

## Asian Soybean Rust In New York State

### IPM Field Teaching Module

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Concept	Activity	Handouts
Help growers prepare for the potential infection by Asian soybean rust.	Discussion	Asian Soybean Rust Identification and Management Soybean Rust Fungicide Decision Tree
Resources: Cornell Guide to Integrated Field Crop Management.		Related Modules: <a href="#">Module 2: Introduction to IPM</a> <a href="#">Module 3: Principles of Scientific Sampling</a> <a href="#">Module 4: What is a Threshold?</a> <a href="#">Module 5: Economic Implications of IPM</a>

#### Here's what we'll do:

**Beforehand:** Set up a meeting at any team member's farm

#### Today on-site:

- Explore and discuss the serious consequences if Asian soybean rust makes it to NY. (Since it overwinters in kudzu, and kudzu has a toehold in Long Island ...)
- Review sampling and monitoring for foliar diseases in the field
- Describe the spread and symptoms of soybean rust
- Discuss the what-ifs—what to do if you suspect rust; how to manage it

<b>ACTIVITY # 1:</b> Knowing Asian soybean rust (and other early season diseases)			
<b>Setting</b>	<b>Time Required</b>	<b>Materials</b>	<b>Handouts</b>
Soybean Field	20 to 30 minutes	Clipboards	Asian Soybean Rust Identification and Management Soybean Rust Fungicide Decision Tree

<b>Q:</b>	<b>Pose a series of questions:</b>	<b>A:</b>
Hand out <i>Asian Soybean Rust Identification and Management</i> and <i>Soybean Rust Fungicide Decision Tree</i>		
Mini-lecture	<p>Asian soybean rust was found in Japan in 1902 and spread throughout Asia in the 50s and 60s. It spread to Hawaii circa 1994, then to Uganda on a storm that crossed the Indian Ocean in '97, spreading through Africa in following years.</p> <p>In 2001, rust blew across the Atlantic, showing up in Paraguay. By 2002 it was in Brazil and Argentina; Bolivia in 2003; Columbia in 2004—the same year it blew into the US, probably via hurricanes in the Gulf of Mexico.</p> <p><b>Show a large map of the world and the progression of the disease—and how quickly it has infected soybeans around the world.</b></p>	
What is Asian soybean rust?	A disease caused by the fungus <i>Phakopsora pachyrhizi</i> .	
How does this rust move from place to place?	Spores move on wind currents from south to north.	
Where would you first see symptoms in your fields?	Disease shows first on lower leaves. It can be difficult to find an early infection.	
How fast does it spread through your field?	Fast. It's the most destructive foliar disease of soybeans where it occurs.	
What yield loss would you expect from Asian soybean rust?	Losses have ranged from 10-80%, depending on how early in the season plants were infected. This rust has the potential to dramatically reduce yields and profitability of soybeans—and other beans as well.	

<p>What is the potential risk of this rust? <i>Mini Lecture:</i></p>	<p>In Gulf States where it doesn't freeze, spores can overwinter on kudzu—a problem weed in the South. The disease builds up in spring and disperses with weather fronts moving north, causing annual epidemics—weather conditions permitting. <b>Show maps of areas where the disease has moved north:</b> <a href="http://sbr.ipmPIPE.org/cgi-bin/sbr/public.cgi">http://sbr.ipmPIPE.org/cgi-bin/sbr/public.cgi</a></p>
<p>How do you identify this rust?</p>	<p><b>Compare pictures of soybean rust with similar-looking diseases:</b>  <a href="http://www.stopsoybeanrust.com/images/final_rustplnthealthguide.pdf">http://www.stopsoybeanrust.com/images/final_rustplnthealthguide.pdf</a></p> <p>First you'll see yellow discoloration on lower leaves of maturing plants at or near flowering. Small reddish to brownish lesions within these yellowing areas then show on upper surfaces of these leaves. Next, tiny pustules—they look like pimples—form on these lesions, <i>but on leaf undersides</i>. You can see them with a 10 or 20x hand lens. They erupt in spores that float away on the wind.</p>
<p>What's the disease cycle of Asian soybean rust?</p>	<p>Pustules show a week to ten days after infection. They produce spores three weeks after that.</p> <p>These spores are the only survival structures for this fungus. They must be on living host tissue to survive. Host plants don't overwinter here, so this rust can't survive our winters.</p>
<p>What temperature range does this rust require?</p>	<p>45° to 83°F.</p>
<p>What field conditions does it require?</p>	<p>Leaves must be moist or wet for infection to occur.</p>
<p>Does Asian soybean rust have alternate hosts?</p>	<p>Kudzu, lima beans, dry beans, and lupines. But apparently not alfalfa.</p>
<p>Are any soybean varieties resistant to this rust?</p>	<p>Not yet.</p>
<p>How can you manage this rust?</p>	<p>Watch the progression of the disease in the US: <a href="http://sbr.ipmPIPE.org/cgi-bin/sbr/public.cgi">http://sbr.ipmPIPE.org/cgi-bin/sbr/public.cgi</a> ? If risk is high, the only control is fungicide.</p>
<p>What must you know to choose fungicides for soybean rust?</p>	<p><i>Show and discuss the soybean rust fungicide decision chart.</i></p>

<p>How do you report a potential infection of soybean rust?</p>	<p>If you think rust might be in your fields, act <b><i>right away</i></b>—contact your Cornell Cooperative Extension fields crops educator or the Plant Disease Diagnostic Clinic at Cornell University (<a href="http://PlantClinic.cornell.edu">http://PlantClinic.cornell.edu</a>); phone: 607-255-7850.</p>
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