

Proposal of common specifications (criteria and sub criteria) to collect and mobilise the seeds

It is important for environmental restoration that measures are implemented with the aim of encouraging the development of natural vegetation through the planting of species ecologically suited to start the natural dynamics, which can lead to the formation of communities that are stabilised, well-structured and floristically adapted to the environmental context. The rule that must always be observed is the one that requires selecting only species ecologically and genetically compatible with the site of introduction. This is important because these species can find favourable conditions to grow and establish themselves permanently, without causing damage due to genetic pollution.

Selecting species for any native planting involves knowing the physical characteristics of the site (soil type, hydrology, slope, aspect, and sunlight exposure) then choosing the most appropriate native plants for that site. All native plantings should include grasses and forbs (both legume and non-legume species). Depending on the objectives, the seed mixes can include annual, biennial, and perennial species to foster both early establishment and maintain long-term diversity. In a context of grassland restoration, the mixes should contain species belonging to the three life-forms mentioned.

Characteristics that a species must meet in the context of Fleurs locales project

The common specifications that all beneficiaries of the project had taken to collect and mobilise the seeds to be used in pilot experiments, followed two main criteria. Other sub-criteria were used depending on the biotopes of the pilot's location.

Main criteria

- 1) All the seeds must be collected from natural populations of the selected species
- 2) Seed provenance from cultivation of native species shall not exceed five propagation cycles.

Sub-criteria

Agrosystems (Vineyards, olive groves, fruit orchards...)

Perennial crop agrosystems ground covers compete for soil water with the main crop, thus, a discerning selection of native species to be used as green covers in the different targeted agrosystems is needed. Several sub-criteria were followed for the species selection to be used in the pilot Mediterranean agrosystems :

- 1) annual plants are desirable since they will naturally die after fruiting at the onset of the summer dry season and persist as seeds
- 2) short life cycle, senescence should occur in May/June
- 3) supply nitrogen, which is needed with the increased microbiological activity that comes with better soil aeration.
- 4) self-sowing capacity, low height,
- 5) fast growth, weeds control capacity,
- 6) superficial root development,
- 7) weak competitor for water resources,
- 8) Capacity to capture nutrients in the onset of the rainy season, specially nitrogen – so they can have a similar function to catch crops in the nutrient cycling at the agroecosystem scale,
- 9) low production of biomass,
- 10) protection of soil from erosion and runoff,
- 11) capacity of structuring the soil in order to increase porosity,
- 12) water retention and biological activity,
- 13) increase soil bearing capacity,
- 14) increase beneficial and/or pollinators,
- 15) easy to mow/cut down/run over,
- 16) compatibility with sowing machine and persistence as dead matter on the ground.

Agrosilvopastoral systems

- 1) capacity for soil cover, reducing erosion.
- 2) high production of biomass in order to increase the volume of pastures.
- 3) capacity to capture nutrients, especially nitrogen to increase the quality of pastures.
- 4) perennial gramineous, due to their capacity to increase the grassland growing season.
- 5) low height.
- 6) deep root development to resist better dry season
- 7) adapted to grazing

Mediterranean pastures

We are testing mixtures of annual, bisannual and perennial species, in order to cover different ecological compartments and to optimise the development of a locally adapted and resilient vegetation.

Criteria for annual and biannual species :

- 1) Fast germination and vegetative development : capacity for rapid soil cover in order to prevent erosion
- 2) Fast production of flowers during the four seasons

Criteria for perennial species :

- 1) Potentially fast germination in order to secure the vegetative development that is the condition of resistance to periods of severe drought
- 2) Adaptation to cutting/grazing

- 3) Production of biomass of significant forage value
- 4) Optional functional traits : attractivity for insects (development of larvae, nectar-rich flowers...)