

Effect of seed rate of *Trifolium repens* in pasture overdrilling

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Introduction In the region of Wielkopolska, unfavourable climatic conditions, particularly periodical shortage of precipitation, have contributed to a rapid degradation of pastures in dairy farms. In grass-clover mixtures *Trifolium repens* (*Tr*) is found to disappear very quickly from the sward. In consequence the DM yield and herbage quality in summer is low. One of the methods of improving of pasture sward and reducing the seasonality of forage production is overdrilling (OD). Many factors affect the success of this undertaking (Sheldrick 2000). This research investigated the response to one easily adjustable factor, that of seed rate (SR).

Materials and methods During 2001-2002 an experiment was set up, in Brody (52° 26' N, 16° 18' E) to evaluate the effect of different SR (3, 4, 5, 6 kg/ha) of *Tr* cv. Barbiana on the success of OD. A block design was used with four replicates (plot size 8 m × 2.5 m). The pastures were situated on poorly mineralised Histosols soils (pH_{KCl} – 6.5, N_t – 0.62%, P₂O₅ – 67.9 mg/100 g, K₂O – 30.0 mg/100 g, Mg – 7.1 mg/100 g). At the time of OD the proportion of *Tr* in the sward yield was 2.3%. The area was prepared by using a rototiller followed by rolling. The seeds were sown in spring (early April 2001) using a Vredo drill. Fertiliser was applied each year at a rate of: N – 80 kg/ha, P₂O₅ – 80 kg/ha, K₂O – 140 kg/ha and 4-5 regrowths were harvested. The effectiveness of OD was evaluated on the basis of the number of seedlings per m² 25 and 50 days from sowing as well as the proportion of *Tr* in the sward (samples were separated and the fractions were weighed). Dry matter yield was measured on an area of 15 m². The herbage was dried in a forced-draught oven at 60 °C. Crude protein (CP) and acid detergent fibre (ADF) were also measured on selected plots using commonly accepted methods. F-tests were applied to main effects. Means were separated by the LSD and were declared different at the p<0.05 level.

Results Increasing the SR of *Tr* resulted in a greater number of seedlings per unit area (Table 1). There was a positive correlation between the proportion of *Tr* in the yield and SR. Increasing the SR from 3 to 4 kg/ha, also increased the proportion of *Tr* in the sward during the first year of utilisation from 14.0% to 20.3%. Increasing SR of *Tr* did not have a significant effect on sward yields. The improvement in sward botanical composition obtained following the introduction of *Tr* had a significant impact on herbage quality. Over the two-year period it was found that increasing SR from 3 to 4 kg/ha resulted in a significant increase in CP concentrations (from 184 to 215 g/kg DM) and a decline in ADF content (from 252 to 217 g/kg DM). The impact on herbage quality of increase in SR from 4 to 6 kg/ha was negligible.

Table 1 Effect of seeding rate (kg/ha) of *Trifolium repens* (*Tr*) in pasture overdrilling

Seeding rate	3	4	5	6	LSD _{0.05}
No. of seedlings per m ² after 25 days from sowing	168	277	336	529	30.4
No. of seedlings per m ² after 50 days from sowing	91	150	213	264	24.3
Proportion of <i>Tr</i> in sward in sowing year (%)	16.6	21.2	22.9	25.2	3.67
Proportion of <i>Tr</i> in sward in year of utilisation (%)	14.0	20.3	21.0	20.5	2.23
Total yield of DM in sowing year (t/ha)	6.84	6.81	6.87	6.84	ns
Total yield of DM in year of utilisation (t/ha)	9.75	10.02	9.89	10.04	ns
Herbage quality – means from two years of pasture utilisation					
CP (g/kg DM)	184	215	206	218	14.3
ADF (g/kg DM)	252	217	233	230	6.8

Conclusions Increasing the SR of *Tr* from 3 to 4 kg/ha resulted in a significant increase in the proportion of this species in the sward and an improvement of herbage quality. Increasing the SR of *Tr* from 3 to 6 kg/ha for pasture OD did not have a significant effect on total DM yield.

Reference

Sheldrick, R.D. (2000). Sward establishment and renovation. In: A. Hopkins (ed.) Grass. Its Production and Utilization. Blackwell Science, Oxford, 13-30.