

control, but the application of Tordon 50-D at a concentration of 0.125 lb of picloram plus 0.5 lb of 2,4-D per acre (0.15 + 0.56 kg per hectare) was much less effective. Amitrole-T at 8 lb per acre (9 kg per hectare) also gave some reduction. The control obtained with picloram at 0.5 lb (0.6 kg per hectare) and 0.25 lb (0.3 kg per hectare) was also good, but below that given by Tordon 50-D at equivalent picloram concentrations. White clover was completely removed with these chemicals and the growth of grass was also depressed with amitrole-T.

Earlier trial work had indicated that higher rates of dicamba, 2,3,6-TBA (both at 8 lb per acre = 9 kg per hectare), and amitrole-T (16 lb per acre = 18 kg per hectare) could produce outstanding results. However, their use at such rates would appear unpractical on large areas. Tordon 50-D at the rate containing 0.25 lb of picloram plus 1 lb of 2,4-D per acre (0.3 + 1.125 kg per hectare) offers reasonable control with more economy.

THE USE OF BIPYRIDYL HERBICIDES TO INCREASE THE CLOVER COMPONENT IN PASTURES

P.D. Lawler and W.C. Stonebridge
 ICIANZ, 'Merrindale' Research Station, Victoria

Considerable evidence exists to suggest that animal production is greatest when pastures contain legumes alone or mixed with grasses than when they contain no legumes. The ability of paraquat to suppress susceptible annual grass species and to manipulate the pasture composition in favour of better subterranean clover (*Trifolium subterraneum*) growth, was therefore examined as a technique of improving pastures.

Successful manipulation of the clover composition of pastures lies in the ability to effectively control or suppress undesirable species, while still maintaining the competitive vigour of clover growth. Effective control of annual grasses with paraquat is dependent on a good chemical cover, and early work suggested that pastures should be well grazed prior to spraying. These investigations on the time and rate of paraquat application on well-grazed pastures indicated that this was best achieved with a rate of 2 oz a.i. per acre (142 g a.i. per hectare) paraquat ion (plus Agral 60 wetting agent) applied just prior to or during the early spring growth of subterranean clover (Table 1).

Since both pasture yield and quality are important factors of animal performance, these studies were extended with a view to improving the final dry matter yield, following chemical application. Brougham (1956) has shown that regrowth of clovers following defoliation is maximal when the leaf area index is about five, at which complete interception of light occurs. In these experiments, pasture defoliated to 5 in. (12.7 cm) yielded approximately 20% more herbage than pasture defoliated to 1 in. (2.54 cm), during the experimental period.

Recent experiments with this manipulation technique have shown that pasture recovery and yield both increase as the degree of defoliation prior to spraying decreases. Maximum recovery and yield occurred when the pasture was sprayed at a height of between 3 and 6 in. (7.6-15.2 cm).

In south-eastern Australia, most pastures are well grazed during the cold winter months when vegetative growth is slow. In practical terms, it would therefore be difficult to manage the grazing intensity such that a pasture was 6 in. (15.2 cm) high during early spring growth. It is therefore suggested that the grazing management towards the end of winter is adjusted to allow the pasture to reach a height of approximately 3 in. (7.6 cm) before spraying to achieve a clover increase. Under these conditions maximum pasture recovery is assured, while weed suppression and clover vigour is maintained. Further, where a desirable perennial grass component exists this will benefit from the selective weeding process.

The provision of chemically manipulated, special-purpose pastures in the farming system is suggested as a means of reducing stock growth problems that occur during the breeding season. Stock health hazards from barley grass (*Hordeum leporinum*) seed heads will be reduced, and good-quality feed will be made available for fast liveweight gains of weaners. Rapid liveweight gains are important in the rearing of breeding ewes, and lambing percentages are increased where ewes are brought into good condition prior to joining. The ability to improve the clover content of pastures by chemical means is therefore an important management method for the maintenance of good-quality pastures, whether it leads to a bettering of stock grazing performances or to the provision of good-quality hay for feeding in time of feed scarcity.

TABLE 1

oz a.i./ac (g a.i./ha)	Time of Spraying	Per Cent Clover at End of Trial (November)		Dry Matter Yield at End of Trial lb/ac (kg/ha)
0 (0)		38	a *	3786 (4244.1) a *
1 (71)	May	78	b	729 (817.2) b
2 (142)		80	b	396 (443.9) b
4 (284)		93	c	297 (332.9) b
0 (0)		45	a	5236 (5869.6) a
1 (71)	August	63	b	3960 (4439.2) a
2 (142)		78	c	4180 (4685.8) a
4 (284)		78	c	3960 (4439.2) a

* Treatment totals flanked by the same letter are not significantly different (P = 0.001, Duncan's Multiple Range Test).