

## **Prof. Massimo Tagliavini**

### **Professional experience**

Full professor of at the Faculty of Science and Technology of the Free University of Bozen-Bolzano (2007-now). He has teaching responsibilities on the following courses at bachelor and master level: Agricultural ecology; Principles of tree management; Crop ecosystems; Soil and water management.

Dean of the Faculty of Science and Technology of the Free University of Bozen-Bolzano (November 2008-September 2014). Vice-president of Eurac Research (2016-). President of the Italian Society of Horticultural Science (2016-). President of the Italian Association of the Scientific Agricultural Societies (2020-).

### **Research areas**

1. Ecophysiology of the internal-tree cycling of nitrogen; 2. Nutrient needs, uptake and partitioning in fruit trees; 3. Iron nutrition and lime-induced iron chlorosis; 4. Physiology of the root system and rhizosphere studies; 5. Carbon fluxes at orchard ecosystem scale and C footprint of fruit products; 6. Water needs and water stress indexes

### **Main recent research projects with scientific responsibility**

- Potential of CO<sub>2</sub> fixation by apple orchards in South Tyrol. Autonomous Province of Bolzano-Bozen 2008-2011.
- Carbon cycle in managed tree ecosystems. Progetto Prin 2008. Minister of University, National coordinator the Project. 2010-2012 (56,000 euro).
- Quantification of net carbon ecosystem exchange in an apple orchard in South Tyrol, funded by the Free University of Bolzano-Bozen, 2011-2013.
- Carbon and energy budgets along the apple production and storage chain, funded by the Italian Association of apple growers, 2012-2014.
- Valorization of agriculture for the water supply in context with climate change, funded by the Province of Bolzano-Bozen, 2014-2014.
- Quality indicators and sustainable irrigation in apple production, funded by the Italian Association of apple growers, 2017-2019.
- Water use efficiency across land use types in South Tyrol. Call of the Free University of Bolzano-Bozen. 2016-2018.
- Atmospheric boundary-layer modeling over complex terrain. Interregional Project Network (IPN) Euregio – 3rd Call (2019-2021)
- Water losses and carbon assimilation in the vineyard as affected by changes of environmental drivers. Call of the Free University of Bolzano-Bozen. 2019-2022.

### **Publications**

Has published more than 200 scientific papers, 110 present in Scopus. HI Scopus =29.

### **Editorial activity**

Editor of “Italus Hortus”, the official Journal of the Italian Society for Horticultural Sciences (2005-2013). Member of the Editorial Board of “European Journal of Agronomy” (since 1997) and “Tree Physiology” (from 2004 to 2016). Editor of the following volumes of the Series Acta Horticulturae (international Society for Horticultural Sciences):324 ISBN n. 90 6605 3658; 383 ISBN n. 90 6605 7572; 594 ISBN n. 90

6605 8269;596 ISBN n. 90 6605 8668.

### **Activities for the national and international scientific community**

Chairman of the working group on “Mineral Nutrition of Fruit Crops” of the International Society for Horticultural Sciences (2000-2005; 2012-2017). Invited keynote speaker at more than 20 national and international conferences. Vice president of the European Academy of Bolzano-Bozen (EURAC) (2016-). President of the Italian of the Italian Society for Horticultural Science (2016-) and member of the board of the Italian association of the scientific agricultural societies (2017-)

### **Organization of Scientific events**

Convener of the International Symposium on Foliar Nutrition of Deciduous Fruit Plants (ISHS), (Meran, Italy) 2001; Co-convener of the “IX International Symposium on Iron Nutrition and Interactions in Plants” (Udine, Italy) 2002; Convener of the National conference on “Mineral Nutrition of fruit trees” (Bologna, Italy) 2005; Organizer of the Workshop on “Mineral Nutrition of crops for mountain areas” (Bolzano, Italy) 2012; Organizer of the XI Conference of the Italian Society for Horticultural Sciences (Bolzano, Italy). 2016. Co-organiser of the VIII ISHS international Symposium on Mineral nutrition of fruit crops, (Bolzano, Italy) 2017. Co-organizer of the XV congress of the Italian association of the scientific agricultural societies (2018) on Sustainable intensification in Agriculture.

### **Most relevant publications (since 2010)**

1. SCANDELLARI F, VENTURA M; GIOACCHINI P., VITTORI ANTISARI L. and **M. TAGLIAVINI**. 2010. Seasonal pattern of net nitrogen rhizodeposition from peach (*Prunus persica* L. Batsch) trees in soils with different textures. **Agriculture, Ecosystems & Environment**, 136, 162-168.
2. CECCON C., P. PANZACCHI, F. SCANDELLARI, L. PRANDI, M. VENTURA, B. RUSSO, P. MILLARD and **M. TAGLIAVINI**. 2011. Spatial and temporal effects of soil temperature and moisture and the relation to fine root density on root and soil respiration in a mature apple orchard. **Plant and Soil**, 432,195-206.
3. BRUNETTO G., M. VENTURA , F. SCANDELLARI, C.A. CERETTA, J. KAMINSKI, G. WELLINGTON DE MELO and **M. TAGLIAVINI**. 2011 Nutrient release during the decomposition of mowed perennial ryegrass and white clover and its contribution to nitrogen nutrition of grapevine. **Nutr. Cycl. Agroecosystems**, 90, 299-308.
4. PIERI L., F. VENTURA, M. VENTURA, **M. TAGLIAVINI**, M. PONTI, R.PISTOCCHI, S. ALBERTAZZI, M. VIGNUDELLI and P. ROSSI PISA. 2011. Chemical and biological indicators of water quality in three agricultural watersheds of the Po valley, Italy. **Italian J. Agronomy**, 6, 29-38.
5. PANZACCHI P. G.TONON, C. CECCON, F. SCANDELLARI, M. VENTURA, M. and **M. TAGLIAVINI**. 2012 Belowground carbon allocation and net primary and ecosystem productivities in apple trees (*Malus domestica*) as affected by soil water availability. **Plant and Soil**, 360, 229-241.
6. ROCCUZZO G., D. ZANOTELLI, M. ALLEGRA, A. GIUFFRIDA, B. TORRISI, A. LEONARDI, A. QUIÑONES, F. INTRIGLIOLO and **M. TAGLIAVINI**. 2012. Assessing nutrient uptake by field-grown orange trees. **Europ. J. Agronomy**, 41, 73-80.
7. CURETTI M., E. SANCHEZ, **M. TAGLIAVINI** and P. GIOACCHINI. 2013. Foliar-applied urea at bloom improves early fruit growth and nitrogen status of spur leaves in pear trees, cv. Williams Bon Chretien. **Scientia Horticulturae**, 150, 16-21.
8. D. ZANOTELLI, L. MONTAGNANI, G. MANCA and **M. TAGLIAVINI**. 2013. Net primary productivity, allocation pattern and carbon use efficiency in an apple orchard assessed by integrating eddy-covariance, biometric and continuous soil chamber measurements. **Biogeosciences**, 10, 3089-3108.

9. D. ZANOTELLI, M. RECHENMACHER, W. GUERRA, A. CASSAR and **M. TAGLIAVINI**. 2014 Seasonal uptake rate dynamics and partitioning of mineral nutrients by bourse shoots of field-grown apple trees. **Europ. J. Hort. Sciences**. 4 (79), 203-211
10. D. ZANOTELLI, L. MONTAGNANI, G. MANCA, F. SCANDELLARI and **M. TAGLIAVINI**. 2015 Net ecosystem carbon balance of an apple orchard. **Europ. J. Agronomy**, 63, 97-104.
11. E. TOME', **M. TAGLIAVINI** and F. SCANDELLARI. 2015. Recently fixed carbon allocation in strawberry plants and concurrent inorganic nitrogen uptake through arbuscular mycorrhizal fungi. **Journal of Plant Physiology**. 179, 83-89.
12. F. SCANDELLARI, D. ZANOTELLI, C. CECCON, M. BOLOGNESI, L. MONTAGNANI, P. CASSOL, G. W. MELO, and **M. TAGLIAVINI**. 2015. Enhancing prediction accuracy of soil respiration in an apple orchard by integrating photosynthetic activity into a temperature-related model. **European Journal of Soil Biology**, 70, 77-87.
13. MIMMO T., CAMIN F., BONTEMPO L., CAPICI C., **TAGLIAVINI M.**, CESCO S., SCAMPICCHIO M. 2015. Traceability of different Apple Varieties by Multivariate Analysis of Isotope Ratio Mass Spectrometry Data . **Rapid Communications in Mass Spectrometry**. 29(21), 1984-1990.
14. CIOTTA M.N., C. A. CERETTA, **M. TAGLIAVINI**, D. ZANOTELLI, D. MOSER, G. NAVA, D. PORRO, G. BRUNETTO. 2015. Leaf water potential, nutritional status and must composition in grapes 'Pinot Nero' with and without irrigation. **Ciência Rural**. <http://dx.doi.org/10.1590/0103-8478cr20141225>
15. VAROLO E, D. ZANOTELLI, **M. TAGLIAVINI**, S. ZERBE & L. MONTAGNANI. 2015. Net ecosystem production in a Little Ice Age moraine: the role of plant functional diversity. **Biogeosciences Discuss.**, 12, 10271-10310, 2015www.biogeosciences-discuss.net/12/10271/2015/doi:10.5194/bgd-12-10271-2015
16. TOMÈ E., M. VENTURA; S. FOLEGOT, D. ZANOTELLI; L. MONTAGNANI, T. MIMMO, G. TONON, **M. TAGLIAVINI**, F. SCANDELLARI. 2016. Mycorrhizal contribution to soil respiration in an apple orchard. **Applied Soil Ecology**. 101, 165-173.
17. REYES F, T. DEJONG, P. FRANCESCHI, **M. TAGLIAVINI**, D. GIANNELLE. 2016. Maximum growth potential and periods of resource limitation in apple tree: **Frontiers in Plant Science**. 7-233. doi: 10.3389/fpls.2016.00233.
18. CECCON C., **M. TAGLIAVINI**, A.O. SCHMITT, D.M. EISSENSTAT. 2016. Untangling the effects of root age and tissue nitrogen on root respiration in *Populus tremuloides* at different nitrogen supply. **Tree Physiology**, 36 (5), 618-627.
19. SCANDELLARI F., G. CARUSO, G. LIGUORI, F. MEGGIO, M. PALESE ASSUNTA, D. ZANOTELLI, G. CELANO, R. GUCCI, P. INGLESE, A. PITACCO and **M. TAGLIAVINI**. 2016. A survey of carbon sequestration potential of orchards and vineyards in Italy. **Europ. J. Hort. Sci.**81(2), 106-114.
20. VAROLO E., D. ZANOTELLI, **M. TAGLIAVINI**, S. ZERBE, MONTAGNANI L.. 2016 Colonization of a deglaciated moraine: contrasting patterns of carbon uptake and release from C3 and CAM plants. **PLOS one** doi:10.1371/journal.pone.0168741s
21. TURRINI A., M. AGNOLUCCI, M. PALLA, E. TOMÉ, **M. TAGLIAVINI**, F. SCANDELLARI and M. GIOVANNETTI. 2017. Species diversity and community composition of native arbuscular mycorrhizal fungi in apple roots are affected by site and orchard management. **Applied Soil Ecology**. vol. 116, ISSN: 0929-1393, doi: 10.1016/j.apsoil.2017.03.016
22. C. DADEA, A. RUSSO, **M. TAGLIAVINI**, T. MIMMO, and S. ZERBE. 2017. Tree species as tools for biomonitoring and phytoremediation in urban environments: a review with special regard to heavy metals. **Arboriculture & Urban Forestry**. 43(4):155–167.
23. ROCCUZZO G., SCANDELLARI F., ALLEGRA M., TORRISI B., STAGNO F. , MIMMO T., ZANOTELLI D., GIOACCHINI P., MILLARD P., **TAGLIAVINI M.** 2017 Seasonal dynamics of root uptake and

- spring remobilisation of nitrogen in field grown orange trees. **Scientia Horticulturae**. 226, 223-230.
24. MONTAGNANI L, D. ZANOTELLI, M. **TAGLIAVINI**, E. TOMELLERI. 2018. Time scale effects on the environmental control of carbon and water fluxes of an apple orchard. **Ecology and Evolution**. DOI 10.1002/ece3.3633 **ECOLOGY AND EVOLUTION**. 8 (1): 416-434
  25. CARRANCA C. G. BRUNETTO, **M. TAGLIAVINI**. 2018. Nitrogen Nutrition of Fruit Trees to Reconcile Productivity and Environmental Concerns. **Plants**, 7, 4; doi:10.3390/plants7010004
  26. THOMA M., J. FRENTRESS, **M. TAGLIAVINI**, F. SCANDELLARI. 2018. Comparison of Pore Water Samplers and Cryogenic Distillation under Laboratory and Field Conditions for Soil Water Stable Isotope Analysis. **Isotopes in Environmental & Health Studies**. 54(4),403-413. doi.org/10.1080/10256016.
  27. WENTER A., ZANOTELLI D., L. MONTAGNANI, **M. TAGLIAVINI** and C. ANDREOTTI . 2018 Effect of different timings and intensities of water stress on yield and berry composition of grapevine (cv. Sauvignon Blanc) in a mountain environment. **Scientia Horticulturae** 236, 137–145.
  28. AGUZZONI A., M. BASSI, P. ROBATSCHER, **M. TAGLIAVINI**, W. TIRLER, F. SCANDELLARI. 2018. Plant Sr isotope ratios as affected by the Sr isotope ratio of the soil and of the external Sr inputs. **Journal of Food and agricultural Chemistry**. DOI: 10.1021/acs.jafc.8b02604
  29. SEUTRA KABA J., S. ZERBE, M. AGNOLUCCI, F. SCANDELLARI, A. A. ABUNYEWA, M. GIOVANNETTI, **M. TAGLIAVINI**. 2019. Atmospheric nitrogen fixation by gliricidia trees (*Gliricidia sepium* (Jacq.) Kunth ex Walp.) intercropped with cocoa (*Theobroma cacao* L.). **Plant and Soil**. 435:323–336 . <https://doi.org/10.1007/s11104-018-3897-x>
  30. TEMPESTA M., G. GIANQUINTO, M. HAUSER, **M. TAGLIAVINI**. 2019 . Optimization of nitrogen fertilization of cauliflower intercropped with clover and in succession with lettuce. **Scientia Horticulturae**. 240, 734-740.
  31. BOSCHIERO M, D. ZANOTELLI, F. E. CIARAPICA, L. FADANELLI, **M. TAGLIAVINI**. 2019 Greenhouse gas emissions and energy consumption during the post-harvest life of apples as affected by storage type, packaging and transport. **Journal of Cleaner Production**. 220:19-45-56 <https://doi.org/10.1016/j.jclepro.2019.01.300>
  32. AGUZZONI A, BASSI M., ROBATSCHER P., SCANDELLARI F., TIRLER W. and **M. TAGLIAVINI**. 2019. Intra and Inter-tree Variability of the 87Sr/86Sr Ratio in Apple Orchards and Its Correlation with the Soil 87Sr/86Sr Ratio **J. Agric. Food Chem**. 67 (20): 5728-5735 DOI: 10.1021/acs.jafc.9b0108
  33. REYES F., B. PALLAS, C. PRADAL, F. VAGGI, D. ZANOTELLI, **M. TAGLIAVINI**, D. GIANELLE, E.COSTES. 2019. MuSCA: a multi-scale source-sink carbon allocation model to explore carbon allocation in plants. An application on static apple-tree structures. **Annals of Botany**. DOI: 10.1093/aob/mcz122.
  34. ZANOTELLI D, L. MONTAGNANI, C. ANDREOTTI, **M. TAGLIAVINI**. 2019. Evapotranspiration and crop coefficient patterns of an apple orchard in a sub-humid environment. **Agricultural Water Management**. <https://doi.org/10.1016/j.agwat.2019.105756>