

# Quality seed mixtures for permanent grassland and field forage growing in Austria

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## Abstract

Austria's grasslands lie in very heterogeneous climatic and soil conditions. Their management, in respect of cutting frequency and purpose of use, therefore requires differentiated and adapted seed mixtures. Within the framework of the Austrian Grassland Federation (AGF), in recent years, a quality standard was established, under private law, – from the cultivation of forage plants to seed production for the composition of mixtures – for the development of regionally adapted quality mixtures for permanent and temporary grassland production. AGF seed mixtures can be produced by every interested company in Austria and offered to grassland farmers. Following a six-year observation period, the best varieties are combined into seed mixtures. This takes into consideration regional aspects (such as climate and soil), as well as differing cultivation systems. The seed must meet quality standards that surpass the seed law regulations. The results are quality mixtures recommended and checked by the AGF for grassland and forage growing. Comparative field tests and experience gained through years of practice with AGF seed mixtures have fostered a strong demand in recent years.

Keywords: permanent grassland, temporary grassland, quality seed mixtures

## Introduction

The production of forage of adapted quality is a prerequisite to improve economical performance of grassland based livestock farming systems. What is essential is to secure the establishment of a stable, enduring, harmonic, healthy, highly digestible, sorrel-free stand of plants adapted to the climate, soil and intended use. In over-sowed, re-sowed and new sowed grasslands the quality of the seed mixture is decisive for achieving these targets. In recent years intensive work was undertaken in Austria to define high-quality seed mixtures for permanent grassland and field forage growing. With entry into the EU, the legal situation for seed has changed. It had great effects on the seed market. The EU standards for seed quality compared to previous norms valid in Austria are significantly laxer. This can have negative consequences, especially in respect of sorrel content. From the experiences of the control points in Austria, it can be concluded that, undoubtedly, many of the varieties listed in the EU catalogue are not suitable for the climatic and cultivation conditions in Austria.

The ecologically and economically motivated concept of quality seed mixtures drawn up originally in Austria were targeted at making high-quality seed available to the farmer. It is a concept that is now carried on, further developed and improved by the Austrian Grassland Federation (AGF). The AGF is a non-profit association that offers a common platform for research, chambers of agriculture, farm economy and farmers, with the aim of promoting grassland management in Austria.

## Principles of the AGF seed mixtures quality certification

AGF recommendations manual ([www.oeag-gruenland.at](http://www.oeag-gruenland.at))

The result of the AGF's work in recent years is a comprehensive total concept, from the cultivation to the propagation and the control of seed to the definition of regionally adapted mixtures. This concept links the production of quality varieties for the alpine grassland region and the added value of these varieties of a controlled quality that clearly exceeds the stipulations of the EU standards. So the AGF, as a private association, furnishes recommended and controlled quality mixtures for permanent and temporary grassland sowing. These are made available to grassland farmers by all participating seed firms. A manual defines the criteria for the attainment and allocation of the AGF standard for seed mixtures, and is the basis of a quality norm under private law (Krautzer *et al.*, 2005).

### Criteria of the AGF quality mixtures

The following specific criteria of the AGF quality mixtures enable Austrian grassland farmers to find a suitable mixture to accommodate the diverse conditions met in the field:

#### *Seed quality*

The minimum requirements for AGF quality mixtures according to the new seed law for purity, germination capacity and "Other Seeds" have been replaced by the AGF norms under private law, which guarantee a significantly better seed quality (Table 1).

#### *Guaranteed lack of dock seeds*

Special value is placed on the lack of sorrel. Every firm producing mixtures certified by AGF must have the individual varieties, as well as the readymade mixtures controlled for the presence of sorrel. As, in the AGF norm, there is a zero tolerance for sorrel seed, (Table 1). Such guarantee for lack of sorrel seed in grassland mixtures, above all under the requirements of organic cultivation, is of prime importance.

Table 1: Comparison of EU seed quality standards to AGF standards of selected grasses and leguminosae related to germinative capacity (GC), tolerated number of dock seeds (TD) and sample size (SS)

Species	EU quality standard			AGF quality standard		
	GC	TD	SS	GC	TD	SS
<i>Dactylis glomerata</i>	80	5	30	80	0	100
<i>Lolium hybridum</i>	75	5	60	85	0	100
<i>Poa pratensis</i>	75	2	5	80	0	50
<i>Festuca pratensis</i>	80	5	50	85	0	100
<i>Phleum pratense</i>	80	5	10	85	0	50
<i>Trifolium repens</i>	80	10	20	85	0	50
<i>Trifolium pratense</i>	80	10	50	85	0	100

#### *Choice of varieties*

Variety tests carried out, over six years, by the Federal Office and Research Centre for Agriculture in Vienna and the HBLFA Raumberg-Gumpenstein, which are located throughout Austria, allow to identify the best varieties on the basis of their persistence, their resistance to diseases, their quality and their adapted growth behaviour. Only the best varieties are added to the "AGF list of varieties" and are used for mixtures with an AGF recommendation.

### *Mixture content*

A significant role is played by the characteristics of the varieties (winter hardiness, competitive resistance, growth behaviour, state of health and degree of performance) for use in the special mixtures adapted to location and purpose of use. The mixtures are defined according to their purpose of use and according to regional aspects (provincial suitability) to provide optimum recipes to meet *all* conditions. Additionally, AGF mixtures must contain a guaranteed minimum share of seed produced in Austria: for 15% to 30% according to mixture type.

### *Control*

Single components of AGF mixtures are subject to severe controls according to seed quality and lack of dock seeds as described above. The readymade mixtures are again controlled for composition in respect of the prescribed AGF recipes. A sample is then taken and tested for the lack of sorrel. The mixtures made according to the norms are released by AGF and must be labelled "Controlled and Recommended by the AGF".

A double-digit percentage of mixtures made commercially available are then controlled annually. In this way the maintenance of regulations is controlled. In field cultivation such mixtures are also used for practice-orientated tests (e.g. to control variety authenticity and to compare to standard mixtures).

### **Declaration, AGF recommendation**

Every AGF quality mixture must carry on the sack a label giving a mixture designation, a brief description, a list of the varieties included in the mixture and the amount (percent of weight) as well as the recommended sowing amounts. AGF mixtures must carry the declaration: "Controlled and Recommended by the AGF".

### **Seed market and commercial implementation of AGF seed mixtures**

An overview on the market shows an Austrian consumption of, in average, 7,500 tons during the recent years. Roughly estimated, the share of the seed for grassland is about 1,800 tons annually. This demand of seed was not only for temporary grasslands, which account for only 6% of the total grassland area, but mainly for (re-)sowing of permanent grassland to regenerate the sward. A grassland area of about 80,000 hectares is subject to over-sowing, re-sowing and new sowing annually in Austria. As much as 75% of the spectrum of varieties used in grassland management comes from abroad. Commercial cultivation firms in Austria have not been active for decades in the production of forage plants. Only the Federal Research and Education Centre Raumberg-Gumpenstein, which has set clear accents in this direction during the recent years, can be mentioned. Up to now, twelve different local varieties of grasses and leguminous plants are available on the Austrian seed market. These varieties are produced on an average production area of 1,100 hectares.

The aim of the concept behind the AGF mixtures is to produce persistent, stable, harmonic, healthy and highly digestible grassland swards. These characteristics have multiple effects on operating results: less expenditure for grassland renewing, care and weed control, a better suitability for silage production and a high nutritive value, would only be some of the positive effects. Extensive comparative tests undertaken, over four years, by the HBLFA Raumberg-Gumpenstein (Buchgraber and Gerl 2000), between conventional grassland mixtures and those certified by AGF, have confirmed these expectations. But clear results in favour of AGF mixtures were also obtained in several field tests in terms of dry matter production (Partl

1997). These better performances, in quantity and quality, are coupled to dense sward less susceptible to weed invasion.

## Conclusions

The AGF concept is meanwhile well established throughout Austria and farmers are convinced about the value of the 21 different AGF quality seed mixtures that are currently on the market. The total sales of AGF mixtures are around 900 - 1000 tons annually, produced by a differing number of 2-5 firms. This means that more than half of the total requirement of seed is covered by AGF quality mixtures for grassland renovation.

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