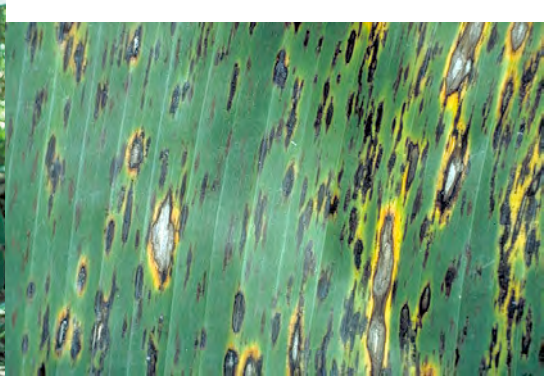
Extension Fact Sheet 2: Black Sigatoka



Common name: Black Sigatoka or Black leaf streak

Scientific name: *Mycosphaerella fijiensis*

Hosts: The fungus infects bananas and plantains, *Musa* species.

Damage

Red-brown streaks appear on the underneath of the third or forth youngest leaf. These form long spots with grey or light brown centres and dark brown or black margins (photo, right). The spots join together, often with yellow areas between. The infected areas often form bands several centimetres wide on either side of the midrib. In severe infections, spots do not occur, but large areas of the leaf turn black and die. Generally, the streaks are more common at the tips and edges of the leaves (photo, left).

The effect of the disease is a loss of leaves: leaves die early. Instead of lasting 200 days they last only 50. This reduces yield by 35-50%, depending on severity of the infection and on the variety. Cavendish varieties are particularly susceptible and these are grown for sale worldwide. About 30% of the production costs in commercial plantations are spent on fungicides to control the disease.

The weight of the bunch and the ripening of the fruit are affected by the number of leaves on the plant: if too few at flowering then bunch weight is low. If less than five leaves at harvest, the fruits do not ripen properly: they may ripen early.

Biology and Life Cycle

Spores are produced in the dead, grey areas on the upper leaf surface. The fungus has two type: ascospores and conidia (see diagram[1]). The ascospores are the most important. They are released from the upper leaf surface when there is rain or high humidity. They travel by air currents or rain splash, and land on the underside of the

[1] The diagram of the life cycle is from APSnet Education Center. Back Sigatoka of bananas and plantains. The permission of The American Phytopathological Society to use this diagram is gratefully acknowledged. http://www.apsnet.org/education/LessonsPlantPath/BlackSigatoka/default.htm

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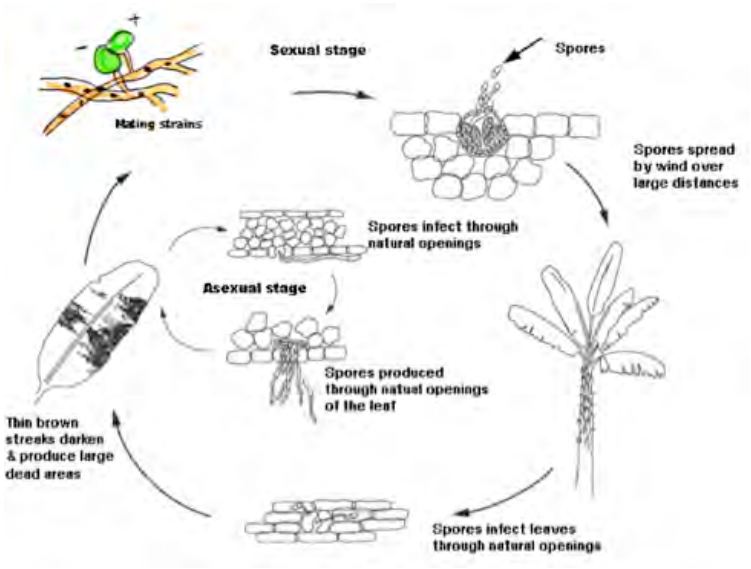
emerging leaves. The spores germinate and the germ tubes enter through natural openings in the leaf. The fungus grows within the leaf, killing plant cells, before returning to the surface to produce more spores. Different strains of the fungus (plus and minus) come together to form the sexual stage (see diagram).

Signs and Symptoms

On leaves, a rapid development of red-brown and yellow streaks, drying from the margins back to the mid-rib, and early death of leaves, are typical of this disease.



Management

Cultural control:
Carry out the following recommended to allow more air into the plantation to dry the leaf surface, to prevent infection, or to reduce the number of spores:

- Cut off leaves (if more than 50% infected), or cut out parts of leaves;
- Plant at wide spacings;
- Weed regularly;
- Cut out suckers, leaving 3-4 plants of different sizes per plant;
- Remove and burn old infected leaves;
- Use a mulch to improve plant health.

Resistant varieties:
Many plantains in Solomon Islands are either resistant or partly resistant to Black Sigatoka. However, if farmers want to grow varieties with Cavendish qualities for household use or the market, then they should ask MAL. The Honduran Foundation of Agricultural Research has bred varieties, e.g., FHIA-1; FHIA-2, FHIA-3. These are dessert or dessert/cooking bananas with resistance to Black Sigatoka.

Chemical control:
Fungicides are only recommended for commercial plantations, these are:

A) Protectant fungicides:

- dithiocarbamates (e.g., mancozeb);
- Banana misting oil.

B) Systemic fungicides

- triazoles (e.g, propiconazole and flusilazole);
- strobilurins (e.g., azoxystrobin).

It is important to rotate the fungicides in the different groups to prevent the build up of resistant strains of the fungus. In drier times, mancozeb can be used alone.

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