

# Sugarcane Rust in Hawaii

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## ABSTRACT

Comstock, J. C., Tew, T. L., and Ferreira, S. A. 1982. Sugarcane rust in Hawaii. *Plant Disease* 66:1193-1194.

Rust caused by *Puccinia melanocephala* was discovered on sugarcane (*Saccharum* spp.) on the Hawaiian island of Kauai on 17 February 1982 and subsequently was found on Oahu, Maui, and Hawaii. Because none of the major commercial sugarcane clones are susceptible to this rust, no significant yield losses are expected.

Rust caused by *Puccinia melanocephala* H. & P. Syd. (= *P. erianthi* Padw. et A. Khan) was discovered on sugarcane (*Saccharum* spp.) in Hawaii for the first time on 17 February 1982 on the island of Kauai in yield trials on experimental clone H71-5849. The disease was present on all five plantations on Kauai and was subsequently observed on the two plantations on the island of Oahu and on one plantation on Maui. On 27 July 1982, the disease was observed on Hawaii, the other sugarcane-growing island in the state. Failure to detect rust on any of the islands during routine inspections of yield trials in 1981 strongly suggests that the original rust infection in the state occurred no earlier than late 1981.

Since 1978, several widespread outbreaks of sugarcane rust have been reported (1,3-12). The first confirmed report of rust in the Western Hemisphere

was from the Dominican Republic by Presley et al in 1978 (11). Soon rust was found in most sugar-producing countries of the Caribbean and Central America, largely on the commercially grown clone B4362 (9). The first report of rust in the United States also occurred in 1978 in Florida (3). By 1979, the disease was known in Mississippi (12) and Texas (Ben Villalon, *personal communication*) and also in 1981 in Louisiana (8).

In the Eastern Hemisphere, sugarcane rust outbreaks were reported from South Africa in 1975 (1) and Australia in 1978 (5). Because widespread outbreaks occurred in both hemispheres at about the same time, they probably were caused by long-distance wind dissemination of rust urediniospores. This hypothesis also might explain the outbreak of rust in Hawaii, which is at least 2,500 miles (4,000 km) from the nearest sugarcane-producing region where the disease exists. The pathogen also could have been introduced on personnel or aircraft.

The two fungi, *Puccinia kuehni* (Krug.) Butl. and *P. melanocephala*, cause sugarcane rust (2). The rust outbreaks in the Western Hemisphere (4,8), Australia (4), and S. Africa (1,4) are caused by *P. melanocephala*. The organism in Hawaii also was identified as *P. melanocephala*. This identification was confirmed by Dr. J. F. Hennen of Purdue University and a specimen was

placed in The Arthur Herbarium (accession number PUR-F19804). The other sugarcane rust pathogen, *P. kuehni*, is not present in Hawaii.

In Hawaii, 13 commercial clones occupy more than 98% of the acreage. The two major clones, H62-4671 and H59-3775, occupying 55% of Hawaii's total acreage, are resistant and moderately resistant to *P. melanocephala*, respectively; other commercial clones resistant to this species are H61-1721, H65-7052, H69-8235, and H70-0144. Commercial clone H68-1158 (1% of the acreage) is intermediate in reaction and clones H54-0775 (2%) and H58-8255 (2%) are moderately susceptible to *P. melanocephala*. The reactions of commercial clones H56-0278, H56-4848, H57-5174, and H61-0467 to this rust in Hawaii are not known; however, the three latter clones were rated as resistant in Florida (T. L. Tew, *unpublished*). Observations of the potential commercial clones in yield tests where rust was discovered indicate that fewer than 15% are rust-susceptible. No yield losses are expected in Hawaii because there are no major plantings of rust-susceptible clones.

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Published with the approval of the Director as Paper No. 523 in the Journal Series of the Experiment Station, Hawaiian Sugar Planters' Association.

Accepted for publication 2 August 1982.

The publication costs of this article were defrayed in part by page charge payment. This article must therefore be hereby marked "advertisement" in accordance with 18 U.S.C. § 1734 solely to indicate this fact.

0191-2917/82/12119302/\$03.00/0  
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