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INDEX

Sessione 1 - RECUPERO - Sviluppo delle aree marginali

ORAL PRESENTATIONS

Micro-plastic Effects on Agricultural Soil: A Bibliometric Analysis. *Antonello Calcutta, Ennio D'Emanuele, Sebastiano Infantino, Enrico Naselli, Antonio C. Barbera*

Developing a Planning Process for a Coastal Wetland and Assessing the Role of Agriculture in Ecosystem Services and Biodiversity. *Anna Rita Bernadette Cammerino, Michela Ingaramo, Massimo Monteleone*

Biomass and Seed Yields of Cardoon (*Cynara cardunculus* L.) Fertilized by Biowaste Compost in Two Inland Hilly Areas of Southern Italy. *Luigi Morra, Nino Virzì, Maurizio Bilotto, Tommaso Enotrio, Antonio Merola, Antonio Leonardi, Stefania Licciardello, Ezio Li Puma, Fabiola Sciacca, Massimo Palumbo, Michele Falce, Anna Ciancolini, Gianmaria Baldi*

Influence of Tillage and Nitrogen Fertilization on Durum Wheat Metabolite Profiling and Yield. *Luigi Tedone, Giovanna Marta Fusco, Rosalinda Nicastro, Petronia Carillo*

POSTERS

Productivity and Product Quality of Organically Grown Saffron in the Etna Area. *Umberto Anastasi, Gaetano Pandino, Concetta Scepi, Salvatore Lamacchia*

Field Vegetation Parameters for Pasture Above-ground Biomass Estimation: A Case Study. *Elena Basso, Cristina Pornaro, Francesco Marinello, Stefano Macolino*

Phytomanagement of a Shooting Range Soil with *Ricinus communis* L. *Linda Carrino, Donato Visconti, Nunzio Fiorentino, Massimo Fagnano*

Quantifying Non-photosynthetic Vegetation in a Mixed Grassland Using Hyperspectral Data: A Case Study in Kenya. *Rodolfo Ceriani, Francesco Fava, Giulia Tagliabue, Micol Rossini, Sonja Leitner, Cinzia Panigada, Vincent Odongo, Valentina Vaglia, Paul Mutuo, Kelvin Kinuthia, Ramin Heidarian, Katayoun Fakherifard, Monica Pepe*

Tolerance of African Fodder Cane to the Cultivation in Heavy Metals Polluted Soils. *Barbara Rachele Ciaramella, Alessandra Piccitto, Alessio Scandurra, Valeria Cafaro, Silvio Calcagno, Salvatore Luciano Cosentino, Giorgio Testa*

Effect of Different Fertilization Strategies on Yield of Cauliflower Grown on Three Different Types of Soil. *Eugenio Cozzolino, Ida Di Mola, Lucia Ottaiano, Maria Eleonora Pelosi, Nunzio Fiorentino, Massimo Fagnano, Mauro Mori*

Seed Yield and Quality of *Medicago intertexta* L. in a Mediterranean Environment. *Giuseppe Di Miceli Giuseppe, Lucia Dinolfo, Nicoletta Lala, Davide Farruggia, Nicolò Iacuzzi, Leto Claudio, Simona Prestigiacomo*

Innovative Products from Apulian Marginal Areas: *Salvia rosmarinus* Schleid. as Source of Bioactive Compounds. *Jihane El Mahdi, Claudia Ruta, Laura Scalvenzi, Giuseppe De Mastro*

Is the Modified Biochar Through the Tannic Acid Suitable in Reclamation of Contaminated Soils by Heavy Metals? A Mesocosm Trial. *Giuseppe Maglione, Carmen Arena, Lucia Santorufò, Ermenegilda Vitale, Gaetano De Tommaso, Fulvio De Paola, Giuseppina Roviello, Elena Chianese, Claudio Ferone, Franca Polimeno, Giulia Maisto, Mauro Iuliano, Luca Vitale*

Monitoring the Development of Meadow Grassland in Agrivoltaic System Through LiDAR Technology. *Michele Moretta, Riccardo Rossi, Marco Moriondo, Gloria Padovan, Enrico Palchetti, Marco Bindi*

Polyannual Cardoon (*Cynara cardunculus* L.) and Compost Amendment Improve Soil Organic Carbon in Two Hilly Areas of Southern Italy. *Luigi Morra, Salvatore Baiano, Antonio Merola, Michele Rinaldi, Nino Virzi, Massimo Palumbo*

Seed Production Of A Valuable Old Variety Of Sulla (*Sulla coronaria* L.) For Sardinian Pastoral Systems. *Teresa Murgia, Maria Nieddu, Maria Sitzia, Giovanni Garau, Pier Paolo Roggero*

Preliminary Results on the Seed Production and Quality of *Tanacetum cinerarifolium* (Trev.) Schultz-Bip. in Southern Italy. *Claudia Ruta, Martina Grdiša, Luigi Tedone, Cataldo Pulvento, Giuseppe De Mastro*

Modelling Camelina (*Camelina sativa* L. Cranz) Yield in Rotation with Barley (*Hordeum vulgare* L.) in Mediterranean Area Using the ARMOSA Crop Model. *Calogero Schillaci, Alessia Perego, Marco Acutis, Marco Botta, Tommaso Tadiello, Mara Gabrielli, Tommaso Barsali, Francesca Tozzi, David Chiaramonti, Arwyn Jones*

Crop Yield Response in the Mediterranean Agroforestry: A Preliminary Metanalysis. *Danilo Scordia, Sebastiano Andrea Corinzia, Jaime Coello, Rosa Vilaplana Ventura, Diana Elisa Jiménez-De-Santiago, Berta Singla Just, Omar Castaño Sanchez, Carme Casas, Marc Tchamitchian, Léa Garreau, Mohamed Emran, Sami Z. Mohamed, Mai Khedr, Mohamed Rashad, Roxanne Suzette Lorilla, Alexandre Parizel, Giuseppe Mancini, Antonella Iurato, Corrado Dimauro, Fabio Gresta, Salvatore Luciano Cosentino, Giorgio Testa*

Impacts of Management Practices on TIMESAT Seasonal Parameters in Mediterranean Grasslands. *Alberto Tanda, Antonio Pulina, Pier Paolo Roggero*

Sessione 2 - CIRCOLARITÀ - Sviluppo di strategie di economia circolare nel settore agro-alimentare

ORAL PRESENTATIONS

Reuse of wastewater in agriculture: risks or benefits? A pilot-scale study on durum wheat (*Triticum durum* Desf.). *Michele Denora, Vincenzo Candido, Francesco De Mastro, Giuseppe Gatta, Cristina De Ceglie, Ruud P. Bartholomeus, Gennaro Brunetti, Michele Perniola*

Effect of Different Fertilization Strategies and Biostimulant Application on Yield and Quality Traits of Eggplant (*Solanum melongena* L.). *Ida Di Mola, Eugenio Cozzolino, Lucia Ottaiano, Roberta Marra, Ferdinando Esposito, Nunzio Fiorentino, Massimo Fagnano, Mauro Mori*

Planning and Managing a Forage System to Constrain Nitrogen Surplus in Dairy Farms. *Francesco Ferrero, Ernesto Tabacco, Gabriele Rolando, Giorgio Borreani*

The Use Of Pelargonic Acid Accelerates Seed-Drying Of Camelina: An Example Of Circularity Of H-EU Project Carina. *Maria Giovanna Sessa, Federica Zanetti, Barbara Alberghini, Andrea Parenti, Sara Berzuini, Angela Vecchi, Anna Ciancolini, Michele Falce, Pieter Ravaglia, Dalila Villano, Gianmaria Baldi, Erika Facciolla, Andrea Monti*

POSTERS

The effect of sludge from citrus peel on the growth of *Lolium multiflorum* Lam. *Silvio Calcagno, Alessandra Piccitto, Carmela Patania, Vivienne Panebianco, Barbara Rachele Ciaramella, Stefania Longo, Giorgio Testa, Salvatore Luciano Cosentino*

Evaluation of Agronomic performance and health-beneficial properties of *Urtica dioica* L. cultivated in Nitrate Vulnerable Zones. *Elettra Frassinetti, Mattia Alpi, Eros D'Amen, Giovanni Dinelli, Ilaria Marotti*

Sustainable Use Of Bioactive Compounds From *Brassicaceae* And *Solanaceae* Wastes For Cereal Crop Protection (SUSinCER). *Chiara Lanzanova, Daniela Pacifico, Roberto Lo Scalzo, Bruno Parisi, Eleonora Pagnotta, Luisa Ugolini, Laura Righetti, Roberto Matteo, Massimo Montanari, Anna Maria Mastrangelo, Daniela Marone, Raffaella Pergamo, Carlotta Balconi*

Growth and Essential Oil Yield of *Salvia officinalis* L. Cultivated under an Agriphotovoltaic System. *Angela Libutti, Laura Frabboni, Antonio Stasi, Marianna Silvestri, Annalisa Tarantino, Grazia Disciglio*

Nano-hydroxyapatite from Wastes: Synthesis and P Release Evaluation Through A Soil Column Compared to Triple Super Phosphate. *Laura Pilotto, Clara Piccirillo, Francesca Scalera, Luca Marchiol, Monica Yorlady Alzate Zuluaga, Youry Pii, Guido Fellet*

Nano-Enabled Agriculture and Circular Economy. Nature-Derived Materials as Smart-Delivery Systems. *Laura Pilotto, Luca Marchiol, Guido Fellet*

Land Occupation Affects Nitrogen Load on Dairy Farms in Northern Italy. *Gabriele Rolando, Francesco Ferrero, Ernesto Tabacco, Giorgio Borreani*

Rooting and Shooting in Single-node Stem cuttings of *Saccharum spontaneum* ssp. *aegyptiacum* as affected by Explant/Transplant Time. *Alessandro Saita, Valeria Cavallaro, Elena Crapio, Alessandra Piccitto, Giorgio Testa, Salvatore Luciano Cosentino, Cristina Patanè*

Sustainable Agronomic Practices for a Top Quality Tobacco. *Maria Isabella Sifola, Daniele Todisco, Luisa del Piano, Eugenio Cozzolino*

Camelina as opportunity for cropping system diversification and bioeconomy development: on-farm multilocation study in Tuscany. *Silvia Tavarini, Alessandro Rossi, Clarissa Clemente, Lara Foschi, Luciana G. Angelini*

Improved digestate for sustainable fertilization: preliminary results of NOMAD project. *Leonardo Verdi, Roberto Vivoli, Marco Mancini, Simone Orlandini, Anna Dalla Marta*

Sessione 3 - BASSO IMPATTO - Riduzione degli sprechi e dell'impatto ambientale

ORAL PRESENTATIONS

A New Sustainable Method Of Soil Solarization For Management Of Soil Pathogens. *Battaglia Valerio, Cermola Michele, Mormile Pasquale, Lahoz Ernesto*

Producing thermoplastics from wheat flour surpluses: mechanical performances of films as related to crop N status, flour baking properties and gluten composition. *Paolo Benincasa, Franco Dominici, Francesca Luzi, Catia Governatori, Laura Gazza, Elena Galassi, Giacomo Tosti, Debora Puglia*

Shade-Avoidance response For Enhanced Tolerance to Weed Competition In a Local Wheat Variety. *Valerio Cirillo, Claudio Russo, Nausicaa Pollaro, Francesco Antonio Carbone, Antonio Di Matteo, Albino Maggio*

Green Mulch For Weed Management In Organic Rice. *Giulia Papandrea, Silvia Fogliatto, Zineb Bennani, Ivan Di Furia, Alessandro Beltramo, Francesco Vidotto*

POSTERS

Carbon Flux As Affected By Different Winter Cover Crops. *Mariam Atait, Roberto Mancinelli, Mohamed Allam, Verdiana Petroselli, Valentina Quintarelli, Emanuele Radicetti*

Environment x genotype influence in the nutritional and antinutritional compounds in camelina seeds. *Sara Berzuini, Federica Zanetti, Barbara Alberghini, Clarissa Clemente, Silvia Tavarini, Luciana Angelini, Incoronata Galasso, Sara Pozzo, Antonella dalle Zotte, Andrea Monti*

Biochar as Soil Amendment to Improve the Sustainability of the Intensive Dairy Cattle Farming. *Lamberto Borrelli, Massimo Valagussa, Alberto Tosca, Daniele Cavalli, Alessandra Lagomarsino, Carla Scotti*

Research Application of Land Parcel Identification System data: a systematic literature review. *Antonio Bruno, Philippe Martin, Elisa Marraccini*

Effect of legume species rotation on durum wheat production in Mediterranean Climate. *Claudio Calia, Luigi Tedone, Claudia Ruta, Cataldo Pulvento, Giuseppe De Mastro*

Environmental evaluation of nitrogen management using self-driving robots. *Davide Cammarano, Vita Antoniuk, Kiril Manevski, Joory Jin, Yeying Zhou, Mathias A. Nemuar*

Reduction of Sorghum Crop Cycle for Water Saving. *Pasquale Campi, Maria Roberta Bruno, Gabriele De Carolis, Anna Francesca Modugno*

Effect of Irrigation Scheduling on Yield-Quality and Water Efficiency Indices in Processing Tomato. *Federica Carucci, Giuseppe Gatta, Anna Gagliardi, Delia Caldarola, Marcella Michela Giuliani*

Agronomical Role Of Different Summer Intercropped Cover Crops On Nutrient Uptake, Weed Control And Yield Performance Of Bread Wheat: A Three-Year Study In The Po Plain. *Paolo Colombatto, Giulia Papandrea, Luca Capo, Raffaele Meloni, Mattia Scapino, Silvia Fogliatto, Amedeo Reyneri, Francesco Vidotto, Massimo Blandino*

Adaptability of Three Ancient Varieties of Durum Wheat Cultivated in Purity and as Mixtures to an Inland Hilly Area of Campania Region. *Eugenio Cozzolino, Ida Di Mola, Lucia Ottaiano, Maria Eleonora Pelosi, Daniele Todisco, Nunzio Fiorentino, Antonio Minoliti, Raffaele Romano, Mauro Mori*

Adaptability of Three Ancient Varieties of Common Wheat Cultivated in Purity and as Mixtures to an Inland Hilly Area of Campania Region. *Ida Di Mola, Lucia Ottaiano, Eugenio Cozzolino, Maria Eleonora Pelosi, Sabrina Nocerino, Nunzio Fiorentino, Antonio Minoliti, Raffaele Romano, Mauro Mori*

Natural-based products as possible sustainable alternatives for cover crops termination. *Giovanni Dinelli, Lorenzo Negri, Antonio Fakaros, Giulia Oliveti, Sara Bosi*

Preliminary Results On The Use Of Dark Green Colour Index (DGCI) To Evaluate The Nutritional Status Of *Camelina Sativa* (L.) Crantz. *Leonardo Ercolini, Andrea Berton, Lisa Caturegli, Nicola Grossi, Nicola Silvestri*

Effects of Arbuscular Mycorrhizal Fungi on Tomato Yield Under deficit irrigation in Greenhouse. *Michela Farneselli, Beatrice Falcinelli, Martina Cerri, Lara Reale, Domizia Donnini, Euro Pannaci, Francesco Tei*

Effects of foliar treatment with various types of biostimulants and different frequency of application on yield and quality of organic oregano. *Davide Farruggia, Salvatore La Bella, Federico Margiotto, Claudio Leto, Mario Licata, Nicolò Iacuzzi*

2D-NANO MAD PLANTS: a PRIN project on the Effects of 2D-nanomaterials on seed plants reproduction. *Guido Fellet, Fabiano Miceli, Mario Baldini, Iris Aloisi, Mauro Tretiacch*

Tenebrio molitor Frass as organic fertilizer: results from a germination test on three crops and a pot experiment on sunflower. *Guido Fellet, Alessandro Foscari and Luisa Dalla Costa*

Agronomic Comparison Between Spring And Winter *Camelina Sativa* Cultivation In North Italy. *Martina Ghidoli, Sara Frazzini, Stefano De Benedetti, Stefano Sangiorgio, Michela Landoni, Alessio Scarafoni, Luciana Rossi, Roberto Pili*

Identifying criteria for harmonizing life cycle assessments of crop-livestock systems and interactions. *Pietro Goglio, Marie Trydeman Knudsen, Klara Van Mierlo, Nina Röhrig, Fossey Maxime, Alberto Maresca, Fatemeh Hashemi, Muhammad Ahmed Waqas, Jenny Yngvesson, Gilles Nassy, Roline Broekema, Simon Moakes, Catherine Pfeifer, Robert Borek, David Yanez-Ruiz, Monica Quevedo Cascante, Alina Sypl, Tomasz Zylowsky, Manuel Romero-Huelva, Laurence G. Smith, Francesco Tei*

Soil amendment application in an olive grove: effects on plant performance. *Rita Leogrande, Liliana Gaeta, Mirko Castellini*

Effects of different agronomic conditions on the production of eight bread wheat varieties. *Roberto Mancinelli, Mohamed Allam, Mariam Atait, Verdiana Petroselli, Emanuele Radicetti*

Understanding the spatiotemporal behaviour and the environmental sustainability of crop yield in an organic farming system. *Stefano Marino, Marco di Cristofaro, Arturo Alvino*

Allelopathic Effect of Buckwheat (*Fagopyrum esculentum* L.) on Germination and Performance of Crops and Weeds: a comprehensive methodology. *Daniel Marusig, Alessandra Virili, Gemini Delle Vedove, Elisa Marraccini*

Reduction of N input using foliar fertilisation and biostimulants: impact on yield and quality of common wheat. *Antonio Minoliti, Ida Di Mola, Lucia Ottaiano, Eugenio Cozzolino, Massimo Fagnano, Mauro Mori, Nunzio Fiorentino*

Camelina, an emerging oilseed crop, intercropped with pulses. *Elena Pagani, Federica Zanetti, Erika Facciolla, Andrea Monti*

Effects Of Deficit Irrigation On Mineral Elements Content Of ‘Early’ Potato. *Gaetano Pandino, Tiziana D’Anna, Giuseppa Scarso, Mariadaniela Mantineo, Davide Arnese, Claudia Formenti, Salvatore Alfio Salicola, Aurelio Scavo, Gaetano Roberto Pesce, Sara Lombardo, Giovanni Mauromicale*

Adaptability of Coloured Potato Cultivars to the Mediterranean Environment. *Alessandra Pellegrino, Salvatore La Rosa, Bruno Parisi, Salvatore Salicola, Giovanni Mauromicale, Anita Ierna*

A Comparative Test Of Rain Gun And Rainger Applied To Grain Maize In The North-eastern Italy. *Gaetano Roberto Pesce, Luca Cestaro, Maurizio Borin, Carmelo Maucieri*

Improving Tomato Production By Inoculation Of Arbuscular Mycorrhizal Fungi. *Valentina Quintarelli, Emanuele Radicetti, Mattia Baretta, Mortadha Ben Hassine, Roberto Mancinelli*

Tomato Plant Growth And Production As Affected By Inoculation With Arbuscular Mycorrhizal Fungi. *Valentina Quintarelli, Emanuele Radicetti, Mattia Baretta, Mortadha Ben Hassine, Roberto Mancinelli*

Use of spectral indices to optimize irrigation management of apricot in Mediterranean environment. *Carmela Riefole, Laura D’Andrea*

Soil Carbon Content in Long-Term Experiment under Different Soil Tillage Management Systems. *Michele Rinaldi, Salvatore Baiano, Antonio Troccoli, Angelo Pio De Santis, Leonardo Morcone, Luigi Morra*

Foliar application of biostimulants enhances sustainability and agronomic performances of wheat: preliminary results from central Italy. *Angelo Rossini, Roberto Ruggeri, Nada Mzid, Francesco Rossini*

Agronomic, Productive, and Qualitative Response of Sugarcane Accessions for Sicily. *Francesco Salamone, Nicolò Iacuzzi, Noemi Tortorici, Federica Alaimo, Teresa Tuttolomondo, Davide Farruggia*

Agronomic Management Of Hybrid Barley: Effect Of Tillage, Seeding Rate And N Fertilization. *Mattia Scapino, Luca Capo, Raffaele Meloni, Paolo Colombatto, Amedeo Reyneri, Massimo Blandino*

‘Early’ Potato – Pea Intercropping: First Evidence On Productive Traits And Insect Control. *Aurelio Scavo, Sara Lombardo, Antonio Biondi, Gaetano Pandino, Giovanna Tropea Garzia, Salvatore Alfio Salicola, Carmelo Cavallaro, Antonio Gugliuzzo, Claudia Formenti, Fabrizio Lisi, Gaetano Roberto Pesce, Giovanni Mauromicale*

Weed Pressure In An Organic Wheat-Legume Intercropping And Relay Cropping. *Danilo Scordia, Francesca Calderone, Oteri Marianna, Stefania Toscano, Fabio Gresta*

Legume Based Rotation In Low Input Agricultural Systems: Sustainability Aspects, Agronomic Traits And Nutritional Features. *Camilla Tibaldi, Mattia Alpi, Elettra Frassinetti, Giovanni Dinelli, Ilaria Marotti*

Yield, Pests and Weeds in Lentil–Cereal Intercropping. *Giacomo Tosti, Beatrice Falcinelli, Marcello Guiducci*

Weed competition ability of perennial forage legumes and grass growth in mixture and in pure stands under increasing level of simulated shade in rainfed condition. *Lorenzo Gabriele Tramacere, Alberto Mantino, Giorgio Ragaglini, Marcello Mele, Massimo Sbrana, Daniele Antichi*

Oper8 Project, a new European thematic network on non- chemical methods of weed control. *Lorenzo Gabriele Tramacere, Christian Frascioni, Lorenzo Gagliardi, Massimo Sbrana, Daniele Antichi*

A two-step approach for the calibration and simulation of wheat-lentil intercropping systems using MONICA. *Alessandro Triacca, Stefano Carlesi, Federico Leoni, Gilbert Koskey, Anna-Camilla Moonen, Moritz Reckling, Claas Nendel*

Improving Skills on Digital Agriculture in Europe: lessons learnt from the AgriSmart project. *Valentina Vaglia, Francesco Fava, Eugenio Carlon, George Dimitriadis, Martyna Kurek, Erika Nika, Heide Reimer, Peter Vnucko, Ambrogio Zanzi, Stefano Bocchi*

Agronomic And Environmental Effects Of Alternate Wetting And Drying In Italian Rice Cultivation. *Andrea Vitali, Barbara Moretti, Chiara Bertora, Eleonora Miniotti, Silvia Fogliatto, Marco Romani, Luisella Celi, Daniel Said-Pullicino, Francesco Vidotto*

Environmental Sustainability of Durum Wheat Cropping Systems: a Life Cycle Assessment Perspective. *Silvia Zingale, Carlo Ingraio, Giuseppe Indovino, Umberto Anastasi, Antonio Carlo Barbera, Paolo Guarnaccia, Thomas Nemecek*

Sessione 4 - RESILIENZA - Adattamento delle produzioni ai criteri di sostenibilità e ai cambiamenti climatici

ORAL PRESENTATIONS

Adapting Crops For The Green Transition: Smart Protein Project Experiences For Plant Protein Production Across Europe. *Gabriela Alandia, Nisha Sharma, Signe Marie Jensen, Fulai Li, Harm Brinks, Johan Wander, Dragica Grozdanic, Lucia Sanchez, Avichai Amrad, Daniel Marusig, Gemini Delle Vedove*

Application of Multi-Height Beerkan Method and BEST-Procedure to Study the Water Impact Effects on Soil Hydraulic Properties Under Alternative Soil Management. *Mirko Castellini, Antonio Preite, Luisa Giglio, Michele Rinaldi*

A New Approach for Developing Sustainable and Health-Promoting Durum Wheat *Composite Cross Populations*. *Paolo Guarnaccia, Silvia Zingale, Umberto Anastasi, Giuseppe Indovino, Alfio Spina, Giovanni Dinelli, Sara Bosi, Francesca Truzzi, Brunella Trucchi, Stefano Benedettelli*

A Two-Step Evaluation of Permanent Legume Living Mulches for Organic and Conservative Vegetable Systems. *Federico Leoni, Stefano Carlesi, Daniele Antichi, Christian Frascioni, Anna-Camilla Moonen*

POSTERS

Optimizing Camelina Sowing Date and Cultivar Choice to Maximize Vitamin E Content. *Barbara Alberghini, Federica Zanetti, Angela Vecchi, Federico Ferioli, Andrea Monti*

Coupling IoT Technologies, Blockchain and Modelling to Enhance Crop Production and Farmers' Financial Resilience Under Extreme Climatic Events: the RESTORATION Project. *Anna Rita Balingit, Giovanni Argenti, Marco Moriondo, Giacomo Trombi, Roberto Ferrise, Sergi Costafreda-Aumedes, Riccardo Rossi, Gloria Padovan, Niccolò Bartoloni, Sara Landini, Gianluca De Donno, Virginia Fani, Bianca Bindi, Romeo Bandinelli, Camilla Dibari*

Abiotic stress and durum wheat: morpho-physiological aspects in the Mediterranean environment. *Silvia Cantalamessa, Afsaneh Nematpour, Giancarlo Pagnani, Fabio Stagnari, Michele Pisante*

The Detection Of Salt- Tolerant Genotypes To Reduce Yield Losses And Pressure on Fresh-Water Reserves: A Quick, Simple, And Affordable Bioassay. *Linda Carrino, Donato Visconti, Daniele Todisco, Nunzio Fiorentino, Massimo Fagnano*

Temporal Changes in Saturated Hydraulic Conductivity under Minimum- and No-tillage Soil Management. *Mirko Castellini, Simone Di Prima*

Evaluating a World Mini-Collection of Domesticated Cowpea (*Vigna unguiculata* [L.] Walp.) for Intercropping With Cereals. *Daniele Cavalli, Luciano Pecetti, Nicolò Franguelli, Tommaso Notario, Paolo Annicchiarico*

Annual Variability Of N Mineralization From Soil Organic Matter As Affected By Climate. *Octavian P. Chiriac, Marco Pittarello, Barbara Moretti, Carlo Grignani, Laura Zavattaro*

Leaf Gas Exchange of Lignocellulosic Perennial Grasses Under Different Soil Water Availability. *Sebastiano Andrea Corinzia, Danilo Scordia, Giorgio Testa, Elena Crapio, Antonella Iurato, Cristina Patanè, Salvatore Luciano Cosentino*

Yield Of Lignocellulosic Perennial Grasses Under Different Soil Water Availability. *Sebastiano Andrea Corinzia, Elena Crapio, Danilo Scordia, Antonella Iurato, Giorgio Testa, Cristina Patanè, Salvatore Luciano Cosentino*

Climate-Smart Forage Systems for Climate-Smart Soils. *Claudia Dămățircă, Barbara Moretti, Luisella Celi, Maria Vicenza Chiriaco, Giampiero Lombardi, Laura Zavattaro*

Assessment of Grazing Intensity Integrating Google Earth Engine (Sentinel-2) and Livestock GPS locations. *Luca de Guttery, Laura Stendardi, Sergi Costafreda-Aumedes, Edoardo Bellini, Andrea Confessore, Chiara Aquilani, Marco Moriondo, Nicolina Staglianò, Carolina Pugliese, Giovanni Argenti, Camilla Dibari*

Modelling Context-Specific Mitigation Potential of Greenhouse Gas Emissions and Nitrogen Losses in Key European Farming Systems For Dairy Production. *Xabier Díaz de Otálora, Agustín del Prado, Federico Dragoni, Fernando Estelles, Barbara Amon*

Crop Performance of Peanut in a South Italy Environment: Effect of Irrigation and Plant Growth-Promoting Microorganisms on Water Productivity. *Michele Andrea De Santis, Daniela Campaniello, Damiana Tozzi, Luigia Giuzio, Maria Rosaria Corbo, Antonio Bevilacqua, Milena Grazia Rita Sinigaglia, Zina Flagella*

Simulating Soil Heterotrophic Respiration with ARMOSA Model: Calibration with Continuous Field Measures of CO₂ Soil Fluxes from the AGRESTIC Project. *Mara Gabbrielli, Marco Botta, Marco Perfetto, Irìde Volpi, Diego Guidotti, Cristiano Tozzini, Pierluigi Meriggi, Alessia Perego, Marco Acutis, Giorgio Ragaglini*

Working On Ancient Wheats And Old Durum Wheat Cultivars At The Dept. Of Agricultural Sciences Of Sassari. *Francesco Giunta, Rosella Motzo, Marina Mefleh, Martina Careddu*

A Network of Farms to Develop and Test Innovations for Climate-Smart Cropping Systems. *Elisa Marraccini, Vittoria Giannini, Gabriela Alandia, Giorgio Borreani, Mirco Corazzin, Gemini Delle Vedove, Francesco Ferrero, Stefano Grigolato, Carmelo Maucieri, Tanja Mimmo, Carlo Nicoletto, Silvia Panozzo, Gaetano R. Pesce, Gabriele Rolando, Luigi Sartori, Paolo Sivilotti, Enrico Sturaro, Ernesto Tabacco, Massimo Tagliavini, Eren Taskin, Damiano Zanotelli, Maurizio Borin*

Greenhouse Gas Emissions and Yield of Durum Wheat Under Organic and Conventional Fertilization in Three Type Soil. *Lucia Ottaiano, Eugenio Cozzolino, Ida Di Mola, Maria Eleonora Pelosi, Luca Vitale, Giuseppe Maglione, Bruno di Matteo, Daniele Todisco, Nunzio Fiorentino, Mauro Mori*

Yield and Quality Comparison of Hard Common Wheat Varieties in NE Italy in the Dry Year 2022. *Anna Panozzo, Simone Piotto, Riccardo Boscaro, Giuseppe Barion, Mirko Volpato, Teofilo Vamerali*

What Happens to Soil Organic Carbon in Venetian Low-lying Plain? Insight from a Long-term Experiment. *Ilaria Piccoli, Riccardo Polese, Nicola Dal Ferro, Francesco Morari, Antonio Berti*

Impact of Alley Poplar Silvoarable Systems with Soybean on Microclimatic Variables. *Simone Piotto, Anna Panozzo, Gaia Pasqualotto, Vinicio Carraro, Giuseppe Barion, Stefano Nale, Lorenzo Furlan, Tommaso Anfodillo, Teofilo Vamerali*

Yield and Yield Components of Alternative Crops in a Climate-Changing Mediterranean Environment. *Cataldo Pulvento, Luigi Tedone, Claudia Ruta, Giuseppe De Mastro*

Adoption of Conservation Agriculture in Winter Wheat (*Triticum Aestivum* L.) with the Aim of Saving Water, Protecting the Environment, Improving Soil Health and Reducing CO₂ Emissions. *Maria Florencia Ribero, Antonio Berti, Michele Pisante*

Leaf Gas Exchange of Sicilian Wheat Landraces Under Contrasting Soil Water Content. *Giorgio Testa, Alessio Scandurra, Paolo Caruso, Valeria Cafaro, Cristina Patanè, Salvatore Luciano Cosentino, Sebastiano Andrea Corinzia*

Can the Adoption of Conservation Agriculture Actually Increase the Soil Carbon Content? *Antonio Troccoli, Salvatore Baiano, Michele Rinaldi, Luigi Morra*

Sessione 5 - TRACCIABILITÀ - Promozione della sicurezza, tracciabilità e tipicità delle filiere

ORAL PRESENTATIONS

Evaluation of different growing systems on the productive and quality features of saffron (*Crocus sativus* L.). *Giovanni Dinelli, Mattia Alpi, Elettra Frassinetti, Ilaria Marotti*

Multi-Mycotoxin Long-Term Monitoring Survey on North-Italian Maize over an 11-Year Period (2011–2021): The Co-Occurrence of Regulated, Masked and Emerging Mycotoxins and Fungal Metabolites. *Sabrina Locatelli, Valentina Scarpino, Chiara L Lanzanova, Elio Romano, Amedeo Reyneri*

Multielement profile and chemometrics for traceability of Pomodorino del Piennolo del Vesuvio PDO. *Luigi Ruggiero, Raffaella Ofano, Diana Agrelli, Carmine Amalfitano, Paola Adamo*

Combining a crop model and remote sensing for crop trait retrieval: a methodological framework. *Fosco Mattia Vesely, Anne Schucknecht, Mirco Boschetti, Gabriele Candiani, Monica Pepe, Stefano Bocchi, Francesco Fava*

POSTERS

Hemp Inflorescences Traceability By Low Field NMR Relaxometry And Biometric Evaluation. *Salvatore Baiano, Mariarosaria Sicignano, Francesco Raimo, Luisa del Piano, Tommaso Enotrio, Paolo Lo Meo, Delia Francesca Chillura Martino, Pellegrino Conte*

Plants Toxic to Farm Animals: Assessment of their Chemical Compounds and Distribution in Central Italy. *Elisabetta Bianchi, Giovanni Argenti, Nicolina Staglianò, Federico Selvi, Silvia Lamanna, Claudia Focardi*

Digital Tools for Field Phenotyping of Processing Tomato Genotypes. *Andrea Burato, Federico Landi, Alfonso Pentangelo, Raffaele Cavaliere, Francesco Vitale, Domenico Ronga, Mario Parisi*

FoodOnLine Project: identification of metabolomic profiles for the certification of agri-food products and their traceability through block chain technology. *Cangemi Silvana, Mondelli Attilio, Mouzakioti Georgia, De Martino Antonio, Vinci Giovanni, Mazzei Pierluigi, Ciardella Giorgio, Spaccini Riccardo*

Evaluation of the effects of plant growth promoting microorganisms on wheat growth by spectral phenotyping: preliminary results from Agritech Project. *Michele Andrea De Santis, Antonio Bevilacqua, Annalisa d'Amelio, Damiana Tozzi, Luigia Giuzio, Michele Rinaldi, Nicola Pecchioni, Zina Flagella*

Greenhouse Covered by Photoluminescent Polyethylene Improves the Agronomical Response of Eggplant (*Solanum melongena* L.). *Ida Di Mola, Eugenio Cozzolino, Lucia Ottaiano, Maria Eleonora Pelosi, Sabrina Nocerino, Massimo Ripa, Pasquale Mormile, Luca Beltrame, Mauro Mori*

Mineral Elements Content In Globe Artichoke As Affected By Mulching Treatment. *Gaetano Pandino, Salvatore Susino, Giuseppe Zito, Claudia Formenti, Salvatore Alfio Salicola, Aurelio Scavo, Gaetano Roberto Pesce, Sara Lombardo, Giovanni Mauromicale*

A Multidisciplinary Approach To Detect Stress Symptoms In Vegetable Crops. *Massimo Pugliese, Luca Alfarano, Roberta Bulgari, Gica Stefanescu Miralles, Lorenzo Comba, Riccardo Cecire, Mery Malandrino, Luisella Celi*

Towards the Production of Durum and Common Wheat for a 0-residues Food Supply-Chain. *Amedeo Reyneri, Luca Capo, Aldo Ferrero, Marta Guarise, Giacomo Pedretti, Massimo Blandino*

Effects of Different Agronomic Conditions on the Production of Eight Bread Wheat Varieties

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Introduction

The upcoming challenges for farmers in coming years are related to the drastic changes in temperatures, rainfall patterns, droughts that negatively affect crop yields. To find solution to climate change and global warming the phenomenon of adaptation represent a key aspect for quantitative and qualitative traits of crop yield, especially for bread wheat. The selection of superior wheat varieties suitable for a particular area play a key role in maintaining high crop yield and quality. Therefore, sustainability of food production has become a priority, increasing the interest in new environmentally friendly tools to replace synthetic agrochemicals or, at least, reduce their impact. The selection of best suitable varieties in different agronomic management could be a way forward to overcome the environmental challenges differently affecting the yield of bread wheat crop varieties (Beres et al., 2020). This study aims to assess effects of variables such as abiotic stresses and management practices on bread wheat performance.

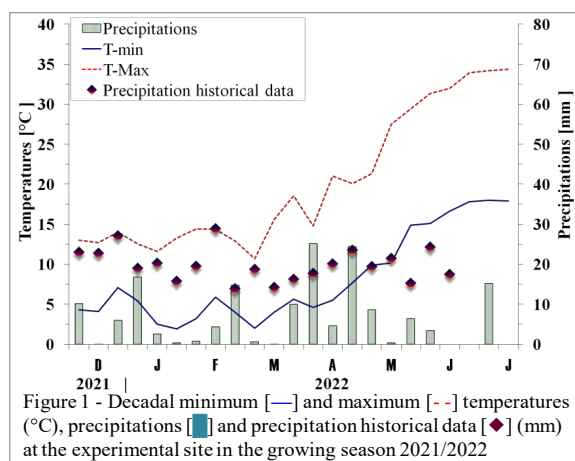
Materials and Methods

The study was carried out at University of Tuscia (UNITUS), Viterbo, Italy, during 2021/2022 growing season of which the climate data are reported in Figure 1. Commercial varieties of bread wheat were evaluated in different treatments. The field was organized in a split plot experimental design with three replications, in which treatments were the main plots and the commercial varieties as sub plots. A total of 8 commercial and widely cultivated bread wheat varieties were evaluated. The bread wheat varieties included Altigo, Bologna, Cosmic, Costello, GK Szilard, Nogal, Skagen, and Skyfall, of which the origin were in France, Italy, Italy, UK, Hungary, France, Denmark, UK, respectively.

Five treatments were applied:

- two fungicide applications, (Full) first application of fungicide "Seguris Xtra" plus the growth regulator "Moddus" at stem elongation stage and second application of fungicide "Prosaro" at heading time;
- one fungicide application, (Optimised) by application of "Prosaro" at heading time.
- No fungicide application (No-treatment);
- two fungicide applications as in the Full plus irrigation (Irrigated);
- management without any synthetic inputs (Organic), all agronomic techniques allowed by Regulation (EU) 2018/848 were adopted.

The sowing was in the middle of November using a seed dose equal for each plot of bread wheat (400 seeds m⁻²). On 02/23/2022, ammonium nitrate was manually applied (50 kg N ha⁻¹), then on 04/20/2022 the urea was applied (50 kg N ha⁻¹). Herbicide "Granstar®" was used for weeding, at stem elongation 8/04/2022. For the Organic treatment organic fertilizer just before the sowing and no weed control was applied. Harvesting time has been in the second middle of June. The statistical analysis was carried out using R software, analysis of variance (ANOVA) has been performed and the differences have been evaluated by student t test.



Results

Because the 2022 season was intensively dry with below-average rainfall (Fig. 1), the climate conditions surely affected the bread wheat crop. In fact, the precipitations were 63% reduced compared to the historical data, in the period January to June 2022.

Concerning the grain yield, the Irrigation treatment showed the best results (4.5 t ha⁻¹ of d.m. grain), followed by the Organic treatment (2.7 t ha⁻¹ of d.m. grain) and then the other treatments (on average 1.8 t ha⁻¹ of d.m. grain). Best levels of grain yields were observed for Nogal, Cosmic, Bologna, Altigo, GK Szilard varieties. The Irrigated treatment and the Altigo variety shown also the best grain dimension (thousand grain weight 34.7 g and 36 g, respectively). Skyfall variety, even if didn't show the best grain yield, resulted to be good for the grains dimension (33.7 g). Among the treatments Full, Optimised and No-treated, the first one positively affected the specific weight, while among varieties, Bologna variety was the best. In the Organic treatment, the plants resulted taller than other treatments (67 cm vs 55 cm on average). The same varieties which showed highest grain yield at the same time resulted to be taller (Nogal, Cosmic, Bologna, Altigo, GK Szilard).

Table 1- The main effect of treatment and variety on grain yield, thousand grain weight, specific weight, plant height, and moisture content. Values belonging to the same parameter and main effect with different letters (in columns) are statistically different according to LSD test ($p < 0.05$).

	Grain yield (kg ha ⁻¹ of dm)	Thousand grain weight (g)	Specific weight (kg hl ⁻¹)	Plant height (cm)	Grain moisture content (%)
<u>Treatment</u>					
Full	1736.5c	27.5b	70.7a	54.1bc	6.1ab
Optimised	1968.6c	29.2b	69.8b	54.9bc	5.3b
No-treated	1835.1c	28.6b	69.9b	53.6c	6.6ab
Irrigated	4526.5a	34.7a	-	56.6b	7.2a
Organic	2659.8b	28.3b	-	67.1a	6.8a
<u>Variety</u>					
Altigo	2726.5a	36.0a	68.6d	61.5a	7.0ab
Bologna	2854.1a	27.3bc	76.6a	60.4a	6.8ab
Cosmic	2879.5a	29.5b	67.2e	59.1a	5.5bc
Costello	2281.0b	29.0b	68.5d	53.4b	8.3a
GK Szilard	2682.5a	29.3b	72.2c	60.6a	4.6c
Nogal	3006.4a	27.9b	73.1b	62.3a	6.6b
Skagen	1806.4c	24.5c	66.3f	51.3bc	6.4b
Skyfall	2126.1bc	33.7a	68.5d	49.3c	6.1bc

Conclusions

There were no significant effects among Full, Optimised and No-treatment, due to the fungicide and growth regulator application for the increasing of grain yield and other parameters for the selected commercial varieties under dry climatic conditions. Perhaps due to the higher soil water retention, the Organic correctly managed could be a potential alternative. The study can help in the identification of promising wheat varieties with high mean performance under unfavourable climatic conditions. In fact, some varieties such as Nogal, Cosmic, Bologna, Altigo, GK Szilard were able to perform better in such dry climate.

Literature

Beres B.L. et al. 2020. Towards a better understanding of Genotype × Environment × Management interactions – a global Wheat Initiative agronomic research strategy. *Front. Plant Sci.*, 11: 828.