INTERNATIONAL ADVANCED SCHOOL IN AGRICULTURAL METEOROLOGY

FOURTH EDITION

Conegliano, Italy
24-28 June 2024

AGRICULTURAL METEOROLOGY
FOR MANAGING THE RISK OF EXTREME EVENTS

The Italian Association of Agrometeorology, AIAM, in collaboration with CNR-IBE, designated as WMO Regional Training Center in Italy, WMO-RTC, the Department of Agronomy, Food, Natural Resources, Animals and Environment – University of Padua – Italy, DAFNAE is proud to announce the Fourth Edition of the International Advanced School in Agricultural Meteorology "Agricultural Meteorology for managing the risk of extreme events". The school is organized with the support of COST-CA20108, and the technical cooperation of the UN Food and Agriculture Organization FAO.

COURSE DESCRIPTION

The increasing frequency of extreme weather events due to climate change represents a severe threat to agriculture. The long-lasting socio-economic costs of extreme events pose serious challenges for the farmers and the communities. Agricultural Meteorology, through the development of new information, knowledge, and innovative tools, will play a key role to manage and reduce the negative impacts of extreme events on the agriculture sector. The school's objective is to promote the use of innovative tools for risk management within the context of weather extreme events. Additionally, it aims to help participants enhance their understanding of scientific findings and advanced technologies related to agrometeorological analysis and monitoring.

The school, in its complex, will be capable to integrate and complete knowledge and operational application capacity offered from fundamental Academic courses. School is a unique occasion for multiple interactions and exchanges between younger students, bringing enthusiasm and new vision, and specialized teachers, allowing a win-win situation.

EXPECTED LEARNING OUTCOMES

Improvement of scientific and technical skills to support the fight against climate changes. Capacity to drive towards reduction of impacts due to extreme events. Support for agricultural sustainable management.

TARGET AUDIENCE AND PRE-REQUISITES

The School is designed primarily for professionals, young researchers and scientists, and PhD students, engaged and interested in the application of advanced agrometeorological methodologies and techniques.

Applicants are expected to have an adequate knowledge of Agrometeorology, Agronomy and agrosystems management, Water and irrigation management, Data analysis, Fundamentals to modelling.

Erwan Hesry on Unsplash

TOPICS and ACTIVITIES

Topics covered:

- Crop Monitoring
- Water management in a contest of extreme rainfall events
- Data-driven approaches for climate related risk assessment
- Economic risk management in agriculture
- Extreme weather events impact on crops and vineyards

Activities and field trips:

Two field trips are planned during which participants:

- ❖ in the first field trip, the participant will visit the Prosecco Hills of Conegliano and Valdobbiadene (UNESCO Heritage). The hills of Conegliano and Valdobbiadene are characterized by a distinctive ridge system that offers a mountainous character with panoramic views and an evolved and continuous landscape, composed of vineyards, forests, small villages, and farms;
- ❖ in the second field trip, the participant will visit an experimental farm in Castelfranco area and they will directly observe the use of tethered balloon for soybean monitoring. This activity fits within the broader theme of crop monitoring through remote sensing with the goal of reducing irrigation volumes while maintaining excellent yields in a context of climate change.

WMO Competency Framework

The school is planned to address the following competency:

- ❖ Provision of Climate Services with a focus on services for agriculture.

LANGUAGE

Official language of the school is English. Translation into other languages is not provided.

TRAINERS

Trainers are experts from different Universities and Research Center: University of Natural Resources and Life Sciences - Wien, Austria; Department of Agronomy Food Natural resources Animals and Environment and Department of Land, Environment, Agriculture and Forestry of the University of Padua - Italy; CMCC Foundation; Auburn University - USA; Center of Studies and Activities for Space, University of Padua - Italy; Agricultural Research Organization - Volcani Institute, Israel; University of Cagliari - Italy; University of Bordeaux – France; National Research Council of Italy, Institute of BioEconomy.

COURSE FORMAT

One-week school in presence with lectures, group discussions, and practical training sessions. Students and teachers of the course will benefit from the Moodle platform through which educational material will be shared and evaluation procedures conducted.

COSTS

A registration fee of **400€** will be charged to all participants to be paid via Internet banking by **5 June, 2024**, before the beginning of the School. Further details will be provided to the selected participants. Tuition fee includes access to the School, course material, coffee breaks, field trips.
Travel and accommodation costs are the responsibility of the participants.

ITALIAN ASSOCIATION OF AGROMETEOROLOGY

The mission of AIAM (www.agrometeorologia.it/), the Italian Association of Agrometeorology, is the promotion of agrometeorological research through conferences, seminars, and training. AIAM also acts as a link between the services and research activities, and this connection favours the promotion of research on relevant agrometeorological themes, internationally disseminated through the Italian Journal of Agrometeorology, published by the Association.

APPLICATION AND SELECTION PROCESS

Interested Candidates can apply online filling the application form.

The members of the scientific committee will evaluate, for each candidate, the application, the motivation, and profile and prepare a ranked list of all the applications. The Course is open to a max of 30 participants: interested applicants are invited to submit their application as soon as possible, because in the selection process, in case of a tie, preference will be given to those who submitted the application first.

Deadline for Applications

Deadline for applications is **15 May, 2024**. Only online applications will be accepted, to be submitted at the following link. Applications received otherwise will not be taken into consideration.

School Certificate and Training Evaluation

There is no final learning assessment test.

A Certificate proving the attendance to the training course will be awarded to the trainees at the end of the School, after completing the individual online survey to evaluate the Training Effectiveness and Impact.

ORGANIZING COMMITTEE
(DAFNAE – University of Padova)

- Carmelo Maucieri
- Franco Meggio
- Vittoria Giannini
- Monica Canton
- Carlo Camarotto

SCIENTIFIC COMMITTEE

- Filiberto Altobelli, CREA-PB and AIAM
- Marina Baldi, WMO-RTC and CNR-IBE
- Anna Dalla Marta, University of Florence-DAGRI and AIAM
- Federica Rossi, CNR-IBE and AIAM
- Francesca Ventura, University of Bologna-DISTAL and AIAM
- Federica Matteoli, FAO

PARTNERS

The school is organized in partnership with:

- ❖ Council for Agricultural Research and Economics (CREA-PB)
- ❖ University of Florence - DAGRI
- ❖ National Research Council, Institute of Bioeconomy (CNR-IBE)
- ❖ Accademia dei Georgofili
- ❖ Foundation for Climate and Sustainability (FCS)
- ❖ Rete Rurale Nazionale

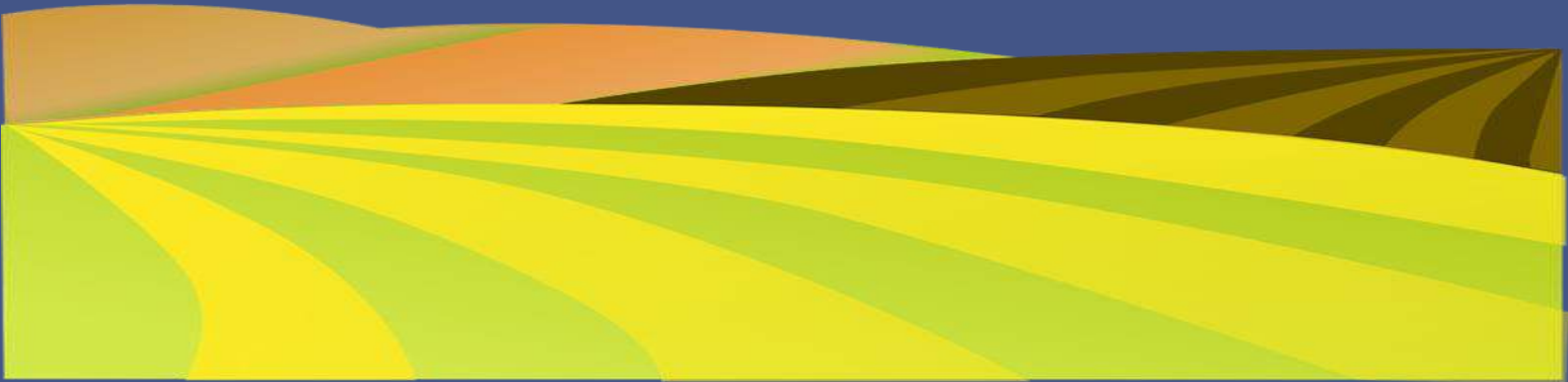## The 4th Edition of the International School is organized by:

INTERNATIONAL ADVANCED SCHOOL IN AGRICULTURAL METEOROLOGY

FOURTH EDITION
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24-28 June 2024

THE PROGRAMME

WORKING HOURS

Morning 09:00-12:30
Afternoon 14:00-17:30

Lectures   Hands-On   Field-Trip

DATE
From Monday 24 June 2024
        h 9:00 am
To   Friday 28 June 2024
        h 5:00 pm

VENUE
Conegliano University Campus
Via G. Dalmasso, 1
Conegliano (Padova), Italy

24 JUNE Monday

9:00 **OPENING**

Prof. Andrea Curioni - Director of Interdepartmental Centre for Research in Viticulture and Enology (CIRVE)

Prof. Gianni Barcaccia - Director of Department of Agronomy, Food, Natural Resources, Animals and Environment (DAFNAE)

Prof. Vincenzo D'Agostino - Director of Department of Land, Environment, Agriculture and Forestry (TESAF)

Prof. Francesca Ventura - President of Italian Association of Agrometeorology

Dr. Robert Stefanski - Chief of WMO Agriculture Meteorology Division

Dr. Marina Baldi – Director of WMO-RTC

Gen. Luca Baione - Permanent Representative of Italy within the WMO

10:00 – 10:30 Coffee break

2hh **Introduction to the Course** *(Facilitator: Filiberto Altobelli, CREA)*

Climate extremes and agricultural production
Prof Pavol Nejedlik, Slovak Academy of Sciences

Disaster and climate risk and impact management for resilient agrifood systems
Dr Sylvie Wabbes Candotti, FAO

From sectoral to nexus WEFE strategies: adaptation and mitigation options to climate change across the Mediterranean region
Dr Marta Debolini, Euro-Mediterranean Centre on Climate Change

Climate smart practices to improve resiliency in Southeast U.S. agricultural production systems
Prof Audrey Gamble, Auburn University

Preserving aquatic ecosystems through smart irrigation planning in a context of water shortage
Prof Thorsten Knappenberger, Auburn University

12:30 – 14:00 Lunch

14:00 **Field trip -** Visit of Conegliano Valdobbiadene DOCG Prosecco wine region

Micrometeorological measurements for vegetation atmosphere exchanges
Dr Federica Rossi, CNR-IBE

UNESCO World Heritage Site: "The Prosecco Hills of Conegliano and Valdobbiadene"
Visit to vineyards, winery and wine tasting

Since the 17th century, in the Prosecco Hills of Conegliano and Valdobbiadene, the use of terraces and small embankments to cultivate areas with steep slopes has created a characteristic checkerboard pattern with rows parallel and perpendicular to the slopes. During the visit, participants will have the opportunity to observe the adaptation strategies to climate change that the farmers are implementing to become more resilient.

Field Trip to Castelfranco Veneto - Crop Monitoring

The multi-spectral data acquired with either satellite imagery, UAV or tethered and stratospheric balloons can be used to calculate vegetation indices directly related to the well-being of the crops providing quantitative information about its health and growth. The aim of field trip, teaching and practical activities is to integrate the remote sensing data with in-situ collected measurements in order to validate remote observations for monitoring soybean water status and requirements.

08:30 – 12:30 Use of tehetered balloon for crop monitoring
Prof Giacomo Colombatti – University of Padua, Italy

12:30 – 14:00 Lunch

14:00 – 15:30 Remote sensing data reduction and analysis
Dr Irene Terlizzi – University of Padua, Italy

15:30 – 16:00 Coffee break

16:00 – 17:30 In situ sensing data reduction and analysis
Dr Giovanni Trevisanuto – University of Padua, Italy

The hands-on session will be facilitated by Filiberto Altobelli (CREA)

IMPORTANT DATES

- ❖ Application deadline: 15 May, 2024
- ❖ Fee Payment: 5 June, 2024
- ❖ School: 24-28 June, 2024

26 JUNE Wednesday

Water management in a contest of extreme rainfall events

Rainwater harvesting systems have emerged as valuable solutions for managing water resources and controlling related problems in a context of weather extreme events, especially for steep-slope agriculture. In this module, a systematic selection procedure to identify micro-water storage sites and a high-resolution overflow simulation model that combines a set of criteria to identify the optimal network of water harvesting structures and quantify the potential for water storage during rainfall of varying intensities will be presented.

08:30 - 10:30 Hill water management in a context of extreme rainfall events – Theoretical approach
Prof Paolo Tarolli, University of Padua, Italy

10:30 - 11:00 Coffee break

11:00 – 12:30 Managed Aquifer Recharge (MAR) to improve water management under climate change scenario
Prof Alberto Carletti, University of Cagliari, Italy

12:30 - 14:00 Lunch

14:00 – 15:30 Hill water management in a context of extreme rainfall events – Modeling/Practical approach – Part 1
Dr Eugenio Straffelini, University of Padua, Italy

15:30 - 16:00 Coffee break

16:00 – 17:30 Hill water management in a context of extreme rainfall events – Modeling/Practical approach – Part 2
Dr Eugenio Straffelini, University of Padua, Italy

The hands-on session will be facilitated by Filiberto Altobelli (CREA)

27 JUNE Thursday

1/2d

Extreme weather events impacts on crops

A synoptic picture of the main climate stressors and their additive impact on yield could improve the development of effective and timely climate services for risk management. In this module an algorithm to develop a composite index (C_index) that summarizes the risk of having exceptionally low yields due to the occurrence of multiple climatic stressors will be presented.

08:30 – 10:30 Data-driven approaches for assessing climate-induced yield risks in Agriculture – Part I
Dr Arianna Di Paola, CNR-IBE, Italy

10:30 – 11:00 Coffee break

11:00 – 12:30 Data-driven approaches for assessing climate-induced yield risks in Agriculture – Part II
Dr Arianna Di Paola, CNR-IBE, Italy

12:30 – 14:00 Lunch

1/2d

Risk Management in Agriculture

The optimization of water productivity is achievable improving irrigation efficiency management through an optimal quantification of the crop evapotranspiration. Data-driven evapotranspiration estimation represents an important step towards the new frontier of artificial intelligence use in the agricultural sector. In addition, climate change is exacerbating uncertainties and vulnerabilities in agricultural production with a negative economic impact. In this context, it is essential to integrate climate data, economic models, and risk analysis techniques to identify and prioritize risks, as well as implementing adaptive strategies to build resilience.

14:00 – 15:30 Data-driven estimation of evapotranspiration for enhanced irrigation management
Dr Offer Rozenstein, Agricultural Research Organization - Volcani Institute, Israel

15:30 - 16:00 Coffee break

16:00 – 17:30 Economic risk management in agriculture facing climate change: methods of analysis, strategies, and tools
Prof Samuele Trestini, University of Padua, Italy

The hands-on session will be facilitated by Filiberto Altobelli (CREA)

19:30 ## Visit of Agriculture Museum and social dinner

1/2 d Workshop "Extreme weather events impacts on vineyards"

Under the present climate change scenario, traditional wine-growing regions, where century-long trial and error processes have optimized terroir expression (i.e. the combination of cultivar/rootstock, soil, climate, and management), will likely experience more frequent and intense extreme weather. This international workshop will deepen the impacts of extreme temperature, drought spells and their combination on grapevine physiology, productivity as well as fruit quality and ultimately wine.

09:00 - 09:30 Institutional greetings
Prof Andrea Curioni - Director of Interdepartmental Centre for Research in Viticulture and Enology (CIRVE)
Prof Enrico Sturaro – Delegate of Department of Agronomy Food Natural resources Animals and Environment (DAFNAE) for the VITAE project

09:30 - 10:15 Physiology of drought stress in grapevine
Prof Carlos Herrera, BOKU University, Austria

10:15 - 10:45 Coffee break

10:45 - 11:30 Impacts of heatwaves on vineyards
Prof Gregory Gambetta, University of Bordeaux, France

11:30 - 12:15 The interplay between climate anomalies and the dynamics of grape ripening and productivity
Prof Franco Meggio, University of Padua, Italy

12:15 - 13:00 Discussion and final remarks

The session will be facilitated by Filiberto Altobelli (CREA)

13:00 - 14:30 Lunch

2 hh WMO survey and certificates delivery

Wrap-up session and closing remarks

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ORGANIZED BY

Associazione Italiana di Agrometeorologia

WORLD METEOROLOGICAL ORGANIZATION

Centro Interdipartimentale per la Ricerca in Viticoltura ed Enologia
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UNIVERSITY OF PADOVA
DAFNAE
Department of Agronomy Food Natural resources Animals and Environment

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Consiglio Nazionale delle Ricerche
Istituto per la BioEconomia

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Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria

UNIVERSITÀ DEGLI STUDI FIRENZE
DAGRI
DEPARTMENT OF AGRICULTURE, FOOD ENVIRONMENT AND FORESTRY

ACCADEMIA DEI GEORGOFILI

RETERURALE NAZIONALE 20142020

FONDAZIONE CLIMA & SOSTENIBILITÀ