ARGENTINE STEM WEEVIL AND LEAFMINER DAMAGE IN FORAGE GRASSES IN WAIKATO HILL COUNTRY

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The wheat sheath leafminer (Diptera, Agriomyzidae: *Cerodontha australis* Malloch) and Argentine stem weevil (Coleoptera, Curculionidae: *Listronotus bonariensis* (Kuschel)) use a large number of grasses as host plants (Barker *et al.* 1984ab; Barker 1989). Frequently, dual infestations by larvae of wheat sheath miner and Argentine stem weevil occur in the same plants (Barker, unpubl.). The effects of Argentine stem weevil larval infestations on different pasture grasses are well documented (eg. Goldson 1982; Barker *et al.* 1984a; Prestidge *et al.* 1984, 1986, 1989), but data on the relative susceptibilities of forage species to Argentine stem weevil damage in hill country have not been previously published. Studies by Barker *et al.* (1984b) showed that wheat sheath miner larvae are capable of reducing ryegrass yields, although tiller infestation rates were commonly less than 20% in Waikato pastures. However, these authors pointed to the probable contribution of wheat sheath miner to overall pest burdens in pastures. As with Argentine stem weevil, no information is available on wheat sheath miner infestations in forage grass species in Waikato hill country.

This contribution reports on wheat sheath miner and Argentine stem weevil infestations in pastures comprising four different forage grass species on sheep-grazed hill country at the Whatawhata Hill Country Research Centre, in the western Waikato.

'Grasslands Nui' perennial ryegrass (*Lolium perenne* L.), 'Grasslands Maru' phalaris (*Phalaris aquatica* L.), 'Grasslands Roa' tall fescue (*Festuca arundinacea* Schreb.) and 'Grasslands Matua' prairie grass (*Bromus willdenowii* Kunth) (all at 500 viable seeds/m²) were established on north and south facing slopes (c. 15° slope) in conjunction with 'Grasslands Huia' white clover (*Trifolium repens* L.) (450 viable seeds/m²) in a cultivated Dunmore silt loam seed bed in autumn 1978. Within aspect, each grass was sown in five replicate 15 x 15 m plots.

In February 1979, tiller populations of the sown species were estimated from thirty 50 mm dia. turf plugs/plot. The level of damage by wheat sheath miner and Argentine stem weevil larvae was estimated by examining 200 tillers cut at ground level randomly from each plot. All grasses were found to be subject to infestation by wheat sheath miner and Argentine stem weevil (Table 1). The percentage and number of tillers damaged by wheat sheath miner were higher in tall fescue than in the remaining grasses ($P < 0.01$) (Table 1). With the exception of prairie grass, the number of tillers damaged by wheat sheath miner was higher in grasses growing on the south aspect than that on the north ($P < 0.05$) (Table 1). As a percentage, however, only in phalaris was tiller damage by wheat sheath miner higher on the south aspect ($P < 0.05$). Tiller damage by Argentine stem weevil larvae was higher in ryegrass than in phalaris, tall fescue and prairie grass ($P < 0.01$). Adult Argentine stem weevil numbers in March 1979, estimated from wet sieving of thirty 75 mm dia. soil cores/plot, were also higher in ryegrass than the other grasses ($P < 0.01$). Only in ryegrass was adult weevil abundance higher on north than on the south aspect (Interaction, $P < 0.01$) (Table 1). The percentage of ryegrass tillers damaged by Argentine stem weevil was higher on the north than on the south aspect slope ($P < 0.05$) (Table 1).

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TABLE 1: Tiller populations of four grasses on north and south aspects of Waikato hill country and damage levels inflicted by Argentine stem weevil and wheat sheath miner.

	Tillers /m ²	Argentine Stem Weevil % tillers damaged by larvae	Tillers/m ² damaged by larvae	Adult weevils/ m ²	Wheat Sheath Miner % tillers damaged by larvae	Tiller/m ² damaged by larvae
North Aspect						
Ryegrass	3700	67.2	2486	413	2.0	74
Phalaris	2910	13.5	393	86	0.2	6
Tall fescue	3491	12.2	426	43	7.8	272
Prairie Grass	2860	27.0	772	52	0.8	23
South Aspect						
Ryegrass	5870	38.8	2276	155	4.2	246
Phalaris	4690	10.5	492	34	3.2	150
Tall fescue	5220	15.0	783	52	9.0	470
Prairie Grass	4210	18.8	791	60	1.8	116
LSD _{5%}	511	13.4	310	77	2.4	116

These results are in agreement with findings in other studies (e.g. Barker 1989) which showed that ryegrasses are more susceptible to Argentine stem weevil than phalaris, tall fescue and prairie grass. Unfortunately, the level of infection by *Acremonium lolii* Latch, Christensen and Samuels in the 'Grasslands Nui' seedline used in the trial is not known: the level of Argentine stem weevil damage sustained suggests that the endophyte infection level was low. The warmer and drier conditions prevailing on the north-facing hill slopes were apparently more favourable to Argentine stem weevil infestations in ryegrass than were the conditions on the south-facing slopes. In contrast, wheat sheath miner infestations were generally higher on the south-facing slopes. The results indicate that tall fescue is more susceptible to leaf miner damage than are ryegrass, phalaris and prairie grass.

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