The effect of fungicide and the control of leaf disease in lucerne

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Lucerne is recognised as highly productive forage ideally suited to the dairy industry. However, on the South Coast of N.S.W. disease has severely restricted the widespread use of lucerne. Of the various diseases present none *is* better known or more widely spread than leaf disease, especially common leaf spot (Pseudopezizia medicaginis). Other leaf disease agents present include Leptosphaerulina trifolii, Stemphylium botryosum, Uromyces striatus, Stagonospora meliloti. The diseases are present wherever the plant is grown, however the level of disease varies with environmental conditions, stage of plant growth and variety. All current varieties are susceptible to leaf disease and production losses may be as great as 43% (1). Two field experiments were established to determine the main effects of time and rate of application of fungicide (Rovral Flowable ?) in controlling leaf disease.

Method

In both experiments, the fungicide was applied as a single application between cuts from a knapsack spray delivering 500 L/ha of water. The 5x3m plots were cut every 35 days. Experiment 1 consisted of a factorial design with 4 replicates. Rovral Plowable ? was applied 15 days post cutting at the product levels of nil, 1.0, 2.0 and 4.0 L/ha to an established stand of P572 lucerne. Experiment 2 consisted of two field sites, each with 3 replicates. Rovral Plowable ? was applied at the product rate of 1.5L/ha; 5, 15 and 25 days post cutting on 7 month old seedling stands of cv P577 and Granada Lucerne. Both experiments were maintained for 12 months and data was analysed by analysis of variance.

Results and Discussion:

The effect of fungicide on lucerne dry matter production is summarised in Tables 1 and 2.

Table 1: The effect of fungicide application on lucerne (P572) dry matter production

Fungicide Rate L/ha	Total Dry Matter kg/ha
Nil	5317
1	6081
2	6236
4	5969
LSD (P:0.05)	877

Table 2: The effect of time of application of fungicide on lucerne dry matter production

Day of Spraying Post Cutting	Total Dry Matter kg/ha cv:P577	cv:Granada
Nil	7584	6062
5	8360	6180
15	9458	6557
25	8354	6598
LSD (P:0.05	1362	223

Fungicide (Hovral Flowable ?) applied at 1.5L/ha as a single application, 15 days after cutting can significantly increase dry matter production of lucerne maintained on a 35 day cutting cycle (Table 2). In both experiments the level of disease burden varied throughout the year and a maximum yield advantage (ca 40%) resulted when at least 25-45% leaf area was affected.

There was no affect of fungicide on leaf/stem ration. The individual affect(s) of the various pathogens on yield reduction was not assessed. The aged, more open lucerne stand (expt. 1) was least responsive to applied fungicides although significant seasonal responses did occur during periods of high leaf disease levels (Table 1). Until leaf disease resistance is incorporated into new lucerne varieties the use of fungicides to control leaf disease appears a short term option. As yet, systemic fungicides, are not available to control many lucerne leaf disease causing agents and consequently when using contact type fungicides consideration will have to be given to timeliness of application, canopy structure and the pathogenicity of the causal agent(s).

1. Morgan, Wendy C. and Parberry, D.G. 1977 Aust. J.Ag. Res. 28 1029-40