INSECT PESTS OF MAIZE

B. B. GIVEN

Ruakura Agricultural Research Centre, M.A.F., Hamilton

Summary

Pests such as soldier fly, white fringed weevil, Argentine stem weevil, wireworm and cutworm usually originate from residual populations in the seed-bed, whereas armyworm, tomato fruitworm, adult black beetle and aphids usually colonise or invade after crop emergence. A damage schedule and general characteristics of the pests are listed and illustrated. Pests of stored mature grain are excluded.

INTRODUCTION

THE maize plant provides an ideal food source for a number of insects and when grown as a dense crop, produces an ecological habitat favouring insect shelter and reproduction. Constant vigilance is necessary to ensure early detection and in some cases, anticipation, of pest attack. This vigilance should precede the drilling of the seed (particularly when sowing a first crop after old pasture) and should continue until near-maturity of the grain.

The following is a schedule of expected insect pest attack with an illustrated description of pests and damage rather than a word description of the insect species concerned.

SCHEDULE OF INSECT PEST ATTACK

The following schedule is given to assist in timing of vigilance and control action.

Pre-drilling:

Old pasture can harbour white-fringed weevil, Argentine stem weevil, soldier fly, cutworm, black beetle adults or other pests. A weedy pasture with little ryegrass and weed or clover dominance may indicate severe infestation, particularly with soldier fly. Spade-sampling prior to cultivation or drilling can provide useful information warning of impending problems.

Early Crop Emergence:

Soldier fly, Argentine stem weevil, white fringed weevil, adult black beetle, cutworm and wireworm are liable to cause damage during this period. Failure of plants to appear and early failure to survive is usually caused by soldier fly, wireworm or stem weevil. Later death or truncation at or near ground-level may be caused by cutworm, white fringed weevil, wireworm or adult black beetle.

Growing Plant From 20 cm Height:

Armyworm is usually the most active pest during this period, damaging both foliage and developing cobs. Tomato fruitworm attacks cobs only. Aphid infestations may become very severe towards cob development and can cause considerable damage particularly to table sweet-corn.

THE INSECTS

Soldier Fly (*Inopus rubriceps* [Macq.]) (Figs. 1, 5, 6)

A major pest in cases where pre-drilling cultivation from infested pasture has not been extensive. Not a problem in second year and subsequent crops. Damage may be on all subterranean portions of the plant, particularly in the form of pitting of the early secondary roots and area between primary and secondary roots. Frequently causes failure of plant emergence.

Argentine Stem Weevil (*Hyperodes bonariensis* Kusch.) (Fig. 7)

Penetration of stem just above secondary root area and central tunnelling by the small, white legless grubs is characteristic. Probably severely damaging only when significant residual populations survive drilling following on established pasture.

White Fringed Weevil (*Graphognathus leucoloma* [Boh.]) (Figs. 2, 8)

Severe chewing just below soil surface. Often confused with wireworm, cutworm or black beetle damage.

(Note: Vicinity of severed or severely damaged plants should be explored to determine the pest species responsible.)

Cutworm (*Agrotis ypsilon* [Hufn.]) (figs. 3, 13)

Plants usually severed at or near ground level. On older plants, prop roots may be destroyed.

Black Beetle (*Heteronychus arator* [F.]) (figs. 9, 10)

Usually damage by adult beetles is similar to cutworm damage but may be from soil surface to several cm below surface.

Wireworm (*Elateridae*) (fig. 4)

Subterranean damage capable of destroying effective root system, causing emergence failure or post-emergence mortality.

Cosmopolitan Armyworm (*Pseudaletia separata* Walk.) (Figs. 14, 16)

The most damaging pest to plants approaching maturity. Causes marginal leaf notching sometimes leaving only midribs. Also extremely damaging to developing cobs, usually entering at or near apex, frequently severing the silks in early stages of attack.

Usually larvae arise from eggs laid on plant but larvae may migrate into crops from neighbouring infested pasture or crops.

Cereals

Tomato Fruitworm (*Helicoverpa armigera conferta* [Hubn.]) (corn earworm)
(figs. 11, 15)

Whereas armyworm enters cobs at apex, fruitworm usually tunnels into the side of the cob. This is not universal however, and larvae should be collected from cobs for positive determination.

Aphids (fig. 12)

Most frequently, infestations build up beneath leaf sheaths and cob sheaths. Honey-dew secretions produce considerable masses of sticky, mould-covered discoloration.

Other Insects etc.

Occasionally, residual grassgrub populations may cause trouble.

In early development, Collembola (springtails), particularly in delayed seed germination and slugs at and after plant emergence, can be troublesome.

On occasion, leaf-mining fly larvae may be noticed as may green looper caterpillars.

Bird damage is common on young plants and on cobs and is sometimes confused with insect damage.

Birds frequently begin cob attack in search of insects such as armyworm.

In addition to damaging species, insects in considerable variety avail themselves of the shelter of maize crops and insect presence does not always indicate damage.

Cereals

2. White fringed weevil adult

4. Wireworm larvae

1. Soldier fly, male, female

3. Cutworm

Cereals

5. Soldier fly feeding scars

6. Soldier fly larvae feeding

7. Stem weevil, feeding damage

8 White fringed weevil larvae and damage

9. Adult black beetle damage

10. Black beetle, male, female

11. Feeding tomato fruitworm

12. Aphids on young cob

Cereals

Cereals

13. Cutworm damage

14. Armyworm leaf damage

15 Cob damage by armyworm and tomato fruitworm

16. Feeding armyworm