Factsheet

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Black sigatoka *Mycosphaerella fijiensis*

Exotic threat to Western Australia

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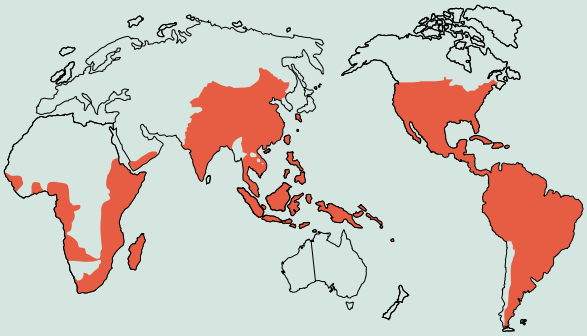
PHOTO: N. CATLIN / HOLT STUDIOS

BLACK SIGATOKA DISEASE ON A BANANA LEAF. EACH SPOT HAS A WELL-DEFINED, DARK-BROWN OR BLACK BORDER AND SURROUNDING TISSUE IS OFTEN YELLOW. STREAKS FREQUENTLY OVERLAP TO FORM COMPOUND STREAKS

Distribution

Black sigatoka, also known as black leaf streak, is a disease of banana caused by the fungus *Mycosphaerella fijiensis.* It was first recorded in 1964 in Fiji, appeared in Honduras in 1972 and subsequently spread throughout Central America and Mexico and south to Colombia and Ecuador. It was then observed for the first time in the Caribbean and Cuba. It has also spread throughout east and West Africa, Taiwan, China, parts of south-east Asia and as isolated outbreaks in north-eastern Australia.

Black sigatoka has not yet established in any mainland commercial production areas of Australia, although outbreaks have occurred on Cape York at Bamaga (1981, 1984, 1999), Pascoe River (1991, 1998), the Bloomfield River area (1993), Weipa (1995) and Daintree (1997). The diseased plants have been eradicated on each occasion, and the disease is yet to spread outside of Cape York. Western Australia is currently free from the disease.



DISTRIBUTION

Potential impact

Black sigatoka causes destruction of banana leaf tissue, which affects the photosynthetic capabilities of the plant and can reduce yields by up to 50%. Black sigatoka is one of the main factors responsible for the decline in banana export industries in South Pacific nations. Commercial plantations producing bananas for export have to maintain a costly fungicide spray program to control Black sigatoka, and have been criticized on the grounds of environmental and human health considerations. However, if not controlled, fruit produced on diseased plants can ripen prematurely during shipment and cause further losses. Economic losses can be expected to be similar to those reported for Yellow sigatoka. For example, in Mexico, Yellow sigatoka caused production to fall from 525,000 tonnes in 1937, the year after Yellow sigatoka was first recorded, to 240,000 tonnes in 1941. Exports from the state of Tabasco ceased entirely. In Ecuador, out of 62 million bunches produced in 1954, only 19 million were fit for export because of uncontrolled Yellow sigatoka on small farms. The ravages of the disease were controlled by chemical sprays in subsequent years (15-17 fungicide applications) but this considerably increased the cost of production.

PHOTO: QUEENSLAND DPI

BLACK SIGATOKA EARLY LEAF SYMPTOMS

Plants affected

Definite symptoms of Black sigatoka have only been recorded on *Musa* (Bananas), *Musa paradisiaca* (Plantains), *Musa acuminata* (Wild banana) and *Musa acuminata* (subsp. *bantesii* and subsp. *zebrina*). Cultivars differ in their reaction to the pathogen. Immunity is not known and it is possible that other wild species and subspecies of *Musa* are infected, but the disease does not develop significantly. *Mycosphaerella fijiensis* may also attack the seedling stage of wild bananas

Season of occurrence

Black sigatoka spores form readily during tropical and sub-tropical summers or under conditions of high humidity and rainfall, especially if there is a film of free water on the leaves. The principle means of spread is through rainwash or splash of spores but later in the development of the disease spores are also forcibly discharged into air currents. Infection occurs on the youngest leaves of the plant during and immediately after unfurling. Older leaves are not readily infected. Obvious visual symptoms appear about 15-20 days after initial infection.

Symptoms

The first symptoms of Black sigatoka are small, chlorotic flecks that appear on the under surface of the third and fourth fully expanded leaves. The flecks develop into narrow rusty brown streaks (up to 2mm wide and 20mm long) and often have truncated ends and sides that are sharply limited by the leaf veins. During early stages, streaks are only visible from the lower surface. The colour of streaks intensifies to red, brown or black, sometimes with a purple tinge. The streaks enlarge, becoming fusiform and elliptical, and darken to give the characteristic black streaking of the leaves. Adjacent tissues are often water-soaked, especially under humid conditions. Central tissues of the lesions eventually collapse. Lesions dry to a light gray with dark brown or black borders and often have narrow, yellow transition zones between the borders and the green leaf tissue. Streaks on juvenile leaves are often oval and surrounded by a yellow margin. Fruit losses occur due to a lack of functional leaf surface area.