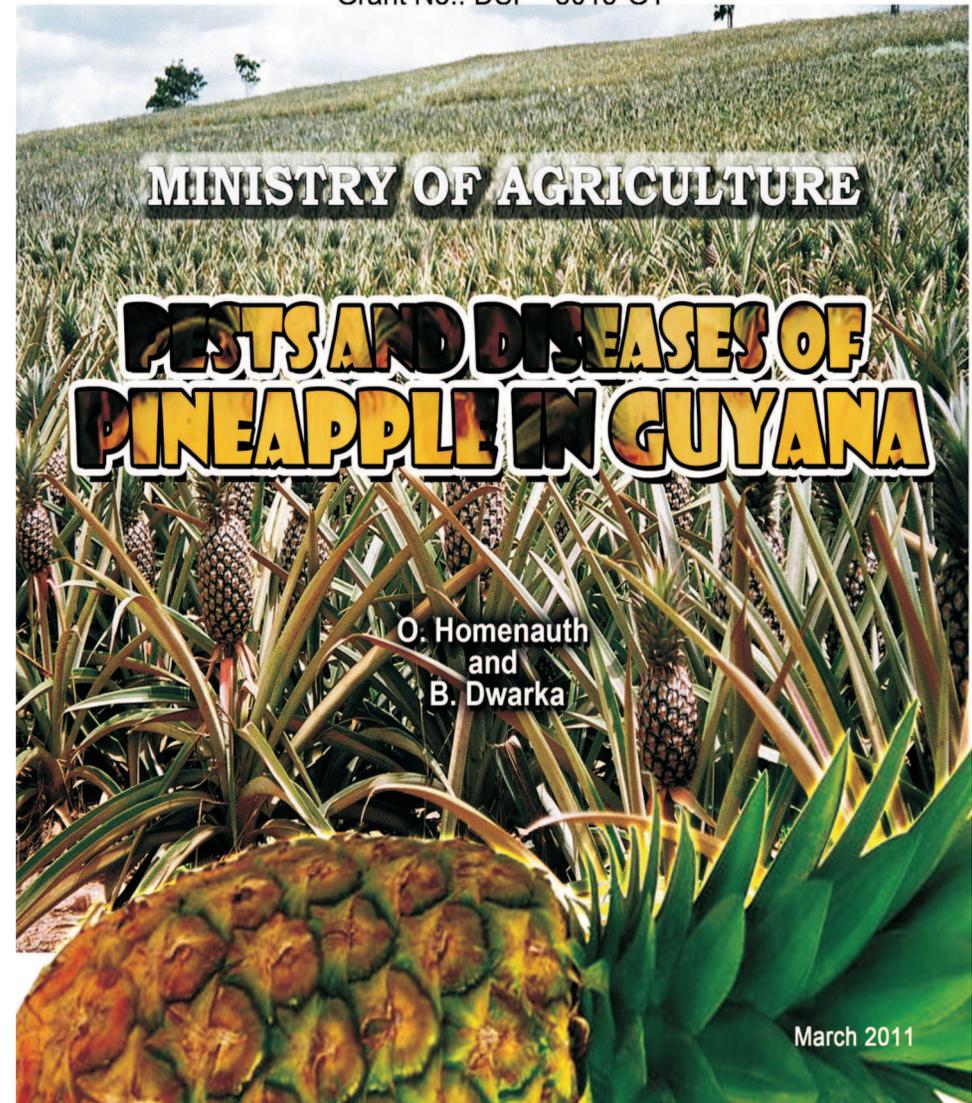




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PESTS AND DISEASES OF PINEAPPLE IN GUYANA

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MAJOR PESTS
AND
DISEASES
OF
PINEAPPLES
IN
GUYANA

SELECTION AND TREATMENT OF PINEAPPLE PLANTING MATERIAL

Selection and treatment of planting material are two important activities, especially when it is recognized that such materials develop into plants that produce the final product - the fruits. As such, cultivation of healthy vigorous planting material can result in the production of healthy plants and fruits. There are different types of planting material.

- (a) Slips: These are found at the bases of fruits.
- (b) Suckers: These represent the side shoots of the plant.
- (c) Crowns: These originate at the top of the fruit.

Irrespective of the type used, all planting material should be selected from healthy mother plants.

Gummosis Disease of the fruit:

This disease follows the attack of the fruit by the *Thecla* butterfly and is characterized by the exudation of an amber coloured resinous material or gum from the wound. Control of the disease is directed at controlling the *Thecla* butterfly.





Figure 3: 'Scarlet Tip' (Stage 3)



Figure 4: 'Scarlet Tip' (Stage 4)

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Figure 1: 'Scarlet Tip' (Stage 1)



Figure 2: 'Scarlet Tip' (Stage 2)

allows for improved development of plants. Removing dry material can also expose mealybugs, and therefore allow for more effective control when pretreating the material with an insecticidal solution.

- (2) Treat planting material with a solution of Basudin 0.05% or Malathion 0.1% before planting. This is accomplished by packing the material into a half drum in an upright position. A solution of Basudin 0.05% is then poured into the half drum until the materials are completely submerged. The planting material should remain in the insecticidal solution for 20 minutes. After this time, the material should be removed from the solution and placed on the ground in an upright position for a further 20 minutes. The planting material should then be inverted and allowed to drain. Planting can begin the following day. The insecticidal solution remaining in the half drum should be used for spraying ant nests in the field. In the absence of ant nests, the insecticide can be used for spraying the soil before planting.

Some Points to Note

- (1) It is preferable that these operations occur under shaded conditions.
- (2) Protective clothing should be worn at all times when treating planting material with an insecticidal solution. For example, wear long boots, long pants, long sleeved shirts, gloves, eye goggles and respirators.

Follow these instructions for the insecticidal mix:

- (1) To prepare Basudin 0.05%, use one “cover cork (1 oz)” of the chemical to each gallon of water.

Some tips for better plant tolerance to Scarlet Tip:

1. Prepare land thoroughly and destroy all pineapple residues.
2. Irrigate plants during the dry periods and provide proper drainage.
3. Ensure good plant nutrition.
4. Time planting to avoid critical periods when stage of plant development coincide with greater mealybug activity and excessively dry and wet conditions.

INTRODUCTION

Pineapple is one of the most important fruit crops cultivated in Guyana both for the domestic and export markets. There are lucrative markets for pineapples in the Caribbean. The major pineapple producing areas are in Regions 3 and 4 where yields range between 15.0—18.0 tons/ha. With improved technology, yields can be as high as 30 tons/ha. Pineapples can be processed and consumed in various forms such as chunks, slices, juices, jams, syrups, diced pineapple, etc. Wastes from processing the fruit can be further converted to sugar, wines, vinegar, animal feed, etc. Pineapple is being targeted as a crop for further expansion under the Agricultural Diversification Programme (ADP), currently being implemented by the Ministry of Agriculture.

PINEAPPLE VARIETIES

There are many varieties of pineapples cultivated in Guyana. The main variety cultivated both for local and export markets is Montserrat. The Sugar Loaf variety is currently being produced organically in Mainstay and processed into chunks and juices. Other varieties cultivated locally include the Smooth Cayenne and Tiger Head.

PINEAPPLE WILT

Ant – Mealybug Complex

Two insects pose a serious threat to pineapple cultivation. These are the Ant (*Solenopsis* sp or *Araucomyrmex* sp.) and the Mealybug (*Dysmicoccus brevipes*). The combination is the Ant Mealybug Complex. Mealybug colonies are tended by ants, which protect them by making shelters of soil around the mealybug.

Initial control should be directed against the ants to ensure success. When the ants are controlled the shelters collapse and control measures can then be directed towards the mealybug.

This is one of the most economically important mealybug pests in Guyana because of its involvement with diseases of pineapple.

Symptoms

On pineapple, the mealybug is responsible for five types of damages:

- (1) the transmission of pineapple wilt or mealybug wilt;
- (2) the transmission of the virus that causes Scarlet Tip Disease;
- (3) the production of chlorotic areas where there has been prolonged feeding and the underlying tissues have been exhausted;
- (4) damage to the bottom of the pineapple by the feeding of large mealybug populations which makes the bottom slices unmarketable and may cause the rotting and leaking of the fruits; and
- (5) "mealybug stripe" which results from the feeding of a short section of each of 3 or 4 inner whorl leaves. It is characterized by streaks of pale green to yellow and by the collapsing of the water storage tissues within these streaks.

Pineapple wilt, or mealybug wilt, causes the most serious type of damage and is the principal cause of crop failure. There are two types of wilt, "quick wilt" and "slow wilt". Both types cause the collapse of roots by the invasion of saprophytic organisms or by drying up the root.

"Quick wilt" is produced by a short period of feeding by a large colony of mealybugs and is characterized by discolouration of leaves. The most visible symptom is a bright bronze to red colouration of the leaves of the young plant or a pinkish and/or yellowish colouration of the older plants. If the plants continue to grow, the leaves lose turgidity and curl outwards. Any fruit produced by these plants is usually small and/or distorted.

observed to be affected by "scarlet tip", but those that have reached 12-15 months seem to succumb to the condition more readily than younger or older plants.

Conditions for Development

In Guyana, hot, dry, sunny weather conditions seem to favour the development of "scarlet tip". During these conditions the disease symptoms seem to be most enhanced. With the onset of rains and cooler conditions, some plants may recover from the symptoms.

Control Measures

1. Rogue and burn all diseased plants as soon as they are spotted in the field.

Selection of Planting Material

- (1) Mother plants from which materials are selected should be green in colour. Planting material should not be selected from mother plants showing reddish leaves, for these plants may be infected with "scarlet tip".
- (2) Mother plants should be free from rots and gums.
- (3) Do not select material from plants infested with mealybugs. Carefully examine, both the inside and outside of leaf bases, for the presence of mealybugs.
- (4) Some plants may show earthen shelters around the plant bases. Do not select material from such plants. These plants are infested with mealybugs that carry the virus germ responsible for "scarlet tip".
- (5) Planting material should be selected from erect plants showing firm leaves. Plants that are too short (dwarfed), and those showing wrinkled or withered leaves should be ignored.
- (6) In the actual selection of planting materials, these must be carefully examined for mealybugs, rots and gums. Only material free of these should be selected.

Treatment of Selected Material

Selected planting material should be treated the following way, to promote healthy plant growth.

- (1) Trim off old (dry) tissues, especially around the bases of the planting material. This is important in exposing tissues that will develop into roots, so that when the material is planted, roots are in better contact with the soil. This in effect,

THE "SCARLET TIP" CONDITION ON PINEAPPLES

Cause

There is strong evidence that the "scarlet tip" condition on pineapple plants is associated with the presence of a virus. It is believed, that during feeding, the pineapple mealybug (*Dysmicoccus brevipes*) transmits the virus via its saliva to the plant and it is this virus that is believed to be responsible for the development of the "scarlet tip" condition.

In Guyana, nematodes, or very tiny worms which cannot be seen with the naked eye have also been reported to be involved in the development of the condition, but this is yet to be confirmed. The symptoms of "scarlet tip" are described as seen on the Montserrat pineapple since this "variety" seems to be most susceptible to the condition in Guyana. The symptoms can be described in four stages.

SYMPTOMS

Stage 1: The first set of symptoms of the condition seems to be the appearance of a pale to pinkish colouration mainly at the middle of the leaves of the 4th whorl. This discolouration spreads outwards towards the leaf margin and upwards towards the leaf tip. Eventually such leaves curl downwards at the margin while the tip remains erect. Irregular spots are sometimes observed on the leaves.

Stage 2: The pink colouration intensifies and the leaves become bright pink to reddish or bronze. Subsequently, the leaf tips turn yellow and curl downwards and the entire plant begins to wilt. Also, during this stage, older leaves (5th whorl) begin to show the pinkish discolouration.

Stage 3: The entire plant becomes severely wilted, leaf tips become straw-coloured and begin to die back while older leaves tend to bend over at about midway along the length.

Stage 4: The plant becomes withered and can be easily uprooted as the roots are severely reduced and rotted. Fruits produced from plants that show symptoms are usually reduced in size, malformed with fibrous, corky and sour flesh.

Development of "scarlet tip"

The causative virus is known to exhibit "latency". This means that even after plants have been infected with the virus by the feeding mealybug, the scarlet symptom may not appear for a period of time, the length of which varies depending upon a number of factors. These include: the nutrient status of the plant, the number of mealybugs feeding on the plant, frequency of feeding of mealybugs on the plant, plant age, and prevailing weather conditions. However, plants of any age have been

"Slow wilt" occurs after the development of a large colony of mealybugs and shows fewer colour changes. Leaves will be covered with mealybug feeding sites, leaf tips are browned, outer leaves droop and the leaf will be flaccid to the touch. Pineapple wilt has also been called "edge wilt" because the margins of the field are affected first and the infection moves inward as the mealybug infestation disperses inwards. Fortunately, this disease has been controlled for the last three decades by routine ant control. However, it may once again become prevalent if mealybugs are not continually suppressed by limiting ant populations.

MANAGEMENT

Mealybug control often focuses on the control of caretaking ants that are essential for the proper development of pineapple mealybugs. They provide the mealybugs shelter, protection from predators and parasites, and keep them clean from detritus that may accumulate in the secreted honeydew and be deleterious to the colony. Because of the essential role of the ants, management practices often include the control of tending ant species. Without the ants, mealybug populations are small and slow to invade new areas and the field would be free of a serious mealybug infestation.

Cultural Control

Previously infested fields should be turned over and all crop residue removed and burned. Crop residues and grass roots left in the field may harbour mealybug populations until the new crop has developed enough to support a mealybug population.

Field borders should be kept clean of weeds and debris that may support mealybugs between plantings. Weeds also provide alternative food sources that maintain ant populations between periods where mealybug infestations are small.

Chemical Control

The chemical control of tending ant species has shown to be effective in the control of mealybug populations on pineapple. In the past chemicals such as heptachlor and mirex have been used to control ant populations and subsequently mealybug wilt in pineapple. Unfortunately, these chemicals have detrimental effects on the environment because of their slow degradation and have been banned for use.

Control of Ants

Ants can be controlled either by drenching their nests with insecticide or by applying baits.

Drenching- Apply a 0.2% Basudin spray to the nest 10 ml/4.5 L of water (2 tsp. in 1 gal water). Soak nest thoroughly.

Baiting - Use Acoushi ant bait or milk bait.

Using the acoushi ant bait

To apply the acoushi ant bait, first place a piece of aluminum foil, or plastic near nest. The purpose of this foil is to prevent the bait from absorbing soil moisture. Moist bait is rejected by the ants.

Place bait in any suitable container with the acoushi ant bait on the aluminium foil or plastic. Cover the container of bait with another piece of aluminium foil. Weight the foil down with stones or pieces of wood. The second piece of aluminium foil protects the bait from rain and sunlight. Disturb the ant nest with a cutlass or any suitable object to arouse the ants for early uptake of the bait. Finally, cover everything with trash to protect the bait, container and foil from vandals and intruders.

Using the milk bait

Apply the milk bait by coating the inside pieces of split bamboo, pineapple, leaf or other suitable material. Remember not to touch the bait with your hands. Place the bait-coated material with the inner surface down, near the nest. As before, disturb the ant nest to excite the ants for early feeding on the bait. Cover baited material with trash.

Control of Mealybug

Spraying the plants in the field after the ants have been eliminated can control the Mealybug. Insecticide application is recommended throughout the plant growing cycle to keep the pest under control. The frequency of these applications depends largely on the level of pest infestation, but are particularly important at the early plant growth stage and during the fruiting season. It is also necessary to apply chemical treatment to the plant suckers before planting (refer to section 6.3.1).

Apply any of the following insecticides:

- i. Basudin 60% EC. Apply 0.2 spray. Mix 10 ml/4.5 L water. (2 tsp/1 gal water).
- ii. Malathion 50% EC. Apply 0.1% spray. Mix 10 ml in 4.5 water. (2 tsp/1 gal water).

When spraying, ensure that the nozzle is directed towards the lower parts of the plant where the mealybugs are found.