## Persistence of timothy in mixture with smooth meadow grass

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**Introduction** Timothy (*Phleum pratense)* is the most common grass species in Iceland for the production of high quality herbage for dairy cows. For this purpose timothy is cut early, often around heading. The high quality, however, is at the cost of limited persistence of timothy. If cut late, three to four weeks after heading, timothy cultivars of northern origin can sometimes dominate for a long time, especially if the aftermath is not cut or grazed. Earlier experiments have shown that, relative to a late cutting treatment, the percentage timothy in the first harvest is reduced by one unit for each week that the harvest is moved forward (Helgadóttir & Hermannsson, 1991). This effect is cumulative over the years and the result applies to swards where all of the fertiliser is applied in spring and smooth meadow grass (*Poa pratensis*) is present in the sward, either sown or invaded. Experiments were run to further study the persistence of timothy under different cutting treatments and N applications and the effect of cultivars of both timothy and smooth meadow grass.

**Materials and methods** Timothy (cvs Adda, Vega and Saga) was sown in a 2:1 mixture with the smooth meadow grass cv. Lavang in 1995 in a 2×2×2×3 factorial experiment with three replicates. Treatments were applied in 1996–1998, the plots harvested and the harvest sampled for botanical analysis between 1996 and 1999. Harvest dates of 1st and 2nd cut were a 2×2 factorial, arranged on main plots. Dates of 1st cut were June, 27–30 and July, 15–17 and dates of 2nd cut were August, 23–25 and September, 6–9. N (180 kg/ha) was all applied in spring or split with 60 kg/ha applied after 1st cut. In 1999 the experiment was cut once, measuring the accumulated effects of treatments. N applied was 100 kg/ha and the plots were harvested on July, 5–6. In a series of three experiments between 1999 and 2002 twelve cultivars of smooth meadow grass were tested in pure stand and in mixture with timothy cv. Adda. The N level was 150 kg/ha in split application.

**Results** Timothy was dominant at the first harvest, 92% and 95% on June, 27 and July, 15, 1996, respectively. The timothy cultivars are all of northern origin with little regrowth potential so that the split application of N favours the smooth meadow grass. In 1996 timothy was 85% and 78% in 2nd cut for all N applied in spring and as split application, respectively. Timothy declined gradually with time and the results presented are for the final harvest in 1999 only. Date of 2nd cut had little if any effect on the persistence of timothy and results are not shown. In Table 1 results are presented for two way combinations of timothy cultivars with each of the factors date of 1st cut and split nitrogen application. The standard error of difference is not valid for direct comparison of cutting dates. Cv. Adda is the most northern of the three cultivars and has persisted the competition better than the others, especially when cut late. On plots with late 1st cut of cv. Adda and all fertiliser applied in spring timothy amounted to 79.5% of the harvest, while on nearby plots with pure cv. Adda and similar treatment it was 85% of the yield, indicating that smooth meadow grass was competing at this cutting date. In the experiments with smooth meadow grass cultivars the over all average of timothy in the herbage was 71.6–73.4% with four cultivars and with the other eight cultivars timothy was in the range 61.1–68.3%. Timothy was in most cases relatively competitive against cultivars that are used as turf grass. The cultivar used in the first experiment, Lavang, was among those most competitive against timothy. Yield differences among cultivars were small. The two cultivars yielding highest in pure stand left a sward with low timothy content in the mixture, whereas none of the cultivars with high timothy content in the mixture were low yielding.

**Table 1** Percentage timothy in 1999**,** SED=2.23

| | Mean date of 1st cut | | N application | | |
|---|---|---|---|---|---|
| | 29 June | 16 July | Spring | Split | Mean |
| Adda | 56.8 | 73.1 | 72.5 | 57.5 | 65.0 |
| Vega | 49.3 | 59.6 | 61.3 | 47.6 | 54.4 |
| Saga | 51.6 | 54.7 | 61.1 | 45.1 | 53.1 |
| Mean | 52.6 | 62.5 | 65.0 | 50.0 | |

**Conclusions** Smooth meadow grass is often sown with timothy in order to secure a dense sward, thus reducing the risk of soil contamination in the harvest. This shortens the lifetime of the timothy, especially if cut early and fertilised after the 1st cut in order to get high quality forage. The highest yielding cultivars of smooth meadow grass are not necessarily the best ones for use in mixture with timothy.

**Reference**

Helgadóttir, Á. & J. Hermannsson (1991). The effect of management on botanical changes in a newly established grass sward and the need for reseeding. In: Varig grasmark – til slått og beite. NJF seminar nr. 196, Kolbotn, Norge, 11.-13. March 1991, 75-81.