MANAGEMENT OPTIONS FOR PASTURE AND CEREAL PRODUCTION IN NORTH-WEST VICTORIA

R.A. Latta[1] and N.L. Hill[2]

[1] Agriculture Western Australia, Katanning, W.A. 6317
[2] Agriculture Victoria, V.I.D.A., Walpeup, Vic. 3507

Abstract

Methods to eradicate grasses in the pasture phase of a pasture-pasture-wheat rotation were evaluated. Selective grass herbicide applied in the first pasture phase was compared to mechanical fallowing applied in the second pasture phase. The selective grass herbicide treatment produced similar pasture production in year 1, more in year 2 but lower grain yield in the cereal phase, year 3.

Key words: Pasture, annual medic, grass, wheat, rotations.

Self-regenerating annual medics (*Medicago* spp.) in pasture-crop rotations may benefit both cereal and livestock through fixing nitrogen, providing a disease break for the cereals, and increasing the quantity and quality of livestock fodder (1). However, these benefits are often reduced due to the high level of grass in the medic-based pastures. The grass limits the medic production and increases the potential for cereal disease transmission.

This study examined grass control practices in a pasture-pasture-wheat rotation with a mechanical fallow and a selective grass herbicide. It measured the impact of those strategies on pasture and cereal production in the Mallee region of north-west Victoria.

Materials and methods

The experiment was conducted at the Mallee Research Station, Walpeup. The treatments applied were:

• selective grass control, 375 ml/ha fluazifop 500 ml/L a.i. applied on 18 August 1994; and,

• a mechanical fallow treatment commenced with a scarifier on 5 July 1995.

There were 3 replicates of each treatment with the 6 plots being 1.25 ha.

Pasture plant establishment densities (20, 0.2 m^2 quadrats each plot) were counted in each year 1994-97. Sheep grazed plots at 1.25 and 4 DSE/ha in 1994 and 1995, respectively. Cumulative pasture production was measured in 1994 and 1995 by the on-off cage method. Plots were sown to wheat on 12 June, 1996, and grain yields and protein percentages measured at harvest on 26 November.

Results

Rain in 1994, 1995 and 1996 totalled 164 mm, 403 mm and 333 mm, respectively. The 90 year average at Walpeup is 338 mm.

There were no treatment differences in the densities of established medic plants in 1994 or 1995 (200 to 300 plants/m^2). There was a lower grass density in 1995 in response to 1994 selective grass control treatment.

Both treatments produced similar biomass until the mechanical fallowing removed pasture in July 1995 and no further pasture was produced. The fallow treatment also had lower densities of medics which established in 1997 following the 1996 wheat crop.

The selective grass control treatment had higher volunteer grass densities than the fallow in the wheat phase of the rotation. The higher grass density reflects the lower grain yield and protein percentage of the herbicide treatment.

Conclusions

This study has shown the potential livestock benefits available from maintaining the pasture production for the full duration of the pasture phase, compared to a fallow. It has also shown a loss of medic seed yield in 1995, due to the fallow treatment, and reflected in lower 1997 medic establishment densities. Benefits from the fallow, higher wheat yield and protein levels were most likely due to better grass control and possibly soil moisture retention.

The use of a selective grass herbicide almost 2 years prior to the cereal crop is desirable to ensure cereal root disease control and maximise legume production (1). However, in this experiment inadequate grass control resulted from the practice.

The economic cost/benefit analysis from both systems are relatively similar. The herbicide cost was balanced by potential prime lamb production in the second pasture year. The cost of fallowing includes the cost associated with re-establishing a medic-based pasture. The environmental issues associated with fallowing, soil erosion and effective water-use are a major industry and community concern which will ultimately force the abandonment of this practice.

Acknowledgments

The Grains Research and Development Corporation provided financial support.

References

1. Latta, R.A., and Carter, E.D. 1996. *Proc. 8th Aust. Agron. Conf.*, Toowoomba. pp. 365-368.