

# Cultivation of Gros Michel Banana in Jamaica

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The Gros Michel variety ranks as world's No. 1, commercial variety excelling other varieties in the combination of desirable characters, having quality fruits of good length, flavour, attractive skin colour, resistance to bruising, grade, yield, symmetry and strength of bunch. It is a voracious feeder with free suckering habit. Its bunch habit is markedly cylindrical, the bunch hanging down almost ideally. Even in the three-fourth mature stage it has a tough skin and so the bunches can be handled and transported naked across oceans, without bruising, in huge quantities of bunches in a ship load. Above all, this variety has proved to be the best suited variety for refrigerated transport lasting from 15—21 days to the United States of America, Canada, England and to countries on the Continent of Europe. It can be said that the banana industry has attained its highest development in Jamaica due mostly to the excellence of this one variety.

**Cultivation in Jamaica:** Banana is grown as a perennial crop in extensive plantations on the lower slopes and valleys of hill ranges in the island. Some of the plantations are a few square miles in extent. Though the Gros Michel banana was first introduced in Jamaica in 1830 from Martinique, its extensive cultivation commenced only in 1899 after the formation of the United Fruit Company. This company not only owned extensive production areas in Jamaica but also provided refrigerated transport for this fruit.

The details of starting new plantations are as follows. Large areas most of them virgin lands, are cleared and roadways made. Next the main blocks and main drains are demarcated. At planting sites, stakes are marked at a distance of eleven feet both ways for the Gros Michel variety. The pits for planting are nearly round holes about 18 inches in depth and 18 inches diameter. Corms with one good peg sucker just sprouting are used for planting. When the corms are big-sized they are cut from two to four bits for planting, depending upon the size of the corm. Generally corms up to 5 inches diameter are planted without cutting to bits. Those with a diameter of 5 to 7 inches are cut into two bits and those above 7.5 inches are cut into four bits. Each bit used for planting will have one good bud or sprout. The remaining buds are removed before planting. To kill the larvae and eggs of the banana

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The details of the banana industry presented in this paper were gathered by the author in the course of his tour to the West Indies in 1950.

weevil (*Cosmopolites sordidus*), the corms are sometimes soaked in lime water for two days before planting. Prior to planting a fertiliser mixture compost and  $\frac{1}{2}$  lb. sodium nitrate or ammonium sulphate is applied mixed with the soil. The sprout or peg sucker is planted at an incline inside the pit and covered with earth, with just the top alone exposed.

After-cultivation consists in forking the area four times a year, when the pseudostems are cleaned, dry leaves cut and all the refuse incorporated into the soil. There are natural irrigation facilities in certain plantations in the valleys. The rainfall distribution is also favourable for the growth of bananas. In certain plantations mulching with grass growing wild is practiced with success. Judicious desuckering is also attended to at the time of forking. Only one sucker is allowed as a follower for each parent clump. The position of the follower is also regulated at the time of desuckering. This is with a view to maintain the spacing between clumps, by not allowing the suckers of two adjacent clumps to approach each other.

All the plantations have adequate spraying equipment, the pipe lines for spraying running about 2-7 miles depending on the extent of the plantation and spraying with Bordeaux mixture 4:4:40 against 'Leaf Spot' (*Cercospora* sp.) disease is systematically done once in three weeks over the entire area. Main pipe lines conveying the spraying chemicals traverse the entire length of the plantation. A length of hose of about 5000-7000 feet in length is also used for spraying. The interval given between two spraying operations is only three weeks, the purpose being to keep the first 3-4 tender leaves always free from infection. Spraying with Bordeaux mixture effectively controls conidial infection on the heart leaves.

**Soil conservation measures:** Due to the slopy nature of many of the plantations, soil conservation methods are adopted by the leading growers. Contour trenches are dug and the earth excavated is used to erect a small bund on the upper portion of the trench and this bund is turfed. These trenches lead to a natural main drain which is also turfed on the sides. Every 2-3 years the trenches are deepened and the earth thrown down. The differences in height between the lower and higher terraces demarcated by the contour drains becomes more and more marked in course of time with the result that each terrace is reduced to a gentle slope gradually. The owners believe in mulching the banana area. The grass growth in the adjoining steep areas are cut and used as thick mulch. The response to this treatment was striking. Each bunch in the mulched area was nearly double the grade (number of hands) of those from the areas not mulched. There was no surface wash and no weeds in the mulched plots. A better and richer surface soil with very vigorous growing plants was the result.

In all the soil conservation methods adopted, the water is designed to be taken off from the fields slowly by laying terraces and contour drains so as to allow more time for the finer soil particles to settle in the field. But when the water reaches the main drain it is cleared quickly, as otherwise the flowing water will act for a long time on the sides and bottom thereby cause more erosion. Except in the Lower Pulneys and portions of Waynad, and the Nilgiris, soil conservation problems do not call for attention by the banana growers of our State. But wherever possible mulching with dry banana leaves or other easily available organic matter can be adopted with profit. In slopy areas formation of contour drains and bunds at suitable distances with a view to cultivation on terraces of gentle slopes should be the objective.

**Manurial practices :** The manurial practices in Jamaica are based on the results of manurial trials conducted by the United Fruit Company in five representative tracts of the island. In all these five places, increased yields were got by the application of nitrogen at the rate of one pound per stool per year, applied in small quantities at frequent intervals varying from four to six times a year. This is because nitrogenous fertilisers like ammonium sulphate act only for a short period. The best results were got when a continuous supply of available nitrates are maintained in the soil throughout the life of the plant. Another important inference was that the number of hands in the bunch is determined early during the life of the banana plant and after this stage any amount of application of manure will not add to the grade or number of hands. Even the first application of manures becomes important on this ground. Finger length and initial stimulus for the follower sucker are affected by the later application of manure. Sulphate of ammonia continues to be the main nitrogenous fertiliser in use. The manures are broadcast on the surface in the form of a circle round the plant, the diameter of this circle increasing up to a maximum of four feet as the plants grow. Occasionally, when the plants are growing on too slopy soils, the fertiliser is put inside shallow holes bored in the soil with a pointed iron bar.

The soils in Jamaica are sufficiently rich in available potash and phosphates and on such soils the manurial dose adopted is three ounces of sulphate of ammonia or its equivalent once in six weeks throughout the life of the plant.

**Implements used in Jamaica :** Of the implements used by the workers, the banana knife with a long, pointed and bent blade ( $1\frac{1}{2}$  feet is the blade length) is used for desuckering, cutting bunches and mattocking. The second implement in use is the mattock with a six-inch axe on one side and an eight-inch hoe on the opposite side. This is used to clear old corms, separate good sprouts, for planting, hoeing and earthing up plants,

cutting old corms to pieces with the axe and spreading round and also for digging pits and covering. Mattocking is systematically attended to. The pseudostem after harvest is cut and removed in three stages so as to allow the follower to attain uninterrupted growth with the parental reserve food. The last bit of the pseudostem is removed only after three months from the date of harvest. The old corm and bits are cut to pieces and spread round the clump with the mattock. The digging fork is used for forking the entire area. In certain plantations, the interspace is worked by a petrol-driven, disc cultivator 'Formall Cub' manufactured by Mc-Cormick Deering, International Harvesting Company of Chicago.

**Harvest and disposal of Bunches:** The harvest of the bunches of Gros Michel is continuous throughout the year. This is due to the progressive fruiting of the differently aged suckers in the perennial clumps. There is a peak production period during January to March.

In every big estate the Jamaica Government Railway has laid out extensions from the main line with special banana coaches to load and carry the banana bunches according to the schedule to the ports. Loading orders in advance of the arrival of ship from United States, of America, England or the Continent are received by cable and published in the dailies for the information of growers. Based on the holding capacity of the vessels each district headquarters is given cutting orders through the special staff to farms regarding the quota and dates of cutting and loading. Cutting of the fruits in a section is invariably done once a week. As soon as the bunches are cut they are carried to the banana coaches by labourers known as 'Headers'. These banana coaches after loading are immediately collected to form a fruit train and taken to the nearest port. Travelling Inspectors inspect the bunches between cutting and loading. The time taken from the commencement of cutting of the bunch to completion of loading in the ship is not more than 36 hours. The timing of the arrival of the ship in the port and the arrival of the train load of bananas is done with great care and system. The loading in the holds of the ship is done after dipping each bunch in an alkali wash tank containing sodium bisulphate solution to remove the copper sulphate spray from the bunches and then in another ordinary water tank to remove the acid. Streams of coolies work continuously to load the bunches heaped like small hillocks at the docks. The total number of bunches loaded in the ship are indicated by checking machines placed in convenient positions in the dock. The number of small metal discs in the possession of each cooly gives the total number of bunches loaded by him. All damaged bunches and over-ripe or below-grade bunches are rejected. Generally a shipload will be about 1,00,000 bunches. In some ships there are conveyer chains which take the bunches to the holds. Bunches are arranged standing end to end, each bunch resting on its butt end. After arranging one to three tiers like this one more tier of bunches is laid flat

**Satisfaction :** The purpose of a recommendation is to satisfy the need of the ryot. A satisfied ryot is the best propagandist we can have. He sets in motion, "by word of mouth", spontaneous publicity. All the energy and time spent in designing a poster should be directed only on well-tried ideas or methods.

**Sincerity and simplicity :** These are the twin features that properly handled will enhance the value of all posters. Statements expressed must adhere to sincerity and not exaggeration. Sincerity gives life and carries a certain amount of conviction with the message. Simplicity means clear or precise in idea and easily understood posters. To attain this, the truth or idea should be clearly expressed so that it gives no room for any kind of misunderstanding of the idea. There should be only one fundamental idea expressed in a single poster. Even if there are more than one illustration in a poster, they must conform to the theme without destroying unity.

**Caption or Headline :** Much of the success of a poster depends on this. The "pulling power" as it is called, lies in the right caption. It should be simple, arresting and true. A few simple words, to convey the sense without detriment to coherence and unity in the regional language, is all that is necessary. The caption must be capable of suggesting to the viewer that there is something he requires. A gloomy side should never be expressed in the picture. The caption should also be effective in suggesting that there is a quick way for adoption of the idea. A caption must be brief and to the point, but not so brief as to be obscure or ambiguous in meaning. A caption should not be casual but must have force and interest. The caption "Manure for Crops" is just casual, but when it is changed to "Swell your Yields" it is catchy with an element of interest.

**Appearance of the Poster :** It is well known that the sense of sight is the most important road to human consciousness and understanding. Pictures are essential in transmitting ideas. With the use of a few words an idea can be made clear by pictures, but it is necessary to see that the colour, composition, balance, contrast, proportion, and rhythm are not sacrificed in any manner.

Colour of a great influence on human behaviour, and hence careful selection of colours is essential. It should be known that red has the maximum attention value. Blue is generally liked by all. Yellow makes an object look larger, while green has the least value. But colour must be rendered as far as possible with fidelity to represent natural objects.

**Composition :** A few points on composition will be helpful to the designer. Avoid repetition of shapes in arranging masses. Groups or masses should be arranged in pleasing relative positions. Variety in its many forms plays a big part towards good

pictorialism. Only sufficient forms must be included to give the right atmosphere, support and balance. There must be harmony in shapes with tone values. One of the most interesting forms of pictorial construction is the diagonal scheme. It lends itself to innumerable variations and has the advantage of being attractive even in its simplest forms. Variety of direction in pictures is also necessary. Other ways of arranging or grouping forms are in radian lines, horizontal lines, pyramidal form, triangles, double curves, "S" curves etc., and a knowledge of these will make the designing of the poster easy and make it appealing.

## Preliminary Report on the Survey of the Additional Production achieved by the G. M. F. Schemes in Madras State

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**Introduction:** Based on a realisation of the necessity for an achievement audit of the actual additional production of food crops secured through the G.M.F. schemes in the country, a survey on the pattern of a standardised technique of random sampling evolved by the I.C.A.R. and approved by the ad-hoc Committee of experts at its second meeting at Indore was undertaken in the whole State of Madras at the commencement of the fasli (Agricultural) year 1950—51. The scheme was confined to only three of the principal measures under the G. M. F. Schemes viz. effects of superior strains of paddy seed, green manure on paddy and ammonium sulphate among the fertilisers on paddy; as these were estimated to contribute about 80 per cent of the increased production targeted under all the intensive cultivation schemes. A study of the effect of new irrigation and cumulative effects of two or more of the G. M. F. aids, though contemplated originally, was not taken up as it was considered that they would complicate the scope of the survey. This is the first year of these surveys in Madras. They may therefore be considered only as exploratory for this State.