



Delinat cover crops for vineyards

The key to any successful soil regeneration in vineyards lies in the choice of the right cover crop. At the Delinat Institute, we develop seed mixtures reflecting the current status of research and tailored to the different conditions found in vineyards. Legumes are used as an efficient nitrogen source. **The seeds of the main species are already inoculated with the required microorganisms**, helping the green manure effect to set in earlier. Small amounts of other herbs lead to enhanced adaptability and biodiversity.

Cover crops are used mainly for the following purposes:

- To add nitrogen to the soil and mobilise nutrients
- To stabilise the ecosystem through biodiversity
- To improve soil structure and aeration at depths
- To improve the soil's ability to retain moisture
- To activate soil life
- To build up humus
- To provide protection against erosion

The seed mixtures are well suited for soils with a pH-level ranging from 5 to 8. On very alkaline or acidic soils, bio-diversity will be more limited. **The high-growing seed mixtures contain seeds from over 50 different species.** It's composition will gradually change in the first years as annual, biennial and perennial species will dominate.

We recommend that you first treat soil with compost and biochar before sowing, thus promoting additional soil activation. In the first year, we advise you to cut back the crop with a view to suppressing weeds. **For aisle upkeep, we recommend the use of a bladed roller (www.rolojack.com).** As far as possible, mowing should only be done after flowering.

Winter cover crop

Seed mixtures for use in Southern Europe: Camena Winterwuchs Delinat V or Intersemillas INVERNAL SIMPLE/DIVERSO (Spain and Portugal). **Central Europe:** Camena Delinat VI

Area of application: high-growing species, for use in aisles (cover crops between rows)

Height: 50-150 cm **Sowing depth:** 2 cm, covered with soil

Sowing rates: Delinat VI: 5 g/m². Delinat V: 3g/m²

INVERNAL SIMPLE: 7 g/m² and INVERNAL DIVERSO: 6 g/m²

High-growing leguminous cover crop for a perennial cover crop

Seed mixtures for use in Southern Europe: Camena Hochwuchs Delinat II or Intersemillas ALTO SIMPLE/DIVERSO (Spain and Portugal). **Central Europe:** Camena Niederwuchs Delinat I

Area of application: high-growing species, for use in aisles (cover crops between rows)

Height: 80 – 150 cm **Sowing depth:** superficial (max. 1 cm)

Sowing rates: Delinat I/II: 2.5 g/m² ALTO SIMPLE: 6 g/m² and ALTO DIVERSO: 4.5 g/m²

Low-growing leguminous cover crop for a perennial cover crop

Seed mixtures for use in Southern Europe: Camena Niederwuchs Delinat II or Intersemillas BAJO SIMPLE A/B (Spain and Portugal). **Central Europe:** Camena Niederwuchs Delinat I

Area of application: Under the vines (1m wide) or covering the whole surface

Height: 10 – 30 cm **Sowing depth:** superficial (max. 1 cm)

Sowing rates: Delinat III/IV: 1.5 g/m² , BAJO SIMPLE A and B: 2 g/m²

Remarks: Cover crop containing grasses already existing should be removed before sowing.

Seed mixtures can be ordered from

Delinat Institute: Claudio Niggli, niggli@delinat-institut.org Tel.: +41 27 203 50 11

Puede pedir las mezclas de semillas a través de Intersemillas (España y Portugal)

Francisco Serrano Jumilla, Telf. +34 96 164 01 01, Fax. + 34 96 166 84 83, www.intersemillas.es



Further strategies: Permanent cover crops

The goal of a sustainable culture is to have a cover crop needing a minimum of care for several years. The best conditions for optimal soil life are when the soil remains undisturbed. Under such conditions, symbiosis between soil life, vines and green cover can be formed. The plants break down and improve the structure of the soil to great depths, thereby improving the soil's long-term capacity to retain moisture.

High-growing leguminous cover crops:

Area of application: Aisles. Recommended in particular for poor and compacted soils with a low humus content. Vigorous cover crops have the advantage of building up greater amounts of humus and producing more nutrients. Soil structure is improved at depth. After rolling, part of the cover crop will continue to bloom, thereby promoting bio-diversity.

Sowing: Early in spring (or early in autumn). In vineyards where the grapes mature late, sowing can be done before the harvest. Wherever possible, shortly before any rainy period. Sowing superficial in a strip of 50-100 cm, depending on water supply, sow at least 70cm away from vines. If possible, roll in seeds.

Southern Europe (dry summers): When using the high-growing seed mixtures, we recommend a cover crop in every 2nd, 3rd or 4th aisle. The remaining aisles either have a winter cover crop or are covered with low-growing legumes. In the 4th or 5th year, the existing cover crop can be tilled in. Other aisles not previously permanently covered are then sown.

Seed mixture: Delinat II or Intersemillas ALTO SIMPLE/DIVERSO (cf. p.1)

Moderate climate with summer rainfall: In such cases, every 2nd aisle should have a cover crop. Where the soil is deep, the remaining aisles are put under a cover crop in the following year.

Seed mixture: Delinat I or Intersemillas ALTO DIVERSO (cf. p.1)

Low-growing leguminous cover crop:

Low-growing and non-vigorous cover crop. Suitable for use under vines. Where soil is not deep, may also be used in aisles. Also recommended as a full cover crop where vine density is high or in steep vineyards. Minimum soilwork. Can also be mown between low-growing vines.

Sowing: Wherever possible, just after the grape harvest. Otherwise in spring after the last frosts. In vineyards where grapes mature late, sowing can be done before harvesting. Wherever possible, shortly before any rainy period. Any weeds under the vines should wherever be possible be removed before sowing. Superficial sowing (max. 1 cm deep).

Southern Europe (dry summers): Under the vines or in the aisles.

Seed mixture: Delinat IV or Intersemillas BAJO SIMPLE A/B (cf. p.1)

Moderate climate with summer rainfall: Under the vines or covering the whole vineyard, when no machine soilwork is possible.

Seed mixture: Delinat III or Intersemillas BAJO SIMPLE A/B (cf. p.1)

Examples of different cover crop schemes

The following diagrams show the numerous possibilities for cover crops. Climatic and soil conditions, the way the vines are planted, and whether the soil can be worked by machines need to be taken into account.

- high-growing leguminous cover crop**
- low-growing leguminous cover crop**
- winter cover crop, spontaneous or seeded, superficial soilwork possible from 1st April until 30 September, from 1st October until 31 March soilwork only allowed for seed bed preparation or aeration**
- superficial soilwork possible in vine tree understory from 15 February**

