SCREENING A RANGE OF WHITE CLOVER AND TWO RED CLOVER LINES FOR RELATIVE TOLERANCE TO CLOVER FLEA

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Regular reports of clover flea (*Sminthurus viridis*) damage occur in Northland, South Auckland and Waikato (Pottinger *et al.* 1985). Past research focused on application of improved chemicals in combination with grazing strategies (Addison and Pottinger 1991). Increased overseas and local concern regarding chemical use necessitates the development of alternative strategies for clover flea control. Recently several improved white clover cultivars have been released in New Zealand. This diverse range of genotypes may show differing tolerance to clover flea attack. During 1993 a trial was established at a sheep/beef property near Kaikohe on a Waiotu friable clay soil. The farm had experienced a regular clover flea problem.

Plants from 22 white clover accessions comprising breeding and commercial cultivars and two red clovers, 'Grasslands Colenso' and 'Grasslands Pawera' were compared. Seedlings were raised in the glasshouse and transplanted at 12 weeks during June 1993 into existing pasture where white clover had been previously sprayed out 3 months earlier using dicamba (Banvel 200) at 0.40 kg/ha.

The trial was laid out as a randomised complete block design with four replicates. For each accession, plots consisted of 10 plants per metre row with 1 m between rows. Relative vigour was assessed in mid August and again following grazing in November using Grasslands Huia as a standard and scoring whole clover rows on a 0 - 10 scale where 0 = no growth, 10 = growth of best plant. Clover flea numbers were not recorded, but damage was scored in August and again in November on clover rows on a 0 - 10 scale where 0 = no damage, 10 = all leaves stripped of foliage.

All accessions established well. Vigorous lines in August were C11005, Gene Pool A, C6681 N.Z. x U.S.A. (N.Z. breeding line) and 'Grasslands Prestige' (Table 1). In November Huia exhibited good growth relative to most other lines, and only Prestige, and Pawera red clover were showing any advantage over Huia.

At the onset of clover flea attack in early August, damaged plants were observed throughout the trial area and in adjacent paddocks. At the first scoring both the Colenso and Pawera red clovers were least affected and Prestige and C15817 were the most tolerant of the white clovers (Table 1). These four accessions had significantly less damage than the Huia standard. In November the level of damage had increased on the majority of lines. Again both red clovers were least affected and Prestige and C15817 were the best of the white clover lines. These lines with the exception of Prestige were significantly better than Huia. Aran was significantly poorer than Huia on both scorings.

Fenemore (1986) suggested red clover may have a greater natural tolerance to clover flea, and results from this trial support this observation. In Australia a bdellid mite *Bdellodes lopidaria* is a natural enemy of clover flea but the cost of introduction and the requirement for host specificity may preclude its introduction into New Zealand.

Prestige was derived from Northland ecotypes which may have developed some natural pest tolerance. This commercial cultivar should be considered by farmers when renovating pastures in problem areas. C15817 is derived from parental lines used in the development of Prestige and both these clover lines showed good vigour in this

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trial. Variation in response to clover flea shown by this material suggests further evaluation of local lines may offer scope for breeding a white clover with resistance to clover flea.

TABLE 1: Relative growth of clover lines compared to G. Huia = 100, and percent damage by clover flea recorded in August and November 1993.

Progeny No.	Line	Relative vigour		% of clover flea damage	
		13.8.93	12.11.93	13.8.93	12.11.93
C6484	G. Huia	100	100	65	77
C3601	G. Kopu	107	73	78	92
C5854	G. Tahora	73*	85	70	77
C5890	G. Pitau	100	73	70	82
C5965	Prop	80	54*	70	87
C8757	G. Prestige	113	127	28*	67
C10601	G. Demand	93	81	65	82
C15817	C9186 & C9187	107	100	35*	60*
C6358	Aran	93	77	85*	90*
C6681	NZ x USA	113	85	70	82
C9263	Pitau nema sel	100	81	70	82
C9759	Sth Europe	107	96	58	87
C9784	Sth Europe	107	88	70	80
C9854	Crau	73*	96	85*	85
C10389	Cool season	73*	58	68	80
C10603	G23	93	61	73	87
C11005	Gene Pool A	113	92	75	87
C11054	Gene Pool F	100	85	68	77
C11224	World collection	107	65	80	92*
C11583	Bulk lge leaf	100	65	73	92*
C11697	Lge leaf stolon	107	73	73	87
C11586	Multi leaf	80	38*	73	85
F2483	G. Colenso	87	50*	20*	35*
Ft 931	G. Pawera	100	138	25*	47*

* Significantly different from Huia (P < 0.05)

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