

# Types of pasture species and combinations thereof

Pastures are plant resources that **serve as food for livestock**. Herbaceous grasses can arise spontaneously or can be sown. Most grass species are not very tall and the roots are not usually very deep, generating a diverse and **dense herbaceous carpet**. These species are highly adapted to grazing or mowing. **They fundamentally belong to two large families: grasses and legumes**. In the meadows, mixtures of two or more forage species, mainly grasses and legumes, offer more advantages over pure sowings.



Figure 1. Close-up of dactyl grass (*Dactylis glomerata*).



Figure 2. Close-up of the legume alfalfa (*Medicago sativa*).

## ■ Pasture species

A pasture, according to the Spanish Pasture Society (SEP), **"is any plant resource that serves as food for livestock, either directly (in grazing) or as fodder"**. Herbaceous pastures are made up of grasses, legumes and other herbaceous species that can arise spontaneously or can be sown. These pastures can include other shrub and/or tree species, which can also feed livestock, provided that grasses and other herbaceous forages remain predominant, they are **shrub pastures and tree pastures**, respectively. There are also pastures of agricultural origin, which have been cultivated, and give rise to **forage crops**.

Most pasture species are **plants that usually live for several years or are perennial**. They are generally **not very tall and the roots are not very deep**, creating a diverse and dense herbaceous carpet. These species are **highly adapted to grazing or mowing** (hay or silage) and, with proper management, can be used for any of these cases. Depending on the geographical, edaphic and climatological conditions where the meadow is located, it will contain some species or others adapted to such conditions.

The species that grow in the pastures belong fundamentally to two large families: **grasses and legumes**. Also, of some

importance, but to a lesser degree, are the **Composite, Cruciferous and Chenopodiaceae** families. (Table 1)

- The most abundant family in the meadows are **grasses** (Figure 1). This is a very broad family that includes species that are very useful for animal feeding, either by grazing or harvesting. They are the main **source of energy for livestock**, with high fibre values, but with a low protein intake. This causes them to have **low digestibility** and frequently show mineral deficiencies. They are plants that need N to grow.
- The second group in importance are **legumes** (Figure 2). These are species that produce forages of **high nutritional quality** for animals due to their richness in protein and **high digestibility**. This is due to the ability to fix atmospheric N. They are more selective plants with respect to the environment than grasses and have hard seeds that generate a long-lasting seed bank in the soil. Although their consumption by animals has a beneficial component due to the **antimicrobial effect** of their secondary metabolites, some precautions are also necessary, since their **direct ingestion can cause bloating** in the animal (except lotus and safflower).
- We can also find **other families**: Brassicaceae, Quenopodiaceae, Compositae, etc. They are present in variable abundance

|                | Species                                               | Life               | Size       | Establishment period | Implantation speed | Productivity             | Resistance to grazing | Palatability | Nutritional quality | Resistance to frost | Resistance to drought |
|----------------|-------------------------------------------------------|--------------------|------------|----------------------|--------------------|--------------------------|-----------------------|--------------|---------------------|---------------------|-----------------------|
| GRASSES        | RAY GRASS ( <i>Lolium perenne</i> )                   | Perennial          | 80 cm      | Spring-Autumn        | Very high          | 10-12 Ton MS/ First year | High                  | High         | High                | Low                 | Low                   |
|                | ORCHARD GRASS ( <i>Dactylis glomerata</i> )           | Perennial          | 60-120 cm  | Spring               | Medium             | 9 Ton MS/Ha              | High                  | Low          | High                | Medium              | Medium                |
|                | BARLEY ( <i>Hordeum vulgare</i> )                     | Annual             | 20-120 cm  | Spring-Autumn        | High               | 5-8 Ton MS/Ha            | Medium                | Medium       | Medium              | Medium              | Medium                |
|                | OATS ( <i>Avena sativa</i> )                          | Annual             | 150 cm     | Autumn               | High               | 11 Ton MS/Ha             | Medium                | High         | High                | Low                 | Low                   |
| LEGUMES        | ALFALFA ( <i>Medicago sativa</i> )                    | Perennial          | 10-80 cm   | Autumn               | Very high          | 8-12 Ton MS/Ha           | Medium                | High         | Very high           | High                | High                  |
|                | COMMON SAINFOIN ( <i>Onobrychis viciifolia</i> )      | Perennial          | 15-80 cm   | Spring-Autumn        | High               | 4-5 Ton MS/Ha            | Medium                | High         | High                | High                | High                  |
|                | SUBTERRANEAN CLOVER ( <i>Trifolium subterraneum</i> ) | Annual             | 20-30 cm   | Autumn               | Low                | 2-12 Ton MS/Ha           | Very high             | High         | High                | Low                 | High                  |
|                | VETCH ( <i>Vicia sativa</i> )                         | Annual             | 60-150 cm  | Autumn               | High               | 6-8 Ton MS/Ha            | Medium                | High         | High                | Medium              | High                  |
| OTHER FAMILIES | COLZA ( <i>Brassica napus</i> )                       | Annual or Biannual | 30-150 cm  | Late summer          | High               | 9 Ton MS/Ha              | Low                   | High         | Very high           | High                | High                  |
|                | MEDITERRANEAN SALT BUSH ( <i>Atriplex halimus</i> )   | Perennial          | 100-300 cm | Spring-Autumn        | Medium             | 1-5 Ton MS/Ha            | High                  | Low          | Low                 | High                | High                  |

**Table 1.** Characteristics of the main types of pasture species.

and can be annual or perennial. They have a **regulatory role for biodiversity** and provide livestock, in addition to food, with antioxidant or medicinal compounds, among others. They are often used as forage crops.

In the pastures, the **mixtures or associations between two or more forage species**, mainly grasses and legumes, offer **advantages over pure sowing**. One of the most outstanding improvements is at the level of the **nutritional quality** of the meadow: **grasses offer carbohydrates** while **legumes provide the necessary protein and salts** for livestock. The mixture of species also favours **the reduction of the risk**

**of weathering or bloating of cattle** mainly due to the direct consumption of legumes. The soil is enriched thanks to the ability of legumes to fix atmospheric nitrogen in the soil, which also benefits the grasses and prevents fertilisation. Also, the fact of having species with different growth, precocity and size characteristics ensures different productions throughout the year and favours their use by livestock. The life of the pasture is prolonged as the different species follow one another in production. Finally, the mixture of species also confers a **diversity** of flora and fauna that produces **stability** by minimising climatic or management effects.