

ILLINOIS

SOYBEAN

RUST

PROGRAM

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INTRODUCTION

The Illinois Soybean Rust Program is a coordinated effort between the Illinois Soybean Checkoff Board, Illinois Fertilizer and Chemical Association, Illinois Seed Trade Association, Professional Crop Consultants of Illinois, University of Illinois, U of I Extension Service, Southern Illinois University, National Soybean Research Center at the U of I, USDA-APHIS & -ARS and the Illinois Department of Agriculture. The purpose of the program is to detect and control soybean rust if and when it appears in Illinois. If soybean rust goes undetected and untreated, it can cause up to an 80% reduction in soybean yields.

In the summer of 2003, Illinois soybean producers suffered a tremendous crop loss due to the infestation of Soybean Aphids. By the time the aphids were detected and economic justifications were given for spraying, much valuable time was lost during the planning process because it started too late. Advanced planning is the key to effectively handling any issue. The Illinois Soybean Rust Program is the best way to stay ahead of the problem of soybean rust so valuable time is not lost.

Although soybean rust is a serious threat to Illinois agriculture, there are a few factors that may help in our efforts to contain and eradicate the problem. Losses from soybean rust are covered under the Federal Crop Insurance Program like other crop losses. It took four years for soybean rust to spread to most areas of Brazil, so Illinois may have some time to protect its crops from damage. Finally, soybean rust cannot over-winter below freezing temperatures. This means that it will have to be re-introduced every spring. This also allows for the possibility for planning and treatment of crops.

SYNOPSIS OF SOYBEAN RUST

Soybean rust, caused by the fungus *Phakopsora pachyrhizi*, may result in soybean yield losses of up to 80%. Although the disease has not yet occurred in the continental U.S., projected losses of \$7.1 billion per year were estimated in a 1984 economic risk analysis, although more recent estimates indicate less of a loss (up to \$2 billion per year) primarily because of the increase in fungicide management options. A less aggressive species, *P. meibomia*, also causes soybean rust in geographically limited areas and is not considered a threat to soybean production.

The first report of rust (*P. pachyrhizi*) was from Japan in 1902. By the 1950s the disease was reported in most Asian countries. It was not until the 1990s that the disease was confirmed in the Western Hemisphere. The first report was from Hawaii in 1994. The disease was first found in South America in 1999 and is now in four countries. The continental U.S. is the only major soybean producing area in the world where soybean rust has not been found. The rapid spread of *P. pachyrhizi* and its potential to cause severe yield losses makes this the most destructive foliar disease of soybean.

Phakopsora pachyrhizi infects over 95 species of plants from more than 42 genera, including soybean and related *Glycine* species. Included in the list are many of the wild and edible legumes. The full host range of both rust species has not been clearly identified and may be

complicated by pathotypes and differential reactions within host species. Included in the list is kudzu (*Pueraria lobata*), which is widespread in the U.S. and in parts of Illinois. This species as well as other hosts could serve as an inoculum reservoir or bridge host (alternative host) for *P. pachyrhizi* in the southern U.S. The large number of host species increases the likelihood that this pathogen will survive and over winter in the southern U.S., as well as in Central America. To our knowledge the fungus can only survive on living hosts and would not survive the temperate climate or the winters in Illinois.

Like most rust fungi, *P. pachyrhizi* produces a copious amount of spores that originate from structures called uredinia. These can develop 5 to 8 days after urediniospores germinate and infect leaves and can be reproduced as early as 9 days after infection. Urediniospore production can continue for up to 3 weeks. Uredinia may develop for up to 4 weeks after a single inoculation, and secondary uredinia will arise on the margins of the initial infections for an additional 8 weeks. Thus, from an initial infection, there could be first generation pustules that maintain sporulation for up to 15 weeks. Successful re-infection is dependant on the availability of moisture. At least 6 hours of free moisture is needed for infection with maximum infections occurring with 10 to 12 hours of free moisture. Temperatures between 15 and 28 C (~60-82F) are ideal for infection.

With the confirmed identification of the Asian soybean rust in South America, the U.S. Department of Agriculture's Animal Plant Health Inspection Service (APHIS), Agricultural Research Service (ARS), Cooperative State Education and Extension Service (CSREES), the United Soybean Board (USB), and other federal and state agencies are concerned about the introduction of soybean rust in the continental U.S. There are major efforts in place for surveillance, detection, and diagnosis of soybean rust by USDA-APHIS in conjunction with the CSREES Regional Plant Disease Diagnostic Centers, and the state of Illinois. APHIS has developed a National Strategic Action Plan for dealing with soybean rust (www.aphis.usda.gov/ppq/ep/pestdetection/soybean_rust/soybeanrust.html). Other web sites that have more information include: APSnet Feature: Soybean Rust: Is the U.S. Soybean Crop At Risk? (<http://www.apsnet.org/online/feature/rust/>), and Soybean Rust from The Plant Health Initiative (<http://www.planthealth.info/rust/rust.htm>).

IDENTIFICATION OF SOYBEAN RUST

Accurate diagnosis is critical to determine the first occurrence of soybean rust in the continental U.S., in the state of Illinois, and in a county and field within the state. Accurate and timely identification is the key to determining whether a response will be attempted and, if so, the extent, direction, and magnitude of that response.

The most common symptom of soybean rust occurs as small (2-5 mm²) tan to dark brown polygonal lesions. Within each lesion is one to many erumpent, globose uredinia where the spores are produced. Urediniospores are released through the circular ostiole. Lesions are found primarily on leaves. A hand lens of X20 or greater is useful to view the lesions. Incubating suspected infected leaves overnight in a closed bag under high humidity also may be needed to induce fungal sporulation. Spores of the soybean rust pathogen can be observed using a compound microscope. Early symptoms of soybean rust may be confused with bacterial pustule (caused by *Xanthomonas axonopodis* pv. *glycines*), or bacterial blight (caused by *Pseudomonas*

savastanio pv. *glycinea*), and brown spot (caused by the fungus *Septoria glycines*), although none of these produce rust spores that can be easily diagnosed under a compound microscope.

In the field, lower leaves of plants usually show symptoms first as a few scattered lesions. As infection and colonization increase, leaves may turn yellow and prematurely defoliate. Under very rapid disease development the leaves may just turn dark and hang on the plant. Normally, as the plant matures and sets pods, infection progresses rapidly under the right environmental conditions (i.e., moisture, high humidity and heat) to cause high rates of infection in the middle and upper leaves of the plant. Clouds of spores have been observed within and above canopies of highly infected plant stands. Plant may become defoliated and mature up to 1 to 3 weeks before normal.

SCOUTING COMMITTEE ACTION PLAN

Training

- 1) Distribution of soybean rust sample bags produced by Bayer Crop Science.
 - Distributed to Certified Crop Advisors (CCAs)
 - Distributed to fertilizer dealerships
 - Distributed to seed companies
 - Distributed to Extension Unit Offices
 - Distributed to producer clientele
 - Distribution funding possibly via ISPOB and Bayer
- 2) Distribution of “Soybean Rust Identification Sheet”
 - Distribution online
 - Link available at stakeholder websites
 - Commonly linked site via USDA, APHIS website
 - http://www.aphis.usda.gov/lpa/issues/sbr/SBR_IDcard_11-04.pdf
 - Distribution via hard copy
 - Distributed to Certified Crop Advisors
 - Distributed to fertilizer dealerships
 - Distributed to seed companies
 - Distributed to Extension Unit Offices
 - Secondary distribution to producer clientele.
 - Funding via USDA-APHIS
- 3) Articles on soybean rust, rust-similar foliar diseases, etc. and pertinent updates published in the University of Illinois’ *Pest Management and Crop Development Bulletin* published **throughout the 2005 growing season**. (Note: Articles on this topic have been published in the *Pest Management and Crop Development Bulletin* since 2002. Those past articles can be found in *PMADB* issues, some examples are listed here:
 - No. 25/ December 3, 2004
<http://www.ipm.uiuc.edu/bulletin/article.php?issueNumber=25&issueYear=2004&articleNumber=6>
 - No.24/ November 5, 2004
<http://www.ipm.uiuc.edu/bulletin/article.php?issueNumber=24&issueYear=2004&articleNumber=7>
 - No.13/ June 18, 2004
<http://www.ipm.uiuc.edu/bulletin/article.php?issueNumber=13&issueYear=2004&articleNumber=4>
 - No.4/April16, 2004:
<http://www.ipm.uiuc.edu/bulletin/article.php?issueNumber=4&issueYear=2004&articleNumber=8>
 - No.2/April 03, 2003:
<http://www.ipm.uiuc.edu/bulletin/pastpest/articles/200302h.html>
- 4) “In House” Extension training to review issue/acclimate units to issue at Extension regional meetings or at Regional Unit Leader meetings

- Retraining of Units in photography for DDDI soybean rust pre-screening option (*Currently available online*)
 - Retraining of Units in handling plant samples (*April 2005*)
 - Specific Unit training in handling suspect soybean rust samples utilizing methods highlighted by sampling committee – (*April 2005*)
 - Retraining of Units in sample submission to U of I Plant Clinic (*April 2005*)
- 5) Soybean rust sessions at various meetings/workshops
- Scouting/Submission protocol reminders at 2004 – 2005 Illinois Pesticide Safety Education Program locations equally distributed throughout the state (Note: Complete list available at <http://www.pesticidesafety.uiuc.edu/training/private/>)
 - Identification/Scouting/Submission protocol information at Illinois Crop Protection Technology Conference – **January 5 and 6**, Urbana
 - Identification/Scouting/Submission protocol information at University of Illinois Corn and Soybean Classic locations
 - **January 11** – Bloomington
 - **January 12** – Rochelle
 - **January 13** – Moline
 - **January 18** – Springfield
 - **January 19** – Mt. Vernon
 - **January 20** - Collinsville
 - Identification/Scouting/Submission protocol information at Vegetable Growers Conference – **February 2**, Mount Vernon
 - Identification/Scouting/Submission protocol information at Illinois Crop Management Conference locations
 - **February 8 and 9**, Effingham
 - **February 22 and 23**, Jacksonville
 - **March 1 and 2**, Malta
 - Identification/Scouting/Submission protocol reminders at various local/regional meetings scattered throughout the state (Note: Complete list of available at **)
- 6) Soybean rust in-depth workshop (*March 29, 2005*)
- Dr. Dean Malvick, Dave Feltes, and Dr. Susan Ratcliffe coordinating
 - Twenty-seven locations throughout the state (Exact location TBA)
 - Delivered via distance delivery conferencing method
 - Speaker list TBA
 - Estimated cost TBA

Scouting and Sample Submission

“LOOK LOW AS YOU GO” – A Plan For Scouting Fields and Submitting Samples For Soybean Rust Diagnosis

Second Edition, December 6, 2004

- While in soybean fields, carefully look at the lower quarter of soybean plants in addition to “top growth”; be sure to examine undersides of leaves using a hand

lens (Note: Effective scouting for soybean rust will require extensive examination of each field rather than brief observations)

- If you see something that looks “suspect” for soybean rust – follow this simple protocol
 - Collect 20 leaflets with suspect symptoms.
 - Leaflets should be flat, dry, and placed between dry paper toweling.
 - Leaflets should be packaged in two layers in zip lock plastic bags.
 - The bags should be clearly labeled with a permanent marker providing: date, host plant, collector’s name, phone number, appropriate supervisor/DSM contact information, collection location within the field, location of the field, county, township & section, and nearest intersection. GPS information is helpful if available.
 - Immediately submit samples to the University of Illinois’ Distance Diagnostics through Digital Imaging (DDDI) system. If the sample cannot be immediately shipped, keep refrigerated until shipment to reduce plant deterioration.
 - DDDI sites are maintained at your local/primary extension unit office.
 - The results of your soybean rust prescreening via DDDI should be available within a few hours.
 - If the DDDI prescreening appears suspect, your plant sample will be submitted via overnight mail to the U of I Plant Clinic. **(Note: The office submitting the sample by mail must make sure that the seams of the box are taped shut. A fee will be charged to clientele for any mailing costs)**

Following confirmation of soybean rust in your area, scout soybean fields using the same protocol and sample submission procedures. Consider evaluating 5 plants in each of 20 locations within a field. If soybean rust is detected and confirmed, fungicides should generally be applied as soon as possible.

LIST OF UNIT OFFICES FOR DDDI CONTACT ATTACHED

University of Illinois Extension Offices with DDDI Units

A/J/M/P/U Unit

(Alexander/Pulaski County) 502 Oakley Lane, Mounds, IL 62964 _____ (618) 745-6310
(Johnson County) 208 East Main St, PO Box 158, Vienna, IL 62995 _____ (618) 658-5321
(Massac County) 1438 W 10th St, Metropolis, IL 62960 _____ (618) 524-2270
(Union County)125 W. Davie St, Anna, IL 62906-1234 _____ (618) 833-6363

Adams/Brown Unit

(Adams County) 330 S 36th St, Quincy, IL 62301 _____ (217) 223-8380
Bond County 925 E. Harris, PO Box 187, Greenville, IL 62246 _____ (618) 664-3665
Boone County 930 W Locust St, Belvidere, IL 61008 _____ (815) 544-3710
Bureau County 850 Thompson St, Princeton, IL 61356 _____ (815) 875-2878
Calhoun/Jersey Unit 818 S Park St, PO Box 366, Hardin, IL 62047 _____ (618) 576-2293

Cass/Schuyler Unit

(Cass County) 651 S Job, Virginia, IL 62691 _____ (217) 452-3211
(Schuyler County) 710 Maple Ave, Rushville, IL 62681 _____ (217) 322-3381
Champaign County 801 N Country Fair Dr Ste D, Champaign, IL 61821 _____ (217) 333-7672
Christian County 1120 N Webster, Taylorville, IL 62568 (217) 287-7246
Clark County 15493 N State, Highway 1, Marshall, IL 62441 _____ (217) 826-5422

Clay/Fayette Unit

(Clay County) 235 Chestnut St, PO Box F, Louisville, IL 62858 _____ (618) 665-3328
(Fayette County) 118 N Sixth St, Vandalia, IL 62471 _____ (618) 283-2753
Clinton County 1163 N 4th St, PO Box 185, Breese, IL 62230 _____ (618) 526-4551
Coles County Northwest Business Park 707 Windsor Road, Ste A Charleston, IL 61920 _____ (217) 345-7034

Cook Chicago Unit

(North Office) 2840 N Lincoln Ave Chicago, IL 60657 _____ (773) 755-2223
(South Office) 8751 S. Greenwood Ave, Ste 112-122 Chicago, IL 60619 _____ (773) 768-7779
Cook/North Suburban Unit 1699 Wall St., Ste. 500, Mt. Prospect, IL 60056 _____ (847) 437-6449
Cook/South Suburban Unit 5527 Miller Circle Dr, Ste A, Matteson, IL 60443 _____ (708) 720-7500
Crawford County Commecium Bldg, 301 S Cross St, Ste 290, Robinson, IL 62454 _____ (618) 546-1549
DeKalb County 1350 W Prairie Dr, Sycamore, IL 60178-3166 _____ (815) 758-8194
DeWitt County PO Box 347, Clinton, IL 61727 _____ (217) 935-5764
DuPage County 310 S County Farm Rd, Ste C, Wheaton, IL 60187 _____ (630) 653-4114
Edgar County 210 W Washington, Paris, IL 61944 _____ (217) 465-8585

Edwards/Wabash Unit

(Edwards County) 350 N Seventh, Albion, IL 62806 _____ (618) 445-2934
(Wabash County) 15039 Four H Ctr Lane, Mt Carmel, IL 62863 _____ (618) 262-5725
Effingham County 1209 Wenthe Dr, Effingham, IL 62401 _____ (217) 347-7773
Ford/Iroquois Unit 912 W Seminary Ave, PO Box 163, Onarga, IL 60955-0163 _____ (815) 268-4051
Franklin County 1212 Rte 14, West Benton, IL 62812 _____ (618) 439-3178
Fulton County 15411 N, IL 100 Hwy, Ste C, Lewistown, IL 61542 _____ (309) 547-3711

Gallatin/Pope-Hardin/Saline Unit

(Gallatin County) 450 N Lincoln Blvd E, PO Box 256, Shawneetown, IL 62984 _____ (618) 269-3049
(Saline County) 34 Veterans Dr, Ste D, P.O. Box 467, Harrisburg, IL 62946 _____ (618) 252-8391
Greene County RR 3, Box 129C, Carrollton, IL 62016 _____ (217) 942-6996
Grundy County 1802 N Division St, Ste 604, Morris, IL 60450 _____ (815) 942-2725

Hamilton/Wayne/White Unit

(Hamilton County) Courthouse Basement, 100 S Jackson, McLeansboro, IL 62859 _____ (618) 643-3416
(Wayne County) 2-B Frontier Dr, Fairfield, IL 62837 _____ (618) 842-3702
(White County) 1715 College Ave, Carmi, IL 62821 _____ (618) 382-2662
Hancock County 550 N Madison St, Carthage, IL 62321 _____ (217) 357-2150

Henderson/Mercer/Warren Unit

(Henderson County) 410 E Main, PO Box 540, Stronghurst, IL 61480 _____ (309) 924-1163
 (Mercer County) 702 SE 3rd St, Aledo, IL 61231 _____ (309) 582-5106
 (Warren County) 1000 N Main, PO Box 227, Monmouth, IL 61462-0227 _____ (309) 734-5161
 Henry/Stark Unit 26234 N 100 Ave, Bldg 4, PO Box 74, Galva, IL 61434 _____ 309) 853-1533
 Jackson County 402 Ava Rd, Murphysboro, IL 62966 _____ (618) 687-1727
 Jasper/Cumberland Unit
 (Cumberland County) 130 Courthouse Square, PO Box 218, Toledo, IL 62468 _____ (217) 849-3931
 (Jasper County) 1401 Clayton, PO Box 31, Newton, IL 62448 _____ (618) 783-2521
 Jefferson County 4618 Broadway Mt Vernon, IL 62864 _____ (618) 242-0780
 JoDaviess/Carroll Unit
 (Carroll County) 807D S Clay St, Mt Carroll, IL 61053 _____ (815) 244-9444
 (JoDaviess County) 204 Vine St, PO Box 600, Elizabeth, IL 61028 _____ (815) 858-2273
 Kane County 535 S Randall Road, St Charles, IL 60174-1591 _____ (630) 584-6166
 Kankakee County 1650 Commerce Dr, Bourbonnais, IL 60914 _____ (815) 933-8337
 Kendall County 7775B Illinois Rte 47, Yorkville, IL 60560 _____ (630) 553-5823
 Knox County 180 S Soangetaha Rd, Ste 108, Galesburg, IL 61401 _____ (309) 342-5108
 Lake County 100 S US Highway 45, Grayslake, IL 60030 _____ (847) 223-8627
 LaSalle County 1689 N 31st Rd, Ste 2, Ottawa, IL 61350 _____ (815) 433-0707
 Lawrence/Richland Unit
 (Lawrence County) 600 Cherry Lane, P.O. Box 657, Lawrenceville, IL 62439 _____ (618) 943-5018
 (Richland County) 306 S Fair, PO Box 130, Olney, IL 62450 _____ (618) 395-2191
 Lee County 280 W Wasson Road, Amboy, IL 61310 _____ (815) 857-3525
 Livingston County 1412 S Locust St, Pontiac, IL 61764 _____ (815) 842-1776
 Logan County 980 N Postville Dr, Lincoln, IL 62656 _____ (217) 732-8289
 Macon County 2535 Millikin Pkwy, Decatur, IL 62526 _____ (217) 877-6042
 Macoupin County 210 N Broad St, Carlinville, IL 62626 _____ (217) 854-9604
 Madison/St Clair Unit
 (Madison County) 900 Hillsboro, Box 427, Edwardsville, IL 62025 _____ (618) 692-7700
 (St. Clair County) 1 S 3rd St, PO Box 405, Belleville, IL 62222-0405 _____ (618) 236-8600
 Marion County 1404 E Main Rt 50, East Salem, IL 62881 _____ (618) 548-1446
 Marshall/Putnam Unit 327 Edward St, Henry, IL 61537 _____ (309) 364-2356
 Mason County 133 S High, PO Box 170, Havana, IL 62644 _____ (309) 543-3308
 McDonough County 3022 W Jackson St, Macomb, IL 61455 _____ (309) 837-3939
 McHenry County 1102 McConnell Rd., PO Box 1430, Woodstock, IL 60098 _____ (815) 338-4747
 McLean County 402 N Hershey Rd, Bloomington, IL 61704 _____ (309) 663-8306
 Monroe County 901 Illinois Ave, PO Box 117, Waterloo, IL 62298 _____ (618) 939-3434
 Montgomery County 1 Industrial Park Dr, Hillsboro, IL 62049 _____ (217) 532-3941
 Morgan/Scott Unit
 (Morgan County) 104 N Westgate Ave, Jacksonville, IL 62650 _____ (217) 243-7424
 (SCott County) 401 N Walnut, Winchester, IL 62694 _____ (217) 742-9572
 Moultrie/Douglas Unit 122 S Walnut St, Arthur, IL 61911 _____ (217) 543-3755
 Ogle County 421 W Pines Rd, Ste 10, Oregon, IL 61061 _____ (815) 732-2191
 Peoria County 4810 N. Sheridan Road, Peoria, IL 61614 _____ (309) 685-3140
 Perry County Room 110, 3764 State Rte 13/127, Pinckneyville, IL 62274 _____ (618) 357-2126
 Piatt County 210 S Market St, Monticello, IL 61856 _____ (217) 762-2191
 Pike County 1301 E Washington, Pittsfield, IL 62363 _____ (217) 285-5543
 Randolph County 313 W Belmont St, Sparta, IL 62286-1708 _____ (618) 443-4364
 Rock Island County 4550 Kennedy Dr, Ste 3, East, Moline, IL 61244 _____ (309) 796-0512
 Sangamon/Menard Unit
 (Menard County) 420 S 7th St, PO Box 138, Petersburg, IL 62675 _____ (217) 632-7491
 (Sangamon County) PO Box 8467, Springfield, IL 62791 _____ (217) 782-4617
 Shelby County 1125 W North 2nd, Shelbyville, IL 62565 _____ (217) 774-9546
 Stephenson County Highland Comm. Col., 2998 W Pearl City Rd, Bldg R, Freeport, IL 61032 _____ (815) 235-4125
 Tazewell County 1505 Valle Vista, Pekin, IL 1554 _____ (309) 347-6614
 Vermilion County 25 E Liberty Ln Ste A, Danville, IL 61832 _____ (217) 442-8615
 Washington County 9623 Wall St Nashville, IL 62263 _____ (618) 327-8881
 Whiteside County 100 E Knox, Morrison, IL 61270 _____ (815) 772-4075

Will County 100 Manhattan Rd, Joliet, IL 60433 _____ (815) 727-9296
Williamson County 1306 N Atchison Ave, Ste A, Marion, IL 62959 _____ (618) 993-3304
Winnebago County 4311 W State St, Rockford, IL 61102 _____ (815) 987-7379
Woodford County 117 West Ctr, PO Box 162, Eureka, IL 61530 _____ (309) 467-3789

SAMPLING COMMITTEE ACTION PLAN

I. Who Will Test Samples for the Presence of Soybean Rust?

The soybean rust pathogen is on the U.S. Select Agent list produced by the U.S. Dept. of Homeland Security. This rust pathogen cannot be transported across state lines without the appropriate permit. Testing of suspect soybean rust plant material should be done within the state of Illinois.

The Plant Clinic at the University of Illinois has been designated as a triage lab for soybean rust sampling by the National Plant Diagnostic Network (www.npdn.org). The clinic director (Nancy Pataky) has participated in training to identify the soybean rust pathogens at an NPDN Asian soybean rust diagnostic training session in Ft. Dietrick, Maryland (Spring, 2003). She also participated in a PCR technique workshop for soybean rust identification in Beltsville, Maryland (Winter, 2004). The University of Illinois Plant Clinic served as the expert lab in a January, 2004 soybean rust release scenario. The purpose of the scenario was to work through communications protocols from sample submission to confirmation of a soybean rust molecular analysis using PCR. The bi-state scenario involved Illinois and Iowa and included the state plant regulatory officer (SPRO) and state plant health director (SPHD) from Illinois as well as university and USDA specialists. All of these experiences point to the University of Illinois Plant Clinic as the primary diagnostic lab for soybean rust unknowns in Illinois.

II. Where Should samples be Sent for Testing?

To avoid overloading the Plant Clinic with soybean rust suspect samples, the U of I Extension DDDI labs will act as a pre-screening/triage lab. The list of U of I Extension DDDI (distance diagnostic digital imaging) Labs is attached. However, if samples are sent directly to the U of I Plant Clinic please phone before sending or delivering such samples. The University of Illinois Plant Clinic telephone number is 217-333-0519. The address is:

Plant Clinic
1401 W. St. Mary's Rd.
Urbana, IL 61802

For those wishing to hand deliver samples, the clinic location map is available at <http://plantclinic.cropsci.uiuc.edu/>. A plant clinic specimen data form should accompany any plant sample submitted to the Plant Clinic. The data form is available at the clinic web site or local extension offices throughout Illinois.

III. How Will Samples be Tested for Soybean Rust?

Plant samples will be examined for rust pustules with the aid of a dissecting microscope. Suspect pustules will be sectioned and examined with a compound microscope for the presence of rust spores. University of Illinois and USDA plant pathology specialists may be called to examine suspect positives. The Plant Clinic microscope-mounted, web-based, live, video camera may then be used to communicate directly with APHIS, PPQ staff in Beltsville, Maryland. If the sample remains a soybean rust infected suspect after this initial examination, then tissue will be sent to APHIS, PPQ specialists with appropriate PPQ forms for PCR testing. Molecular testing with PCR is a relatively quick method of positive identification of rust to the species level. It is a definitive way to identify *Phakopsora pachyrhizi*. APHIS PPQ specialists have been designated as the final determinants of an initial soybean rust find in a state. Should soybean rust be confirmed in Illinois, subsequent samples may be tested using the molecular testing PCR technique at the NPDN regional expert lab in East Lansing, Michigan.

IV. How To Prepare a Sample

Soybean rust may appear on any above-ground soybean plant part. The leaves are the easiest to work with in the lab and comprise the typical suspect sample submitted. Ideally samples should include about 20 leaves, flat, dry, and between dry paper toweling. They should be packaged in two layers of zip lock plastic bags. The bags should be clearly labeled with a permanent marker providing: date, host plant, collector's name, phone #, collection location within the field, location of the field, county, township & section, and nearest intersection. GPS information is helpful if available. If the sample is mailed, the seams of the box must be taped shut. It is best to keep the sample refrigerated or on ice until it arrives at the testing lab.

V. Payment for Samples

When a sample is sent through the U of I Extension DDDI Lab, the fee will be paid by a third party. When a sample is sent directly to the U of I Plant Clinic without first being tested by the U of I Extension DDDI Lab, the fee of \$12.50/sample must be paid by the sample submitting entity. The University of Illinois Plant Clinic requires a payment of \$12.50 per sample at the time a sample is submitted. Checks should be made payable to the University of Illinois. Samples sent to APHIS PPQ specialists for PCR testing may or may not require additional payment. Illinois APHIS officials are currently trying to request funds through the NAPIS program to possibly cover the expense of some testing. At this point we encourage testing but ask that individuals contact the Plant Clinic before sending samples so that samples can be screened and so that payment plans can be negotiated.

VI. Special Confidentiality Note

It must be noted that when a positive soybean rust case is found in Illinois, the official announcement will be made by the Director of Agriculture or his designate. This person will be able to provide resources and answer questions that will surely follow. The Plant Clinic staff will not release results of soybean rust testing and cannot make an announcement directly. National protocol prohibits release of such information until a positive has been confirmed through APHIS PPQ.

Note: Please complete this **entire** form before submitting specimen(s). This will ensure more timely and accurate diagnosis.

Plant Clinic
1401 W. St. Mary's Road
University of Illinois
Urbana, IL 61802
(217)333-0519

PLANT CLINIC SPECIMEN DATA FORM

Plant Clinic No. _____

Date Received _____

County _____

Submitted by _____

Respond to: _____

Grower _____

Address _____

Commercial _____ Home Grower _____ Consultant _____

Crop or Plant _____ Variety _____

Phone _____ E-mail _____

Appearance of Plant Parts:

Roots: normal _____ poor growth _____ galls or swellings _____ discolored _____ rotted or decayed _____ other _____

Stem, trunk, or branches: normal _____ poor growth _____ galls or swellings _____ cankered _____ external discoloration _____
top dieback _____ cracked _____ rotted or decayed _____ other _____

Leaves: normal _____ abnormal growth _____ galls or swellings _____ wilted _____ falling prematurely _____
spotted or blighted _____ yellowed _____ mottled _____ rotted _____ shotholed _____ other _____

Fruit or flowers: normal _____ abnormal growth _____ spotted _____ rotted _____ mottled _____ other _____

Condition Appears: Serious _____ Potentially serious _____ Minor _____

Distribution: scattered plants _____ Groups of plants _____ Most planting _____ In low areas _____ Slopes _____
No association with terrain _____ Other _____

Symptoms Appeared in Past: _____ days; _____ weeks; _____ months

Conditions Prior to Symptom Development: Temperature Range _____ Rainfall Amount _____ Humidity _____
Storms with high winds _____ Hail _____ Blowing soil _____ Lightning _____

Soil Type or Mix: _____ Organic matter _____% pH _____

Planting History: Crop two years previous _____ One year previous _____

Year current crop last planted in this area _____ Did problem occur previously? _____

Tillage History: _____

Soil Test Information _____ Type of nitrogen used _____

Chemicals Applied This Year: Fertilizer _____

Herbicide(s) & rates _____ Type of application _____

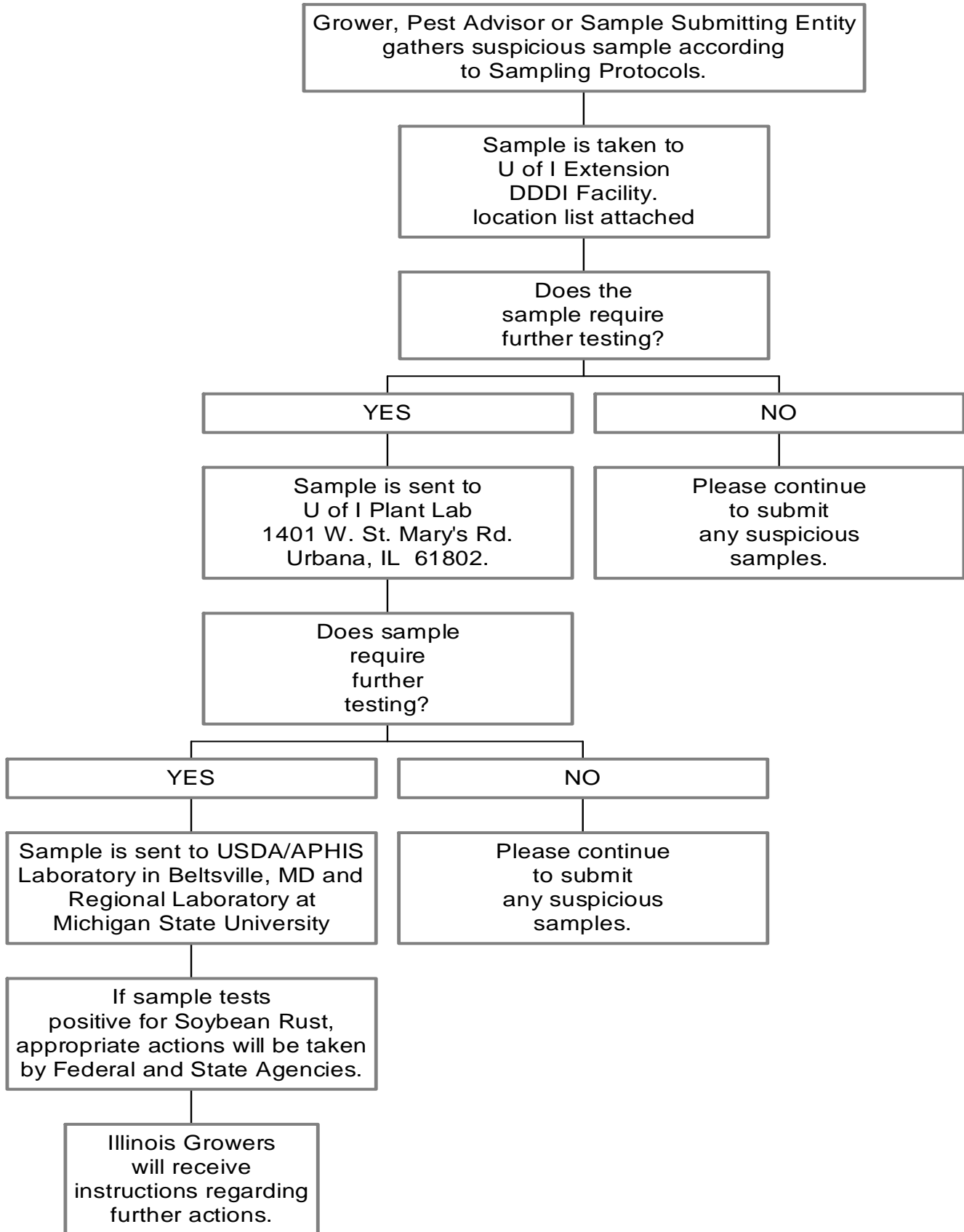
Herbicide(s) previous year _____ Insecticide(s) _____

Fungicide(s) _____ Nematicide(s) _____

SUSPECTED PROBLEM AND COMMENTS:

Do Not Write Below This Line

Soybean Rust Sample Submission Flow Chart



Sample Submission Action Plan

Step 1 – Grower, Pest Advisor or other Sample Submitting Entity brings sample to U of I extension DDDI (Distance Diagnostic Digital Imaging) location. (attached list gives all locations and contact information)

Note: any Sample Submitting Entity may submit samples directly to the U of I Plant Lab. However, the individual or group submitting the sample must then pay the sample processing charge of \$12.50/sample. If the sample is submitted through the U of I Extension DDDI Unit, the fee will be paid by a third party.

Step 2 – DDDI staff acknowledges receipt and enter sample into system assigning a unique lab ID number to the sample.

Step 2a – DDDI staff examines and takes digital images.

Step 2b – Images are downloaded onto the system for diagnosis by a qualified plant pathologist.

Step 2c – The diagnostician will contact submitting lab staff with initial diagnosis and recommendation for further testing. If sample needs further testing, skip to step 4.

Step 3 – When sample is found to be negative for soybean rust and needs no further analysis, the DDDI staff will explain what was found, why it has not been identified for SBR, and why it is important for the person who submitted the sample to continue to submit suspicious plant samples.

Step 4 – When a sample is found to need further analysis, the DDDI lab staff must package the sample following the protocol outlined in the Sampling Plan. Once packaged as described, the sample is double bagged in zip-able bags and sealed in a box with tape. Sample submission slip must be included in the box. The sample can be either hand delivered to the U of I Plant Lab or sent OVERNIGHT through a delivery service. (same day hand delivery is preferred)

Step 5 – When the sample arrives at the U of I plant lab for diagnosis, it will be checked into the system using the sample number assigned at the DDDI location.

Step 5a – Diagnosis will be made by expert lab personnel.

Step 5b – If the samples check positive for SBR, continue to step 6.

Step 5c – If the sample does not contain SBR, plant lab personnel will call the submitting DDDI lab and report finding. DDDI personnel will then follow the instruction in **Step 3**.

Step 6 – Upon finding a sample that is thought to have SBR, the U of I Plant Lab staff divides the sample and sends to both the NPDN Expert Lab and the APHIS Confirming Diagnosis Designate for diagnosis, unless the Designate indicates to the U of I Plant Lab to send only to one of the two entities.

Step 6a – The U of I Plant Lab personnel will package the samples as described in the Sampling Plan and send to the appropriate location(s).

Step 6b – The U of I Plant Lab informs Expert Lab and APHIS Diagnosis Designate of sample shipment time and delivery method, including tracking number and sample number.

Step 7 – Nancy Pataky of the U of I Plant Lab will make the appropriate phone calls.

Step 7a – Dave McKay, the APHIS SPHD, will be contacted and informed of the suspect sample being entered into the system.

Step 7b – Mark Cinnamon, the IL SPRO, will be contacted and informed of the suspect sample being entered into the system. Mark Cinnamon will initiate the Illinois Primary Response Call List.

Step 8 – Illinois Primary Response Call List members will meet regarding what steps will be taken in the event of a positive identification for SBR.

FUNGICIDE COMMITTEE ACTION PLAN

According to a paper by Miles, Hartman and Frederick from USDA-ARS, *Managing Soybean Rust: Host Resistance and Chemical Control*, three fungicides are registered for use on soybean, labeled for soybean rust and are commercially available. These fungicides are Quadris[®], Bravo[®], Echo[®]. In late 2004, Headline[®] also was registered as a soybean rust fungicide. Quadris contains the active ingredient azoxystrobin while Bravo and Echo both contain the active ingredient chlorothalonil. Headline contains the active ingredient pyraclostrobin. Bravo and Echo also are available in more than one formulation. All products are registered with the Illinois Department of Agriculture (IDA) for use in the state. See Table 1 for information regarding these products. Other products may contain the above-mentioned active ingredients, or other active ingredients, but do not have soybeans or soybean rust listed on their labels. In order to be in compliance with the laws and regulations, products must be properly registered with the U.S. Environmental Protection Agency (USEPA) and the IDA and their labels must include the intended use – in this case to treat for soybean rust on soybeans.

In anticipation of limited supplies of existing products, possibly less than desirable efficacy against soybean rust for some of the above-mentioned fungicides, and the need for a wider array of treatment products, a Section 18 emergency exemption approval application has been submitted to the USEPA for approval of the use of additional products involving seven different active ingredients or combinations of active ingredients. See Table 2 for information regarding these products. At the time of submittal of the section 18 application to USEPA, soybean rust had not been detected in the U.S. Therefore, a restriction was placed on any section 18-approved product: “The use of the Section 18-approved products will not be allowed until soybean rust is confirmed by the U.S. Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS) in the United States.” Since soybean rust was confirmed in Louisiana in November 2004, application of the products will be allowed following the approval of the Section 18 exemption by USEPA. The section 18 submittal requested approval of up to two applications of the section 18 fungicides on all of the acres planted to soybeans in Illinois. Treatments are to be made from reproductive stages R-1 to R-6 (beginning bloom to full seed). Pre-harvest intervals must be observed for the various products that may be applied. USEPA must approve the emergency use of the requested products through the granting of an exemption under the provisions of section 18 of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

Fungicide Application Scenarios*

Scenario A: Disease Expected

A. Disease Expected not yet present

- a) Benzonitrile (Bravo, Echo, protectants) application; OR Pyraclostrobin + Boscalid (Pristine, a protectant); OR Propiconazole + Trifloxystrobin (Stratego, a curative & protectant)

A2. Disease still imminent but now need a 2nd spray

- a) Triazole application (Propiconazole, Myclobutanil, Tebuconazole, Tetraconazole, curatives)

Scenario B: Disease Expected & Disease develops after initial application

B. Disease Expected not yet present

- a) Strobilurin application Azoxystrobin (Quadris, protectant), or Pyraclostrobin (Headline, protectant); OR Benzonitrile application (Bravo, Echo, protectants)

B2. Disease still imminent or now present and now need a 2nd spray

- b) Triazole application (Propiconazole, Myclobutanil, Tebuconazole, Tetraconazole, curatives)

B3. Disease still present or imminent and 3rd spray needed

- c) Benzonitrile (Bravo, Echo, protectants) application if PHI allows; OR Triazole application (Propiconazole, Myclobutanil, Tebuconazole, Tetraconazole, curatives)

*NOTE: Protectant Fungicides (Strobilurin and Benzonitriles); apply prior to infection. Strobilurins lose effectiveness after 3-5% rust severity.

Curative Fungicides (triazoles); apply when rust is present. After 10% severity triazoles may not provide full yield protection.

Section 18 Fungicides: Do not make more than 2 total applications of section 18 products within a season.

Intended for informational purposes only, not product endorsement.

If the disease is discovered in the state, additional pesticide applicators may be needed to apply fungicides. The Illinois Department of Agriculture will make every attempt to promptly license individuals requesting a pesticide applicator's license. Provisions within the Illinois Pesticide Act require the training, certification and licensure of pesticide applicators in this state. To become certified, an applicator must successfully complete one or more examinations covering various aspects of pesticides and their safe application. Department of Agriculture staff will attempt to schedule and conduct special testing sessions at airports or other non-traditional locations for non-certified aerial pesticide applicators entering Illinois to assist with pesticide applications to control soybean rust. Such testing sessions will be scheduled on an as-needed/requested basis, considering available staff and budgetary resources.

“Applying pesticides for another” issue – Pursuant to the Illinois Pesticide Act [415 ILCS 60/4. 7. B.], a “Private [pesticide] applicator” means a certified applicator who purchases, uses, or supervises the use of any pesticide classified for restricted use, for the purpose of producing any agricultural commodity on property owned, rented, or otherwise controlled by

him or his employer, or applied to other property if done without compensation other than trading of personal services between no more than 2 producers of agricultural commodities. Thus, a person currently licensed by the Illinois Department of Agriculture as a private applicator may apply a restricted use pesticide to the property of up to two other agricultural commodity producers if they receive no compensation other than the trading of personal services. Specific questions regarding this or any other pesticide licensing issue should be directed to the Illinois Department of Agriculture's Bureau of Environmental Programs at (217) 785-2427.

“Aerial applicator licensing reciprocity” issue – An individual can become licensed to commercially apply pesticides in Illinois by successfully completing a competency examination and submitting an application to the Illinois Department of Agriculture. Individuals already holding a valid pesticide applicator's license issued by another state (must be their state of residency) may meet the Illinois examination requirement through reciprocity, depending on the specific examination requirements of their state of residency. If the individual has successfully completed appropriate examination(s) in their state of residency during the last three years, Illinois will accept that exam in lieu of an Illinois exam. However, the individual must still apply for (including the payment of applicable fees) and receive an Illinois license to legally make pesticide applications in this state. Interested individuals are instructed to contact the Illinois Department of Agriculture's Bureau of Environmental Programs at (217) 785-2427 for specific details and appropriate forms.

Regulations adopted under authorities granted in the Illinois Pesticide Act require state approval for the construction and use of operational and secondary containment structures and systems at agrichemical facilities where 300 gallons or more of liquid pesticide or 300 pounds or more of dry bulk pesticides are mixed or transferred. If soybean rust is discovered in Illinois, numerous out-of-state aerial pesticide applicators are expected to come to Illinois to assist in the pesticide application efforts. Considering the number of acres that may require treatment, it can be assumed that applicators will exceed the containment requirement threshold at every loading site. The Department does not have statutory authority to grant a waiver to the containment requirements. The Department believes that the best approach to containment compliance would be for non-Illinois based aerial applicators to align themselves with existing state-licensed aerial applicators and operate from existing airport/landing strip containment facilities that have already been permitted and built. A second option would be for non-Illinois applicators to utilize portable containment systems that would meet the environmental protection requirements of the regulation and would not be as economically burdensome as permanent systems. The Department will make applicators aware of these two options whenever and wherever possible.

The listing of any product within this report implies no guarantee, warranty, or endorsement. The use of brand names does not imply approval of any product to the exclusion of others that may also be suitable for use.

Table 1. Fungicides currently registered in Illinois for use on soybeans to aid in the control of soybean rust.

Trade Name	Chemical Name (active ingredient)	EPA Reg. No.	Use Classification*	Registrant
Quadris®	Azoxystrobin	100-1098	General	Syngenta Crop Protection, Inc Greensboro, NC 27419
Bravo Weather Stik®	Chlorothalonil	50534-188-100	General	Syngenta Crop Protection, Inc Greensboro, NC 27419
Bravo Ultrex®	Chlorothalonil	50534-201-100	General	Syngenta Crop Protection, Inc Greensboro, NC 27419
Echo® 720	Chlorothalonil	60063-7	General	Sipcam Agro USA, Inc. Roswell, GA 30076
Echo® 90DF	Chlorothalonil	60063-10	General	Sipcam Agro USA, Inc. Roswell, GA 30076
Echo® Zn	Chlorothalonil	60063-4	General	Sipcam Agro USA, Inc. Roswell, GA 30076
Headline®	Pyraclostrobin	7969-186	General	BASF Corporation Research Triangle Park, NC

* General use means the product is not a restricted use pesticide (RUP).

Table 2. Fungicides for which a Section 18 emergency exemption for Illinois has been approved by USEPA to aid in the control of soybean rust. To view the Section 18 label for the fungicide, click on the trade name of the product.

USEPA and the State of Illinois have approved the use of a maximum of 3 total applications using approved section 18 products collectively, as long as no more than 2 applications are made with any given active ingredient. This applies to all the section 18 products listed below, with the exception of Domark. Only one application per year involving Domark may be made.

Trade Name	Chemical Name (active ingredient)	Formulation	EPA Reg. No. †	Use Classification*	Registrant
Tilt®	Propiconazole	3.6EC	100-617	General	Syngenta Crop Protection, Inc Greensboro, NC 27419
PropiMax™	Propiconazole	3.6EC	62719-346	General	Dow AgroSciences, LLC Indianapolis, IN 46268
Bumper®	Propiconazole	41.8EC	66222-42	General	Makhteshim-Agan Raleigh, NC 27609
Folicur®	Tebuconazole	3.6F	3125-394 or 264-752	General	Bayer CropScience Research Triangle Park, NC 27709
Orius	Tebuconazole	3.6F	264-752- 66222	General	Makhteshim-Agan Raleigh, NC 27609
Uppercut™	Tebuconazole		264-752-352	General	DuPont Crop Protection Newark, DE
Laredo™ EC	Myclobutanil	25EC	62719-412	General	Dow AgroSciences, LLC Indianapolis, IN 46268
Laredo™ EW	Myclobutanil	25EW	62719-493	General	Dow AgroSciences, LLC Indianapolis, IN 46268
Stratego®	Propiconazole + Trifloxystrobin	2.08F	264-779 or 3125-562	General	Bayer CropScience Research Triangle Park, NC 27709
Domark	Tetraconazole	230ME		General	ISAGRO USA Morrisville, NC 27560
Quilt™	Azoxystrobin + Propiconazole	1.66EC	100-1178	General	Syngenta Crop Protection, Inc Greensboro, NC 27419
Headline® SBR	Tebuconazole + Pyraclostrobin	Co- Pack		General	BASF Corporation Research Triangle Park, NC 27709
Alto®	Cyproconazole	100SL		General	Syngenta Crop Protection, Inc Greensboro, NC 27419

† Although a Section 18 product is exempt from U.S. EPA registration due to the emergency condition, the Section 3 EPA registration number of the product registered for other uses is provided for reference information.

* General use means the product is not a restricted use pesticide (RUP).

** Section 18-approved products are current as of April 25, 2006.

MEDIA COMMITTEE ACTION PLAN

Purpose: to develop a mechanism for members of the Soybean Rust Media Planning Committee to exchange important information in the event Soybean Rust (SBR) is suspected or detected in the United States.

The intent of the plan is to share information. This will help ensure an accurate and unified message is presented when members answer questions from the press and disseminate information to constituents. It is not designed to manage the crisis itself. In other words, the plan is not a mechanism for public and private officials to determine the best course of action to control the disease. However, the decisions these officials make should be included in the information that is shared when the media plan is activated.

Outline:

I. Prep plan

A. SBR Plan press release

- i. To be distributed to media throughout the state on or about May 15 and emphasize awareness of the potential rust problem as well as an active plan for its detection and eradication.*

B. Chemical Approval press release

- i. Upon Section 18 approval of the chemicals needed to fight or treat soybean rust, a release will be distributed statewide.*

C. Planning Committee press releases

- i. As the SBR Plan evolves, releases updating the public about the progress of the four planning committees will be issued.*

D. Agency press releases

- i. Agencies will be responsible for writing and sending press releases announcing their own soybean rust-related programs or community outreach. As a courtesy, these releases should be sent to members of the Media Planning Committee.*

II. Crisis Communications Plan

A. How to share information

- i. Information shall be shared with committee members or their representatives through a conference call. The member activating the plan is responsible for scheduling the conference call and notifying fellow members of the arrangements. If the member activating the plan is not able to make arrangements, the conference call can be set-up through the Illinois Department of Agriculture by calling the Office of Public Information at (217) 785-9272. The member activating the plan is encouraged to share as much detail as possible about the suspected or confirmed case of soybean rust, as well as information about the message that will be communicated to the public. Members then will discuss how to best execute the message. **By participating in a conference call, each member agrees to protect any and all information deemed confidential by the member providing that information.****

Soybean Rust Media Planning Committee			
Name	Organization	E-mail address	Phone number
Jeff Squibb	Ill. Dept. of Agriculture	jsquibb@agr.state.il.us	(217) 782-4712
Chris Herbert	Ill. Dept. of Agriculture	cherbert@agr.state.il.us	(217) 557-5678
Lyle Roberts	Illinois Soybean Assoc.	robertsl@ilsoy.org	(309) 663-7692
Ed Mies	Illinois Soybean Assoc.	jmies@hotmail.com	(217) 435-7091
Todd Gleason	University of Illinois	tgleason@uiuc.edu	(217) 333-9697

B. When to share information

- i.* In determining whether to activate the crisis communications plan, the primary guiding factor should be known or anticipated media interest. Anytime media coverage of a soybean rust emergency --- defined as either a confirmed or *suspected* case of the disease --- is known or anticipated, notification of members shall take place. Practically, this means the earliest point at which notification might take place is when either a rumor spreads that the disease is present in the United States or a sample has been sent to a laboratory for testing **and** a media inquiry is received. The latest point at which notification should take place is upon confirmation of the United States' initial soybean rust case.

1. When soybean rust is confirmed

- a.** Confirmation of soybean rust will come from Plant Protection and Quarantine's national mycologist (PPQ is affiliated with the Animal and Plant Health Inspection Service, a branch of the United States Department of Agriculture). After the disease is confirmed, PPQ and APHIS's Legislative and Public Affairs (LPA) staff will communicate the detection.
- b.** LPA and CSREES (Cooperative State Research, Education and Extension Service) will coordinate with the affected state and the American Soybean Association to prepare a press release announcing the detection of soybean rust.
- i.** LPA and CSREES will distribute the press release and coordinate answers to reporters' questions.
- ii.** PPQ will post the release on its website and staff a toll-free hotline to answer questions.
- c.** CSREES will hold evening public meetings to address issues and concerns in the area where soybean rust is found.
- d.** CSREES, LPA and state public affairs officials will be available to the media.

- e. The Media Planning Committee most likely will issue a supplementary press release that reminds farmers and interest groups of the Illinois Soybean Rust Plan. The release will emphasize Illinois' preparedness and review the specific steps that either have or will be taken to control the disease.

C. Where to share information

- i. Committee members are encouraged --- especially when the crisis communications plan has been activated --- to share soybean rust press releases with the Illinois Soybean Association for posting on its soybean rust web page, which shall act as a clearinghouse for information on the disease.

D. What information to share

- i. Personal information will not be released without consent. Therefore, if asked about a case of soybean rust, only a location identification will be provided, unless the farm operator has no objections. For example, committee members might confirm rust has been found in "Sangamon County," but would not release the fact the positive sample was collected on the "John Smith" farm without his consent.

III. Chain of Command

To ensure accurate and unified information, we ask that only the Committee Chairperson comment on his or her committee's plan to the press or public about the Illinois Soybean Rust Program. If other members of a committee are asked about the Illinois Soybean Rust Program, inquiries should be directed to the committee chairperson or to the Media Chairperson at the Illinois Department of Agriculture. It is not being suggested that it is inappropriate to speak with the press or public about soybean rust, but when asked about the Illinois Soybean Rust Program specifically, it is important to direct questions to those who are the most knowledgeable about the program to avoid misinformation

RESEARCH

Host resistance. In cooperation with the USDA-ARS Foreign Disease-Weed Science Research Unit (FDWSRU) at Ft. Detrick and support from the United Soybean Board, part of the research focus has been to identify resistant germplasm and evaluate fungicide efficacy. There are over 16,000 soybean accessions in the USDA Germplasm Collection located at the University of Illinois. These soybean accessions are being evaluated for resistance to *P. pachyrhizi* in the USDA-ARS FDWSRU Biosafety Level 3 Containment Greenhouses, along with commercial and public cultivars grown in the U.S. The germplasm evaluations are done on seedlings using a mixture of isolates from Africa, Asia and South America. From the 16,00 soybean accessions screened to date, less than 100 have been identified as having some level of resistance. None of the U.S. commercial cultivars evaluated were found to be resistant to the mixed inoculum. The soybean accessions showing some level of resistance will be further evaluated using individual isolates to detect race specific and/or partial resistance. They also will be planted in field trials in Brazil, Paraguay, China, Thailand, South Africa and Zimbabwe to be evaluated for adult plant resistance. Additionally, the 1,000 plus *G. soja* accessions will be screened along with verification of the perennial *Glycine* spp. previously reported as having resistance. As sources of resistance have been identified, crosses have been made to incorporate these resistance traits into adapted backgrounds for commercial use. This work is being done both by scientist in the private and public sector.

Fungicides. Fungicide applications will be the primary tool used to control soybean rust should it arrive in the U.S. in the near future. Our current research is designed to answer some of the questions raised about fungicide application and efficacy on soybean. The first question to be addressed is which fungicides, among those that could be or are already registered for use in the U.S., are effective in controlling soybean rust. To answer this question a multi-location efficacy trial has been established to evaluate 17 fungicides in a replicated trial where two vs. three applications were compared. The second question to be addressed involves improving the methods of fungicide application. A multi-state project, funded by the Critical Issues Program of USDA-CSREES, to examine aerial and ground application methods is in progress. The aerial application experiment will evaluate canopy penetration using different volumes of water with two fungicides. The ground application experiment will compare canopy penetration and coverage with different application volumes and nozzle types, within and above the canopy. Both ground and aerial applications will start at flowering with additional applications at 20-day intervals. Crucial questions still remain regarding the availability of fungicides and the equipment to apply them should a severe epidemic occur in the U.S. There is a further need to determine the timing, minimum number of applications, and effective rates for each compound, as well as the economics of using fungicides on soybeans.

Control of soybean rust can be accomplished through utilization of fungicides and selection away from super susceptible cultivars. Partial resistance or tolerance may be the most effective resistance strategies, especially when combined with stacked single genes or single genes with broad resistance. The scenario that is playing out now in Brazil will provide information needed to develop effective control strategies before the pathogen arrives in the continental U.S. Each season without the introduction of the disease into the U.S. allows for additional fungicides to be evaluated and registered, application methods to be improved, and provides time for the incorporation of resistance and/or tolerance into commercial germplasm.

Source primarily from: Miles, M.R., R.D. Frederick, and G.L. Hartman. 2003. Soybean rust: Is the U.S. crop at risk? <http://www.apsnet.org/online/feature/rust/>

STAKEHOLDERS

The Illinois Soybean Checkoff Board has developed a stakeholder list of over 1,000 names of individuals, businesses and groups involved in agriculture that would be affected if and when soybean rust appears in Illinois or the U.S. When it is determined that the stakeholders need to be advised of current situations regarding soybean rust, the Illinois Soybean Checkoff Board will contact the stakeholders electronically (email).

SPECIAL RECOGNITION

Glen Hartman and Monte Miles have been a tremendous help in the planning of the Illinois Soybean Rust Program. The program has benefited from their knowledge and expertise in the area of soybean rust.

Organizational Chart

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