ually by amount of foliage produced, revealed that de-blossomed plants not only produced more prolifically but that those plants produced were larger. The only exception was in 1968 when the 'Dabreak' failed to produce larger plants when de-blossomed.

Daughter plants produced in the winter nursery are transplanted to the summer nursery. A review of the literature failed to clarify the effect of plant size on daughter plant production. Therefore, the use of larger transplants in the summer nursery may not be beneficial. But increased production of daughter plants is most desirable, and in these trials the average yields of the de-blossomed plants were from 114 to 300 per cent of the control plants. To obtain yields similar to de-blossomed plants, acreage for the control plants would need to be increased in a proportional manner. The cost of the additional fumigant ($150/A), plants ($50/A), fungicides, and additional land along with the burden of weed control for the increased acreage would usually be greater than the cost of blossom removal. The removal of blossoms on a weekly basis requires less than one man-hour per week per acre. De-blossoming is required for about ten weeks. With labor priced at two dollars per hour the cost of blossom removal would be approximately twenty dollars per acre. This is the value of the fumigant and plants needed for one-tenth of an acre of nursery.

The results of these trials confirm the information obtained elsewhere (4, 6) in indicating that de-blossoming is a profitable practice which promotes increased production of daughter plants in Florida's winter strawberry nurseries.

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AN UNUSUALLY SEVERE OUTBREAK OF SWEET AND FIELD CORN RUST IN COLLIER COUNTY

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ABSTRACT

An unusually severe outbreak of rust (*Puccinia sorghi* Schw.) of sweet corn (*Zea mays* var. *rugosa* L.) and field corn (*Zea mays* L.) was observed for the first time in two locations of Collier County. The disease was first discovered in the Sunniland area of Florida 112 field corn on April 9, 1969. Rust pustules were widespread on older leaves but not conspicuous on the younger leaves. On April 15 the rust disease was discovered spotting 75% of the mature foliage of a 50 acre block of Iobelle sweet corn 24 miles west of Sunniland. Although the disease did not affect the sweet corn ears, it did spread to an adjacent 50 acre field of younger sweet corn within five days. It is suspected that the rust spores were spread by the strong eastern winds, as a 400 acre field of sweet corn 15 miles southwest in the Royal Palm Hammock area escaped the disease. In the Sunniland area a single aerial spray application of Dithane M-45 80 W (manganous ethylene bisdithiocarbamate) at the rate of 2 lbs. per acre was sufficient to control the disease in mature plants of Florida 112 field corn, while unsprayed end rows were defoliated.

INTRODUCTION

Sweet corn was a minor crop in Florida prior to 1946 when it was estimated that less than one hundred acres were grown annually. The growth

of the sweet corn industry has greatly increased in organic soils of the counties surrounding Lake Okeechobee called the "Glades." It is estimated that a total acreage of 54,900 acres matured during 1968-1969, producing nearly 1,000,000 crates with a total value of $2,430,000.00 (1).

In the "Glades" control of diseases and pests is one of the principal problems of sweet corn production. It is necessary to spray as often as 12-15 times to prevent serious losses to northern (*Helminthosporium turcicum* Pass.) and southern (*Helminthosporium maydis* Nis. and Miy.) leaf blights. A third disease, rust (*Puccinia sorghi* Schw.), is often found in combination with both blights, but it seldom causes any concern, since it is also controlled by the fungicides used to control both leaf blights (4).

In Collier County sweet corn production is small and generally does not excede five hundred acres. The pest and disease control spray schedules followed are similar to those of the "Glades" areas (4).

Field corn is not normally planted in Collier County, but recently two to three hundred acres have been planted at irregular intervals for cattle feeding.

Northern and southern blights and rust have been observed in Collier County. Rust, as in Glades County, has been considered a minor disease and has never caused much damage until recently.

The purpose of this paper is to report for the first time a sudden and severe outbreak of rust on both field and sweet corn grown twenty-five miles apart in two areas of Collier County.

The Disease

Corn rust occurs on the leaves as small reddish-brown pustules that break through the epidemis. When examined closely, or rubbed, these pustules are found to contain a brown powdery material composed of masses of summer spores (uredospores) of the fungus. Toward the end of the growing season the pustules become dark brown or black, as the uredospores are replaced by the winter spores (teliospores) (2).

In the U. S. the uredospores may overwinter in the Corn Belt areas and infect corn directly the following season. The teliospores overwinter in the corn leaves and germinate in the spring forming transparent spores (basidiospores) which may affect an entirely different plant, the sorrel (*Oxalis* spp.). On this plant, spores of another kind (aeciospores) are produced which, in turn, may infect the corn leaves, where uredospores and teliospores are produced (2).

In Florida, and in the rest of the U. S., rust is of such minor economic importance that little effort has been directed toward breeding resistance to it. However, there are wide ranges of resistance to this disease among the varieties of sweet and field corn grown in Florida (3). The casual organism of rust on corn is *Puccinia sorghi* Schw. (2).

Disease Outbreak

On April 9, 1969 rust pustules began to appear in the older leaves of scattered Florida 112 field corn plants in a four hundred acre planting of the API Ranch in Collier County (Fig. 1).

The rust pustules increased so rapidly in number within three days that the infected leaves abscised the fourth day. Although the disease appeared in the eastern part of the four hundred acres, it quickly spread to the entire field. A younger planting of field corn (Florida 200) at first did not appear to be attacked, but as the season progressed, the older leaves began to show abundant rust pustules. The disease was identified by the authors as corn rust caused by the fungus *P. sorphi* Schw.

On April 15, rust pustules were first observed on the older leaves of a one hundred acre field of nearly mature Iobelle sweet corn plants of the Harvey Brothers planting in Section 1, Range 25 East, Township 48 South, of Collier County.

The rust disease rapidly spread within the one hundred acre block, but was more prevalent in the eastern part of the field with decreasing incidence in the middle and western parts. Within three days the disease increased in severity, practically defoliating the sweet corn plants in the eastern and middle sections of the field and greatly reducing the yield of the entire field.

A second, younger block of one hundred acres planted to the west of the first block and separated from it by a thirty foot ditch plus two twelve foot access roads was not attacked at first. As the disease incidence increased in the eastern one hundred acre block the number of rust pustules rapidly increased in the eastern part of the western one hundred acre block, with some of the plants bordering the road losing many older leaves.

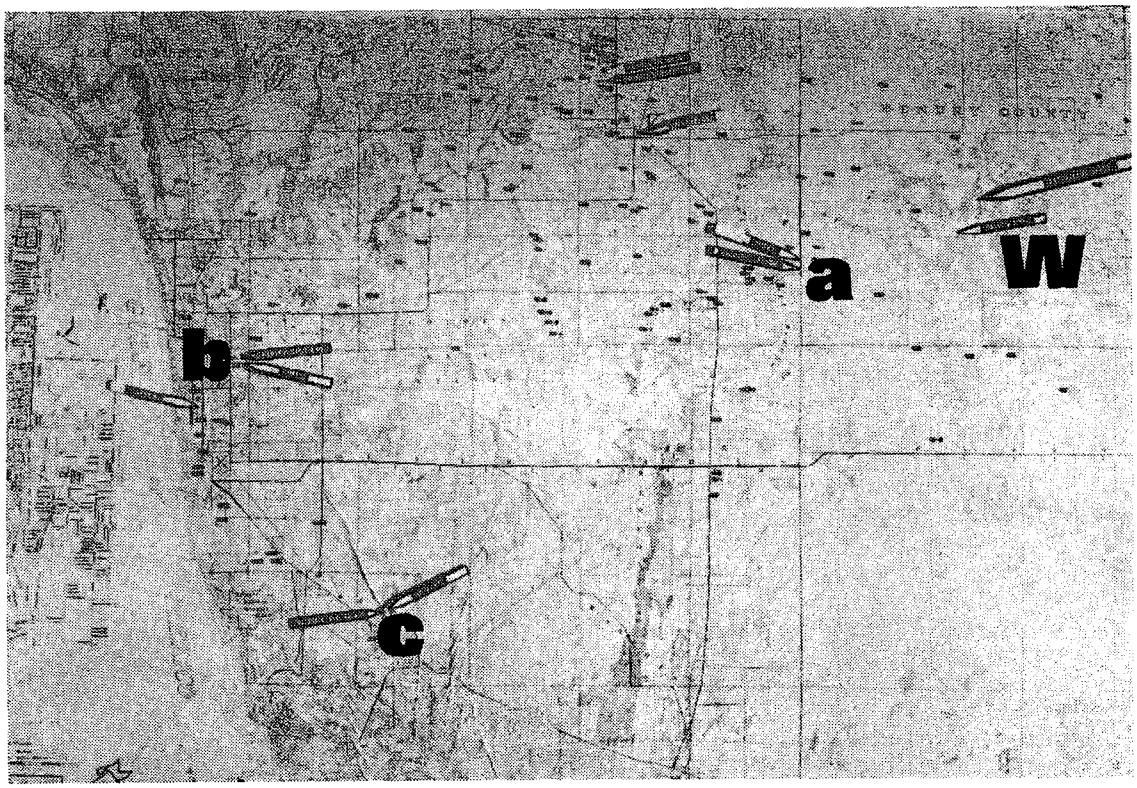

Figure 1.—Map of Collier County showing prevailing wind direction (W) during April 7-10, 1969, and the location of the API Ranch field corn (A), Harvey Brothers sweet corn (B), and the A. Duda & Sons sweet corn fields (C).

This second severe outbreak of rust was also determined to be caused by the fungus *P. sorghi* Schw., the same fungus that severely defoliated the field corn planting located twenty-four miles east on Section 13, Range East, Township 48 South.

A third planting of corn (Florida Gold 106A sweet corn) at the A. Duda & Sons fields located on Section 4, Range 27 East, Township 51 South, fifteen miles southwest of the Harvey Brothers planting and thirty miles on a southeasterly direction from the API Ranch, was not attacked by the rust disease and remained clean throughout the growing season (Fig. 1).

Disease Control

The rust disease of field corn at the API Ranch was controlled with a single aerial application of Dithane M-45 fungicide at the rate of 2 lbs. to the acre, while unsprayed rows were defoliated.

Rust disease control was attempted at the Harvey Brothers sweet corn field with aerial applications of 5% zineb dust at the rate of 35 lbs. to the acre. After two dust applications it was decided to change to Dithane M-45 aerial sprays at the rate of 2 lbs. per acre. The zineb dust did not appear to be effective in the control of the rust disease of corn. A total of four aerial applications of Dithane M-45 was sufficient to completely control rust of sweet corn.

Discussion

The rust disease of corn is usually an unimportant disease in areas where fungicides are sprayed at short intervals for the control of the northern and southern leaf blights. In Collier County, corn rust occurs nearly every year, but has never before been recorded in epiphytotic proportions.

From the 7th to the 17th of April when the disease became epiphytotic the prevalent winds were from the east and did not change direction until the latter part of the month (Fig. 1).

It is suggested that the prevailing westerly winds during April may be responsible for the severe outbreak of rust in the two locations of Collier County. The outbreak may have been due to the large build up of aeciospores on species of Oxalis in areas directly east of the API Ranch, and their subsequent westerly dissemination by the prevailing winds during April 7 through 10. This would explain both the epiphytotic outbreak at the Harvey Brothers' fields located twenty-four miles west and the absence of the disease at A. Duda & Sons' fields located thirty *miles southwest* of the API Ranch.

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AN EPIDEMIOLOGICAL COMPARISON OF DOWNY MILDEW AND GUMMY STEM BLIGHT DISEASES ON WATERMELON

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ABSTRACT

Airborne spores of the pathogens of gummy stem blight (*Mycosphaerella citrullina*) and downy mildew (*Pseudoperonospora cubensis*) were collected in spore traps in increasing numbers with increasing disease incidence. Ascospores of *M. citrullina* were released predominantly at night while sporangia of *P. cubensis* were released predominantly during the day. Spores of *M. citrullina* were more numerous than those of *P. cubensis*. Spores of *M. citrullina* were collected before first disease symptoms appeared, whereas those of *P. cubensis* were trapped only after disease was established in the field. Maximum development of gummy stem blight was associated with frequent rains whereas downy mildew was not. Downy mildew was controlled satisfactorily with fungicides during periods favoring rapid disease development, whereas gummy stem blight was not. Disease forecasting and sanitation could be useful in control of gummy stem blight but would be of limited value in control of downy mildew.

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INTRODUCTION

Downy mildew, caused by *Pseudoperonospora cubensis* (B. and C.) Rostow., and gummy stem blight, caused by *Mycosphaerella citrullina* (C. O. Smith) Gross., have been the most prevalent fungus leaf spot diseases on Florida watermelons (*Citrullus lanatus* (Thunb.) Mansf., in recent years. Since a knowledge of epidemiology is essential to development of an effective disease control program, this study was initiated to ascertain fundamental epidemiological information for these two diseases. The purpose of this report is to summarize several years observations regarding the epidemiological differences and similarities between the two diseases and relate this information to their control.

METHODS

Numbers of airborne spores of the pathogens were estimated using a spore trap (6) (Fig. 1) located in the center of an unsprayed area of 'Charleston Gray' watermelons. Disease extensiveness was estimated at three- to four-day intervals using the Horsfall rating system (2) to estimate the percent of visible leaves with disease symptoms (percent disease). Weather data recorded in the vicinity of the spore trap included rainfall (standard U. S. Weather Bureau rain gauge), temperature and relative humidity (recording hygrothermograph in a