The Influence of Management on Health Status of *Festuca Rubra* in Mountain Meadows

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Introduction Snijders & Winkelhorst (1996) investigated swards in West Europe and showed that it was not the snow mould (*Microdochium nivale*) but other species of the genus *Fusarium* (*F. cerealis* (Cooke) Sacc., *F. graminearum* Schwabe, *F. culmorum* (Wm. G. Sm.) Sacc. and *F. acuminatum* Ellis & Everh.) that caused serious damage to grasslands where *Lolium perenne* L. and *Festuca rubra* L. were dominant components. In this study the spread and harmfulness of pathogeneous fungi involved in damage to and death of some species (*Festuca rubra* L., *Holcus mollis* L.) in grass swards was examined.

Material and methods The spread and harmfulness of pathogenic fungi involved in the senescence of two dominant species of grasses (*Festuca rubra* and *Holcus mollis*) was observed mainly from the viewpoint of phytopathology. The investigation was carried out in 1999 – 2003 in controlled experiments. The experimental site (Zhůří in the Šumava Mountains) was situated at an altitude of 1150–1180 m. In the experiments, three treatments (Mo – mowing, Mu -mulching, F – fallow) were imposed with three replicates (30 m^2 per plot) per treatment.
Phytopathological analysis of plants with symptoms indicating an attack of *Fusarium* fungi was carried out in May of each year. The method for evaluation of symptoms in plants, according to Dixon & Doodson (1971), was used. The projective dominance of the grasses was estimated in mid-July of each year (prior to mowing or mulching of the Mo or Mu treatments).

Results During the observation of *Fusarium* fungi in selected grass species, there were significant (p<0.001) differences in the extent of attack on *F. rubra* from that on *H. mollis*. The least extent of *Fusariium* symptoms was recorded in *H. mollis* whereas the most serious damage was found in *F. rubra,* especially in the unharvested fallow treatment.
In this treatment, *F. rubra* also showed the greatest decrease of coverage from the original value of 30-40 % D to only 3-6 % D (% D = projective dominance). In the mulched treatment, a trend in a reduction in *F. rubra* to 20-30 % D was also recorded owing to the fungal attack. The increased attack by *Fusarium* fungi found in the mulched treatment and an even more severe attack on unharvested *F. rubra* created worse conditions for subsequent fodder crop production. The infestation of *F. rubra* with the *Fusarium* fungi was twice as intense in the mulched treatment (28.9%) and almost 4.5 times as intense in the unharvested treatment (65.2%) in comparison with the mown treatment (14.0%).
A high correlation was found between the attack of *Fusarium* fungi (in May) and subsequent reduction in *F. rubra* along with a simultaneous increase (parallel with *F. rubra* retreat) in *H. mollis* (Figure1).

Conclusions The least extent of damage caused by *Fusarium* fungi was recorded in *H. mollis* whereas the most serious damage was found in *F. rubra,* especially in unharvested herbage.

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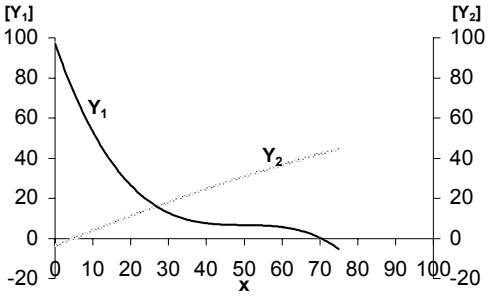

Figure 1 Correlation between *Fusarium* fungi attack of *Festuca rubra* in May (x in %) and consequent cover change of *F. rubra* (Y_1 in %D) and *Holcus mollis* (Y_2 in %D) in July: Y_1=97.678-5.362x+0.105998x^2-0.000704x^3 (R^2=0.816; P<0.01); Y_2=-6.873+0.750x-0.001742x^2 (R^2=0.744; P<0.01)

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