

SOYBEAN RUST MANAGEMENT IN WISCONSIN, 2005

Identification: Symptoms and signs of soybean rust vary by age of infection site, soybean variety, climatic conditions, and whether a fungicide has been applied for control. Symptoms and signs usually appear lower in the crop canopy. Soybean diseases such as brown spot, bacterial pustule, frogeye leafspot and particularly downy mildew can be confused with soybean rust.

Initial symptoms of soybean rust include formation of small, gray spots on soybean leaves, particularly on the undersides of leaves and alongside leaf veins. In the lower regions of the crop canopy where conditions are more favorable for spores to germinate and infect, spots are visible on both sides of leaves. Symptoms can also occur on petioles, stems and pods. Spots increase in size over time and change color from gray, to tan, to reddish-brown or black. As the plant canopy closes and pods begin to set, the soybean rust fungus can rapidly spread from the lower to upper foliage of plants. Chlorosis and defoliation are symptoms of advanced stages of soybean rust.

Disease Cycle: At this time there is no evidence that the soybean rust pathogen will survive through Wisconsin winters. As a result the soybean rust pathogen must be introduced into fields each year. Spores are disseminated by weather systems and are likely to be deposited into fields with rain. Environmental conditions that favor soybean rust development are long periods of leaf wetness (greater than 8 hours), high relative humidity (75-80%) and temperatures between 59°F and 86°F. Temperature above 86°F may stop or slow disease development. Spores can be produced 10 days after infection and are continually released as long as environmental conditions are favorable. Soybeans are susceptible to rust infection at all growth stages.

Scouting for rust: Early detection and a rapid response are critical to maximizing fungicide effectiveness. Scout fields frequently, concentrating on early planted fields and early maturing varieties, and in fields that are subject to prolonged dews. Start monitoring at emergence and continue weekly. Once soybean rust has been reported in a neighboring state, increase scouting frequency to twice a week. Use a hand-lens to assist with identification and concentrate efforts on lower leaves where rust symptoms are likely to show first. Check the North American Soybean Rust Alert System (www.usda.gov/soybeanrust/) frequently to track development and movement of rust in other states. You may also call the University of Wisconsin, Plant Pathogen Detection Clinic's toll free number (1-866-787-8411 or 1-866-RUST411) for a recorded message on soybean rust movement.

If you believe you have found soybean rust, select leaves representing the range of symptoms, keeping them cool until mailing and record as much field history information as possible. Place the leaves between layers of cardboard and paper towels and place in a self-sealing plastic bag prior to mailing and send to: Plant Disease Diagnostics Clinic, Department of Plant Pathology, University of Wisconsin-Madison, 1630 Linden Drive, Madison, WI 53706-1598. Telephone: 608-262-2863.

Management: Continue using proven crop management practices that provide the greatest soybean yield potential for your farm. Modifying crop management practices in the absence of rust may reduce yields and provide lower financial return to your farm. Best management practices should include timely scouting and management of soybean aphids, weeds and other diseases.

Variety Selection: It is likely that soybean varieties will differ in their susceptibility to rust. However there are currently no known varieties in the Midwest that are resistant to soybean rust.

Cultural Practices: Plant soybeans as early as practical. If soybean rust does occur, yield loss is likely to be less when rust starts at later reproductive growth stages. Cultural practices such as wider row width and reduced plant populations could potentially decrease the severity of rust by decreasing the length of time leaves remain wet. Wider row width may also be beneficial for sprayer movement in the field and better coverage of leaves throughout the crop canopy. Note: It is not known how much of an impact these methods may have on soybean rust. Growers should consider the impact of all diseases before changing cultural practices. Continue to strive for high yields using proven best management practices for your fields, including selecting varieties to combat diseases which are most yield limiting.

Fungicides: Fungicides are the only in-season control practice that is effective against soybean rust. Several fungicides are registered for soybean rust and more are likely to be granted section 18 emergency use labels in the future.

Soybean fungicides are either preventative or curative. Preventative fungicides have no curative ability and include chlorothalonil (Bravo, Echo) and strobilurins (Quadris, Headline). Curative fungicides are most effective when applied to plants with less than 10% infection in the lower canopy. Curative fungicides are the triazoles (Bumper, Domark, Folicur, Laredo, PropiMax, and Tilt). When a protectant and curative fungicide are required, premixes of a strobilurin and triazole are available (Domark 230 ME, Headline SBR, Quilt, Stratego).

Up to two fungicide applications may be necessary depending on when rust arrives and at what crop stage the first application is made. Chlorothalonil or strobilurins should only be used as the first fungicide application in a pre-infection strategy. Be sure to read and follow fungicide labels for pre-harvest intervals and spray intervals for special disease situations. Due to resistance concerns, successive applications of Strobilurins or Triazoles should be avoided.

For fungicides to be most effective, choose application techniques which promote thorough coverage of the leaves, stems and pods. Always follow label directions. Ensure adequate leaf coverage by selecting nozzles that deliver fine to medium droplets (200-350 microns) and that are designed to promote canopy penetration. Use spray pressures between 40-70 PSI and outputs over 15 gallons per acre (5 gallons per acre for aerial application).

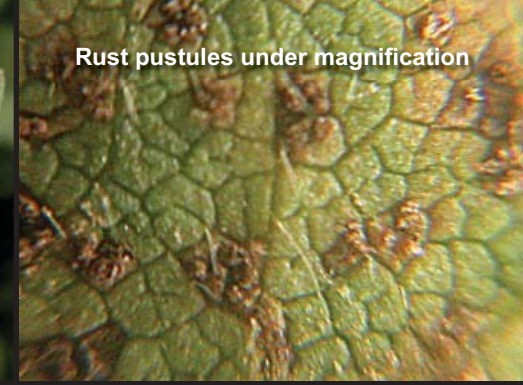
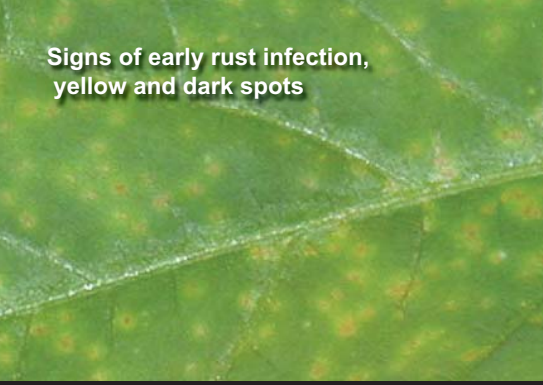
For the most recent and up-to-date soybean rust information, contact your local county extension agent and point your web browser to the University of Wisconsin Department of Plant Pathology's Soybean Health Website at <http://www.plantpath.wisc.edu/soyhealth/>

Author: Craig Grau, Professor of Plant Pathology at University of Wisconsin-Madison, in cooperation with the NPM and IPM programs. This publication is available electronically from the NPM Program's website (<http://ipcm.wisc.edu>). To order a paper copy, contact the NPM program by phone at (608)265-2660 or by email (npm@hort.wisc.edu). Before publicizing, please call for publication availability.

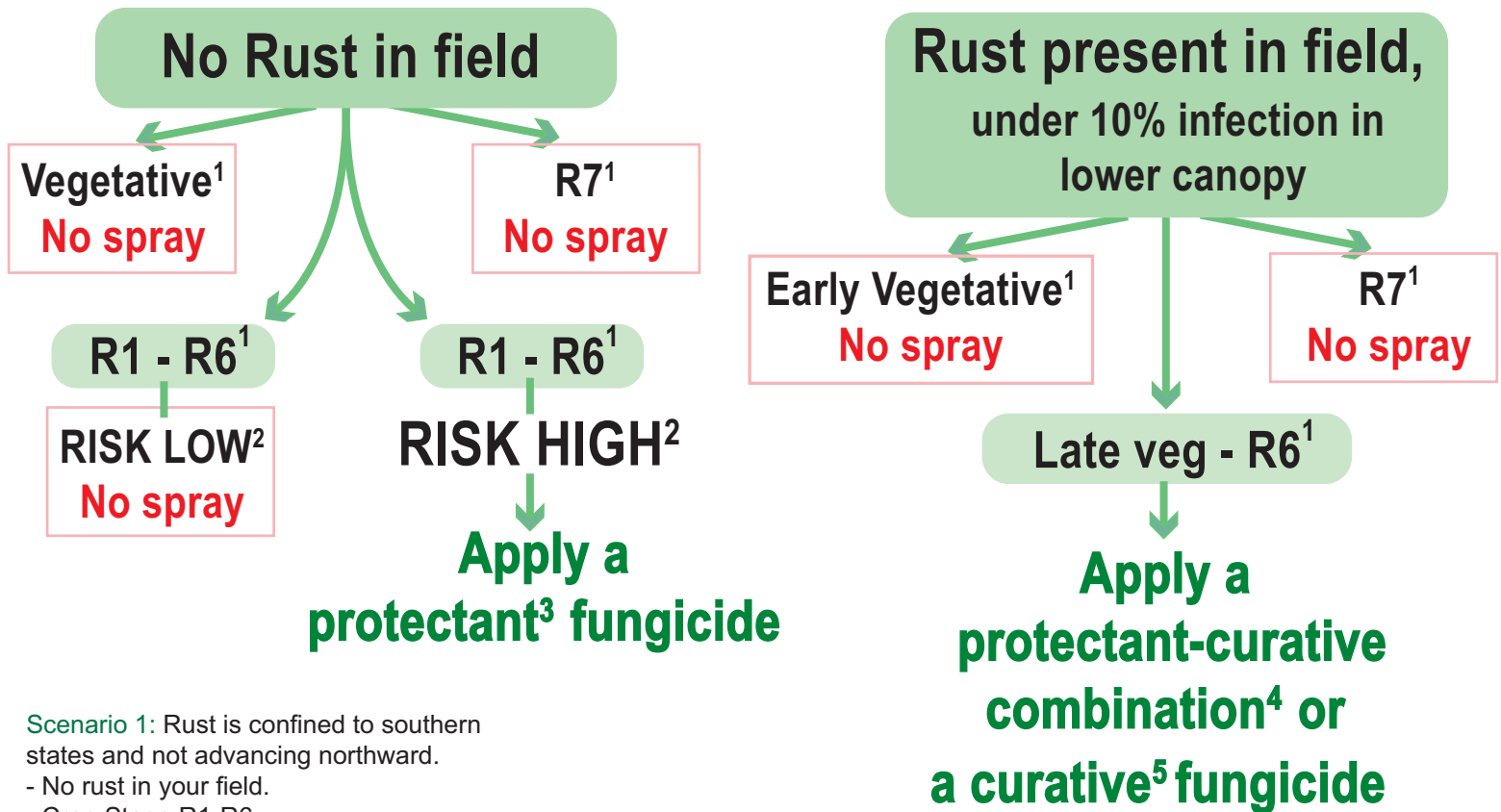
Signs of early rust infection, yellow and dark spots

Conical pustules are signs of advanced infection

Rust pustules under magnification



2005 Soybean Rust Fungicide Use Guidelines



Scenario 1: Rust is confined to southern states and not advancing northward.

- No rust in your field.
- Crop Stage R1-R6.
- Risk is LOW².
- Do not spray.

Scenario 2: Rust is advancing northward from southern states.

- No rust in your field.
- Crop Stage R1-R6.
- Risk is HIGH².
- Apply a Protectant³ fungicide.

Scenario 3: Rust is found in your field at very low levels (1-10% of leaves in lower canopy).

- Rust is present in your field under 10% infection in lower canopy.
- Crop Stage R1-R6.
- Apply a ProtectantCurative combination⁴ or a Curative⁵ fungicide.

Scenario 4: Soybeans are mature.

- Rust may or may not be present.
- Crop Stage R7.
- Do not spray.

¹Crop growth stages: Vegetative - before flowering, R1 - beginning flowering, R6 - full seed, R7 - beginning maturity. Reports from Africa and Brazil indicate that soybean rust does not need to be controlled when detected in the vegetative crop stages as long as a curative spray program is initiated as soon as crop flowering begins (R-1). Spraying before crop flowering may be prudent if disease is increasing and the crop is approaching R1.

²RISK: Risk is determined according to national, regional and local reports of rust activity and disease forecasts. (University of Wisconsin's Plant Pathology Detection Clinic 1-866-8411 and <http://www.usda.gov/soybeanrust>).

³Protectants: Bravo Weather Stik, Echo 720, Headline, Quadris.

⁴Protective-Curative combination: Domark 230 ME, Headline SBR, Quilt, Stratego.

⁵Curative: Bumper 41.8 EC, Folicur 3.6 F, Laredo EC, Laredo EW, PropiMax, Tilt.

References to pesticide products in this publication are for your convenience and are not an endorsement of one product over other similar products. You are responsible for using pesticides according to the manufacturer's current label directions. An EEO/Affirmative Action employer, the University of Wisconsin-Extension, provides equal opportunities in employment and programming, including Title IX and ADA requirements.

I-5-2005-12.5M

