

# Cover crops for pest control in Mediterranean citrus orchards

## Problem

New challenges in Mediterranean citrus pest control are invasive pests (two new species of mealybugs) and the resurgence of whiteflies (*Dialeurodes citri* and *Paraleyrodes minei*).

## Solution

Planting cover crops (sown covers or spontaneous wild covers) can be a good solution to support natural enemies and improve pest control.

## Benefits

Cover crops benefit both natural enemies and soil composition, while supporting pest control. They offer shelter and food to natural enemies (predators, parasitoids and phytoseiids) and improve soil resilience to extreme weather events, such as heavy rains and organic matter.

## Practical recommendation

- Vegetation covers can be spontaneous or sown (cover crops). Even if sown, they will tend to become natural cover over the years (Picture 1c). The Mediterranean shrub flora is varied and can be in flower most of the year.
- Cover crops can be:
  - Mixed grasses (Picture 1a) which are drought resistant, conserve soil and increase organic matter (e.g., Festuca, Lolium, Bromus...)
  - Leguminous mixtures (Picture 1b) which fix nitrogen and increase soil fertility. Widely used in organic farming (Trifolium sp., Alfalfa...).
  - Mix legumes and grasses to combine the benefits of both above.
  - Mix of flowers (Picture 1d) using local plant species that flower most of the year.
- Sow coverer crops in spring or autumn. Sowing rate of 25-50 kg/ha. Temper or water the soil after sowing; otherwise, the ants will carry away the seeds. Sometimes it is necessary to reseed the following season.
- Maintenance (or tillage): Mow about 2-4 times a year (depending on rainfall intensity). With a mower (Picture 2) or a mulcher (at a maximum height of one inch).

## Applicability box

### Theme

Crop production, Citrus fruits, Disease and pest control

### Keywords

Citrus, Plant protection, Pest control, Biological control, Natural enemies

### Context

Mediterranean basin

### Application time

Spring and autumn

### Required time

One year

### Period of impact

From 1 to 3 years

### Equipment

Mower or shredder

### Best in

Organic farming/conventional farming



Picture 1a) Different types of ground cover a) sown with grasses. Photo: Vercher, R., Ecovalia



Picture 1b) sown with leguminous plants. Photo: Vercher, R., Ecovalia



Picture 1c) wild ground cover. Photo: Vercher, R., Ecovalia



Picture 1d) sown with a mix of 26 species of Mediterranean plants. Photo: Vercher, R., Ecovalia



Picture 2. Mowing of vegetation covers with tractor-adapted mowers. Photo: Vercher, R., Ecovalia

## Further information

### Video

- [Citrus pest control. Plant covers and natural enemies.](#) (ES)

### Further reading

- Aguilar-Fenollosa, E., Ibáñez-Gual, M.V., Pascual-Ruiz, S., Hurtado, M., Jacas, J.A. [Effect of ground-cover management on spider mites and their phytoseiid natural enemies in clementine mandarin orchards \(I\): Bottom-up regulation mechanisms](#), Biological Control
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- Gómez-Marco, F., Urbaneja, A. Tena, A., [A sown grass cover enriched with wild forb plants improves the biological control of aphids in citrus](#), Basic and Applied Ecology
- Sorribas, J., González, S., Domínguez-Gento, A. Vercher, R. [Abundance, movements and biodiversity of flying predatory insects in crop and non-crop agroecosystems](#). *Agron. Sustain. Dev.* **36**, 34 (2016).

### Weblinks

- Check the [Organic Farm Knowledge platform](#) for more practical recommendations.

## About this practice abstract

**Publisher:** Ecovalia, Edificio Insur, Avda Diego Martínez Barrio, nº10, 1ª Planta, Módulo 12, ES-41013 Sevilla  
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**Permalink:** [organic-farmknowledge.org/tool/44866](https://organic-farmknowledge.org/tool/44866)

**Project name:** BIOFRUITNET- Boosting Innovation in ORGANIC FRUIT production through stronger networks

**Project website:** <https://biofruitnet.eu>

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