

Soil management, fertilization and plant nutrition in organic systems in Spain: A review of the research in last 20 years

Victor Gonzalez (1) and M^a Dolores Raigon Jiménez (2)

(1) Spain (vgonzalez@agroecologia.net) Spanish Society for Agroecology/Organic Farming, (2) Spain (mdraigon@qim.upv.es) Politechnical University of Valencia

The Spanish Society for Agroecology/Organic Farming (SEAE) is a private charity association, founded in 1992, with the purpose to support organic farming practitioners. The principal aim is to join the efforts farmers, technicians and scientifics and others organizations and persons, related to develop sustainable agriculture systems, based on ecological and socioeconomic principles promoted by the international organic farming movement, with the purpose to obtain foods and first resources with high quality, considering the vulnerability of the environment and preserving the soil fertility, with the optimal and adequate use of the local resources, taking in account the rural culture and the ethical value of the social development and the life quality.

One of the most relevant and know activity of SEAE is the celebration of one (scientific) Congress every two years. This is the most important event on this issue in Spain. In the last 20 year, eleven events of this kind have been organised in 11 different places (Toledo, Pamplona, Valencia, Córdoba, Gijón-Asturias, Almeria, Zaragoza, Bullas-Murcia, Lleida, Albacete, Vitoria-Gasteiz). The average participation in the Congress was growing up from 100 to 350 persons), from all over Spain. During this events, researchers, advisors, trainers, politicians and operators (farmers, processors, certifiers, marketers, consumers, etc.) shared and update the scientific results, projects in force, political measures, statistics and proposals to develop the organic farming sector

Research in organic farming is still low in Spain and the majority of the results in this matter are being presented as papers in this Congresses. Over 1500 papers from over 100 spanish research groups giving information about the research results have been presented in this events, One of the most relevant topic of this research is done on soil conservation, soil fertility and organic crop fertilization and organic matter management in the soil, after organic plant health and plant protection. In total 12 % of the papers presented in these events were devoted to soil conservation, soil fertility and plant nutrition management. We have analyzed this papers contributions dividing in five categories: a) organic and mineral fertilization; b) general evaluation of soil fertility under organic management; c) compost making and compost types; d) soil conservation and fertilization; e) crop fertilization and food quality

The results shows that over 20 % of the total papers presented were related to general aspects of crop fertilization in 16% types of vegetables crops, 14% on arable crops and pastures and 8% on perennial crops (almonds, citrus, vineyards, olive trees, and banana) have been presented. Most studies were done on vegetables and very few on nutrient balance have been published. Some papers deal with cover crops. The soil fertility impact of organic farming compared with conventional is focused is included in nearly 30 % of all the scientific papers presented. Compost from different crop residues and the effects on soil and on different crops, including waste sludge (not allowed in organic farming) have been researched. Also some studies deal with how to use the residues of the olive oil mills or residues of vineyards as organic fertilizer.

Some of the most recent studies are focused on how compost can control pest and diseases in crop cultivation. Another type of study has analyzed the soil disinfection potential of manure with high exposition to the sun (high temperature) to be used in greenhouses. Few studies are concentrated in the application of mycorrhizae to enhance the capacity of the plants to absorber nutrients from soil. We found some few studies on biofertilisers, but there are many different inputs being offered to organic farmers as natural fertilizer. Soil conservation and organic fertilisation studies are scarce and not sufficiently detailed. Finally we found a five category of very few studies on the relation between fertilization of different crops and the final quality of the crops and fresh foods.

The paper presents the most relevant results of research about organic farming fertilization in several crops conducted in Spain, which could be useful for Mediterranean countries with similar soil and clima

Key words: compost, , mediterranean, nutrients balance, soil fertility,