



Seed production and use of subalpine and alpine legumes

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Richly varied seed mixtures at middle and high altitude in mountain environment with the aim of obtaining a natural-like or site-specific vegetation cover, primarily oriented to nature protection and secondary to the production of forage, has gained significance in recent years.

In a time of the relegation and destruction of extensively used grassland, the areas suitable for restoration must also be seen as areas of potential ecological balance. A prerequisite for the successful realisation of these aims is the production and availability of seed of suitable site-specific species.

The four different legumes *Anthyllis vulneraria* ssp. *alpestris*, *Trifolium alpinum*,

Trifolium badium and *Trifolium pratense* ssp. *nivale*, all naturally occurring in the middle and higher zones of the Alps, were assessed during the last decade. The possibilities and conditions of their successful seed production as well as their use for agricultural utilisation were assessed.

All four assessed species were proved satisfactory for restoration and agricultural utilisation of areas in the middle and higher zones of the Austrian Alps.

The cultivation of *Trifolium alpinum* can be seriously endangered by nematodes.

Due to a very slow development of seedlings, low competitiveness and seed yields clearly below 100 kg ha⁻¹, the seed production of *Trifolium alpinum*

and *Trifolium badium* is too cost-extensive.

Anthyllis vulneraria ssp. *alpestris* and *Trifolium pratense* ssp. *nivale* show satisfying usability for seed production and can be recommended for site-specific seed mixtures up to the alpine vegetation belt.

References

- Krautzer, B., G. Peratoner and F. Bozzo, 2004: Site-Specific Grasses and Herbs, Seed production and use for restoration of mountain environments, Food and Agriculture Organization of the United Nations, 111 p.
- Peratoner, G., 2003: Organic seed propagation of alpine species and their use in ecological restoration of ski runs in mountain regions, Dissertation Universität Kassel, Witzenhausen, 238 p.

Table 1: Important characteristics and suitability for agricultural use

Species	Distribution	Vegetation belt			Parent rock		Moisture		Tolerance against		
		Montane	Subalpine	Alpine	Siliceous	Calcareous	Dry	Wet	Fertilization	Cutting	Trampling
<i>Anthyllis vulneraria</i> ssp. <i>alpestris</i>	Middle/south Europe	+	+	+	(-)	+	+	-	(+)	(-)	(+)
<i>Trifolium alpinum</i>	Middle/south/west Europe	-	(+)	+	+	-	(+)	(+)	+	+	+
<i>Trifolium badium</i>	Europe, Siberia	(+)	+	+	+	+	+	+	(+)	+	+
<i>Trifolium pratense</i> ssp. <i>nivale</i>	Middle/south Europe	-	+	+	+	(+)	(+)	+	(+)	+	+

Table 2: Characteristics for cultivation and fertilisation

Species	thousand seed weight in g	seed rate kg ha ⁻¹	row spacing cm	fertilisation		average yield kg ha ⁻¹
				P ₂ O ₅	K ₂ O	
<i>Anthyllis vulneraria</i> ssp. <i>alpestris</i>	3,2-3,5	8-10	20-45	80	140	100-250
<i>Trifolium alpinum</i>	4,8-5,2	10-14	12-24 or 45	60	100	2,5
<i>Trifolium badium</i>	0,70-0,85	10-12	15-20	60	100	40-120
<i>Trifolium pratense</i> ssp. <i>nivale</i>	1,1	8-12	20-25	80	160	150-300

