EVALUATION OF CHEMICALS FOR MANIPULATING SUMMER PASTURE GROWTH

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Low rates of the herbicide paraquat have been used to suppress spring grass growth, encourage summer clover dominance and aid in the establishment of oversown species in hill country (Blackmore 1965, Williams and Palmer 1969, MacFarlane 1985). Mefluidide has been used to suppress grass seed head development (Field and Whitford 1983), improve pasture digestibility (Glenn *et al* 1980) and encourage clover growth resulting in an associated increase in lamb growth (Goold *et al* 1982). The work reported here aimed to test a wider range of chemicals which may have similar potential for manipulating pasture growth characteristics to assist farm management.

Six commercially available and five experimental chemicals were evaluated for 6 months in a randomised block design small plot trial. Plots at Hauorongo Research Area, near Palmerston North, were sprayed in late October 1983 on short (900 kg DM/ha), moderate fertility sheep pastures of diverse species composition. All chemicals were applied in 200 litres water/ha with 0.25% 'Agral LN'. The two rates used were approximately 10 and 20% of those recommended for effective herbicidal activity. The trial was mob stocked with sheep when plots reached 2000-3000 kg DM/ha and grazed down to 850-1000 kg DM/ha (approximately 1, 3 and 5 months after spraying). Treatments were assessed for their effects on pasture dry matter (DM) production, pasture composition, grass tiller density and seed head development.

Pasture DM production was significantly depressed for the 4 weeks following spraying by all chemicals except Hoe 35609, Hoe 33171 and the mixture of 35609 and 33171 (Table 1). Excluding sethoxydim and Monsanto 8000, low rates were as effective in suppressing growth as the higher rates. No differences in DM production occurred between late November and early January, but isolated instances of compensatory growth occurred with mefluidide, fluzafop-butyl, Hoe 35609 + 33171 mix and Dowco 453 between mid January and the end of March.

Pasture composition 3 months after spraying was significantly influenced by all chemical treatments (Table 1). Both rates of paraquat, glyphosate, sethoxydim, Dowco 453 and the high rate of fluzafop-butyl increased the percentage of clover in the pasture. This effect was also noted by Rolston *et al* (1985) for paraquat, sethoxydim and Dowco 453. Mefluidide, however, did not significantly increase the clover component as was found by Goold *et al* (1982). All chemicals except Hoe 33171, the low rates of the Hoe mix and Monsanto 8000 reduced the dead component within the pasture. Mefluidide, Hoe 35609 and some rates of paraquat, fluzafop-butyl, Monsanto 8000 and Dowco 453 reduced the grass stem component. There were no differences in grass leaf or weed content. Five months after spraying, the high rate of glyphosate and low rates of sethoxydim and Dowco 453 were still notable for their greater clover and lower dead matter contents. Tiller counts indicated that no long term loss of grass density occurred with any of the treatments.

Significant differences in seed head densities were only evident for the 3 weeks immediately post spraying. This was attributed to the diverse range of grass species present in the pasture flowering over a wide range of dates.

Over the whole 6 month trial period, chemical treatments generally resulted in herbage yield losses of between 500 and 1500 kg DM/ha, due largely to immediate post spraying suppression. In some instances this lower spring production may be advantageous, especially when combined with an increase in clover and decrease in dead matter content (Korte 1982). Both paraquat and mefluidide have been promoted in this

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TABLE 1: Pasture growth rates and percent composition relative to untreated control, after herbicide treatment.

Chemical		Pasture growth rates relative to untreated ¹					% Composition relative to untreated				
		28/10 to 21/11	22/11 to 5/1	6/1 to 17/2	18/2 to 28/3	29/3 to 17/5	30/1/84		28/3/84		
							clover	dead	stem	clover	dead
	Rates (g ai/ha)										
mefluidide	100	--	0	+	0	0	0	-	-	0	0
	150	--	0	0	0	0	0	--	-	0	0
paraquat	60	--	0	0	0	0	+	--	-	0	0
	100	--	0	0	0	0	+	--	0	0	-
paraquat + diquat	60	--	0	0	0	0	0	-	0	0	0
	100	--	0	0	0	0	0	-	0	0	0
glyphosate	70	--	0	0	0	0	+	-	0	0	0
	150	--	0	0	0	0	+	+	-	0	+
fluzafop- butyl	60	--	0	+	0	0	0	-	0	0	0
	120	--	0	+	0	0	+	+	-	0	0
sethoxydim	50	-	0	0	0	0	+	-	0	0	0
	100	--	0	0	0	0	+	-	0	0	0
*Hoe 35609	50	0	0	0	0	0	0	-	-	0	-
	100	-	0	0	0	0	0	-	-	0	0
*Hoe 33171	20	0	0	+	-	0	0	0	0	0	0
	50	0	0	0	0	0	0	0	0	0	0
*35609 + 33171	40	0	0	0	0	0	0	0	0	0	0
	90	0	0	+	+	0	0	-	0	0	0
*Monsanto 8000	60	-	0	0	0	0	0	0	-	0	0
	120	--	0	0	0	0	0	-	0	+	0
*Dowco 453	50	--	0	0	+	0	+	-	0	+	-
	110	--	0	0	+	0	+	--	-	0	-

¹Untreated control: 200 litres water/ha

*Not available commercially at time of testing

Below (-, --) and above (+, ++), untreated control at 5% and 1% significance levels respectively.

role. However it would appear that other grass-selective herbicides could prove equally effective when applied at very low rates. Choice should be governed by current economics.

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