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Some notes on the most important pests of citrus and banana in Surinam — E.W. van Brussel

Introduction

Insects pests affect practically all cultivated plants in Surinam.

It was Van Dinther, who first felt the need for a systematically arranged list of the insects which affect agriculture in this country. During the years 1953—56 he compiled the relevant results of research. The comprehensive publication, "Insect pests of cultivated plants in Surinam", in which entomologists can obtain the necessary information about the noxious insects, was a result of this work. Although information for the control of most of the insect pests are given, the development of new and better insecticides and other modern control methods urgently asks for an intensive study of this matter.

During the last three years applied entomology has occupied an important place in the programme of entomological research in this country.

Research was done on the most important pests, that infest the economic important crops such as rice, citrus, banana etc.

CITRUS

The citrus rust mite

Economic importance and nature of injury

In all probability the citrus rust mite, **Phyllocoptruta oleivora** Ashm., ranks first among the injurious pets on citrus in Surinam. The leaves as well as the fruits are infected.
By rupturing the cells and sucking sap from the skin of the fruits it cause a serious russeting of oranges and grapefruit.
The damage of the fruit varies from 20% to 60% and since the shipping quality is affected, this fruit is thrown away because there is no market for it.

Distribution

The rust mite occurs on all citrus trees in the coastal plain and could not be detected till now on the citrus trees at the "Baboenhol" citrus estate of the S.E.L., which is located in the interior.
It is unknown whether the plant material was not infested by the rust mite or the climatic conditions in the interior are not suitable for the development of this pest.

Life History and Habits

The adult mite measures about 0.02 inch in length, with two pairs of legs at the head end. Reproduction takes place entirely by parthenogenesis. Sexual differences have never been distinguished in the rust mites. Generations succeed each other at intervals as short as one week and up to 26 eggs were found deposited by one female. In general it was found that under favourable conditions the population density reaches a maximum in about 4 weeks and in about 4 weeks it is very low again.

From this it could be seen that under favourable conditions its rapid rate of reproduction enables it to cause damage to the fruit and foliage in a very short time.

In a cage experiment it was found that feeding of 400 rust mites per 0.24 square inch of a fruit area during 3 days has not resulted in ruseting of the rind. Thus in Surinam the critical population density will probably occur after about 2 weeks.

According to Fisher c.s. (1949) and Muma (1955) the population density of the rust mite in Florida stays for a rather long period on a high level. Fisher has mentioned a maximum infestation in June, July and August. Muma has found a more gradual increase in the population density during a period of 3 months.

Since the increase in the population density in Surinam shows a steep curve, a weekly checkup of the number of mites on the fruit or leaves is necessary to prevent that the control of the rust mite will take place too late.

Research workers agree that the probable cause of the abrupt decrease in the population density of the rust mite is due to a fungous disease. Examination of the dead mites have usually shown certain fungal filaments protruding from their bodies. Fisher c.s. (1949) have stated that a fungus associated with dead mites has been identified as a species of **Hirsutella** Pat. Yothers and Mason (1930) and Muma (1955) have found endoparasitic hyphal bodies on the inside of the dead mites.

According to Yothers and Mason (1930) it has been observed annually since 1912 that the citrus rust mite reaches the point of maximum infestation just after the beginning of the rainy season. Muma (1955) has found in the month with the highest average rainfall a top in the population density of the rust mite.

In Surinam the increase of the rust mite population occurs at the beginning of the dry season and it normally reaches the point of maximum infestation in the dry season.

During the rainy season practically no rust mites occur. Only in one case millions of rust mites were found on some fruit that was picked in the middle of a rainy season.

Control

The flowering of oranges and grapefruit occurs mainly at the beginning of a rainy season. In the period between flowering and ripening of the fruit two dry season are to be expected.

The control of the rust mite should take place a the beginning of the dry season. Up to now low volume spraying with sulphur and chlorobenzilate has given the best results.

Scale insects

Economic importance and nature of injury

The scale insects rank second among the injurious pests on citrus in Surinam. Are the fruit damaged year after year by the rust mite, the scale

insects may be listed as highly noxious to young citrus plants. Five noxious species occur on citrus in Surinam, namely **Chrysomphalus ficus** Ashm., **Selenaspidus articulatus** Morg., **Lepidosaphes beckii** Newm., **L. gloverii** Pack. and **Fiorinia** sp.

The former two species infest mainly the leaves and the fruit. Infested leaves become yellow and drop in an early stage.

The latter three species infest the twigs as well as the leaves and fruit. Infestation of the twigs may lead to a complete destruction of the whole plant. These species live mainly on and alongside the mid-rib and on the edges of the leaves. On these places the first yellowing of the leaves occur.

Distribution

The scale insects occur in the coastal plain as well as in the interior. The young citrus trees of the „Baboenhol" citrus estate were badly infested by scale insects in 1966. This was probably the most serious infestation of scale insects that had ever been observed in Surinam. In the interior **S. articulatus** was dominating, while in the coastal plain it was the other species, which has done severe damage to the young citrus trees.

Life History and Habits

So far only from **Ch. fixus** biological data was obtained. One generation may develop in about 7 weeks. The length of the adult life is about 6 weeks and during this period a female may deposit an average of 150 eggs. After the end of oviposition, the females die rather quickly. For their development the females prefer the lower side and the males the upper side of the leaves.

The scale insects may infest the plants both in the wet and in the dry season. During the dry season, however, the infestation is more severe.

Natural control

Both **Ch. ficus** and **S. articulatus** may become parasitized to a very high degree by an orange-coloured fungus.

In control experiments against the rust mite, the author observed a build-up of scale insects as a result of applications of sulphur sprays. This was in agreement with the results of experiments by Griffiths and Fisher (1949) in which the residues of sulphur and copper sprays may kill the fungi which are parasitic on these scale insects.

Ch. ficus may be parasitized by a tiny **Chalcidid, Aphytis Chrysom-phali**. Ladybird beetles and their larvae have been observed preying intensively on these scale insects.

Chemical control

High volume spraying with gusathion E.C. has proved to be successful against the scale insects. A high mortality could be detected two weeks after the treatment.

BANANA

The Banana Fruit-scarring beetle

Economic importance and nature of injury

The Banana Fruit-scarring beetle, **Colaspis hypochlora** Lef., fam. **Chrysomelidae**, can be listed as one of the most important insect pests of banana in Surinam. Reyne (1923) stated that since 1913 banana plantations have suffered from attack by this beetle. Owing to the occurrence of the Panama disease an end came to the cultivation of Gros Michel bananas. In 1960 bananas were cultivated on a large scale again, thanks to the introduction of the Congo variety, which is resistant to the Panama disease. Up to 1964 **Colaspis** occured on a small scale but later on the attack became severe.

The beetle attacks the young fruits and as a result the so called „spotted bananas" occur.

The infestation starts at the centre of the bunch near the fruit stalks. On a bunch where one can only see some scars at the outside the infestation often is in such a way, that the bunch is completely unfit for export.

The adult beetles also infest the young unrolled leaves, but the damage is of little importance.

In the daytime as well as at night always 2 to 5 beetles could be observed on a bunch. Observations give us the impression that the beetle is only little mobile. Moreover the beetle was never seen by day on the outside of a bagged bunch. It seems that the beetles are staying continiously on the bunches. A heavy infested bunch is probably the result of the gnawing of 2 to 5 beetles during a period of at least 3 weeks.

Life History and Habits

In Surinam the biology of this beetle has not been studied yet. Gowdey (1926) gives a description of the unadult stages. These are: egg 7—9 days; larva, 20—22 days; pupa, 7—10 days. Gowdey believes that there are four generations in a year, which appear towards the beginning of April, the end of June, the end of August and the end of October. According to Gowdey oviposition takes place at the roots of bananas, while the larvae are feeding on the young roots.

In Surinam infestations occur only in the main rainy season, which normally begins in April or May. The beetles disappear at the beginning of the dry season. So far no infestations have been observed in the small rainy season. In Surinam the beetles occur during a relatively short period in the bananas. The development of more than one generation in the bananas is not expected. The beetle has probably another foodplant on which it reproduces during the rest of the year.

The infestations occur almost every year in those fields that are next to the forest. Similar data has been reported by Reyne (1923). The author believes that the primary foodplant of the beetle is in the forest.

Control

The beetles can be controlled by atomizing the bunches with DDT w.p. by means of a knapsack sprayer. Experiments with aircraft applications of insecticides are taking place.

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