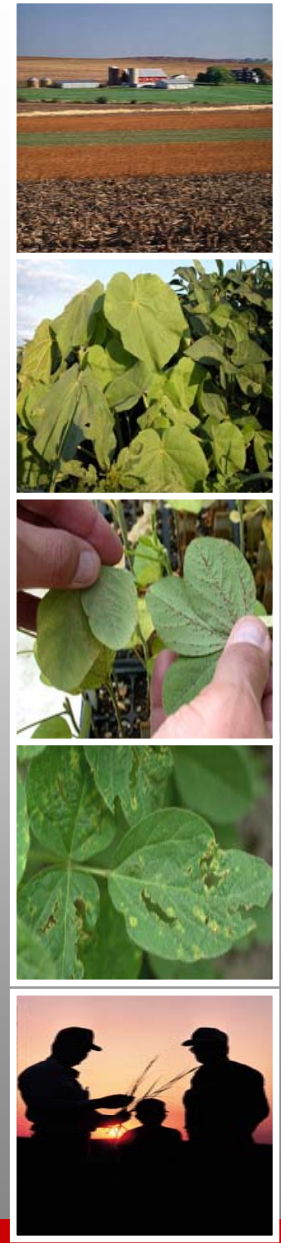
Asian Soybean Rust



What is Asian Soybean Rust?

- Disease caused by the fungal species *Phakopsora pachyrhizi.*
- Attacks the foliage of a soybean plant causing early leaf drop, which then inhibits pod setting and reduces yield.
- Amount of damage depends on how early in the growth of the soybean plant infection occurs.

Why is there such concern?

- Soybean rust was confirmed for the first time in the continental United States near Baton Rouge, Louisiana on November 10, 2004!
- Has been present in Asia and Australia for decades.

Reasons for Concern

- Soybean rust moved from Asia to Uganda in 1996; spread throughout Africa by 2002.
- Was found in South America in 2001. It quickly spread through soybean growing areas in Brazil, Paraguay, and Bolivia causing yield losses up to 80% or more.

Soybean Rust Characteristics

- Soybean rust spores are transported by air currents and can spread rapidly over wide distances.
- Spores need live, green tissue to germinate and reproduce.
- It has a broad host range and can infect many different species of legumes including: dry beans, green, lima and butter beans, vetch species, lupines, and medic.

Soybean Rust Characteristics

- Kudzu, a widespread weed in parts of the U.S., could serve as an overwintering host for the pathogen.

Environmental Effects

- Incidence and severity of disease affected by environment.
- For spore germination and infection to occur need: prolonged leaf wetness, temperatures between 59° and 86° F, and humidity of 75-80%.
- Under these conditions spores are produced within 10-21 days. An initial infection site can produce spores for as long as 15 weeks.
- A plant can go from the first sign of infection to severe defoliation in 1-2 weeks.

Symptoms

- Early symptoms first appear as a yellow mosaic discoloration and small spots/lesions on lower leaves.
- Spots increase in size and can change color from gray to tan or rust.

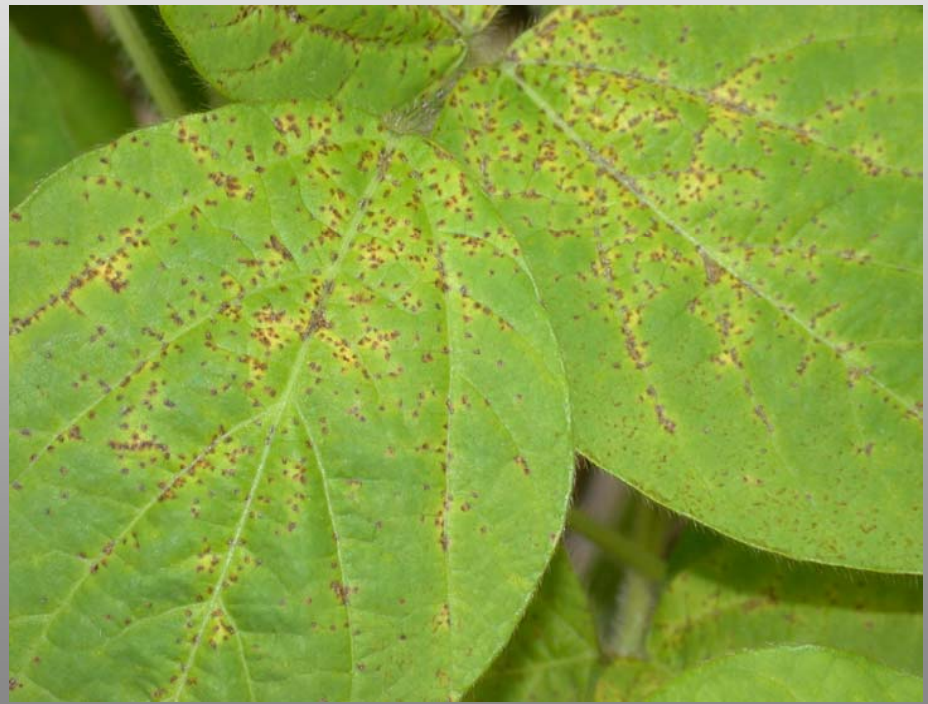
Symptoms

- Most spots occur on the underside of leaves but can also be seen on petioles, stems and pods.
- After pod set begins infection can spread to middle and upper leaves.
- Leaves turn yellow, then brown and fall from plant.

Identification

- **Symptoms viewed with the naked eye.**

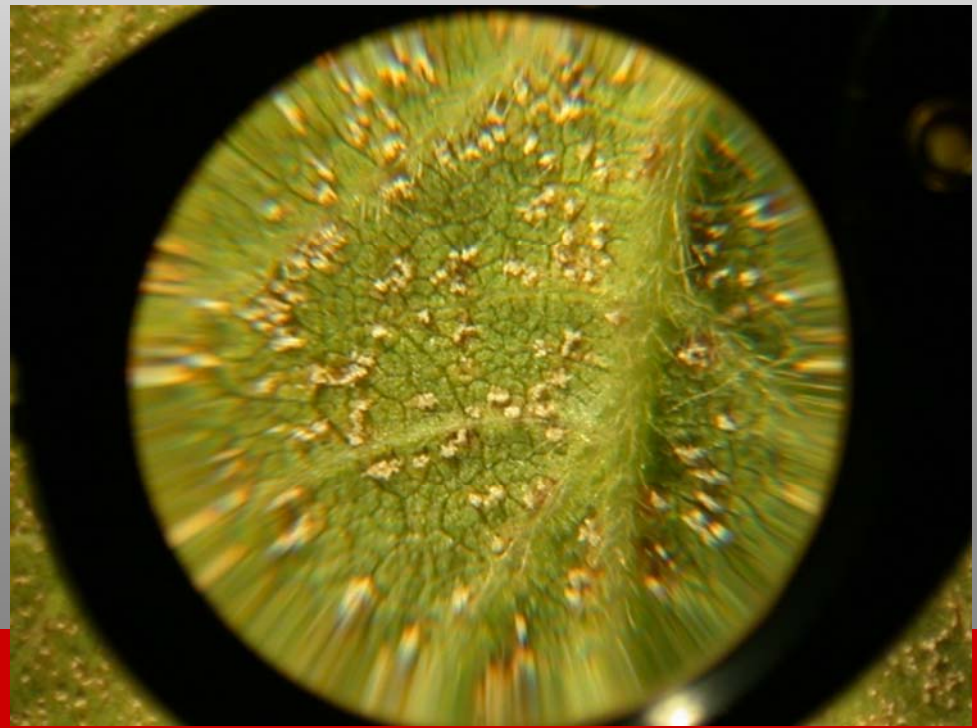
  Small reddish-brown, irregular-shaped spots, usually confined to, or clustered close to, leaf veins.



Identification

- **Symptoms viewed with a hand lens.**

  In early infections, emerging pustules look like miniature volcanoes topped with a pore. There is no yellow halo surrounding the pustule. Later, pustules “burst” releasing masses of rust-colored spores.



Identification

- Assessing environmental conditions can help identify soybean rust. Favorable conditions for infection and spread are: cool (68-75º F) temperatures, high humidity and frequent rains.
- Molecular analysis provides accurate identification and can be used to confirm the presence of Asian soybean rust.

Scouting Guide - Soybean Rust and Look-alike Diseases

Disease	Favorable Environmental Conditions	Where to scout for early detection	Typical Symptoms
Soybean Rust	Cool and Rainy	Lower Leaves	Pustules
Bacterial Pustule	Hot after rain	Upper Leaves	Pustules
Bacterial Blight	Cool and Rainy	Lower Leaves	Ragged Leaves
Cercospora Leaf Blight	Warm, wet	Upper Leaves	Brown, leathery
Brown Spot	Rainy	Lower	No Pustules

Management Recommendations

- There are no commercially available soybean varieties resistant to soybean rust.
- Early detection is very important for effective management.

Management Recommendations

- Fungicide applications may reduce yield loss depending on soybean stage, time disease is detected, and fungicide application method.
- Currently seven fungicide emergency exemption (Section 18) applications have been submitted to EPA for approval for soybean rust control in soybeans **if** the disease is detected in the continental United States.

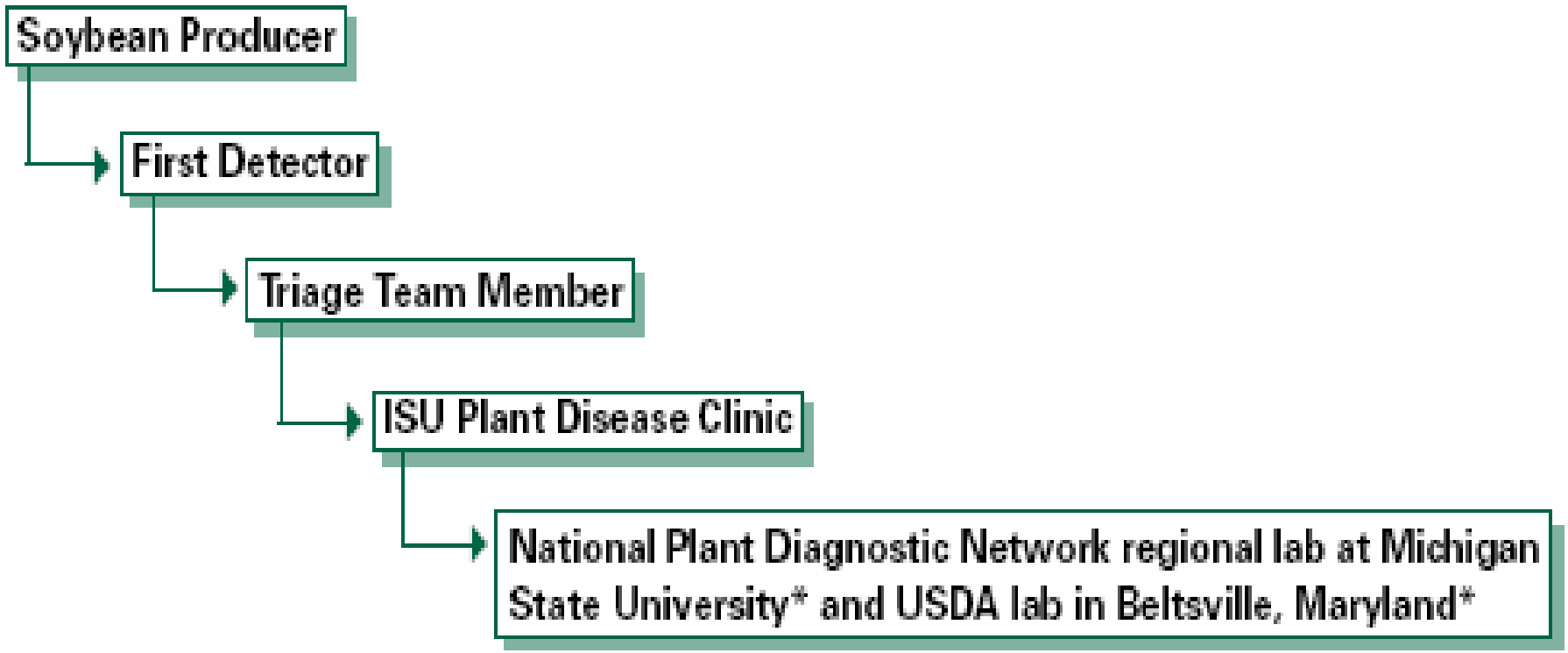
Soybean Rust Preparedness

- Iowa Soybean Rust Team formed in 2003 to help Iowa soybean producers identify, diagnose, and manage soybean rust.
- About 40 ISU Extension field staff members were trained to identify the early stages of soybean rust.
- More training will be offered this winter on how to identify soybean rust.

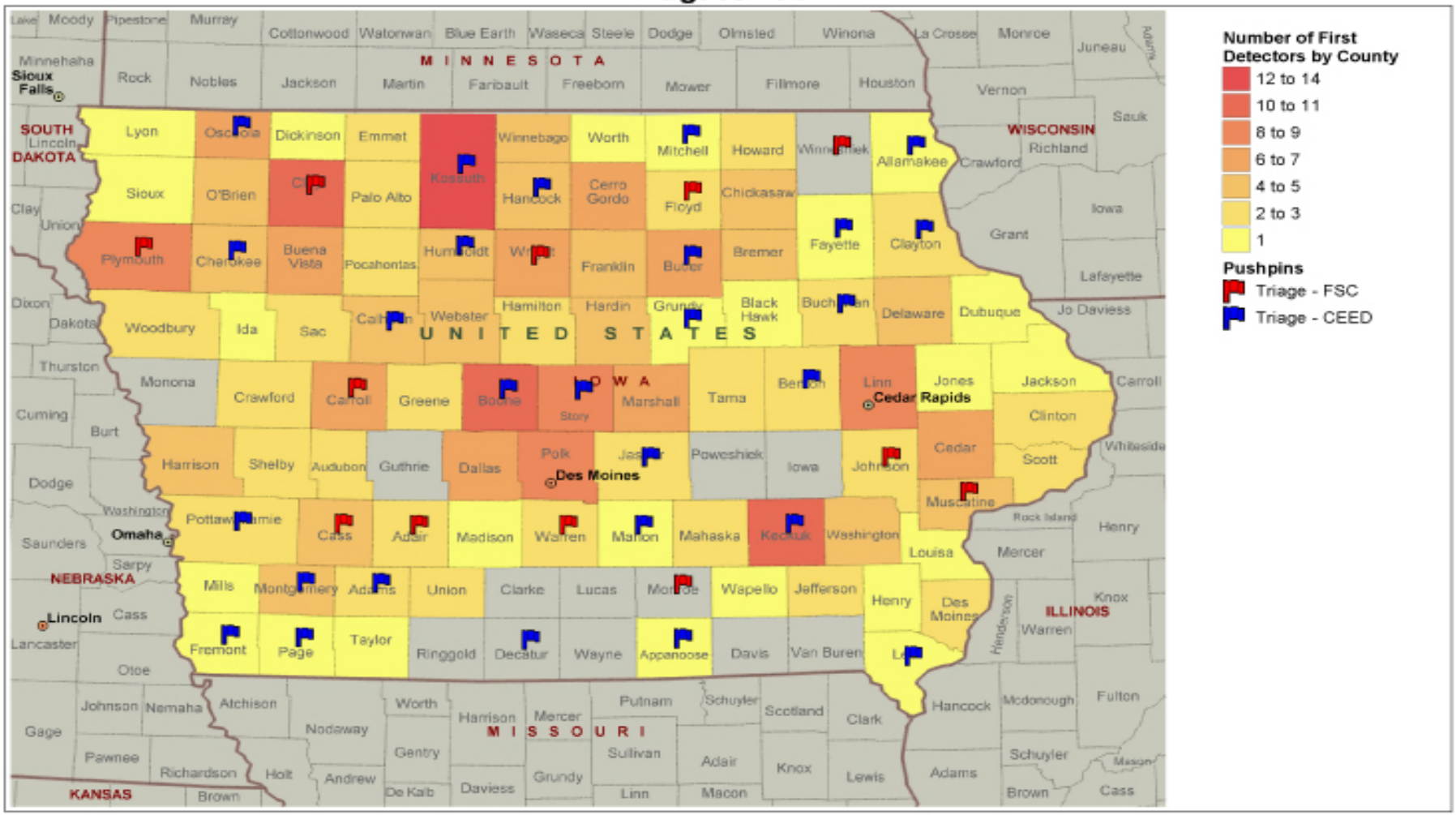
Iowa Soybean Rust Fast Track

- Iowa Fast Track System developed to increase speed and accuracy of diagnosing soybean rust
- Soybean producers submit samples to a First Detector who will examine sample and send to a Triage Team Member, if warranted.
- No cost for diagnosis when using this system – otherwise there will be a charge for each sample

Iowa Soybean Rust Fast Track Program



Asian Soybean Rust - First Detectors and Triage Personnel in Iowa
August 2004



IOWA STATE UNIVERSITY
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For more current information on Asian Soybean Rust in Iowa go to

www.soybeanrust.info