



GREEN INFRASTRUCTURE IN WINE-GROWING LANDSCAPES

Nature-based solutions and recommended
best practices in vineyards

Identified problem:

Tilling the soil is a widely implemented practice in some wine-growing regions to prevent competition for resources (water and nutrients) between vines and ground cover vegetation. However, this practice can negatively affect biodiversity, affecting both the refuge areas and food sources of various animal species, as well as soil diversity and functioning. It also alters soil structure, promoting erosion and causing waterlogging due to compaction.

Best practice recommended by ECOSPHEREWINES: ESTABLISHMENT OF VEGETATION COVER

The introduction of **vegetation cover in vineyards** contributes to the conservation of soil structure, improving soil stability and resistance to adverse weather conditions, thereby promoting the long-term sustainability of the viticultural system. These covers also play an effective role in controlling erosion, especially during winter and in situations of heavy rainfall. Ground cover can be **sown** or spontaneous and may be **temporary** or **permanent**. Whenever possible, **priority** should be given to **spontaneous** cover, but cover can also be sown to correct nutritional imbalances, improve soil physical conditions or with the aim of introducing a second crop in the vineyard. When properly managed, they provide diverse environmental, social, economic, and cultural **benefits**, commonly described as **ecosystem services**.

How can this best practice be implemented?

- 1. Plan the vegetation cover:** allow naturally occurring vegetation to develop in the case of spontaneous covers. For seeded covers, define the species to be sown. If there is a risk of competition for water, species with short cycles and low water requirements should be selected. It is recommended to sow local species, adapted to the climatic conditions of the area, to ensure successful establishment of the cover. Depending on the desired benefits, it is necessary to select the appropriate species:
 - Grasses: they grow quickly and are effective in increasing organic matter and reducing erosion, reducing compaction and recovering nutrients from lower soil layers.
 - Legumes: they add nitrogen to the soil.
 - Cruciferous plants: they add potassium, reduce compaction and help control pests, diseases and unwanted weeds by releasing compounds that limit their growth.
- 2. Sowing:** preferably in autumn (just after the grape harvest) or also in spring (although with less success). Before sowing, till the soil superficially to break up and remove spontaneous vegetation.
- 3. Maintain the sown cover:** permanent covers are recommended (normally 5 years, extendable to 8-10 years), with periodic cutting to control growth, prevent water competition, facilitate transit and reduce the risk of disease. If the cover crops are incorporated as green manure, destroy them mechanically in March-April so that they do not compete with the vines.

What ECOSYSTEM SERVICES do vegetation covers generate in the vineyard landscape?

• Provision:

- Diversification of the production, generating extra income for the winery by introducing cover crops as secondary crop.

• Regulation:

- Natural soil retention, improving soil structure, porosity and permeability, limiting runoff, erosion and the transfer of plant protection products to nearby areas.
- Improvement in the natural availability of nutrients, reducing the need for fertilisation, allowing for the conservation and increase of organic matter and biological activity.
- Natural control of pests affecting the vineyard.
- Pollination of crops beneficial to the vineyard.
- Protection of plant diversity and, consequently, of beneficial arthropods and soil microorganisms.



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