RESEARCH NOTE

FIELD BEHAVIOR OF CERTAIN SWEETPOTATOES TO MOSAIC IN PUERTO RICO

Sweetpotatoes grow very well in Puerto Rico, but most of the production comes from small patches. Recently, interest has developed in growing this crop on a broader scale commercially.

At present the sweetpotatoes produced in Puerto Rico are used almost entirely for local consumption. With improvement in the production and marketing of the crop Puerto Rico could profitably produce an increased quantity of sweetpotatoes for local consumption and for processing. During certain times of the year it would be feasible to ship fresh sweetpotatoes to outside markets, and substantial outlets also could be developed for the canned products if supplies were adequate.

Although mosaic of sweetpotatoes has been known to be present in Puerto Rico for a number of years, it has not constituted a problem until recently[1]. The disease is known to occur in different places throughout the Island where sweetpotatoes are grown and is capable of affecting our best commercial varieties. In the field the disease appears as a distinct mosaic mottling of the younger leaves. As the infected plant grows, the leaves become chlorotic and wrinkled. Sometimes they develop puckering in the form of raised green areas alternating with light-green areas. Affected plants are usually stunted. Frequently, however, the above-mentioned symptoms assume a milder manifestation and close scrutiny is necessary to detect infected plants in the field. The virus causing this sweetpotato mosaic is not transmissible by mechanical means. The only means of transmission is by grafting. So far no insect vector of the virus has been found. Virus or viruslike diseases of the sweetpotato have been reported in the United States and Africa[2, 3]. According to Adsuar[1] the sweetpotato mosaic present in Puerto Rico resembles the feathery mottle mosaic described originally by Doolittle and Harter[2].

The simplest method of transmitting the virus to sweetpotato has been by insertion of plugs from mosaic-diseased roots into roots of healthy plants. The healthy sweetpotato root is first cut in halves and one portion planted as a control. A core of diseased root tissue is then removed from the fleshy

[1] Adsuar, J., A mosaic disease of sweetpotato, *Ipomoea Batatas*, in Puerto Rico, *J. Agr. Univ. P. R.* **39** (1) 49–50, 1955.

[2] Doolittle, S. P. and Harter, L. L., A graft-transmissible virus of sweetpotato, *Phytopath.* **35** (9) 695–704, 1945.

[3] Sheffield, F. M. L., Virus diseases of sweetpotato in East Africa, I, Identification of the viruses and their insect vectors, *Phytopath.* **47** 582–90, 1957.

root of mosaic plant with a cork-borer and inserted in a hole made in the remaining half of the healthy root with a borer one size smaller. In many cases actual union occurred between the mosaic root plug and the surrounding healthy tissue, but even when the plug eventually decayed, the shoots from the inoculated roots always developed typical mosaic symptoms. All control roots produced only healthy shoots.

The following sweetpotato varieties, considered among the best grown in the Island, were obtained from the Agronomy Department at this Station and found susceptible when inoculated by root grafting in the laboratory: Rico, Cobre, Canela, Blanquita, UPR 3, and Rubia. Infected roots of the highly susceptible variety Comba were used as donors of the virus.

As nothing is known about field transmission of the virus causing sweetpotato mosaic under our conditions, and as all local observations tend to demonstrate that the disease seems to spread very sparingly among the commercial varieties planted in the Island, it was considered of interest to test the susceptibility of the above-mentioned varieties, as well as the incidence of the disease under field conditions when nearby sources of infection are provided.

Field-plot experiments were started in March 1958 at the Station farm, in a field selected because previous observations had shown that sweetpotatoes grown there had acquired the virus. One of the objectives was to find whether planting alternate rows of the healthy and virus-infected sweetpotato plants would result in disease incidence in the healthy plants. In these experiments mosaic-free cuttings of the above-mentioned sweetpotato varieties were planted in small plots 6 feet by 12 feet, with plots of infected Comba intercalated between them. The borders surrounding the field were also planted with the infected variety. Observation on the presence and spread of mosaic in the healthy plots were made monthly up to harvesttime. Account was also taken as to presence of insects during the course of the experiments.

These experiments covered winter, early spring, and fall plantings and were terminated during the latter part of April 1959. No virus symptoms could be found on any of the plots planted with the mosaic-free varieties, although the presence of aphids, and especially leafhoppers and whiteflies, was noticed during the course of the field inspections.

Since our virus is not readily transmissible except by tissue union or prolonged contact of diseased and healthy tissue[1], it is not likely to be widely disseminated by means other than an insect vector. So far such vectors are unknown.

However, in a recent paper Hildebrand[4] has demonstrated that a white-

[4] Hildebrand, E. M., A whitefly, *Trialeourodes abutilonea*, an insect vector of sweetpotato feathery mottle in Maryland, *Plt. Dis. Rpt.* **43** (7) 712-4, 1959.

fly, *Trialeurodes abutilonea* (Hald.), is the vector of feathery mottle in Maryland. He also found this fly breeds on a weed *Abutilon theophrastis* (Medic.) near the field, and that it migrates to sweetpotatoes only after the host begins to seed and shed leaves. He attributed the variability and difficulties of transmission of the feathery mottle virus by the whitefly to the intricacies of the insect life cycle, plus the variable character of the plant response to the inoculation with the virus.

Since, as has been already stated, the virus present in sweetpotatoes in Puerto Rico seems to be closely related to, if not identical with feathery mottle virus, the apparent field resistance of the varieties under study may well be due to an insect-vector relationship similar to that cited by Hildebrand, involving the whiteflies observed in the Island.

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