



**NATAE**  
North African Transition  
to AgroEcology

# Permanent soil cover in the Mediterranean

## Agroecological zones

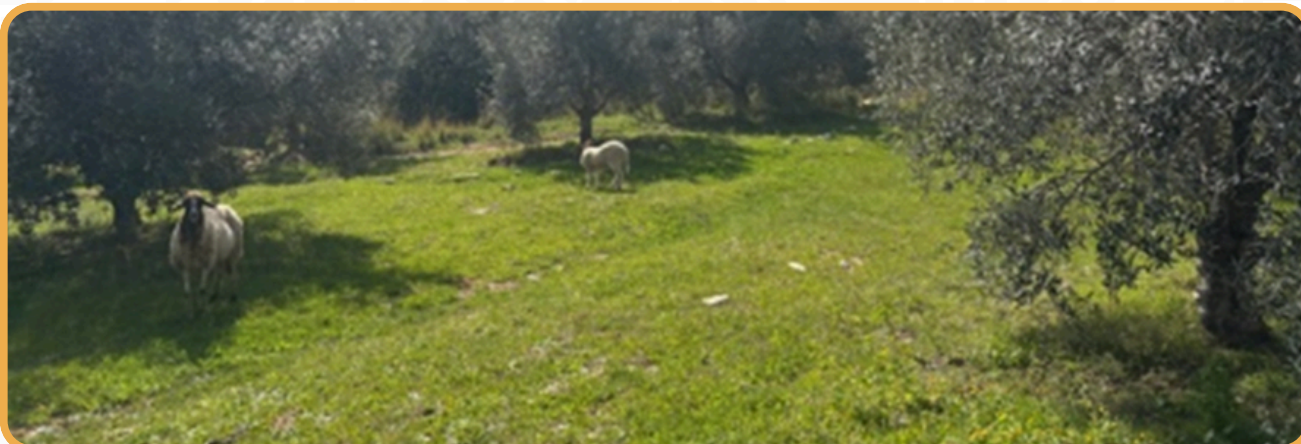
Mountains

Cereal Plains

### Introduction



Source: INAT, Tunisia



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Permanent soil cover is a practice that can be applied to a variety of agricultural systems. It helps reduce erosion, conserve soil moisture, manage weeds and improve fertility.

## Soil cover in conservation agriculture field crop systems

Permanent soil cover with a crop or crop residue is one of the pillars of conservation agriculture. This involves establishing long rotations, diversifying crops, mixing crop species or varieties or conserving crop residues. In the non-irrigated cereal systems of North Africa, legumes, industrial crops and cereals are grown from October to June. At harvest, and in the absence of crops that can be planted during the hot, dry summer months, the only alternative is to keep crop residues on the land for permanent cover. For irrigated cereal systems, several rotations can provide permanent soil cover, such as cereal-tomato, cereal-legume-sorghum or cereal-legume-corn rotations.

### Challenges and limitations

- **Permanent cover:** In arboriculture and viticulture, spontaneous species can be maintained between the rows of plantations, or even sown. Maintaining these crops protects the soil from erosion and improves water infiltration. The cycles of the different species overlap, and these plants capture carbon, absorb minerals during their development cycle and release them into the soil at a later date, providing fresh plant matter for soil fauna and microorganisms, thus improving soil fertility. During the dry season, the residues of these plants form a mulch that protects the soil from erosion and high temperatures.

Permanent grass cover is generally managed, where necessary, by grazing or mowing, or, in the case of small farms, by brushcutting. Monitoring the evolution of the cover is necessary to maintain species diversity.

- **Intercropping:** In arboriculture, several crops can be planted between rows of fruit trees, helping to enhance biodiversity, improve soil fertility, protect the soil from wind and water erosion and diversify income. Leguminous plants, associated with rhizobia, enrich the soil, in nitrogen, benefiting the trees. In the Mediterranean context, olive-bean and olive-barley associations are fairly common in rainfed systems (**see Intercropping in olive groves factsheet**).

Intercropping must be carefully managed so as not to create competition between the crop and the fruit tree for resources, particularly water. Crops are planted during the tree's vegetative rest, which corresponds to the rainy season.

### Mulching

**Mulching**, whether organic (straw, hay, compost, plant residues) or plastic, offers several advantages:

- **Moisture conservation:** Mulching reduces water evaporation and improves soil moisture retention, which is crucial in Mediterranean regions where water is a limited resource.
- **Reduced erosion:** Mulching protects the soil surface from the impact of rain and wind, thereby limiting erosion.
- **Improved soil structure:** Organic mulch decomposes into organic matter, improving soil structure and fertility. It provides a habitat for soil organisms that actively contribute to the decomposition of organic matter.

**Plastic mulching** eliminates weed competition. Artificial mulching is used in market gardening and arboriculture. However, the sustainable management of plastic waste is a constraint, as recycling channels are not always available. Biodegradable and compostable films, in particular those based on corn starch, offer an ecological alternative.



## Challenges and limitations

Maintaining plant cover or crop residues can sometimes prove difficult due to overgrazing, which can also lead to soil compaction. Controlled grazing can be an effective way of minimizing these drawbacks, or even an agroecological practice to improve soil fertility. Fodder banks can also be considered (agroforestry practice consisting in the planting or sustainable management of woody species with high plant biomass production and good feed nutritional value, particularly in the dry season).

The time required for mulching, and possibly its cost (purchase, transport), should not be overlooked.

Plastic mulch, which can also be woven fabric, must be combined with sensible waste management, particularly for those with a short lifespan.

In arid zones, maintaining an organic mulch requires irrigation during periods of water stress. Drought-tolerant species should be preferred.



Source: INAT, Tunisia



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