Repeated strip-seeding of a legume-grass mixture into permanent grassland in the Czech Republic

A. Kohoutek, P. Komárek, V. Odstrčilová and P. Nerušil
Research Institute of Crop Production Prague, Research Station of Grassland Ecosystems Jevicko, K. H. Borovskeho 461, Czech Republic 569 43, Email: vste@seznam.cz

Keywords: grassland, botanical compounds, strip-seeding

Introduction Although ruminants do not belong to the main consumers of protein supplements, there is a possibility to decrease the use of feed grain by increasing the protein content in the forage from permanent grassland. This paper describes strip-sowing of a legume-grass mixture. Saved protein supplements can then be used for feeding pigs and poultry.

Materials and methods Strip-seeding trials were established on a fluvisoil at Jevicko, Czech Republic in a mild climatic region (average annual temperature 7.5 °C, annual rainfall 629 mm, altitude 330 m). Strip-sown grassland (SG) was compared with permanent grassland (PG). Strip-seeding in 1991 (seeding machine SE 2-024), 1996, 2000 and 2003 (seeding machine for strip-seeding - prototype) was done with the same mixture and seed quantity (29 kg/ha). The mixture had this composition: Festulolium hybrid (*Lolium multiflorum*. x *Festuca arundinacea*) cv. Felina (12 kg/ha), Perennial ryegrass (*Lolium perenne*) cv. Sport (8 kg/ha), Cocksfoot (*Dactylis glomerata*) cv. Niva (4 kg/ha), Red clover (*Trifolium pratense*) cv. Kvarta (3 kg/ha), White clover (*T. repens*), cv. Huia (2 kg/ha). The original grassland and the strip-sown alternative were fertilised with 30 kg/ha P as super phosphate and 60 kg/ha K as potash salt. This paper reports dry matter (DM) production and corrected DM production of strip-sown legumes and grasses (corrected DM production = DM production x percentage of botanical group / 100).

Results Average DM productions of SG of all years was 29% higher than PG (Table 1). DM production of strip-sown legumes plus grasses (SL+G) amounted to 59.1 % of total DM yield. Substantial modification of the botanical composition in favour of strip-sown species was acquired by annually repeated strip-seeding. DM production of SL (mostly red clover) was highest in the first year after strip-seeding, but in following years only traces of SL were recorded, which is in accordance with the general persistence of red clover in central European for two to three years. SGr have higher and more regular DM production than SL, because the most productive and persistent grass species were used in the mixture (mainly *Dactylis glomerata* and Festulolium hybrid).

Table 1 DM production (t/ha)

Var./year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	AVG
PG	3.83	3.78	3.30	3.66	8.32	7.79	5.81	4.03	7.26	6.15	6.45	8.02	5.69	5.40
SG	3.54	8.49	5.56	5.91	10.41	8.44	9.31	6.29	8.59	5.90	6.91	8.28	6.54	6.97
$LSD_{0,05}$	0.78	1.69	1.34	1.45	2.98	2.71	2.03	2.13	2.79	1.38	1.65	1.69	1.43	.
$LSD_{0,01}$	0.91	1.95	1.56	1.71	3.58	3.21	2.40	2.52	3.30	1.63	2.06	2.00	1.75	.
SL	0.38	2.38	1.20	0.52	0.00	0.00	4.71	1.79	0.02	0.26	3.32	1.28	0.38	1.22
SGr	0.56	3.60	2.17	3.74	3.30	3.72	3.66	3.00	3.17	3.01	2.36	3.61	2.41	2.90
SL+Gr	0.94	5.98	3.37	4.26	3.30	3.72	8.37	4.79	3.19	3.27	5.68	4.89	2.79	4.20

SL: strip-sown legumes; SGr: strip-sown grasses; SL+G: total strip-sown legumes + grasses

Conclusions Strip-seeding of a legume-grass mixture repeated every 3 to 5 years would contribute substantially to increased productivity of PG. The proportion of strip-sown species and especially legumes is highest in the first yield year after strip-seeding.

Acknowledgements Support of the research project No. VZ01 'Creation, calibration and validation of sustainable and productive cropping systems' is gratefully acknowledged.