

Olive Oil Production in Greece¹

The 1981 accession of Greece into the EEC was significant for the olive oil sector. Greece is covered by 1,025,748 hectares of olive groves. In the period of 1991 to 1996, the country produced an annual average of 307,000 tons annually, which accounted for 16% of the total world production. And in 2002, the production was up to 430,000 tons. The greater production is attributed to a number of factors, including: a) the intensification and mechanization as well as the use of external inputs and irrigation, b) improvements in olive cultivation, c) the sufficient net income comparing to other crops due to the high level of CAP support and high olive-oil prices and d) the lack of opportunities for other crops due to agro-climatic and socioeconomic conditions. Because olive oil production has been a practice since the ancient Greeks and



the Romans, it is deeply embedded in the nutritional, historical and cultural identity of the Mediterranean. The olive tree is emblematic of the European Mediterranean, its cultivation dating back to ancient times.

Environmental implications

Olive oil production, from the planting of the trees to pressing the olives at the mill, is associated with a variety of positive and negative environmental implications. The Mediterranean landscape is littered with olive trees. This is because olive trees are well adapted plants for the arid Mediterranean climate, potentially putting minimum demand on water supply compared to other agricultural crops. One ecological service olive trees provide is the prevention in soil erosion. Also, they provide an agricultural ecosystem to native insect and bird species. However, the intensification of olive cultivation is associated with environmental concerns including the application of chemical pesticides and fertilizers, and the compacting of the soil through the use of mechanized tilling.

Historical and cultural importance of olive oil

The Romans extended the cultivation of the olive tree throughout their occupied territories on the Mediterranean coast. The cultural importance of the olive for Greece in particular is apparent in its history and mythology. Some historians date the appearance of

the olive in the Greek islands to the Phoenicians in the 16th century B.C. and on mainland Greece sometime between the 14th and 12th century B.C., where its cultivation increased and gained great importance (International Council of Olive Oil, 2005). In Greek mythology, Zeus was originally the protector of the holy olive tree, the "oria elaiia". Legend holds that the city of Athens obtained its name because Athenians considered olive oil more essential than water, thus preferring the offering of an olive tree from the goddess Athena over a spring of water gushing out of a cliff from Poseiden the god of the sea. The olive-laden landscape, which claims approximately 5.5 million hectares of European soil, has aesthetic and sentimental value to the people of that region, appearing in traditional artwork and literature.

It is a symbol of abundance, glory and peace within Greek mythology. The EU Mediterranean countries can all be characterized by their olive tree landscapes; they share a cuisine that is centered on olive oil; and olive oil production is something embedded in their histories.



Social concerns

Olive oil is appropriate to look at in order to understand the causes and implications of the marginalization of particular rural agricultural communities, an important concern of the social aspect of sustainable agriculture. Olive trees were traditionally grown in hill-side landscapes in the European Mediterranean. Like much of agriculture, olive farming has moved toward industrialized agricultural practices, leaving many of the traditional olive groves to abandonment.

Economic importance of olive oil

The Mediterranean and specifically those states that are part of the EU, have depended and continue to depend on olive oil as one of their agricultural industries. The Greeks had used olive oil as a medium of transaction and marketing since the Minoan Times. More recently, olive oil production has become a significant industry for the southern Member States. The European Community records showed that there were 2,311,998 producers between 1991 and 1996. As of the year 2000, the European Union (EU) produced 70% of the world supply of olive oil (EC 2000). Its five top producers are Spain, Italy, Greece, Portugal and France respectively.

The economic viability of olive oil has fluctuated throughout history, depending on the scale of farms, competitiveness of the market, environmental constraints such as drought or frost, and

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governmental intervention. Today the economic benefits of olive oil production go primarily to large-scale intensive producers whose productive value is high but whose intensive practices compromise the integrity of surrounding ecosystems and whose industrialized form has encouraged the movement of olive cultivation out of remote traditional olive oil regions, marginalizing those communities.

Current state of olive oil in the European Union

Within olive oil production, the scale of production that is associated with the highest environmental, social and cultural attributes is not the most economically lucrative system. Olive farms in southern Europe with the highest environmental values, including biodiversity, landscape conservation, and water conservation, have not shown to be profitable for the individual farmer. A study conducted by the Technical College of Agricultural Engineers, Madrid found that for olive oil production in the southern Member States of the EU, the farms that were most favorable to the health of local ecosystems suffered from net annual losses of €402.50 per hectare while the farms that had the most negative effects on the ecosystem made an average annual profit of €1,378 per hectare. These economic disparities come as a result of market competition coupled with EU subsidies that reimburse farmers according to the volume of production. Numerous studies including the “report on sustainable agriculture” of the European Community conclude that the general state of European agriculture is of the domination of intensified production leading to certain negative effects on the environment and rural communities. Three categories of olive groves are: a) traditional low-input groves; b) traditional high-input groves; and c) large modern high-input groves:

Small traditional olive groves

The first category includes small groves of 40 to 250 trees per hectare, and is often characterized by scattered trees. These are the groves that are typically located in the remote mountainous areas, and in continual decline because of their inability to compete economically. The traditional small groves often have terrace walls, as they are predominantly associated with steep terrain. Their under storey is often maintained by grazing rather than through the use of herbicides or heavy tilling. There is little to no chemical fertilization associated with these small productions, with manure as the most common application for the addition of nutrients. Pesticide application is rare and usually means applying traditional treatments such as copper and lime. Due to the inaccessibility of water sources in these inclining areas, traditional plantations are rarely irrigated. Farmers in these

traditional groves generally do not replace plants when they are no longer in their full productive capacity, preferring to preserve the richness that olive trees add to the landscape and history of the region, and thus the oldest trees are found in these groves. The olive groves of Kefalonia all fit into this designation of scale.

Traditional high-input groves

Next, the intensified traditional olive farms are typically located in hills and rolling plains, with 80 to 250 trees per hectare. Though the number of trees does not exceed the number in the first category, these small modern groves differ in scale due to the maximization of yield per tree the farmer attempts to achieve. In order to encourage maximum fruiting every year, this scale of olive farming can be characterized by repeated tilling and herbicides to manage the under storey and the use of 2-6 kg/ha of combined fertilizer per tree and 2 to 10 pesticide treatments per year. Though not all have been equipped with irrigation, these groves are increasingly receiving water by way of drip irrigation, to further encourage maximum fruiting and a heavy average weight for each olive.

Large modern high-input groves

Finally, the intensive modern olive farms are located on plains, with the capacity for 200 to 400 trees per hectare. There is no terracing and the under storey is managed through repeated use of herbicides. Chemical fertilizers are usually applied through drip irrigation in the form of Nitrogen (150-350kg/ha annually). Finally, trees are treated with pesticides 2 to 10 times a year as they are under intensified traditional practices.

The low-input traditional olive farms have potentially the highest natural values, including biodiversity and landscape conservation. They also provide the most positive effects (such as water conservation in upland areas) as well as the least negative effects on the environment. These plantations also represent an ancient culture, harboring trees that date 500 or more years and continuing the traditional practices of small olive groves. The more intensified the plantation and the higher the chemical inputs, the greater the negative environmental impacts, particularly in the form of soil erosion, run-off to water bodies, degradation of habitats and landscapes, and exploitation of scarce water resources. In addition to degrading local ecosystems, the larger plantations are more representative of industrialized agriculture than they are of the olive landscapes associated with Greek tradition.

Economic concerns in olive oil production

Because looking at olive farming from an environmental standpoint would lead one to believe that traditional, low-input practices are the most favorable, it is useful to look at the differences in yield and labor input in order to see why the more environmentally and culturally supportive system is not necessarily regarded as the most attractive alternative by the individual farmer. While the average annual yield of the traditional low-input plantations is 200 to 1,500 kg of olives per hectare, the most intensive plantations can produce up to 10,000 kg/hectare. It also doesn't help that the trees of smaller plantations, due to a lack of heavy irrigation, produce according to their natural rhythm, which is usually only every other year. Intensely fertilized and irrigated plantations succeed at getting at least some olives from trees every year. Further, the labor requirement is much higher for the smaller plantations, where the harvest and pruning are done by hand in comparison with the mechanized system of harvesting and pruning common to modern practices.

A 1998 ESTIA study on these three types of plantations for Spain estimated that the low-input traditional plantations received €97.50 per hectare in production support each year while the most intensive plantations received €975.0 (ten times the amount of the former). Though the direct costs were significantly lower for the traditional groves (€650 per hectare) compared to the intensive farms (€1,547/ha), the sales were disproportionately lower - €150 per hectare compared to €1,950 per hectare annually - for each plantation. In all, the net annual income for low-input traditional olive oil farmers was a loss of €402.50 per hectare while intensive modern plantations made an average annual profit of €1,378 per hectare.

Olive oil in remote mountain communities

Economic, cultural, climatic and landscape variables compete to determine what agricultural practices each olive producer will choose. In the mountainous regions of the European Mediterranean, steep terrain limits the amount of mechanization possible within the olive groves. These areas are also associated with human populations that are resistant to change, and therefore older traditional practices tend to be most prevalent in these regions. Such resistance simultaneously offers the attribute of cultural preservation and hinders a community in its ability to adapt and compete.

The puzzle to be examined therefore is not how rural communities can adapt technologically to assimilate the more competitive intensive farming practices of the plains, but how traditional practices can be supported by modern technology, the global market and progressive policy reforms.