

Effect of mineral nutrition on red clover leaf area index

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Introduction The legume red clover (*Trifolium pratense*) fixes its own nitrogen (N), but requires P and K fertilisation. There are no recent reliable data in the domestic literature, on the amounts of P and K recommended to farmers; present recommendations are often either inadequate or excessive. Red clover mineral nutrition is significantly affected by soil and weather conditions (Taylor & Quesenberry, 1996). The objective of our two-year study was to enable rational fertiliser application in accordance with soil type and agro ecological conditions.

Material and methods The trial was carried out in the field conditions during 2000 and 2001. The red clover cv. Kolubara, was grown in monoculture plots, with 20 cm row distance. The experimental design was a randomised block with four replicates. Soil analyses showed slight acidity (pH 6.64), mean N content 0.20 % and P and K contents 12.10 and 14.0 mg/100g of soil, respectively. Fertiliser rates were based on the soil supply with these elements and their removal by yield. The soil N content was 45 kg/ha (determined by the N-min method), and there were three different P and K rates (P₁-40, P₂-80 and P₃-120 kg/ha; K₁-60, K₂-120 and K₃-180 kg/ha, and control, 12 treatments in total. Treatments were applied in one application during the winter. At maturity, dry matter (DM) yield (t/ha) and leaf area index-LAI (m²/m²) were determined. LAI was determined on the basis of leaf DM weight and leaf area (Sarić *et al.*, 1986).

Results and discussion Taking the two study years together, the highest LAI was obtained in the P₁K₂ treatment, followed by P₂K₁ and P₃K₁. The lowest LAI was recorded in the control (Table 1). In the first year of study, three cuts produced an average DM yield of 14.5 t/ha, while in the second year, also from three cuts the average yield was 13.8 t/ha. The correlation coefficient between LAI and DM yield was (r=0.25) was not significant in contrast to Vasiljevic *et al.* (2003), who reported a large effect of LAI on DM yield.

Table 1 Effect of mineral nutrition on red clover leaf area index-LAI (average for two years)

Cut	Control	P ₂	K ₂	P ₁ K ₁	P ₂ K ₁	P ₃ K ₁	P ₁ K ₂	P ₂ K ₂	P ₃ K ₂	P ₁ K ₃	P ₂ K ₃	P ₃ K ₃	Average	LSD (5%)
First	4.2	4.3	4.1	4.2	4.8	4.2	4.7	4.4	3.5	4.2	4.3	4.3	4.2	0.51
Second	2.3	2.6	2.4	2.4	2.4	2.6	2.5	2.3	2.2	2.4	2.1	2.4	2.4	0.35
Third	0.7	0.6	0.6	1.2	1.3	1.3	1.5	0.8	1.1	1.0	0.7	1.0	0.8	0.21
Total	6.7	7.5	7.1	7.8	8.5	8.1	8.7	7.5	6.8	7.6	7.1	7.7	7.4	0.85

Conclusion Red clover cv Kolubara achieved high DM yields, confirming that the species has a high genetic yield potential. Results were influenced by precipitation.

References

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