



RESEARCH IN ORGANIC FARMING AND COMPOSTING IN SPAIN AND SECTOR PRIORITIES IN EUROPE

José Luis Porcuna, President of the Spanish Society of Organic Farming (SEAE)

Víctor González, Board of Directors of the European Union's Regional Group of the
International Federation of Organic Agriculture Movements (IFOAM-EU)

ECA Camino del Puerto s/n 46470 Catarroja (Valencia).

E-mail: presidente@agroecologia.net E-mail: victor.gonzalvez@ifoam-eu.org

www.agroecologia.net

www.ifoam.org

SUMMARY

This paper gives a brief historical account of the development of organic farming in Spain, with special reference to composting, the use of compost and soil eco-biology in organic farming on the basis of an analysis of the minutes of scientific meetings held over the last few years.

The present state of research and experiment in organic farming is also evaluated on the basis of analyses carried out in different workshops and meetings held in the last two years. We end with some conclusions and recommendations that may help to establish priorities for the needs and real problems of the "organic sector" and to develop a more participatory and hands-on research focus. The strategy is to make better use of the potential offered by existing resources and to channel this towards obtaining greater practical advantage for more people.

I. INTRODUCTION

The development of Organic Farming in Europe, which comprises research, experiment and counselling, as a method for the production of foodstuffs, was possible in its initial stages from the 1920's to the '70's thanks to pioneer efforts and experiments carried out by organic farmers themselves, although there were from the start "scientists" and philosophers who accompanied and supported aspects of research at conceptual level and that of fundamental principles, like R.Steiner, H.Mueller, H. Peter Rusch and A.Howard. It was in the '80's that the idea of Organic Farming earned acceptance in some central European universities, although small research centres had devoted limited efforts to the subject, especially in the field of biodynamic agriculture, ever since the '50's. [1]

In Mediterranean Europe, including Spain, Organic Farming developed later than it did in the countries of central and northern Europe for several reasons. Chief among them have been the

smaller scale of polluting industrial development and scant institutional backing for the Organic Farming sector where research and support services are concerned [2]. In 1997 Spain allocated less than 5% of the figure set aside by Germany, less than 2% of that set aside by Sweden and less than 1% of that earmarked by Denmark for organic farming research [3].

Generally speaking, Europe's Mediterranean countries enjoyed no economic support, either official or from private foundations or donors, to carry out research or back production with organic farming as the more industrialized countries of central and northern Europe did [4]. This, together with the way in which research is organized, means that there are no institutions specifically dedicated to ecological research in this part of Europe. All the research carried out during the last two decades has been due to the good will of a few researchers employed by conventional research institutions who have devoted part of their time to this work. It is only in the last 5 years that European Union (EU) funds, national funds or regional funds have been set aside for research in organic farming. This situation aroused the interest of other researchers on this topic, offering possibilities to extension agents and farmers to set up small organic farming research projects.

Composting is now common practice in countries where application techniques have become part of the culture. This cannot be said of Spain, where composts are still mainly prepared for family plots with a view to making use of crop, urban and rural agro-industrial wastes.

This paper discusses the development, present situation and prospects of organic farming and composting in Spain, on the basis of the bibliography: the principal magazines, other publications and minutes of specifically Spanish "scientific" events like congresses, conferences, symposia, seminars and technical workshops. Finally we talk about the development and priorities of the European sector in organic farming research.

II. FIRST STEPS IN ORGANIC FARMING RESEARCH IN SPAIN

In spite of the fact that a number of specialized reviews and organizations like Sendero, Vida Sana and, in particular, the best known of them, Revista Integral, started to promote and disseminate the achievements and benefits of organic farming in Spain at the end of the '70's, even publishing the first books to come out on organic farming and composting here [5], it was not until 1983 that the first official scientific reference to biological or organic farming appeared in a review published by the Ministry of Agriculture and Fisheries [6]. The prologue said it wanted to draw the attention of the sector's leaders to the undeniable contradictions inherent in the large-scale industrialization of agriculture. The editor wrote that Spain's official agricultural research institutions had, until that moment, ignored the matter, at least in their publications. The review presented a few papers by Spanish naturalists and researchers which had, in isolation, taken up the subject from viewpoints very similar to those of organic farming. The ideas and ideals of the organic farmer were thus finally aired [7]. These papers clearly showed the efficacy and high yields achieved with traditional methods in two representative areas of Spanish agriculture: olive and meadows holm-oak meadows [8]. Other authors [9] studied the ecological systems used in highland agriculture, with reference to traditional cereal-leguminous crop rotation in the hills of Teruel [10].

The participation of the International Federation of Organic Agricultural Movements (IFOAM) in the European Scientific Congress on Biological Agriculture [11] at a venue provided by the Higher Council of Scientific Research in Madrid (CSIC) converted the event into an explicit recognition of this approach to agriculture by certain "official" scientific

circles. It also opened a cycle of “scientific” meetings on organic farming, which lasted almost 10 years. A number of congresses and seminars were organized by Vida Sana, with some support from the Ministry of Agriculture, Fisheries and Foodstuffs (MAPA).

In the prologue to the report on this event, the representatives of agricultural research and training corroborated that at that time there existed no MAPA centre devoted specifically to organic farming, although they indicated that several research units dependent on the National Institute for Agricultural Research were working on over 40 projects indirectly related to the subject. Among the projects referred to, was a group working on desertification control and soil loss, but no detailed information was given.

35 research papers were presented at this Congress, 15 of them Spanish, on different aspects of organic farming, especially organic fertilisation, green manure and organic pest control. Two papers, from Granada and Valencia, dealt with composting, [12] and [13]. At that time, before the coming into force of EEC Regulation 2092/91 on Organic Farming, the use of sludge from urban sewage treatment plants was considered feasible. Two other papers, [14] and [15], addressed biological aspects of the soil in relation to plant diseases.

At the second important “scientific” meeting on Organic Farming, “Soil Fertility” [16], 15 Spanish papers, 9 of them on soil fertility and organic fertilisation, were submitted. The composting of sludge from industrial sewage treatment plants to obtain agricultural fertilisers was addressed again in two papers, [17] and [18], from Madrid and Barcelona. The ecological aspects of the soil were discussed in one of the papers presented [19].

At other seminars and congresses also organized by Vida Sana in Madrid between 1989 and 1994, [20], [21], [22], [23], [24], [25] and [27], some experimental and research work related to organic farming was presented, although no paper addressed specific aspects of composting and soil life. At one of them, however, there was a paper offering a radically different approach to the handling of soil fertility which later gave rise to a book [26]. In the report on one of the three seminars organized in later years by Vida Sana on pest and disease prevention in biological crop and livestock farming [28], two papers, [29] and [30], linked soil biology to pest and crop disease prevention.

At a meeting on Eco-compatible Agriculture, organized by the Regional Government of Extremadura in Badajoz in 1991 [31], a few papers stressed the importance of organic matter in the preservation of soils. Two of the 14 papers published, [32] and [33], highlight the importance of organic matter. These were not, of course, the only forums or reviews to produce scientific contributions during this period, but we have accounted for the most important.

III. THE CONTRIBUTION OF THE SEAE

Nevertheless, it is the Spanish Organic Farming Association (SEAE) that has, at state level, provided the principal forums for exchange and dissemination of organic farming research. Over 450 research papers have been presented in them over the last ten years [34], a modest enough number in the light of the surface area and output of organic farming in Spain compared with the work done by other countries in the area.

Since it was set up in Madrid in 1992 the SEAE has been promoting, at state level, a number of scientific and technical exchange activities involving experts, scientists and – recently – farmers. These have basically taken the form of conferences and technical seminars.

It was an SEAE working group, formed shortly after the association came into being, that set forth, in 1993, the first recommendations for research work in organic farming in Spain. They emphasized the need to support soil-earth management and nutrition. These priorities arose in the course of a seminar on research, instruction and SEAE counselling [35], which were later taken up by another official working group on research organized by the Council for the Regulation of Organic Farming (CRAE) in 1995. This defined research priorities at official level. Some of these priorities, which refer explicitly to soil ecology in relation to management and cultivation technology in the context of the improvement of soil structure and properties with organic matter, as well as manure and pig slurry quality criteria for their use in organic farming, are still valid today.

One of the papers presented at an SEAE seminar [36] also speaks of the importance of the concept of soil fertility, laying special emphasis on the roles of micro-organisms, organic matter, compost and composting, as well the interrelations which are produced between all these elements and with the plant and the atmosphere. The paper talks of a qualitative change in the oversimplified concept of chemical fertilization. Other papers presented at the same seminar, [37], [38], [39] and [40], describe research and teaching activities in different places in Spain – Barcelona, Córdoba, Manresa and Tenerife -, including composting and soil fertility experiments.

However, perhaps because of the lack of a strong tradition in the use of compost in Mediterranean farming, there have been few studies on its application. As we shall see, most of the research carried out into composting has to do with making use of agricultural waste, like olive marc and other crop residues, but not with using it as a method to increase the biological activity of the soil.

At the first SEAE Congress in Toledo [41], over 65 experiments and research papers were presented on organic farming, 10 of which dealt with soils and ecological fertilization. One of them addressed the biological activity of the soil and diseases [42] and four were devoted entirely to composting, [43], [44], [45] and [46]. At the second SEAE Congress in Pamplona [47], there were 52 papers, 6 of them on soils and fertilization, but none specifically addressed to composting. At its third Congress in Valencia [48], there were 62 communications and papers and 58 posters, of which 22 discussed soils and organic fertilization but only one [49] the use of compost. 116 communications and posters and 12 papers were presented at the SEAE's fourth Congress in Córdoba [50], 13 devoted to soils and fertilization, two of them on composting in organic farming [51] and another a summary [52] on the specific use of olive marc compost. Only one of the papers presented in the soils and fertilization section of the fifth SEAE Congress held in Gijón [53] addressed the use of compost [54], but in the section on pests and diseases there were six papers, [55], [56], [57], [58], [59] and [60], on the capacity of various composts or their extracts to counteract soil diseases. This has represented a whole new line of research that is still being pursued today. Not in vain have 5 papers on the positive effects of composting in the regulation of pests and diseases in organic farming been presented for the plant protection section of the sixth SEAE Congress to be held this year in Almería. Another four papers will be presented in the production and traditional practices section and five more in that on soils and fertilisation, making a total of 14.

The SEAE's Technical Symposiums are less general in their scope. Eight have been held since 1993 [61], although they tend not to include such specific research. We would, however, draw attention to two papers on composting, the first devoted to manure and pig slurry composting [62] at the Symposium on Ecological Livestock Farming held in Lugo in 1999 and the second on aspects of compost fertilisation at SEAE's eighth - and international - Symposium on organic banana groves in La Palma, Tenerife [63]. No papers on composting figured in two other recent SEAE symposiums [64] and [65], but there was discussion of micro-biological activity in the soil.

IV. OTHER EVENTS IN WHICH THE SEAE HAS TAKEN PART

Papers on the composting of olive marc and mill wastes were also presented at the Mediterranean Symposiums on organic olive groves, production and traditional cultures (ECOLIVA), the last two of which, those of 2002 and 2004, the SEAE has helped to organize. Papers on the industrial use of olive mill wastes as agricultural fertilisers were given at ECOLIVA's 1997 meeting, [66] and [67], and those of 1998 and 2000 [68]. Four papers from the 1997 Symposium, [69], [70], [71] and [72], deal with the use of these wastes after composting as fertiliser in organic farming. Other papers, presented at ECOLIVA 98 and 2000, [73], [74], [75], [76], [77], [78], [79] and [80], also address the question.

But it was at the 1st International Conference of IFOAM on ecological olive groves, production and traditional cultures [81] in 2002 that the largest number of papers were submitted on the subject. Of the 26 presented in the science and technology section 14, seven of them Spanish, spoke of the use of olive marc and mill wastes in organic farming. The 7 Spanish papers, [82], [83], [84], [85], [86], [87] and [88], studied various aspects of olive marc composting and the elimination of compost toxicity in some crops. One publication that came out before the fourth ECOLIVA symposium in 2002 [89] recommends the reuse of olive marc composting in ecological olive groves. This year the fifth ECOLIVA meeting has been held with more papers on this subject. Other meetings on olive growing have also included communications about the use of ecological olive groves [90].

Some SEAE members have also contribute to the development of compost practices, especially at the Canarian Island, in cooperation with organic farmers, using and developing compost preparations with the CMC¹ method, by their own, without any support from the oficial institutions, with a relatively success, using this preparation as crop fertilizers and also for disease control (compost tea²), through effective microorganisms (EM), with the support of some local advisors³. We do not have references of this experiences, but we think it necessary to follow up this results, in order to gain more experience and disseminate it to the rest of the organic farmers.

¹ With support from Angelica Luebke

² Proposed by Steven Cheuerell

³ Domingo Herrera BIO GAMA. E-mail: micropost@vodafone.es; Yanai Nir E-mail: yanainir@hotmail.com; Carmelo Batista. E-mail: cbatista@nalcom.com

V. PUBLICATIONS AND DISSEMINATION OF COMPOSTING IN SPAIN

There is not a great deal of literature on composting and organic farming in Spain. Some publications, however, had already extolled the virtues of composting in organic farming, [91] and [92], back in the '80's. Most of this country's informative publications have addressed the subject of composting, taking their material from outside sources. This is true of Spanish magazines on biodynamic farming, [93], [94] and [95], which attach considerable importance to composting. Worthy of special mention is a monograph on composting [96] published by Biolur (Navarra), one of the longest-standing associations of organic farmers in Spain. Two recent publications discuss organic matter in the soil [97] and the best way to obtain good compost [98]. The Ministry of Agriculture [99] carried a special issue on composting and its use and the CAAE has come out with another on olive marc composting [100].

Various recent editions of manuals also devote sections to composting [100, 101].

Finally, there are guides to products available for use in organic farming, written as vademecums, [102] and [103]. The most recent [102] talks of commercial composts for the organic farming market. Over 60 organic products are listed that can be used by organic farmers in Spain, according to a declaration of good intentions from the manufacturers.

VI. RESEARCH PRIORITIES IN THE EUROPEAN SECTOR

The Organic Farming sector is organized within a number of associations at European Union level. Nevertheless, the largest and oldest organization is the Regional Group of the IFOAM⁴, which includes more than 300 associations and bodies of every kind (farmers, manufacturers, marketers, distributors, certifiers, researchers, technicians, etc.) in almost 30 European countries, making it a meeting place of inter-professional character. Many of its members are private research institutes which have studied and experimented with composting (FIBL, LBI, DARCOF, etc.)⁵, specially in central and northern Europe.

The IFOAM-EU Group has a board of directors, one per member country, which meets three or four times a year. One of these meetings is with the Organic Farming Unit of the Directorate General for Agriculture of the European Commission in Brussels. A Subcommittee for Research into Organic Farming has been set up within this group to inform European Union authorities and officials of the direction being taken by framework research programmes and the inclusion of lines of research and matters related to organic farming and food, to secure greater sector participation in the establishment of research priorities and, in certain cases, to take part directly in organic farming research projects. The IFOAM-EU Group is currently involved in five European projects for the certification of organic farming inputs, organic farming support policies, the revision of European organic farming legislation, the European ecological market information system and the evaluation of action plans to promote organic farming.

The research priorities established by the sector are structured in accordance with the following guidelines: 1) ideas for research on vegetable production; 2) ideas for research on

⁴ International Federation of Organic Agriculture Movements (IFOAM), www.ifoam.org

⁵ Frick's Organic Farming Research Institute (FIBL) in Switzerland, the Louis Bolk Instituut Drichergen (LBI) in the Netherlands and the Danish Research Centre for Organic Farming (DARCOF)

animal production; 3) ideas for research on socio-economic aspects; 4) quality, health and food safety; 5) the environment.

Guideline 1) establishes the framework for research on compost and soil eco-biology in the context of soil health and its impact on plant health (priorities 1 and 5). This should study the potential for good soil management and cultivation systems (rotation, green manure, use of high quality compost, etc.) to minimize animal health problems and, in particular, soil diseases in organic farming. New technologies should be tried to improve the health status of the soil, using specific compost or soil extracts capable of suppressing diseases in different climates. Tests involving the participation of farmers and dissemination activities with explanation of results are considered essential.

VII. CONCLUSIONS

Research work on organic farming, soil ecology, organic fertilizers and composting has been increasing since 1994 when the first SEAE Congress was held.

With regard to composting, we should emphasize that this technique has not been much used traditionally in Spain, in spite of the lack of organic matter and the impoverishment of the soil.

Since most of the research done on organic farming is of a practical or applied nature, frequently carried out by farmers and extension agents little interested in compost, working together on ecological farms, few experiments have been devoted to this subject. If soil fertilization has not been a priority for Spanish researchers, composting is still further down their list.

The events organized by the SEAE, especially its bi-annual congresses, have until now been the Spanish forums where most scientific information on the sector has been shared, as is shown by their minutes. Around 450 papers, communications and/or posters have been presented to date.

Initially, compost researchers were principally interested in making use of sludge from sewage treatment plants in agricultural fertilisers. However, when EEC Ruling 2092/91 on organic farming, which expressly prohibits its use, came into force on account of the hazard presented by high heavy metal contents, they started to look at the composting of reusable crop wastes (almond shells, olive marc, etc.). Their work on organic olive groves has been especially important in combatting the environmental effects of olive mill industries.

Composting studies in Spain have been concerned more with the effect of application to crops than to preparation and adaptation to farmers' needs.

A new line of research arose only a short time ago on the beneficial effects of composting and organic material on the soil, reducing or counteracting crop pests and diseases.

Most of the publications that have appeared on composting in Spain are based on work done elsewhere. Nevertheless, Spanish work on olive marc composting and the preparation of homemade compost has started to appear in the literature.

One of the research priorities of the European organic farming sector, the use of compost and its extracts (or compost teas), is linked to the prevention of soil borne pests and diseases and the maintenance of soil health, a line of research which is also gaining ground in Spain.

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