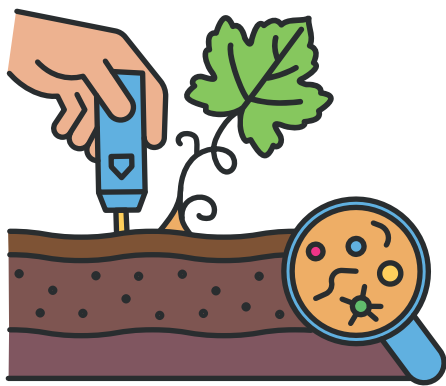




# GREEN INFRASTRUCTURE IN WINE-GROWING LANDSCAPES

Nature-based solutions and recommended  
best practices in vineyards

## Identified problem:

Vineyard crops are susceptible to **pests and diseases**, which can cause significant damage to grape production and quality. In conventional systems, **synthetic chemical pesticides** are used to combat them, which generate a series of side effects (environmental contamination from chemical residues, imbalances in non-target communities, development of resistance, etc.) that degrade natural resources and reduce biodiversity and the landscape values of the environment.

## Best practice recommended by ECOSPHEREWINES:

### USE OF BIOPESTICIDES AND OTHER BIOCONTROL STRATEGIES

For pest and disease control in sustainable viticulture, the following alternatives to synthetic chemical pesticides are noteworthy: 1) the use of agricultural **biopesticides**; 2) the release of natural enemies of pests (**augmentative biological control**); and 3) the adoption of practices aimed at preserving and promoting natural enemies (**conservation biological control**). These alternative techniques cause less environmental pollution, are safer for human health and ecosystems and, as a result, reduce the associated economic costs. When properly managed, they provide **diverse** environmental, social, economic, and cultural **benefits**, commonly described as **ecosystem services**.

## How can this best practice be implemented?

**Select one** of the following techniques for controlling and/or eliminating pests and diseases, as an alternative to synthetic chemical pesticides, in order to promote sustainability and increase the quality of wine production:

### 1. Use of biopesticides, from which you can choose:

- Microbial agents (fungi, yeasts or bacteria) that compete with pathogens or produce substances that inhibit their growth.
- Entomopathogenic fungi and bacteria that cause the death of insects.
- Mycorrhizal fungi, which form symbiotic associations with plant roots, improving nutrient and water absorption and allowing greater resistance to stress and protection against pathogens.
- Entomopathogenic nematodes, which parasitise insects, causing their death.
- Use of synthetic pheromones (sexual confusion) that disorient males, preventing insects from mating and, consequently, reducing pest populations.

### 2. Biological protection strategies based on:

- Release of specific natural enemies.
- Selection of conditions that favour the presence, multiplication and action of natural enemies in the vineyard, such as the creation of spaces with native vegetation (biological corridors such as hedges and plant cover) that serve as shelter and food.
- Planting of trap crops that attract pests and allow natural enemies to feed on them.

## What ECOSYSTEM SERVICES do biopesticides and other biocontrol strategies provide in the vineyard landscape?

### • Provision:

- Safer and more environmentally friendly agricultural production, with less pesticide residues.

### • Regulation:

- Natural control of pests and diseases and prevention of resistance to synthetic pesticides, by diversifying control methods and limiting their use.
- Reduced risk of soil, water and atmospheric contamination, improving soil fertility and health and promoting soil activity and structure.
- Protection of soil and environmental biodiversity, and improved ecosystem health and nutrient cycle efficiency.

### • Cultural:

- Improved acceptance of wine products by society, as they come from more sustainable harvests.



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