SOCIETA' ITALIANA DI CHIMICA AGRARIA

PhD Winter School

Feeding the world: the contribution of research in agricultural chemistry to sustainable development

9-12 February 2015, Piacenza, Italy

Organizing Committee: Gian Maria Beone, Luciano Cavani, Stefano Cesco, Claudio Ciavatta, Tanja Mimmo, Roberto Terzano, Marco Trevisan

Book of Abstracts

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Sustainable farming systems: compromises and advantages in horticulture

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The key principle behind the concept of sustainability is meeting the needs of the present without compromising the needs of future generations. If natural resources such as soil, nutrients and water are used up at a rate faster than they are replenished, then the farming system becomes unsustainable. Another key concept of sustainability is to maintain a high level of biodiversity also by adopting sustainable pest management (integrated pest management) strategies in order to reduce at minimum the risk for human health and the environment (EU directive 128/2009). Vineyards and fruit trees are some of the most important and extensive crops in Mediterranean agro-ecosystems. In conventional farming systems, adopted by the majority of the farmers in Southern Italy, frequent soil tillage enhances soil erosion and loss of soil fertility, and often reduces soil microbial diversity and soil microbiota complexity, that strongly contribute to the overall soil fertility. For these reasons, these conventional agronomic practices should evolve in a more sustainable management (e.g., grass cover, pruning residues recycling, organic matter inputs) addressed to improve soil organic matter. Under semi-arid climatic conditions, the application of endogenous organic matter can be a key factor to enhance soil quality and fertility and to preserve natural resources, mainly soil and water, avoiding detrimental effects on the environment. Furthermore, agricultural practices can play an important role in carbon sequestration. The carbon stock can be viewed as measure of the relative contribution to biomass to the carbon cycle, and the capacity to store organic carbon depends to a great extent upon climate and soil properties, although the cultivation system can play a considerable part. Together with the soil management, other critical points for a sustainable horticulture are the fertilization and the irrigation system which could influence water use efficiency, yield quality, and pest and soil management. Results of experiments carried out in the last two decades will be presented. The final goal is to encourage farmers to adopt a sustainable farming system as a whole, not just as individual elements, in order to promote good-quality fruit production without negative effects on the environment.