

Ecological value of site-specific and conventional seed mixtures compared

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Great changes have taken place in the last few decades in the alpine regions. On the one hand, large areas are no longer farmed and remain fallow, and on the other hand constant intervention is undertaken through improvement to the infrastructure (ski-run expansion, road building) and protection against natural dangers. These constructional measures lead to the need for restoration of these resulting open areas.

The more extreme the site conditions, the more difficult the restoration measures. In many cases a reasonably priced restoration technique is combined with a cheap non-site-adapted seed mixture, which often leads to ecological and economical problems such as flora adulteration, insufficient vegetation cover, erosion and high subsequent costs due to repeated measures.

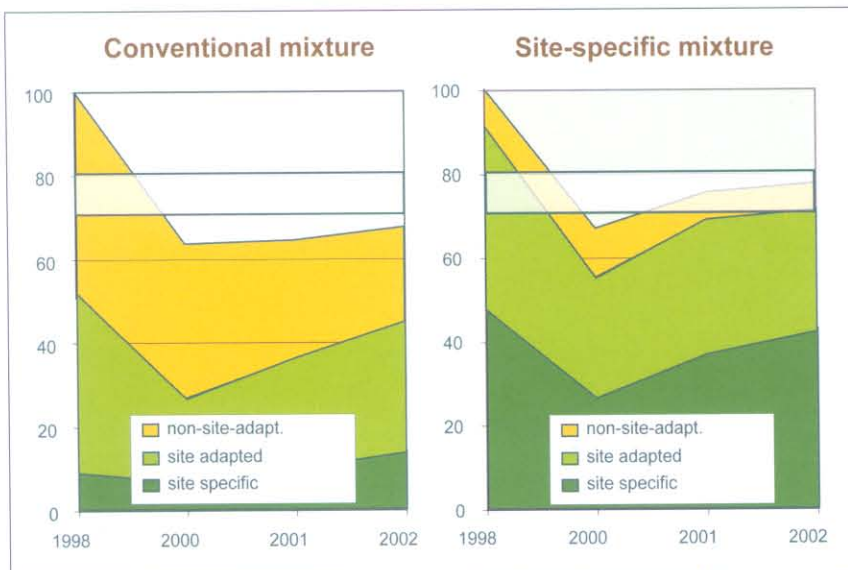
The results of many years of tests

Several scientific projects were carried out at the Federal Research and

Education Centre Raumberg-Gumpenstein in recent years to clarify whether site-specific seed mixtures, compared to conventional mixtures, show greater stability and endurance, and produce more ecologically valuable vegetation.

At eight different sites, the development of vegetation from site-specific seed mixtures and a conventional mixture was observed and compared over a period of four years. According to their ecological distribution, the individual species were arranged in site-specific, adapted and non-site-adapted groups and the share of the individual groups given as the total cover in percent. Site-specific species at a given

location are native, while adapted species are not site-specific but are enduring under the given climatic- and soil conditions. Non-site-adapted species are not normally found under the given site conditions and die off within a short time (Ill. 1). Non-site-adapted species are represented by 50% of the sown weight of a conventional mixture, 40% are adapted species and 10% site-specific species. If one assesses the average development of ground cover on all test sites, the conventional mixture achieved only somewhat above 60% of the total cover. In the fourth year of vegetation, the target value for achieving erosion-stable conditions to the formulated limit of a 70% cover could still not be achieved! More than 24% of the total assessed cover was attributed to non-site-adapted species (with their failure that must be reckoned with in the short- or medium-term), 29% to adapted species and 15% to site-specific species. The site-specific restoration mixtures had an average share of just on 90% in weight of site-specific and site-adapted species. In 2002, the last year of observation, the cover share in the vegetation was more than 70% in comparison to a conventional mixture with a significantly better total cover of 79%. The share of site-specific species compared to the share of the initial mixture remained stable at about 50%. Thus the site-specific restoration mixtures achieved a clearly and comparably more stable sod, better endurance and correlated permanent erosion protection.



Ill. 1: total cover in percent and share of various ecological groups with comparison of a conventional mixture and site-specific restoration mixtures (seeding = mixture composition in weight percentage).





Comparison of a conventional mixture (left) with a site-specific mixture (right) at an altitude of 1,600 metres, the yield strength of the species in the conventional mixture are clearly recognisable, the number of species is higher for a site-specific mixture, due to the slight altitude the state of development of both mixtures is similar.



Comparison of a conventional mixture (left) with a site-specific mixture (right) at an altitude of 1,900 metres, the conventional mixture shows clearly less cover and less species, the site-specific mixture is rich in species and shows an advanced state of development.



Comparison of a conventional mixture (left) with a site-specific mixture (right) at an altitude of 2,400 metres, the conventional mixture merely struggled, the site-specific mixture showed a satisfactory cover and biomass production at this height, the number of species is sufficient and endurance is guaranteed through the formation of seed.

The greater ecological value of site-specific seed mixtures was to be clearly seen on all areas. The excellent plant stocks from restoration with site-specific seed clearly show greater endurance against climate and use (skiing-operation wear in winter and grazing in summer).

Importance of the results for practice

The tests showed clearly that independent of the composition of the seed mixture, no sufficient erosion protection can be achieved within the first year of vegetation. It is therefore absolutely necessary to ensure the use of a good application technique with an additional cover layer of mulch over the topsoil. The composition of the seed mixture had no influence on the occurrence of erosion in the first weeks after seeding. The volume of seeding of 15g/m² (150kg/ha) was sufficient with the use of a high-quality alpine mixture for restoration in high zones!

The right technique at the right time combined with high-quality seed is thus decisive in practice for the success of a recultivation measure. A single fertilisation on restored areas is generally sufficient with the use of site-specific mixtures. Further fertilisation could be necessary under difficult conditions. With the use of site-specific mixtures, the further restricted use of fertiliser is not absolutely necessary. It means that restoration on ski runs also remains dense and stable without cutting or grazing.

Restoration measures should therefore be carried out with site-specific mixtures to achieve high ecological value. The use of non-adapted species is of no use under extreme climatic- and soil conditions.

