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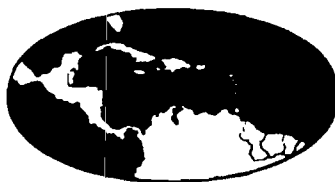
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A REVIEW OF SOLO PAPAYA PRODUCTION IN NEVIS

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INTRODUCTION

Interest in the Solo papaya originated out of an agricultural program on the St. Croix Radio, which included advice on the production of papaya for the New York and Boston markets and recommended the Solo variety. Upon this, our Department of Agriculture corresponded with Dr. Bond in St. Croix who referred us to Dr. Krochmal from whom we did succeed in procuring all information concerning the variety, plus a supply of pure seeds. A one half acre plot of solo papaya was established in May 1963 on each of two Government estates.

In Nevis, the soil type is a heavy clay. The rainfall status is low, averaging 37 inches per annum, reaching as high as 51 inches in parts and as low as 15.5 inches; and not unlike many tropical small land masses, 75 per cent of the total annual precipitation is confined to about four months of the year July to October.

That the papaya is not extremely exigent in its water and nutrient requirements, has been demonstrated in the very fair growth and continuous yields of the local varieties. Resulting from this observation, the department envisaged the development of an expert trade in papaya, whose production had always been in far excess of local demand. Two handicaps were, however, the enormous and varied sizes of the fruits, and a lack of firmness of the flesh; hence the colossal interest in, and the ready introduction of the Solo variety of papaya which is of superior shipping quality and excellent flavor.

The two plots established from seeds sent us by Dr. Krochmal, suddenly went down with an unidentified disease, a full report on which was sent, accompanied by slides to the Caribbean Organization's Secretary General as follows:

REPORT ON SOLO PAPAYA AT PROSPECT

Papaya of the variety Solo imported from St. Croix as seeds, was planted at Prospect Agricultural Station on a half-acre on May 30th, 1963.

Thirty-two plants were planted 10 feet apart in two rows separated by vegetable seedlings on a plot of land which previously grew a legume, and therefore enjoyed a high nutrient status. In this light, fertilizer application was never effected throughout the entire life of the plants.

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The trees were off to an uniform and promising start, a performance which for long continued. Flowering which began in December was profuse and turned out to be a positive indication of this very heavy bearing which began in January 1964, reaching its peak in March.

The first signs of a diseased condition were observed near the end of April and a gradual but progressive senescence set in:

Phase 1. Yellowing of lower leaves (and progressively upwards) then dying, followed by abscission. The scar, however, was soft and seemed to be a definite site of entry for the pathogen into the main stem of the plant.

Phase 2. There was an apical dying back, resembling a typical bud-rot.

Phase 3. The fruit, which nevertheless remained attached in great density, showed signs of rotting in the older fruit and shrivelling in the young fruit, two weeks after the apparent onset of the diseased condition.

The rainfall figures for the period at this station are as follows:

<u>1963</u>		<u>1964</u>	
April	2.19	January	6.30
May	3.24	February	0.51
June	2.77	March	3.47
July	8.52	April	3.86
August	3.71		
September	6.39		
October	2.03		
November	7.73		
December	1.55		

Drought and a general debilitated condition, coupled with the heavy bearing (a probable drain on the plants resistance) probably made it susceptible to an organism normally present and nonpathogenic

This infection was not specific to the Solo variety of papaya, as a local variety only 10 feet away showed the exact symptoms.

Since the attack was late in the life of the plant, as evidenced by the larger infection zones nearer the top, the heavy bearing could be a very significant factor.

Report on Cades Bay Solo Papaya Caps

The Cades Bay Solo Papaya population shows incipient signs of the disease which completely destroyed the stand at Prospect Agricultural Station earlier in 1964. The predisposing factors have been almost identical, except for the higher rainfall experienced at Cades Bay, and the present rainy season. The trees were planted mid July 1963, showing the first disease symptoms very early in August of this year the time of declining bearing. Only three plants, however, cut of a total stand of 130 have completely gone down with the disease but many exhibit Anthracnose on the fruit and incipient apical senescence evidenced by the great profusion of lateral shoots. An examination of the root systems of three plants uprooted and subsequently burnt, showed clear signs of rootrot and nematode attack.

It was proposed to implement regular spraying with a copper fungicide; and secondly to effect a potash manurial trial since the onset of the disease seems to coincide with, or shortly follow the time of peak bearing. Moreover Cades Bay, like Prospect, is potash deficient.

The disease of the leaves and stem was later identified by Dr. Bird, Pathologist, Agricultural Experiment Station, University of Puerto Rico as Corynospora cassicola, and that of the fruit as Colletotrichum. For the control of these fungal disorders, regular spraying with standard fungicides was strongly suggested with special emphasis placed on the dithiocarbamates, Maneb & Zineb.

A one-acre plot of solo papaya was established to investigate the degree of control of the fungus, the applications to commence on first appearance of the disease as evidenced by oily or water soaked spots on the stem. Spraying was done once weekly early in the morning using Bordeaux mixture and Perenox alternately for the first eight weeks, and subsequently a Maneb/Zineb complex sold as Dithane M.45. The investigation was started in August of last year, and up to date, even with regular spraying, as much as 80 per cent of the stand have completely gone down with Corynospora, and of this quantity, 90 per cent eradicated just prior to, or in the early stages of bearing.

The unsprayed plots in the same block were, as expected all sooner wiped out, but in contrast, many unsprayed plots of Solo papaya in the higher rainfall regions have shown little mortality, and unto now, the time of bearing, the survival rate is over 80 per cent much higher than the sprayed investigational plots; and one very important observation was that: in the higher rainfall areas, many plants, unsprayed, quickly and easily outgrew and overcame incipient infection by Corynospora; an observation also recorded in some plants on the sprayed plots. This evidence, coupled with the fact that 90 per cent of the loss occurred during the prolonged dry spell, as the attached rainfall figures show, would suggest that, commencing spraying operations on the appearance of oily spots, meant that the infection was tackled after the disease had already

gained entry; moreover the fungicidal sprays which were merely protective, only affected subsequently landing spores. The plants, therefore had to depend on the vigour of growth to overcome that infection already entered. A study of the low rainfall figures may therefore suggest, the reason for the rapid spread of the infection despite an intensive spraying programme.

An investigation into the degree of disease control or protection of the plants from Corynospora, when spraying commences at the time of transplanting the papaya seedlings. On observation, the rate of death was higher just prior to or during bearing, and this suggested hypo-potash nutrition of the plants; moreover, the soils of Nevis are definitely potash deficient. It was on this basis that a fertilizer trial with young Solo papaya plants was laid down with an aim to investigate the degree of resistance to the fungus, and the effect on subsequent bearing. This fertilizer trial was conducted on a two acre plot at Prospect Agricultural Station in November of last year, employing two levels: 10-30-10 and 10-30-20 at 2 to 6 months, giving each plant 1/4 lb. of fertilizer mixture; and at 6 to 12 months a 40-90-25 and 40-90-50 mixture, giving each plant 3/4 lb.

First signs of the disease appeared early in the control plots, and immediately, spraying commenced using Dithane M. 45, but the disease symptoms were not apparent in both fertilized plots until four and five months after establishment, whence a full once weekly spraying program was embarked upon. The disease remained controlled only until very dry conditions set in, when about 20 per cent of the fertilized stand was lost. The reason for this being probably the unavailability of the fertilizer during drought.

In contrast to the site of previous investigation involving the use of fungicides alone, Prospect Station has much lower rainfall status, yet the percentage loss is much less; and least in the plot receiving the higher level of potash.

The effects of the fertilizer applications on yields are not yet measurable, as the plants are just in the early stages of bearing.