

## Important Insect Pests of Sugarcane in the Bombay Presidency.

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SUGARCANE is one of the most important crops of this Presidency. According to the recently published statistics, the area under this crop in this Presidency (including the states) is about one lakh of acres. As a result of the protection in the form of tariff, the area is fast increasing and there are indications that the cultivation of the cane crop will extend very considerably and the problems connected with this industry are sure to assume more and more prominence in future. Of the different problems, the one connected with the insect pests is no less important and it is certainly desirable that the sugarcane farmer should know how to save his crop, as far as possible, from the ravages of insects. So far as the present knowledge about the control of insect pests in general goes, all advice is embodied in two sentences: (1) "Prevention is better than cure" and (2) "Catch and kill". However, common-sense methods of control based on the habits of the pests are also useful and it is with this intention that this article is written, giving all the available information about the major insect pests of sugarcane, along with the control measures, which have been tried and found useful.

Thanks are due to Dr. K. R. Karandikar, Ph.D., for going through the manuscript and making some useful suggestions.

The following is the list of the important insect pests found on sugarcane in this Presidency:—

place. As regards the white-ants they are polyphagous and as such should not be considered as a specific pest of the sugarcane.

### THE SUGARCANE GRASSHOPPER.

Of the pests feeding on the leaves of this crop, the grasshoppers should be considered as the most important. Since last 10 years not a year has passed without receiving any report from the cultivators, on the attack of this pest. The species found in the sugarcane area is not the typical *Hieroglyphus banian* which is usually found attacking the paddy crop, but it is a variety of the same species known as 'elongata' (Uvarov, 1922). This grasshopper resembles the "Rice grasshopper" to a great extent, but is larger in size. From the eggs laid in the waste lands, in the previous season, the nymphs hatch out after the first showers of the monsoon, i.e., by the beginning of June. These nymphs spread about in the adjoining cane crop and remain active feeding on leaves. The growth is complete by the end of September and from October onwards their activity diminishes. The height of damage is reached in the months of August and September and in bad cases of attack all the plants are almost stripped of leaves leaving only the midribs. So far as this Presidency is concerned the 'elongata' variety appears to be confined to the sugarcane area under the Pravara Canals

| Serial No. | Common name               | Scientific name   | Nature of damage      | Status                              |
|------------|---------------------------|---|-----------------------|-------------------------------------|
| 1          | Grasshopper               | <i>Hieroglyphus banian</i> Fb.<br>Var. <i>elongata</i>  | Leaf eating           | Occasionally major                  |
| 2          | Mealy bug or Scale insect | <i>Trionymus sacchari</i> Ckll.   | Leaf and stem sucking | Minor                               |
| 3          | Mealy wing or white fly   | <i>Aleurolobus barodensis</i><br>Mskll.   | "                     | "                                   |
| 4          | Leaf hopper               | <i>Pyrrilla aberrans</i> Kirby  | "                     | "                                   |
| 5          | White-ants                | <i>Termites</i> sp.   | Roots                 | Occasionally major                  |
| 6          | Cockchafer grubs          | <i>Phyllognathus dionysius</i>  | "                     | "                                   |
| 7          | Root-boring caterpillar   | <i>Emmalocera depressella</i><br>Swinh.   | "                     | Minor                               |
| 8          | Stem-borers               | (i) <i>Chilo zonellus</i> Swinh.<br>(ii) <i>Argyria sticticraspis</i><br>Hmp.<br>(iii) <i>Procometis trochala</i> | Stem boring           | Very minor & rare<br>Major<br>Minor |

From the point of damage the stem-borers are the most destructive. Next in rank may come the grasshoppers and the cockchafer grubs. Mealy bugs and other insects will occupy the last

(Ahmednagar District) and also attacks rice in Belgaum.

The usual method of controlling grasshoppers is by bagging. This is a useful method in the

very early stage and when the crop is small ; but this is out of question in the sugarcane crop in July, when the crop is about five or six months old and too tall for bags to be worked and much less afterwards. Poison baiting was tried, but it was not effective for two reasons. Firstly, there was the difficulty of keeping the baits in proper places and secondly the bait did not attract the grasshoppers. At the end of December these adult grasshoppers might be migrating to the fallow and waste lands round about the cane area, since none of those grasshoppers have been observed in the fields. It is in these waste, fallow and unploughed lands that the egg-laying is done and the infection starts in the next season from these waste lands. Therefore, the following control measures are suggested :—

(1) Plough in summer every year all the waste and fallow lands round about the affected field to expose and destroy the egg masses.

(2) Bagging should be done immediately after the nymphs hatch out in the open fields and before they migrate to the cane crop.

#### THE SUGARCANE MEALY BUG.

The mealy bug found on sugarcane belongs to the species *Trionymus sacchari* (known formerly as *Pseudococcus sacchari*). It is pinkish-white in colour and is covered with a powdery white meal. These bugs always remain hidden under the sheathing leaves. Small pinkish eggs are found under the body of the female covered with a white mealy mass. Young ones after hatching find out suitable places for feeding purposes. Owing to the attack of this pest, the crop becomes stunted and looks unhealthy. The infestation spreads from field to field by means of setts taken for planting from the affected fields. The quality and quantity of *gul* are affected. In the year 1920-21 on the Manjri Experimental Farm (now abolished) and in 1921-22, on the Belapur Company, the sugarcane crop was very badly infested by these bugs. The following methods of control then used were found to be useful and efficacious :—

(1) All the cane setts at the time of planting were dipped in a strong solution of Fish Oil Rosin soap (2%).

(2) All the trash and rubbish were collected and burnt after harvest.

(3) Ratooning was stopped.

#### THE SUGARCANE WHITE FLY.

This is a minor pest. Wherever this pest is present the leaves of the crop especially the undersides are covered with black specks. These are the young stages of the adult insect which possesses two pairs of wings. The adults die away after laying the eggs on top shoots. The nymphs that hatch out stick on at suitable places, feed on the sap and grow. The grown-up nymphs are covered with a waxy meal. The attacked crop looks unhealthy. The only control measures that may be used are :—

(1) Destroy all affected leaves as soon as the pest is noticed.

(2) As far as possible the old cane should be harvested before new planting is done, taking care to destroy all the trash from the fields where the pest is present.

#### THE SUGARCANE LEAF HOPPER.

The species found prevalent in this Presidency is *Pyrilla aberrans*. As a rule, this is a minor pest, occasionally becoming abundant in certain localities. This leaf hopper is a small bug with a prolonged head and yellowish brown antennae and wings. It lays eggs in masses on the under side of leaves, covered with a white waxy material. The nymphs are peculiar creatures and can only be recognised by a pair of fluffy processes at the end of the abdomen. The nymphs and adults, both suck the juice. The insect is very active from August to December.

Control measures :—

(1) Collect and destroy the egg masses.

(2) Destroy all the trash after harvest.

(3) Do not take a ratoon crop.

#### TERMITES (WHITE-ANTS).

Great amount of damage to sugarcane is done by white-ants. The damage is done by feeding at the roots and causing the death of the setts. This pest is very active a short time after ploughing, i.e., from April to June. Owing to the damage of some plants a patchy appearance of the field is noticed. The best control is afforded by the application of Crude Oil Emulsion in the irrigation water to the affected plots.

#### COCKCHAFER GRUBS.

This is a very serious pest and has been reported from all over the Presidency. These grubs are found under the soil and feed on the roots. Consequently, the damaged clumps wither and die. The damage is very serious from July to October. It is not exactly known as to how many species are involved. The species that was reported in 1920-21 from the grubs sent from Satara was *Phyllognathus dionysius*. It has been observed that those fields which receive ill-rotted manure are generally more affected.

A large number of remedial measures has been advised in different books such as the use of Gypsum and Naphthalene, but none of them seem to be practicable and economic.

Hardly any control measures are there possible at the time when the crop has been sufficiently tall, however the following preventive measures may be tried :—

(1) Do not give an ill-rotted farmyard manure to the sugarcane fields.

(2) Plough the fields after harvest to expose the grubs.

#### THE ROOT-BORER.

This is very rarely observed in this Presidency except in some localities where ratooning is practised. The damage is done underground and is ordinarily ascribed to white-ants. In 1921 this pest was noticed on the Belapur Company in the old canes. The caterpillar is pale yellow in colour with a brown head. It bores into young seedling and tunnels down towards the root causing the death of the whole clump. It is active from April to June. The only control measure that can be advised is that no ratooning should be done where the pest is prevalent.

STEM-BORERS.

Of all the pests, the stem-boring caterpillars are the most destructive. Isaac and Misra (1933) mention that "there are five species of stem-boring caterpillars known and of these the following three are the most important :

- (1) *Argyria sticticraspis*.
- (2) *Chilo zonellus*.
- (3) *Diatraea venosata*.

Of these three the first two are more important than the third. Ramkrishna Ayyar and Margabandhu (1933) state that *Argyria sticticraspis* is the principal pest in Madras and add "What is *Diatraea sacchari* to the sugarcane countries like Louisiana, British Guiana, &c., *Argyria sticticraspis* is to us." So far as this Presidency is concerned *Argyria sticticraspis* and *Procometis trochala* are found attacking the stems.

1. *Argyria sticticraspis*. Of these two borers the first one is the most important and widely found. The species *Chilo zonellus* has rarely been found on sugarcane in the Deccan tract (Ramrao, 1920). The facts known about the *Argyria* caterpillar as mentioned in the Bulletin "The Sugarcane Borer and its Control" (Ramrao, 1920) are as follows :

(1) The pest hibernates as a larva during the cold of winter in cane shoots, which it attacks before the setting in of cold winter.

(2) The generations overlap considerably as even among the hibernating larvae we usually find young and old caterpillars.

(3) The larvae continue to attack young cane shoots all through the year except during the cold winter months. Such young shoots are almost always found in cane fields. The pest therefore gets ample opportunities to breed as the cane occupies the field during the whole year.

The loss to the sugarcane grower is not restricted to the death of germinating cane where the loss is often as high as thirty to forty per cent., but the crop tends to show a bushy growth resulting in thin canes which do not ripen at the same time as the rest. The yield is less in juice and the cane gets a check at the start which it cannot easily make up."

Control measures :

(1) The cane should be planted as early as possible. The first week of January will suit the conditions of sugarcane cultivation in this Presidency.

(2) After the harvest the stubbles should be dug out and the roots exposed to the sun to prevent any tillering of the stubbles.

(3) Ratooning is not advisable.

The first recommendation of "early planting" is based on the fact that the cane plants should be at least three months old, if they have to escape being attacked by the borer which becomes active by the middle of March in the Deccan. This recommendation is being followed largely by the sugarcane growers in this Presidency and the following figures received from one of the sugarcane farms (Gokak Dist. Belgaum) will illustrate the relation between early planting and the incidence of the borer attack :

| Date of planting | No. of rows | No. of total canes | No. of affected canes | Percentage of borer attack |
|------------------|-------------|--------------------|-----------------------|----------------------------|
| 15 2 33 ..       | 9           | 147                | 0                     | 0                          |
| 1 3 33 ..        | 7           | 117                | 10                    | 8.5                        |
| 15 3 33 ..       | 9           | 181                | 20                    | 11.0                       |
| 1 4 33 ..        | 9           | 167                | 55                    | 32.9                       |
| 15 4 33 ..       | 9           | 161                | 180                   | 39.0                       |

2. *Procometis trochala* Myer. When the sugarcane on the Manjri Experimental Farm was being harvested in the month of February 1924, a large number of canes was observed being bored by caterpillars which were reported to be *Argyria* sp. On examination these borers were found to be quite different. The moths reared from them were got identified as *Procometis trochala* from Pusa.

This borer has been observed by the writer for the first time in 1924 attacking the sugarcane. The caterpillar is dirty white with a reddish tinge, head reddish brown; when full grown it measures 1 1/2". It has the habit of feeding into the pith by making large galleries, throws out a large amount of frass and feeds from inside the pellet of excreta. The whole cane is damaged. More than one caterpillar are found inside one cane.

Considering the amount of damage this is a minor pest and needs no control measures.

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