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FACT SHEET



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COFFEE LEAF RUST

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IS COFFEE LEAF RUST A SERIOUS DISEASE?

Coffee Leaf Rust is regarded as the most devastating and widespread disease of coffee throughout the world. In fact, it was the devastation of the coffee industry in Ceylon, now Sri Lanka, by Coffee Leaf Rust in the 1870s which inspired disease research on coffee. However, Coffee Berry Disease, which apparently only occurs on the African continent and which affects young coffee berries, is currently regarded as a more serious disease.

SYMPTOMS

The disease is identified by orange to yellow powdery spores on the underside of leaves. These spores are held together in circular spots which appear yellow on the top side of the leaves. Before spores are produced, all that is seen are the yellow spots. Older spots with spores eventually cause death of the affected leaf tissue which appears brown and dry.



a) Symptoms of Coffee Leaf Rust on the top of coffee leaves



b) Symptoms of Coffee Leaf Rust on the underside of coffee leaves

EFFECTS OF COFFEE LEAF RUST

- The rust fungus (*Hemileia vastatrix*) kills the section of the leaves on which it grows.
- The disease reduces the ability of the trees to manufacture carbohydrates.
- This subsequently leads to fewer berries at harvest.
- The disease can cause severe leaf fall or defoliation which is ultimately followed by poor vegetative growth and reduced yields.

IDEAL CONDITIONS FOR DISEASE DEVELOPMENT

- A susceptible host plant – *Coffea arabica* – is the species most susceptible to this disease. Ninety percent of the coffee trees grown in Jamaica are of this species.
- Host density or plant spacing – The closer the trees are planted, the faster the disease develops due to the longer time moisture remains on the leaves. Conversely, the further apart the trees are planted, the slower the disease develops, because moisture does not stay on the leaves long enough for fungal spores to germinate and the disease to develop.
- High – yielding trees are especially susceptible to rust and other diseases. This is because trees come under **stress**, or become weakened from heavy bearing. Most of the carbohydrates produced by the trees are used up to produce berries, leaving very little energy to ward off diseases.
- Rainfall is perhaps the single most important environmental factor contributing to disease development. The development of coffee rust in any season can ultimately be related to the rainfall pattern of the area or region. Rainfall provides the moisture needed for fungal spore germination and disease spread. **In fact, if moisture is not present on coffee leaves, spores will not germinate and the disease will not develop.**
- Disease will develop and spread during the rainy season, but because it takes approximately 3-6 weeks for spores to germinate and infect the leaves, the **maximum amount of disease will be seen early in the dry season.**
- Temperatures between 15°C and 32°C are favourable for coffee rust development, 21°C to 25°C being the most favourable.
- Altitude is important to disease development insofar as it affects temperature. At altitudes above 1700 m, night temperatures frequently fall below 15°C, preventing spore germination.
- Excessive shade – Indications are that shade is no longer regarded as a factor which assists in disease development but, rather, contributes to maintaining a moist atmosphere which favours spore germination.
- Exposure to light causes increased productivity which in turn puts the trees under stress causing them to become more sensitive to the disease.

CONTROL

The control of coffee leaf rust must be carried out by a combination of agronomic, genetic and chemical interventions. The reliance on chemicals for the control of pests and diseases has become addictive. As a result of this farmers seem to be overlooking the importance of maintaining healthy coffee trees. It must be constantly reinforced, that a healthy tree, like a healthy body, is best able to fight off attacks from pests and diseases.

(A) Agronomy

Healthy trees are achieved through proper crop care which includes:

- the proper and timely application of fertilizers when required, to the roots of all trees
- pruning away of dead branches
- pruning away of gormandizers
- the removal from the coffee grove and burning of pruned branches and stripped and fallen berries
- the general cleaning and weeding (not bare weeding) of the field, when needed

(B) Resistant Varieties*

The most successful, resistant variety still remains the "Hibrido de Timor", a cross between *C. arabica* and *C. canephora*. This variety has been widely used in crosses with Caturra to produce "Catimor". This hybrid bears well but is not resistant to all the rust races. Other resistant varieties include robusta hybrids, e.g. arabusta, icatu as well as arabica hybrids. These too are resist-

ant to several strains of the fungus but not all. However, the cup quality of the above varieties is inferior to *C. arabica*.

(C) Chemical control

Chemical control of pests and diseases may be carried out after it has been determined that it is necessary. The common practice of applying a "cocktail" of insecticides and fungicides is an unnecessary waste of resources and is environmentally hazardous.

Chemicals recommended for the control of coffee leaf rust:

Copper fungicides, eg., **copper oxchloride and Kocide®** which are **protectant fungicides** are still the most **cost effective**. Their 'tonic' effect is well known, boosting plant growth and causing leaf retention. This is perhaps why severe leaf fall or defoliation, the devastating end result of the disease, is not common in Jamaica. It is also important to note that fungi have not built up resistance to copper.

Rate of application: Apply copper at 4-6 weeks intervals during the rainy season at a rate of 3-5 kg in 250-700 L/ha or 6.6 - 11.0 lb in 66.0 - 185 US gal water/2.5 acres. One application at the start of the rainy season is advised. If using Ultra Low Volume applicators (ULV), 1-3 kg in 20 L of an oil/water emulsion/ha.

* Check with the local authority for varietal recommendations

Bayleton® (triadimefon), a systemic fungicide, is highly recommended.

This fungicide has provided the best results in controlling rust to date. It is reported to have curative properties, i.e., the disease disappears. However, this fungicide is very costly.

Rate of application: A single application during the rainy season at 71 g - 567 g/ha or 0.16 lb - 1.25 lb/ 2.5 acres, with follow-up applications of a protectant fungicide at 4-6 weekly intervals.

NB: More than two applications of Bayleton® during a season may have adverse effects on yield.

Sicarol® (pyracarbolid) is also effective. It causes infected leaves to fall off prematurely, inhibiting disease development and spread. Once the leaves fall off immature fungal spores will not develop any further. However, mature spores will survive for a while until they dry out or are dispersed to other leaves on the tree.

Rate of application: Make the first application when disease symptoms first appear at a rate of 0.5 - 0.1% active ingredient. This chemical may be used

more frequently than Bayleton®.

NB: The above are recommendations from research conducted in other countries and not based on local field tests.

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