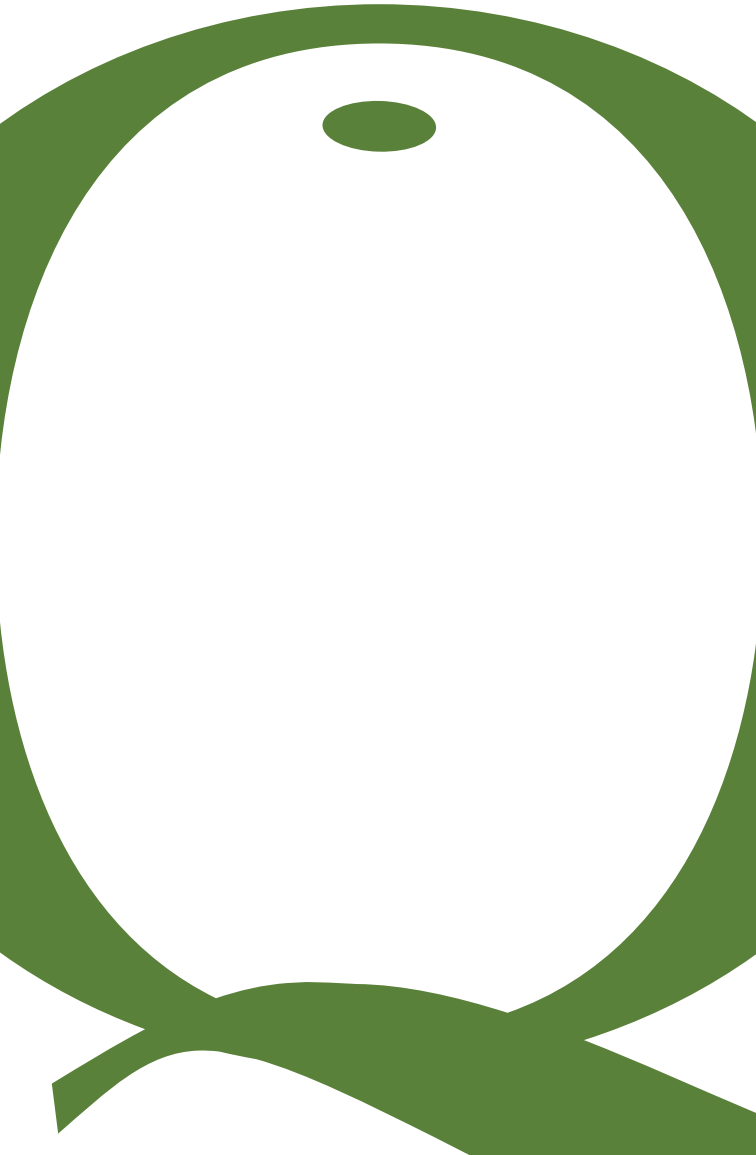
Guide for the production of quality in the field



Guide for the production of quality in the field

CEQ is a consortium that promotes and protects the quality of extra virgin olive oil, extending the concept to the entire production process, from cultivation to marketing and conservation. The aim is to ensure that the consumer receives an excellent product from both an analytical and a sensorial point of view, and that this is achieved while fully respecting the environment. Conscious of the fact that quality is developed in the field, CEQ proposes a set of guidelines to follow in order to produce a high quality extra virgin olive oil, based on rational criteria for olive grove management.

1

Healthy, undamaged olives

- Producing olives following rational, scientific criteria in order to prevent damage to the fruit.
- Protecting the fruit from dehydration, freezing or damage caused by olive fruit fly attacks *(Bactrocera oleae)* and mechanical damage in general.

Oil is a product that is subjected to very little manipulation from the moment of harvest to the marketing stage. Unlike other processed products, is almost impossible to add quality to poor raw materials, on the other hand it is relatively easy to spoil great fruit through lack of attention and poor decisions at all stages of the production process, from the field to the table. This is why it is particularly important to avoid damaging the fruit.

2

A coherent choice of olive varieties according to the production area

- Combine multiple genotypes to obtain harmonious oils with different characteristics, enhancing the qualities of each single variety.
  Choose interfertile varieties that are well adapted to the pedo-climatic conditions of the cultivation area and which can provide well-balanced oils, rich in oleic acid and phenolic compounds with a wide variety of sensorial notes.
- Any variety of olive is able to produce extra virgin olive oil, if properly processed. There are, however, considerable varietal differences in relation to the fatty acid composition, the concentration of phenolic compounds and volatile compounds that form the sensory descriptors.

From a sensorial point of view, there are olive varieties whose oils are characterized by notes of green almond, others by hints of tomato, artichoke, cardoon and so on. There are also rarer cases in which the oil is characterized by very specific sensations, such as berries or herbs.

3

Correct cultivation methods

- Choose to train the tree structure into forms that leave the foliage "free", requiring no more than 100 labour hours per hectare if the pruning is done manually. The foliage must have a high ratio of exposed surface to volume and should not be more than 5 m high.
- High plant density is preferable, over 250 plants/ha, to achieve maximum productivity.

The cultivation method does not affect the quality of the oil as long as good light penetration and uniform distribution of the fruit are both ensured. For this reason, for the last decade the pruning technique employed has favoured "free" tree shapes, achieved by implementing minimal pruning for the containment of production costs. The pruning techniques and the training system employed in the groves have a significant influence on the productivity of the olive trees. Trees that do not exceed 5 m in height and that have foliage with a high ratio of exposed surface and volume tend to be more productive than those with a low surface-volume ratio.

4

Soil management and controlled grassing

- Sow grass between the rows of trees.
- Start grassing from third to fourth year of the grove, so as to avoid impediments to growth and delays in becoming productive.

Soil management through controlled grassing does not change the characteristics of the oil, but significantly improves the physical, chemical and biological properties of the soil compared to periodic processing techniques or chemical weed control. This practice increases the porosity of the surface layers of the soil and in particular of the elongated and irregular pores, which are important for root penetration, water infiltration and the diffusion of gases. The positive effects of this technique on the structural elements of the soil surface and in preventing the erosion are mainly due to protection from the consequences of driving rain and to the increase in stability of the soil particles and micro-aggregates from the fine roots.

5

Organic fertilization – a priority

- Estimate the olive tree's need for nutrients by analysing the soil, the leaves, or by calculating the amount removed or lost.
- Fertilise with nitrogen when the olive tree becomes productive, with 2-3 applications starting from germination, it is preferable to fertilise through irrigation or by applying it to the leaves

Take an olive grove in production, without pronounced alternation, managed on a yearly basis with light pruning, expected production would be 20 kg of olives and 12 kg of olive leaves and branches - the elements removed are approximately 200 grams of nitrogen, 160 grams of phosphorus and 190 grams of potassium. Fertilizers can be administered to the soil, through the leaves or during irrigation (fertigation).
If administered to the soil, the dose of the element removed needs to be increased by 50-100% depending on the degree of humidity of the soil. If administered to the leaves or by fertigation, distribute the dose of fertilizer calculated. The use of organic fertilizers can reduce or prevent the depletion of organic matter in the soil and preserve the fertility and productivity of soils. Organic fertilizer is usually slower to take effect but more long-lasting than mineral fertilizers.

6

Deficit irrigation

- Apply deficit irrigation by administering only 30-70% of the volume of water required for full irrigation.
- Distribute the water in the olive grove locally, that is in small quantities, at low pressure and in a restricted volume of soil.

The olive tree is productive in areas with 500-600 mm of annual rainfall. Below this level is is necessary to irrigate to obtain high production. Generally speaking, 50 mm seasonal irrigation in humid climates and 100 mm in drier climates are sufficient levels to significantly increase productivity. Deficit irrigation has three main objectives: reducing water consumption, maintaining production at levels comparable with fully irrigated trees and improving the quality of the fruit for table olives and olive oil.

7

Harvest slightly before ripening

- Harvest rapidly, with mechanical tools or facilitators as far as possible.
- Harvest the olives when the pigmentation of the skin has reached about 50% of the surface.

The use of vibrating-shaking machines or straddling harvesters allows for 90% higher yields than manual harvesting, even when the harvest is carried out early.
It is necessary to have a single trunk in order to harvest with vibrating-shaking machines, while the crown of the tree should be small to use straddling harvesters.
Only a few varieties do not provide good yields with trunk vibrating-shaking machines. Pneumatic combs or other facilitators allow for greater flexibility, but costs are higher in comparison with mechanical harvesting.

8

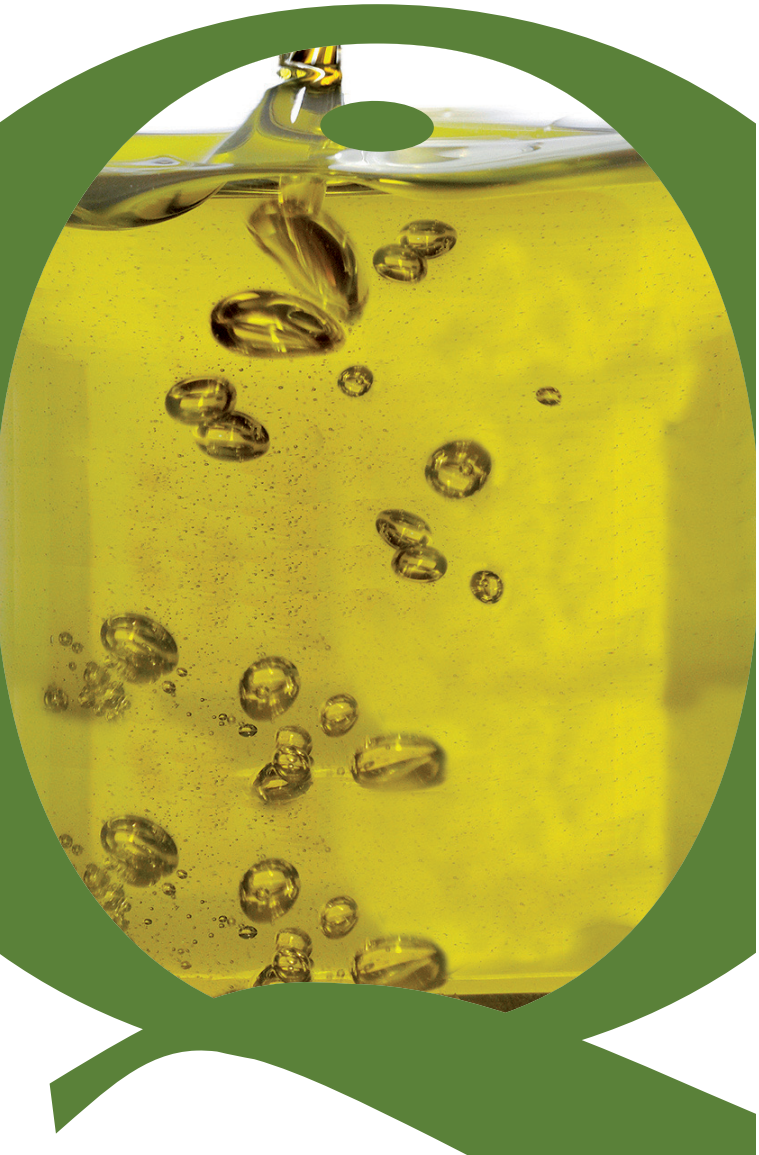
Keep the interval between harvesting and milling the olives as short as possible

- Store the olives in thin layers, in a dry and ventilated environment.
- Do not let more than 24 hours pass between harvesting and crushing.

Minimizing, as far as possible, the time between harvest and milling significantly increases the quality of the oil extracted. This aspect is often underestimated by producers, who pay more attention to other aspects that are important but less effective. Reducing the time the olives spend on the farm or at the mill involves a greater commitment to organization, but produces excellent results where quality is concerned.

9

Monitoring and timely intervention regarding Bactrocera oleae, the olive fruit fly, a major pest in the olive grove.

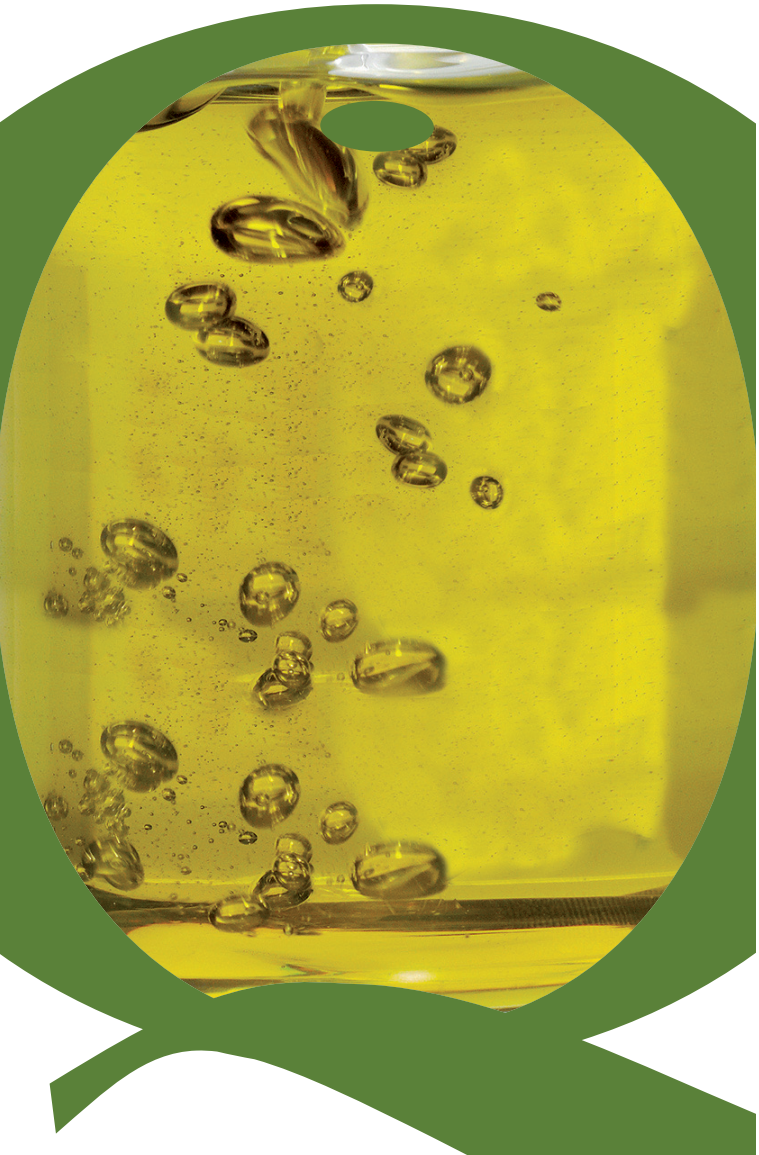


- Quantify and qualify infestation by sampling at least 100 olives/ha. Randomly gather one per plant.
- Conventional defence sees the use of phosphate esters if the presence of eggs and live larvae of the first and second stage is over 10-15%.
  Organic actions, if the area of farm is larger than two hectares, should focus on strategies to reduce the adult population by use of an insecticide with a natural active ingredient, Spinosad, which should only be applied to parts of the crown and on 50% of plants in the affected olive grove.
  Take action when the first adult specimens are caught, detectable using 2-3 traps/ha. In olive growing areas with a moderate risk, use organic methods to contain infestations: repellents and/or products to dissuade egg-laying to be distributed on the foliage, for example silicate clays like kaolin.
  Take action as soon as the first adults are caught.

The larvae of this fly feed on the mesocarp of the fruit, causing biochemical changes that are strictly dependent on the extent and type of infestation present, which may in turn jeopardise the quality of oil. They cause qualitative damage to the fruit due to the oxidation of the pulp through the exit hole opened by the third-stage larvae.

10

Preventive diagnostics for minor pests and diseases



- Determine the ideal time to treat against the olive moth *(Prays oleae)* and Margaronia *(Beats unionalis)*, if necessary, after assessing the degree of infestation of the affected parts of the tree.
- In conventional olive cultivation, implement systemic or cytotropic insecticides, typically phosphoric esters, that are authorized for this use. In the case of the olive moth, take action against the second stage generation when at least 15% of the olives show signs of attack.
- Use growth-inhibiting insecticides, such as Buprophezin, to suppress juvenile stages of black scale *(Saissetia oleae)*. Intervene when the population density is higher than 5-10 juveniles/leaf.
- In organic olive production, use *Bacillus thuringiensis* to contain significant infestations of primary generation olive moth and to limit any infestations of Margaronia, both in the nursery and in the field.
- Use light mineral oils, paraffin in particular, against the earlier juvenile stages of black scale.
- Carry out precautionary treatments at the end of winter and after the first rains of autumn, using copper-based products, hydroxides or oxides, both in integrated and organic olive farming in order to fight the mildew "olive peacock spot" *(Cycloconium oleaginum)* and the spread of bacterial olive knot *(Pseudomonas siringae pv. savastanoi)*.

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