

Nonsurvival of Sugarcane Rust at Meridian, Mississippi

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ABSTRACT

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Sugarcane (*Saccharum* spp.) rust, first found at Meridian, MS, after Hurricane Frederick in 1979, was not observed in 1980 and 1981. Systematic inspections of plots of a known susceptible sugarcane clone planted as a test host, several thousand sugarcane lines, and clones of *Saccharum spontaneum*, *Arundo donax*, and *Arundinaria gigantia* were negative. Inoculations of sugarcane plants representing a wide range of germ plasms, with spores of a rust on bamboo (*Bambusa vulgaris* and *Phyllostachys bambusoides*) that was morphologically similar to the spores of the rust on sugarcane also were uniformly negative. These completely negative results strongly indicate that sugarcane rust may not survive in the Meridian area because of the long period (November to April) during which there is no actively growing leaf tissue above the ground.

Sugarcane (trispecific hybrids of *Saccharum officinarum* L., *S. spontaneum* L., and *S. robustum* Jeswiet), and introduced clones of *S. spontaneum*)

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rust incited by *Puccinia melanocephala* Syd. from natural infections was found on sugarcane seedlings at Meridian, MS, in 1979 (6) shortly after Hurricane Frederick passed through the area. Because sugarcane rust had recently been reported in Louisiana (3) and Florida (2) and in several Caribbean areas (4,5), all sugarcane fields at the U.S. Sugarcane Field Station in Meridian and in adjacent areas were monitored for sugarcane rust throughout the 1979, 1980, and 1981 growing seasons.

When sugarcane rust first appeared in Louisiana and Florida (2,3), it was hoped that, because Meridian is near the northern limit of the area where

sugarcane can be grown, the rust disease, if and when it appeared in the area, might not be severely damaging to the crop because of the short growing season and the relatively low temperature during the winter in Meridian. The average date of the first killing frost at Meridian is 6 November, while the last killing frost in the spring is 22 March. Because there is little or no green foliage on sugarcane from November until the end of April (approximately 5 mo) there is apparently no available susceptible host tissue on which the sugarcane rust fungus can overwinter.

Puccinia melanocephala, States II & III, had been reported on common bamboo (*Bambusa vulgaris* Schrad.) from Mississippi (1), but had not been reported on sugarcane in the Western Hemisphere. A rust similar to *P. melanocephala* was widespread on common bamboo and giant bamboo (*Phyllostachys bambusoides* Sieb. & Zucc.) growing on the Meridian station. *Bambusa vulgaris* was growing less than 100 m from the initial 1979 rust site (6). The rust on sugarcane and bamboo could not be separated morphologically.

MATERIALS AND METHODS

Stalks of a known susceptible sugarcane

seedling that showed heavy infection by rust in 1979 were stripped of leaves and placed in a 1.25% solution of sodium hypochlorite for 2 min, allowed to dry, and planted in the greenhouse in December 1979. The plants from these stalks were rustfree. Stalks from these greenhouse-grown, disease-free plants were planted in the field at Meridian in May and November 1980 and in May 1981 in areas approximately 100 m from the initial infection site. The plants from these stalks were examined periodically for rust infection. All sugarcane plants on the station were inspected systematically several times during each growing season for rust. Related plants, possible hosts of sugarcane rust, ie, *Arundo donax* L. and *Arundinaria gigantia* (Walt.) Chapm. that were growing within several miles of the station were also examined systematically for rust infections.

In addition, sugarcane plants with a wide range of germ plasm heterogeneity were inoculated several times in 1980 and 1981 with urediniospores and teliospores from pustules on bamboo by dusting these spores onto young sugarcane plants while they were wet with dew.

RESULTS AND DISCUSSION

No rust infections were observed on sugarcane at Meridian in 1980 and 1981. Repeated inoculations with urediniospores and teliospores from the rust on bamboo gave negative results.

These completely negative results strongly indicate that sugarcane rust does not survive in the Meridian area. This may be due to the long period (November to April) during which there is no sugarcane actively growing above the ground to serve as a host. It is speculated that the rust spores for the epidemic in

1979 were brought into the Meridian area from areas where the rust survives by Hurricane Frederick (12 September 1979) because rust was not seen in the 1979 inspections of the field where it was later found (6).

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