

Agricultural & Natural Resources Update



ALACHUA COUNTY COOPERATIVE EXTENSION 2800 NE 39th Avenue, Gainesville, FL 32609 (352)955-2402

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Asian Soybean Rust: Identification & Control

Asian soybean rust (ASR) disease was first detected on soybeans in the United States in Baton Rouge, Louisiana on November 6th, 2004. Long distance movement of the pathogen was suspected to have occurred from

Central America via Hurricane Ivan. Since then, ASR has been found as far north as Indiana and Illinois. ASR can cause severe losses in soybean yield due to premature defoliation, poor pod fill, and production of low quality seed. Crop loss estimates range from 10-90% depending on the growing region, time of epidemic initiation, and environmental conditions.

Symptoms

Symptoms of ASR are characterized by tan to brown volcano-like pustules (uredinia) on the lower surface and chlorotic flecking on the upper surface of infected leaves (Fig. 1). Pustules (83 x 309µm) contain slightly oblong urediniospores (a type of spore produced exclusively by rust fungi ~15 X 18µm) that are light brown to hyaline and are echinulate (spiny).



Figure 1

(continued on next page)

Asian Soybean Rust: Identification & Control - continued:

Rust pustules are most commonly found on the leaves, but they also occur on the stems, pods, and cotyledons of heavily infected plants. Telia (~50-150µm) contain teliospores (a thick-walled resting spore produced by rust and smut fungi), that are dark brown to black at maturity. Telia are produced on the underside of infected kudzu leaves among uredinia (Fig. 2). Teliospores are densely packed in layers within the telium and are pale brown to yellow.

Pathogen

ASR is caused by the filamentous fungal plant pathogen, *Phakopsora pachyrhizi*. Soybean rust also is caused by a less aggressive New World species, *Phakopsora meibomiaae*, which is not present in the Continental U.S. and is primarily restricted to Puerto Rico and the Caribbean basin. *Phakopsora pachyrhizi* is capable of direct penetration through the host cuticle (the waxy top layer of the leaf surface), other rust fungi typically infect through natural openings in the plant (i.e. stomata). Most rusts exhibit a high degree of host specificity. However, *P. pachyrhizi* affects a wide range of cultivated and weedy legumes that currently encompass 31 species in 17 genera in the field, and 60 species in 26 genera under controlled conditions (i.e. greenhouse) (Sinclair and Hartman 1996). In inoculated field trials, soybean was the only host of several legume crops evaluated that was shown to support an ASR epidemic in North Central Florida (Harmon et al. 2006).

Management

Data from fungicide trials conducted in Georgia (Sconyers et al. 2006) and Florida (Harmon et al. 2006) have shown that ASR management options include applications of strobilurins (pyraclostrobin, azoxystrobin, trifloxystrobin), triazoles (tebuconazole, propiconazole), and tank mixes of strobilurins and triazole compounds. Yield increases of 20 bu/A have been noted with fungicides as compared to non treated plots. Current efforts seek to determine treatments that maximize yield while minimizing economic costs to soybean producers by investigating fungicide selection and application timing. Long-term research goals include the development of resistant soybean cultivars, improving disease risk assessment tools, and optimizing available fungicide options.

Information for this report was compiled from:
Asian Soybean Rust. Wayne M. Jurick II et al,
University of Florida. 2007.
<http://edis.ifas.ufl.edu/PP157>

Soybean Disease Control. Bob Kemerait,
University of Georgia. 2009.
http://www.ent.uga.edu/pmh/Com_Soybean.pdf

Asian Soybean Rust in Alabama.
Edward J. Sikora et al.,
Auburn University. 2007.
www.aces.edu/pubs/docs/A/ANR-1310/ANR-1310.pdf



Figure 2

Fungicide	FRAC Code	Rate	Remarks
Azoxystrobin (Quadris)	11	6.2-15.4 fl oz/A	Must be applied as a preventative measure before infection.
Pyraclostrobin (Headline)	11	6.0-12.0 fl oz/A	Must be applied as a preventative measure before infection.
Azoxystrobin+propiconazole (Quilt)	11+3	14-20 fl oz/A	Must be applied as a preventative measure before infection.
Tetraconazole (Domark 230ME)	3	4.0-5.0 fl oz/	Works as a preventative and curative fungicide. <u>Works best as a preventative</u>
Tebuconazole (Folicur, Orius)	3	3.0-4.0 fl oz/	Works as a preventative and curative fungicide. <u>Works best as a preventative</u>
Propiconazole (Tilt, Bumper)	3	4.0-8.0 fl oz/	Works as a preventative and curative fungicide. <u>Works best as a preventative</u>
myclobutanil (Laredo)	3	4.0-8.0 fl oz/	Works as a preventative and curative fungicide. <u>Works best as a preventative</u>
Chlorothalonil (Bravo, Equus, Echo)	M3	See label	Must be applied as a preventative measure before infection. Contact only fungicide

PESTICIDE UPDATES



- ▶ Dow Agrosience has just released a new herbicide for pastures, GrazonNext®. GrazonNext® contains the same active ingredient as Forefront® (aminopyralid+2,4-D). However, reports indicate that GrazonNext® will be sold for around \$40 per gallon compared to \$60 per gallon for Forefront®. GrazonNext® is an excellent option for control of tropical soda apple and other broadleaf pasture weeds.
- ▶ The EPA has approved time-limited tolerances for the fungicide metconazole (Caramba®) and its metabolites on sugarcane and sugarcane molasses. The tolerances expire at the end of 2011. The Agency has also approved permanent tolerances for sweet corn and cotton. (*Federal Register*, 5/7/09).
- ▶ The EPA is intensifying its evaluation of spot-on pesticide products for flea and tick control for pets due to recent increases in the number of reported incidents. Adverse reaction reported range from mild effects such as skin irritation to more serious effects such as seizures, and in some cases, death. Health Canada has also identified similar concerns. (*EPA OPP Update*, 4/17/09).

To simplify information available in the newsletter, it is sometimes necessary to use trade names of products, equipment and firms. No endorsement is intended, nor is criticism implied of similar products, equipment and firms not mentioned.

UPCOMING EVENTS

Private Applicator Agricultural Pest Control License Training

Friday June 26, 2009
9:00 a.m. - 1:00 p.m.
Alachua County Extension Service
2800 NE 39th Avenue, Gainesville

Registration fee is \$5.00
Registration deadline is June 23, 2009
Pre-registration required
For more information call (352)955-2402

2 CEUs (Core and Private Applicator) will be available!

2009 Hay Field Day

Tuesday, June 30, 2009
9:00 a.m. - 3:00 p.m.
Mark Randall Farm
16645 CR 137, Wellborn, FL

To register please contact either the Alachua
County Extension Office at (352)955-2402 or
the Suwannee County Extension Office
at (386)362-2771 by June 26th