Collection of Practice Abstracts

G5

the good practices

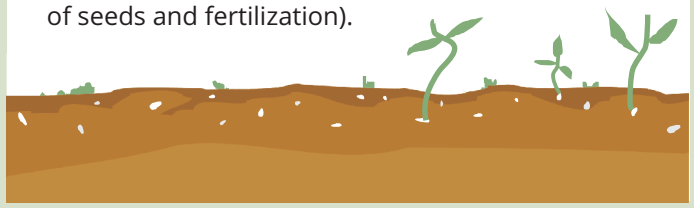
THE COVER CROP

THE RESULTS OF SUSTAINOLIVE

SUSTAINOLIVE.EU

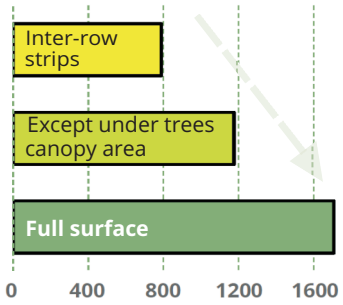
SPONTANEOUS OR SEEDED ?

Soils in olive groves host seed banks that tend to sprout **spontaneously** upon the rainy season. **Seeding** cover crops is a valuable option for soils severely affected by intensive tilling practices and long-time herbicide exposure, allowing farmers to select the species they consider more valuable and effective. However, the implementation of seeded cover crops is often linked to an economic cost (purchase of seeds and fertilization).



A NOVEL EXPERIMENT

240 experimental plots of olive groves were selected in different Andalusian provinces to check for the beneficial effects of cover crops. The only feature that all plots had in common was that they had maintained herbaceous cover crops for at least the last 8 years. The management model (intensive, semi-intensive, traditional), the plantation framework and remaining characteristics of each of the farms were extremely variable.



Average weight of dry aerial biomass (kg per hectare and year)

40 experimental plots had their entire surface covered, 60 preserved the herbaceous cover at full surface except under the canopy of the olive trees and the remaining 140 experimental plots had stripped inter-row herbaceous cover crops. Our initial hypothesis was that **the greater the amount of herbaceous aerial biomass in each olive grove, the greater the amount of agroecosystem services delivered and, therefore, the greater the number of values** of the olive farm, both ecological and economic.

ONE REMARK

(Agro)ecosystem services are the benefits that (agro)ecosystems provide to society by improving people's health, economy and/or quality of life.

IT´S ALL ADVANTAGES

Cover crops in an olive grove:

- Increase the **levels of organic matter** and all soil **fertility** indicators
- **Capture carbon dioxide** (CO_2) from the atmosphere and store it in the soil as organic carbon, thus helping **mitigate climate change**
- Provide an **extra supply of nitrogen** to olive trees in the case of legumes
- Promote **nutrient retention**
- Promote **mycorrhizae** (associations between the roots and some fungi that provide olive trees with nutrients)
- Provide **habitats for natural enemies** of some olive grove pests
- Increase **water infiltration** and, therefore, might improve the amount of **water available** for olive trees
- **Retain the soil** and significantly reduce **the rate of soil erosion**

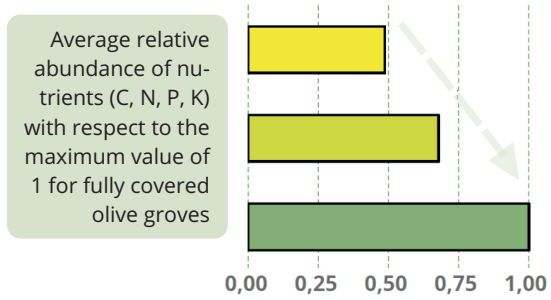
extra info

DID YOU KNOW THAT...

70% of the rainfall that olive groves receive in the south of Spain are mainly concentrated between autumn and spring, just when olive groves are less active biologically and thus use less water ?

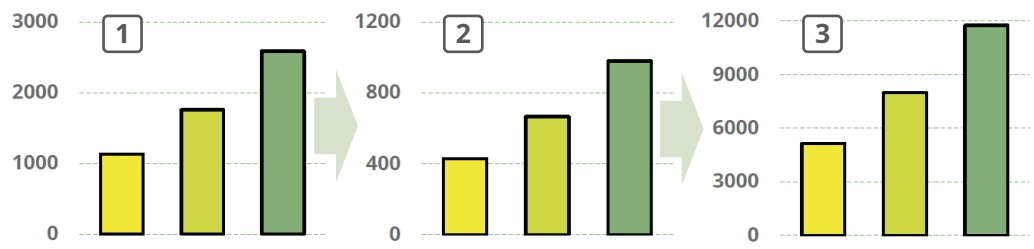
Maintaining a cover crop adequately controlled that **increases the soil water reserve over time and prevents water losses due to runoff** is an excellent decision.

SOME INTERESTING FIGURES OBTAINED IN EXPERIMENTAL OLIVE GROVES



Average relative abundance of nutrients (C, N, P, K) with respect to the maximum value of 1 for fully covered olive groves

Cover crops occupying the entire surface of the olive grove showed on average 32% and 51% more essential nutrient retention within the farm than that excluding the area under trees canopy and that exhibiting inter-row strips, respectively. In the case of carbon, olive groves **fully covered captured a significantly greater amount of CO_2** (graph 1).



kg of CO_2 captured by cover crops in 1 hectare of olive grove for 1 year

How many liters of diesel would have to be consumed to emit as much CO_2 as that captured by the cover crop of 1 hectare of olive grove for 1 year?

How many kilometers would be travelled thanks to that amount of fuel?

When the quantity of diesel that would have to be consumed to produce this amounts of CO_2 is estimated (graph 2), the resulting figures are really significant:

The extra fuel derived from fully covered olive groves compared to the management excluding trees canopy area would allow a car to travel 3.800 km (graph 3).

3.800 are the kilometers that separate **A Coruña from Kiev (Ukraine)**

The extra fuel derived from fully covered olive groves compared to those using inter-row strips covers would allow a car to travel for 6.600 km (graph 3).

6.600 are the kilometers that separate **Madrid from Punta Cana** (Dominican Rep.)

KEEP IN MIND THAT...

livestock grazing (mainly sheep) in olive groves makes it possible to **control cover crops**, reducing the tillage and the use of herbicides that might end up polluting soils and groundwater, thus affecting human health. In addition,it represents a **complementary economic activity** that allows farmers to diversify their businesses and obtain food for their own consumption.

A **flock of 50 sheep** grazes around **45 tons of dry plant biomass per year**, an amount equal to the weight of 10 medium-sized 100-hp agricultural tractors.

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