

TREES & VINES

Olive Farming Systems Developments

by Giuseppe Fontanazza

In recent years, many California growers, both olive growers and non-olive growers, have begun to look to cultivating olives for oil as a way of diversifying their activities.

This new look toward olives has been motivated by several factors, not the least of which has been the amazingly steady increase in olive oil sales due to its real and perceived health benefits.

Nevertheless, any effort to revive an olive oil industry in the United States (it was thriving until just 50 years ago), must face the issue of economics and foreign competition. This is true even if many of today's new American producers intend to market very small amounts of oil and position their product on the very high end of the market. This is also linked to the fact that consumers still perceive olive growing as a very traditional cultivation practice that makes little use of modern techniques.

Economic issues are affecting cultural practices very strongly now, even in countries such as Italy, where the image of traditional olive oil production is the strongest. This article would like to serve as an insight into some of the ways that Italian olive oil producers are changing their ways, seeking to carry their crop into the 21st century.

The Current Situation

In Italy today olive oil farming is still beset by a crisis. The underlying causes have to be traced to the structure of existing holdings, characterized by moderate unit productivity and high production

costs, rather than to market shortages or difficulties.

This situation arises from the prevalence of traditional orchards which are fettered by outdated farming methods and require a large amount of labor because of the difficulty of mechanizing cultural practices, harvesting and pruning. Another associated factor is alternate bearing, which is heightened by the advanced age of the trees.

A New Model

For several years now, the Olive Research Institute in Perugia, Italy, managed by Italy's National Research Council (IRO-CNR) has been carrying out research aimed at improving cultivation practices. Since the early 1970s the institute has been developing a series of techniques, first in propagation and nursery breeding and in the agronomic field, which have led to a new productive model of intensive, mechanized olive growing. This model was designed to safeguard quality while sharply increasing production and lowering costs by intensifying cultivation and systematically introducing machine harvest and pruning.

These are the objectives that are not readily achieved in traditional orchards, which is why the model is based on the integral conversion of cropping areas that are suited to live farming.

The fundamental requirements are That:

- The cultivars used must be ergonomically suitable and capable of guaranteeing high yields as well as assuring a swift start to bearing and uniform productivity;
- Orchard structure and training shapes must be suited to machine harvest and pruning.

With the techniques applied, the trees start to bear fruit between the third and fourth year; and can reach full production between the seventh and eighth year when grown under irrigation, and between the eleventh and twelfth year when dry-farmed. Productivity is high and constant (not less than 50 quintals per hectare or 4,500 pounds per acre) over a period of 40 to 50 years when the orchard is viewed as an aggregate unit.

Costs are curbed by mechanizing harvesting and pruning, which lowers labor requirements, specifically from 400 hours per hectare (160 hours per acre) needed on traditional orchards to no more than

120 hours per hectare (48 hours per acre).

High product quality standards are guaranteed by the fact that all the cultural practices are rationalized, the fruit is harvested quickly and the growing environment is carefully chosen. The choice of cultivar is another fundamental factor in ensuring that the orchard is a success. Particular caution is taken by pinpointing the varieties that are best adapted to the operating environmental conditions and that possess the qualities listed earlier. Cultivars from other environments or new cultivars must be properly tested before being introduced. In recent years, new olive cultivars have been developed that perfectly adapt themselves to modern intensive cultivation conditions. These varieties are now available and are performing very well as cultivars for oil.

Intensive Orchards

Careful consideration must also be given to planting intensity if we bear in mind that layout has a decisive impact on the length of time it takes to achieve top production levels. The choice of layout depends on cultivar vigor, training shape and environmental conditions, particularly soil fertility, moisture availability and solar radiation. The training shapes adopted for the IRO-CNR model are prevalently upward-developing like the monoconical, spindle, or free single-trunk shapes. With these, crown development is swift, the trees start to bear early, pruning costs are considerably lower and the trees are suited to mechanical harvesting and pruning. Since they produce predominantly upward growth, they also allow greater crop intensification as they can take more closely set layouts than other training shapes used in olive farming. Given that in the first 10 to 13 years of planting production is correlated with the number of trees per unit of area, the model adopts what is known as the "dynamic layout" when the trees are growing on fertile soil and moisture is available. This layout involves planting the olives closely together along the row (three to four meters or 10 to 13 feet) and six to seven meters (20 to 23 feet) between rows. Compared with the customary layouts (six by six meters or 20 by 20 feet; seven by seven meters or 23 by 23 feet), this makes it possible to double the quantity of crop obtained, at least during the stage of ascending production (third

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to 15th year). Correct application of the training shapes indicated makes it possible to avoid competition between contiguous plants in the row. The trees can be chinned out between the 10th and 12th years of planting. Even better, they can be left if they are properly pruned, manually or mechanically, to prevent excessive radial growth of the crown.

Mechanical Pruning and Harvesting

The IRO-CNR has looked into machine pruning. 10 Years' work had led to the development of a trial method using tractor-mounted pruners which make a continuous slanted cut on the outer wall of the canopy. Pruning follows a three year cycle consisting of machine-pruning in the first year, no pruning of any kind in the second year, and hand pruning in the third. In the tests production rose sharply in the machine-pruned trees while labor requirements dropped drastically.

Machine harvest has seen the consolidation of multidirectional trunk shakers. Equipped with a lightweight head (about 85 to 160 kilograms to 185 to 350 pounds) and mounted on ordinary medium-power tractors (60-70 hp), they are coupled with plastic nets laid out manually underneath the trees or with catching frames to collect the olives as they are dislodged. In the first case there are five people on the harvest squad, one to drive the tractor and the rest to spread out the nets or unload the olives; worker efficiency is 80 to 100 kilograms per day (220 pounds per day). In the second case there are no more than four people on the squad and harvesting performance is slightly better.

An Operational Model

The IRO-CNR model described here has become operational. Since the scan of the 1980s, many olive farmers in Italy have started updating their equipment, initially testing them on small acreages and then extending them over larger areas once they have checked the model's performance.

At this point in time it is hard to hazard a guess as to how many new intensive mechanized olive orchards have started up in Italy in the last 10 years. We could reckon, however, that there are by now about several thousand hectares of such orchards spread throughout the country, with a greater concentration in central Italy. This is quite a fast-developing phenomenon which tends to contrast with the other feature of Italian olive farming in the last fifteen years, namely gradual abandonment of difficult olive farming areas, which has caused an overall reduction in olive acreage and an attendant falloff in production.

On a trip to the United States in spring of 1993, we saw that certain areas in California present ideal conditions for olive cultivation according to the model described above, from the standpoints of both climate and soil conditions. The data indicated above hold promising perspectives for those interested in growing olives for oil in California according to modern intensive techniques.

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