

Organic Agriculture in the Mediterranean Area

by CIHEAM – Mediterranean Agronomic Institute of Bari

Contents

Presentation

Foreword

Part I – Organic agriculture in the Mediterranean area: State of the art

- 1. Origin and development of organic farming**
- 2. Regulatory framework**
 - 2.1. EU rules and regulations on organic farming**
 - 2.2. The influence of the regulatory framework in the Mediterranean Basin**
 - 2.3. Support Policies**
- 3. Sector Overview**
 - 3.1. Data and problems of organic farming development at the world level**
 - 3.2. The Mediterranean region**
 - 3.2.1 The agri-food system*
 - 3.2.2 The organic agri-food system*
- 4. Mediterranean organic agriculture: some major agronomic features**
 - 4.1. Major agronomic problems of Mediterranean organic farming**
 - 4.1.1 Overall soil fertility improvement*
 - 4.1.2 Phytosanitary control*
 - 4.1.3 Weed control*
 - 4.1.4 Agroecosystem complexity and its self-regulation: a holistic approach*
- 5. The market**
 - 5.1. The market along the southern and eastern shore**
- 6. Conclusive Remarks**

Part II – Countries report

- **Albania**
- **Algeria**
- **Egypt**
- **France**
- **Greece**
- **Italy**
- **Lebanon**
- **Malta**
- **Morocco**
- **Tunisia**
- **Turkey**

List of Abbreviations and Acronyms

Members of the MOAN (Mediterranean Organic Agriculture Network)

- 1. Coordination Committee**
- 2. Research Group**

Part II

Countries report

ALBANIA

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1. General aspects

Organic agriculture products have been firstly introduced in Albania by HIPP, the German producer of organic baby food. It has been promoting and selling basically organic foods in Albania since 1995. They have a good distribution system all over the country and operate basically with drug stores.

Oxfam - Novib support a very interesting project in Northern Albania in the region of Shllak to develop permaculture. (Permaculture is a dose relative to organic agriculture, with a strong orientation on farm planning and very diverse cropping. The objective is to produce sufficient amounts of diversified food in a small area). They have developed a good extension network in approximately 30 villages, elaborated interesting training modules and introduced numerous successful technical improvements (including water reservoirs, mulching and "Konfej" as fertilizer). In 1998, they created a resource centre (near Skodra) with the objective of creating a model farm according to permaculture. Even though the centre is not yet fully operational, they have been holding courses and demonstrations (train approximately 20 people a month) during the summer months. This project has supported the establishment of a co-operative for herbs, which tends to export under 'organic' label.

At least one private fresh herb producer and exporter "Aris-frucht" is certified by BIOSWISS and is exporting fresh herbs to Switzerland, since January 2001.

Two groups of women are certified by an Italian certification body as organic herb collectors in Zadrima, region in Lezha district. There are no data on exporting wild herbs.

Three bee-keepers have applied to the Organic Agriculture Association (OAA) to convert to organic, but OAA is not yet recognized as a certification body, neither by IFOAM nor by the Albanian government.

Some olive oil producers, members of OAA, are actually trying to enter the procedure for labeling 'organic' and thinking for exporting.

The OAA, whose objectives are the promotion of organic agriculture in Albania, is a young and dynamic association. It was established on June 1997. It has undertaken a number of interesting activities, all on voluntary basis, and has developed a strong membership among the agricultural experts. The Association is very conscious of the need to

motivate more producers to become involved in organic production. Agricultural producers in three districts are members of the Association and are willing and capable to deliver organic goods if and when some infrastructure will be set up. However, efforts in contacting producers is limited because of the lack of resources.

The activities OAA has undertaken, especially efforts to present organic agriculture to a wider public, have created a lot of interest among both "intellectuals" and consumers. A local market, though small, does exist in Tirana for higher quality goods, for Albanian specialities and products, which can be easily traced to the producer.

OAA has established a commission for the certification of organic products based on the IFOAM basic standards.

OAA is now supporting the efforts of one of its members to improve the performance of a shop (natural and organic) in Tirana in which organic products can be sold.

Recently OAA has been appointed as Albanian coordinator for the project "Introduction of Organic Agriculture and Low Input Sustainable Agriculture in Balkan Countries", in the framework of Stability Pact.

From the government side, there are attempts to introduce organic agriculture in its policies. In the governmental strategy for agriculture "The Green Strategy" organic agriculture is considered as an alternative in rural areas, especially in the mountains.

2. Regulatory aspects

Actually, there is no legislation in the country concerning organic agriculture. The inspection and certification system in the country is managed by OAA, but it is still weak, since it is not associated with any national legislation or international scheme of inspection and certification.

3. Structural aspects

There is only one organic farm certified by BIOSWISS, Switzerland.

The farm's area is about 4 ha (two in the open field and two under green house). It is located in Gjakaj - Tirana. The main product is fresh herbs. The total production per year is around 20 tons. The turnover is around \$US 80 000 per year.

There are groups of farms in Lezha districts involved in wild collection of herbs and certified by an Italian association (not yet identified). Also, there is a herb cooperative called "Kiri 2" in Shllak Shkoder, which is collecting organic herbs (but not yet certified). Some training

activities were organized, financed by the Ministry of Agriculture, the World Learning Program (USAID) and the Mediterranean Agronomic Institute of Bari.

4. Agronomic aspects

The main problem in soil fertility management is the lack of adequate drainage and irrigation systems.

The main issue in pest and weed control is the quality of pesticides and the lack of knowledge about their use.

The main authorized product for soil fertility is manure.

Imported propagating material is basically certified, but not necessary as organic. Propagating material in the country might be considered organic.

There are not local companies producing technical means.

5. Market aspects

There are no organic shops in Tirana and no organic products are sold in supermarkets. Products usually go to the foreign market such as Switzerland and Italy. About 20 tons of organic fresh herbs are exported to Switzerland per year.

Aris-frucht is the company that exports to Switzerland. There are some demands from German and British markets.

The main difficulty in exporting Albanian products is the lack of internationally recognized inspection and certification body.

Domestic consumption of certified organic products is not developed yet. Ten percent of people in remote rural areas consume non certified organic products (self producing and self consuming).

There are no evident forms for promoting organic products, apart from the organization of pavilions in national fairs by OAA.

6. Association

In Albania actually there is only one organic association, the OAA, which has branches in main districts of the country, and good membership (90 members). It has also continuous contacts with the Ministry of Agriculture and Food.

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ALGERIA

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Introduction

Algerian agriculture includes the so-called "modern" and traditional production. At the contrary of the "modern" and intensive, the traditional production (70% of agricultural useful area) is characterized by a low level of mechanization and absence of fertilizers and pesticides.

Organic agriculture, as a system of production under legislation, does not exist yet.

This delay comes from the fact that the last thirty years, agriculture was not considered as a priority by the authorities and so, not encouraged as it has been done for industry.

1. Organic farming in Algeria: the beginnings

In the year 2000 the first attempts to introduce organic agriculture in Algeria started:

- Some lectures addressed to teachers and students of the National Institute of Agronomy (Algiers) and the Institute of Agronomy of Blida and to the executive staff of the Ministry of Agriculture were organized.
- A report about the importance of the development of organic farming in the country and its environmental and economic aspects was submitted to the Minister of agriculture.
- The Minister of agriculture strongly supported the promotion of organic farming in the country.
- First contacts with the main producers' organization were undertaken. Potential organic farms were identified and a first list was compiled. In the year 2001 a seminar on "Introduction to organic farming" was organized by the "Institut National des Recherches Agronomiques d'Algiers" (INRAA) with the contribution of the Research Institute of Organic Agriculture (ASI Global).

2. Regulatory aspects

There is no legislation on organic agriculture in Algeria. The competent authority for the promotion of organic farming is the Ministry of agriculture, principally through the following departments:

- the National Centre of Control and Certification;
- the Veterinary Services;
- the Vegetable Protection and Control techniques;

- Training, Research and Vulgarization;
- The National Institute of Agricultural Vulgarization.

3. Conclusion

Organic farming in Algeria is at its beginnings. However, there is a certain interest to its promotion from the authorities, especially the Minister of agriculture, and also from a certain number of producers. Some measures have been undertaken to set up a development project.

EGYPT

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1. General aspects

The Egyptian agriculture has been fully organic for more than ten thousand years and until 1940. Since the beginning of agricultural activities in the Nile Delta and Valley and due to the high fertility of these soils, there was no need for any kind of fertilizers particularly in soils destined to be flushed and flooded every year by new fresh mud brought from the jungles of Ethiopia, Uganda and South of Sudan. Crop rotation, including clover and grasses for animal feeding, was used. Integrated animal and crop production system was practiced. In such a system animal urine and manure were saved for crop production. Natural agents for disease and insect control were used and are still being used in some areas nowadays. Most of these agricultural practices were documented on the temple's walls during the Pharaonic time, 5000-7000 years ago. These agricultural practices had been the main bases for agriculture and ecosystem sustainability for thousands of years.

Since 1940 the development of agricultural practices focusing on short-term productivity based on an intensive use of external inputs, such as chemical fertilizers and pesticides, introduced a fragile system of monocultures. This new system revealed to have many negative environmental impacts and harmful health hazards for both humans and animals. Serious threats on farmers, due to the use of chemicals, are increasing. Pollution of the Nile as a direct result of the intensive use of agro-chemicals causes a real health hazard for all Egyptian citizens.

Certified organic agriculture started in Egypt 23 years ago in the eastern desert where a small farm (Sekem) of about 17 ha produces medicinal herbs for export market. Expansion of this activity was quite slow until 1988. Thereafter, a rapid growth has occurred in the bio-dynamic production of vegetables, fruits, cereals, cotton and medicinal herbs. This rapid growth was initiated mainly by Sekem and by some other growers in Fayum and Kalubia governorates.

In 1995 a new group of organic growers established the Union of Growers and Exporters of Organic and Bio-dynamic Agriculture (UGEOBA). The Union members produce and trade mainly organic herbs, vegetables, fruits, potato and some cereals.

Shortly after, in summer 1998, a new organic project was started by Al-Hoda for agromanufacturing due to the high market demands for

organic fruits and vegetables. At the same time Ever Green Egypt, Sonak, Sultan Farm, Fayum Society of Small Organic Farmers and others got involved in the organic movement (table 1).

The organic agriculture activity in Egypt is growing very fast due to the public awareness as well as to the increasing demands for organic food and fibers on both local and export markets. The number of farms reached more than 300, with a total acreage of more than 10 000 feddans (4167 hectares). According to the Egyptian Ministry of agriculture (2000) the total cultivated area is 7.4 million feddans (3 083 333 hectares) of which organic farmed areas represent about 0.14%. Beside the certified organic production, in the remote areas, there are more than 500 thousand feddans (208 333 ha) cultivated traditionally without any use of chemicals and depending only on the rain or the underground water for irrigation. From a technical viewpoint, these areas could be easily converted into certified organic production.

Organic and bio-dynamic productions in Egypt include all kinds of vegetables, mangetot, sugarsnap, baby corn, medicinal herbs, potato, citrus, grape, mango, banana, apricot, strawberry, liquorice, henna, palm date, cereals and cotton.

2. Regulatory aspects

In 1990 the Egyptian Bio-dynamic Association (EBDA) was founded to provide consultancy, training and applied research services to farmers. Together with the German and Swiss partners, EBDA established the Center of Organic Agriculture in Egypt (COAE), a local certification body.

COAE follows the inspection and certification schemes of the Institute of Market Ecology (IMO) of Switzerland. In 1997 COAE was registered as a limited liability company by Sekem, IMO and DEMETER international for inspection and certification. Sekem owns the major part of this company.

Later, in the same year, this company was accredited by DAP, the German accreditation organization. COAE office is located at the Sekem Headquarter at the beginning of Belbies Desert road, Hiekstep, Cairo. All inspectors, administrators and certification board members are local personnel. Inspection and certification are performed according to the Demeter Bio-dynamic standards and to the EU rules and regulations. COAE inspects 122 farms distributed among 11 governorates as recorded in table 2.

In September 1995, the Egyptian Center of Organic Agriculture Society (ECOAS) was established as a nonprofit, non governmental

organization. The 15 initiating members were university professors, agriculture experts, scientists, farmers and consumers. ECOAS started when some organic and bio-dynamic growers felt the need to establish another organic project in Egypt beside Sekem, which until 1995 was the only one in the country. Most of the initiators of ECOAS were working and co-operating with Sekem project.

ECOAS follows inspection and certification schemes reported in the Regulation (EEC 2092/91) and its amendments and in the IFOAM Basic standards. Naturland's guidelines are also taken into account. A complete inspection and certification scheme was designed for ECOAS to do the job under the supervision of IMO and Naturland.

Later on, within the framework of ECOAS and with the support of Naturland, four organic growers and Agrofood Company founded the Union of Growers and Exporters of Organic and Bio-dynamic Agriculture (UGEOBA) and a local control body.

A filing system was designed for UGEOBA for both farms and firms. Both IMO and Naturland were consulted at all steps, including the format of extension visits, inspection report forms, sanctions, and appeal procedures. Information flow through contacts with the international organic community was very helpful in improving performance.

An evaluation is performed annually by IMO and Naturland to meet international requirements and find markets for organic products in Europe.

From four organic farms and one firm at the beginning of the project in September 1995, we passed, in summer 1998, to 75 farms with an average size of 17 ha, and seven firms. Organic products include medicinal herbs and ornamentals, henna, fresh vegetables, roots and tubers, rice, wheat and cotton. These organic products are exported to most EU countries, the USA and Arab countries, besides being sold on the local market.

Later on, ECOA company was founded as a sharing company of ECOAS mainly for inspection and certification with the aim to comply particularly with the standards of IFOAM's International Organic Accreditation Service (IOAS), ISO Guidelines 65 and the European Norms (EN 45011). A new organizational chart and job descriptions for all authorised personnel were developed. Policy paper and standards were prepared for a certification scheme to comply with international requirements.

In the year 2000, ECOA company was accredited according to the EU 45011 by the DAP, same German accreditation body which accredited the COAE earlier. All inspectors and certification board members are

local personnel. The number of farms is 62 distributed among 11 governorates as recorded in table 3.

Due to the enormous evolution of organic movement in the country more projects were established in the last few years. The biggest is Al-Hoda for Agro-manufacturing which established the largest organic farm in the Middle East in Sinai with a surface of 650 feddans (about 150 hectares) producing organic vegetables, fruits, roots and tubers, peanuts and baby corn for both local and export market. Inspection and certification of this project is being performed by the English Soil Association Ltd. Three other small groups started in the last two or three years. These are the following:

- Ten farms and firms inspected and certified by the German BCS which has established an office in Cairo, which inspectors are both local and German. Certification is done according to the EU rules and regulations.
- Four farms and firms inspected by the Italian IMC which has established, one year ago, an office in Cairo and inspection and certification processes are performed jointly by local and Italian personnel. Certification is carried out according to the EU rules and regulations.
- Two or more farms are inspected by Bioagricoop, an Italian certification body, according to the EU rules and regulation. Both inspection and certification are performed by Italians. No office is known in Egypt for Bioagricoop yet.

3. Structural Aspects

Two large organic and bio-dynamic projects are now well established in Egypt: Sekem and UGEOBA. More than 3000 ha are organically grown in Egypt, and a very wide range of organic products are available on both local and export markets. Tables 1, 2, 3 and 4 show the organic activities of the different groups and organic projects until the year 1998.

The recent structural situation at the end of 2001 may be summarized in tables 5 and 6.

Farm numbers and productions in all projects are increasing quite fast. Organic activities in general are spreading rapidly around the country and all over the southern Mediterranean region. This happened particularly after the establishment of the Mediterranean IFOAM group (AgriBioMediterraneo) in July 1997, with its permanent secretariat at the Mediterranean Agronomic Institute of Bari, Italy.

3.1. Producers' Associations

- *Egyptian Biodynamic Association (EBDA)*

Address: Sekem, Hykestep, Belbeis Desert road, Egypt

Number of members: about 137 growers plus Sekem Holding Companies

Products Types and Quantity (see table 5)

Products destination: local and export markets.

- *Union of Growers & Exporters of Organic and Biodynamic Agriculture (UGEOBA)*

Address: Agrofood Co. 3 Kamps str. from Mesadaq, Dokki Giza Egypt

Number of members: about 120 growers plus 7 Companies

Products Types and Quantity (see table 5)

Products destination: local and export markets.

- *Egyptian Center of Organic Agriculture Society (ECOAS)*

Address: 17a Hadaik Eloubor, suite 2 -12th floor, Salah Salim Str, 11371 Nasr City, Cairo Egypt.

Number of members: 30 scientists, growers and environmental activists.

Products destination: local and export markets.

3.2 Training activities

Sekem deals with Biodynamic practices training whereas ECOAS is involved in Organic agriculture training activities, such as:

- organization of a training workshop for junior inspectors from eight African countries through the IFOAM African Group project "four of organic agriculture till 99";
- organization of training seminars in Palestine and in Tunisia to help establishing organic projects in these countries;
- attempts to establish an organic project in Bosnia.

ECOAS' Chairman is coordinating the organic agriculture Committee of the Agriculture Commodity Council (ACC) at the Egyptian Ministry of Economy and Foreign Affairs as well as the ad-hoc committee for formulating the organic agriculture rules and regulation in Egypt.

4. Agronomic Aspects

Organic farming practices have long been documented in the Egyptian agricultural traditions. Safe use of environmental resources, building-up of soil fertility, biodiversity and the concept of natural equilibrium were used more than five thousand years ago. Animal manure and Nile mud were the only fertilizers used. Crop rotation

was the only mean for soil fertility conservation, and solarization was used in plant protection and disease control. Social aspects were very important in the agricultural community, not only in Egypt but also in most Mediterranean countries. In recent times, in most southern Mediterranean countries, in both conventional and organic agriculture, a socially, culturally and economically integrated system is the main feature of the country side.

Today, in Egypt, the organic farming system depends on reasonable and continuous applications of composted animal manure and farm wastes and on the use of natural additives for enriching compost, such as rock phosphate, orthoclase, gypsum, desert shale, bone meal, as well as plant and seaweed extracts. Waste recycling is the predominant way of compensating the nutrients removed from the soil. Balanced crop rotations, with 20% legumes, are used with both deep- and shallow-rooted crops. Plant biodiversity is fostered, and the farm environment is made complex through the establishment of evergreen hedges and different plant species to accommodate birds and insects. Green manuring and cover crops are applied. Prevention and biological control measures are considered, beside the safe use of plant extracts and other natural substances for pest and disease control. A successful example is sulfur mixed with bentonite and lime to control mildew; jojoba oil and other mineral oils as insecticides; pheromone traps sticky sheets and mating disruption perfumes as well as cover crops for pest control. Sheep husbandry within the farm makes this system economically viable.

Integrated animal and plant farming is the most successful way to establish organic farms on newly reclaimed land in the Egyptian desert (a very arid climate). Minimizing the use of external inputs is a successful concept for enhancing the economic feasibility of the organic farming operation, in particular after the stop of governmental subsidies for most agricultural production.

The main issues opposing the progress of organic agriculture in Egypt are the following:

1- Some restrictions in the EU regulations concerning the long conversion period (three years) which is not necessary for Egypt because in most European countries, the growing season is short (four to five months per year), while in Egypt there are three growing seasons a year.

2- Manure limits per unit area requested by the EU regulations is quite low for the desert soils which is very poor in organic matter contents (less than 0.1%).

3- Organic seeds are not always available, sometimes even absent. If available, they are very expensive. There is no local organic seed production for many products particularly vegetables.

4- Disease and insect control is still not easy; biological control agents are imported and are very expensive. Local practices need to be developed through intensive research programmes.

5- Nitrogen requirements are still not fulfilled according to the allowed rates of application in all national and international rules and regulations. More research activities are needed for soil fertility conservation in the desert environment.

FRANCE

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Groupe de Recherche en Agriculture Biologique

1. General aspects

The French agriculture is dominated by cereals and the so-called "grandes cultures", including potato, sugar beet and wheat. Most of the growers receive subsidies according to the European Common Agricultural Policy, taking into consideration the competition with foreign countries.

Organic growers do have to respect the European Regulation (EC 2092/91) for plant production. They have to declare their intention of selling organic products, and they are to be controlled by certified organisms that check the technical management of different crops on the farm.

Organic Agriculture (OA) concerns around 1.5% of all cultivated surfaces in 2001 (i.e. 420 000 ha), which is increasing but not much compared to other EU countries like Austria or Holland. Most of the OA is done in south-east and west of France (Britannia) where mountains, vineyards and extensive crops are found.

Organic animal husbandry is strongly increasing, especially in the mountainous areas and in Britannia. The organic animal husbandry has led to the development of organic pastures whose surfaces have increased rapidly: pastures (70%), cereals and beets (18%), vineyard (3%), orchards (2%), vegetables (2%) and miscellaneous (7%).

However, organic animal husbandry has caused a lack of vegetal proteins in cereals, oleaginous and proteaginous, which led to the import of around 60% of the concentrates.

Subsidies for Organic Agriculture are given by the government during the conversion period (three years), and they range from US\$ 250 up to 600 for vineyards. Those subsidies may have convinced many growers to produce organically, without having the ethical behaviour, which is a must. We shall, thus, wait that subsidies drop down to see the evolution.

Different local groups are organising training, information and market initiatives for helping organic growers to sell and to be better known.

2. Regulatory aspects

The reference legislation is the European regulation (EC 2092/91) which is always readapted and discussed. Most of the growers refer

to this legislation but some do apply a more severe one, for example, Swiss (Biosuisse) or French (Nature & Progrès), as they consider that some elements of Regulation EC 2092/91 do not belong to their way of thinking Organic Agriculture.

Some growers also work "bio-dynamically" and have very few possibilities of using inputs, but enhance plant or animal health through telluric forces.

The competent authority is the Ministry of Agriculture (Direction Générale de l'Agriculture), which represents France in European decisions. Inspection boards are allowed to control farmers and to deprive them from their label.

Once the producer has gone through the 3-year conversion period, he is authorised to label his products with the logo :

This logo, put on the left of the label, is a national one, and is about to be replaced by a European one, to be put on the right.

During the first year of conversion the grower has to sell his produce traditionally. In the second year, he can indicate that the products are produced organically but in transition period.

Several independent organisms are approved by the government to make regular and unexpected controls on farms.

Those organisms are : Ecocert, Qualité France, Ascert International and Ulase.

Most of these structures have local delegates (table 1).

3. Structural aspects

According to 2001 statistics, there are 420 000 hectares (figure 1) organically grown in 10 400 farms representing 1.5% of the total cultivated area and 1.6% of all farms, respectively.

West and south-east of France are the more dynamic regions, because they are already very concerned with husbandry, and they have the capacity to develop pastures.

These regions are: Languedoc-Roussillon, Provence-Alpes-Côte-D'Azur, Franche-Comté, Alsace and Pays-de-la-Loire for the first ones.

Crop and animal productions are shown in tables 2 and 3.

There are some conservatories with old and local varieties of cultivated species, mainly fruits and vegetables. The main conservatories are reported in table 4.

3.1. Producers' associations:

- FNAB
40, rue de Malte
75011 PARIS
F.N.A.B@wanadoo.fr

- Nature & Progrès
68, boulevard Gambetta
30700 UZES
Nature.et.progres@wanadoo.fr

3.2. Research institutions

- Institut Technique de l'Agriculture Biologique (ITAB)
itab@itab.asso.fr

- Groupe de Recherche en Agriculture Biologique (GRAB)
grab@wanadoo.fr

- Civam Bio Corse
biocorse@aol.fr

- FRAB
civambiolr@wanadoo.fr

- GDAB
Gdab-mp@club-internet.fr

Main investigations are:

- assessment of varieties for organic farming;
- control of main diseases in respect of EC regulation: post harvest decay, fungi, aphids;
- fruit thinning;
- assessment of relations between the crop and its environment;
- relationship between soil and parasitism.

3.3. Training institutions

- Réseau FORMABIO
JM Morin
Morin@educagri.fr

- Ecole d'Agrobiologie de Beaujeu
Domaine de Mallevall
69430 Beaujeu

4. Agronomic aspects

4.1. management of soil fertility

The mineralization and nitrogen kinetics of organic amendments are pretty bad known, since their precise composition is very mobile. Thus, growers hardly know if the organic matter they bring is helpful or dangerous for their soil and micro-fauna. This may lead to soil disfunction and, eventually, sterility.

4.2. Main issues in the control of pests and weeds

- use of natural insecticides (pyrethrum, rotenone and neem) and of antagonists (insects and molecules);
- mechanical control or managed seeding with non competitive species;
- alternatives to the use of copper: choice of varieties, low copper oxides, essential oils;
- EU regulation relevance with some accepted molecules.

We strongly have to enhance the global and systemic conception of organic farming: instead of thinking of a unique solution for a pest, we have to focus on strategies for avoiding this pest to occur in the crop. That means, prophylaxis, use of hedges and floral strips care are going to be more important for production.

The legalisation of more and more natural insecticides (which have a large and non selective spectrum) leads to a classical way of managing the crops and prevents the development of beneficial insects. Large use of copper may also be responsible for ground microbial unbalance.

4.3. Main authorized material for soil fertilisation, protection and processing

are those reported in annex 1 & 2 of EC regulation 2092/91.

4.4. Origin of the propagating material

Organic seeds are becoming more and more available, as seeders and growers are becoming interested. EC regulation asks for organic material starting from the beginning of the 2004, but a lot of research is needed before being able to supply all farmers.

Research institutes, like GRAB (Groupe de Recherche en Agriculture Biologique), are working for its feasibility: a fruit tree nursery was set up in 2001, to evaluate the feasibility of organic apple and peach

trees. Some work has also been done for seed disinfection against fungi. ITAB (Institut Technique de l'Agriculture Biologique) joined the European network called ECO-PB, created in 2001 (www.eco-pb.org), which started research mainly on cereals.

There are different cooperatives and around thousand shops belonging to the Biocoop network (tables 5 and 6).

Supermarkets (mainly Carrefour and Auchan) are interested and offer more and more organic products.

The local market is always less important, compared to supermarkets.

The main foreign markets are: Germany (fruits and vegetables), United Kingdom (vegetables and fruits) and Northern Europe (table 7).

There are some marketing difficulties due to export constraints:

- Italian competition and lower prices for fruits and vegetables;
- Post-harvest decay of fresh fruits;
- high demand of northern Europe, which means long conservation period.

Many bio-markets and special bio-events are regularly organised in all the country.

Also the Ministry of agriculture organised, in 2000 for the first time, the "Printemps de la Bio", a national event for promoting organic produce with local organisms.

Ecocert also organises its national and annual event.

Annex 1 Source for the collection of data and information

1. ITAB network for organic trials in cereals is pretty efficient, and this kind of trials was done in 1999:

- variety mixtures;
- management of several wheat in organic farming;
- fertilisation monitoring;
- wheat yield comparisons;
- weed control.

2. see below the list of our past and present investigations, on perennial and vegetable crops:

- assessment of organic fertilisers mineralisation kinetics;

- comparison of qualitative and physico-chemical properties of organic and conventional carrots;
- control of pests in OA : fruit flies, codling moth, aphids, white fly;
- impact of hedges on the crop sanitary status;
- alternatives to copper on olive, potato and wine;
- alternatives to plastic mulching;
- observation of rootstocks and varieties behaviour.

GRAB has the role of national co-ordination for national fruit and vegetables trials, in order to avoid that experiments are being done twice.

GREECE

Renia Bitsaki

Mediterranean Agronomic Institute of Chania – Crete

1. Regulatory aspects and certification

The reference legislation in Greece are:

- Regulation EC 2092/91 with all its amendments;
- Regulation EC 2078/92 for the introduction of hectare subsidies;
- Regulation EC 1804/99 for organic animal husbandry.

The competent authorities for organic agriculture are the Ministry of Agriculture-Bureau of Biological Products and Agrocert-Organization for the Certification and Supervision of Agricultural Products.

All the Certification and Inspection Bodies are accredited by the Ministry of Agriculture.

All the inspection facilities as well as the personnel are Greeks. Some of the organizations have already gained a long experience and they have structured their services and facilities in a very efficient way. Generally, all the system of inspection and certification of organic products, as well as of accreditation of certification bodies, is harmonised with the European templates.

The following three Certification and Inspection Bodies exist in Greece:

DIO, SOGE and Fysiologiki.

DIO is the biggest one and certifies (1999) 2677 producers-businessmen.

No data for 1999 for the other two organisations.

Localisation: DIO: all over Greece, SOGE: all over Greece, Fysiologiki: Central & Northern Greece.

2. Structural aspects

2.1. Number of farms

The data come from the Ministry of Agriculture and from the three certification bodies, and they refer to 1998.

The number of farms in 1998 was 4231 and they represent 0.48% of the total farms in the country.

According to the Ministry of Agriculture in 1998, data were the following:

Area organically cultivated: 27 738 stremma (2774 ha).

Area in conversion: 126 282 stremma (12 628 ha).

The total organic and under conversion area is 154 020 stremma (15 402 ha) representing 0.47% of the total agricultural cultivated land.

Organic farms are distributed all over Greece as shown in table 1.

Table 1. Regional distribution of Organic Farms in 1998 (DIO and FYSILOGIKI, 1998).

2.2. Productions

According to the Ministry of Agriculture, 1998, organic productions was that reported in table 2.

2.3. Processing units

In 1998 there were 35 processing and packaging units while in 1999 there were 66, 27 of which dealing only with packaging, two with processing and 37 with processing and packaging. These data refer only to processing units certified by DIO (table 3).

2.4. Wild products

There are no data on collection of wild products. BIOLETA company in Lafkos, Pelion region cultivate organic herbs and collect little quantities of wild plants. Generally in Greece, especially in Crete, collection of wild herbs is common but there is no interest so far to certify them as organic.

2.5. Producers' associations

- Cretan Agri-Environmental Group (CAEG)

P.O. Box 59, GR-70400 Moires, Crete

Tel: +30 892 22026

Fax: +30 892 22828

Number of members 115

Products: olive oil, olives, currant

Activities carried out: production, rural development, environment, research and training.

- Agroenvironmental Network of Organic Producers of Western Greece (AE.N.O.P.)

Tel: +30 631 28381

Fax: +30 631 28381

Number of members: over 250

Products: olive oil, olive, currant, citrus, cereals and vegetables

Product destination: Greek and European market

Activities carried out: production, processing, trade and vocational training.

There are also some more small producers' associations as well as some mixed associations of producers and consumers.

2.6. Research

In Greece there is not so far a University Department or a Research Institute devoted exclusively to Organic Agriculture. However in all Agricultural Universities of Greece there are integrated topics and issues related with most aspects of Organic Agriculture.

Recently the Technological Educational Institute of Epirus has initiated a new department in Kefallonia island for "Biological Agriculture".

Besides, the National Agricultural Research Foundation is going to establish such departments as well.

There is also the National Network for Organic Agriculture, funded by the Ministry for Development, which includes in its activities the organisation of scientific seminars on Organic Agriculture.

The Inspection and Certification bodies of the country implement, also, training activities including courses, seminars and publishing informative books and magazines. Local Authorities very often contribute in these efforts as well as producers' associations (not only organic).

3. Agronomic aspects

The main problem is the conservative way of thinking of growers: they are used to apply the easy solution of chemical fertilizers, in combination with a low level of technical information.

The problem of soil erosion and soil salinity is significant in some regions of the country.

In most mountainous or semi-mountainous regions, the conditions do not permit to have access to mechanical means and, consequently, the application of green manure is difficult. Additionally the soil in such regions has often a low nutrient content.

Furthermore, since crop and animal production are traditionally separated in Greece, growers cannot be easily supplied with manure.

All over the Mediterranean countries and specially in Greece, many insect problems are very serious, for example the problem with *Dacus Oleae* Gmel. In many cases, plant protection products allowed in organic agriculture cannot control the pest efficiently. There is also a

great number of weeds depending on landscape features, which are difficult to be controlled mechanically.

Since production in Greece is very limited, many organic products are imported. It is also the case of most fertilization and plant protection products allowed.

A lot of this imported material should comply with the European and the national legislation. The national legislation for plant protection agents is different than that for fertilization or processing and is rather strict.

The origin of propagating material in most cases is conventional, although in some cases it is organic (produced by the organic farmer himself). In most cases it is imported. At least the imported propagating material has to be sanitary certified.

The Mediterranean Agronomic Institute of Chania (MAICH) has been asked by most agricultural companies in Greece to tell which products allowed in Organic Agriculture to purchase (for fertilization, plant protection). There are a lot of local companies that either produce such products or import them.

4. Market aspects

Most of the organic products are sold in specialised shops. Fruits and vegetables are also sold in the local open markets. Organic wine is sold in some wine shops together with conventional one. A few big supermarket chains in the large cities have introduced organic products in their stock.

The main foreign markets are Germany and England and, at a lesser extent, USA. The most important product for export is olive oil, wine, fresh fruits, currants and vegetables. The local market absorbs mainly vegetables and some fruits.

Most organic producers or groups of producers trade their produce by themselves, without intermediate organisations.

5. Promotion of organic products

National labels and national laws, subsidies for farmers, trade and processors, training of farmers and consumers, setting up producers associations, development of state research, building of marketing channels are some of the goals that will support organic agriculture and will promote organic products.

ITALY

Vincenzo Fersino and Damiano Petruzzella
CIHEAM - Istituto Agronomico Mediterraneo di Bari

1. Regulatory environment

Organic farming had taken hold in Italy and across Europe, by the 1980s, in response to the growing demand for quality products.

During the 1990s, following the profound changes which were eked out in the Common Agricultural Policy (CAP) and the sharper focus on the environmental impact of agricultural activities, organic farming gained increasing acceptance.

Council Regulation (EEC) no. 2092 of June 24, 1991 on "organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs" was approved by the Council of the European Communities and published in the Official Journal (22/07/91).

Over the past few years, increasingly larger land areas have been converted to organic farming. Regulation (EEC) 2092/91, which set a regulatory framework and Regulation (EEC) 2078/92, which provided for the allocation of aid schemes to organic farms, have propelled organic farming in Italy as well.

A further stride ahead was the approval of the regulation on the development of a logo for organic products (Regulation (EEC) 331/2000) and of the regulatory framework on organic livestock farming (Regulation (EEC) 1804/99).

1.1. Inspection and Certification

Any operator who produces, prepares or imports from a third country organically produced agricultural products or foodstuffs shall notify this activity to the competent authority of the Member State in which the activity is carried out and submit his undertaking to the inspection system in force. The Member State shall set up an inspection system operated by one or more designated inspection authorities or approved private bodies.

The Member State shall designate an authority responsible for the supervision of such bodies to ensure compliance with the inspection rules.

Products can be marketed with indications referring to organic production methods, provided that they have been subject to the inspection and certification arrangements.

Annex III of Regulation (EEC) no. 2092/91 lays down detailed rules for implementing the inspection arrangements and sets the requirements operators shall comply with.

When the inspection arrangements are first implemented, the inspection body shall draw up a full description of the unit. In addition, the producer shall notify the body of its schedule of production of crop products, giving a breakdown by parcel.

Documentary accounts must be kept which allow to trace the origin, nature and quantities of all raw materials bought as well as the nature, quantities and consignees of all agricultural products sold.

Where an operator runs several production units in the same area, the land parcels and storage locations for conventional farming shall be clearly separated from those for organic farming. Crops of the same varieties as those produced at the organic unit may not be produced using conventional methods at the same units as the whole farm shall be subject to the inspection arrangements.

Processing and packaging units for organically produced products shall be subject to the same rules on identification, inspection and registration. The keeping of accounts shall enable the inspection body to trace the nature and origin of both raw and processed materials.

Where conventionally produced products are also processed, packaged or stored in the unit concerned, the unit must have separated areas within the premises for the storage of products and operations must be carried out continuously until the complete run has been dealt with, separated by place and time from similar operations performed on products not covered by organic methods. If such operations are not carried out frequently, they must be announced in advance to the inspection body. Every measure must be taken to ensure identification of lots and to avoid mixtures with products not obtained in accordance with the rules on organic production methods.

As far as importers are concerned, the inspection scheme measures are intended to ensure close check of the movements of each lot, through detailed information on the transportation and consignees of the products.

The inspection authority shall ensure that: (i) where an irregularity is found, the indications referring to the organic production method are removed from the entire lot or production run affected by the irregularity concerned and (ii) where a manifest infringement, or an infringement with prolonged effects is found, prohibit the operator concerned from marketing products with indications referring to the

organic production method for a period to be agreed with the competent authority of the Member State.

Each Member State is responsible for setting up a national inspection system, therefore, the systems which are currently operating vary widely among the Member States. In the Netherlands, there is one single inspection authority, whereas in Germany the inspection authorities (51) are Länder-based. In the other Member States the number of the inspection bodies is more limited: Belgium (4), Denmark (2), Greece (2), Spain (2), France (4), Ireland (4), Italy (9), Luxemburg (3), Portugal (2), and United Kingdom (7). Hence, with the exception of the Netherlands, the operator is more or less free to choose the inspection authority to which to be subject.

1.2. Inspection authorities in Italy

Like the vast majority of the Member States, Italy has opted for a mixed system whereby inspections are carried out by designated private bodies which, in turn, are supervised by the Ministry of Agriculture and Forestry and the Regional Boards (Annex 1).

Decree no. 220/95 sets a series of obligations which must be fulfilled by the inspection authorities:

- ensure that inspections carried out are objective and involving all the stakeholders;
- operate on an equal footing with no single sector outstripping the others;
- be permanently staffed with personnel entertaining neither professional nor economic relationships with the operators subject to the inspection;
- employ graduate or undergraduate skilful staff;
- be suitably equipped (head office, computer and technical equipment);
- have an organisation based in at least four Regions;
- carry out documented in-house audits and periodical revisions of compliance with the criteria listed in the UNI 45011 European Standard.

1.3. How to qualify for organic farming

Any operator wishing "to go organic" shall register with either an inspection body approved by the Ministry of Agriculture and Forestry or a designated supervised body.

Should the producer intend to convert only part of the holding, he shall indicate the "Production Unit" to be converted to organic farming, which shall be separated from any other units (by hedges, non productive rows etc.). In addition, crops of the same variety as those produced at the selected unit should not be produced at the other units (i.e. Golden apples).

Having decided whether to convert the whole farm or part of it, the producer shall draw up a report (the forms shall be provided by the certification bodies, the associations or the designated public authorities) containing a full description of the farm, as requested by the Ministry.

The producer shall send the report to the Inspection body and a copy to the Ministry of Agriculture and Forestry. Should changes occur in the farm, the producer shall notify a revised full description of the farm (explants, new planting, channels etc.)

Each year, the producer shall notify its Annual Production Schedule.

After the registration has been notified to the Ministry, the "Conversion period" starts, which lasts three years of consecutive harvesting for agricultural produce. After this period, during which compliance shall be ensured with the EEC Regulation, the farm production can be termed "ORGANIC". Hence, the production of farms in conversion cannot be sold as "organic", but as "transitional organic" and can only be marketed after the first year of organic farming.

Written and documentary accounts shall be taken of the implemented farming practices (treatments, tillage etc.) as well as of the raw materials bought and of the agricultural products sold with copies of the supporting documents (records/invoices). The necessary documents shall be provided by the Inspection Body.

Traceability of the production sold, in conversion or organic, shall be ensured (on a package basis, whenever possible) in order to unequivocally identify both the lot and the producer, through accompanying documents detailing the product quality and characteristics. (Documents and instructions shall be provided by the Inspection body).

1.4. Policies to support and promote organic farming

Regulation (EEC) no. 2078/92 on organic production and conservation of the countryside is an accompanying measure of the CAP reform (July 1992). It stipulates for aid schemes part-financed by the EAGGF (European Agricultural Guidance and Guarantee Fund) Guidance Section to grant annual premia per hectare to farmers who commit to

adopting agricultural production methods which have beneficial effects on the environment. In particular, the Regulation promotes the use of agricultural production methods which reduce the polluting effects of agriculture and favour farming systems that are compatible with the protection and enhancement of the environment, the countryside, the soil etc. Similar objectives underlie the production principles of organic farming. Article two provides for assistance to farmers who commit to significantly reducing the use of fertilisers and/or plant protection products or to maintaining the implemented reduction or introducing or maintaining organic farming methods, provided that these measures prove of environmental merit and have a positive fall-out on the environment and the countryside.

Measures designed to sustain integrated and organic production (reduced chemical inputs) are included and aids are granted, in the vast majority of the Member States, to both newly converted and pre-existing organic farms.

The "organic" measure stems from Regulation 2092/91 which provided fund assistance for training and demonstration projects.

No clearly defined aid scheme is envisioned to support the inspection system, but some countries (Austria, United Kingdom and some German regions) devote additional aids to such activities. Some other countries have also set up market-based and consumer-oriented technical updating and information services (Denmark, Austria and Germany).

Regulation (EEC) 2078/92 is an agri-environmental accompanying measure of the CAP reform, whereby the aid to agricultural income is not only de-coupled from the market action but is also aimed at implementing environmental protection policies.

Under this Regulation, A 1 and A 2 measures are specifically designed to curb the use of plant protection products, whereas A 3 and A 4 measures are focused on the introduction and maintenance of organic farming.

1.5. State of application

A 1 and A 2 measures (on supervised control and integrated production) take the lion's share (40% of the area covered by the Regulation and 56% of the submitted applications).

Organic farming (A 3 + A 4 measures) ranks second (15.9% of the total surface) outpacing any previous forecasts.

The reasons lie in the firm commitment of the public authorities that have helped propel low-impact production methods. A measures account for 79% of the total funds allocated (425 billions were granted in 1996) and the national area under this Regulation accounts for 7% of the Useful Agricultural Area.

The set objective was to attain 12% of the total farmland over the first four years.

A list of the other less specific aid schemes follows.

Regulation (EEC) no. 866/90 was designed to improve agricultural produce processing and marketing through fund assistance to investments in the agri-food business. Within the framework of the investments and expenditures eligible to EAGGF part-financing (article 11), provisions were introduced on organic farming. Absolute priority was given to investments which boosted new outlet-building. The Regulation (EEC) no. 3669/93, as last amended on December 22, 1993, further reiterated this concept referring to Regulation (EEC) n°2092/91. Similarly, in the description of the annual selection criteria, the organic farming sector featured high among the general priorities. It is, therefore, self-evident that this Regulation was specifically designed to promote the development of a wide array of activities within the organic farming sector.

Within the framework of the reform of the Structural Funds (Regulation (EEC) no. 2081/93 of 20 July 1993, amending Regulation (EEC) no. 2052/88 on the purposes of Structural Funds), some Community regional programmes provide for the support of agricultural and rural development. These structural programmes are designed for the less prosperous regions (Objective 1) and the rural areas (Objective 5). Regulation (EEC) no. 2085/93, which sets out the provisions for the application of the actions funded by the EAGGF Guidance Section, is designed to support rural development in the aforementioned areas. The envisioned actions include initiatives to reconvert and diversify production and promote investments with a view to enhancing the quality standards of agricultural produce. This action opens up a host of fresh opportunities to organic farming.

The programmes, which have been approved by the Commission based on the proposals submitted by the relevant regions, grant fund assistance to a series of measures, actions and products. Therefore, whole sectors are backed by aid schemes to part-financing of farms and processing and marketing plants and funds to facility strengthening, extension services, training and promotion activities.

Community action also focuses on agronomical research within the framework of Technological Research and Development programmes.

The programmes, which are primarily designed for agriculture (AIR research programmes for the period 1990 -1993; the new programme for the period 1994-1998 is being finalised), include priority actions to develop new methods of activities with regard to agricultural quality and diversification. Organic farming fits naturally in those actions which periodically invite scientific institutions and universities to submit projects. The new Community programme for the period 2000-2006 is currently being designed. It includes measures aimed at enhancing and consolidating the development of Organic Farming.

2. Structural aspects

Italy is among the leading European Member States in terms of organically farmed areas and number of organic farms.

Based on data sets provided by the Ministry of Agriculture and Forestry, in 2000 in Italy there are 54 004 organic farms, 49 490 of which are only farms, 1330 are farms/processing units, 2817 are only processing units and 67 are only importers of organic products (table 1).

As far as the geographic distribution of farms is concerned, 67% of them are concentrated in Southern Italy and in the islands, thereby confirming a development of organic farming which is fine-tuned to some given cropping, soil and climatic properties.

The organically cultivated area is 1 040 377 ha, of which 502 078 ha are organically farmed and 538 299 ha are in conversion (table 2). Here again, Southern Italy has come to the fore with 71% of the area being concentrated in southern regions and in the islands.

In keeping with the Italian extensive-crop-oriented trends of production, the main organic farming sector is that of cereals and forage crops.

However, there is a scope for market growth for both the fruit sector (3%), the citrus sector (1.5%) and the olive (9%) sector, the main processed products being pasta, olive oil and preserves.

The main information gap in this connection concerns the market as the plethora of producers' associations (annex 2) yields no detailed domestic data.

3. Research and experimentation in organic farming

3.1. Agronomical features

The periodical censuses carried out by the "Centro di Documentazione Agricoltura Sostenibile" (CEDAS) and the Mediterranean Agronomic Institute of Bari (IAMB) on research and experimentation programmes indicate that an increasing number of scientific institutions are focusing on the organic production method.

A comparative analysis of the 1994 census (Agro-environmental Observatory in Cesena) and the 1998 census (CEDAS – IAMB) shows that the number of organisations and researchers soared from 50 to 100 and from 70 to 500, respectively. In addition, approximately 80 specific research activities on organic farming have involved not only mainstream research groups, but also universities and national and regional research centres.

The Italian scientific institutions are clearly lagging behind in the face of the fast-paced evolution which is sweeping across the international arena and activities are randomly scattered across the country as they are often funded with local resources. Only two programmes, which have been funded over the past few years by the Ministry of Agriculture and Forestry, can be regarded as truly nation-wide.

The northern countries have long massively invested on organic farming research. Over the past decade, more than 400 projects have been masterminded in Norway, Sweden, Finland and Denmark, totalling Euro 40 million. Switzerland invests 3% of the funds allocated by the Federal Office for Agriculture on research in organic farming. Recent surveys estimated that the mean annual expenditure per hectare of organically farmed land amounts to Euro 25 in Denmark, Euro 40 in Switzerland and Euro 55 in Norway.

In the remaining countries, the investments on organic farming research are more modest, though the United Kingdom and France have recently increased their fund assistance share and have laid the groundwork for the development of targeted research activities in the years ahead.

Also the Austrian investments are deemed inadequate, given the growing importance the sector has gained (1.6% of the total expenditure in agricultural research).

In Italy, the funds which have so far been invested in organic farming research activities are absolutely ludicrous in the face of the relentless growth and the mounting technical difficulties presented by the Mediterranean climate and the fruit and legume sector. A projection, based on an estimate consistent with the European mean

expenditure (Euro 20 per ha and per year) calculates for Italy an overall investment per year of Euro 19 million.

And this, despite the fact that, as yet, the organic sector has grown in response to rising foreign demand. Hence, given the expected increase in the domestic consumption of organic products, there would be much scope for expansion, up to an estimated 10%.

Generally speaking, on the one hand, innovation needs to be fuelled in the mainstream domestic organic sectors (fruit and legumes and cereals), whereas, on the other hand, it is advisable to implement strategies to boost the weaker sector (i.e. livestock farming) which is most subject to fierce competition from leading Member States.

Bottom line, despite some strong signals stemming from the Census, the information gap remains in the Mediterranean regions where strategies are modelled on the northern European systems, which differ widely with regard to cropping systems and soil and climatic conditions.

3.2. Main research topics and institutions

3.2.1 Soil fertility management

Organic farming and sustainable agriculture regard the soil as a renewable resource, the fertility of which has to be maintained and enhanced to the benefit of the generations to come.

The organic farming model epitomises the basic criteria which ensure the attainment of this key aim. These criteria, which are cited in the Council Regulation (EEC) no. 2092/9 of 24 June 1991 on organic production methods, highlight the use of green manuring and on-farm organic matter.

Four major research activities call for in-depth probing:

3.2.1.1 Soil conservation

Assessment of the impact of the introduction of organic farming systems on soil fertility and quality.

Identification of integrated technical pathways of fertilisation in organic farming.

3.2.1.2 Crop covers

Green manuring as a sound soil management technique in organic farming.

3.2.1.3 Recycling

Use of farming and agro-industrial residues for fertilisation purposes in organic farming.

3.2.1.4 Composting

Composting combines the need to properly manage “wastes”, which have so far been regarded as an inconvenience and a cost item of productive processes, and the need to return organic matter to severely depleted soils, by reusing the direct or indirect by-products of production processes, thereby closing the natural biological cycles.

Compost can be described as an organic product of composting which can be used in agriculture to restore the equilibrium of the altered organic matter cycle.

Its use is conducive to sustainable agriculture in which a balance is struck between the organic matter which has been withdrawn from and that which has been returned to the biosphere.

Compost is often cited in Annex II of Regulation (EEC) 2092/91 (as last amended) which lists products authorised for use in soil conditioning. The importance to the sector is strategic since so far wasted on-farm organic substances (pruning and horticultural crop residues, straw and farmyard manure) and farm-related substances (oil-mill olive pomace and residual water, marc etc.) can be composted. In addition, a shift is brought about from farm to local enhancement involving all the stakeholders.

3.2.1.5 Technical grade products

- Characterisation and validation of the potential use of seaweed and plant extracts (for inclusion in the list of authorised products).
- Identification and gauging of methods of analysis for biostimulants.
- Identification of new formulations and application procedures to enhance the agronomic efficacy of natural products (bio-fertilisers and natural chelates).

3.2.2 Pest control

Organic farming is regarded by some people as a flat denial of synthetic chemicals and a return to ancient times which does not deserve further scientific investigations. By contrast, the complexity of inter-playing phenomena calls for in-depth probing.

As to pest control, all the agronomical methods which ensure prevention of pest attacks have to be resorted to, such as crop rotations, the choice of resistant or tolerant varieties, hedges, the protection of useful organisms and, only if need be, the products

listed in Annex II B of Regulation (EEC) no. 2092/91 are to be applied.

Plant protection products of low environmental impact constitute the only tools authorised for use in pest control under organic farming. Therefore, exhaustive data sets on technical grade products and thorough scientific investigations are required to back decisions on agricultural, agro-environmental, agri-food and agro-industrial policies to be taken on the regional, national and Community level. It is worth recalling that plant protection products authorised for use in organic farming are rather scanty and poorly effective and that, for some of them (i.e. copper salts), restrictions to the use are about to be imposed and this is a major stumbling block to the growth of organic production. Hence, an overall strategy needs to be devised in order to promote the reorientation of environmentally-friendly agricultural policies.

One of the objectives to be pursued is therefore to assess the efficacy of the currently applied pest control methods, develop the best dosages and identify the most suitable timing of treatments and the possible side effects of products.

More importantly, agro-system design actions have to be urged in order to boost the system "self-control", thereby limiting and/or nullifying the use of off-farm inputs. Of utmost importance to the Mediterranean region is then the identification of valuable alternatives to the use of copper.

3.2.3 Quality of organically-farmed products

The argument for the increased safety of organic products versus conventional ones, resulting from the prohibited use of synthetic chemicals, is often challenged by the claim that, in the absence of external protection from pest attacks, plants in general and horticultural crops in particular trigger self-protecting mechanisms and produce molecules in concentrations which are more hazardous to people's health than plant protection products. In addition, in the case of plants, the absence of external protection systems magnifies the risk that biological contaminants will produce substances (i.e. aflatoxines) which are extremely hazardous to man.

More interestingly, little is known about the impact organic production methods have on nutritional and organoleptic properties as opposed to conventional methods. In this respect, it is fair to say that a comparison is often difficult to assess, because, beside the techniques in use, some other factors come into play, such as the variety, the maturity stage, the soil and climatic conditions, the sun radiation and the harvesting and post-harvest techniques. All the aforementioned

factors are likely to induce changes in the chemical composition and nutritional and organoleptic quality.

Hence, there is a pressing need for additional and focused research programmes. Two approaches may prove helpful to assess and establish the quality of organic products:

- an agronomical approach designed to assess the extent to which specific agronomic practices which do without synthetic chemicals may impact on the chemical composition of organic products when compared to conventional practices;
- an approach keyed to the food-man relationship to assess the extent to which the total or partial consumption of organic products instead of mainstream products may affect the type and composition of the diet and the nutrient uptake.

3.2.4 Organic Stockfarming

Regulation (EEC) no. 1804/99 on organic livestock products has been adopted since August 24, 2000. However, most of the rules contained in it do not stem from technical and scientific investigations, which are lamentably rare in this field, but draw heavily from various European scenarios. Hence, the practicability of the proposed method remains highly questionable.

For an unbiased judgement to be expressed, insights need to be gained into some of the key issues which have taken and will take centre stage throughout the application stage.

The rules on livestock feeding feature high among the priority fields of investigation. The prohibited use of some feedstuffs and additives calls for the identification and experimentation of alternative products which meet the animal nutritional requirements. It is generally accepted that feeding is one of the major determinants which is likely to affect the quality of livestock products, therefore, it is absolutely necessary to investigate the possible repercussions on milk and meat properties. However, the quality of organic products depends on a vast array of factors and focusing on the specific quality of organic livestock products is no easy task, as confirmed by the scanty bibliography available.

The physical and chemical properties of these products might be investigated for a start, based on the current production discriminating factors. The results would yield a few clues as to the best fitted system to produce meat which is more likely to be accepted by the consumers not only because of its compliance with the organic status, but also because of objective parameters and properties.

The development of analytical inspection and identification methods of organic stockfarming products may form the basis for further activities.

One of the issues which deserves marked attention is animal health, which plays a pivotal role in the regulation, ranging from prevention measures (the selection of appropriate breeds, livestock housing, rearing density, access to pasturage, animal welfare) to the use of homeopathic and phytotherapeutic medicinal products and the restricted use of chemically-synthesised allopathic medicinal products. This issue is all the more topical in so far as the consumer expects to buy organic livestock products which, like plant products, have not been treated with synthetic chemicals.

No less important is animal slurry from organic livestock farms, as some animals are kept on pasturage and this boils down to a whole host of problems. Given the slimness of data on the Mediterranean regions, guidelines on waste management should be knowingly advocated.

3.2.5 Assessment and design of the organic production method in farm holdings

The pattern of development which is still prevailing is modelled on intensive, specialised and highly productive farming which capitalises on cutting-edge technologies.

The impact of this production method on the environment and the conservation of natural resources have long been seriously underrated or shamefully neglected while food self-sufficiency and economic profitability were in the spotlight.

During the second half of the last century, the agricultural research activities and policies, which supported this model of development, have brought about radical changes in the agro-ecosystems. The food webs involved have been excessively simplified in order to attain the maximum yield per unit and off-farm inputs, especially plant protection products, fertilisers and energy, have been increasingly used with alarmingly devastating consequences on the environmental resources.

Over the past few years, the European scenario has substantially changed. Food self-sufficiency has been outpaced by surplus management and the demand for healthy and quality products has soared along with the awareness of the limited natural resources available. This has prompted the design of new production models, hinged on the sustainable development of rural areas, within which farming has been assigned a prominent role.

Against this new background, efforts are being leveraged to try out and transfer methods and models, which are best fitted for low-or-null environmental impact agriculture, envision a more rational use of natural resources and champion the use of low off-farm inputs and the enhancement of self-regulating mechanisms in the system.

Hence, methods based on measurable and comparable criteria need to be devised in order to thoroughly explore the farm dynamics and the various factors which interplay in the agro-ecosystem. Such an approach is indispensable to assess Mediterranean tailor-made organic production methods and gauge the innovations stemming from the experimental activities on the farm level.

Research should, therefore, focus on:

- the design of a method to analyse and assess organic farming systems and system/process innovations, based on measurable criteria;
- the multi-criteria assessment of the organic farming systems.

The technical capabilities are not lacking in Italy. A number of farms currently either produce most of the products admitted for use in organic farming or import them from foreign farms. Unfortunately, no data are available on the type and quality of the products in use, though a noticeable drop has been reported in the use of inputs in agriculture. From 1998 onward, the market for plant protection products has steadily shrunk as a result of a string of factors, such as the attempt at cutting intermediate production costs, the use of low-dose products, the market trends and the climatic conditions. Fungicides and insecticides have recorded the sharpest drop. The total consumption which equalled 160 thousand tons in 1996 dropped to 110 thousand tons in 1998.

As to the plant propagating material, which is available in Italy, though not enough to meet the demand, the share traded remains low and hard to quantify, given the derogation period ratified by the European regulation.

3.2.6 Some of the most active Research Institutes

- Istituto Sperimentale per la Zootecnia – Rome
- Istituto Sperimentale per la Nutrizione delle Piante – Rome
- Istituto di Patologia Vegetale – Rome
- Istituto di Ricerca per gli Alimenti e la Nutrizione – Rome
- Istituto Agronomico Mediterraneo – Valenzano (Bari)
- Centro di Sperimentazione Agraria e Forestale -Laimburg

- GRAB-IT Gruppo di Ricerca in Agricoltura Biologica – at Ancona University
- Dipartimento di Agronomia – Florence University

4. *Training and awareness-building in Organic Farming*

One of the major stumbling blocks to the development of Organic Farming in Italy is the poor training, information and know-how transfer activity. The latter relies heavily on conventional strategies (publications and conferences). Farm assistance services, demonstration, training and reskilling programmes are lamentably lacking. In addition, the vast majority of promotional devices, though multimedia-based, are not sufficiently updated to catch up on the evolution of technical and scientific findings.

Networking is a priority for organic farming researchers and scientists with a view to:

- forging links between the demand for research and decision-makers;
- circulating information and expertise, thereby initiating synergies and reducing redundant overlapping;
- fostering constant updating with respect to regulations, technicalities and methods;
- improving the spreading of the results of the activities.

In order to ease the transfer of scientific knowledge and information, within the framework of the inter-regional programme on organic farming, the Ministry of Agriculture and Forestry has funded a project to set up a national information system on organic farming (BIOITALIA). The project, which has been implemented by IAMB, was designed to:

- set up a national and a series of regional Web sites on organic farming;
- promote information exchanges between the Ministry of Agriculture and Forestry, the Regional Boards and the Inspection bodies (institutional Intranet);
- foster the spreading of scientific knowledge and exchanges between the stakeholders involved;
- set up a national documentation centre;
- back up the Regional Boards in handling the data sets relating to the application of Regulation (EEC) 2092/91.

Within the framework of this inter-regional programme, ISMEA (Istituto per gli Studi, Ricerche e Informazione sul Mercato Agricolo) was funded a promotion and communication project on organic farming and the Agency for Agricultural Development of Tuscany was sponsored a training course on the surveillance of inspection bodies. A host of local activities have been launched within the region. Noteworthy is BIOPUGLIA information system (www.biopuglia.iamb.it). However, despite the strides made, organic farming has still a long way to go.

5. Market issues of organic farming

5.1. Type of local market organisation

The marketing of products obtained from organic farming has always presented specific problems. In the past organic farmers used only direct selling channels; afterwards the first specialised shops were opened and a rapid increase in sales has then been experienced through specialised retailing (specialised and herbalist's shops). Direct selling, herbalist's shops and specialised shops are still the main channels of sale by retail.

These types of sale show nowadays structural limits and hence restrain the growth potentials of the sector.

Starting from the late nineties, to satisfy the constraints imposed by the market evolution, a renewal process in sale types has started. Such a renewal process implies the enlargement of premises, the training and re-organisation of the staff, the introduction of informatics as a support to management, and the adoption - also in the field of organic products - of the marketing tools currently used for all agri-food products. In particular, the enlargement of the average selling area is essential for reducing the incidence of fixed costs on the turnover of the business. The experience shows that the limitation of commercial costs is the first step to get the reduction of selling prices, that is historically one of the critical points of district shop supply.

In 2000, in Italy there were 1038 points of sale by retail (table 3), including specialised shops of organic products, herbalist's shops, natural food shops, macrobiotic and dietetic shops¹.

The alternative to traditional retailing is the Modern Distribution, where till few years ago, the organic product had not its own space and in some cases it was devalued by a random arrangement.

At present organic productions are the core of a reasoned policy of single signboard differentiation. In 1998, in Italy there were 357

supermarkets with a selection of organic products, mostly fruits and vegetables. At the end of 2000 their number exceeded 1400 units (table 4).

5.2. Type of product and quantity

An important parameter in assessing the economic weight of organic farming is the production pattern; it deeply affects the economic and commercial evaluations of the producing farms and their level of profit.

Based on the data provided by the Italian inspection bodies, at the end of 1999 (figure 1), 38% of the Agricultural Area, both organic and under conversion, was grown with forage crops. The 15% of the production patterns is devoted to forage-pasture crops. The largest area of forage and forage-pasture areas is found in Sardinia. These data explain the strong characterisation of organic farming for extensive crops.

Cereal crops account for 19% of the national area, and rank second, with a cropped area - in 2000 - of over 194 600 hectares, of which more than 40 thousand hectares in Sicily, 31 thousand in Sardinia and 29 thousand in Apulia. These three regions account for half of the national organic cereal production. The third crop is olive that accounts for 9% of the Agricultural Area, followed by the other cropping patterns.

5.3. Main market outlets and types of product

The success that organic farming is starting to experience is the result of a deep transformation of the food awareness of the Italians who - during the nineties - turned to the organic products as a reaction to the fear triggered by the Chernobyl accident, by the atrazine contained in water and by the frequent alerts of newspapers on the progress of chemistry in foodstuffs.

At the dawn of the new millennium we are definitely out of the pioneer stage of organic products, characterised by some aspects of pauperism and healthiness, and we are going to enter the age of marketing and of the communication of the product value to the consumer: an austere image is not interpreted any longer as a guarantee of healthiness and safety of cultural techniques.

The changes in the approach to food fruition have induced some modifications also in the structure of preferences and in the willingness to purchase, increasing the number of people who consider the consumption of organic products as the best way to effect a healthy diet.

In Italy, the modes of supply and the low level of investments in the communication have not favoured the approaching of new potential consumers, so that organic product purchases are mostly concentrated in Northern Italy, whereas the level of consumption is still low in the rest of the country.

A market research, carried out at the end of 1998 within the Biopuglia project on the consumption of organic products in Apulia, has enabled to outline the model of Apulian consumers purchase behaviour, providing useful indications to those who should take strategic market decisions or to those who want to have additional information about the Apulians' customs towards this category of products.

Beyond some products mostly consumed by adults (wine, dried fruits) or by youth (honey, fruit preserve) all types of organic products are consumed by the whole Apulian family.

The preference for fresh, or at least poorly elaborate, products, typical of the Mediterranean diet, is observed in the commodities mostly purchased by the Apulian consumers: cereals and their derivatives, fresh fruits and vegetables, honey, milk and dairy products, fruit preserves, olive oil, tomato sauce and wine.

The Apulian consumers of organic products purchase frequently but in small quantities.

The place of purchase mostly used by Apulian consumers is certainly the specialised shop, where one can buy, in very high percentages, all types of products, especially the dried and processed ones.

Fresh fruits and vegetables are available in specialised shops or directly at the producer and only marginally in supermarkets. Besides fruits and vegetables, oil and wine are mostly purchased directly at producers' farms.

Lastly, it is noteworthy that a substantial portion of the national organic production is not marketed on the domestic market, but it finds an outlet in foreign markets. Unluckily, no statistical monitoring system is now available to quantify the fluxes of product that are consumed outside the national boundaries, and the destinations.

5.4. Data on the domestic consumption

Estimating the consumption of organic products in Italy is not very easy due to the high fragmentation of production structures, the strong presence of direct and informal channels and the uneasy definition of market boundaries.

In Italy, the same as in most European countries, organic products are confronted with a competitive universe that includes also other products; it may be defined universe of the natural. It comprises natural products², dietetic products³ and the products obtained from integrated cultivation.

Considering only the organic products marketed as such, and easily identifiable by the consumer, the estimated market size is between US\$ 1000 and 1050 million. The volume of business of the organic sector has grown, over the last few years, at a mean rate of 9% and presently accounts for 0.9% of the total food consumption of the Italians. Some estimates indicate, for the first years of the twenty-first century, a 2.5-3% incidence of the organic sector on the total food market. A considerable share ranging between 30 and 40% comes from foreign countries.

5.5. Forms of organic product promotion

The promotion of organic products is usually undertaken so as to develop the knowledge and the consumption of a product or to contribute to the strengthening of products already consumed.

Promotion is often associated with "enhancement", including several actions aimed at increasing the value of products and at subsequently increasing the market price.

The forms of promotion and enhancement are a major tool to stimulate the demand for organic products. Among the forms of promotion and enhancement including the participation in fairs and national and international events of the sector, the adoption and promotion of trade-mark policies, the promotion of the organic sector is also effected today through the association of the organic message and of its products to other aspects of public interest that are particularly successful towards consumers, citizens and their institutions. The organic sector is actually promoted also through actions and projects in the fields of environmental and food education, holidays on the farm, rural tourism and social solidarity, all action areas with which the organic sector seems to create easy and natural synergies.

Following the provisions in force, all the Italian organic products are marked by at least two trade-marks: the EU trade-mark, represented by the wording ORGANIC FARMING – EEC INSPECTION REGIME, supported by the private trade-mark of one of the nine certifying and inspection bodies recognised in our country.

On the same product, the single producer can also apply his own business trade-mark, to distinguish it from other similar products and

exploit the renown and trust of the consumer, acquired through advertising campaigns and successful promotional actions.

Although still emerging for the moment, the introduction of organic products in collective catering services could be, in the long run, an important commercial outlet for the sector. It is, at the same time, an equally powerful promotional incentive.

Moreover, rural tourism has attracted an increasing number of visitors over the last few years. The reasons for the great success are basically the supply of new low environmental impact recreational services, that are alternative to the traditional tourist packages, and the possibility, supplied by rural tourism, to get near to nature, to its cycles and its equilibrium.

The need for re-establishing a contact with the natural environment, on one hand, and the concern for its preservation, on the other, are indeed topical themes that are increasingly common to the different social and economic groups of modern societies.

Organic farming, for its part, responds, in an efficient and stimulating way, to this wish of nature. It favours the preservation and enhancement of rural resources, agricultural systems, local landscapes and communities, and, at the same time, through the supply of healthy and genuine products, it acts on the diet that is a crucial aspect of the every-day life.

Lastly, it seems important to mention, in this context, the so-called "organic small-scale markets", organised by local bodies and associations, to upgrade a village, a district or a natural area, supplying tourists and residents with a pleasant attractive. These are, mostly, occasional events in which organic producers exhibit and sell their own goods together with bee-keepers, craftsmen and artists, retailers of herb-products, booksellers, organic, environmentalists', volunteers' associations and other agents of the ecological world and of "natural living". Within these fair-markets other activities and events are also organised to enhance the informational and promotional aspect of the event, beyond the merely commercial one.

LEBANON

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1. General aspects

By the end of the war, the Lebanese citizens started to put more attention on the quality of their food and to claim products clean from pesticide residues and other chemicals. Organic farming started upon the demand of the local market. Of course, it started spontaneously without any regulation, norm or special technique or product. Thus, what is known on the market as 'baladi' or local/traditional product is considered more or less an organic product. These products are mostly ancestral produced without the use of chemical inputs. Other products followed to fulfill the market demand. Unfortunately, the number of farmers is still reduced and the development of organic farming is compromised. The main reasons are the following:

- the economical crisis since the end of the war, and especially the last 3 years, which reduced the demand of the market and the abandon of organic production by many farmers;
- the lack of investments in the agricultural sector in general: both the government and the private sectors don't give priority to agriculture since the beginning of the war;
- the lack of information and know-how on organic farming at the farmer's level and the absence of regulations and extension service at the ministry level;
- the absence of any regulation concerning organic farming, and the absence of foreign inspection and certification bodies.

Nevertheless, many potential points should be mentioned:

- the climatic conditions of the country are optimal for many agricultural crops such as: sub-tropical and tropical fruits (avocado, anona, banana, citrus and loquat), Mediterranean crops (cereals, legumes, fig, olive, grapevine, almond and pomegrenade), temperate fruits (apple, pear, cherry, peach, plum and walnut) and vegetables (potato, tomato, cucumber, watermelon, melon, strawberry, lettuce, cabbage, beet, onion and garlic);
- the agro-industrial sector is well developed and is able to absorb a part of the production;
- the will of many farmers to convert into organics if the marketing of their products is assured;
- the accessibility to information for engineers and the possibility of importing necessary techniques for organic production;

- the awareness of a big part of citizens to the necessity of having clean and healthy products.

The aspect of organic farming is very heterogeneous and changes from a situation to another, but we can define three types of farmers in Lebanon:

1) Amateurs that do genuine organic farming due to their personal conviction and awareness: They are not real farmers. Most of them have access to foreign information and techniques through their original career. These farmers lack organization, and need a technical support to resolve their field problems. They have a small-scale market and do not count on their production to make money.

2) Farmers that do organic farming on an economical scale, due to their awareness and conviction: These farmers count on their production to live. They also lack information and need better marketing channels and evaluation for their products.

3) Farmers that - ipso facto -do organic farming on an economical scale: these farmers usually do not use any chemical input because either it is not feasible or they cannot afford buying those inputs. This is the case of non-irrigated crops (cereals, legumes, "mekti", garlic, watermelon, grapevine, cherry, apricot, almond, mulberry, olive and apple) and forest products (pine nut, carob, sage, oregano, sumac and blackberry). These farmers are numerous and can reach more than 30% of the number of exploitations in some areas. They do not have any scientific knowledge about organic farming.

In Lebanon farmers do lack of all kinds of support: no legislation, no norms, no certification, no extension service, no material or technical support, no marketing or advertising support, neither from the state, the private sector nor from foreign companies.

A few foreign experts ensure some knowledge transfer to some local agricultural engineers and farmers, within the umbrella of Non Governmental Organizations (NGOs) such as Greenline and MECTAT (Middle East Centre of Transfer of Appropriate Technology).

2. Regulatory aspects

The legislative aspect of organic farming is still not defined in Lebanon. Actually, there are no legislations or norms for organic farming. There are no organisms that are inspecting and certifying the production either.

The small-scale market counts on the honesty of the farmers, while some supermarkets claim certification and prefer to import their products. As there are no organic farmers association or cooperative, the legislative process is very slow.

LIBNOR is the official organism responsible for the elaboration of norms and standards.

Greenline is an NGO that seeks to make a cooperative so as to make a certification by a foreign organism feasible on the farmers' scale.

MECTAT, the Ministry of Environment and the United Nations Development Programme (UNDP) are trying to launch a national project to define the norms and legislations of some organic products (Citrus, Olives, and Vegetables) and insure the inspection and certification program.

Choutoul Est. is planning to open a laboratory to test pesticide residues in the products that they buy from the farmers.

3. Structural aspects

3.1. Farmers and type of production

As mentioned before, there is no statistical information about organic farming in Lebanon. This induced me to make a survey on the field to gather some information about the situation of this sector.

The number of farmers cannot be defined because there is no certified farming or products, but there are some farmers who can be considered as potential organic farmers if certification is ensured. Many farmers are willing to convert into organic farming too, if certification and market are available.

The overall surface of organic farming cannot be defined, though the total cultivated area by the mentioned farmers does not exceed 160 ha and 90 ha in conversion, out of 247 934 ha (total cultivated area of Lebanon in 1999). The farmers grow several crops at the same time and do not have a notebook, which make the estimation of the surface area dedicated for each crop hard to define. In Annex 1 are reported the main organic producers.

Choutoul Est. is a company which has been buying products of different farmers producing a wide range of crops and distributed in all the country (table 1).

Many others are ipso facto growing without using any synthesized chemical products, and selling part of their production as organic, like the cooperatives of Taraya and Aarsal.

In Taraya, wheat, lentil, chickpea, grapevine and mekti are grown “organically” on 1200 ha approximately. Almond, fig and bean are produced but only for house consumption. In Aarsal, some of the cherry production is sold as organic.

Crops grown traditionally without the use of chemical inputs could give potential organic products. These crops include the typical Mediterranean non-irrigated or partially irrigated crops (table 2).

Other crops are grown but, due to the intensive agricultural practices, they require (irrigation, fertilization, weed control and pest management), their conversion into organic farming is difficult on a short-term perspective.

3.2. Product price

The information on farm price is not available for all crops, especially when most of the products are either sold at the same price as conventional products, or consumed by the farmers (table 3).

3.3. Wild products

The main collected wild products are:

Pine nuts (*Pinus pinea*) and Carob pods (*Ceratonia siliqua*): pine nuts are collected from the pine forests found in the central part of the country, on the coastal slopes of Mount Lebanon from sea level up to 1500 m. The estimated exploited area is only 6100 ha, giving a production of 16 500 tons of nuts. Carob trees are found on the coastal slopes up to 800 m either spontaneously in the Mediterranean oak forest, or grafted and planted near olive orchards. The estimated exploited area covers 700 ha and the production of pods is around 7400 tons. Pine nuts and carob molasses are used for culinary purpose in the local market. A part of the carob molasses is exported.

Many other plants (or parts of the plant) are collected for culinary or medical use. Most of these species are found:

- in all mountains under 1500 m: *Campanula rapunculus*, *Cichorium intybus*, *Eringium creticum*, *Malva sylvestris*, *Matricaria chamomilla*, *Melissa officinalis*, *Micromeria myrtifolia*, *Origanum syriacum*, *Pyrus syriaca*, *Rosa canina*, *Tanacetum parthenium*, *Malva sylvestris*;
- from sea level up to 2000 m on coastal slopes only: *Alcea setosa*, *Crataegus monogyna*, *Malus triloba*, *Prunus mahaleb*, *Rhus coriaria*, *Taraxacum officinalis*;
- in humid areas: *Eleagnus angustifolia*, *Mentha aquatica*, *Mentha pulegium*, *Nasturtium officinalis*, *Rubus tomentosus*, *Rubus collinus*, *Rubus hedycarpus*, *Tussilago farfara*, *Urtica dioica*, *Urtica urens*;

- in alpine areas (over 1500 m): *Ferula hermonensis*, *Gundelia tournefolii*, *Rheum ribes*;
- under the Mediterranean forest only (from sea level up to 1000 m): *Laurus nobilis*, *Myrtus communis*, *Salvia fruticosa*.

Many other species have culinary, aromatic or medical properties, but they are not explored at all by man (i.e. *Salix alba*, *Juniperus oxycedrus*, *Capparis spinosa*, *Lavandula stoechas*).

3.4. Processed products

Agro-industry is a prosperous sector in Lebanon, but unfortunately, most of the raw material is imported. The main agro-industries that are using local ingredients and that can give a potential organic product in the future are:

- Olive: organic oil production is done in the same unit that extracts conventional olive oil. There are 485 units and scattered all over the country (50% in the North), especially in the main producing areas: Koura, Zgharta, Batrun, Aakar, Hasbaya, Marjayoun, Bent-Jbeil, Tyr, Chouf.

- Wheat: grinding wheat produces Borghul, and drying a mixture of the precedent with yogurt produces Kishk. Both products are homemade or produced by small-scale industries. These industries are mainly found in Bekaa valley area. Only a few farmers produce organic Borghul and Kishk (mainly E. Ayub).

- Carob molasses extracted from carob pods in small extraction units are found mainly in Batrun, Jbeil, Metn, Chouf and Tyr areas. Only three factories are registered at the Ministry of Industry and they export some of their production of molasses and carob seeds.

- Grapevine: although vinegar, molasses, arak and wine are produced on small scale, there are 84 factories that produce most of the alcoholic drinks (wine and arak) mainly in the Bekaa valley (Zahle, West Bekaa and Rachaya) and Mount Lebanon (Keserwan and Metn), but no organic products are mentioned. It is to mention that Lebanese wine is famous Worldwide and 40% of the production is exported (more than three million bottles). Most of the vineyards producing wine and arak, are grown without using synthesized chemicals or fertilizers.

- Many fruit jams, and syrups are produced, but very few can be considered organic (sugar free blackberry jam). Others are produced by using conventional sugar (mulberry syrup, apple juice, apple,

quince jam and apricot jam). Antoine Chamoun (Jwar-el-Hawz/Baabda) is a potential organic producer of these items.

- Goat milk gives organic dairy products (E. Ayub in Kfarmeshki/Bekaa). Many shepherds are also producing labneh, cheese and cream from traditional farming, counting only on natural grazing land, and not using any chemicals for veterinary uses.

Most of these units are present at a regional scale, and thus are not registered at the Ministry of Industry. Many products are also homemade which makes impossible the estimation of the quantity of production and the number of processing units.

There is no processing unit dealing only with organic products and having any kind of certification.

According to Choutoul est, there is a project Factory in the Metn area to process organic products. This factory already processing conventional products. The main items will be: carob molasses, tahina (sesame oil and sauce), fruit jams, pomegranate syrup, grape molasses, Borghul, kishk, apple and grape vinegar.

3.5. Associations

Associations dealing with organic farming (production or marketing) do not exist, but some agricultural cooperatives are trying to market their products as organic (Cooperatives of Taraya and Aarsal).

The first organic farming cooperative will be founded soon, with 8 members by the help of Greenline and the Ministry of Cooperatives. The main activities of this cooperative will be ensuring the inspection and certification services and the selling of their products (vegetables, olive oil, wheat and lentils).

3.6. Research

LARI (Lebanese Agriculture Research Institute) is the official research organism. It has several branches dealing with food quality, animal husbandry, plant protection, soil science, irrigation, plant breeding and plant production (cereals, olive, grapevine, citrus, almonds and greenhouse crops).

The National Center for Scientific Research (CNRS), American University of Beirut (AUB), Lebanese University (LU), St Joseph University (USJ) are also involved in scientific research.

AUB, LARI, LU and the ministry of agriculture are working on the biological control of Citrus pests (Leaf minor, Aphids, Mediterranean Fly and Tristeza Virus) in collaboration with the Citrus Board in Tartus-Syria.

LARI has also many programs and research lines that could be converted into organic farming such as:

The introduction of *Encarsia formosa* for white fly control; Population study on *Cales noaki* and other predators and parasitoids of Citrus pests; Biological control of the Mediterranean fruit fly etc.

4. Agronomic aspects

4.1. Management of soil fertility

This is the major problem for organic farmers due to the lack of organic components for composting. Forage crops are not always available in Lebanon.

Crop rotation and soil fertility are not taken into consideration when planting a crop, due to the small scale land and economical reasons.

Animal production is not enough to produce manure for all farmers, and mixed farms (crop and animal production) are not common in Lebanon. The manure is either applied fresh or dry but rarely as compost.

Green manure is not common and the only species used are mainly cereals (wheat and barley) and legumes (vetch, lucerne and fava bean).

Some of the amateurs produce their own compost, but due to their limited resources, they cannot increase the cultivated surface. Besides, small farmers, or orchard cannot make their own compost or make a crop rotation.

Some farmers import organic compost (with 18 units of nitrogen added).

Two existing factories produce compost, using mainly the remaining of olive oil, carob molasses and sugar beet extracts (NPK content: 2-1-2).

4.2. Control of pests and weeds

Pest management is the main problem for many organic growers: the main pests are leaf miners, mites, aphids, Mediterranean fruit fly, olive fly, mildew, blights, rust and botrytis.

Under greenhouses, pest management is either very expensive or not feasible (Dakkache, 1998).

Farmers use only copper and sulfur as chemicals to prevent fungi and mites attacks. They also try to use cultural practices such as protecting the leaves of some vegetables from leaf miners by a fiber film or cover. Others use some traps (for flies), or try to release

natural predators and parasitoids (in citrus orchards against aphids, citrus leaf minor and mealy bugs).

Bacillus Thurengiensis is also used against Lepidoptera worms.

Most of the organic amateurs do not have any knowledge or agricultural background to resolve pest management problems.

Weed control is done mechanically (by hand or ploughing).

4.3. Availability of technical means

Most of the material and techniques are imported from European and North American companies (France, Italy, UK, Germany and USA). Some organic technical means are imported only on personal command. Thus, organic pesticides, traps, fertilizers and compost are not very common, but could be always be imported by local companies.

The most commonly used organic pesticides are: cooper, sulfur and Bacillus Thurengiensis.

4.4. Authorized material

As there is actually no norms and certification, there is no mention of authorized or non-authorized material in Lebanon.

4.5. Origin of the propagating material

Most of the amateurs import their seeds (mostly conventional), especially for vegetables as they grow them on a small scale.

Local cultivars of vegetables, cereals and legumes come from local conventional seeds. This is the case of tomato, white cucumber (Mekti) and white zucchini which are produced by the farmers themselves or by specialized farmers or companies.

Fruit trees are propagated in local conventional nurseries, using non-certified material. Recently some companies importing new varieties of fruit trees, certified as "virus free" from France and Italy (vines, pome and stone fruits).

4.6. Local companies producing technical means

National companies producing compost at a large scale is DOUBALINE in Aanjar in the Bekaa valley, and MDAWAR establishment in Dekwaneh, Beirut.

Companies producing seeds and propagating agricultural material are almost absent. Only HAYEK establishment in Bsouss (near Beirut) has a tissue culture laboratory to produce strawberry, banana and ornamental plants.

AGROTEC has a factory of agricultural sprayers. It is located in Bechmezzine in Koura. Many companies produce agricultural tools and they are mainly located in the Bekaa valley (the final list of these factories will be made upon request at the Ministry of Industry by the end of December).

5. Market aspects

Marketing of organic products is not developed like in Western and Northern Europe.

The term "organic" is mixed up with "natural" and with "dietetic", we can find organic products hidden and mixed with other products used for special diets or with natural products known as "baladi".

These products started to have a place among the supermarkets and the dietetic shops of Beirut and its suburbs (Abou Khalil, Basha, Bechara, Coin du Régime, Goût Frais, Smith, Spinneys, Tony Maroun) but this experience failed in most of the supermarkets and contracts didn't last for more than 6 months.

Marketing of the products by the farmers themselves is also common.

Some farmers have started to send their products to restaurants. While Crepaway, a fast food chain (6 branches in Beirut and suburbs) is studying a project for shifting into organic food.

Trying to find a solution for marketing the products, Choutoul Est. which is the main provider for the supermarkets has started with some associates to open specialized shops in Beirut and suburbs (first shop in Jisr el Bacha will open in January 2001). On a long-term project, a gross market will be established in Beirut.

As mentioned before, there are no available data about local consumption, or importation of such products (because all products are mixed together). But it is known that all the organic farmers sell their production for the local market only.

There is no export of organic products because there is no certification from one side, nor big farmers or producers' associations from the other side.

Potential organic products are many, including carob molasses, pine nuts, sage leaves and other wild products that are already exported.

Finally, due to the modesty of the production, there is no specific promotion for any product or farmer. Anyway, until now the demand is much higher than the production.

This does not mean that the farmers do not suffer from marketing problems. The major constraints are:

- the modesty of the production diversity and quantity of a single farmer in a matter that he cannot fulfill the needs of a supermarket for a season or all year round;
- the absence of cooperatives, merchants or boards that can deal with the farmers to buy their products and resell them to the supermarkets and specialized shops and to make promotion for these products;
- the absence of any certification and labelling to install a certain trust between the farmers and the market.

MALTA

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Introduction

The Maltese archipelago consists of three main islands: Malta, Gozo and Comino, the total area being merely 315 km². Malta, the main island, measures 246.6 km², Gozo 65.8 km² and Comino 2.8 km². Out of these 31500 ha just over 10 000 ha of the agricultural land is cultivated. It is estimated that about 8% is irrigated whereas the rest depends directly on rainfall. The annual average rainfall is about 550 mm of which the effective rainfall is 300 mm / year. Considering that the rainy season normally extends from September to March, vegetables and summer field crops are impossible to grow during the dry season ranging from April to August, unless irrigation is applied.

1. Agricultural Holdings

Agriculture accounts for 3% of the Gross Domestic Product (GDP) and 2% of employment.

Malta is self sufficient in fresh vegetables, pork, fresh milk and fresh eggs. The number of full-time farmers is constantly decreasing and accounts only about 1000 plus about 400 full time livestock breeders. The reason for this decrease is mainly due to the subdivision of the holdings as a result of inheritance. When the holding is subdivided from generation to generation it is no longer viable to sustain a living. This trend however does not seem to have a negative effect since the agricultural land is being well cultivated on a part-time basis. This subdivision of the holdings is however creating problems of fragmentation resulting in several fields or rather individual plots of land in the same fields.

2. Soil Aspects

Malta's agricultural land is characterised by the sloping terraced fields bounded by retaining rubble walls. These are very often, shallow soils normally ranging from 20 to 75 cm depth. There are also a few flat areas near valley beds which are very fertile such as at Pwales (Ghajn Tuffieha) and Burmarrad. These soils are of sediment origin and are over a metre deep but overly a saline aquifer.

It is estimated that land areas under forage production total around 4500 ha. Production of fresh fruit and vegetables is about 75 000

tons of which 6000 tons is fruit. This is all raised under conventional methods both in the open field and under plastics.

Livestock production totals around 40 million kg of fresh milk, 11.2 million kg of pork, and four million kg of broilers and 5.5 million eggs each year.

The main soil types are:

- (i) Terra Rossa Soil, red soils found on coralline limestone in the North (Mellieha) and in the South East (Kirkop / Zurrieq);
- (ii) Xerorendzina soils overlying blue clay rock in Rabat areas;
- (iii) Carbonate raw soils, white soils with high calcium carbonate.

However, over the years there has been an extensive movement of soils from one area to another for agricultural land reclamation and addition of soil to existing shallow fields. Hence, it is common to find a mixture of soil types in the same locality and even in the same field.

Water permeability in soils vary tremendously depending on the soil type, very low on clay soil to very high in terra rossa soils. Water retention is high only in clay soils and very low in all other soils. Considering the low soil depth of most of the terraced fields, soil water storage is quite low and, hence, there is a need for frequent irrigation sometimes even during the rainy season.

3. General Aspects

Organic Agriculture in Malta was not heard until a few years ago. However, in the last five years there has been a great interest in this subject, now that most people are conscious of the need to protect the environment and to consume healthy food. Farmers and growers have also shown limited interest in raising crops with controlled applications of chemical fertilizers and pesticides.

The first commercial attempt to grow crops organically was about four years ago when it was said that an organic soil conditioner can be sprayed on the field and all chemicals present in the soil would be neutralized. Few crops like tomato, potato, vegetables and melon were grown on various plots of land as a trial. However, since no organised marketing system of organic production has been set up, this production had to be discontinued as financial returns did not justify the added expenditure of treating the soil.

Recently a voluntary organization called Malta Organic Agriculture Movement (MOAM) was set up by some individuals who are attempting to create awareness towards organics. It seems that they are facing a difficult task to convince farmers and growers to convert

into organics. This is understandable when taking into consideration the characteristics of the agricultural activity in the Maltese Islands, that is, the marketing system, land, fragmentation, lack of land, absence of organic matter in soils, non rotation systems of production and pest and disease persistence in a warm Mediterranean environment.

4. Regulatory Aspects

No regulation framework is present in Malta.

5. Structural Aspects

There are only some trial plots organically farmed.

6. Productions

Trial plots exist for the growing of vegetables such as lettuce and tomato, fruits such as melon and water melon, and some vines.

7. Agronomic Aspects

The main constraint relating to the management of soil fertility is the lack of organic manures produced in livestock farms. Moreover, due to the huge number of small holdings and to the lack of agricultural land, crop rotation and green manuring is hardly practised. Organic fertilizers which have to be imported are not readily available.

Due to the intensive farming and to the lack of rotation, persistent pests diseases, viruses and weeds are the major problem in the Maltese agriculture. Very little biological control of some pests is practised.

All synthetic fertilizers and pesticides normally commercialized in other countries can be imported. Constraints do exist to the importation as long as the normal procedures are followed.

All imported seeds or plants have to be sanitary certified.

Government institutions and private companies or individuals produce technical information (but in organic agriculture).

8. Marketing aspects

Marketing of organic products is not yet developed.

MOROCCO

Lahcen Kenny

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Introduction

In Morocco, there are two main sectors in Agriculture: a traditional one for rainfed crops, mainly cereals and legumes, and a relatively modern one for irrigated crops mainly those oriented to export. Irrigated crops include vegetables, ornamental plants, flowers and fruit trees.

Traditional farming systems with low external inputs and no or few chemicals are widespread in all parts of the kingdom. In the northern part of the country, the main commodities are cereals, legumes and non-wood forest products (i.e. mushrooms). In the central part, medicinal plants, temperate fruit trees (apple, pear and cherry) and subtropical species (fig and pomegranate) are the dominant crops. The eastern, southern and south-eastern parts are characterized by an arid and semi-arid climate with very few rainfed crops. In these areas vegetables and fruits are mostly under irrigation using surface water in some remote areas and dam or underground water in modern farms. The agricultural scene in south of Morocco is also famous for its endemic species such as argan, date palm and caper.

1. General aspects

In Morocco Organic agriculture was launched in 1986 in Marrakech area by citrus growers with the help of some French farmers. Today, the concept of organic farming and production has gained more regions. Farmers in Agadir, Marrakech, Azemour and Benimellal regions are currently involved in one aspect or another of organic production.

Organic commodities come from both cultivated and wild plantations. The latter is so far predominant in terms of surface. Organic production from cultivated crops was first initiated by a French and some Moroccan growers in Marrakech area (South of Morocco) and concerned only citrus. From 1986 to 1992, the progress was very slow, but in 1993 a larger experience was launched by few citrus and vegetable growers first in Marrakech and later in Agadir.

Today, there are around 1000 ha of organically cultivated crops and 7000 ha of natural forest such as argan and some medicinal plants.

2. Regulatory framework

Two ministerial laws concerning organic agriculture were promulgated in 1992:

- law no. 02/92 was promulgated by the EACCE (Etablissement Autonome de Contrôle et de Certification des Exportations) and it concerns the technical control of organic labelled export-oriented products.

- law no. 1434 of 3 August 1992 promulgated by the DPVCTRF (Direction de la Protection des Végétaux et de la Répression des Fraudes), the competent authority normally in charge of certification and inspection in the field of Agriculture. This law was just a summary of the European legislation on organic farming and was not recognized by the EU authorities.

Even though the activity of organic farming in Morocco is 14 years old, the country has issued a national regulation only in 2002. This regulation is now published in French under the title: "Norme Marocaine de la Production Biologique".

Due to the absence of regulation and because neither DPVCTRF nor EACCE have so far developed the competence and prerogatives needed for the control, certification and inspection are carried out all over Morocco by foreign companies. Four multinational companies share the Moroccan market: ECOCERT, Qualité-France, Biosuisse and GfRS (Gesellschaft für Ressourcenschutz mbH). The latter is acting as a co-certifier with an Austrian company. The personnel involved is Moroccan in the case of the French companies and German in the case of GfRS. Addresses of the inspection boards are given below:

- Gesellschaft für Ressourcenschutz mbH
Prinzstraße 4
37073 Göttingen
Germany
Phone 0551-586-57
Fax 05 51-587 74

- Ecocert
BP 47 32600
L'Isle Jourdain
France
Tel 0562073424
Fax 0562071167

- Qualité- France
18, rue Volney – 75002
Paris, France
Phone: 01.42.61.58.23
Fax: 01.4260.51.61

- Biosuisse
Margarethenstr, 87
CH-4053 Basel
Tel 00 41 061 385 N96 10
Fax 00 41 061 385 96 11
website: www.bio-suisse.ch
e-mail: bio@bio-suisse.ch

3. Structural aspects

3.1. Number of farmers

According to internal documents of national NGOs and certification bodies, 61 persons take part in the organic production movement in Morocco. These are producers, exporters, processors or traders. This figure is, however, far under-estimated because many producers working with wild plantations (argan and medicinal plants) are not included. According to our proper investigation another 500 men and women are involved in collecting organic products from wild plantations. Therefore, the total number of persons involved in organic production is about 555 (table 1).

3.2. Overall surface

The overall cultivated and wild certified organic area is about 11 956 ha of which 35% is under conversion. The main production comes from wild plantations particularly argan. Except for some medicinal plants collected in the Atlas forest under temperate climate, all the other products are collected or grown in the central and southern part of the country characterized by a semi-arid and arid climate. Details on the surface according to areas and commodities are given in table 2.

3.3. Production

In Morocco non-cultivated crops represent 75% of the total organic production (table 2). Cultivated crops including citrus, olive, vegetables, medicinal and aromatic plants (MAP) are destined to the European and American markets.

3.3.1 Citrus

Organic production of citrus commodities initiated in 1986 by some growers in Marrakech area. The main areas of production are currently Marrakech (150 ha) and Agadir (100 ha). The main varieties are Clementine, Washington Navel, Lemon, Washington sanguine and Salustiana. The whole production is oriented toward export.

According to some commercial agents, Moroccan products are well appreciated in Europe and are sold at prices varying from 6-7 FF/kg which is 20 to 30 % more than what is offered for products coming from other countries.

The main period of export goes from December to May. Exceptionally, the period can be extended to June-July if storage is ensured for late products. According to ProNatura, a french company specialized in marketing of organic products, in Morocco there is a prospect to export more organic oranges in winter and late spring, even though a strong competition of other Mediterranean countries has taken place on the European market. This assumption is based on two considerations: (i) in winter time, there is a gap of one month (February) during which organic fruits are not available on the European market; (ii) since late producing varieties are not available in Europe, in summer time demand is met by South American products.

3.3.2 Olive

Attempts to export organic olive oil and fruits have been done since the eighties, but the activity is still limited to two regions (Taza and Taroudant). According to the certifying companies (Ecocert and Qualité-France) the total certified organic surface has reached 120 hectares representing 0.02% of the total olive surface in Morocco (455 000 ha).

3.3.3 Vegetables

Organic production of vegetables was launched in 1994 with few species. By 2000, around 1500 tons of eight commodities were produced in three different areas: Agadir, Taroudant and El jadida. The production is mainly oriented toward export (table 2). Tomato represents 43% of the production, cucumber and carrot 37%. Organic vegetables are grown under plastic houses during winter season in order to meet the European off-season demand. Most of the farmers use drip irrigation, soil mulching and biological tools to control pests and diseases. Over the last five years, production of organic vegetables has become popular in Agadir where the biggest community of vegetable growers is located. From 1997 to 1998 the

total surface allocated to these crops trepled and the trend seems to steadily increase (Table 3).

3.3.4 Medicinal and aromatic plants (MAP)

Cultivated MAP represent 16% of the total organic production. About 20 species are cultivated in certified farms in four areas: Rabat, Marrakech, Taroudant and Agadir (figure 1). These are: rosemary, menthe, thymus, verbenas, salvia, cumin, oregano, coriander, common oleander, eucalyptus, fennel, lavender, marjoram, basil, pine, strawberry, chamomile, peppermint, citronella, aneth, violet, absinthe, mugwort, mayweed, savory, angelica and hyssop. Saffron is produced solely in Taliouine, a remote area in the Southwest of Morocco.

3.4. Collection of wild products

3.4.1 Argan

Argan is an endemic tree to Morocco covering a total area of 830 000 ha of which 4000 ha are organically certified by French and German agencies. The main areas of production are indicated in figure 1. Argan fruits are traditionally collected by the local population and are used for the extraction of a valuable oil from the seeds. Three main companies are working in this sector: a private company based in Casablanca and covering Aoulouz area, a local association of women covering Agadir and Essaouira areas and a third company based also in Casablanca and covering parts of the forest in Essaouira.

Argan oil is extracted in a five - step process: (i) nuts extraction; (ii) heat treatment; (iii) grinding; (iv) paste pressure and (v) oil purification.

Two types of oils (or oil quality) are produced: (i) a regular oil extracted in a traditional way exclusively used for consumption and (ii) a highly purified oil extracted without heating (cold extraction) reserved for cosmetic uses.

The German government, through its international agency (GTZ), launched in 1994 a project for the development of organic production of argan in the Southwest of Morocco. The main objectives of this project were to establish a network of rural cooperatives of women specialized in organic production of argan oil. Thirteen cooperatives with 376 women are involved in this network. A similar approach was undertaken by a Canadian NGO which contributed to the creation of another women cooperative in Tamarar area (SouthWest of Morocco).

3.4.2 *Medicinal plants*

More than 25 000 Kg of medicinal plants and plant extracts (conventional and organic) were exported in 1998, 70 % of which are certified. The Atlas forests (Ourika and Azrou) are the main sites where most of the wild medicinal plants are collected. The main species are: thymus, eucalyptus, rosemary, salvia, matricaire and absinthe. Other species are collected from arid and semi-arid land such as Ourazazate and Errachidia (East of Morocco, figure 1).

3.4.3 *Processed products*

There are three types of organically certified processed products: green bean, caper and olive oil. Green bean and olive oil are processed by private companies based in Casablanca and Taza Area, respectively; caper is processed by both farmers and industrial units in Fes and Meknes.

3.4.4 *Foreign investments*

European businessmen and farmers have been involved in the organic sector in Morocco for many years at several levels: (i) production: Belgium and Italian growers own and manage production units specialized in medicinal plants and citrus; (ii) certification: four European companies act as certifiers (see regulatory aspects) and (iii) market: a French company (Pronatura, see Marketing aspects) is involved in exporting and marketing Moroccan products.

3.5. Producers' associations

There are two professional associations: Maghrebio and APFB (Association des Professionnels de la Filière Biologique). The latter is the largest one with 44 members including 19 producers, nine industrials (packaging and canning), 12 salesmen and nine administrators and certifiers. Maghrebio is based in Marrakech and has 17 members including six producers; the rest are either industrials or certifiers.

- Association des Professionnels de la Filière Biologique (APFB)

30 Rue Abou Ishak El Marouni

Maarif, Casablanca

Tel: +212 2 25 21 18 / 99 40 29 / 23 05 81

Fax: +212 2 23 07 61

- Maghrebio

Immeuble Gidel, 127 Av. Mohammed V, Marrakech

Tel: +212 44 43 97 26

Fax: +212 44 43 97 26

E-mail: maghrebio@iam.net.ma

3.6. Research and training

All initiatives (education, training and extension activities) are mostly carried out by public institutions, farmers and some international bodies. Until 1997, very few activities were undertaken by governmental institutions to promote organic agriculture in the country. In 1995 the CMPE (Centre Marocain de Promotion des Exportations) organized some seminars in Agadir and Rabat to promote export of organic products to the European market.

In 1997, the "Institut Agronomique et Vétérinaire Hassan II" (IAV) has launched a program on research and training on organic farming. IAV is the largest Institute for research and higher education in the field of agriculture in Morocco. It has 1200 students and 330 faculty members with two campuses, the main one in Rabat and a second one in Agadir.

Since 1997, the Department of Horticulture in Agadir has integrated a course on organic agriculture in the fifth year of the Master program. Research thesis on organic production of medicinal plants and biological control of insects have also been developed in the departments of Horticulture and Plant Protection. Since 2000, some IAV's students have been participating each year to a post-graduate and Master program launched by the Mediterranean Agronomic Institute of Bari (IAMB).

4. Agronomic aspects

4.1. Management of soil fertility

In olive orchards, the common practice used for soil management consists in leaving the soil without ploughing. Weeds are left on site and are used as organic matter. Few farmers practice cereal intercropping in olive orchards.

In citrus growing, soil is ploughed twice a year: at the beginning of the rainy season (October) and later in February. Intercropping with legumes in heavy soil and Medicago species (Alfalfa) in sandy soil are common practices applied in Marrakech. Manure is the main source of fertilizers. Up to 30 tons per hectare are spread in-between the rows at the end of winter, right after harvest. Organic fertilizers are not commonly used neither with citrus nor with olive.

In general, fruit producers are facing various problems in the management of soil fertility. The total amount of nutrients available in organic orchards is far from the optimum, and this is due to: (i) the low amount of manure added annually; (ii) the lack of organic fertilizers added to the soil or applied as foliar treatment and (iii) the

absence of legumes intercropping. Consequently, the yield is far from the optimum.

Vegetables are grown under plastic house and most of organic growers have more than 10 years of experience in this field. Therefore, they are generally well acquainted with technical constraints and crop requirements. Soil fertility is managed through three types of actions: (i) manuring, (ii) the use of non synthetic fertilizers and (iii) foliar application of some amino-acids and organic compounds.

The amount of manure applied vary from 15 to 60 tons per hectare according to the crop requirements. For most vegetables, well decomposed bovine manure is applied directly to the soil around the plant. For tomato, a special practice is undertaken by some farmers: it consists of mixing manure with water (1:1 volume) and releasing it in a soluble form with irrigation. Other organic fertilizers are also used at different concentration rates according to the crop requirements and to the stage of growth (table 4).

4.2. Disease, pest and weed management

The main pests and diseases of citrus are California Red scale, Mediterranean fruit fly (*Ceratitis capitata* Weid) and aphids. To control California Red scale and aphids, a commercial product (Neemix) mixed with mineral oils is used. Fly traps are the only mean to biologically control the Mediterranean fruit fly.

For vegetables, several pests and diseases are reported. The main pesticides used are presented in table 5. Biological control of insects is also quite common. More than 70 biological agents are authorized by the Moroccan legislation, law no. 2548 of April 1, 1998 (annex 2). However, the most frequently used biological agents are those reported in table 6.

4.3. Propagation material

Seed vegetables are imported from Holland, Spain and sometimes from Israel. Varieties used in organic production are often the same of conventional; therefore, seeds are produced solely by international companies. However, many sale companies are now offering non-treated seeds for organic production.

In olive and citrus growing, propagating material is the same used in conventional. The main producers are specialized nurseries located in Meknes and Marrakech areas. Plants of the main varieties cultivated in Morocco are produced by semi-herbaceous cuttings in spring and summer in the case of olive and by budding in the case of citrus. Certified virus-free material is available for citrus but not for olive.

4.4. Constraints

The management of soil fertility is a serious problem in most organic farms, particularly in remote areas where farmers with no basic training in organic farming are not well acquainted with agronomic and microbiological benefits of organic fertilizers.

Few organic fertilizers and pesticides are available on the market with high prices compared to conventional. According to commercial agents the problem is related to the homologation system adopted in the country: a new product imported from abroad needs two to three years to be homologated.

For technical advices, some producers are collaborating with foreign consultants from France, Holland and Italy. The cost is, however, very high.

5. Market aspects

All organic products are oriented toward export (tables 7 and 8). Vegetables and citrus represent 95% of the total quantity exported to Europe. France, UK and Germany are the primary destination for Moroccan products. The national market of organic commodities is still so far absent.

In Morocco export is done through two types of channels: (i) through dealers operating on the foreign markets (mainly for vegetables) and (ii) through a specialized French company (Pronatura) based in Marrakech. According to Pronatura agents, prices offered for organic products are 20 to 30% higher than those of conventional products. The demand is particularly high in winter. Pronatura recommends its clients a late production for which the European demand is not yet satisfied. The market for vegetables and citrus, as shown in table 7, has increased during the last three years. According to APFB's president, tomato export alone will reach 9000 tons in 2001.

TUNISIA

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1. Characteristics of organic agriculture

Organic agriculture is relatively new in Tunisia. The main productions are olive, date palm, almond, jojoba, vegetables, fruit trees, aromatic plants and honey. All the production is directed to the export market. Organic farms are mainly located in the centre and in the southern part of the country.

Many agricultural areas and crops can be easily converted to organics because of many factors: (i) unfavorable climatic conditions to pests and diseases; (ii) traditional techniques and practices and (iii) biodiversity. The main difficulties in converting to organic agriculture in some areas are related to the lack of: (i) products for fertilization and soil amendments; (ii) products for pest and disease control; (iii) unrestricted veterinary medicines and (iv) experience in marketing organic products.

2. General aspects

Organic agriculture started in Tunisia in the eighties with private initiatives. It had a slow evolution until the last three years which were characterized by a high increase in area and number of farms. In 1997, there were about 10 farms covering a surface of 300 ha. In 2000, they became about 137 farms over a surface of 15 035 ha. This increase is due to the development of some policies supporting this sector underlined in the national strategy:

- Aids: 30% of subsidies for all equipments used in organic agriculture and 70% for certification fees during the first five years of production with a maximum of US\$ 3500.
- Information: the "Centre Technique de l'Agriculture Biologique" (CTAB), the "Sous-Direction de l'Agriculture Biologique – Ministère de l'Agriculture" and the "Agence de Promotion des Investissements Agricoles" (APIA) offer technicians and farmers all the information related to various aspects of organic agriculture.
- Training: the CTAB in collaboration with the "Agence Nationale de Vulgarisation et de Formation Agricole" (AVFA), the "Institution de Recherche et d'Enseignement Supérieur Agricole" (IRESA) and the Mediterranean Agronomic Institute of Bari (IAMB) organize many training activities (short sessions and courses) on various topics of organic agriculture addressed to technicians and farmers. Some modules on organic agriculture are also offered at university level.

- Marketing: some subsidies are given by the Centre de Promotion des Exportations (CePEX) to facilitate the marketing of organic products.

3. Regulatory aspects

The reference legislation in Tunisia is the IFOAM Basic Guidelines, EEC and the Tunisian regulations. A national regulation (law no. 99-30) was issued in April 5, 1999 followed by decree no. 2000-409 in February 14, 2000.

A reference regulation on organic agriculture is available at national level only for plant production.

The complete national regulatory framework will be ready by the year 2001. The last version of the national technical standards on plant and animal production and processing is being prepared.

The competent authority is the Commission Nationale de l'Agriculture Biologique (CNAB). Its main tasks are: (i) to prepare proposals for organic agriculture promotion and support; (ii) to study all files and documents related to organic agriculture and (iii) to approve or withdraw certification bodies.

The inspection and certification system comply with the IFOAM standards, EEC regulation and the Tunisian legislation. The inspection and certification bodies are the following:

- Institut National de la Normalisation et de la Propriété Industrielle - INNORPI (Tunisian) in cooperation with BIOAGRICOOP (Italian): the personnel (mainly inspectors) is Tunisian and Italian. They inspect 9% of the total organic area.

INNORPI, Rue Alain Savary, Cité El Khadra,
1003 Tunis Belvédère, Tunisie
Tel: +216 1 785 922 ; Fax: +216 1 781 563
E-mail: inorpi@email.ati.tn

- ECOCERT International: inspectors are mainly Tunisian. They inspect 90% of the total organic area;

ECOCERT International, Förster Str 87, D-37520 Osterode, Germany
Tel: +49 5522 651161; Fax: +49 5522 951164
E-mail: info@ecocert.de

ECOCERT Tunisie, 35A complexe Elmanar, rue Habib Thameur,
3000 Sfax, Tunisie. Tel: +216 4 225 458; Fax: +216 4 297 602

- LACON, BCS (German): inspectors are German and inspect 0.7% of the total organic area;

- AIAB (Italian): inspectors are Italian and cover 0.3% of the total organic area.

4. Structural aspects

By 2000, there were 15 035 ha of organically farmed area and 137 farms of which 90 are certified (12 400 ha), 43 in conversion and 4 mixed (organic and conventional). Processing units were 15 distributed over a surface of 5 ha. Productions are reported in table 1.

Most of organic farms and processing units are located mostly in the centre and the south and few in the north of the country.

Future prospects (2002-2006):

- Area: 22 000 hectares
- Vegetable production: 135 000 tons
- Milk: 5000 liters
- Eggs: 4 000 000
- Meat: 100 tons

No organic farms are owned by foreign companies. Two farms (350 ha) are run by both Tunisian and foreigners.

4.1. Producers' associations

- Fédération Nationale des producteurs Biologiques
Union Tunisienne de l'Agriculture et de la Pêche
Rue Alain Savary, Cité El-Khadra 1003 Tunis, Tunisie
Tel: +216 1 800 800 ; Fax: +216 1 798 598

Number of members : 137 organic farmers

Products: see table 1

Activities carried out: organization, information and support.

- Société Zayatine
Immeuble Abid, no 101 Avenue d'Algérie, 3000 Sfax, Tunisie.
Tel: +216 4 212 241; Fax: +216 4 221 755

Number of members : 23 from the 137 organic farmers

Products: olive oil (1 000 000 kg) and almond (15 000 kg)

Activities carried out: organization, information and marketing

- Other farmers' associations are being established.

4.2. Research

4.2.1 Structures

There are ten national research committees under the umbrella of IRESA dealing with various aspects of agricultural research: conventional and organic. They set up the priorities for research topics. Research is done by both research institutes and university.

4.2.2 Research topics

The major lines are: (i) variety testing (vegetables); (ii) compost quality; (iii) use of various organic matters (farm by-products and manure); (iv) cultural practices (grafting); (v) disease and pest control (olive, date palm and vegetables) and (vi) animal production techniques.

4.3. Training

Some modules on organic agriculture are given to agricultural technicians and engineers in different agronomic institutes.

CTAB in collaboration with AVFA organize training sessions of one day or more for technicians and farmers on different topics of organic agriculture.

5. Agronomic aspects

5.1. Soil fertility

In Tunisia soil is generally poor (low organic matter content, low biological activity and poor structure). The main problems of soil fertility improvement are related to (i) the introduction of green manure in rotation programmes; (ii) the training of farmers on compost management (of different organic matter origins) and (iii) the finding of authorized organic and mineral fertilizers (in sufficient quantity) in the country.

5.2. Pest and weed control

The control of some pests and diseases is not efficient because many authorized products cannot be found in the country or are not yet registered. In this respect, a preparation of a list of registered products is underway.

A rational crop rotation for a good weed control is not always followed by the farmers.

Working towards the biological equilibrium and bio-diversity restoration should be a must.

5.3. Technical means

There are some constraints to import technical means. These are the following:

- a complete list of recorded inputs authorized in organic agriculture is still lacking;
- the import of organic matter is still prohibited;
- equipments used in organic agriculture (i.e. compost and weed management) are not well known by the farmers.

5.4. Main authorized material for soil fertilization, protection and processing

- local organic matter;
- natural minerals allowed by EEC regulation;
- sulfur products;
- copper products;
- mineral oils;
- *Bacillus thuringiensis*;
- Pheromones in traps;
- methaldehyd in traps;
- local natural predators and enemies (i.e. beneficial insects);
- additives and processing aids allowed by EEC regulation.

A complete list of authorized material is being prepared.

5.5. Propagating material

Seeds, seedlings and other propagating material used in organic agriculture are both local and foreign, either organically certified or just not chemically treated. Olive and date palm were planted long time ago.

5.6. Local companies

Producing technical means are rare. There is only one company producing compost. Production of local predators is done by an experimental station.

New projects are underway.

6. Market aspects

There is not yet a local market for organic products in Tunisia. Some organic products are sold as conventional. A strategy is being prepared to encourage local consumption and marketing. Most of the

production is directed to the export market and sold as typical Tunisian products. Types and quantity of exported organic products are given in "structural aspects".

The main foreign markets and the relative products are:

- Italy and Spain: Olive oil;
- France and Germany: Dates;
- France and Great Britain: Vegetables;
- Switzerland: Jojoba;
- France: Aromatic plants and Wine.

Most of the farmers are producers and exporters and they export their production by themselves. A farmers' association, the "Zayatine", groups 23 farmers and exports their production. Few farmers have contracts with exporters.

The marketing of some organic products (i.e. olive oil) is still difficult. The main export constraints are based on the lack of (i) market assessment and a marketing plan (evaluation of opportunities, future demands and prices of organic products) and (ii) efficient regional and national marketing networks of organic products.

The promotion of organic production is done through the participation at national and international fairs.

The main barriers to have access to international markets are:

- authorization from European authorities;
- lack of information;
- European labels (like AB in France);
- small quantities of organic products.

At the moment, there aren't organizations dealing with the marketing of organic products but the efforts made to organize the marketing of organic oil, led to the establishment of Organic Olive Oil, a new oil marketing society.

7. Development of Mediterranean organic

Agriculture

The major needs for the development of Mediterranean organic agriculture are the following:

- specific and appropriate Mediterranean regulations;
- training for technicians and farmers;
- establishment of farmers' associations;

- establishment of marketing organization;
- supply of organic fertilizers and authorized products to be used in plant and animal protection.

TURKEY

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1. Characteristics of organic agriculture

Organic production in Turkey is mainly driven by the export market. According to the figures in 2000, dried fruits and nuts have the largest share in organically grown crops with a percentage of 65.8%, followed by field crops (17.5%), fresh or processed fruits (9.5%), vegetables (1.9%), berries (1.3%), medicinal and aromatic plants (1.4%) and others (2.6%). 18 375 organic farmers produce 95 different crops on an acreage of 57 001 ha. Total organic production reached to nearly 220 000 tons in 2000. The demand from the local market started recently during the last few years. There is an urgent need to widen the product range and include fresh fruits and vegetables, wheat and flour for bread and pasta industry, meat and milk and their products in order to meet the demand of a Turkish household and develop the internal market. Continuous information flow of technical advice and market information must be provided to the farmer. The crucial issue to initiate the production of new crops is to establish the bridge between the farmer and the consumer. Inputs used in organic farming and proven satisfactory under the prevailing conditions like beneficial insects, plant extracts or soil amendments must be available at a low cost. Organic agriculture in Turkey is in an increasing trend as could be seen in Figure 1, however, most of the production comes from the traditional commodities and are destined for exportation.

2. General aspects

In Turkey, organic production started in 1984-85 with the demand of European companies interested in organically grown traditional crops such as dried fruits and nuts. During this period, the companies received consultancy from the European firms. During the last 5-8 years, the demand increased for new products and even if the product range is increasing the quantities are limited. To further the development of organic agriculture in Turkey, different sectors have different needs and functions. These urgent needs can be classified under three headings: training, research and market development of organic inputs and products.

There is no policy to support farmers, yet. Even if the rate is decreasing, fertilizers and agrochemicals are still subsidised, however foreseen to be ended by 2001. There are some training and research activities supported by the Ministry of Agriculture and Rural Affairs

(MARA) and by ETO, the Turkish Association on Organic Agriculture (Ekolojik Tarım Organizasyonu Derneği). Training activities are carried out since 1996 and mainly addressing to the technical staff of the state extension services. The senior extensionists in each of the 81 provinces attended a one-week seminar once or twice. During the last four years, about 520 agricultural engineers had two-week training courses under the framework of a project supported by the State Planning Organization. Nearly half of the participants came from MARA and the other half were unemployed agricultural engineers. Lately, advanced courses are being organized to the researchers at the research institutes of the MARA.

The Turkish Scientific and Technical Research Council, a state funding agency announced organic farming as a priority area. The State Planning Organization, MARA and research funds of the universities are also supporting research projects on organic agriculture. The institutions and researchers involved in organic agriculture is increasing every day. A research network was established within MARA but is not very active.

Activities to introduce organic agriculture to a wider group are being carried out by ETO, Ege University Faculty of Agriculture and MARA. Conferences, panel discussions and seminars are held in different parts of Turkey.

3. Regulatory aspects

3.1. Reference legislation

A national regulation (ETK 22145) for organic plant and animal production based on EEC Regulation 2092/91 and IFOAM Basic Standards was issued on December 18, 1994. It is at the final stage of revision to cover the aspects related to animal production, processing and labelling. In general, it is based on EU and Codex standards.

3.2. The competent authority

The competent authority for organic agriculture is the Committee on Organic Agriculture (ETK) at MARA. ETK composes of representatives coming from different general directorates of MARA. The Committee secretariat is located at the Department for Research, Planning and Coordination (APK Department).

3.3. Inspection and certification system

The inspection and certification activities are carried out by independent bodies authorized by the MARA. Farmers can apply to inspection and certification bodies individually or together as a group

through the contracting company. In order to function in Turkey, the inspection and certification bodies have to apply MARA, present all the documents required as stated in the national regulation and get authorization.

3.4. Inspection boards

There are seven inspection bodies in Turkey. Six of them are Turkish branches of foreign companies (BIOAGRICOOP, Bio Control System (BCS), ECOCERT, Institut für Market Ökologie (IMO), INAC and SKAL) and the seventh one is a local one (table 1). All inspection bodies have to have a minimum number of Turkish personnel and an office according to the national regulation ETK 22145.

4. Structural aspects

In Turkey, average farm size is rather small and the plots are divided. The average size of an organic farm is 3.1 ha. Organic farming is generally practiced as contracted farming since from the very beginning the exporters had to search for farmers who would be willing to produce according to organic rules. The contracting company supports the farmer by paying the inspection and certification cost and provides technical advice. In 1999 there were 12 435 organic farmers and 44 552 ha while in 2000 organic farmers increased to 18 375 with a surface of 57 000 ha (table 2).

There are 38 processing units distributed as follows: 30 units in Izmir, two in Ordu, one in Trabzon, one in Mersin, one in Malatya, one in Antalya, one in Afyon and one in Mugla. Wild products picked from the nature are: rosehip, garden sage, laurel, myrtle, thyme, rosemary, wild prune, lime, mulberry and cornelian cherry. Their production vary between 10 and 500 tons (table 3).

No farm is run or owned by foreign companies. They generally carry out organic production under a contract and give the technical advice. There are two farmers' cooperatives in Turkey involved in organic production, TARIS and BASMAKCI. TARIS, the biggest farmers' cooperative in Turkey produces organic dried figs and raisins and is about to start dealing with olive oil and cotton. Among TARIS members, the total number of organic fig farms is 160, that of olive 170 and that of vineyards 89. The total number of members in TARIS is 116 182 (Cotton growers: 55 967, Olive growers: 26 918, Grape growers: 25 424 and Fig growers: 7873). Basmakci is situated in Afyon in the eastern part of the Aegean Region and the cooperative produces organic and biodynamic rose and its products and sesame seeds for the export market.

5. Agronomic aspects

5.1. Soil fertility

Surveys must be carried out in different parts of the country to determine the raw material available for composting. Suitable and practical methods of green manuring and composting must be developed and introduced to farmers. Research work on methods promoting the mineralization of nitrogen and cycling of organic matter in the soil need to be carried out and/or to be put into practice.

5.2. Pest and weed management

There are many research activities on biological and biotechnical methods for pest, disease and weed management. An overall evaluation of the results in order to put forth a complete and integrated approach is necessary. Adaptation trials of the results obtained in other countries under relevant conditions must be fulfilled. Some of the techniques can be easily imported. Preparations permitted in plant protection must be tested under regional conditions and results must be integrated into the present programs. A new concept has to be developed for weed regulation (not for control).

Authorized materials are mostly imported and certified by inspection and certification bodies. Even if limited, there are some local companies which produce technical means such as copper, sulphur and attractants.

5.3. Technical means

The following are some constraints to import and availability of technical means: (i) difficulties in registration of preparations; (ii) complexity and length of the identification process of a product presented as convenient to organic farming; (iii) the need for the adaptation tests of certified preparations to be performed under local conditions and (iv) absence of an official body for the testing or registration for conformity to organic farming.

5.4. Propagating material

There is only one local organic nursery for few fruit species (apple) and an attempt to produce seeds of few vegetable species as tomato and pepper. All the other propagation material comes from the conventional market or the organic farmer produces his/her own seeds. Propagation material of fruit trees is generally local and possess a sanitary certificate. Most of the vegetable seeds are of foreign origin.

6. Market aspects

6.1. Organization of the local markets

Greater part of the products is sold in specialized shops (ca 50 points) in the main cities. In big supermarkets there are corners in which organic crops are sold but the product range is rather limited. Only one company has a mail order selling system.

6.2. Type of product and quantity

Almost all of the Turkish organic products are dry or processed food or non-food commodities with a long shelf life providing ease in post-harvest and marketing stages. Totally 92 different organic crops are available for both local and foreign markets. These are categorized as 99 700 tons of dry and dried fruits, 8000 tons of fresh fruits, 2700 tons of vegetables, 33 000 tons of field crops, 2400 tons of berries, 3200 tons of medicinal and aromatic plants and 10 600 tons of other crops. During the last years there is an increase of processed products.

6.3. Main foreign markets

Germany (61%) is the major market followed by the USA (15%). England (5%) and other EU or non-EU European countries have shares ranging between 2-3%. The main commodity group is dried fruits and nuts. According to the national regulation, all goods produced and exported as organic need to be declared to the exporters' union. The Aegean Exporters' Union in Izmir is responsible to collect all the information from the other regions.

6.4. Difficulties encountered

There is no difficulty in exportating dried fruits and nuts since Turkey is the major producer country. For fresh fruits and vegetables, the most important constraint is the transportation cost and short shelf life.

6.5. Consumer demand

According to a public survey made on 1000 consumers by Ege University, Faculty of Agriculture, consumers are ready to buy organically grown products in the three biggest cities of Turkey, Istanbul, Ankara and Izmir. However, the price of the products is still relatively higher than that of conventional ones. The consumers are ready to pay more on certain products as greenhouse grown tomatoes that they believe contain hormones or pesticides than others.

6.6. Future plans for promoting organic agriculture

New attempts to promote organic agriculture in Turkey are being scheduled by MARA, ETO and the Exporter's Union. National symposia are being held every two years since 1999. Fairs represent other opportunities for promotion. The Center for Promotion of Exportation gathers information on organic production and companies involved in exportation and publishes through its website (www.igeme.org.tr) or pamphlets.