TETRAPION: EVALUATION FOR THE CONTROL OF RHIZOMATOUS GRASSES AND TOETOE

G. R. ROWE and B. P. O'CONNOR

ICI, New Zealand Limited, Hamilton and Palmerston North

Summary

Trials are described where tetrapion at 6 to 12 kg/ha has demonstrated activity on Kikuyu grass (*Pennisetum clandestinum*), couch (*Agropyron repens*), Indian doab (*Cynodon dactylon*), browntop (*Agrostis tenuis*) and toetoe (*Cortaderia fulvida*).

INTRODUCTION

Tetrapion is a translocated herbicide with indicated activity against rhizomatous grasses. The mode of action on these grasses is similar to that of 2,2-DPA and TCA, namely formative effects including tubular leaf formation, buckling and leaf-tip chlorosis. Tetrapion is root and leaf absorbed and is translocated to the growing points of the plant. It has a long residual life in perenniating organs of the plant such as the rhizomes, from which it can be subsequently translocated when growth commences.

A series of trials was initiated to evaluate tetrapion on a number of troublesome rhizomatous grasses and toetoe.

METHOD

All the reported trials were of a randomised block design with three replicates and plot sizes of 2 to 3 m x 10 m. A precision plot sprayer was used to apply the treatments. In all trials a 60% aqueous concentrate of tetrapion was applied, with water rates which varied between trials. These rates, together with treatment dates, are shown with the results for each species. All trials were visually assessed by two independent observers.

RESULTS

Kikuyu grass (*Pennisetum clandestinum*)

The site contained a thick sward of Kikuyu grass and the treatments were applied at a dilution rate of 600 litres/ha (Table 1).

TABLE 1: KIKUYU GRASS, % CONTROL — MANGERE
Applied 7th November 1972

Treatments kg/ha	months after application				
	2	4	6	9	12
untreated	0	0	0	0	0
tetrapion 6	30	40	70	90	80
tetrapion 12	50	75	90	100	90
bromacil 10	75	75	55	40	25

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Although slow for the first 2 to 4 months following application, from 6 months tetrapion showed high activity on Kikuyu grass scoring 70 and 90% control respectively at the 6 and 12 kg/ha rates. After 6 months, both rates of tetrapion were superior to bromacil.

Toetoe (*Cortaderia fulvida*)

Two trials were sited on the Mamaku plateau and the treatments were applied in 300 litres/ha.

Trial A

A pilot study to assess the activity of tetrapion was initiated in October 1971. The toetoe plants were at an early growth stage, and measured 20 to 40 cm in height (Table 2).

TABLE 2: TOETOE, % CONTROL

Treatments kg/ha	months after application				
	3	7	12	18	22
untreated	0	0	0	0	0
tetrapion 3	20	80	70	90	90
tetrapion 6	20	100	90	100	100
tetrapion 12	20	100	100	100	100

Tetrapion at 6 and 12 kg/ha caused complete desiccation after seven months. Further assessments recorded during the subsequent two year period indicated permanent control from these two rates.

Trial B

Treatments of tetrapion and tetrapion plus paraquat were applied in September 1972, over toetoe plants which measured 40 to 100 cm in height (Table 3).

TABLE 3: TOETOE, % CONTROL

Treatments kg/ha	months after application		
	3	10	13
untreated	0	0	0
tetrapion 6	25	60	65
tetrapion 9	25	90	100
tetrapion 12	30	90	100
tetrapion 6 + paraquat 0.6	55	60	90

Tetrapion at 9 and 12 kg/ha provided a high level of control at the 10 and 13 month assessments. The addition of paraquat to tetrapion at 6 kg/ha enhanced the level of control at the 13 month period after treatment.

Couch (*Agropyron repens*) and Indian doab (*Cynodon dactylon*)

This trial was located in the Manawatu on a recent alluvial soil type. The treatments were applied on the 27th of November 1972 in 350 litres/ha. The trial area was densely infested with couch 15 to 20 cm high at the time of spraying. The results from this trial are shown in Table 4.

TABLE 4: COUCH CONTROL — MANAWATU

Treatment kg/ha	months after application	
	% Desiccation 2	% Couch control 7
untreated	0	0
amitrole 4.5 + ammonium thiocyanate 4.1	80	0
tetrapion 1.5	20	20
tetrapion 3.0	20	66
tetrapion 6.0	25	97
tetrapion 9.0	30	99

Tetrapion was much slower in activity than amitrole plus ammonium thiocyanate which reached a desiccation rating of 80% after two months in comparison to tetrapion which recorded 20 to 30% for all rates. Tetrapion however provided superior long term control of couch as shown at the seven month assessment. At this assessment the control of couch increased with the rate of tetrapion reaching nearly complete control at 9.0 kg/ha. Amitrole plus ammonium thiocyanate plots had recovered to the extent that they contained the same amount of couch as the untreated.

The results from two trials located on railway waste land in the Manawatu are shown in Table 5. In both trials all treatments were applied in 675 litres/ha. At both times of treatment the sites harboured a variety of species including couch.

TABLE 5: COUCH, % CONTROL (5 and 10 months after treatment)

Treatment kg/ha	Applied 15.5.73		Applied 21.11.72	
	5 month	10 month	5 month	10 month
untreated	0	0	0	0
tetrapion 3.0	44	56	89	43
tetrapion 6.0	66	86	95	77
tetrapion 9.0	78	86	99	77

All rates of tetrapion provided some couch control at both 5 and 10 months after treatment at both times of application. Except for the 10 month assessment of the November application couch control improved as the rate of tetrapion was increased. There was an indication that tetrapion acted more quickly at the November application, but that better longer term control was achieved from the May application.

The results from two trials located in the Manawatu on river silt are shown in Table 6. The treatments were applied in 650 litres/ha. Species present at spraying included couch and Indian doab at both times of application and browntop (*Agrostis tenuis*) on the 12th of January 1972 application.

DISCUSSION

Tetrapion has demonstrated activity against Kikuyu grass, couch, Indian doab, browntop and toetoe. On Kikuyu grass, tetrapion at 6 to 12 kg/ha showed a high level of control after 12 months, although initial activity was slow. At 6 kg/ha applied in autumn tetrapion controlled couch. Results however were poorer from spring/summer application. Indian doab appeared to be less susceptible to tetrapion than did couch and a rate of 8 kg/ha was required to prevent regrowth.

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TABLE 6: COUCH AND INDIAN DOAB, % CONTROL

Applied 15th October 1971 months after treatment					
7			16		
Treatment kg/ha	Indian doab	couch	Indian doab	couch	
untreated	—	—	—	—	
tetrapion 4.0	97	100	56	0	
tetrapion 8.0	100	100	93	100	

Applied 12th January 1972 months after treatment					
4			13		
Treatment kg/ha	Indian doab	couch	browntop	Indian doab	couch
untreated	—	—	—	—	—
tetrapion 4.0	100	100	86	57	90
tetrapion 8.0	100	100	100	66	100

Mature toetoe was completely controlled at rates of tetrapion above 9 kg/ha, whilst good control of young toetoe was obtained from 6 kg/ha, activity from tetrapion has been recorded on other species including paspalum (*Paspalum dilatatum*), Australian sedge (*Carex longibrachiata*) and *Juncus* species.

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