Scuola di Scienze Agrarie, Forestali, Alimentari ed Ambientali

CATALOGO RICERCA DELLA SAFE

STRUTTURATO PER AREE DI RICERCA (ADR)

AGGIORNAMENTO

PUBBLICAZIONI EDITE NELL'ANNO 2022

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Grafica e impaginazione
a cura della Commissione Ricerca

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PREMESSA

Con l'obiettivo di fornire agli stakeholders e a tutti i soggetti interessati un continuo aggiornamento della vivace attività scientifica svolta nella SAFE, con il prezioso supporto della Commissione Ricerca, è stato eseguito l'aggiornamento del catalogo della ricerca con i lavori scientifici prodotti nell'anno 2022 dagli afferenti alle diverse aree di ricerca. Le pubblicazioni dei professori e ricercatori della SAFE prendono spunto dal contesto territoriale Lucano e delle Regioni limitrofe, caratterizzato complessivamente dal forte interesse verso il settore primario, e i risultati illustrati nella maggior parte dei lavori, non presentano limiti territoriali poiché hanno un contesto di riferimento editoriale di livello internazionale. Dai lavori pubblicati si evince lo sforzo fatto dai professori e ricercatori della SAFE per migliorare la sostenibilità e la qualità delle produzioni del settore primario nel contesto post pandemia-Covid e della contingente situazione economica internazionale. Inoltre è evidente la sempre più rapida evoluzione dei sistemi produttivi agro-ambientali-industriali che condiziona la crescente velocità dello sviluppo delle innovazioni ed impone un continuo aggiornamento della didattica offerta e delle attività di orientamento e di terza missione.

Il Direttore
Prof. Giovanni Carlo Di Renzo

AdR

FORESTE E LEGNO

Coordinatore Prof. Luigi Todaro

PUBBLICAZIONI SSD AGR/05

Docenti afferenti:
Prof. Borghetti M., Prof. Ripullone F., Prof. Pierangeli D.,
Prof. Nolè A., Dr. Colangelo M.

Pubblicazioni del settore

1. Saulino L., Rita A., Allegrezza M., Zotti M., Mogavero V., Tesei G., Montecchiari S., Allevato E., Borghetti M., Bonanomi G., Saracino A. (2022). Clonality drives structural patterns and shapes the community assemblage of the Mediterranean Fagus sylvatica subalpine belt. *Front. Plant Sci.,* 13, 947166. https://doi.org/10.3389/fpls.2022.947166

2. Nolè A., Rita A., Spatola M.F., Borghetti M. (2022). Biogeographic variability in wildfire severity and post-fire vegetation recovery across the European forests via remote sensing-derived spectral metrics. *Science of The Total Environment*, 823, 153807, ISSN 0048-9697. https://doi.org/10.1016/j.scitotenv.2022.153807.

3. Campelo F., Sánchez-Salguero R., Rodríguez-González P.M., Colangelo M., Sánchez-Miranda A., Rita A., Francesco Ripullone, Camarero J.J. (2022). Growth phenological variations in the narrow-leaved ash (Fraxinus angustifolia) over the Mediterranean region: A simulation study. *Dendrochronologia*, 76, 126013, ISSN 1125-7865. https://doi.org/10.1016/j.dendro.2022.126013.

4. Pergola M.T., Saulino L., Castellaneta M., Rita A., Pecora G., Cozzi M., Moretti N., Pericolo O., Pierangeli D., Romano S., Viccaro M., Ripullone F.

(2022). **T**owards sustainable management of forest residues in the southern Apennine Mediterranean mountain forests: a scenario-based approach. *Annals of Forest Science,* 79, 14 (2022). https://doi.org/10.1186/s13595-022-01128-w

5. D'Andrea G., Šimůnek V., Castellaneta M., Vacek Z., Vacek S., Pericolo O., Zito R.G. Ripullone F. (2022). Mismatch between Annual Tree-Ring Width Growth and NDVI Index in Norway Spruce Stands of Central Europe. *Forests,* 2022, 13, 1417. https://doi.org/10.3390/f13091417

6. Vacek Z., Vacek S., Cukor J., Bulušek D., Slávik M., Lukáčik I., Štefančík I., Sitková Z., Eşen D., Ripullone F., Yildiz O., Sarginci M., D'Andrea G., Weatherall A., Šimůnek V., Hájek V., Králíček I., Prausová R., Bieniasz A., Prokůpková A., Putalová T. (2022). Dendrochronological data from twelve countries proved definite growth response of black alder (Alnus glutinosa [L.] Gaertn.) to climate courses across its distribution range. *Central European Forestry Journal*, 68(3), 139-153. https://doi.org/10.2478/forj-2022-0003

7. Masiello G., Ripullone F., De Feis I., Rita A., Saulino L., Pasquariello P., Cersosimo A., Venafra S., Serio C. (2022). The IASI Water Deficit Index to Monitor Vegetation Stress and Early Drying in Summer Heatwaves: An Application to Southern Italy. *Land*, 11(8), 1366. https://doi.org/10.3390/land11081366

8. Filizzola C., Carlucci M.A., Genzano N., Ciancia E., Lisi M., Pergola N., Ripullone F., Tramutoli V. (2022). Robust Satellite-Based Identification and Monitoring of Forests Having Undergone Climate-Change-Related Stress. *Land*, 11(6), 825. https://doi.org/10.3390/land11060825

9. Castellaneta M., Rita A., Camarero J.J., Colangelo M., Ripullone F. (2022). Declines in canopy greenness and tree growth are caused by combined climate extremes during drought-induced dieback. *Science of the Total Environment,* 2022, 813, 152666. http://dx.doi.org/10.1016/j.scitotenv.2021.152666

10. Caballol M., Ridley M., Colangelo M., Valeriano C., Camarero J.J., Oliva J. (2022). Tree mortality caused by Diplodia shoot blight on Pinus sylvestris

and other mediterranean pines. *Forest Ecology and Management*, 505 ,119935. https://doi.org/10.1016/j.foreco.2021.119935

11. Gazol A., Camarero J.J., Igual J.M., González de Andrés E., Colangelo M., Valeriano C. (2022). Intraspecific trait variation, growth, and altered soil conditions at tree species distribution limits: From the alpine treeline to the rear edge. *Agricultural and Forest Meteorology*, 315, 108811. https://doi.org/10.1016/j.agrformet.2022.108811

12. Gonzalez de Andres E., Gazol A., Querejeta J.I., Igual J.M., Colangelo M., Sánchez-Salguero R., Linares J.C., Camarero J.J. (2022). The role of nutritional impairment in carbon-water balance of silver fir drought-induced dieback. *Global change biology*, 28, 14, 4439-4458. https://doi.org/10.1111/gcb.16170

13. Camarero J.J., Gonzalez de Andres E., Colangelo M., de Jaime Loren C. (2022). Growth history of pollarded black poplars in a continental Mediterranean region: A paradigm of vanishing landscapes. *Forest Ecology and Management*, 517, 120268. https://doi.org/10.1016/j.foreco.2022.120268

14. Rita A., Camarero J.J., Colangelo M., Gonzalez de Andrés E., Pompa-García M. (2022). Wood Anatomical Traits Respond to Climate but More Individualistically as Compared to Radial Growth: Analyze Trees, Not Means. *Forests*, 13(6), 956. https://doi.org/10.3390/f13060956

15. Gazol A., Oliva J., Valeriano C., Colangelo M., Camarero J.J. (2022). Mixed Pine Forests in a Hotter and Drier World: The Great Resilience to Drought of Aleppo Pine Benefits It Over Other Coexisting Pine Species. *Front. For. Glob. Change,* 5, 899425. https://doi.org/10.3389/ffgc.2022.899425

16. Camarero J.J., Díaz-Delgado R., Colangelo M., Valeriano C., Sánchez-Salguero R., Madrigal J. (2022). Differential Post-Fire Recovery of Tree and Shrub Growth and Water-Use Efficiency in a Mediterranean Coastal Dune System. *Fire,* 5(5), 135. https://doi.org/10.3390/fire5050135

17. Camarero J.J, Campelo F., Colangelo M., Valeriano C., Knorre A., Solé G., Rubio-Cuadrado A. (2022). Decoupled leaf-wood phenology in two pine species from contrasting climates: Longer growing seasons do not mean

more radial growth. *Agricultural and Forest Meteorology*, 327, 109223. https://doi.org/10.1016/j.agrformet.2022.109223

18. Tumajer J., Serra-Maluquer X., Gazol A., Gonzalez de Andrés E., Colangelo M., Sangüesa-Barreda G., Olano J.M., Rozas V., García-Plazaola J.I., Fernández-Marín B. (2022). Bimodal and unimodal radial growth of Mediterranean oaks along a coast-inland gradient. *Agricultural and Forest Meteorology*, 327, 109234. https://doi.org/10.1016/j.agrformet.2022.109234

PUBBLICAZIONI SSD AGR/06

Docenti afferenti:
Prof. Moretti N. Todaro L.

Pubblicazioni del settore

1. Maulana M.I., Lubis M.A.R., Febrianto F., Hua L.S., Iswanto A.H., Antov P., Kristak L., Mardawati E., Sari R.K., Zaini L.H., Hidayat W., Lo Giudice V., Todaro L. (2022). Environmentally Friendly Starch-Based Adhesives for Bonding High-Performance Wood Composites: A Review. *Forests*, 13(10), 1614. https://doi.org/10.3390/f13101614
2. Lovaglio T., D'Auria M., Gindl-Altmutter W., Lo Giudice V., Langerame F., Salvi A.M., Todaro L. (2022). Thermal Modification and Alkyl Ketene Dimer Effects on the Surface Protection of Deodar Cedar (Cedrus deodara Roxb.) Wood. *Forests*, 13(10), 1551. https://doi.org/10.3390/f13101551

AdR

BIO-AMBIENTALE

Coordinatore Prof. Antonio Scopa

PUBBLICAZIONI SSD BIO/02-BIO/03

Docenti afferenti:
Prof. Fascetti S., Dr. Colacino C., Dr. Rosati L.

Pubblicazioni del settore

1. Potenza G., Gerardi G., Fascetti S., Rosati L. (2022). Habitat Fragmentation and Lichen Diversity in Peri-Urban Woodlands: A Case Study in the Municipality of Potenza (Southern Italy). *Plants*, 11(14), 1858. https://doi.org/10.3390/plants11141858

2. Conti F., Cancellieri L., Cangelmi G., Filibeck G., Rosati L., Bartolucci F. (2022). New records of native and alien vascular plants from Abruzzo, Lazio and Molise National Park (Italy) and additions to the flora of Abruzzo and Molise administrative regions. *Annali di Botanica*,12, 23-33. https://doi.org/10.13133/2239-3129/17631

3. Galasso G., Domina G., Andreatta S., Argenti C., Astuti G., Bacaro G., Bacchetta G., Bagella S., Banfi E., Barberis D., Bartolucci F., Bernardo L., Bonari G., Brundu G., Buccomino G., Calvia G., Cancellieri L., Capuano A., Celesti-Grapow L., Conti F., Cuena-Lombraña A., D'Amico F.S., De Fine G., de Simone L., Del Guacchio E., Emili F., Fanfarillo E., Fascetti S., Fiaschi T., Fois M., Fortini P., Gentili R., Giardini M., Hussain A.H., Iamonico D., Laface V.L.A., Lallai A., Lazzaro L., Lecis A.P., Ligato E., Loi G., Lonati M., Lozano V., Maccherini S., Mainetti A., Mascia F., Mei G., Menini F., Merli M.,

Montesano A., Mugnai M., Musarella C.M., Nota G., Olivieri N., Passalacqua N.G., Pinzani L., Pisano A., Pittarello M., Podda L., Posillipo G., Potenza G., Massimiliano Probo M., Prosser F., Quaglini L.A., Ravetto Enri S., Rivieccio G., Roma-Marzio F., Rosati L., Selvaggi A., Soldano A., Stinca A., Tasinazzo S., Tassone S., Terzi M., Vallariello R., Vangelisti R., Verloove F., Lastrucci L. (2022). Notulae to the Italian alien vascular flora: 14. *Italian Botanist*, 14, 99-118. https://doi.org/10.3897/italianbotanist.14.97758

4. Rosati L., Farris E. (2022). Phytosociological study of fringe communities of Sardinia (Italy). Phytocoenologia, 51, 111-139. https://doi.org/10.1127/phyto/2021/0385

5. Romano VA., Rosati L., Fascetti S., Cittadini AMR., Racioppi R., Lorenz R., D'Auria M. (2022). Spatial and temporal variability of the floral scent emitted by Barlia robertiana (Loisel.) Greuter, a Mediterranean food-deceptive orchid. *Compounds*, 2, 37-53. https://doi.org/10.3390/compounds2010004

6. Buldrini F., Pezzi G., Barbero M., Alessandrini A., Amadei L., Andreatta S., Ardenghi N.M.G., Armiraglio S., Bagella S., Bolpagni R., Bonini I., Bouvet D., Brancaleoni L., Brundu G., Buccheri M., Buffa G., Ceschin S., Chiarucci A., Cogoni A., Domina G., Forte L., Guarino R., Gubellini L., Guglielmone L., Hofmann N., Iberite M., Lastrucci L., Lucchese F., Marcucci R., Mei G., Mossetti U., Nascimbene J., Passalacqua N.G., Peccenini S, Prosser F., Repetto G., Rinaldi G., Romani E., Rosati L., Santangelo A., Scoppola A., Spampinato G., Stinca A., Tavano M., Caruso F.T., Roberta Vangelisti R., Venanzoni R., Vidali M., Wilhalm T., Zonca F., Lambertini C. (2022). The invasion history of Elodea canadensis and E. nuttallii (Hydrocharitaceae) in Italy from herbarium accessions, field records and historical literature. *Biological Invasions*, 25, 827-846. https://doi.org/10.1007/s10530-022-02949-6

PUBBLICAZIONI SSD AGR/07

Docenti afferenti:
Prof.ssa Gioia T., Dr.ssa Logozzo G.

Pubblicazioni del settore

1. Rocchetti L., Gioia T., Logozzo G., Brezeanu C., Guasch Pereira L., De la Rosa L., Marzario S., Pieri A., Fernie A.R., Alseekh S., Susek K., Cook D.R., Varshney R.K., Kumar Agrawal S., Hamwieh A., Bitocchi E., Papa R. (2022). Towards the Development, Maintenance and Standardized Phenotypic Characterization of Single-Seed-Descent Genetic Resources for Chickpea. *Current Protocols*, 2(2), e371. https://doi.org/10.1002/cpz1.371
2. De Ron A.M., Rodiño A.P., Gioia T., Brezeanu C., Burzo I., van Rensburg B.J., Pastor Corrales M.A., Nay M.M., Fourie D., Nkhata W., Shimelis H., Ø. Solberg S., Logozzo G., Marzario S., Gonçalves-Vidigal M.C., Vaz-Bisneta M., Valentini G., Galván M.Z., Abán C., Brezeanu P.M. (2022). Common bean genetics, breeding, and genomics for adaptation to biotic stress conditions. genomic designing for biotic stress resistant pulse *Crops*, 1-116. https://doi.org/10.1007/978-3-030-91043-3_1
3. Marzario S., Gioia T., Logozzo G., Fascetti S., Coppi A., Selvi F., Farris E., Rosati L. (2022). Population genetic structure of Gymnospermium scipetarum subsp. eddae (Berberidaceae), an endangered Forest endemic from the Southern Apennines (Italy). *Plant Biosystemsthis,* 156(4), 1039–1049. https://doi.org/10.1080/11263504.2021.1992524

4. Vitti A., Bevilacqua V., Logozzo G., Bochicchio R., Amato M., Nuzzaci M. (2022). Seed Coating with Trichoderma harzianum T-22 of Italian Durum Wheat Increases Protection against Fusarium culmorum-Induced Crown Rot. *Agriculture (Switzerland)*, 12(5), 714. https://doi.org/10.3390/agriculture12050714
5. Bochicchio R., Labella R., Vitti A., Nuzzaci M., Logozzo G., Amato M. (2022). Root Morphology, Allometric Relations and Rhizosheath of Ancient and Modern Tetraploid Wheats (Triticum durum Desf.) in Response to Inoculation with Trichoderma harzianum T-22. *Plants*, 11(2), 159. https://doi.org/10.3390/plants11020159

PUBBLICAZIONI SSD AGR/13

Docenti afferenti:
Prof. Scopa A., Dr. Drosos M.

Pubblicazioni del settore

1. AbdelRahman M.A.E., Afifi A.A., Scopa A. (2022). A time series investigation to assess climate change and anthropogenic impacts on the degradation of some heavy clay soils, Egypt. *ISPRS International Journal of Geo-Information,* 11(1), 30. https://doi.org/10.3390/ijgi11010030

2. Abuzaid A.S., Abdel-Salam M.A., Ahmad A.F., Fathy H.A., Fadl M.E., *Scopa A.* (2022). Effect of marginal-quality irrigation on accumulation of heavy metals (Mn, Pb, and Zn) in TypicTorripsamment soils and food crops. *Sustainability,* 14(3), 1067. https://doi.org/10.3390/su14031067

3. Mang S.M., Camele I., Trotta V., Scopa A. (2022). Metagenomic analysis of bacterial community structure and dynamics of a digestate and a more stabilized digestate-derived compost from agricultural waste. *Processes,* 10(2), 379. https://doi.org/10.3390/pr10020379

4. Savarese C., Xiong L., Drosos M., Vitaglione P., Scopa A., Piccolo A. (2022). The impact of long-term field experiments under different cropping system on the molecular dynamics and stability of the Humeome. *Agriculture, Ecosystems and Environment,* 331, 107928. https://doi.org/10.1016/j.agee.2022.107928

5. Elsharkawy M.M, Sheta A.A..S., D'Antonio P., Abdelwahed M.S., Scopa A. (2022). Tool for the establishment of Agro-management Zones Using GIS Techniques for Precision Farming in Egypt. *Sustainability* 14(9), 5437. https://doi.org/10.3390/su14095437

6. Perna A., Gambacorta E., Simonetti A., Grassi G., Scopa A. (2022). Effect of ozone treatment exposure time on oxidative stability of cream milk. *European Jounal of Lipid Science and Technology,* 124, 2100238. https://doi.org/10.1002/ejlt.202100238

7. AbdelRahman M.A.E., Afifi A.A., D'Antonio P., Gabr S.S., Scopa A. (2022). Detecting and mapping salt-affected soil with arid integrated indices in feature space using multi-temporal Landsat imagery. *Remote Sensing,* 14(11), 2599. https://doi.org/10.3390/rs14112599

8. Aboelsoud A.M., AbdelRahman M.A.E., Keir A.M.S., Eid A.S.M., Ammar K.A., Khalifa T.H.H., Scopa A. (2022). Quantitative estimation of Saline-Soil amelioration using Remote Sensing Indices in arid land for better management. *Land,* 11(7), 1041. https://doi.org/10.3390/land11071041

9. AbdelRahman M.A.E., Metwaly M.M., Afifi A.A., D'Antonio P., Scopa A. (2022). Assessment of soil fertility status under soil degradation rate using Geomatics in West Nile Delta. *Land* 11(8), 1256. https://doi.org/10.3390/land11081256

10. Radice R.P., Sansone M., D'Arienzo G., Scopa A., Martelli G.B. (2022). Bioremediation of crude oil by *Haematococcus pluvialis*: preliminary study. *Processes,* 10(12), 2472. https://doi.org/10.3390/pr10122472

11. Vitti A., Pagán I., Bochicchio B., De Stradis A., Piazzolla P., Scopa A., Nuzzaci M. (2022**).** Cucumber mosaic virus is unable to self-assemble in tobacco plants when transmitted by seed. *Plants,* 11(23), 3217. https://doi.org/10.3390/plants11233217

12. Savarese C., Cozzolino V., De Martino A., Piccolo A., Scopa A., Verrillo M., Vinci G. (2022). Combination of humic biostimulants with a mycorrhiza-based microbial inoculum improves plant productivity, nutrient uptake, and primary and secondary metabolism. *Plant & Soil,* https://doi.org/10.1007/s11104-022-05634-8

13. Megahed H.A., GabAllah H.M., AbdelRahman M.A.E., D'Antonio P., Scopa A., Darwish M.H. (2022). Geomatics-Based modeling and hydro-chemical analysis for groundwater quality mapping in the Egyptian Western Desert: A case study of El-Dakhla Oasis. *Water,* 14(24), 4018. https://doi.org/10.3390/w14244018

14. Shi W., Bian R., Li L., Lian W., Liu X., Zheng J., Cheng K., Zhang X., Drosos M., Joseph S., Pan G. (2022) Assessing the impacts of biochar-blended urea on nitrogen use efficiency and soil retention in wheat production. *GCB Bioenergy*, 14(1), 65-83. https://doi.org/10.1111/gcbb.12904

15. Feng X., Xia X., Chen S., Lin Q. Zhang X., Cheng K., Liu X., Bian R., Zheng J., Li L., Joseph S., Drosos M., Pan G. (2022). Amendment of crop residue in different forms shifted micro-pore system structure and potential functionality of microaggregates while changed their mass proportion and carbon storage of paddy topsoil. *Geoderma*, 409, 115643. https://doi.org/10.1016/j.geoderma.2021.115643

16. Chen S., Feng X., Lin Q., Liu C., Cheng K., Zhang X., Bian R., Liu X., Wang Y., Drosos M., Zheng J., Li L., Pan G. (2022). Pool complexity and molecular diversity shaped topsoil organic matter accumulation following decadal forest restoration in a karst terrain. *Soil Biology & Biochemistry*, 166, 108553. https://doi.org/10.1016/j.soilbio.2022.108553

17. Wang J., Kang Y., Duan H., Zhou Y., Li H., Chen S., Tian F., Li L., Drosos M., Dong C., Joseph S., Pan G. (2022). Remediation of Cd +2 in aqueous systems by alkali-modified (Ca) biochar and quantitative analysis of its mechanism. *Arabian J. of Chemistry*, 15, 103750. https://doi.org/10.1016/j.arabjc.2022.103750

18. Wu H., Sui F., Duan H., Si T., Li H., Wang J., Huang X., Li L., Drosos M., Joseph S., Dong C., Pan G. (2022). Comparison of heavy metal speciation, transfer and their key influential factors in vegetable soils contaminated from industrial operation and organic fertilization. *J. of Soils and Sediments*, 22, 1735-1745. https://doi.org/10.1007/s11368-022-03187-y

19. Rui Z., Lu X., Li Z., Lin Z., Lu H., Zhang D., Shen S., Liu X., Zheng J., Drosos M., Cheng K., Bian R., Zhang X., Li L., Pan G. (2022). Macroaggregates serve as micro-hotspots enriched with functional and networked microbial

communities and enhanced under organic/inorganic fertilization in a paddy topsoil from Southeastern China. *Frontiers in Microbiology*, 13, 831746. https://doi.org/10.3389/fmicb.2022.831746

20. Liu C., Xia R., Tang M., Chen X., Zhong B., Liu X., Bian R., Yang L., Zheng J., Cheng K., Zhang X., Drosos M., Li L., Shan S., Joseph S., Pan G. (2022). Improved ginseng production under continuous cropping through soil health reinforcement and rhizosphere microbial manipulation with biochar: a field study of Panax ginseng from Northeast China. *Horticulture Research*, 9, uhac108. https://doi.org/10.1093/hr/uhac108

21. Shi N., Li W., Drosos M., Luo H., Li L., Pan G. (2022). Compositional DOM of Biochar from different raw materials. *Acta Scientiae Circumstantiae*, 42(9), 281-290. https://doi.org/10.13671/j.hjkxxb.2021.0578

22. Liu C., Xia R., Tang M., Liu X., Bian R., Yang L., Zheng J., Cheng K., Zhang X., Drosos M., Li L., Shan S., Joseph S., Pan G. (2022). More microbial manipulation and plant defense than soil fertility for biochar in food production: A field experiment of replanted ginseng with different biochars. *Frontiers in Microbiology*, 13, 1065313. https://doi.org/10.3389/fmicb.2022.1056313

AdR

SISTEMI COLTURALI E DIFESA DELLE PIANTE

Coordinatore Prof.ssa Stella Lovelli

AdR "Bio-Ambientale"

PUBBLICAZIONI SSD AGR/02

Docenti afferenti:
Prof.ssa Amato M., Prof.ssa Lovelli S., Prof.ssa Rivelli A.R.

Pubblicazioni del settore

1. Bochicchio R., Labella R., Rossi R., Perniola M., Amato M. (2022). Effects of soil water shortage on seedling shoot and root growth of Saragolle lucana tetraploid wheat (*Triticum durum* Desf.) landrace. *Plants,* 1(24), 3492. https://doi.org/10.3390/plants11243492
2. Caporale A.G., Amato M., Duri L.G., Bochicchio R., De Pascale S., Di Rauso S.G., Palladino M., Pannico A., Rao M.A., Rouphael Y., Adamo P. (2022). Can Lunar and Martian soils support food plant production? The effects of horse/swine monogastric manure fertilisation on lettuce growth and physiology, soil enzymatic activity and nutrient bioavailability. *Plants*, 11(23), 3345. https://doi.org/10.3390/plants11233345
3. Altieri G., Maffia A., Pastore V., Amato M., Celano G. (2022). Use of High-Resolution Multispectral UAVs to Calculate Projected Ground Area in Corylus avellana L. Tree Orchard. *Sensors*, 22, 7103. https://doi.org/10.3390/s22197103
4. Vitti A., Bevilacqua V., Logozzo G., Bochicchio R., Amato M., Nuzzaci M. (2022). Seed Coating with *Trichoderma harzianum* T-22 of Italian Durum Wheat Increases Protection against *Fusarium culmorum* Induced Crown Rot. *Agriculture*, *12*, 714. https://doi.org/10.3390/agriculture12050714
5. Denora M, Amato M, Brunetti G, De Mastro F, Perniola M (2022) Geophysical field zoning for nitrogen fertilization in durum wheat (*Triticum*

durum Desf.). *PLoS ONE,* 17(4), e0267219. https://doi.org/10.1371/journal. pone.0267219

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PUBBLICAZIONI SSD AGR/11

Docenti afferenti:
Prof.ssa Battaglia D., Dr. Trotta V.

Pubblicazioni del settore

1.

1. Forlano P., Mang S.M., Caccavo V., Fanti P., Camele I., Battaglia D., Trotta V. (2022). Effects of Below-Ground Microbial Biostimulant *Trichoderma harzianum* on Diseases, Insect Community, and Plant Performance in *Cucurbita pepo* L. under Open Field Conditions. *Microorganisms,* 10(11), 2242. https://doi.org/10.3390/microorganisms10112242

2. Caccavo V., Forlano P., Mang S.M., Fanti P., Nuzzaci M., Battaglia D., Trotta V. (2022). Effects of *Trichoderma harzianum* Strain T22 on the Arthropod Community Associated with Tomato Plants and on the Crop Performance in an Experimental Field. *Insects*, 13(5), 418. https://doi.org/10.3390/insects13050418

3. Chira D., Borlea F. G., Chira F., Mihnea C. MCiocîrlan I.C., Turcu D.O., Cadar N., Trotta V., Camele I., Marcone C., Mang S. M. (2022). Selection of Elms Tolerant to Dutch Elm Disease in South-West Romania. *Diversity*, 14, 980. https://doi.org/10.3390/d14110980

4. Maxim A., Albu V.C., Vodnar D.C., Mihăiescu T., Mang Ș.M., Camele I., Trotta V., Bonomo M.G., Mihalescu L., Sandor M., Ranga F., Borsai O. (2022). Assessment of Tomato (Solanum lycopersicum) Landraces for Their Agronomic, Biochemical Characteristics and Resistance to Phytophthora infestans. *Agronomy*, 13, 21. https://doi.org/10.3390/ agronomy13010021

5. Mang S. M., Trotta V., Scopa A., Camele I. (2022). Metagenomic Analysis of Bacterial Community Structure and Dynamics of a Digestate and a More Stabilized Digestate-Derived Compost from Agricultural Waste. *Processes*, 10, 379. https://doi.org/10.3390/pr10020379

PUBBLICAZIONI SSD AGR/12

Docenti afferenti:
Prof. Camele I., Prof. Crescenzi A., Dr. Elshafie H.S., Dr.ssa Nuzzaci M.

Pubblicazioni del settore

1. D'Ippolito I., Mang S.M., Elshafie H.S., Camele I., Scillitani G., Mastrodonato M., Sofo A., Mininni A.N., Xiloyannis E. (2022). Morpho-anatomical and microbiological analysis of kiwifruit roots with KVDS symptoms. *Acta Horticolturae*, 1332. ISHS 2022. International Symposium on Kiwifruit Proc. X. Ed.: A. Atak. https://doi.org/10.17660/ActaHortic.2022.1332.18

2. El-Attar M.S., Elshafie H.S., Sadeek S.A., El-Farargy A.F., El-Desoky S.I., El-Shwiniy W.H., Camele I. (2022). Biochemical Characterization and Antimicrobial Activity against Some Human or Phyto-Pathogens of New Diazonium Heterocyclic Metal Complexes. *Chemistry & Biodiversity*, 19, e202100785. https://doi.org/10.1002/cbdv.202100785

3. Soliman, S.A., Hafez, E.E., Al-Kolaibe A.M.G., Abdel Razik E.-S.S., Abd-Ellatif, S., Ibrahim A.A., Kabeil, S.S.A., Elshafie H.S. (2022). Biochemical Characterization, Antifungal Activity, and Relative Gene Expression of Two Mentha Essential Oils Controlling Fusarium oxysporum, the Causal Agent of Lycopersicon esculentum Root Rot. *Plants*, 11, 189. https://doi.org/10.3390/plants11020189

4. Elshafie H.S., Sadeek S.A., Camele I., Mohamed A.A. (2022). Biochemical Characterization of New Gemifloxacin Schiff Base (GMFX-o-phdn) Metal Complexes and Evaluation of Their Antimicrobial Activity against Some Phyto- or Human Pathogens. *Int. J. Mol. Sci.*, 23, 2110. https://doi.org/10.3390/ijms23042110

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7-Hydroxy-4-Methylcoumarin, the Plant-Based Natural Benzopyrone Derivative. *Int. J. Mol. Sci*. 23. https://doi.org/10.3390/ijms23148019

8. Mohamed A.A., Ahmed F.M., Zordok W. A., El-Shwiniy W.H., Sadeek S.A., Elshafie H.S. (2022). Novel Enrofloxacin Schiff Base Metal Complexes: Synthesis, Spectroscopic Characterization, Computational Simulation and Antimicrobial Phyto-Pathogens. *Inorganics*, (10), 177. https://doi.org/10.3390/inorganics10110177

9. Mang S.M., Marcone C., Maxim A., Camele I. (2022). Investigations on Fungi Isolated from Apple Trees with Die-Back Symptoms from Basilicata Region (Southern Italy). Plants, 11, 1374. https://doi.org/10.3390/plants11101374

10. Elshafie H.S., Camele I. (2022). Rhizospheric Actinomycetes Revealed Antifungal and Plant-Growth-Promoting Activities under Controlled Environment. *Plants*, 11, 1872. https://doi.org/10.3390/plants11141872

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14. Elshafie H.S. (2022). Plant Essential Oil with Biological Activity. *Plants*, 11, 980. https://doi.org/10.3390/plants11070980

15. Forlano P., Mang S.M., Caccavo V., Fanti P., Camele I., Battaglia D., Trotta V. (2022). Effects of Below-Ground Microbial Biostimulant *Trichoderma harzianum* on Diseases, Insect Community, and Plant Performance in *Cucurbita pepo* L. under Open Field Conditions. *Microorganisms*, 10, 2242. https://doi.org/10.3390/microorganisms10112242

16. Abd-Ellatif S., Ibrahim A. A., Safhi F. A., Abdel Razik E. S., Kabeil S. S. A., Aloufi S., Alyamani A. A., Basuoni M. M., ALshamrani S.M., Elshafie H.S. (2022). Green Synthesized of Thymus vulgaris Chitosan Nanoparticles Induce Relative WRKY-Genes Expression in *Solanum lycopersicum* against *Fusarium solani*, the Causal Agent of Root Rot Disease. *Plants*, 11, 3129. https://doi.org/10.3390/plants11223129.

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20. Risoli S., Cotrozzi L., Sarrocco S., Nuzzaci M., Pellegrini E., Vitti A. (2022). Trichoderma-Induced Resistance to *Botrytis cinerea* in Solanum Species: A Meta-Analysis. *Plants*,11, 180. https://doi.org/10.3390/plants11020180

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AdR

SCIENZE E TECNOLOGIE ANIMALI

Coordinatore Prof.ssa Adriana Di Trana

PUBBLICAZIONI SSD AGR/18

Docenti afferenti:
Prof.ssa Di Trana A. Prof. Pacelli C.

Pubblicazioni del settore

1. Di Trana A., Di Rosa A.R., Addis M., Fiori M., Di Grigoli A., Morittu V.M., Spina A.A., Claps S., Chifalo V., Licitra G., Todaro M. (2022). The quality of five natural, historical Italian cheeses produced in different months: Gross composition, fat-soluble vitamins, fatty acids, total phenols, antioxidant capacity, and health index. *Animals*, 12(2), 199. https://doi.org/10.3390/ani12020199
2. Gannuscio R., Ponte M., Di Grigoli A., Maniaci G., Di Trana A., Bacchi M., Alobisio M., Bonanno A., Todaro M. (2022). Feeding Dairy Ewes with Fresh or Dehydrated Sulla (*Sulla coronarium* L.) Forage. 1. Effects on Feed Utilization, Milk Production, and Oxidative Status. *Animals*, 12(18), 2317. https://doi.org/10.3390/ani12182317
3. Pacelli C., Barile V.L., Sabia E., Casano A.B., Braghieri A., Martina V., Barbato O. (2022). Use of GnRH Treatment Based on Pregnancy-Associate Glyco-Proteins (PAGs) Levels as a Strategy for the Maintenance of Pregnancy in Buffalo Cows: A Field Study. *Animals*, 12, 2882. https://doi.org/10.3390/ani12202822

PUBBLICAZIONI SSD AGR/19

Docenti afferenti:

Prof.ssa Braghieri A., Prof. Freschi P., Prof. Cosentino C.,
Prof.ssa Perna AM., Dott. Sabia E.

Pubblicazioni del settore

1. Napolitano, F., Braghieri, A., Bragaglio, A., Rodríguez-González, D., Mora-Medina, P., Ghezzi, M.D., Álvarez-Macías, A., Anahí Lendez, P., Sabia, E., Domínguez-Oliva, A., Jacome-Romero, J., Mota-Rojas, D. (2022). Neurophysiology of Milk Ejection and Prestimulation in Dairy Buffaloes. *Animals*, 12, 2649. https://doi.org/10.3390/ani12192649

2. Mota-Rojas D., Bragaglio A., Braghieri A., Napolitano F., Domínguez-Oliva A., Mora-Medina P., Álvarez-Macías O., De Rosa G., Pacelli C., José N., Barile V.L. (2022). Dairy Buffalo Behavior: Calving, Imprinting and Allosuckling. *Animals*, 12(21), 2899. https://doi.org/10.3390/ani12212899

3. Braghieri A., Pacelli C., Riviezzi A.M., Di Cairano M., Napolitano F. (2022). Promoting the direct sale of pasta filata cheese. *J. Dairy Sci.*, 105, 7334–7343. https://doi.org/10.3168/jds.202121285

4. Serrapica F., Masucci F., De Rosa G., Braghieri A., Sarubbi F., Garofalo F., Grasso F., Di Francia A. (2022). Moving Buffalo farming beyond Traditional Areas: Performances of Animals, and quality of Mozzarella and Forages. *Agriculture*, 12(8), 1219. https://doi.org/.3390/agriculture12081219

5. Napolitano F., Di Cairano M., Braghieri A. (2022). Dynamic profile to optimize the addition of preservatives in dry-cured meat products. Sensory Analysis for the Development of Meat Products. Methodological Aspects and Practical Applications, 223-238. Eds. Jóse Manuel Lorenzo, Mirian Pateiro, Erick Saldaña, Paulo E.S. Munekata. ISBN 978-0-12-822832-6. Woodhead Publishing, Cambridge. https://doi.org/10.1016/C2019-0-05236-3

6. Cosentino C., Paolino R., Rubino, M, Freschi P. (2022). Effect of the addition of donkety milk on the acceptability of Caciotta cow cheese. *Animals*, 12(11), 1444. https://doi.org/10.3390/ani12111444

7. Paolino R., Freschi P., Claps S., Tarricone R., Sepe L., Cosentino C. (2022). Effect of donkey milk adition on the acceptability of Caprino, a typical goat cheese from Basilicata region, Italy. *International Journal of Dairy Technology*, 75(2), 460-462. https://doi.org/10.1111/1471-0307.12837

8. Freschi P., Fascetti S., Riga F., Rizzardini G., Fortebraccio M., Ragni M., Paolino R., Cosentino C. (2022). Diet selection by the Italian hare (*Lepus corsicanus de Winton*, 1898) in two protected coastal areas of Latium. *Animals*, 12(6), 687. https://doi.org/10.3390/ani12060687

9. Perna A., Gambacorta E., Simonetti A., Grassi G., Scopa A. (2022). Effect of ozone treatment exposure time on oxidative stability of cream milk. *European Journal of Lipid Science and Technology*, 124(8), 2100238. https://doi.org/10.1002/ejlt.202100238

10. Matera A., Altieri G., Genovese F., Polidori P., Vincenzetti S., Perna A., Simonetti A., Mahdi Rashvand Avei, Calbi A., Di Renzo G.C. (2022). Effect of continuous flow HTST treatments on donkey milk nutritional quality. *LWT*, 153, 112444. https://doi.org/10.1016/j.lwt.2021.112444

11. Grassi G., Simonetti A., Gambacorta E., Perna A. (2022). Decrease of activity of antioxidant enzymes, lysozyme content, and protein degradation in milk contaminated with heavy metals (cadmium and lead). *JDS communications*, 3(5), 312-316. https://doi.org/10.3168/jdsc.2022-0222

AdR

ECONOMIA E INGEGNERIA

Coordinatore Prof. Alessandro Comegna

PUBBLICAZIONI SSD AGR/01

Docenti afferenti:
Prof. Romano S., Prof.ssa Coppola A., Prof. Cozzi M.,Prof. Viccaro M., Dott. Perretti B.

Pubblicazioni del settore

1. Pergola M.T., Saulino L., Castellaneta M., Rita A., Pecora G., Cozzi M., Moretti N., Pericolo O., Pierangeli D., Romano S., Viccaro M., Ripullone F. (2022). Towards sustainable management of forest residues in the southern Apennine Mediterranean mountain forests: A scenario-based approach. *Annals of Forest Science*, 79, 14. https://doi.org/10.1186/s13595-022-01128-w.

2. Coppola A., Cozzi M., Romano S., Viccaro M. (2022). CSR profiles and innovation in italian agri-food firms. *Journal of Cleaner Production*, 371, 133625. https://doi.org/10.1016/j.jclepro.2022.133625

3. Cozzi M., Prete C., Viccaro M., Sijtsma F., Veneri P., Romano S., (2022). Understanding the Role of Nature in Urban-Rural Linkages: Identifying the Potential Role of Rural Nature-Based Attractive Clusters That Serve Human Well-Being. *Sustainability (Switzerland)*, 14, https://doi.org/10.3390/su141911856.

4. Viccaro M., Caniani D., Masi S., Romano S., Cozzi M., (2022). Biofuels or not biofuels? The "Nexus Thinking" in land suitability analysis for energy crops.

Renewable Energy, 187, 1050-1064. https://doi.org/10.1016/j.renene.2022.02.008.

5. Coppola A., Amato M., Vistocco D., Verneau F. (2022). Measuring the economic sustainability of italian farms using FADN data. *Agricultural Economics (Czech Republic)*, 68, 327-337. https://doi.org/10.17221/169/2022-AGRICECON.

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PUBBLICAZIONI SSD AGR/08

Docenti afferenti:
Prof. Coppola A., Prof. Comegna A., Dott. Di Prima S.

Pubblicazioni del settore

1. Comegna A., Severino G., Coppola A. (2022). A review of new TDR applications for measuring non-aqueous phase liquids (NAPLs) in soils. *Environmental Advances*, 9, 100296. https://doi.org/10.1016/j.envadv.2022.100296.

2. Vanella D., Longo-Minnolo G., Belfiore O.R., Ramrez-Cuesta J.M., Pappalardo S., Consoli S., D'Urso G., Chirico G.B., Coppola A., Comegna A., Toscano A., Quarta R., Provenzano G., Ippolito M., Castagna A., Gandolfi C. (2022). Comparing the use of ERA5 reanalysis dataset and ground-based agrometeorological data under different climates and topography in Italy. *Journal of Hydrology, Regional Studies*, 42, 101182. https://doi.org/10.1016/j.ejrh.2022.101182.

3. Hassan S.B.M., Dragonetti G., Comegna A., Sengouga A., Lamaddalena N., Coppola A. (2022). A bimodal extension of the ARYA&PARIS approach for predicting hydraulic properties of structured soils. *Journal of Hydrology*, 610, 127980. https://doi.org/10.1016/j.jhydrol.2022.127980.

4. Belviso C., Satriani A., Lovelli S., Comegna A., Coppola A., Dragonetti G., Cavalcante F., Rivelli A.R. (2022). Impact of zeolite from coal fly ash on soil hydrophysical properties and plant growth. *Agriculture*, 12(3), 356. https://doi.org/10.3390/agriculture12030356.

5. Comegna A., Dragonetti G., Kodesova R., Coppola A. (2022). Impact of olive mill wastewater (OMW) on the soil hydraulic and solute transport properties. *International Journal of Environmental Science and Technology*, 19, 7079-7092. https://doi.org/10.1007/s13762-021-03630-6.

6. Bancheri M., Fusco F., Dalla Torre D., Terribile F., Manna P., Langella L., De Vita P., Allocca V., Loishandl-Weisz H., Hermanng T., De Michele C., Coppola A., Mileti F.A., Basile A. (2022). The pesticide fate tool for groundwater vulnerability assessment within the geospatial decision support system LandSupport. *Science of The Total Environment*, 807, 150793. https://doi.org/10.1016/j.scitotenv.2021.150793.

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8. Awada H., Di Prima S., Sirca C., Giadrossich F., Marras S., Spano D., Pirastru M. (2022). A remote sensing and modeling integrated approach for constructing continuous time series of daily actual evapotranspiration. *Agricultural Water Management,* 260, 107320. https://doi.org/10.1016/j.agwat.2021.107320.

9. Castellini M., Di Prima S., Stewart R., Biddoccu M., Rahmati M., Alagna V. (2022). Advances in Ecohydrology for Water Resources Optimization in Arid and Semi-Arid Areas. *Water*, 14, 1830. https://doi.org/10.3390/w14121830.

10. Di Prima S., Giannini V., Ribeiro Roder L., Giadrossich F., Lassabatere L., Stewart R.D., Abou Najm M.R., Longo V., Campus S., Winiarski T., Angulo-Jaramillo R., del Campo A., Capello G., Biddoccu M., Roggero P.P., Pirastru M. (2022). Coupling time-lapse ground penetrating radar surveys and infiltration experiments to characterize two types of non-uniform flow. *Science of The Total Environment*, 806, 150410. https://doi.org/10.1016/j.scitotenv.2021.150410.

11. Pirastru M., Iovino M., Marrosu R., Di Prima S., Giadrossich F., Awada H. (2022). Large-scale lateral saturated soil hydraulic conductivity as a metric

for the connectivity of subsurface flow paths at hillslope scale. *Hydrological Processes*, 36, e14649. https://doi.org/10.1002/hyp.14649.

12. Talukder R., Plaza-Bonilla D., Cantero-Martínez C., Di Prima S., Lampurlanés J. (2022). Spatio-temporal variation of surface soil hydraulic properties under different tillage and maize-based crop sequences in a Mediterranean area. *Plant Soil*, https://doi.org/10.1007/s11104-022-05758-x.

13. Yilmaz D., Di Prima S., Stewart R.D., Abou Najm M.R., Fernandez-Moret D., Latorre B., Lassabatere L. (2022). Three-term formulation to describe infiltration in water-repellent soils. *Geoderma*, 427, 116127. https://doi.org/10.1016/j.geoderma.2022.116127.

PUBBLICAZIONI SSD AGR/09

Docenti afferenti:
Prof.ssa D'Antonio P., Dr.ssa Fiorentino C.

Pubblicazioni del settore

1. Megahed H.A., GabAllah H.M., AbdelRahman M.A.E., D'Antonio P., Scopa A., Darwish M.H. (2022). Geomatics-Based Modeling and Hydrochemical Analysis for Groundwater Quality Mapping in the Egyptian Western Desert: A Case Study of El-Dakhla Oasis. *Water*, 14, 4018. https://doi.org/10.3390/w14244018.

2. AbdelRahman M.A.E., Metwaly M.M., Afifi A.A., D'Antonio P., Scopa A. (2022). Assessment of Soil Fertility Status under Soil Degradation Rate Using Geomatics in West Nile Delta. *Land*, 11(8), 1256. https://doi.org/10.3390/land11081256.

3. AbdelRahman M.A.E., Afifi A.A., D'Antonio P., Gabr S.S., Scopa A. (2022). Detecting and Mapping Salt-Affected Soil with Arid Integrated Indices in Feature Space Using Multi-Temporal Landsat Imagery. *Remote Sensing*, 14(11), 2599. https://doi.org/10.3390/rs14112599

4. Elsharkawy M.M., Sheta A.E.A.S., D'antonio P., Abdelwahed M.S., Scopa A. (2022). Tool for the Establishment of Agro-Management Zones Using GIS Techniques for Precision Farming in Egypt. *Sustainability (Switzerland)*, 14, 5437. https://doi.org/10.3390/su14095437.

5. Fiorentino C., Crimaldi M., Libergoli P., D'Antonio P., Scalcione V. (2022). Farm Management Information Systems: Digital Register of Farm Management in Southern Italy. In: Biocca M., Cavallo E., Cecchini M., Failla S., Romano E. (Eds) *Safety, Health and Welfare in Agriculture and Agro-food Systems. SHWA 2020. Lecture Notes in Civil Engineering*, vol 252. Springer, Cham., https://doi.org/10.1007/978-3-030-98092-4_35.

PUBBLICAZIONI SSD AGR/10

Docenti afferenti:
Prof. Picuno P., Prof. Margiotta S., Dott. De Luca V.

Pubblicazioni del settore

1. Picuno P., Godosi Z., Picuno C. (2022). Agrochemical Contamination and Ageing Effects on Greenhouse Plastic Film for Recycling. *Applied Sciences*, 12(19), 10149. https://doi.org/10.3390/app121910149

2. Picuno P. (2022). Farm Buildings as Drivers of the Rural Environment. *Frontiers in Built Environment*, 8, 693876. https://doi.org/10.3389/fbuil.2022.693876

3. Cillis G., Statuto D., Schettini E., Vox G., Picuno P. (2022). Implementing a GIS-based Digital Atlas of Agricultural Plastics to Reduce Their Environmental Footprint: Part II, A Deductive Approach. *Applied Sciences*, 12, 7545. https://doi.org/10.3390/app12157545

4. Manniello C., Cillis G., Statuto D., Di Pasquale A., Picuno P. (2022). Experimental analysis of concrete blocks reinforced with Arundo Donax fibres. *Journal of Agricultural Engineering*, 53, 1288. https://doi.org/10.4081/jae.2021.1288

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AdR

SCIENZE, TECNOLOGIE E BIOTECNOLOGIE ALIMENTARI

Coordinatore Prof.ssa Fernanda Galgano

PUBBLICAZIONI SSD AGR/09

Docenti afferenti:

Prof. Di Renzo G.C., Prof. Altieri G., Prof. Genovese F., Dott. Matera A.

Pubblicazioni del settore

1. Altieri G., De Luca V., Genovese F., Matera A., Scarano L., Di Renzo G.C. (2022). A Low-Temperature and Low-Pressure Distillation Plant for Dairy Wastewater. *Applied Sciences*, 12, 11465. https://doi.org/10.3390/app122211465

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PUBBLICAZIONI SSD AGR/15

Docenti afferenti:

Prof.ssa Galgano F., Dr. Condelli N., Dr.ssa Di Cairano M.

Pubblicazioni del settore

1. Cela N., Galgano F., Perretti G., Di Cairano M., Tolve R., Condelli N. (2022). Assessment of brewing attitude of unmalted cereals and pseudocereals for gluten free beer production. *Food Chemistry*, 383, 13261. https://doi.org/10.1016/j.foodchem.2022.132621

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4. Condelli N., Cela N., Di Cairano M., Scarpa T., Milella L., Ascrizzi B., Flamini G. Galgano, F. (2022). Drivers of coffee liking: Effect of physico-chemical characteristics and aromatic profile on consumers' acceptability of mono-origin and mono-variety coffees. *Journal of Food Science*, 87, 4688. https://doi.org/10.1111/1750-3841.16323

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PUBBLICAZIONI SSD AGR/16

Docenti afferenti:

Prof. Parente E., Prof.ssa Capece A., Prof.ssa Ricciardi A.M., Prof.ssa Zotta T.

Pubblicazioni del settore

1. Zotta T., Di Renzo T., Sorrentino A., Reale A., Boscaino F. (2022). Selection of *non-Saccharomyces* wine yeasts for the production of leavened doughs. *Microorganisms,* 10, 1849. https://doi.org/10.3390/microorganisms10091849

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10. Gullo M., Zotta T. (2022). Probiotics in dairy products: Microencapsulation and delivery. *Advances in Dairy Microbial Products*, 271–285. https://doi.org/10.1016/B978-0-323-85793-2.00032-1

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AGGIORNAMENTO

PUBBLICAZIONI EDITE NELL'ANNO 2022