CONTROL OF RATSTAIL IN PASTURE

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Summary

Ratstail (*Sporobolus africanus*) is a perennial weed grass commonly found in hill and coastal country pastures of the warmer parts of New Zealand. On dry, sunny faces it can become completely dominant. Trials and management factors are described which indicate that spraying 1.5 lb a.i. 2,2-DPA in 25 gal of water per acre successfully eradicates ratstail. This treatment has little effect on desirable pasture species. If the chemical treatment is followed by good pasture management (including fertilizers and high stocking) reinfestation does not occur.

INTRODUCTION

RATSTAIL (*Sporobolus africanus*) is a native of South Africa and was probably introduced to New Zealand before 1840, as it was recorded in the Bay of Islands in that year (Allan, 1940). It is a coarse, unpalatable, tussock-forming grass which competes on dry sunny faces very successfully with more desirable pasture species. It is fairly common to hill and coastal country of the Auckland Province, and is spread by seed. It has been claimed that control and eradication are possible with fertilizer and stocking (Newman, 1960).

The writer's observations suggest that, once the weed is established, it may be controlled, but cannot be effectively eradicated, with good pasture management. Cattle, judiciously handled, appear to keep it from becoming completely dominant. On rolling country, control by cultivation can be successful.

Bell (1961) reported that light rates of 2,2-DPA offered an effective and relatively cheap method of eliminating ratstail.

EXPERIMENTAL WORK

Three trials conducted near Auckland are described (all rates of chemicals are expressed as lb a.i. per acre). These trials were conducted in the same paddock at Maraetai on a sunny face dominant in ratstail. Sheep and cattle leniently grazed the area during the duration of the trials. The heavy soil, derived from greywacke had been topdressed lightly (3 cwt molybdenum superphosphate applied a year before the trial commenced).

TRIAL RESULTS

The first trial laid down in October 1959, compared the effect of superphosphate and lime and molybdenum on the ratstail-dominant sward. The rates of fertilizer used were: Superphosphate 3 and 6 cwt, lime 0, ½,

1 and 2 tons, and molybdenum 0, 2½, 5 and 10 oz per acre. There were two replicates. The pasture consisted of dominant ratstail with paspalum (*Paspalum dilatatum*), browntop (*Agrostis tenuis*), *Notodanthonia* spp., sweet vernal (*Anthoxanthum odoratum*), subterranean clover (*Trifolium subterraneum*) and *Lotus* spp.

Observations showed that some high-fertility pasture species such as perennial ryegrass (*Lolium perenne*) and white clover (*Trifolium repens*) established after oversowing. Observation also showed that stock selectively grazed the topdressed areas and, while the proportion of ratstail was reduced, there was no indication that the species was being eliminated with this treatment.

A second trial was laid down in December 1960 adjacent to the first one. This consisted of rates of 2,2-DPA crossed with rates of amitrole. Chemicals were applied in 25 gal of water per acre using a boom. Ratstail at this time was seeding and leaves were about 8 in. long. There were two replications. The trial was oversown with perennial ryegrass and white clover during the autumn and an adequate dressing of superphosphate. Lime was also applied. The first observation made after three months showed that the majority of the ratstail plants on the area were dying.

The results of observations three years after the trial was laid down are shown in Table 1.

TABLE 1: MARAETAI TRIAL II — PROPORTION OF RATSTAIL IN THE SWARD (%)

Rates of 2,2-DPA (lb)	Rates of Amitrole (lb)		
	0	0.5	1.0
0.7	12	7	7
1.5	6	5	3
2.2	7	2	4

This table shows that the rate of reinfestation was very slow and that 2,2-DPA at 1.5 lb was adequate for ratstail control.

The third trial was laid down adjacent to the previous two in January 1962. In this trial treatments consisted of rates of paraquat and 2,2-DPA.

Table 2 presents the results of the visual assessment made on this trial 15 months after laying down.

This trial demonstrated that 0.7 lb 2,2-DPA was ineffective and that paraquat at rates used was of little value in reducing the ratstail population.

TABLE 2: MARAETAI TRIAL III — PROPORTION OF RATSTAIL IN SWARD (%)

Rates of Paraquat (lb)	Rates of 2,2-DPA	
	0	0.7
0	75	58
0.5	63	58
0.75	63	60
1.0	50	45

OBSERVATIONS ON MANAGEMENT FACTORS

A stock grazing trial, comparing rates of fertilizers and stocking rates, was set up in 1964 on a ratstail-dominant sward on sandy country north of Helensville. In July 1965, the trial area, which consisted of 24 acres, was sprayed with 1.5 lb 2,2-DPA in 20 gal of water through a boom mounted on a Landrover. This treatment and the subsequent heavy stocking and topdressing on the area have changed the pasture from one dominated by ratstail to a highly productive pasture free of the weed. Regular point analysis of the whole area on 80 permanent transects has shown that the ratstail proportion of the sward has remained very low over a six-year period. There has been no relationship between treatments and the degree of reinfestation. This is particularly pertinent because the low fertilizer treatment (1 cwt superphosphate over two years), has been as effective in controlling reinfestation following the chemical application as the high fertilizer treatment (which consisted of 8 cwt superphosphate per year). There have been no differences in the degree of reinfestation as a result of three stocking levels. It should be emphasized that all stocking rates are in fact very heavy by farmers' standards for the district (between 8 and 15 ewe equivalents per acre).

DISCUSSION

These trials and observations indicate that ratstail can be eliminated from pastures with 2,2-DPA at 1.5 lb as an overall spray. Amitrole and paraquat were also tried on light rates without the same success. Observations show that 2,2-DPA at 1.5 lb has little effect on desirable pasture species. Consequently, large production losses are unlikely to occur using this chemical to eradicate ratstail. However, after ratstail has been eliminated with 2,2-DPA, good pasture control appears to inhibit reinfestation.

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