CARDI
CARIBBEAN AGRICULTURAL RESEARCH AND DEVELOPMENT INSTITUTE

REPRINTED: MAY 1992
ORDER NO.: PP–F / 6·89

Factsheet

CONTROL OF THE FALL ARMYWORM
(AN IMPORTANT PEST OF FORAGE SORGHUM AND CORN IN BARBADOS)

Ian Gibbs

CONTROL OF THE FALL ARMYWORM

Sorghum (*Sorghum vulgare*) and corn (*Zea mays*) have been grown in Barbados for many years as grain crops. Commercial production of forage sorghum and sorghum x Sudan grass (*Sorghum sudanense*) hybrids (e.g. Sordan and Sudax) began in 1981 and they are now grown on many dairy and beef cattle farms throughout the island. Trials conducted by the Ministry of Agriculture and CARDI showed that the sorghum x Sudan grass hybrids yielded up to 2,700 kg/ha (2,400 lb/ac) dry matter per harvest, which can be fed as green chop or ensiled. Unlike corn, forage sorghum and sorghum x sudan grass hybrids ratoon, are drought tolerant, and with good management can be harvested as many as eight times over an 18-month period.

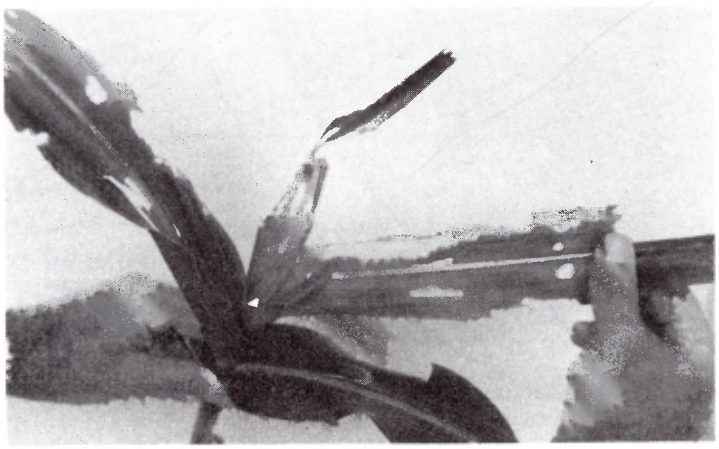
The fall armyworm (*Spodoptera frugiperda*) is the major pest of these crops in Barbados. An outbreak of this pest can result in a total loss of the crop in its early stages of establishment.

In addition to attacking other forages such as Guinea grass and the *Cynodon* grasses e.g. Giant African Star grass and Coast cross #1, the fall armyworm is also a pest of many vegetable crops including cabbage, cucumber and okra.

LIFE CYCLE

The female moth lays her small pale eggs in masses on the underside of the lower leaves, and covers them with whiteish scales from her body. On hatching the young larvae feed on the surface layer of the leaves, and after a few days migrate to the central portion or whorl of the plant to eat the tender unfurling leaves. Caterpillars cause the most damage to this part of the plant espcially when the plants are very young i.e. at the 3 to 8 leaf stage.

PERFORATED AND JAGGED LEAVES CAUSED BY FALL ARMYWORM FEEDING



In this somewhat protected area the caterpillars will continue to feed until they are fully grown, at which time they leave the whorl and drop to the ground to pupate in the soil. After 9 days the adult moth emerges. The life cycle of the pest takes about 32 days to be completed.

CONTROL OF THE FALL ARMYWORM

Integrated Pest Management (IPM) is crucial for the successful control of the fall armyworm. IPM involves the use of chemical, biological and agronomic practices in a balanced manner to optimize crop yields and to keep a pest or group of pests within manageable levels. It also seeks to minimize crop losses, the destruction of beneficial parasites and predators and the contamination of the environment.

Scouting the field to determine the population of caterpillars and to assess plant damage is the most vital step in any IPM programme. Scouting must be done daily as soon as the plants have emerged from the soil for 2 weeks and thereafter at least twice per week. Chemical and/or biological control methods have been very effective in controlling the fall armyworm in Barbados. Where sorghum or corn has been grown continuously in an area for many years the existing population of parasites and predators in surrounding forage fields is adequate to keep the armyworm under control. If however, a forage crop is being planted for the first time, or there has been a lapse of a year or more between crops, then the number of beneficial insects is insufficient to prevent severe attacks on the young plants. "Outbreaks" of the pest have to be prevented and this can be accomplished by applying a recommended insecticide. More than one application may be necessary depending on the severity of the outbreak. However, once the pest is under control, parasites like *Euplectrus plathypenae* should be released and the field routinely monitored for new damage.

SCOUTING

It is most important to scout (examine) the fields for pest activity. This is done by selecting and examining 50 plants per acre (125 plants per ha) at random in a zig-zag pattern across the entire field. If more than one caterpillar on average is found per plant whorl the crop should be sprayed immediately. At the 3 to 8 leaf stage one caterpillar or more per plant whorl is as damaging as 25 per plant whorl ("outbreak" level) in a nearly mature plant. In an "outbreak" spraying with a recommended insecticide is necessary to reduce pest numbers to manageable levels.

CHEMICAL CONTROL

A list of some suggested insecticides and their rates of application is given in Table 1.

TABLE 1: Some Suggested Insecticides and Their Rates of Application for the Control of Fall Armyworm Larvae on Corn, Forage Sorghum and Related Hybrids.

Common Name	Trade Name®	Formulation	Rate of Application * Per ac	Per ha	Remarks
Acephate	Orthene®	75S	$^2/_3$ - $1^1/_2$ lb	600 - 1200 g	Toxic to bees. Do not graze treated areas within 6-9 days.
Diazinon	Diazinon®	60EC	$^3/_4$ - $1^1/_2$ US pt	900 - 1800 ml	Toxic to bees. Ducks and geese are highly susceptible to this compound. Do not mix with copper compounds.
Decamethrin	Decis®	2·5EC	4 - 7 fl. ozs	300 - 500 ml	
Cypermethrin	Sherpa®	25EC	9 fl. ozs	650 ml	Toxic to bees and fish.
Pirimiphos methyl	Actellic®	50EC	$^3/_4$ - $1^1/_2$ pt	900 - 1800 ml	Toxic to fish.
Quinalphos	Ekalux®	480 g/l EC	$^1/_2$ - 1 pt	600 - 1200 ml	Toxic to bees and fish. Do not mix with alkaline compounds.
Methomyl	Lannate®	L	1 - 2 pt	1200 - 2400 ml	Toxic to bees, fish and birds.

* Manufacturers recommendations.

BIOLOGICAL CONTROL

The fall armyworm has many natural enemies which attack it at various stages in its life cycle. The most important of these are: a tiny wasp (*Telenomus remus*) destroys a large number of armyworm eggs. Two other wasps (*Chelonus antillarum* and *Euplectrus plathypenae*) parasitize and kill armyworm larvae.

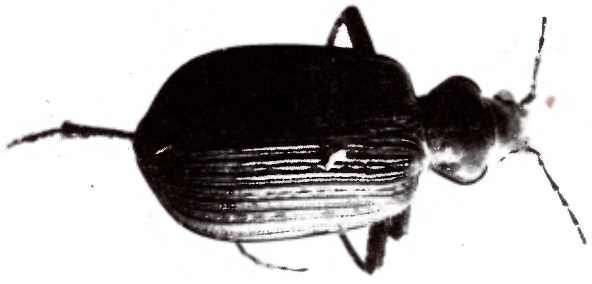
Predators like the lacewing feed on the pest's eggs while lady bird beetle larvae consume young armyworm caterpillars.

Lacewing

Ladybird beetle

"Jack-Spaniard" wasps and ground beetles feed on larger armyworm larvae and pupae.

"Jack-Spaniard"



Ground beetle

These helpful insects are usually readily found in the field but indiscriminate and untimely use of insecticides will kill them. Efforts should be made to conserve the parasites and predators already in the fields as this results in less expenditure on insecticides.

CULTURAL CONTROL

The fall armyworm feeds and multiplies on a wide range of alternate host plants. Many are weeds and removal of some of them, like prickly caterpillars (*Amaranthus* spp.), from the fields will reduce the breeding grounds for the pest. Thorough ploughing and cultivation of the field following the final harvest of the crop will also destroy large numbers of fall armyworm pupae in the soil and help to lessen pest infestation of surrounding forage crops.

PROPER USE OF INSECTICIDES

Insecticides are poisonous! They should be handled and used properly.

- Store them in a safe, cool, dry place under lock and key, and away from children, food and animal feedstuffs.
- Wear protective clothing including a mask and goggles when mixing or spraying insecticides.
- Read the label carefully before mixing and using. Check whether or not a spreader sticker is required.
- Do not exceed the recommended rates.
- Avoid spray falling on the body and avoid contact with sprayed foliage.
- Wash arms and any part of the body wetted with spray. Remove any wet clothing.
- Wash out sprayers after using.
- Dispose of empty insecticide containers by placing them in the garbage or by burying them. Do not re-use these containers!
- Spray with the wind behind you. Allow the wind to carry the spray into the crop. Do not spray on very windy days.

Acknowledgements

The author wishes to thank Dr. J. Reid, CARDI, Jamaica for her technical and editorial advice.

BARCLAYS

This publication was produced with assistance from The Barclays Development Fund in the Caribbean.