



Potassium application affects leaf drop, common leaf spot disease and yield of lucerne

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Methods

To study the response of dryland lucerne (*cv.* Genesis) to potassium (K) application, an on-farm trial was sown on 10 June 1998 at Kevin & Julie Aitken's property near Duri. The soil of the experiment site was medium/heavy clay and dark greyish brown in colour with a pH of 7.3 (1:5 CaCl₂). Topsoil (0-15 cm) had 1.03 meq/100g K (amm. ac. extracted) and subsoil (15-30 cm) had 0.88 meq/100g K. The experiment was conducted in a randomised block design with 6 rates of potassium supply (0, 20, 40, 60, 80 and 100 kg K/ha). Each treatment was replicated 3 times. A treatment of 120 kg K/ha was also applied (two reps only). The source of potassium was muriate of potash (potassium chloride). Herbage (above ground biomass) was harvested once during 1998 (16 November 1998) and six times during 1999 on 5 January, 12 March, 15 May, 23 August, 18 October and 8 December. Herbage yields based on oven dry weight basis were used to determine the impact of different rates of potassium application.

Results and discussion

Results indicate a significant increase in total herbage yield of 7 cuttings of lucerne with potassium application (60, 80 and 100 kg K/ha) over control (Figure 1). There was no statistically significant effect of the lower levels of potassium (20 and 40 kg/ha) upon dry matter yield of lucerne. Application of potassium @ 60, 80 or 100 kg/ha also significantly reduced leaf drop and occurrence of common leaf spot disease in lucerne. These results suggest that leaf drop and common leaf spot disease have an association with potassium nutrition of lucerne. These associations may have widespread implications in managing the growth and yield of lucerne for hay cutting and/or grazing, and potential nitrogen contributions of lucerne rotations in paddocks having low available potassium. Potassium is one of the essential element for plants. Low potassium usually results in the accumulation of soluble nitrogen compounds and sugars in plants which are suitable food source for parasites (e.g. fungus). Adequate potassium nutrition results in stronger tissue and thicker cell walls which are more resistant to disease penetration.

Conclusions

Potassium application increases lucerne yield and reduces occurrence of common leaf spot disease and leaf drop in lucerne on soils low in potassium. Growers need to carry out soil tests and plant tissue tests if they suspect low soil potassium is affecting establishment or production of their lucerne crop.

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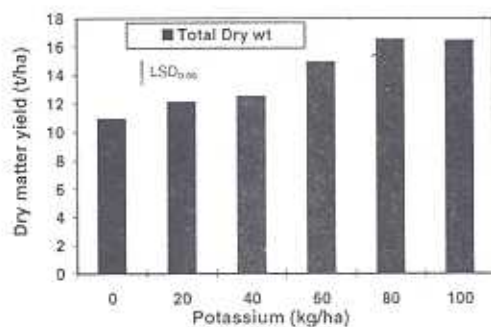


Figure 1. Effects of applied potassium on lucerne dry matter yield of 7 cuttings in an on-farm dryland lucerne trial near Tamworth, NSW.