

## **Economical and ecological requirements of seed mixtures for mountain pastures**

Graiss W.<sup>1</sup>, Krautzer B.<sup>1</sup>, and Pötsch E.M.<sup>2</sup>

<sup>1</sup>*Department of Forage Crop Breeding and Ecological Restoration, Federal Research Institute for Agriculture in Alpine Regions, Gumpenstein, A-8952 Irdning, Austria*

<sup>2</sup>*Department of Grassland Sciences, Federal Research Institute for Agriculture in Alpine Regions, Gumpenstein, A-8952 Irdning, Austria*

### **Abstract**

Pastures within the montane and alpine vegetation belt belong to the most sensible parts of the Alps. Therefore, seed mixtures used for such areas should combine different economic and ecological characteristics such as low demands on nutrients, satisfying yield and digestibility, a closed sward, endurance and good adaptation on climate and soil.

At the location Eschwald (1.400 msm, Styria, Austria), one commercial seed mixture (SM1, containing fast growing grassland varieties that should enable intensive utilisation combined with high yield) and one mixture containing a high percentage of species well adapted to the site conditions (SM2, enabling yields adapted to site conditions) were compared over a period of three years. A fertilisation was carried out each year. The assessed species were divided into 3 ecological groups, based on their adaptation to the site. In the last year of observation, a clear better vegetation cover, a higher share of site adapted species with satisfying forage quality and higher yield was assessed for SM2. In comparison, most species of SM1 disappeared after three years. Nevertheless, the remaining vegetation in plots containing SM1 showed a higher share of site specific species that were able to colonize the developing gaps.

At the location Hochwurzen (1.830 m a.s.l., Styria, Austria), one commercial seed mixture and one mixture containing site-specific subalpine and alpine species, that are also useful for agricultural utilisation, were compared over a period of four years. With regard to the normally limited possibilities to reach and utilise such areas, only a single fertilisation in the setup year was carried out. Again, the assessed species were divided into 3 ecological groups, based on their adaptation to the site. Summarizing the two valuable groups with expected sustainability, site-specific seed mixtures reached more than 80 % cover with site-specific and site-adapted species. In comparison, the share of valuable groups from the commercial mixture remained about 50 %.

Due to the worsening climatic conditions, the poor soils and the low intensity of utilisation, site specific species become more important with increasing altitude. Results obtained generally showed an increase of positive ecological effects on plots where site-specific seed mixtures were used. Only the seed mixtures containing a high share of site-specific and site-adapted species were able to guarantee a sustainable vegetation and sufficient protection against erosion. In comparison to commercial seed mixtures, a negative influence on agriculturally important parameters like yield and forage quality could not be assessed if site specific seed mixtures were used.

**Key words:** montane pasture, site specific seed mixture, sustainability, recultivation, persistency of vegetation.