Being Proactive on Coffee Leaf Rust

John C. Cross
HCA Research Committee
Edmund C. Olson Trust II
Ka'u Coffee Mill

Coffee Leaf Rust

- Coffee Rust
- Rust
- Roya
- *Hemileia vastarix*
- “The most economically important coffee disease in the World”, (American Phytopathological Society)

Coffee Leaf Rust and Hawaii

- Coffee Leaf Rust does not exist in Hawaii, at least not yet. <u>We are the only coffee growing region without the disease</u>
- We need to be aware of this pest and be vigilant looking for its potential arrival in the State
- Knowledge and strict attention by all employees and orchard managers will be our best defense
- At the International Coffee Rust Summit sponsored by US-AID and Promecafe it was stated that "Complacency and Not Enough Warning" lead to the worst ever attack of the disease in Guatemala
- What have we learned from the CBB outbreak on the Big Island? CBB: "The most serious insect pest of coffee in the World", (Trujillo, et. al)

Background of Coffee Leaf Rust

- Coffee Leaf Rust existed in the native forest realms of Ethiopia
- In 1850 the Rust made it to Ceylon (Sri Lanka) and devastated the crop there, it was first identified, described and named at this time.
- By 1960, Rust had spread throughout Indonesia
- By 1970, Rust had crossed the oceans to South America
- By 1985, Rust had spread to the entire Central and South American coffee growing regions
- Recent changes in weather patterns and Global warming trends have elevated the damage to epic proportions in Central and South America.
- Question: Has Rust made it to other Pacific islands? We need to look into this.

The Biology of Hemileia vastarix:

- Coffee Leaf Rust is considered an “obligate parasite fungus” that is it MUST have coffee plants as a host in order to reproduce and infect other coffee plants. Other fungi diseases have an alternate host plant. Being an obligate parasite could be used to our advantage

- Spores need free water in order to germinate and infect the leaves. Periods of rain or heavy dew enhance infection.

- Germination and Infection of the leaf requires 24 to 48 hours of free moisture

- Temperatures can influence spore germination. Temperatures below 59^F or above 88^F appear to slow germination, (APS.net & SCAA)

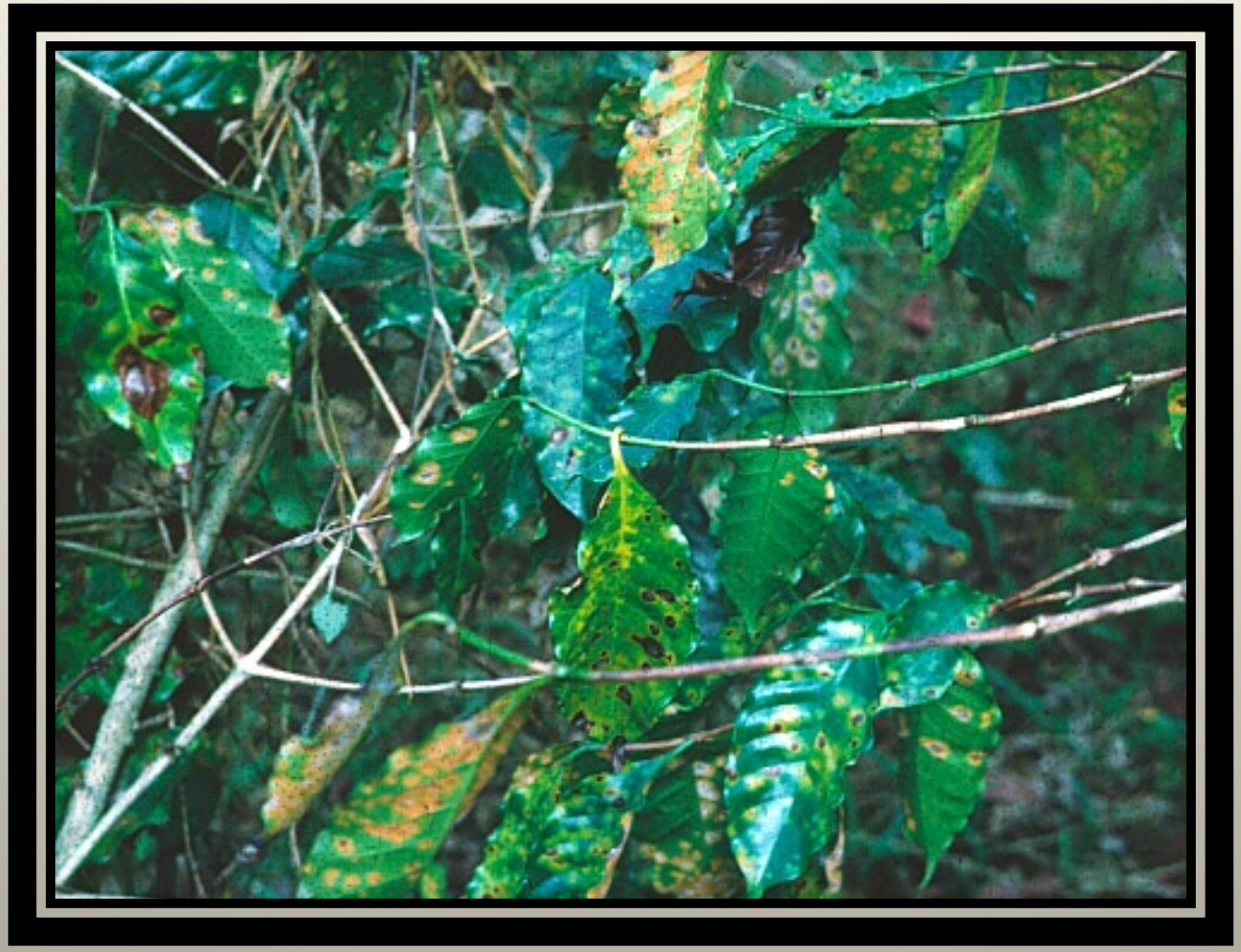
- It takes 10 – 14 days from spore germination to lesion development and new sporulation. A single lesion can produce four to six crops of spores releasing about 300,000 urediniospores over a period of 3 to 5 months. The potential for explosive epidemics in enormous, (APS.net)

Coffee Rust lesion, showing characteristic "Rust" colored urediniospores

Photo by: J.R. Baker

Lesions become necrotic

Photo by: H. F. Schwartz



Infected leaves drop prematurely

Photo by: H.D. Thurston

Severe infestation can kill trees

Photo by: H.D. Thurston

How has Hawaii been spared from this disease?

- The Pacific Ocean and our isolation from other infested regions keeps spores from blowing in the wind to our shores

- Quarantine Laws within the State assist in keeping imported plant material out and possible infested stock from entering

How could Hawaii get Coffee Leaf Rust?

- Human Traffic of spores would be the most likely to blame
  - Could be accidental like on the clothes of seasonal workers or picking gear transported to the State
  - Could be intentional..Economic-Agro Terrorism…We live in an increasingly crazy and unpredictable world

If Coffee Leaf Rust is found in Hawaii what should we do?

- Report the suspected outbreak immediately to CTAHR and DOA
- Quarantine all entry to the area
- Clean all equipment and personal apparel that entered the suspected area
- Upon consultation with researchers, apply control measures

A small outbreak can be controlled early, an ignored outbreak could jeopardize the entire industry

Possible Control Measures

- Spray approved fungicides on all trees in orchard
- Prune back all infested trees and all trees within a 30 yard radius, bury or spray the trees with diesel oil (APS.net)
- Only a few fungicides are available to spray
  - Copper Fungicides are cleared for foliar spray in Hawaii.
  - Brand names = Kocide, Nu-Cop, Nordox, Cupper Hydroxide. (www.ctahr.hawaii.edu, Hawaii Coffee Quarterly, Issue 6, 2005, by Scot Nelson).

The CBB – COFFEE RUST CONUNDRUM….

Fungicides control Fungus(i.e. Rust)

A Fungus named Beauvaria bassiana controls CBB

What we do now will keep us Prepared and able to control this disease

- LEARN, Know this disease and what to look for(COFFEE RUST POSTER)
- BE VIGILENT and AGGRESSIVE, Walk your fields and “talk to your plants”
- USE or CONVERT TO CULTURAL PRACTICES that make it easier to battle the pest.
  - Increase Row and Plant Spacing
  - Improve Air circulation
  - Control Weeds

Increase Row and Plant Spacing

Typical close spacing = greater than 500 trees per acre

Wider 15’ by 6’ spacing = less than 500 trees per acre

What we do now will keep us Prepared and able to control this disease

- Feral Coffee and Abandoned Coffee Orchards will again be a serious problem – just like they are a problem with CBB

- Perhaps the industry needs to make feral and abandoned coffee orchards an “Action Item”

What we do now will keep us Prepared and able to Control this disease

- Keep Nitrogen and Phosphorous levels at approved levels, EXCESSIVE POTASSIUM can increase susceptibility (APS.net)
- Keep approved fungicides at hand or available. "Just in Case". Spray intervals should be 21 days or less
- SUPPORT CTAHR, DOA and HARC
  - Register new chemicals (systemics)
  - Improve and enforce quarantine laws
  - Develop new resistant clones

RESEARCH SOURCES

- The American Phytopathological Society
- The Specialty Coffee Chronicle, SCAA
- International Coffee Rust Summit
- Trujillo, Ferriera, Schmitt & Mitchell, 1995 CTAHR
- H.C. “Skip” Bittenbender, CTAHR, Personal Communication
- Andrea Kawabata, CTAHR, Personal Communication
- Wall Street Journal, Leslie Josephs
- New York Times, Elisabeth Malion