

**WIREWORM (*CTENICERA* SP.) AND TWO-SPOTTED MITE
RECORDED ON WAIKATO MAIZE**

L.N. ROBERTSON, G.M. BARKER and L.J. WYMER*

*Ruakura Research Station, MAFTech, Private Bag, Hamilton
Baylys Road, R.D. 1, Tirau

This note records wireworms (*Ctenicera* sp.) and two-spotted mite (*Tetranychus urticae*) feeding on maize at Okoroire, southern Waikato.

Wireworms (larval Elateridae) were found damaging maize (*Zea mays*) seed on 6 November 1986 when the seedlings were at the 2-4 leaf stage. Between 20% and 40% of the seeds were damaged by wireworm tunnelling and removal of seed starch reserves. Approximately 50 ha of maize was affected. The soil type at Okoroire is a Tirau silt loam derived from ash.

Soil coring over the maize plants on 12 November gave density estimates of 0.65 (± 0.06 s.e.) wireworms per plant (or 5/m² assuming all wireworms were around plants). A second sampling on 26 November indicated a similar density (0.67 per plant), but virtually all seeds had been attacked by wireworms by that date. Very little evidence of wireworm attack on root tissues was evident, with approximately 2% of the wireworms recovered, feeding in or on mesocotyl, plant roots or stem base. No plant deaths were observed, and plant growth appeared to be vigorous despite the presence of wireworms.

A further sampling on maize rows on 10 December 1986 gave a wireworm density of 0.17 per plant, and a density of 2/m² between rows. Wireworms had apparently moved off the rows of plants when the maize seed reserves were exhausted.

The wireworms were a species of *Ctenicera*, but specific identification has not been possible due to the lack of systematic studies on larval and adult elaterids in New Zealand. In Canada, the species have a long life cycle of 3-5 years (Doane 1977). A sample of 85 wireworms collected at Okoroire on 6 November was weighed, giving a mean weight of 7.5 mg (range 1-33 mg; median value 6 mg). The size distribution of the sample suggested a predominance of young individuals (82% weighed between 2 and 10 mg).

Ctenicera strangulata (White) has been recorded damaging onion and garlic crops near Blenheim (Wightman and Morrison 1978), and one or more *Ctenicera* species have attacked potatoes in Otago and Southland (K.M. Stewart, pers. comm.). Individuals from Okoroire were tested against potatoes but would not feed on cut tubers. Apart from the obvious attractiveness of germinating maize seed as food, wireworms were observed to be cannibalistic and one individual was observed feeding on an unidentified fly maggot in the field. *Ctenicera* wireworms, indistinguishable from the Okoroire species, have been found preying on grass grub (*Costelytra zealandica*) larvae in an ash soil near Te Kuiti (pers. obs.). Young larvae of some *Ctenicera* species are known to feed on soil organic matter, and this may also be the case for the Okoroire population. The fields had been continuously cropped with maize for about 10 years at Okoroire, with no soil insecticide for the last 5 years. In North America, *Ctenicera* species breed in cropped soils and can damage cereal crops when densities exceed 20/m² (J.F. Doane, pers. comm.). Despite the lack of plant damage at Okoroire in 1986-87, an increase in population levels and a shift towards greater densities of large instars may result in wireworm damage to maize plants in subsequent years.

There is little documented evidence of wireworm damage to maize in New Zealand. In their review of maize pests, Watson and Hill (1985) listed pasture wireworm (*Conoderus exsul*) and variable wireworm (*Agrypnus variabilis*) as pests of seedling maize. The only published record of damage levels suggested that wireworms are insignificant maize pests (East and Watson 1978); a complex of variable wireworm and *Conoderus* spp. reduced seedling emergence by about 1%.

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The crop at Okoroire was monitored throughout the growing season and an area was also found to be heavily infested with two-spotted mite (*Tetranychus urticae*) in March 1987. The mites caused mottling and webbing of the leaves, with severe distortion, desiccation and yellowing of lower leaves in particular. Infestation was found to be widespread over the 50 ha block on 11 March. The crop was well developed by this date and little economic damage from the mites was expected. The predatory ladybird, *Stethorus* sp. was also abundant on leaves in the area heavily infested by mites. Collyer (1976) recorded two-spotted mite as a pest of sweetcorn in New Zealand, and the mite is known as a pest of maize in North America (Anon, undated). There are no published records of two-spotted mite as a pest of maize in New Zealand.

REFERENCES

- Anon, undated. Omite. Chemical division of Uniroyal Inc., Connecticut: 1-34.
- Collyer, E., 1976. Two-spotted mite, *Tetranychus urticae* Koch, life cycle. DSIR information series 105/24: 1-3.
- Doane, J.F., 1977. Spatial pattern and density of *Ctenicera destructor* and *Hypolithus bicolor* (Coleoptera:Elateridae) in soil in spring wheat. *Can. Ent.* 109: 807-822.
- East, R., and Watson, R.N., 1978. Effects of white-fringed weevil on maize. *Proc. 31st N.Z. Weed and Pest Control Conf.*: 92-95.
- Watson, R.N. and Hill, M.G., 1985. Pests of maize in New Zealand. In: Maize-Management to Market. Eagles, H.A. and Wratt, G.S. (eds). Special publication No. 4 Agronomy Society of N.Z. pp 47-58.
- Wightman, J.A. and Morrison, G., 1978. Wireworms (Coleoptera:Elateridae) associated with damaged onions and garlic crops near Blenheim. *N.Z. Ent.* 6: 438-441.