

Lucerne sowing rate and its effect on plant density and productivity

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Introduction

High sowing rates are normally recommended for lucerne establishment to maximise dry matter (DM) production. However, growers often hesitate about sowing lucerne because of the costs involved in seed and establishment and because climatic conditions in this environment do not guarantee success every year. To encourage the widespread use of lucerne in central-western districts of New South Wales, there is a need to reduce the costs of establishment.

In this trial, we aimed to demonstrate and quantify the effects of reduced lucerne sowing rates on its ability to establish and produce DM in a low-rainfall environment.

Methods

Lucerne (cv. Genesis) was sown into a field trial in May 1998 at three different rates (1, 2, and 4 kg/ha) without a cover crop (in four replicate plots). DM yield was measured from eight permanent quadrats (50 by 50 cm) in each plot for 17 cuts over 5 years. Lucerne plant and stem numbers were also counted from each quadrat.

Results

The sowing rates (1, 2, and 4 kg/ha) were successful in establishing stands with different densities, resulting in 23, 33, and 40 plants per m² respectively at January 1999. The plant numbers from each treatment have slowly reduced over time. Interestingly, the largest DM yields were consistently harvested from the lowest plant density stands, and the lowest yields were from the middle-density, 2-kg/ha stands (Figure 1). The

difference between these treatments was equal to 7 t over the 5 years of this trial.

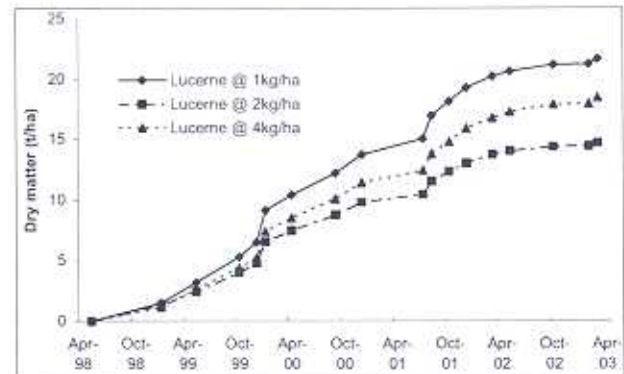


Figure 1. Cumulative DM measured over time for three lucerne sowing rates.

The lucerne plants grew larger to compensate for extra space in low-density plots. The stem densities were similar at each sowing rate; however, the larger plants in the low-density plots produced heavier stems, which accounts for their greater productivity.

Conclusions

These results show that lucerne plant size can compensate for the density of plants present, enabling good forage yields to be achieved from seeding rates as low as 1 kg/ha when sown without a cover crop. By sowing lucerne every year at a lower rate, growers may be more confident that, in years with good rainfall, they will be successful in establishing productive lucerne stands. Also, in low-rainfall years where establishment is not as successful, the growers' financial outlay and risk will be much lower.