



agriculture & rural development

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PROVINCE OF KWAZULU-NATAL

INSECT PESTS OF MAIZE IN KWAZULU-NATAL

Insect Pests of Maize in KwaZulu-Natal

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Maize Stalkborer

Introduction

The maize stalkborer, *Busseola fusca*, is the most serious insect pest of maize in South Africa, and has caused enormous crop losses (estimated at more than 10% of the national crop). The use of pheromone moth traps has greatly enhanced timeous spraying against this pest.

Life-cycle

First-generation moths emerge in spring. They are night-flyers. Each female moth lays about 1 000 eggs, in batches of up to 150, between the leaf-sheath and the stem. Moths live for one week and are very mobile. The eggs hatch after eight to nine days. Larvae take about 30 days to develop in the plant. Newly-hatched larvae climb to the top of the plant, where they feed for a few days on the young, rolled-up leaves. When these leaves unfold, the characteristic "shot-holes" appear. As larvae become stronger, they bore into the stem. Before pupating they excavate an escape hole for the future moth. A certain amount of migration occurs, of small caterpillars from plants primarily infested to neighbouring plants, which they enter at any convenient point. First generation pupae normally occur in January / February. They last for 18 days.

Second-generation moths emerge from escape holes from late January onwards. Eggs hatch after eight to nine days. Second-generation larvae bore directly into the stem, or into a developing cob. They overwinter in the root of the plant, below ground-level, in a state of diapause. The larvae pupate in spring and the pupal stage lasts for about 21 days.

Control measures

1. *Trap crops*

Early maize in fairly large blocks, reasonably spread around the farm, will entice the spring moths to lay their eggs before the main crop is up. The trap crop must be used for silage before the second generation develops.

2. *Clean culture*

The hibernating larva is the weak link in the life-cycle. Tillage reduces subsequent stalkborer threat.

3. **Chemical control**

Although flight-patterns will differ from area to area, farmers are advised to watch their maize for "shot-hole" symptoms from the middle of November onwards. Insecticide should be applied at the funnel stage, when small shot-holes are evident in the youngest leaves and borers have not yet migrated into the stalks, or seven days after eggs have been found on 2,5 percent, or more, of the plants. Many insecticides are registered for early corrective post-emergence treatment. If late corrective treatment is required, i.e. when the larvae have started to tunnel into the stem and 10 percent, or more, plants show shot-hole damage, a systemic insecticide may be used.

Pre-emergence preventative treatments involve applying insecticide to the soil together with the seed. These treatments are very expensive, and should be contemplated only if a moderate to high yield of maize is expected.

In all cases of chemical control, the latest "Guide for the control of plant pests" must be consulted. Details can be obtained from the Director, Agricultural Information, Private Bag X144, Pretoria, 0001. (Telephone 012-319 7141)

Cutworm

Introduction

The second most important maize pest in South Africa is the cutworm (*Euxoa* and *Agrotis* species). It is a general feeder, and attacks almost any kind of succulent young plant. Most damage occurs in spring.

Life-cycle

Eggs are laid in autumn and winter. Larvae emerge and mature. They remain as larvae in the ground, unprotected or in earthen cells, until the end of winter. The larvae rely on winter weeds as a food source. The overwintering larvae pupate during August / September. The pupal stage lasts two weeks. Moths emerge. They fly at night and lay eggs on weeds and volunteer maize. Moths may lay over 1 000 eggs. Eggs hatch after one week. Larvae feed on the leaves of plants or weeds for a few days. Although they also feed during the day, they avoid direct sunlight. A few days after the second instar the larvae creep into the soil during the day, and emerge at night. When still small they feed on the leaves. Thereafter they start feeding on the stems of young plants. A second generation soon follows the first.

Control measures

1. *Winter tillage*

Tillage prior to August destroys winter weeds. Larvae exposed on the soil surface might be damaged, or taken by birds. Frost also kills them. The destruction of winter weeds prevents the larvae from feeding, and also denies the moth a site for oviposition.

2. *Use of herbicides*

The application of herbicides well before planting is a very effective method to control cutworm. A minimum period of 35 days prior to planting is needed in order to starve the larvae. Weeds on contour banks and land perimeters must also be controlled.

3. *Chemical control*

This is essential at planting time, in addition to previous control methods. Sprays as well as baits are available, and it is often advisable to use both. The method used is that which best fits into the farming system. Refer to the latest "Guide" for currently-registered poisons.

Black Maize Beetle

Introduction

The black maize beetle, *Heteronychus arator*, affects a wide variety of crops, including maize, sorghum, wheat, ryegrass and oats. Symptoms are sometimes confused with cutworm damage. Although it occurs virtually throughout S.A., there are certain areas in which it assumes plague proportions. It seems to favour cooler areas and sandy soils.

Life-cycle

Eggs are laid during the last week of September. A young female lays from 20 - 80 eggs, at a depth of 130 - 155 mm in the soil. Ideally this places them in the root zone. Eggs take 11 days to hatch. Larvae appear as white grubs. These feed on the humus in the soil. It takes a few months for the larvae to reach maturity and to form pupae. Pupae are found in large numbers in the soil from February to April. The pupal stage lasts from six to 30 days. The beetles emerge from February to May and overwinter in the soil. Beetles crawl out of the ground in the evenings or on overcast days. Exit holes are clearly visible. The beetles search for maize plants, crawl in to the soil when they are near the plant and begin to feed on it. If a plant that is under attack is dug up, the beetle is usually found feeding on it. A typical symptom is the dying-off of the crown of the plant. Malformed structures re-grow. Beetles mate and after 14 days the eggs are laid. It is not known how long the adults live, but large numbers have been found dead during November and December.

Control measures

1. Cultivation

1. . Because the larval stage is very sensitive to disturbance, partial suppression of insect numbers might be obtained by cultivation during September and October.

1. Chemical control

2. . Refer to the latest "Guide" for currently-registered poisons.

Maize Snout Beetle

Introduction

The common name, maize snout beetle, refers to several kinds of closely-related weevils which feed on the leaves of young maize plants. There are four different species that cause the most loss, and others that are occasionally troublesome. The four major species are *Tanymecus destructor*, *Systates exaptus*, *Mesoleurus dentipes* and *Protostrophus* spp. None of these fly. Once a land is infested trouble can be expected year after year.

Life-cycle

Adults emerge from the soil in large numbers after the first soaking rains. As plants are generally very small at this time, damage can be severe. Adults shelter under trash or soil clods during the day. They feed mainly at night. Eggs are laid in batches of about 20, in pockets made in folds in the eaten edges of maize leaves. The young grubs which hatch from these eggs drop into the soil to feed and grow. They hibernate in the soil throughout the dry season, and pupate in spring. Chemical control

Refer to the latest "Guide"

Spotted Maize Beetle

Introduction

The spotted maize beetle, *Astylus atromaculatus*, is also known as the *Astylus* beetle or the pollen beetle. The adult feeds on pollen, but will also attack the soft, young kernels of maize cobs when the silks are wilting off. Larvae can reduce seedling stands drastically. Larvae are also known to drill into maize pips, preventing their germination.

Life-cycle

Adults live for several months during the summer and are usually most abundant during January and February, there being only one generation a year. They lay eggs in clusters under dry leaves on the ground. Eggs hatch after two weeks. Larvae take six months or longer to mature and usually hibernate in the soil, where they pupate.

The pupal period lasts about two weeks.

Chemical control

Soil insecticides, as for the black maize beetle, will control the larval stage.

Army Worm

Introduction

In the high-rainfall areas of Mpumalanga and KwaZulu-Natal, outbreaks of the army worm, *Spodoptera exempta*, occur periodically. Important factors that influence these outbreaks are temperature and the presence of young succulent grass. High-pressure weather-patterns over central-east Africa are believed to be influencing factors. The caterpillars can feed on grass

only, mainly sweet grasses. When more mature they will attack any kind of grass and particularly maize plants.

Life-cycle

Eggs are laid at night and hatch after about three days. The tiny larvae scatter and crawl to the top of the grass to feed. There are six instars. As the larvae grow older, they become darker in colour until they are almost black. They require a temperature of 24 - 32°C to develop. Development takes place in three weeks. The caterpillar then enters the soil to pupate in a fragile cocoon of soil particles tied together with silk. The pupal stage lasts about three weeks. Moths emerge. This means that the total life-cycle is completed every 45 days.

Chemical control

Refer to the latest "Guide"

American Bollworm

Introduction

The American bollworm, *Heliothis armigera*, derives its common name from the fact that it is one of the worst pests of cotton in the United States. Where it attacks maize cobs it is commonly called the cobworm. The moth measures about 30 mm across the wings and is variable in colour, ranging from dull yellow to a dark brown. The larva also varies in colour from green and pink to dark green and black. Along its sides there are always white lines, which are more or less characteristic.

Life-cycle

The eggs are laid singly on leaves, one moth laying up to 300 eggs, which hatch in from two to three days. The larval stage lasts about two weeks in summer, so that there are many generations per year. One of the main features of this pest is the suddenness with which it develops and takes farmers quite by surprise.

Control measures

1. Cultural control

Maize lands should be kept free of weeds.

2. Chemical control

The cobs should be regularly inspected for the presence of cobworms. A full-cover application of a registered insecticide, directed towards the cobs, might be necessary.

Other Pests

The maize chafer beetle, *Adoretus cribrus*, attacks tender growth at night, causing damage to the leaves. It is easily controlled with insecticides, but spraying is seldom necessary.

Various members of the family Aphididae suck the sap from young leaves. Spraying is seldom necessary.

The maize rootworm, *Buphonella murina*, is becoming a significant pest in parts of South Africa. A granular systemic insecticide is registered for use against maize rootworms.

Leafhoppers belonging to the family Jassidae transmit streak virus in maize. Systemic insecticides are registered for use against these leafhoppers.

Wireworms (Elateridae) and false wireworms (Tenebrionidae) are sporadic but potentially serious pests, and it is occasionally necessary to treat for these pests.