



Pest e-alerts



Entomology and Plant Pathology, Oklahoma State University
127 Noble Research Center, Stillwater, OK 74078
405.744.5527

Vol. 16, No. 35

<http://entopl.okstate.edu/pddl/pdid/>

10/2/2017

Soybean Disease Update

John Damicone, OSU Extension Plant Pathologist
Department of Entomology & Plant Pathology
Oklahoma State University - 127 Noble Research Center

As the soybean season winds down there were a couple of noteworthy diseases observed that are worth reviewing and looking out for in the future.

Aster Yellows

Sudden Death Syndrome

This is the third year in a row that sudden death syndrome (SDS) of soybeans has been observed in Oklahoma. The disease was observed this year in eastern and western parts of the state. The disease is essentially a Fusarium root rot caused by an unusual species of *Fusarium*, *F. virguliforme*. Symptoms first appear during August during reproductive stages of crop development when leaves show scattered pale green spots between major leaf veins (Figure 1). The spots enlarge and turn brown, leaving only the areas surrounding major leaf veins green (Figure 2). Severely affected leaves fall to the ground, but the petioles remain attached to the plant. Affected plants have a decayed and discolored root system and affected plants are easily pulled from the ground. The lower stems and crowns show an internal grey to light brown discoloration that is visible when the surface is scraped back with a knife (Figure 3). Pod and seed development usually ceases when plants begin to defoliate so yield loss is most severe when plants are affected early in reproductive development.

SDS is favored when infested fields are saturated with water from heavy rains during periods of cool temperatures. The optimum temperatures for SDS development are from 70 to 75° F. These conditions were widespread in Oklahoma during the first two weeks of August. Hardpans in the soil that restrict drainage and root injury from the soybean cyst nematode also favor disease development. SDS often appears in patches where drainage is poor or where the pathogen is present. The fungus persists in the soil for extended periods of time as resistant spores (chlamydospores) that are formed in roots and soil. Therefore, the disease is likely to appear again when conditions are favorable for SDS development.

Management of SDS is best achieved by planting soybean varieties with the best SDS resistance rating. On a scale from 1 to 9 with 9 being the most resistant, there are varieties with scores of 7 to 8, which provide adequate resistance. Other management strategies that may help control SDS include managing levels of soybean cyst nematode through crop rotation and planting cyst resistant varieties, and using practices that reduce soil compaction and improve drainage.



Figure 1: Foliar symptoms of sudden death syndrome (photo courtesy Beck Johnson, Johnson Agronomics)



Figure 2: Progression of foliar symptoms of sudden death syndrome.



Figure 3: Light brown discoloration of vascular system in lower stem affected by sudden death syndrome.

Bacterial pustule

A crop consultant reported the possible presence of soybean rust in north central Oklahoma in late summer. Upon examination, the disease turned out to be bacterial pustule, a look-alike of soybean rust, caused by the bacterium *Xanthomonas axonopodis* pv. *glycines*. Soybean rust and bacterial pustule can be difficult to tell apart because they both produce raised bumps, or pustules in the spots that they cause. Bacterial pustule first appears as tiny, pale green spots with raised centers. The spots turn brown and a prominent raised pustule develops. Spots are usually surrounded by a yellow border or 'halo' (Figure 4). The spots may coalesce and produce large areas leaf browning which may split and fall out giving the leaves a ragged appearance. Profuse bacterial streaming is observed when lesion sections are observed under a microscope in a drop of water. Without the aid of a microscope, the main distinguishing characteristic between soybean rust and pustule is that the raised pustules of soybean rust (Figure 5) usually have profuse sporulation consisting of tan colored spores compared to the lack of fungal spores produced by bacterial pustule (Figure 6). Spore production can be observed with the aid of a hand lens.

Bacterial pustule can cause severe disease development that results in defoliation and yield loss through a reduction in seed size. However, bacterial pustule is typically of minor importance in temperate regions of the world. The disease has been more important in tropical areas where it becomes aggressive when temperatures and humidity are high. Planting varieties with the *Rxp* gene for resistance is the most effective management strategy for bacterial pustule. However, seed companies do not score soybean varieties for resistance to bacterial pusture. This is likely due to the limited importance of the disease. The disease also is seed borne and survives in old crop residue. Crop rotation is effective for bacterial pustule.



Figure 4: Bacterial pustule of soybeans.
(photo courtesy of Daren Mueller, Iowa State University, Bugwood.org)



Figure 5: Soybean Rust.

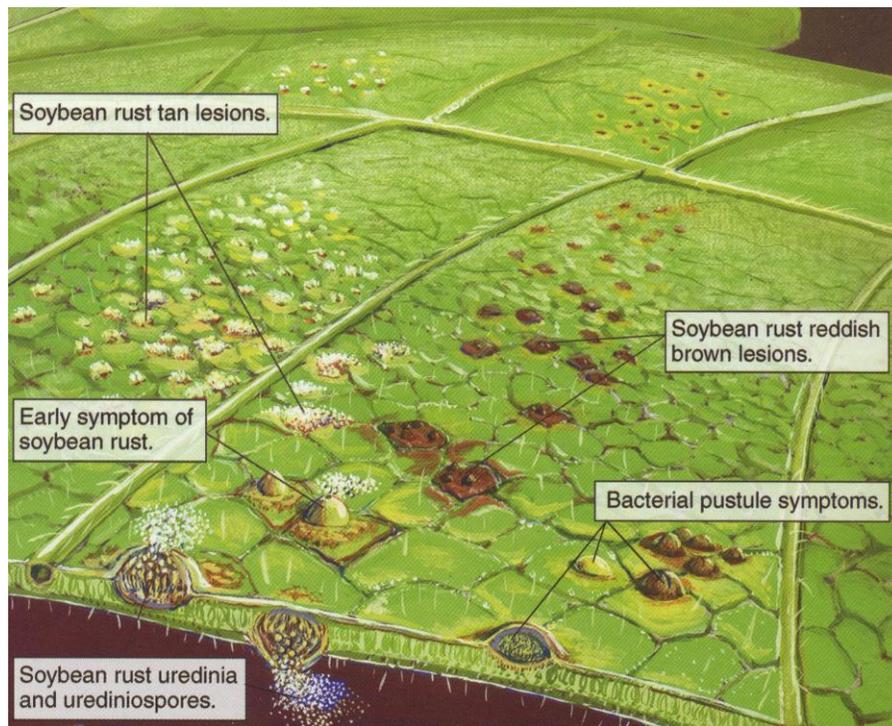


Figure 6: Diagram depicting differences between soybean rust and bacterial pustule (Courtesy of National IPM Center)

Plant Disease and Insect Diagnostic Laboratory

The pesticide information presented in this publication was current with federal and state regulations at the time of printing. The user is responsible for determining that the intended use is consistent with the label of the product being used. Use pesticides safely. Read and follow label directions. The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, and Title IX of the Education Amendments of 1972 (Higher Education Act), the Americans with Disabilities Act of 1990, and other federal and state laws and regulations, does not discriminate on the basis of race, color, national origin, genetic information, sex, age, sexual orientation, gender identity, religion, disability, or status as a veteran, in any of its policies, practices or procedures. This provision includes, but is not limited to admissions, employment, financial aid, and educational services. The Director of Equal Opportunity, 408 Whitehurst, OSU, Stillwater, OK 74078-1035; Phone 405-744-5371; email: eeo@okstate.edu has been designated to handle inquiries regarding non-discrimination policies: Director of Equal Opportunity. Any person (student, faculty, or staff) who believes that discriminatory practices have been engaged in based on gender may discuss his or her concerns and file informal or formal complaints of possible violations of Title IX with OSU's Title IX Coordinator 405-744-9154.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is issued by Oklahoma State University as authorized by the Vice President, Dean, and Director of the Division of Agricultural Sciences and Natural Resources.