

Asian Soybean Rust:

2005 'Azole' Soybean Injury in Brazil



The 'Azole' family of fungicides are the most widely utilized products for the safe and effective control of Asian soybean rust in Brazil, being used as either solo or premix products in 84% of the market in 2003/04. Azole injury symptoms were rarely observed and have had no reported negative impact on soybean yield potential.

In the 2004/2005 season, Brazilian soybean growers have experienced an increased level of 'azole' crop injury symptoms as compared to previous years.

What is the reason for this increase in injury symptoms? Should growers in the USA be concerned, especially since several 'azoles' fungicides have received Sec. 18 Emergency Exemptions for control of Asian soybean rust?

Asian Soybean Rust:

Questions Concerning 'Azole' Injury



- **Triggers for Injury Symptoms in Brazil?**
- **Injury Symptoms Appearance?**
- **Impact of Injury on Yield?**
- **'Azole' Fungicide Family Potential for Injury?**
- **Why More 'Azole' Injury in Brazil in 2005 as compared to other years?**
- **Will 'Azole' Injury Occur in the USA?**

Asian Soybean Rust:

Triggers: Injury Symptoms in Brazil

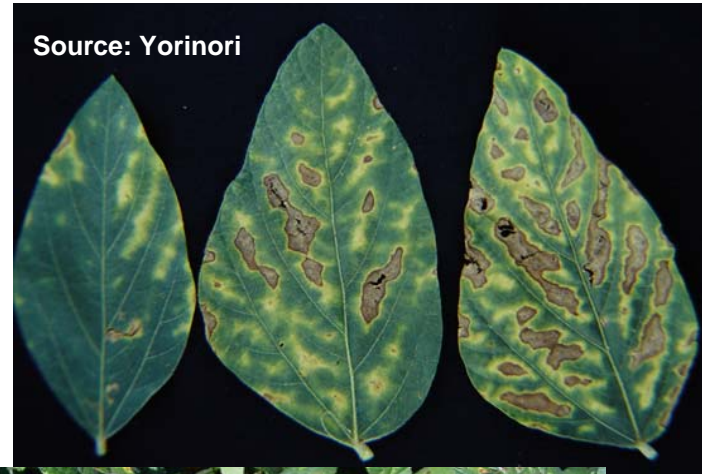


- **Environment (key factor)**
 - Hot, drought-like weather conditions with high light intensity for extended time periods following applications
- **Soybean Variety Selection**
 - Sensitive varieties: A small percentage of soybean varieties show sensitivity to certain 'azole' fungicides
 - Widespread use of determinate varieties: Upper canopy leaves may receive multi-applications of an azole fungicide
- **Use of Aggressive EC Formulations**
 - EC formulations enhance quick penetration of the fungicide into the foliage
- **Spray Adjuvants**
 - Use of oils with EC fungicide formulations-further enhancement of penetration into the foliage
- **Inherent Activity of the 'Azole' Fungicide**
 - Folicur, the most active and effective 'azole' chemistry for Asian soybean rust control, has shown injury symptoms more frequently than others

Asian Soybean Rust:

'Azole' Fungicide Injury Symptom Appearance

- Typically limited to the uppermost leaves of the soybean canopy which receive the greatest concentration of fungicide spray
- First appear as small, pale yellow, chlorotic areas between veins. This interveinal chlorosis may develop into areas of necrosis over time
- Affects only the leaves directly sprayed, newly emerged leaves will show no symptoms
- May develop several weeks after an application if environmental conditions become hot and drought-like



Asian Soybean Rust:

Impact of Injury on Soybean Yield



Embrapa, (Brazil's organization similar to the USA's USDA), has stated that 'azole' injury symptoms in soybeans, although visible, have not had a negative impact on soybean yields in Brazil in previous years.

Asian Soybean Rust:

Azole' Fungicide Family Potential for Injury



- 'Azole' fungicide injury to soybeans has rarely occurred in Brazil
- Several 'azoles' fungicides have been reported to have potential for crop injury under certain conditions
- Folicur, the most active and effective 'azole' chemistry for Asian soybean rust control, has shown more frequent cases of injury symptoms

Asian Soybean Rust:

Why More Azole Injury in 2004/05?



Key Factor:

- Hot, drought-like conditions were more prevalent in 2004/05

Secondary Factor:

- Increased use of oil adjuvants/mixtures (especially with aerial applications) with EC fungicide formulations

Asian Soybean Rust:

Will 'Azole' Injury Occur in the USA?



- The USA may experience some rare environmentally-related problems with azole injury, but probably less so than in Brazil

Why less problems in the USA?

- Widespread use of indeterminate soybean varieties – upper canopy leaves will not receive multi-applications of an azole fungicide
- No identified sensitive soybean varieties in the USA to date
- Less aggressive fungicide formulation used – Folicur is an SC in the USA vs. an EC in Brazil
- Use of oils are not recommended with Folicur in the USA

Asian Soybean Rust:

Azole Fungicide Injury Summary



- **‘Azole’ fungicide injury may occur in the USA under rare conditions**
- **Hot, drought-like conditions are the key factor driving potential injury**
- **Folicur injury potential to soybeans in the USA should be less than in Brazil**

Folicur: Adjuvant Use Guidelines for Soybeans

- **Preventative Application Timing:** (ASR not present but environmental conditions are favorable for infection)
 - Apply Folicur @ 4 fl oz/a
 - Adjuvants usage not necessary
- **Early Post-Infection Application Timing:** (ASR is present at $\leq 10\%$ incidence, soybean plants stressed from hot, dry environmental conditions)
 - Apply Folicur @ 4 fl oz/a
 - Adjuvant usage not recommended
- **Early Post-Infection Application Timing:** (ASR is present at $\leq 10\%$ incidence, soybean plants are not stressed by environmental conditions)
 - Apply Folicur @ 4 fl oz/a
 - Adjuvant usage recommended (NIS, spreader-sticker only, use lowest labeled rate)