

YELLOW SPOT DISEASE OF SUGARCANE

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Yellow spot is a foliar disease of sugarcane caused by Mycovellosiella koepkei (Kruger) Deighton (formerly Cercospora koepkei Kruger) (3,4). The disease is

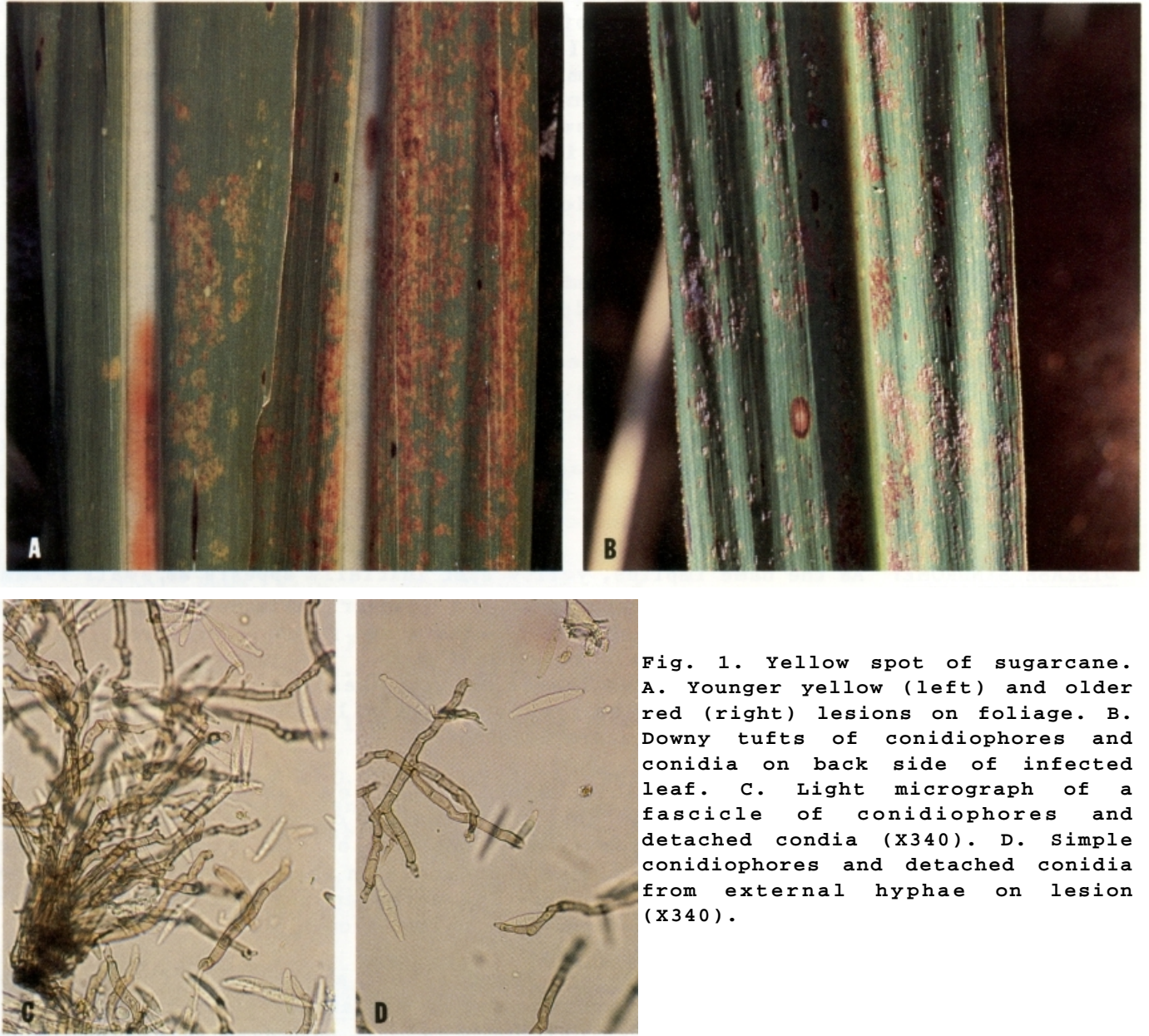


Fig. 1. Yellow spot of sugarcane. A. Younger yellow (left) and older red (right) lesions on foliage. B. Downy tufts of conidiophores and conidia on back side of infected leaf. C. Light micrograph of a fascicle of conidiophores and detached conidia (X340). D. Simple conidiophores and detached conidia from external hyphae on lesion (X340).

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widespread in south and east Asia, central and south Pacific islands, and also occurs in Australia and Africa (3). Pre-1980 records from India, Central and South America, and the West Indies-Caribbean have been considered doubtful due to suspected confusion with Cercospora longipes Butler, which causes brown spot of sugarcane (11,16). Confirmed records of yellow spot were reported from Guyana (2,18) in 1980, from Trinidad (1) and Barbados (17) in 1981, and from Jamaica (8) in 1983. Yellow spot was recorded for the first time on the North American continent in October, 1985, near Canal Point, FL (10).

Yellow spot disease is capable of inflicting considerable losses on susceptible cultivars of sugarcane under conditions of high relative humidity and heavy rainfall (9,12). The pathogen is apparently able to cause disease under a wide range of temperatures (9). Losses can vary from season to season due to weather fluctuations. Under disease-conducive conditions, yellow spot can appear very suddenly over a matter of a few days. Field losses on susceptible varieties range from 7-25%, due mostly to reduced sucrose in infected stalks, but also due to reduced tonnage (7,9,12,15). Early flowering and early harvested varieties of susceptible cane experience greatest sucrose reduction, while late-maturing susceptible varieties suffer greatest tonnage losses (12).

In Florida, yellow spot has been observed on six sugarcane varieties. Of these six, the most susceptible variety is apparently CL 72-895 on which the disease was first observed. CL 72-895 is not a commercial variety at the present time but two others, CL59-1052 and CL68-575, are both released commercial varieties occupying 7.7% and 0.7% respectively of the total 1985-86 acreage of approximately 381,000 A. The other three varieties are unreleased varieties and occupy only about 30 A total (10). Although the appearance of yellow spot in the U.S. likely portends a phasing out of some of these and perhaps other as yet unidentified susceptible sugarcane varieties in Florida, genetic resistance to yellow spot is common in breeding lines, and resistant varieties with good commercial qualities are available (9).

DISEASE SYNDROME: As the name implies, yellow spot initially appears as small 1-2mm diameter yellow lesions on leaves, mostly on the younger foliage. As the lesions enlarge under favorable weather conditions, the spots can reach 1-2cm across and are generally irregular and elongated along the leaf axis. Red pigmentation develops around and in lesions as the infected leaves mature. Lesions are evident on both sides of the leaf and can coalesce to occupy essentially the entire leaf. Only leaves and perhaps upper leaf sheaths are infected.

Fungal sporulation is readily visible to the unaided eye as a gray fuzz, most prominent on the lower leaf surface. This fuzz consists of masses of conidiophores both in fascicles emerging mainly from stomata but also arising singly from hyphae on the leaf surface. Conidia are produced abundantly on these conidiophores, and are distributed by wind and water splash. The pathogen perennates on infected debris and on infected host plants escaped from cultivation.

HOST RANGE: Mycovellosiella koepkei is found almost exclusively on Saccharum officinarum Linn. The pathogen has been reported on Miscanthus sinensis Anderss. in Japan and M. japonicus Anderss. in New Caledonia (4). M. sinensis is escaped from cultivation in Florida and should be considered a possible host for survey and detection purposes, and perhaps for disease control considerations.

CONTROL: Fungicides such as benomyl, basic copper sulfate, copper oxychloride, and sulfur dust can be used to control yellow spot (9,14) but application and coverage are difficult on this crop, and the use of fungicides may be impractical and uneconomical. Resistant varieties provide the basis for control, but breakdown of host resistance has been noted in Australia and Mauritius, implying that the emergence of different races of the pathogen may complicate the selection and breeding process for disease resistance (5,6,7,13,15).

SURVEY AND DETECTION: Yellow spot disease of sugarcane appears as small yellow leaf lesions which enlarge and redden with age. A gray fuzzy down of conidiophores and conidia can often be observed on the underside of the leaf. Initial Florida records were from east and south of Lake Okeechobee from Canal Point to Lake Harbor, Florida (10).

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