

Trial Site Obertauern, Ski run

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Introduction

The excursion destination is on the Gamsspitz in the Radstadt Tauern at an altitude of 2,150 m, which is distinguished by a rough, alpine climate. During the course of extending a skin run, trial sites were laid out on the levelled, 30° gradient run in the area of the upper station of the Zehnerkar lift. Differing restoration methods, such as seeding with and without a mulch cover, the planting of vegetation sods, sowing- and sod methods, as well as site-specific roll sods are demonstrated. The differences between a site-specific mixture and a conventional mixture are clearly visible.

Obertauern is one of 16 skiing areas in the province of Salzburg with 95 km of prepared runs and a capacity of 35,600 persons per hour on 26 lift facilities (as of 2004).

Einleitung

Das Exkursionsziel in Obertauern liegt am Gamsspitz in den Radstädter Tauern auf 2150 m Seehöhe und zeichnet sich durch ein raues, alpines Klima aus. Im Zuge einer Skipistenerweiterung wurden Versuchsflächen auf der planierten 30° geneigten Piste im Bereich der Bergstation des Zehnerkarliftes angelegt. Unterschiedliche Begrünungsmethoden wie Ansaat mit und ohne Mulchdecke, Verpflanzen von Vegetationsziegeln, Saat-Sodenmethode sowie standortgerechte Roll soden werden demonstriert. Die Unterschiede zwischen einer standortgerechten Mischung und einer herkömmlichen Saatgutmischung sind deutlich sichtbar.

Obertauern ist eines von 16 Skigebieten im Bundesland Salzburg mit 95 km präparierten Pisten und einer Kapazität von 35.600 Personen pro Stunde mit 26 Liftanlagen (Stand 2004).

Introduzione

La meta dell'escursione si trova sulla Gamsspitz nei Tauri di Radstadt, ad un'altitudine di 2150 m, ed è caratterizzata da un rigido clima alpino. In seguito ad un ampliamento delle piste da sci sono state realizzate delle prove sperimentali su una pista ad elevata pendenza (30°) nei pressi della stazione di monte del Zehnerkarlift. Qui viene data dimostrazione di diverse tecniche di inerbimento come la semina con e senza copertura a mulch, il trapianto di piote erbose, metodi di inerbimento combinanti la semina e il trapianto di piote erbose e l'uso di tappeti erbosi con specie idonee al sito. Le differenze tra un miscuglio idoneo al sito ed uno convenzionale sono chiaramente visibili.

Obertauern è uno dei 16 comprensori sciistici dello stato federale di Salisburgo con 95 km di piste battute ed una capacità di 35.600 persone/ora mediante 26 impianti di risalita (dati aggiornati al 2004).

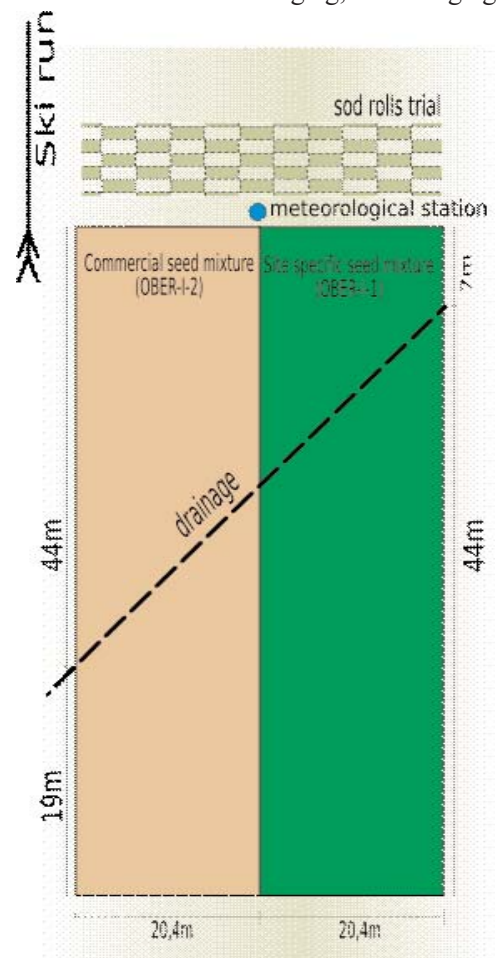
The Trial

Description:

- 2 sample areas per 946 square meter (21.5 to 44 meter)
- Location: N 47°14'24.3" E 13°32'3.7"; at the Gamsspitz, Radstädter Tauern - about 70 km south-south-east of Salzburg (bee-line)
- Altitude: 2150 msl (lower alpine vegetation belt)
- Exposition: North-east
- Inclination 30°
- Date of set up: July, 14th, 2004

Soil parameters:

- pH soil: 6.8
- Concentration of nutrients: P: 4.6 mg/kg; K: 9.5 mg/kg



Surrounding vegetation

The biotope type formed by the surrounding vegetation can be classified as a subalpine heath. The area is quite heavily influenced by the construction and rebuilding of the ski run and the accompanying infrastructure.

Detailed set up, set up plan

The trial consists of two of plots: The first one represents the local state of the art with a commercial seed mixture and, as application technique, blank handsoving and mineral fertilizer. On the second plot, a site specific seed mixture and a long-term organic fertilizer was used, in combination with the black green system.

Total area of trial site: 924 m²

Application technique with site specific seed mixture:

- black-green system with straw, about 500 g/m²
- Bitumen emulsion: Water : Bitumen 490 : 210 ml/m²

Seed application rate:

- Site specific seed mixture: 15 g/m²
- Commercial seed mixture: 30 g/m²

Fertilisation:

- **Site specific variant:**

„ReNatura provideVerde“, rate 80 g/m²

Contents: 67% organic matter, 4.4% N total, 2.2% P₂O₅ total, 1.5 % K₂O total, spores of *Penicillium* sp.

- **Commercial variant:**

„Vollkorn Gelb“ (mineral fertilizer), rate 30 g/m²;

Contents: 15% N, 15% P₂O₅ and 15% K₂O



Figure 1: In the second year of the trial (2005), interventions continued at the trial site, for example a storage pond was built in direct vicinity to the trial site

Specific to this site were constant disturbances, due to continuing infrastructural interventions as building of an artificial lake and building or renovations of buildings in the near surroundings (see also *Figure 1*). Also cattle came into the trial site and causing damage, resulting in patches without vegetation. Therefore, the overall cover is not homogenous, there are even patches found with no vegetation at all in 2006.

Results

The development of the cover shows the following trend: All not site-specific species show a decline in cover, resulting in a step decline in cover in the variant

Site specific seed mixture

Species	Variety/Origin	percent by weight
<i>Achillea millefolium</i>	Kärntner Saatbau 98/85	0.45
<i>Agrostis capillaris</i>	Highland	4.50
<i>Anthyllis vulneraria</i> ssp. <i>alpestris</i>	Hansi Gerhard (Seed producer)	3.00
<i>Bellardiochloa variegata</i>	Kärntner Saatbau Ecotype A	3.15
<i>Festuca nigrescens</i>	Kärntner Saatbau Ecotype A	44.12
<i>Festuca pseudodura</i>	Kärntner Saatbau Ecotype A	3.60
<i>Festuca supina</i>	Kärntner Saatbau Ecotype A	3.60
<i>Lotus corniculatus</i>	Gran San Gabriele	5.40
<i>Phleum rhaeticum</i>	Kärntner Saatbau Ecotype A	1.80
<i>Poa alpina</i>	Kärntner Saatbau Ecotype A	12.61
<i>Trifolium badium</i>	BAL Gumpenstein	0.49
<i>Trifolium pratense</i> ssp. <i>nivale</i>	Hochgatterer Paul (Seed producer)	6.49
<i>Trifolium repens</i>	Haifa	10.80

Commercial seed mixture

<i>Agrostis capillaris</i>	Highland	2.00
<i>Cynosurus cristatus</i>		2.00
<i>Dactylis glomerata</i>	Amba	5.00
<i>Festuca pratensis</i>	Mimer	14.00
<i>Festuca rubra</i>	Echo	25.00
<i>Lotus corniculatus</i>	Gran San Gabriele	6.00
<i>Phleum pratensis</i>	Phlewiola	13.00
<i>Poa pratensis</i>	Balin	16.00
<i>Trifolium hybridum</i>	Aurora	7.00
<i>Trifolium repens</i>	Haifa	10.00

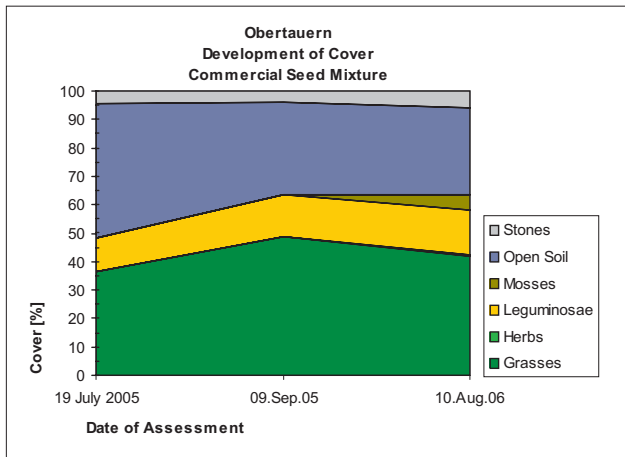


Figure 2 (left): Development of overall cover at the trial site Obertauern, commercial seed mixture: 70% percent of cover for erosion prevention are not reached

with the commercial seed mixture, whereas the site specific species keep growing. In the end, the commercial seed mixture reaches not 70% of cover (see Figure 2 and 3).

If you look at the cover on a species level, it becomes obvious that the cover of the commercial seed mixture comes in 2006 mainly from two species, which are known that they can adapt to high altitudes, namely *Phleum pratense* and *Festuca rubra* (see Figure 4).

Species of the site specific mixture show (after a gap in 2005) an increase in the year 2006, whereas the species count from the commercial seed mixture show a constant decline. Additionally, the different *Festuca* species in the site specific mixture (*Festuca nigrescens*, *Festuca pseudodura*, *Festuca supina*) could only be registered as *Festuca* sp., they started only at the end of the second vegetation period (2006) to differentiate. Therefore we have in the site specific seed mixture more or less all species from the mixture.

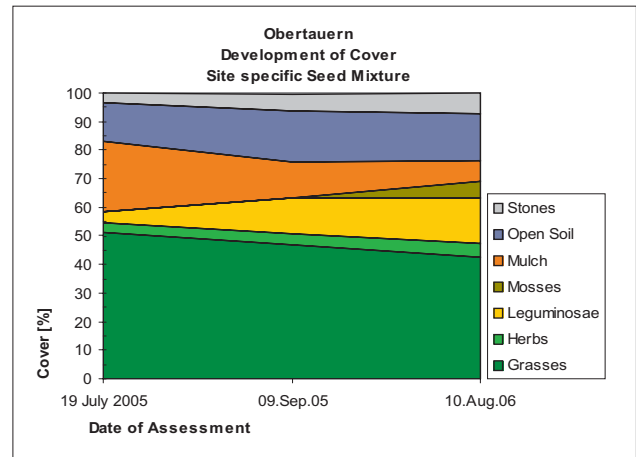


Figure 3 (right): Development of overall cover at the trial site Obertauern, site specific seed mixture: 70% percent of cover for erosion prevention are reached at the end, but only with the help of mosses and remaining of the mulch layer applied (black green system). Further explanations in the text.



The trial site in September 2005: The influence from ongoing construction work is obvious. On the left side, it is the construction work of the storage pond (see Figure 1).

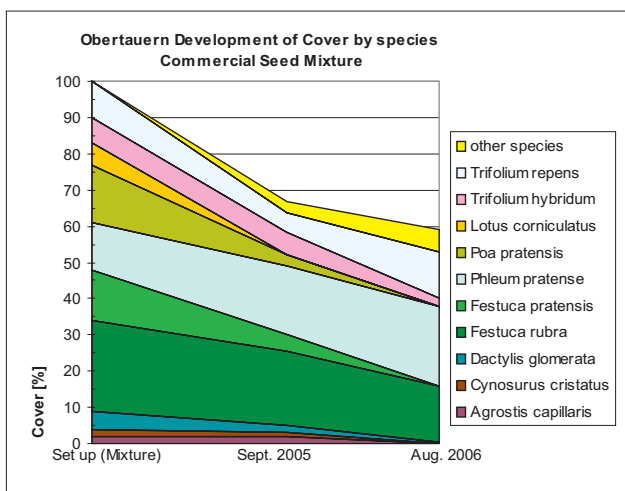


Figure 4: Development of cover of species, commercial seed mixture. The main part is taken by only two species: *Phleum pratense* (light green) and *Festuca rubra* (dark green)

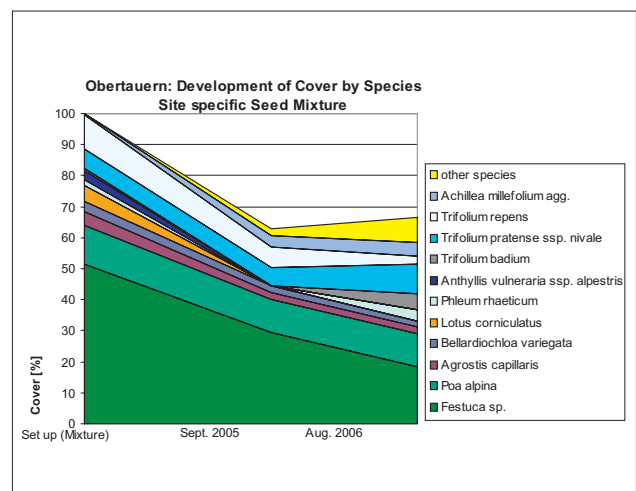


Figure 5: Development of cover of species, site specific seed mixture

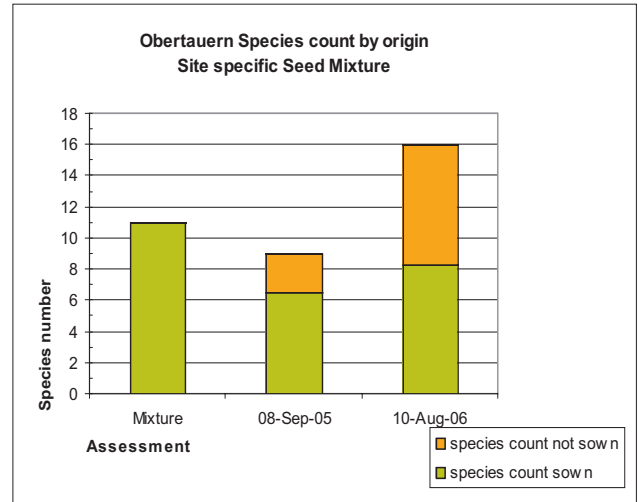
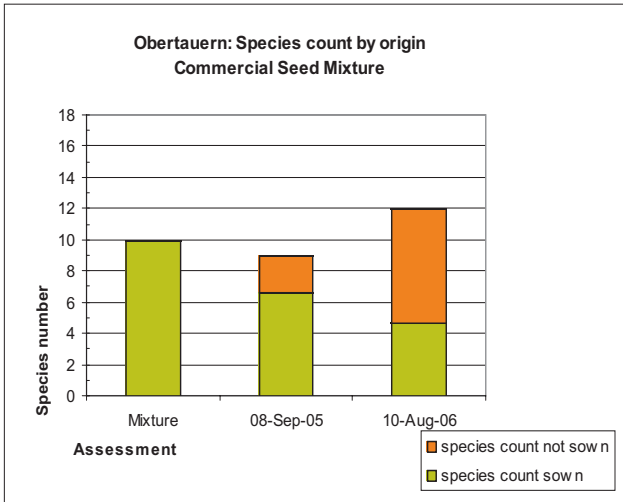


Figure 6 (left) and Figure 7 (right): Species count (average of three replicas) by origin (sown and not sown).



Pictures from the setup