



COVER CROP MANAGEMENT



DISMANTLING PREJUDICES

One of the most deeply rooted social beliefs within the ideological realm of olive farming is that herbs growing in the soils of olive groves are harmful by their own nature.

Contrary to such extended belief, well-managed cover crops deliver a long list of benefits to olive groves, subsequently **resulting in direct and indirect economic profitability gains.**

They improve machinery operability: a mature plant cover usually facilitates the passage of machinery, allowing harvesting in very rainy years in areas where this would be difficult if the soils were tilled.

They improve air quality: cover crops, along with the suppression of the burning of pruning wastes (which are commonly crushed and remain in the inter-rows), significantly reduce the emission of greenhouse gases that are the key cause of global warming.



They increase the content of soil organic matter: tillage aerates the soil, which intensifies the decomposition of organic matter and thus, the release of CO₂ into the atmosphere. Cover crops reduce this effect considerably. Furthermore, the decomposition of plant wastes on the soil surface favors the incorporation of organic carbon into the soil. Both increasing carbon sequestration and decreasing CO₂ emissions contribute positively to climate change mitigation.

[extra info](#)

They reduce costs: the use of cover crops tends to decrease the number of field-based working hours and thus the working costs, in comparison with tillage.

They improve rainwater infiltration: the herbaceous roots, along with the organic matter supplied by the cover crop, increase the porosity of the soil, resulting in a spongier structure that improves water infiltration rates.

They increase soil fertility: green plant covers increase almost all soil fertility indicators, since they retain nutrients that would otherwise escape from the farm through soil erosion and surface runoff. Including legumes in the cover crop implies the activation of a free flow of nitrogen from the atmosphere into the soil of the farm.

[extra info](#)

They increase biodiversity: micro and macroinvertebrates find in olive groves with vegetation cover a suitable environment to feed, reproduce and develop themselves, increasing their populations significantly. Maintaining a biodiverse fauna is usually highly beneficial for olive groves, since it guarantees the presence of natural predators of key pests.

They reduce soil erosion: cover crops protect the soil against the impact of raindrops. In most Andalusian olive-growing areas, reductions of more than 80% of soil erosion rates have been measured in non-tillage with respect to tillage olive groves

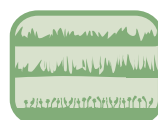
[extra info](#)

DID YOU KNOW THAT...

to promote the development of spontaneous green plant covers, fertilization with **composted olive mill pomace or manure** is highly recommended? Specifically, in a dose of **between 3 and 5 tons per hectare** applied along the inter-rows at the beginning of autumn or following olive harvesting, and at least for a couple of years.

THE COMMON QUESTIONS

WHAT TYPES ?



SPONTANEOUS, consisting of herbs that germinate spontaneously within the soil seed bank.
SEEDED, normally grass species (barley, brome, *Brachypodium*, etc.) with a short growth cycle, although these can be mixed with legumes with high self-sowing potentiality.

A spontaneous herbaceous cover is cheaper to implement, but becomes dependent on the health of the seed bank and the fertility of the soils, which in many cases can be seriously diminished.

WHEN ?



Cover crops need to be mowed to minimize the possible competition rates with olive trees for the water available which in Mediterranean areas tends to be short and irregular. It is unrealistic to provide with an estimate date for all types of covers and locations although, generally speaking, mowing is recommended during the period **between the third week of March and mid-April**. These dates can be advanced or delayed depending on:

- **Soil types.** Shallow soils should be mowed sooner since they retain and store little water. In the case of deeper agricultural soils, harvest dates can be delayed since their water reserves are generally higher.
- **Farming characteristics.** Under colder climate conditions, for example in mountainous areas, olive groves show a delay in the vegetative development of both herbs and olive trees and thus, cover crops should be mowed later.
- **Weather conditions.** The mowing dates can be pushed back during wet years without risk of competition for water. Conversely, during dry and hot years, these dates should be brought forward. Regardless of the delay in the mowing date, the herbaceous cover should not be mowed later than the second half of April, since water losses due to evapotranspiration from cover crops could negatively affect olive production rates. In any case, if weather forecast indicates an absence of rain for the following weeks, this should then be the adequate time to think about mowing green plant cover.

WHERE ?



Cover crops can be found occupying the entire ground surface of the olive grove, or alternatively be distributed in bands of a certain width in the center of the inter-rows and arranged perpendicularly to the line of maximum slope. The benefits shown on this Practice Abstract are amplified when the vegetation cover occupies the entire surface of the olive grove soil in relation to when it is arranged in bands.

[extra info](#)

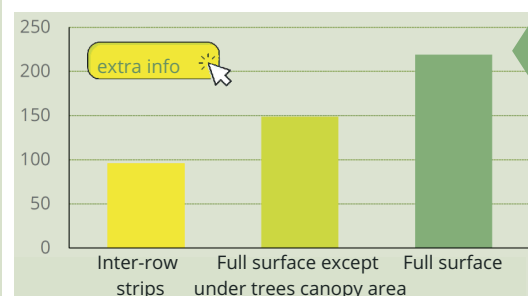
HOW ?



Generally, we would recommend applying mechanical or tine mowing, avoiding where possible the use of herbicides. Regarding mechanical mowing, which is the most widespread approach, brushcutters are used that can have either chains, blades (not recommended in stony areas), hammers (the most commonly used ones), and hoses (preferred for mechanical control of the canopy at the foot of the trees).

Periodic mechanical mowing along many years can trigger the appearance of vegetation species that are difficult to control and have a great capacity for regrowth (mallows, *Conyza*) and also of quick grasses (bindweed, gherkin) that escape mechanical clearing. That is why it becomes such a good idea to apply, in olive groves with little risk of erosion, a cultivator every certain number of years, to control the green cover. Harvesting is commonly used in olive groves where integrating sheep flocks is an option; under such conditions, the olive farmer saves the financial cost of mechanical mowing whilst sheep manure fertilizes the grove, resulting in a win-win situation.

KEEP IN MIND THAT...



[extra info](#)

Price (€ per hectare and year) of CO₂ eq. in the international market in the case that agriculture was to be fully included in the trade of CO₂ eq. Reference price: €84.6 per ton of CO₂ eq. - dec. 22)

Voluntary carbon markets are lately being launched in which olive farmers can participate. According to SUSTAINOLIVE estimates, olive farmers who maintain green cover crops over the entire surface of their farms could earn, in compensation for their contribution to climate change mitigation, an amount **125% to 50% higher** than those who keep inter-row herbaceous strips or remove the herbs under trees canopy area, respectively.

In contrast, olive farmers who leave the soils of their farms completely bare will see these financial compensation gains reduced and, in the worst cases (farms that act as sources of net CO₂ emissions), farmers will **need to pay for their contribution to the intensification of climate change.**

[extra info](#)