

Black medick – a beneficial companion crop for use in organic grass production

R. Macháč and B. Čagaš

OSEVA PRO Ltd., Grassland Research Station at Zubri, Hamerská 698, CZ-756 54 Zubri, Czech Republic,
Email: machac@quick.cz

Keywords: perennial ryegrass, timothy, organic seed production

Introduction Organic farmers must use only organically produced seed for establishing new meadows and for renovation and undersowing of old pastures, in accordance with EC regulations. Therefore an important and difficult goal is to obtain enough seed of grasses without the use of pesticides and inorganic fertilisers. The seed yield is closely related to the number of fertile tillers, which depends on adequate nitrogen in the soil. Growing grasses for seed with a legume, as a companion crop, is one possibility for providing a source of organic nitrogen. Aamlid (1999) claimed that growing timothy together with white clover or alsike clover can produce yields of timothy grass seed comparable to conventional production. The need for more information about growing grasses with leguminous crops was emphasised by Marshall & Humphreys (2002) and was the subject of this research.

Materials and methods Seed yields of perennial ryegrass (*Lolium perenne* L.) cv. Bača and timothy (*Phleum pratense* L.) cv. Sobol, grown together with companion legumes were compared in a 3-year field trial. A multifactorial trial was established in April (timothy) and August (ryegrass) 2000 at the Grassland Research Station at Zubri. Timothy was undersown into spring wheat as a cover crop, but perennial ryegrass was sown directly. The trial consisted of two grass species (factor 1); three leguminous companion crops (factor 2), i.e. diploid red clover (*Trifolium pratense* L.) cv. Start, white clover (*T. repens* L.) cv. Vysočan and black medick (*Medicago lupulina* L.) cv. Ekola, and N-nutrition (factor 3), i.e. N-transfer from current legumes, the organic N from previously harvested legumes (mulching) or organic manuring with slurry. Each treatment combination had four replicates. The seed yield from all combinations of the factors was compared with that from conventional grass seed production and tested by ANOVA.

Results The seed yield of timothy ranged from 158 to 863 kg/ha. Timothy with black medick produced 676 kg/ha (15 % lower than conventional practice) in the 2nd harvest year (the seed of legumes was harvested in the 1st year) and 255 kg/ha (29 % higher than conventionally grown seed; highly significant difference) in the 3rd year. Total seed yield of timothy (for harvest years 2 and 3) is shown in Table 1. The combination of perennial ryegrass with black medick gave the best results, with overall weighted mean (organic treatments) of 529 kg/ha in the first harvest year, 472 kg/ha in the second harvest year and 167 kg/ha in the third harvest year. Compared with the conventional grass seed production, the yield in the 1st year was 8 % higher, in the 2nd year 32 % lower, and in the 3rd year it was 40 % lower. Total seed yield of three harvest years for perennial ryegrass is shown in Table 2.

Table 1 Seed yield of timothy (kg/ha)

Treatment	Bacterial nodules	Mulching	Organic manure	Conventional
Companion crop				
Red clover	533	582	858	730
White clover	680	581	797	700
Black medick	1012	716	1072	928
Without legume				912

Table 2 Seed yield of perennial ryegrass (kg/ha)

Treatment	Bacterial nodules	Mulching	Organic manure	Conventional
Companion crop				
Red clover	779	414	843	1173
White clover	944	558	1130	1431
Black medick	990	677	1307	1491
Without legume				1480

Conclusions The 3-years field trial showed that timothy and perennial ryegrass grown for seed together with black medick are able to produce seed yields comparable to those produced conventionally especially when the medick is combined with organic manuring.

Acknowledgements Supported by the Ministry of Agriculture of the Czech Republic, Project No. QD 0004

References

- Aamlid, T.S. (1999). Organic seed production of timothy (*Phleum pratense*) in mixed crops with clovers (*Trifolium* spp.). *Proceedings of 4th International Herbage Seed Conference*, Perugia, 28-32.
- Marshall, A.H. & M.O. Humphreys (2002). Challenges in organic forage seed production. *Proceedings of the COR Conference*, 26-28 March 2002, Aberystwyth, 53-54.