

## 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.

### 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.

### Land Preparation

Pineapples grow well in Guyana on a wide range of soils. Most of the pineapples grown commercially are on riverain silt loams, clay loams and clay high in organic matter (Pegasse soils), that have benefitted from improved drainage and water control systems. Best growth is achieved on well-drained, fertile, sandy loam soils with a pH range of 4.5–5.5.

Where cultivation is to be done for the first time, on forested new lands, the 'slash and burn' method of land clearing could be used. On the heavier riverain soils, when replanting old pineapple cultivation or using lands previously used for other crops, the areas should be ploughed and left to weather for 3–4 weeks. The land is then harrowed and the crop can be planted.

On riverain and potential acid-sulphate soils where water is critical, a system of raised beds and drains will be required. The width of the beds and drains will depend on whether single or double rows of plants will be used. If single rows are to be used, the beds should be made 240cm (8ft) wide and for double rows the beds should be 390cm (13ft) wide. Drains on either side of the bed should be made 60cm (2ft) deep.

### Planting

The pineapple is propagated vegetatively. Planting materials are obtained from various parts of the plant and are identified according to the part of the plant on which they are found. Basal suckers commonly referred to as 'slips' are the preferred type of planting material since these produce fruit fourteen to sixteen months after planting.

Remove dried leaflets found at the base of suckers and trim ends with a sharp knife. The slips with leaflets pointing upwards, should be packed in a container, layer after layer. When the container is filled, add a solution of Malathion or Diazinon 0.1% - 5ml in 4.5 L water (1tsp/1 gal; water) until the slips are fully covered, in order to ensure all pests are killed. Submerge slips for twenty minutes then drain off the solution into another container and store for reuse. Using gloves remove suckers from the container and pack on ground under



Single row planting



Double row planting

shade in an up-right position for seven days.

When planting, ensure that the "heart" of the plant is above soil level otherwise rotting will occur particularly if the soil is wet. Either the single or double row system, can be used. However, for a more cost effective land use, the philosophy is to have the largest number of plants per unit area as is practical. This is better achieved by the double row system which accommodates more plants while still permitting some room to manoeuvre between the plants. This double row system is therefore the recommended system for planting.

### Fertilizers

The fertilizer recommendations are based on a plant density in the double row system of 25,000–29,000 plants/ha (10,000–12,000 plants/ac).

It is important to have the soil analyzed to obtain recommended levels of fertilizers, but on the whole, the pineapple plant requires high levels of fertilizers for satisfactory production.

In the absence of a precise soil analysis, the following general recommendations will suffice.

### Sandy Soils

The upland sandy soils are infertile and require a complete fertilizer with added trace or minor nutrients. A general recommendation will be to apply on a per annum basis:

600 kg/ha (532 lb/ac) of 12:12:17:2

24 kg/ha (20 lb/ac) of 3:9:30 + FTE (trace elements)

The total amount of nutrients should be applied on equal split applications at two months intervals, i.e. 104 kg/ha of the total mixture is to be applied every 2 months.

If 12:12:17:2 is unavailable then it may be substituted by:

Urea —200 kg/ha (90 lb./ac)

TSP —150kg/ha (80lb./ac)

MOP —112 kg/ha (85 lb./ac)

Magnesium Sulfate —23 kg/ha (5 lb./ac)

### Riverain Soils

Apply half the amounts as recommended for sandy soils but maintain the same times of applications.

## PEST MANAGEMENT

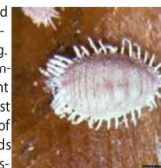
### The Ant Mealy Bug Complex

Two insects pose a serious threat to pineapple cultivation. These are the Ant (*Solenopsis* sp or *Araucomyrmex* sp.) and the Mealybug (*Dysmicoccus* spp.). 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 be directed towards the mealybug. Ants can be controlled either by drenching their nests with insecticide or by applying baits.

### Control of the 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 during the fruiting season. It is also necessary to apply chemical treatment to the plant suckers before planting.



### Fruit Pest

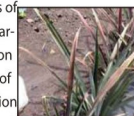
Fruits of the pineapple can be attacked by the larvae of a specific butterfly. This leads to gummosis disease of the fruit. The control of the pest is achieved by the application at the time of flowering and during the blooming period, of the same chemicals used to control the mealybug. As such the timing of application could be so coordinated to control both pests simultaneously.

## DISEASE MANAGEMENT

### Scarlet Tip' Condition of Pineapples

The symptoms of 'scarlet tip' are described below:

**Stage 1:** The first set of symptoms of the condition seems to be the appearance of a pale 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 coloration 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. The method recommended for the control of 'scarlet tip' is roughing and burning all diseased plants as soon as they are spotted in the field.

### Pineapple Wilt Disease

The most common Wilt Disease is caused by a virus/toxin associated with the Mealybug. 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 older plants. Any fruit produced by these plants is usually small and/or distorted. Control is effected by taking the measures to control the mealybug. Also, all infected plants should be removed from the plant site and destroyed by burning as these plants are a source of infection.

## Gummosis Disease

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 .

## Artificial flower —Induction

Artificial flower induction is a procedure that utilizes synthetic hormones to induce plants to flower. The main products used to enhance flower in pineapples are Naphthalene Acetic Acid (NAA) and Ethrel. The NAA is available in in tablet form (0.5 mg active ingredient per tablet) and treatment is achieved by placing one or one-half a tablet into the whorl of each suitable plant. Ethrel is a liquid and is used as a 0.1-0.2% spray solution. To enhance its performance, it is recommended that Urea be added to the solution to a level of 2%. In practice this is 20-40mls of Ethrel + 400gms of Urea per 20L Sprayer or approximately 1.5-3 tablespoons of Ethrel + 1lb. Urea per 5 gal Sprayer. The application is made to the centre of the whorl delivering about 30mls (2 tablespoons) of the mixture per plant.



## Internal Browning

Internal browning is a common post harvest disorder affecting pineapples in Guyana. Symptoms begin as small grayish translucent areas at the base of the fruit near the core. These areas eventually darken and in severe cases the entire internal flesh turns brown to black in colour. Control of internal darkening may be obtained by waxing the fruit.



## Harvesting and Storage

Fruit maturity is evaluated on the extent of fruit eye flatness and skin yellowing.



Code CS1  
Eye Colour:  
All Green Eyes  
Average Brix:  
Top10



Code CS1  
Eye Colour:  
5-20% Eyes Yellow  
Description:  
Green Mature  
Average Brix:  
Bottom-12



Code CS6  
Eye Colour:  
20-40 %Eyes Yellow  
Description:  
Intermediate Green  
Green Mature/ Fully Rip



Code CS4  
Eye Colour:  
40-80% Eyes Yellow



Code CS5  
Eye Colour:  
90% Eyes Yellow  
5-20% Reddish Brown



Code CS6  
Eye Colour:  
20-100% Eyes  
Reddish Brown  
Description:  
Fully Mature  
Average Brix:

Pineapples are harvested by breaking or cutting the stalk a few centimeters below the fruit. The harvested fruit is packed either in the field or at a central packing shed. While in the field it should be placed in shaded conditions. After harvesting the fruits should be placed in crates (polyethylene sacks or bags must not be used) for transport.

Pineapples fruits are quite perishable and should ideally be packed for market within a day of harvest. For the export market, the stem must be trimmed very close to the base and the crown has to be cut back to a length of 10cm. Then the fruit has to be washed in a soap solution and thoroughly scrubbed on the outside with a brush to remove all insects. The wash water should be properly chlorinated (150 ppm free chlorine) and maintained at a pH of between 6.5 to 7.0. For maximum post harvest life, p i n e a p p l e



should be cooled to 8°C as soon as possible after harvest and maintained at this temperature during transport to market. At this temperature pineapples harvested at the quarter yellow stage have a shelf life of approximately three weeks. Pineapples should not be stored at temperatures below 8°C as this will result in chilling injury. Pineapples harvested at different stages of ripeness will inhibit different post harvest storage capabilities. Pineapples are susceptible to wilting and shriveling in low relative humidity storage environments. Ideally, pineapples should be held at 90 to 95 % RH. Mature green pineapples should be stored at a temperature of 8-10C and at RH of 85090%. Under these conditions it should have a storage life of 23 weeks.

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Ministry of  
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Growing  
Pineapples in  
Guyana



Rural Enterprise and Agricultural  
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