

VI INTERNATIONAL CONFERENCE ON SAFETY, HEALTH  
AND WELFARE IN AGRICULTURE AND AGRO-FOOD SYSTEMS  
**RAGUSA SHWA**  
SEPTEMBER 15-16, 2021 ON-LINE

PROGRAMME

Date: 15 September, 15-18 h (CET)

Main Room – [Click here](#)

If requested: ID meeting: 980 9451 1190 - Passcode: 403043

Opening ceremony

Chairman: Giampaolo Schillaci - *University of Catania. Ragusa SHWA Convener*

Moderator: Remigio Berruto - *University of Torino. CIGR President*

Lectio Magistralis

15,15-15,45

Daniela Colombini - *Director of International ergonomic school EPM*

*ISO/NP TR 23476 - Ergonomics - Application document for International - ISO Standards in the agricultural sector for prevention of biomechanical overload: an application study*

15,45-16,15

Fabio Salbitano - *University of Florence*

*Urban nature as a paradigm of human health. The comfort of nature in the cities of tomorrow*

Discussion

5 minutes' break

Main Communications

16,30-17,15

Peter Lundqvist - *Swedish University of Agricultural Sciences*

*Swedish and international perspectives on health & safety in agriculture*

Claudio Colosio - *University of Milan. Director, Occupational Health Unit and International Centre for Rural Health of the Saints Paolo and Carlo Hospitals, Milano*

*The effects of legislative interventions on the trends of reports of occupational diseases in agriculture. The example of Italy*

17,15-18,00

Poster session

TOPIC 2. WMSDs Work related Musculoskeletal Disorders

Biomechanical risk for the hand-arm system during work activities on peach fruit tree

*Massimo Cecchini, Andrea Colantoni, Danilo Monarca, Filippo Cossio, Leonardo Bianchini, Simone Riccioni*

Health and safety risks in hop-picking activities: an analysis of the state of the art

*Giovanni Matranga, Niccolò Pampuro, Lucia Vigoroso, Eugenio Cavallo, Federica Caffaro*

TOPIC 3. Machine Milking, Animal Welfare, Sustainable livestock farming

Pre-slaughtering phases and meat quality of highly profitable cattle (Piedmontese fat ox)

*Simone Stella, Silvia Mazzola, Annamaria Costa, Erica Tirloni, Ernesto Beretta, Francesco Tangorra*

Calculation of the mixing time as a function of the dairy cow diet chemical homogeneity inside the mixing hopper

*Francesco Tangorra, Vera Perricone, Alessandro Agazzi, Aldo Calcante, Giovanni Savoini, Annamaria Costa*

Gut inflammation in adult pigs exposed to high ammonia levels during neonatal life. The effects of manure management on pig health

*Katarzyna Palus, Valentina Herrera, Silvia Modina, Alessia Di Giancamillo, Annamaria Costa*

The effect of lift crates on piglet survival rate during farrowing

*Annamaria Costa, Cecilia Salvagnini, Canzio Meneghello, Francesco Tangorra, Fabio Palmeri, Andrea Salvagnini, Silvia Mazzola*

Use of the daily milk yield deviations as an index of resilience in water buffalo

*Roberto Steri, David Meo Zilio, Giustino Gaspa, Alfredo Pauciullo*

TOPIC 5. Instrumentation, Equipment, Periodic Procedures and Tests

Check and calibration of spraying machinery in Lombardy: results of more than 15-years activity

*Domenico Pessina, Lavinia Eleonora Galli, Davide Facchinetti*

TOPIC 6. Safety Health and Welfare in Building

Lighting of milking parlours: results from a field study

*Francesco Tangorra*

TOPIC 7. Agriculture 4.0, Automation, Remote Control, Robot and Innovative Vehicle

Rovitis 4.0: an autonomous robot for spraying in vineyards

*Letizia Aiello, Cristiano Baldoin, Marcello Biocca, Cristian Bolzonella, Pietro Gallo, Massimo Gardiman, Francesco Meneghetti, Federico Pallottino, Giorgio Pantano, Matteo Pantano, Jurij Rakun, Peter Lepej, Denise Vicino, Nicola Vicino, Alessandro Zanzotto*

Automatic image labelling for deep-learning-based navigation of agricultural robots

*Dario Calogero Guastella, Domenico Longo, Giovanni Muscato*

Estimating costs of a chestnut mechanical harvester

*Arlindo Almeida*

#### TOPIC 8. Noise, Vibration, Dust, Endotoxin, Microorganism

Wood dust exposure during dry pruning in vineyard

*Pietro Gallo, Sabina Failla, Marcello Biocca, Enrico Paris, Giampaolo Schillaci*

Operators' exposure to hand-arm vibration in small olive growing

*Angela Calvo, Roberto Deboli, Christian Preti*

Hand arm vibration: comparison between laboratory and in field tests

*Emanuele Cerruto, Giuseppe Manetto, Rita Papa*

Fisherman's exposure to the noise emitted by a prototype of an on-board rotating sorting machine for clams (*Chamelea gallina*)

*Laura Fornaciari, Roberto Fanigliulo, Giuseppina Mascilongo, Corrado Costa, Renato Grilli, Marcello Biocca, Daniele Pochi*

A new methodology for assessing worker's safety in agriculture

*Giuseppe Aiello, Pietro Catania, Eliseo Roma, Mariangela Vallone*

#### TOPIC 9. Occupational Health

Critical Issues in the INAIL methodology for the assessment of work-related stress in the agricultural sector

*Massimo Cecchini, Leonardo Bianchini, Filippo Cossio, Simone Riccioni*

Effects of climate change on the health of people working in agriculture and forestry

*Erich Koch*

Tackling work-related diseases in agriculture

*Gert van der Laan*

Innovative solutions to reduce the risk levels of accidents and occupational diseases in hazelnut cultivation

*Danilo Monarca, Leonardo Bianchini, Andrea Colantoni, Filippo Cossio, Simone Riccioni, Giampaolo Schillaci, Luciano Caruso, Emanuele Cerruto, Giuseppe Manetto, Massimo Cecchini*

#### TOPIC 10. Impacts of crops and livestock productions

Ammonia emissions from a BAT farrowing room. Results of a yearly monitoring survey

*Annamaria Costa, Cecilia Salvagnini, Fabio Palmeri, Andrea Salvagnini, Francesco Tangorra*

Evaluation of employed equipment for plant protection product application in olive orchards

*Souraya Benalia, Lorenzo M.M. Abenavoli, Bruno Bernardi, Giuseppe Zimbalatti*

Safety in hazelnut mechanical harvesting

*Pietro Catania, Maria Alleri, Eliseo Roma, Mariangela Vallone*

Potential bioenergy and biofertiliser production from livestock waste in Mediterranean islands

*George Attard, Noel Azzopardi, Antonio Comparetti, Carlo Greco, Antony Gruppetta, Santo Orlando*

The influence of tractors on soil compaction in the last four decades

*Santo Orlando, Antonio Comparetti, Pierluigi Febo, Carlo Greco*

A case study of circular bioeconomy in Sicily through a home biowaste valorisation system

*Carlo Greco, Antonio Comparetti, Santo Orlando*

#### TOPIC 11. Precision farming and traceability

Purpose-intended modification of a conventional sprayer machine for application in precision agriculture

*Elio Romano, Giampaolo Schillaci, Domenico Longo, Carlo Bisaglia, Sabina Failla*

Farm management information systems: digital register of farm management in Southern Italy

*Paola D'Antonio*

#### TOPIC 13. Environment Safety, People Health Protection and Welfare

Environmental and health hazard from urban waste compost: the role of information to overcome users' beliefs

*Lucia Vigoroso, Giorgia Bagagiolo, Niccolò Pampuro, Eugenio Cavallo*

Evaluation of sustainable weeding methods for the control of spontaneous flora in urban areas

*Lucia Bortolini*

Analysis of spray behaviour using different sprayers in Citrus groves

*Souraya Benalia, Laura Violi, Pasquale Barreca, Giuseppe Zimbalatti, Bruno Bernardi*

*Error on drop size measurement due to image analysis digitisation*

*Giuseppe Manetto, Emanuele Cerruto, Domenico Longo, Rita Papa*

#### TOPIC 14. ROPS and Stability Research

"Ask me what I need": Investigating users' training needs and design requirements to encourage the correct operation of foldable rollover protective structures

*Federica Caffaro, Lucia Vigoroso, Margherita Micheletti Cremasco, Giuseppe Paletto, Eugenio Cavallo*

A method to ascertain the lateral stability of wheeled narrow-track tractors

*Domenico Pessina, Davide Facchinetti, Lavinia Eleonora Galli, Maurizio Cutini, Carlo Bisaglia*

Track widening for a safe travelling of a timber tractor-trailer combination

*Gianfranco Airoidi, Marco Manzone, Angela Calvo*

ROPS design guidelines for the effective driver's protection in case of tractor overturning

*Domenico Pessina, Lavinia Eleonora Galli, Davide Facchinetti*

#### TOPIC 17. Food Safety

Effect of nano particles of pomegranate peel extract on shelf life of some fruit and vegetable products

*Domenico Rongai, Francesca Baldassarre, Carlo Di Marco, Giuseppe Ciccarella*

*Comparison of cold brew and cold drip coffee extraction methods and stabilization technologies to extend the shelf life*

*Giulia Angeloni, Piernicola Masella, Lorenzo Guerrini, Agnese Spadi, Ferdinando Corti, Maria Bellumori, Marzia Innocenti, Luca Calamai, Alessandro Parenti*

## PROGRAMME

Date: 16 September, 14,30-18,00 h (CET)

Room 2 – [Click here](#)

If requested: ID meeting: 939 0905 8052 - Passcode: 168436

### Main Communication

14,30-14,45

John Rosecrance, Molly Hischke - *Colorado State University*

Giuseppe Todde, Maria Caria - *University of Sassari*

*Quantification of trunk postures among in vegetable and fruit pickers in Sardinia*

Room 1 – [Click here](#)

If requested: ID meeting: 938 7823 7254 - Passcode: 677607

14,45-17,45

### Parallel Session - Topic: 1-8

Chairman: Domenico Pessina – *University of Milano*

#### TOPIC 2. WMSDs Work related Musculoskeletal Disorders

Image analysis for ergonomic risk assessment for rope arborists

*Massimo Cecchini, Andrea Colantoni, Danilo Monarca, Filippo Cossio, Francesco Mazzocchi, Leonardo Bianchini*

#### TOPIC 3. Machine Milking, Animal Welfare, Sustainable livestock farming

Using of NMR milk metabolomics to evaluate mammary gland health status in dairy cows

*Cinzia Marchitelli, Daniele Pietrucci, Marco Milanese, Luca Casadei, Fernando Porcelli, Giovanni Chillemi, Alessandra Crisà*

Precision livestock farming for milk (PLF4MILK): a look inside the Buffalo sub-project

*David Meo Zilio, Gennaro Catillo, Vittoria Barile, Antonella Chiariotti, Miriam Iacurto, Roberto Steri, Francesco Cenci, Maria Chiara La Mantia, Luca Buttazzoni*

#### TOPIC 5. Instrumentation, Equipment, Periodic Procedures and Tests

Contribution of inspection methods to monitoring operator comfort during agricultural operations

*Elio Romano, Carlo Bisaglia, Roberto Oberti, Aldo Calcante, Alberto Zani, Denis Vinnikov, Andrea Marconi, Ermanno Vitale, Massimo Bracci, Venerando Rapisarda*

Assessment of external sprayer cleaning efficiency

*Marco Grella, Davide Allochis, Paolo Marucco, Paolo Balsari*

## TOPIC 6. Safety Health and Welfare in Building

Spatial analyses to assess the availability of sheep wool as potential building component

*Monica Parlato, Francesca Valenti, Simona Maria Porto*

## TOPIC 7. Agriculture 4.0, Automation, Remote Control, Robot and Innovative Vehicle

Smart machinery and devices for the reduction of risks from human-machine interference

*Pierluigi Rossi, Pier Luigi Mangiavacchi, Danilo Monarca, Massimo Cecchini*

Remot controls of solar drier micro-plants for process standardisation

*Tiziana Maria Piera Cattaneo, Carlo Bisaglia, Alessandro Cammerata, Annamaria Stellari, Elio Romano*

## TOPIC 8. Noise, Vibration, Dust, Endotoxin, Microorganism

Dynamic characteristics of seats equipping old tractors

*Christian Preti, Roberto Deboli, Angela Calvo*

How much are the hand-arm vibration and noise level generated by chainsaw used at small-scale forestry?

*Salvatore Francesco Papandrea, Andrea Rosario Proto, Stefano Grigolato, Raffaele Cavalli, Giuseppe Zimbalatti*

Comparison of whole-body-vibration exposure between quarry and farm activities

*Massimo Cecchini, Danilo Monarca, Andrea Colantoni, Filippo Cossio, Guido Alfaro Degan, Gianluca Coltrinari*

Analysis of mechanical vibrations generated by tractors: human body absorption in drivers with different body mass index

*Rino Gubiani, Nicola Zucchiatti, Ugo Da Broi, Carlo Moreschi*

Abatement systems efficiency: comparison of PM emitted by biomass combustion

*Andrea Colantoni, Enrico Paris, Monica Carnevale, Beatrice Vincenti, Adriano Palma, Leonardo Bianchini, Francesco Gallucci*

**5 minutes' break**

14,45-17,45

Parallel Session - Topic: 9-17

Room 2 – [Click here](#)

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Chairman: Eugenio Cavallo - *STEMS, CNR Torino*

## TOPIC 9. Occupational Health

The figure of the occupational safety officer (RLS) in agriculture: a survey in some Italian regions

*Rino Gubiani, Massimo Cecchini, Luciano Caruso, Simone Riccioni*

### TOPIC 11. Precision farming and traceability

#### Blockchain and IoT for food traceability

*Andrea Colantoni, Luisa Gaburova, Massimo Cecchini, Danilo Monarca, Leonardo Bianchini, Filippo Gambella, Silvia Raggi, Francesco Gallucci*

### TOPIC 12. Effect of landscapes on human health and welfare

#### Therapeutic value of a green roof in a prison. A case study in central Italy

*Francesca Piccioni, Massimo Cecchini, Chiara Grazini, Leonardo Bianchini*

### TOPIC 13. Environment Safety, People Health Protection and Welfare

#### CO<sub>2</sub> use and energy efficiency in closed plant production system by means of mini-air handling unit

*Claudio Perone, Michela Orsino, Giovanna La Fianza, Lucio Brunetti, Ferruccio Giametta, Pasquale Catalano*

#### Environmental evaluation of a conventional vineyard airblast sprayer through a mass-balance approach

*Marco Grella, Paolo Marucco, Gianluca Oggero, Marco Manzone, Fabrizio Stefano Gioelli, Paolo Balsari*

#### A survey on safety among tree-climber professional arborists

*Marcello Biocca, Leonardo Bianchini, Pietro Gallo, Federica Caffaro, Eugenio Cavallo, Massimo Cecchini*

### TOPIC 14. ROPS and Stability Research

#### Can digital games be adopted as a learning method to engage farmworkers in training sessions?

#### Perspectives and possible applications

*Lucia Vigoroso, Federica Caffaro, Margherita Micheletti Cremasco, Eugenio Cavallo*

#### Design, manufacturing and strength test of a 4-post ROPS fitted on a very low-profile tractor (TRACLAS project)

*Domenico Pessina, Davide Facchinetti, Francesco Santoro, Pierluigi Febo, Santo Orlando, Danilo Monarca, Massimo Cecchini, Maurizio Cutini, Vincenzo Laurendi, Davide Gattamelata, Simone Pascuzzi*

### TOPIC 15. SHWA & Augmented reality, Gamification, IoT

#### Smart glasses' acceptance by agricultural stakeholders using the technology acceptance model (TAM)

*Gabriele Sara, Giuseppe Todde, Marco Polese, Maria Caria*

### TOPIC 17. Food Safety

#### Ozone and sanodyna® to increase safety and sustainability in extra virgin olive oil production chain

*Alessio Cappelli, Piernicola Masella, Alessandro Parenti, Enrico Cini*

#### Food process safety investigated through NIR water absorption variations

*Tiziana Maria Piera Cattaneo, Laura Marinoni, Alessandro Cammerata, Annamaria Stellari, Massimo Brambilla, Elio Romano*

#### CO<sub>2</sub> use and energy efficiency in closed plant production system by means of mini-air handling unit

*Claudio Perone, Michela Orsino, Giovanna La Fianza, Lucio Brunetti, Ferruccio Giametta, Pasquale Catalano*

### 5 minutes' break

15,00-17,30

**Special Session "Innovation for Smart Dairy Farming" (CowBhave project, PRIN 2017 project)**

Under the auspices of ICTAgri CowBhave project, PRIN 2017 project, AIIA II Section, CIGR, and Di3A  
Room 3 – [Click here](#)

Meeting Chair: Prof. Claudia Arcidiacono - *University of Catania, Italy*

Session Chair: Prof. Daniele Torreggiani - *University of Bologna, Italy*

**15:00 – WELCOME SESSION**

Prof. Agatino Russo – University of Catania

Dean of the 'Agriculture Food and Environment' Department

Prof. Remigio Berruto – University of Turin

CIGR President

Prof. Patrizia Tassinari – University of Bologna

AIIA II Section President

Prof. Giampaolo Schillaci – University of Catania

Ragusa SHWA Conference Convener

**15.20 - LECTURES ON Innovation and sustainability for smart dairy farming COWBHAVE final results**

The COWBHAVE system: an open-source accelerometer-based system for monitoring dairy cows' behavioural activities, and the Virtual on-farm demonstration.

*Prof. Claudia Arcidiacono – University of Catania*

Using deep neural networks to detect cow behaviour from CowBhave accelerometer collar

*Dr. Victor Bloch – Natural Resources Institute Finland*

PRIN2017 intermediate results:

Task 1: PLF and barn microclimate

*Dr. Lisette Leliveld, University of Milan*

Task 2: Free access to pasture for dry cows: effects on health, behavior and production

*Dr. Lorenzo Leso, University of Florence*

Task 3: PLF and big data for the mitigation of the effects of heat stress

*Prof. Stefano Benni, University of Bologna*

Task 4: On the determination of acceleration thresholds for the automatic detection of cow behavioural activities in extensive livestock systems

*Dr. Giulia Castagnolo, University of Catania*

Task 5: Application of computer vision systems for herd management

*Prof. Stefano Benni, University of Bologna*

Task 6: PLF and sustainability in dairy cattle breeding

*Dr. Daniela Lovarelli, University of Milan*

The effect of microclimate conditions on ammonia emissions from an open-sided dairy barn during spring

*Dr. Provvidenza R. D'Urso, University of Catania*

Spatial variability of ammonia and carbon dioxide concentrations in an open-sided dairy barn

*Dr. Provvidenza R. D'Urso, University of Catania*

17:30 – Discussion

17,50- 18,00

Closure ceremony

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Remigio Berruto – *University of Torino. CIGR President*

Giampaolo Schillaci – *University of Catania. Ragusa SHWA Convener*