

# HIGHER EDUCATION FOR SUSTAINABLE *Food Production*

2nd Joint Meeting of Agriculture-oriented PhD Programs  
UniCT, UniFG and UniUd  
14-16 SEPTEMBER 2020



UNIVERSITÀ  
degli STUDI  
di CATANIA



UNIVERSITÀ  
di FOGGIA



UNIVERSITÀ  
DEGLI STUDI  
DI UDINE



## **Monday September 14**

### **09:30 - 09:50 Welcome address**

**Giancarlo Colelli:** Coordinator PhD in Management of Innovation in the agricultural and food systems of the Mediterranean Region, UniFg

**Milena Senigallia:** Director - Department of Agriculture, Food and Environment, UniFg

### **MORNING SESSION 1** (Chairpersons: Alessia Incardona – Ruggero Menci)

#### **Main lecture:**

*Carmelo Rapisarda, Department the Science of Agriculture, Food and Environment; University of Catania*

**10:30 - 10:55:** Microscopic and molecular detection of pathogenic parasites in vegetables and berries sold on the Italian market

*Alessandra Barlaam, Unifg*

**10:55 - 11:15:** Different approaches for clogging assessment in a pilot treatment wetland

*Alessandro Sacco, Unict*

#### **11:15 - 11:45: Break**

**11:45 - 12:00:** Adding unprecedented economic and social values to the side- and by-products of Mediterranean fruit and vegetables by reshaping them in novel source of nutrients and tailored food products mediated by 3D printing technology

*Mehmet Onur Oral, Unifg*

**12:00 - 12:15:** Castor oil as an innovative raw material for an energy supply chain in semi-arid environments

*Silvio Calcagno, Unict*

**12:15 - 12:35:** Determinants of spring frost tolerance in fruit crop *Vitis vinifera*

*Valeria De Rosa, Uniud*

**12:35 - 12:50:** Red Mark Syndrome in rainbow trout: etiopathogenetic study

*Massimo Orioles, Uniud*



**12:50 - 13:15:** Use of innovative postharvest technologies to add value to minor horticultural crops

*Danial Fatchurrahman, Unifg*

**13:15 - 14:15: Lunch Break**

**AFTERNOON SESSION 1** (Chairpersons: Flavia Fulvio – Silvia Pianezze)

**14:15 - 14:45: Keynote -**

*Francesco Ceglie, PhD;*

**14:45 - 15:10:** Health and eco-innovations in food packaging

*Antonella Cammarelle, Unifg*

**15:10 - 15:25:** New breeding techniques in Citrus: effect of genotype, explant source, in vitro cultural condition and interaction with *Agrobacterium* on transformation efficiency

*Lara Poles, Unict*

**15:25 - 15:45:** Hazelnut supplementation in lamb diet: effect on welfare and meat quality

*Martina di Corcia, Unifg*

**15:45 - 16:15: Break**

**16:15 - 16:30:** Discriminating fruits and vegetables using innovative and non-destructive techniques

*Hassan Fazayeli, Unifg*

**16:30 - 16:50:** Two different approaches to edit genes involved in the carotenoid pathway for producing lycopene enriched pigmented oranges

*Fabrizio Salonia, Unict*

**16:50 - 17:05:** Anaerobic digestion for waste management and control of environmental impact of fish farms with renewable energy production

*Owono Owono Bartolomè, Uniud*

**17:05 - 17:25:** A multidisciplinary approach for citrus rootstock evaluation

*Giulia Modica, Unict*



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**17:25 - 17:50:** Agronomic strategies for the sustainable management of durum wheat cultivation in Mediterranean area

*Federica Carucci, Unifg*

**General conclusions in plenary session and creative performance by UniFG.**



## Tuesday September 15

### MORNING SESSION 2 (Chairpersons: Marco Vuerich – Simona Tortorici)

#### Main lecture:

*Paola Scrolavezza, Department of Modern Languages, Literatures and Cultures, University of Bologna*

**09:30 - 09:55:** Reducing mechanical damage induced by fresh-cut processing

*Alessia Incardona, Unifg*

**09:55 - 10:15:** Selection and proteomics characteristics of  $\beta$ -glucosidase positive *Lactiplantibacillus plantarum* strains under simulated table olives conditions

*Amanda Vaccalluzzo, Unict*

**10:15 - 10:30:** Exploring the molecular mechanisms underlying the pathogenesis of 'Candidatus Phytoplasma solani'

*Gaia Carminati, Uniud*

**10:30 - 10:45:** "Bio-refinery" processes for the enhancement of industrial tomato processing waste

*Francesco Contillo, Unifg*

**10:45 - 11:00:** Exploring multitrophic interactions under changing climate

*Milan Milenovic, Unict*

**11:00 - 11:30: Break**

**11:30 - 11:50:** Functional characterization of Rvi 12 resistance gene against Apple Scab

*Ayesha Yousaf, Uniud*

**11:50 - 12:05:** Variability of cannabinoid synthases genes in industrial and medical strains of *Cannabis sativa*

*Flavia Fulvio, Unifg*

**12:05 - 12:20:** Industrial crops for phytoremediation and bioenergy production in heavy metal polluted soil

*Barbara Rachele Ciaramella, Unict*



**12:25 - 12:40:** In vitro rumen aflatoxin decontamination mediated by microbes

*Matteo Braidot, Uniud*

**12:40 - 13:00:** Cover cropping: a sustainable management for improving soil health, weed management and nitrogen dynamics in mediterranean agro-ecosystem

*Stefania Fontanazza, Unict*

**13:00 - 14:00: Lunch Break**

## **AFTERNOON SESSION 2** (Chairpersons: Ashraf Ali – Lara Poles)

**14:00 - 14:30: Keynote –**

*Saheed A. Salami, PhD; Research fellow - solutions deployment team*

**14:30 - 14:50:** Fractionation of the  $\delta^{13}\text{C}$  of the fatty acids in bovine organism

*Silvia Pianezze, Uniud*

**14:50 - 15:05:** Biofortification of vegetables for new consumer demand

*Camila Vanessa Buturi, Unict*

**15:05 - 15:20:** Conflict between carnivores and livestock activities in the Triveneto mountainous areas: north-eastern Italy

*Marcello Franchini, Uniud*

**15:20 - 15:40:** Production, Efficiency and Moral Hazard in the Italian Viticulture

*Simone Russo, Unifg*

**15:40 - 16:10: Break**

**16:10 - 16:25:** Genetic studies on grapevine cultivars with different susceptibility to Flavescence dorée: intermediate results obtained with two approaches

*Sofia Casarin, Uniud*

**16:25 - 16:40:** Extraction of the extra virgin olive oil using innovative technologies

*Hazard Mjahed, Unifg*

**16:40 - 17:00:** Sheep's wool-based reinforcement fibers in raw earth materials

*Monica Parlato, Unict*



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**17:00 - 17:15:** Measuring ammonia and GHG concentrations in open and semi-open dairy houses: influence factors and data collection procedures

*Provvidenza Rita D'Urso, Unict*

**17:15 - 17:30:** Sex pheromone of the asparagus moth: extraction, chemical analysis and electroantennography

*Onofrio Marco Pistillo, Unifg*

**17:30 - 17:50:** Blood microbiome correlated to gut microbiome as a biomarker for dysbiosis in dogs

*Elisa Scarsella, Uniud*

**General conclusions in plenary session and creative performance by UniUD.**



## Wednesday September 16

### **MORNING SESSION 3** (Chairpersons: Danial Fatchurrahman – Ayesha Yousaf)

**Main lecture:** Some little things about research that I've learnt in the past thirty years

*Francesco Nazzi, Department the Science of Agriculture, Food and Environment, University of Udine*

**09:30 - 09:55:** 3D Printing in Food Manufacturing: A Case on Starch Gels

*Maddalena Paolillo, Unifg*

**09:55 - 10:15:** Monogenic and pyramided grapevine cultivars reveal early biomarkers upon artificial inoculation with *Plasmopara viticola*

*Ramona Mihaela Ciubotaru, Uniud*

**10:15 - 10:35:** Herbivore induced VOCs, secondary metabolites and enzymatic activity in *Solanum* species

*Simona Tortorici, Unict*

**10:35 - 10:50:** Genomic selection for durum wheat improvement

*Paolo Vitale, Unifg*

**10:50 - 11:05:** Grapevines subjected to different water regimes: a study of the physiological and molecular responses

*Riccardo Braidotti, Uniud*

**11:05 - 11:30: Break**

**11:30 - 11:50:** Detection of food fraud in commercial fish products through DNA barcoding

*Ashraf Ali, Unifg*

**11:50 - 12:05:** Population dynamics and carob variety susceptibility to the invasive ambrosia beetle *Xylosandrus compactus*

*Antonio Gugliuzzo, Unict*

**12:05 - 12:20:** Effect of pasture finishing on lipid and sensory characteristics of beef from culled italian Simmental cows

*Ndong Ncogo Castro, Uniud*



**12:20 - 12:35:** The adoption of 4.0 agriculture for wine production in order to improve efficiency, sustainability and competitiveness

*Mubshair Naveed, Unifg*

**12:35 - 12:55:** Dietary tannins to improve efficiency and product quality in ruminant extensive production systems - a preliminary *in vitro* rumen fermentation of a grass or hay substrate in combination with different tannin extracts

*Ruggero Menci, Unict*

**13:00 - 14:00: Lunch Break**

### **AFTERNOON SESSION 3** (Chairpersons: Camila Vanessa Buturi – Elisa Scarsella)

**14:00 - 14:30: Keynote –**

PhD **Udine**

**14:30 - 14:50:** Drought and grapevine: physiological and anatomical insights

*Marco Vuerich, Uniud*

**14:50 - 15:05:** Host plants preference and the feeding behavior of plant sap-sucking insects, vectors of important diseases in agricultural crops

*Alessia Farina, Unict*

**15:05 - 15:20:** Postharvest technology to reduce husk scald in pomegranate skin

*Mahshad Maghoubi, Unifg*

**15:20 - 15:35:** How interaction among stress factors might affect honey bees health

*Elisa Seffin, Uniud*

**15:35 - 15:55:** Characterization of new fungal diseases of Pistachio in Sicily and development of sustainable management strategies

*Giorgio Gusella, Unict*

**15:55 - 16:20: Break**

**16:20 - 16:35:** Physiological and molecular study of mechanisms involved in iron and nitrogen nutrition in crops

*Arianna Lodovici, Uniud*



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**16:35 - 16:50:** Contactless and no-destructive quality assessment of fresh-cut fruit and vegetables

Michela Palumbo, *Unifg*

**16:50 - 17:05:** Remote sensing techniques for supporting the sustainable irrigation management under semi-arid conditions

Giuseppe Longo-Minnolo, *Unict*

**17:05 - 17:25:** Novel CRISPR/Cas9 approaches for improving crop protection in grapevine

Loredana Moffa, *Uniid*

**17:25 - 17:50:** Callose response to phytoplasma infection: plugging at the sieve plate or something more?

Chiara Bernardini, *Uniid*

**17:50 - 18:15: Discussion**

**General conclusions in plenary session and creative performance by UniCT.**



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**Session 1**

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**Session 2**

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**Session 3**

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**3D Printing in Food Manufacturing: A Case on Starch Gels**

Maddalena Paolillo - [maddalena.paolillo@unifg.it](mailto:maddalena.paolillo@unifg.it)

Carla Severini

Recently, the interest for the layer-by-layer food manufacturing, commonly referred 3D Food Printing (3DFP) is steadily increasing. In the field of food sector the development of this revolutionary technology is pushed mainly from the benefits generated from creative food design at different angles such as the novel structure, shape and texture and consequently new flavor of food. Starch is a critical component that affects texture, appearance, and the quality of food. Starch pastes properties such as retrogradation effects, different botanical origins (wheat, maize, rice cassava, potato starch) different contents of amylose and amylopectin affect texture, appearance and the quality of food. We have investigated the printing of food-grade starch gels analyzing the effect of Crystal Texture concentration (CT), storage time (ST) before printing and printing temperature (PT) on in-depth rheological analyses and printing fidelity. We have interpreted the printing fidelity – morphological and microstructure features – in light of the effect of above variables on the viscosity of ink-gels and the dispensability force needed to deposit material. At first, CT and ST were the variable of primary importance for the viscosity of ink-gels. Each variable (CT, ST and PT) significantly affected the dispensability force, however, the printed structure was completely shapeless. The changes in rheological properties of the gels also affected with high extent the printing fidelity. The analysis of deviation of morphological and microstructure properties from 3D virtual model allowed to define the best printing conditions.



## **Contactless and non-destructive quality assessment of fresh-cut fruits and vegetables**

[Michela Palumbo](mailto:michela.palumbo@ispa.cnr.it) – *michela.palumbo@ispa.cnr.it*

Giancarlo Colelli - Dr.ssa Maria Cefola

Computer Vision System (CVS) is an innovative contactless and non-destructive methodology that combines mechanics, optical instrumentation, electromagnetic sensing and digital image processing technology to predict and discriminate the products quality. CVS can automatically extract from an image the most discriminative colour features, related to the quality of the product analyzed, and can assess and predict its quality through the construction of mathematical models and algorithms.

This Ph.D. project is aimed at developing and validating CVS for the quality assessment of packaged rocket leaves and of common commercial fresh-cut fruits (apple and melon) to provide an innovative method for the quality prediction of products through the packaging material. This activity will be carried out within the PRIN project SUS&LOW (Sustaining Low-impact Practices In Horticulture Through Non-destructive Approach To Provide More Information On Fresh Produce History & Quality) whose purpose is to support the quality of productions and of the environment through low-input agricultural practices and non-destructive quality assessment.

During the first year, three experiments on rocket leaves, obtained using different low impact agricultural practices, were realized at the Institute of Science of Food Production of National Research Council. Rocket leaves were stored at 10 °C and the quality level (QL) was assessed using a 5 to 1 rating scale. At each QL leaves were subjected to destructive quality characterization and to non-destructive analysis by CVS.

Preliminary results showed that the CVS can be a valid non-destructive and contactless technology for the QL assessment of unpackaged rocket leaves.

Moreover, preliminary trials were conducted on fresh-cut apples to select cultivars more suitable to postharvest handlings.



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