Is Wisconsin at Risk for Soybean Rust?

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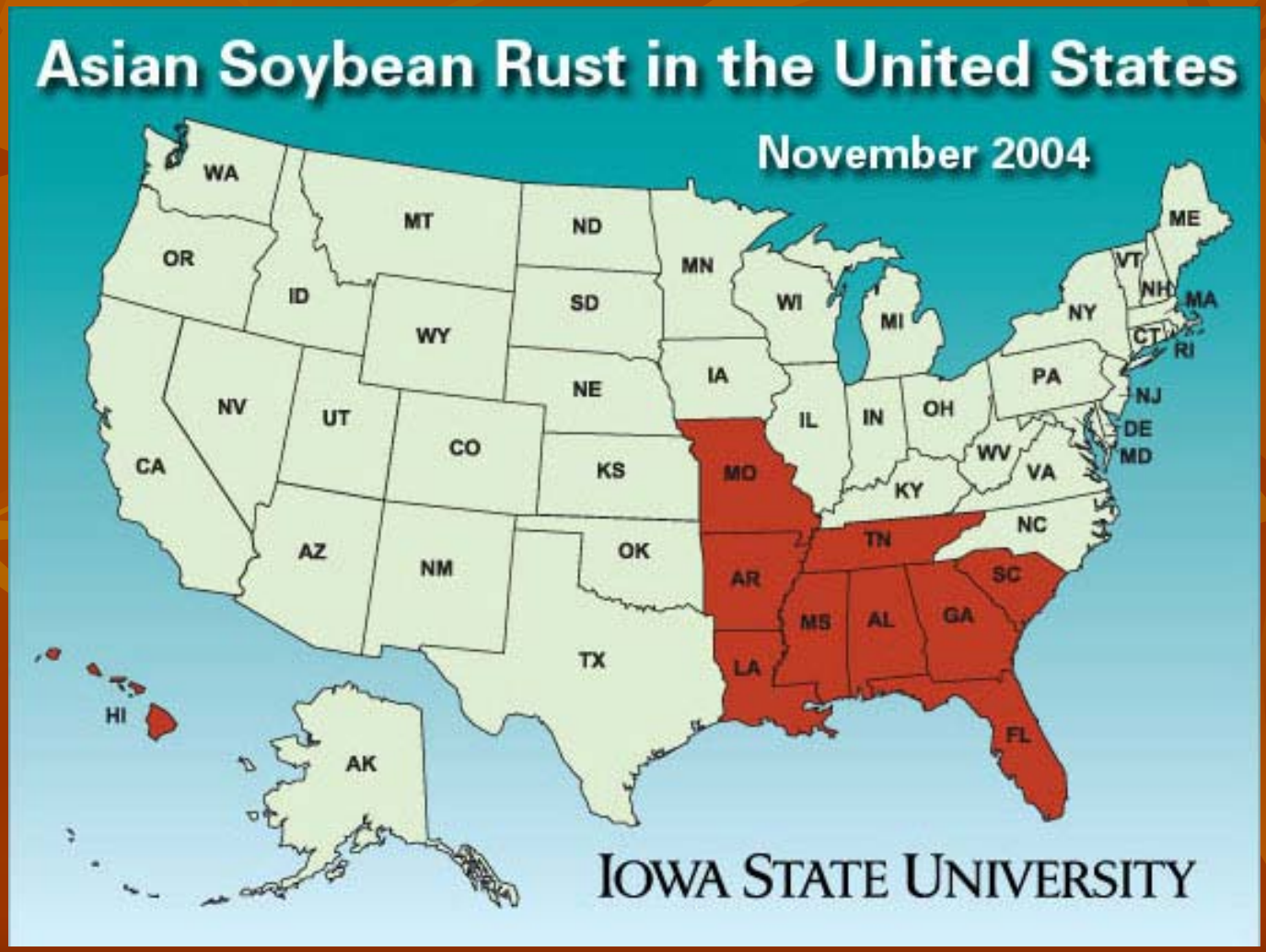
States confirmed with Soybean Rust



Soybean Rust Pathogen in USA

Survival of Rust Fungus

Must have living green leaf tissue

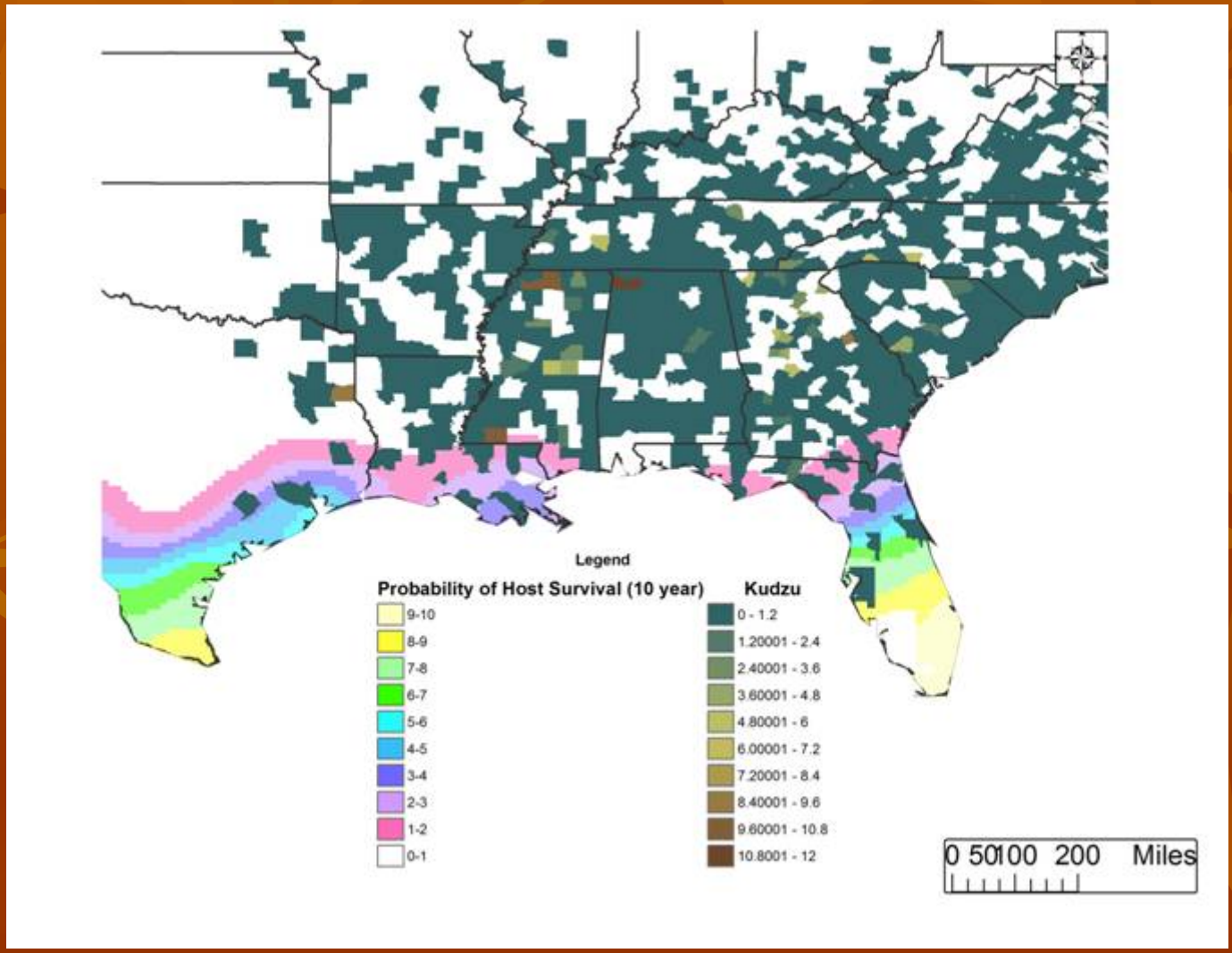
- Soybean
- Common bean (snapbean and etc)
- Pea
- Kudzu (introduced legume weed in S.E. USA)
- Yellow sweetclover (WI)
- White clover (WI)
- Lupine (WI)
- Purple crownvetch (WI)
- Ticktrefoil (WI)

Kudzu
Potential Survival of Rust Fungus

Assumption

- Kudzu will be major winter survival host
- Soybean rust pathogen will not survive in Wisconsin or Upper Midwest
  - Foliage of perennial hosts will freeze and die each winter
- Soybean rust pathogen must be reintroduced into Northern States each growing season

Projected Survival of Kudzu



Projected movement of soybean rust pathogen in the USA

Over-winter in Gulf Coast States

South-North spread of inoculum each growing season

The earlier spores arrive, the greater the severity of rust

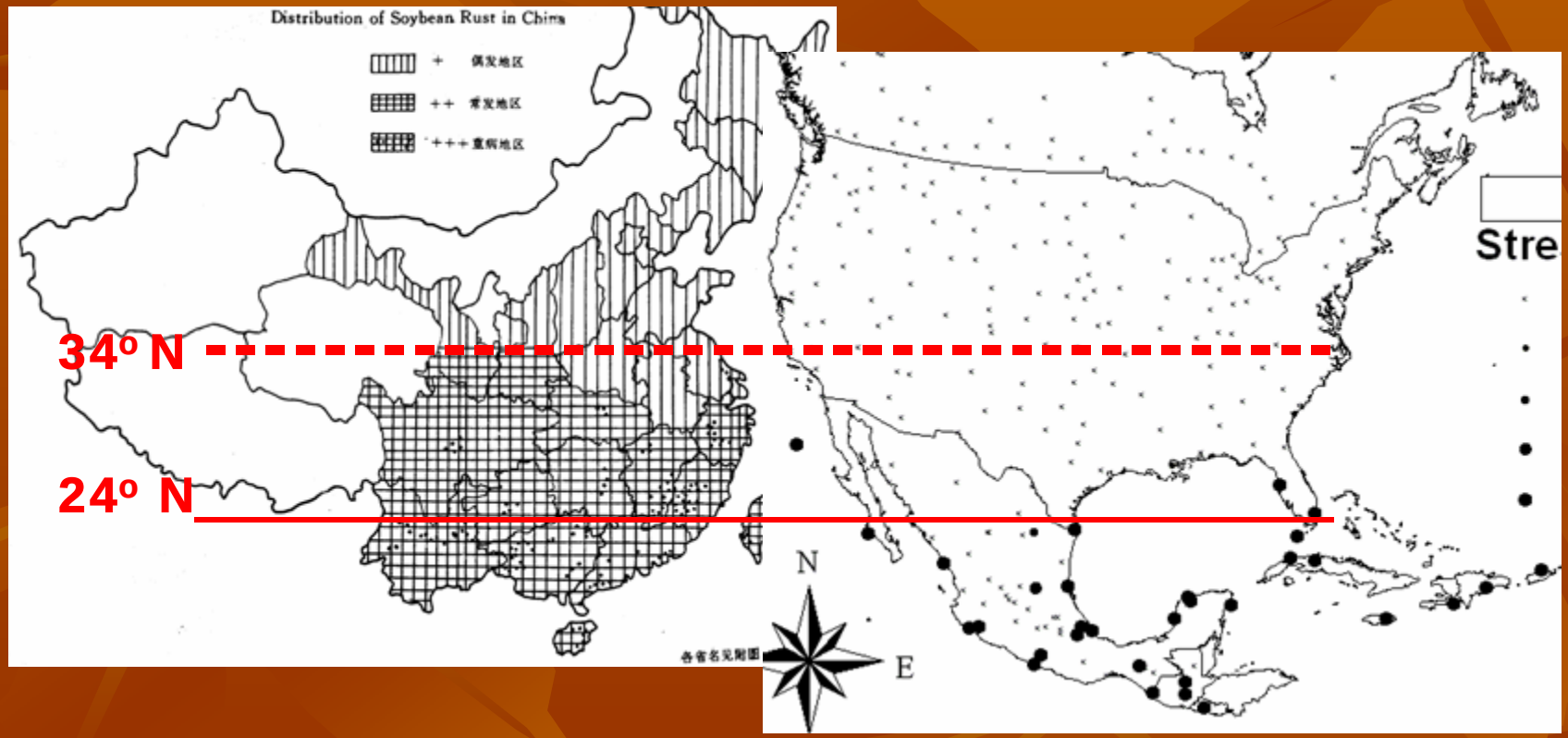
Environmental impact on soybean rust

- Temperatures between 59° F to 86 ° F
- Duration of leaf wetness
  - 8-12 Hours
- Rain events during growing season
  - Frequency of rain days
  - Amount of rain

Rust epidemic and rain (Sept only), Hubei, China

Year	Rainfall (inches)	Rainy days	Epidemic Severity
1973	6.8	22	Severe
1974	2.2	10	light
1975	3.3	10	light
1976	2.0	13	light
1977	5.1	12	moderate
1978	0.4	4	very light
1979	2.0	12	light

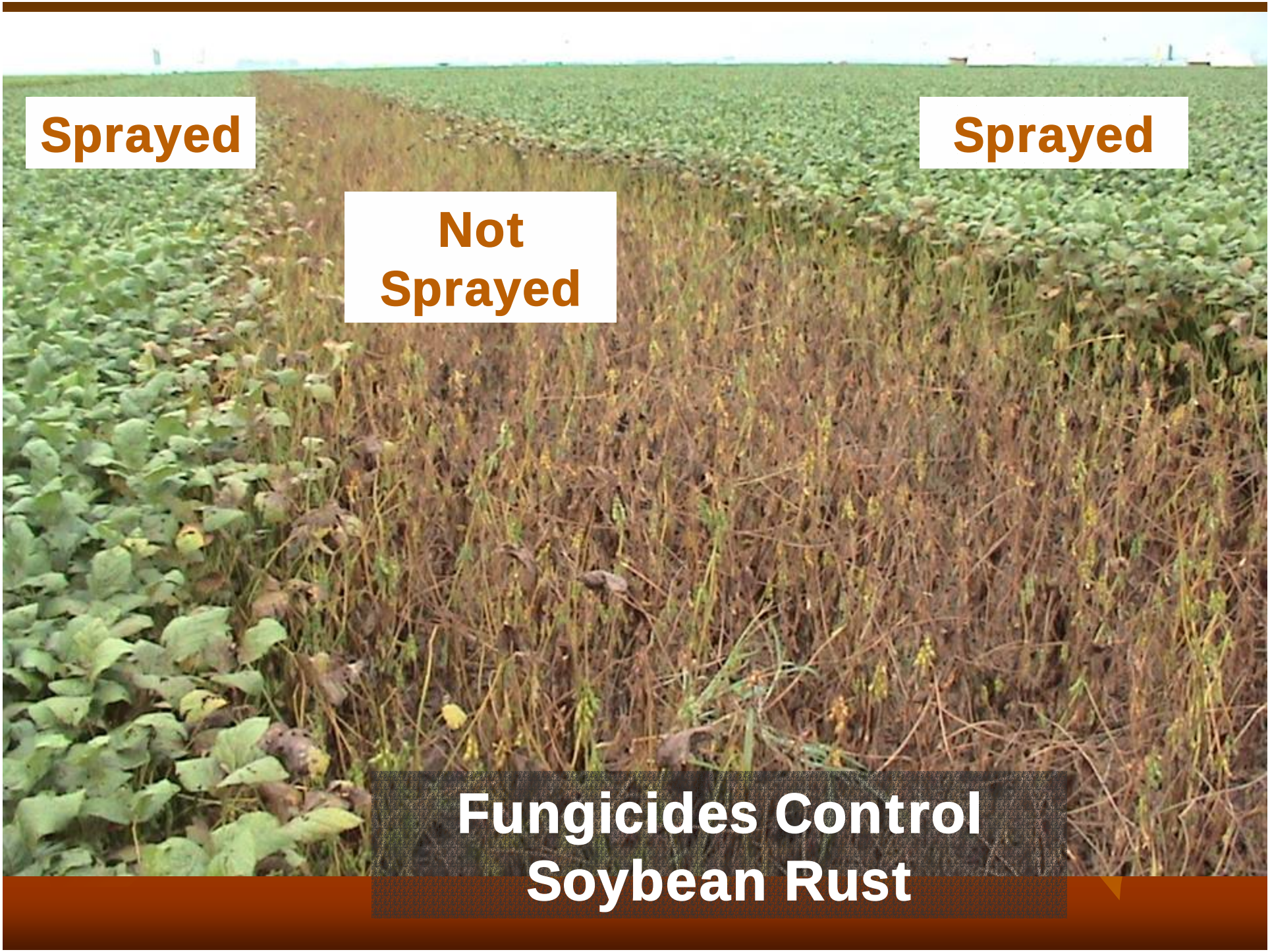
Soybean Rust: China & USA



Crop Management

Strategies to Control Rust

1. ELIMINATE OVERWINTERING HOSTS.
   - Not practical
2. Cultural Practices ????.
3. SCOUT FOR RUST CONTINUOUSLY.
4. APPLY FUNGICIDES.
5. SOYBEAN VARIETY SELECTION?


Sprayed
Not Sprayed
Sprayed
Fungicides Control Soybean Rust

Scenarios for 2005

- 1. Rust identified late in South, similar to 2004
- 2. Rust advancing northward from South
- 3. Rust identified in Wisconsin prior to growth stage R5.5

Rust Management Approaches with Fungicides

- Plan not to apply fungicides.
- Apply before symptoms appear.
  - Monitior North American Alert system to track soybean rust with Sentinel Plots.
- Apply when first symptoms appear.
  - Risk of misidentification or too late with detection

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Soybean Rust
Symptoms and Signs

Fully Registered Fungicides
Section 3
Active ingredients and Products

- **Chlorothalonil**
  - Echo 720
  - Bravo Weather Stik
- Protectant activity
- Chlorothalonil group

- **Azoxystrobin**
  - Quadris
- **Pyraclostrobin**
  - Headline
- Protectant activity
- Strobilurin group

Section 18 Approved
Active ingredients and Products
Triazole Group

- **Propiconazole**
  - Tilt
  - PropiMax
  - Bumper
- **Tebuconazole**
  - Folicur
- Curative activity

- **Myclobutanil**
  - Laredo 25 EC
  - Laredo 25 EW
- Curative activity

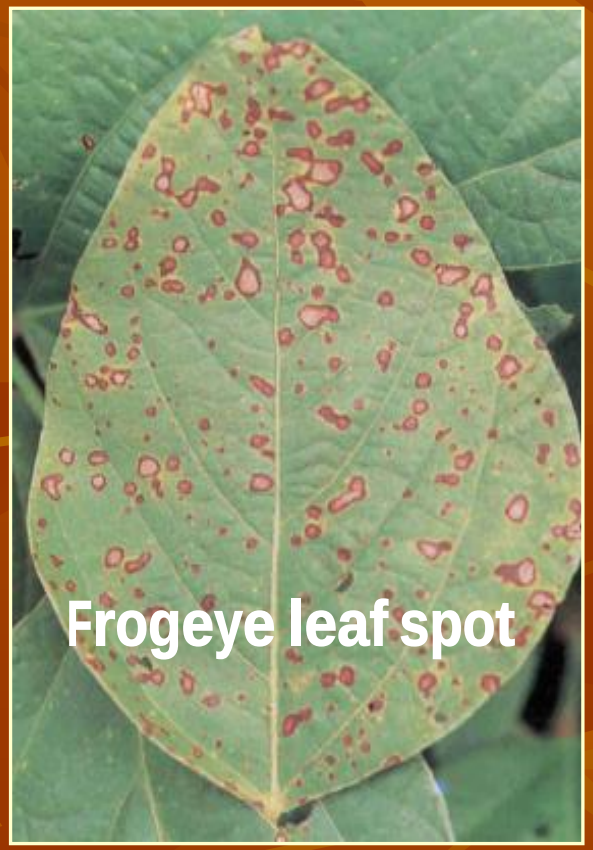
Information on Soybean Rust

- **University of Wisconsin Extension**
- **Soybean Plant Health Website**
  - **www.plantpath.wisc.edu/soyhealth**
- **Soybean Plant Health Initiative; North Central Soybean Research Program http://www.ncrsp.com/planthealth**
- **Each website links to many other sites**

Fungicide Websites

- www.plantpath.wisc.edu/soyhealth
- www.ncpmc.org/soybeanrust/
- www.planthealth.info/rust/rust.htm
- www.plantpath.iastate.edu/soybeanrust.html
- www.oardc.ohio-state.edu/ohiofieldcropdisease/soybeans/soybean_rust.htm
- http://www.ppdl.purdue.edu/ppdl/SBR/SBR_fungicide.htm

Mimic Diseases



Mimic Diseases
Downy Mildew

Fungicide Terms

- Protectant (preventative)
  - Barrier between leaf surface and rust spores
- Curative
  - Kills pathogen after early infection
- Systemic
  - Locally systemic
  - Translaminar

Definitions

- **Preventative**
  - **Preventing the establishment of infection**
- **Curative**
  - **Inhibiting the development of an established infection which is not showing visible symptoms**

Effects on rust fungal development

Spore germination	Penetration	Mycelial growth	Pre-sporulation	Sporulation

Bravo

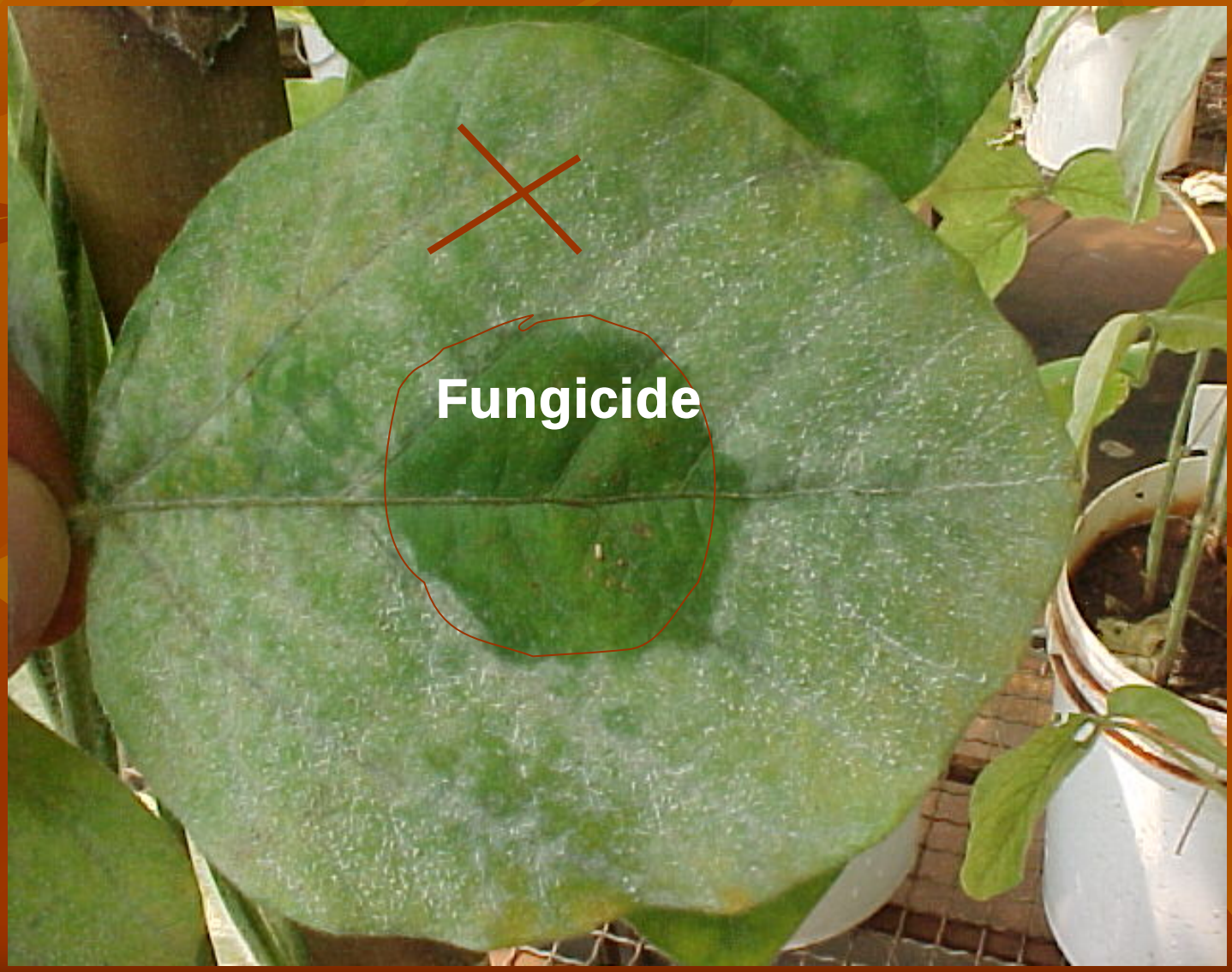
Triazoles

Azoxystrobin

Highly effective

Little or no effect

Preventive Activity



Curative Fungicide