81 *In-season crop model autocalibration for variable rate nitrogen fertilization in winter wheat*  
F. Morari (Università di Padova, Italy)
- P.82 *High-resolution soil moisture mapping in micro-irrigated orchards by on-the-go microwave radiometry*  
E. Scudiero (University of California - Riverside, USA)
- P.83 *Use of remote sensing and machine learning techniques to study the impact of climate extremes of crop evapotranspiration*  
V. Sharda (Kansas State University, USA)
- Poster Session: Crop Characterisation & Monitoring (Woody crops & Vineyards)**
- P.84 *Development of a high-throughput monitoring system for fire blight in fruit orchards*  
V. Maß (Leibniz Institute for Agricultural Engineering and Bioeconomy, Germany)
- P.85 *High-efficiency harvesting of jujube by air suction harvester: suction pipe gas MHD acceleration control*  
J. Nie (Shihezi University, China)
- P.86 *Yield prediction in different fruit species using systematic sampling*  
R. Ortega (Universidad Tecnica Federico Santa Maria, Chile)
- P.87 *Automated apple orchard blossom mapping from drone image analysis*  
M. Piani (Università di Bologna, Italy)
- P.88 *Quantifying temperature on apple surface by means of thermal point cloud*  
N. Tsoulas (Leibniz Institute of Agricultural Engineering and Bio-economy, Germany)

**POSTERS' LIST**

- P.89 *Automatic detection of woody crop diseases combining aerial-ground robots and network sensors: An upscaling remote sensing approach*  
J. Valente (Wageningen University and Research, Netherlands)
- P.90 *Detection of Citrus bark cracking viroid (CBCVd) on hop (*Humulus lupulus*) using multispectral imaging*  
U. Žibrat (Agricultural institute of Slovenia, Slovenia)
- P.91 *A novel fruit-zone cooling system to face multiple summer stress in Pignoletto cv G. Allegro (Università di Bologna, Italy)*
- P.92 *Complementarity between manual measurements and image analysis for grape yield estimation.*  
C. Germain (Laboratoire IMS, France)
- P.93 *Vinelapse: an autonomous grapevine observation image sensor*  
F. Rançon (Bordeaux Sciences Agro, France)
- P.94 *Detection of damaged white grape bunches*  
A. Ribeiro (Centre for Automation and Robotics, Spain)
- P.95 *Early detection of *Botrytis cinerea* infection in plants by pulsed thermography*  
M. Rippa (CNR-Istituto di Scienze Applicate e Sistemi Intelligenti, Italy)
- P.96 *LIDAR and Multispectral 3D data fusion for identifying fungal disease traits in vineyards*  
S. Vélez (Wageningen University and Research, Netherlands)
- Poster Session: Machine Learning**
- P.97 *Machine learning based prediction of soil total nitrogen by using hyper-spectral data in laboratory*  
Y. Afrasiabian (Technische Universität München, Germany)
- P.98 *Development of an On-line Object Detection Neural Network for weed detection in Tomato Crops*  
D. Andujar (CSIC, Spain)
- P.99 *Machine Learning regression for Leaf Nitrogen Content Prediction throughout the entire lifecycle of Sugarbeet crops in Spain*  
R. Fortes (HEMAV, Spain)
- P.100 *Sub-field Scale Soil Salinity Prediction using Machine Learning Algorithms with Remotely Sensed Data in the Prairie Area of Saskatchewan, Canada*  
T. Ha (University of Saskatchewan, Canada)
- P.101 *Development of a prototype mobile app for crop weight estimation using AI techniques*  
S. K. Lee (APEC Climate Center, Republic of Korea)

**POSTERS' LIST**

- P.102 *A Non-invasive Method of Monitoring the Growth of Individual Melons using UAVs and Machine Learning*  
P. Majewski (Wroclaw University of Science and Technology, Poland)
- P.103 *Detection of Conyza spp in a hedgerow olive orchard by deep learning convolutional neural networks*  
F. J. Mesas-Carrascosa (Institute for Sustainable Agriculture, Spain)
- P.104 *Cognitive computing for classification of six weed species in tomato and maize crops.*  
G. Mesías-Ruiz (CSIC, Spain)
- P.105 *A mobile phone-based tomato maturity monitoring system using identification markers*  
K. Morita (University of Tokyo, Japan)
- P.106 *Transfer and zero-shot learning for weed species detection with small datasets and unseen classes*  
J. M. Peña (CSIC, Spain)
- P.107 *Development of multimodal machine learning model for wheat traits assessment under climate change*  
A. Pivchenko (The Hebrew University of Jerusalem, Israel)
- P.108 *Seed Spacing Estimation using CNNs and Seed Localization Sensing System*  
A. Sharda (Kansas State University, USA)
- P.109 *Optimization algorithms for plant segmentation of point clouds onboard agricultural robots*  
C. Valero (Universidad Politecnica de Madrid, Spain)
- P.110 *Active vision and multi-view perception to efficiently tomato target part in high clutter scenario*  
W. Xin (Wageningen University and Research, Netherlands)

## ECPA - SUNDAY 2 JULY 2023

	ROOM 1	ROOM 2	ROOM 3
17.00	17.00 - 19.00 REGISTRATION OF PARTICIPANTS		
18.00	<i>Welcome Cocktail</i>		
19.00			

## ECPA - MONDAY 3 JULY 2023

	ROOM 1	ROOM 2	ROOM 3
09.00	09.00 - 10.30 PLENARY SESSION		
10.30	10.30 - 11.00 <i>coffee break</i>		
11.00	11.00 - 12.00 GENERAL PERSPECTIVES	11.00 - 13.00 SURFACE CHARACTERISATION	11.00 - 13.00 GENERAL METHODOLOGY 1
11.30	12.00 - 13.00 EDUCATION AND TRAINING		
12.00	13.00 - 14.30 <i>Lunch</i>		
13.00			
14.30	14.30 - 16.15 AUTONOMOUS VEHICLES	14.30 - 16.00 NUTRIENTS MANAGEMENT	14.30 - 16.00 GENERAL METHODOLOGY 2
15.30			
16.00	16.00 - 16.45 <i>coffee break</i>		
From 16.00	POSTER PRESENTATION & SESSION		
17.30	17.30 - 19.00 GROUP & SOCIETY MEETINGS		
19.00	<i>End of the conference day</i>		

## ECPA - TUESDAY 4 JULY 2023

	ROOM 1	ROOM 2	ROOM 3
09.00	09.00 - 11.00 WEED & PEST MANAGEMENT 1	09.00 - 11.00 CROP SENSING 1	11.30 - 13.00 MACHINE LEARNING 1 1
10.30			
11.00	11.00 - 11.30 <i>coffee break</i>		
11.30	11.30 - 13.00 WEED & PEST MANAGEMENT 2	11.30 - 13.00 CROP SENSING 2	11.30 - 13.00 MACHINE LEARNING 2
12.00			
13.00	13.00 - 14.30 <i>Lunch</i>		
14.30	14.30 - 16.00 PESTICIDE SPRAYING	14.30 - 16.30 CTOP SENSING 3	14.30 - 16.00 MACHINE LEARNING 3
15.30			
16.00	16.00 - 16.45 <i>coffee break</i>		
From 16.00	POSTER PRESENTATION & SESSION		
17.30	17.30 - 19.00 GROUP & SOCIETY MEETINGS		
19.00	<i>End of the conference day</i>		

## ECPA - WEDNESDAY 5 JULY 2023

	ROOM 1	ROOM 2	ROOM 3
09.00	09.00 - 09.30 <b>PLENARY SESSION</b>		
09.45	09.45-11.00 <b>WATER MANAGEMENT 1</b>	09.45 - 11.00 <b>CROP CHARACTERIZATION (WOODY CROPS)</b>	09.45 - 13.00 <b>INTEGRATED APPROACHES</b>
11.00			
11.00	11.00 - 11.30 <i>coffee break</i>		
11.30	11.30 - 13.00 <b>WATER MANAGEMENT 2</b>	11.30 - 13.00 <b>CROP CHARACTERIZATION (VINEYARDS)</b>	<b>SIDE EVENT</b> 11.30 - 13.00 <b>AGRITECH</b>
13.00	13.00 - 14.30 <i>Lunch</i>		
15.00	<b>AGRITECH</b> <b>Field Tour</b>		
17.30			
14.30	<b>SIDE EVENT</b> 14.30 - 18.00 <b>CONFAGRICOLTURA</b>	<b>SIDE EVENT</b> 14.30 - 18.00 <b>CREA</b>	
18.00			
20.30	<i>Gala Dinner</i>		

## ECPA - THURSDAY 6 JULY 2023

	ROOM 1	ROOM 2	ROOM 3
09.30	09.30 - 10.30 <b>SMART WATER MANAGEMENT</b>	09.00 - 11.00 <b>CROP SENSING 1</b>	11.30 - 13.00 <b>MACHINE LEARNING 1 1</b>
10.30	10.30 - 11.00 <i>coffee break</i>		
11.00	11.00 - 11.30 <b>PLENARY SESSION</b>		
11.30	11.30 - 12.00 <b>AWARDS &amp; CONCLUSIONS</b>		
12.00	<i>End of the conference day</i>		



**USEFUL INFORMATION****CONFERENCE VENUE**

**Conference Center Hotel Savoia Regency**

Via del Pilastro, 2 40127 Bologna

**HOW TO REACH THE VENUE**

- **From Central Rail Station**  
Bus n. 35 (direction Rotonda Baroni)
- **From the Airport**  
MARCONI EXPRESS to Central Station: <https://www.marconiexpress.it/>

**GALA DINNER**

5th July at 20:00 at Hotel Savoia Regency

**FIELD VISIT**

5th July from 14:00 to 18:00 at Cadriano University Area (Via Gandolfi, 19, 40057 Granarolo dell'Emilia)

Bus service will be available departing at 15:00 from Hotel Savoia Regency

**USEFUL NUMBERS**

**Onsite Secretariat:** + 39 348 2487176

**Taxi service:** + 39 051 372727 / + 39 051 4590

**Private cars:** + 39 051 519090 (Cosepuri) / + 39 051 553415 (Cab)

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