



Fodder associations adapted to Mediterranean areas

Agroecological zones

Cereal plains

Mountains

Oases

Introduction

The integration of agriculture and livestock farming is at the heart of agroecological systems. However, in the Mediterranean, activities continue to specialise, with a growing disconnection between agriculture and livestock farming. Small ruminant farming, which is very important in North Africa, is being affected by the degradation of rangelands, rising feed prices and supply difficulties in markets that are highly dependent on imports.



Source: INAT, Tunisia

In this context, fodder associations, made up of at least two species of legume and cereal (meslin), are an agroecological alternative that provides fodder of good nutritional quality and improves the soil. Fodder mixtures can be grazed, ensiled, used as hay or grain.

The species used must be adapted to local conditions.

The benefits of growing meslin in dry Mediterranean areas

Meslin has a number of benefits:

- **Improved animal nutrition:** the biomass produced by fodder mixtures is generally greater in quantity than that produced by a single species. What's more, the proportions of legumes and cereals used in the combinations are designed to provide fodder that is both protein-rich and energy-rich, guaranteeing an optimum ration for the livestock.

- **Improved soil structure:** the simultaneous presence of root systems of different depths and development enhances soil porosity and stability.
- **Nitrogen enrichment of the soil:** the leguminous plants in meslin fix nitrogen from the air, which benefits the associated cereal and subsequent crops in the rotation.
- **Weed control:** The covering power of the species used in the mix limits the appearance of weeds.
- **Resistance to drought and pests:** Meslin is adapted to difficult soil and climate conditions. The diversity of associated plants improves the crop's resilience. Some species can use water earlier in the season, while others are more resistant to periods of drought. Meslin is more resistant to disease and pests than monocropping.
- **Biodiversity:** Fodder associations encourage soil biodiversity and, for certain species, pollinating insects.

Some meslin compositions adapted to semi-arid conditions

The choice of associated species depends not only on the farmer's objectives, but also on the climatic characteristics of the region and the type of soil.

The following mixtures, which combine cereals and legumes that are not very sensitive to drought, are possible in several regions of North Africa.

- Oat vetch
- Lamb's-quarters vetch
- Vetch-oat-fenugreek
- Berseem ryegrass
- Vetch-oats-triticale-fenugreek
- Faba bean, vetch, oats, barley, field pea

The vetch-oat mixture used in the Siliana Living Lab is made up of 75% vetch and 25% oats. Other mixtures are adapted to this region: vetch-triticale (60% vetch and 40% triticale) and fenugreek-triticale (65% fenugreek and 35% triticale).



This image was created using Artificial Intelligence (DALL-E 3)

Technical itinerary for the vetch-oat fodder association

Sowing takes place in autumn, from September to November, depending on the bioclimatic zone. A conventional seed drill or a no-till drill can be used. The usual sowing rate is 150-160 kg/ha.

It is preferable to add compost or manure to the surface. The fodder cereal needs nitrogen to act as a support for the legume.

The cutting stage depends on the feed grain in the combination and its intended use:

- For silage: milky to milky-doughy stage of fodder cereals (e.g. oats).
- For hay: pasty stage

Challenges and limitations

Although fodder associations are strongly encouraged, they present a number of challenges:

- Choice of species: the combination of species must be balanced and well adapted to the conditions of the region (soil and climate). The proportions to be used depend on the development of the two species, so that one does not cover the other and prevent its development. They must also meet the specific nutritional needs of the animals (favour proteins for meat production and cereals for milk).
- The selling price of fodder varies according to the farms in the region and the demand from farmers.
- Mastery of the crop's technical package is important to ensure quality production.

The role of fodder associations in agroecology

By promoting crop diversity, soil health and animal health (through a balanced feed ration), fodder associations can play an important role in agroecological systems. Introducing legumes into these associations helps to limit the use of chemical nitrogen fertilisers. This type of meslin is a good precedent for cereal crops. Biomass-rich associations improve the soil's organic matter content, helping to improve its fertility and structure. Fodder mixtures therefore have their place in agroecological systems that integrate livestock farming with crop production, helping to diversify farmers' incomes and improve the profitability and sustainability of cropping systems. Fodder associations can be used in agroforestry as intercrops between rows of fruit trees. Species that attract pollinators can be introduced into the crop mix. In the Siliana Living Lab, a vetch-oat fodder association has been planted between olive trees. In addition, by encouraging soil cover over a long period, fodder associations can guarantee a grazing period well spread out over the year, limiting dependence on imported fodder.



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