HESSIAN FLY — A NEW PEST OF PRAIRIE GRASS?

R.A. PRESTIDGE, S. VAN DER ZIJPP, M. FRASER*

MAFTech Ruakura Agricultural Research Station, Private Bag, Hamilton

*Wairakei Research Station, MAF, RD 1, Taupo

INTRODUCTION

Several new grass species have recently been made available to arable farmers (Lancashire 1985). Some have been developed to complement and to out-produce perennial ryegrass (*Lolium perenne*) at critical feed times, such as in late summer-early autumn, while others have been promoted as alternative pasture species to perennial ryegrass. While monitoring a 1 ha pasture of 'Grasslands Matua' prairie grass (*Bromus willdenowii*) for Argentine stem weevil (*Listronotus bonariensis*) infestation, a serious infestation of Hessian Fly, *Mayetiola destructor* was discovered.

The prairie grass pasture used in this study was grown on Atiamuri gravelly sand at the Wairakei Research Station, near Lake Taupo. Prior to its establishment the area had sustained a lucerne (*Medicago sativa*) crop for the previous 10 years. Prairie grass seed was treated with benomyl fungicide and broadcast at 40 kg/ha into a paddock that had earlier been sprayed with glyphosate and then rotary cultivated. The prairie grass seed was sown on 10 October 1985 with 4 kg/ha 'Grasslands Pawera' red clover (*Trifolium pratense*) and 3 kg/ha 'Grasslands Pitau' white clover (*T. repens*). After sowing, the paddock was lightly harrowed and rolled. On 15 October 250 kg/ha of 30% potassic superphosphate was applied and 25 kg N/ha sulphate of ammonia was applied on 6 November 1985.

Pastures were rotationally grazed with sheep every 5-8 weeks. Argentine stem weevil populations were monitored at key times (Prestidge unpubl. data) and estimates of pasture production and composition were taken at 5-8 week intervals as described by Prestidge *et al* (1987).

Both generations of stem weevil larvae were monitored during the first year. Percentage of prairie grass tillers infested with larvae was 15% in December 1985 and 7% in January 1986. The plants tolerated this attack well and no differences in yield were detected between insecticide treated and untreated areas (Prestidge *et al* 1987).

Prairie grass yield during the second summer of 1986/87 (December-February) was much less than during its establishment year (Table 1). Many tillers were found to be dead and dying and plants were generally stressed, showing extensive yellowing. Close examination of plants in January revealed the serious effects of Hessian Fly larvae and pupae (Table 1). Specimens have been deposited with Dr T.K. Crosby, Entomology Division, DSIR, Auckland.

TABLE 1: Prairie grass yield (kg DM/ha), numbers of live and dead tillers, Hessian Fly larvae and pupae and Argentine stem weevil larvae per plant (n = 25) in January, 1987.

	Mean	± SE	Range
Yield			
1 December-28 February 1985/86	4545	257	
1 December-28 February 1986/87	993	28	
Pasture status in January 1987:			
dead tillers/plant	21.5	2.3	5-51
live tillers/plant	30.5	2.9	1-64
larvae + pupae/plant	33.4	5.7	6-139
Argentine stem weevil larvae/plant	0.5		0-2

Proc. 40th N.Z. Weed and Pest Control Conf.

Fig. 1: The frequency of Hessian Fly in prairie grass tillers, as measured in January 1987.

Many tillers had more than one larva or pupa present (Fig 1.) and 74% of tillers examined had larval damage. Examination of plants from neighbouring paddocks of 'Grasslands Wana' cocksfoot (*Dactylis glomerata*), 'Grasslands Maru' phalaris (*Phalaris aquatica*) and 'Ellett' perennial ryegrass revealed no larvae, pupae or damage attributable to Hessian Fly.

Very little is known about Hessian Fly and its host plants in New Zealand. It was first recorded here in the 1870s and is currently found throughout the wheat growing districts (Scott 1984). It is an international pest of wheat, and most other cereal crops but will feed on some grasses. Several Hessian Fly biotypes (races) exist in the USA. In New Zealand, the insect has two generations. Adults emerge in the spring from pupae which have overwintered on wheat straw or stubble. Eggs are laid onto leaves of host plants and upon hatching the larvae move to the leaf sheath and tunnel downwards between the leaf sheath and the stem. Larvae pupate near nodes and give rise to the second generation in December-January. In cereal crops the recommended form of control is destruction of overwintering pupae by burning or deep ploughing stubble, and the use of resistant cultivars.

The Taupo region in the central North Island is not a cereal growing district and it is not known why Hessian Fly was recorded at such high densities in this pasture. The effects that were attributed to this population were exacerbated by the extremely dry spring and summer conditions (rainfall September-December 1986/87 255 mm, 20 yr mean 435 mm). It is possible that other regions of New Zealand with similar climatic extremes as this winter cold/summer dry district will also experience a Hessian Fly problem in prairie grass.

ACKNOWLEDGEMENT

We gratefully acknowledge the technical assistance of Richard Hunter and Christine Hawke.

REFERENCES

- Lancashire, J.A., 1985. Some factors affecting the rate of adoption of new herbage cultivars. In Burgess, R.E., Brock, J.L. (eds). Using Herbage Cultivars. Grassl. Res. and Practice Series No. 3 N.Z. Grassl. Ass. Palmerston North. pp 79-87.
- Prestidge, R.A., Van der Zijpp, S., Fraser, M., 1987. The effect of Argentine stem weevil on pasture grasses in the volcanic plateau. *N.Z. J. Agric. Res.* (submitted).
- Scott, R.R. (ed). 1984 New Zealand Pest and Beneficial Insects. Lincoln University College of Agriculture. Christchurch. 373 pp.