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SOYBEAN DISEASES

David S. Wysong
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1. BACTERIAL LEAF DISEASES: *Pseudomonas glycinea, Xanthomonas phaseoli* var. *sojense.* Bacterial blight and bacterial pustule, respectively, are difficult to distinguish from one another because both produce similar symptoms. Black spots with water soaked margins surrounded by a narrow, yellow halo on the leaves are typical signs of bacterial blight. Bacterial pustule has similar lesions except the spots are slightly raised and lack the water soaked margins. The presence of blisters and absence of water soaked margins distinguish bacterial pustule from bacterial blight. Bacterial blight is favored by warm weather which is common in late July and August. At present, there are no effective chemical control measures. Fall plowing to remove infected tissue and resistant varieties are accepted practices. Since both diseases may be seed-borne the selection of disease free seed will lower the incidence of bacterial diseases.

2. DOWNY MILDEW: *Peronospora manshurica.* Downy mildew is characterized in its early stages by light chlorotic areas which develop on the upper surface of the leaf. As the season progresses, these areas turn grayish-brown and are surrounded by a light yellow border. At this time grayish tufts of moldy growth develop on the lower side of the spots. Severely infected leaves drop prematurely. The disease is initially seed-borne and as these infected plants develop, they provide the source of further infections. To effectively control downy mildew, use disease-free seed and practice good sanitation measures. Resistant varieties are currently being developed for areas where the disease is a problem.

3. CERCOSPORA LEAF SPOT: *Cercospora sojina.* This disease, also known as "frog eye" spot, is common in the warmer regions of the soybean belt. Typical symptoms are zonate gray spots on the leaves with purplish margins. Similar spots may also develop on the stem and pod. As the fungus invades the pod a gray to brown discoloration occurs on the seed coat. The parasite persists in leaves and stems left as debris as well as in the infected seed. The disease is easily spread by these methods. Where Cercospora leaf spot is a problem, the use of early maturing varieties is recommended. Removal of infected residue and use of disease free seed further reduces disease potential.

4. POD AND STEM BLIGHT: *Diaporthe phaseolorum* var. *sojae.* Pod and stem blight is a common disease found in the soybean area of the central United States. Infected plants have dark brown lesions with indefinite margins on the stems and pods, and less commonly on the leaves. The infection often starts at the junction of stem and branch, girdling this area and resulting in premature death. In the later stage of infection, small black bodies occur in the older dead portions of the lesions. The only economical control measures available are selection of clean seed and sanitation.

5. SOUTHERN STEM BLIGHT: *Sclerotium rolfsii.* This disease has not yet been found in Nebraska. It is common to areas south of Nebraska where soybeans are grown in sandy soils under conditions of high temperatures and humidity. The disease is characterized by a rot at the base of the plant. Infected plants die prematurely, sometimes before the seed forms. The fungus is also capable of attacking other legumes in a similar manner. Deep plowing and crop rotation with nonsusceptible plants are accepted control measures.

6. STEM ANTHRACNOSE: *Colletotrichum truncatum.* Although not a major disease of soybeans, stem anthracnose is found in all major soybean producing areas of the United States. Soybean plants in all stages of growth are subject to this disease. When infected seeds are planted, many of the germinating seeds are killed before emergence. If the plant starts to grow the cotyledons may become infected and die or the fungus may grow from them into the tissues of the young stems. Infection is characterized by elongated, sunken, reddish-brown lesions. In advanced stages, small black fungal bodies are found on the surface of the invaded tissue. Seeds harvested from infected plants may be shrivelled and moldy. Removal of infected debris and chemical seed treatment are the recommended control measures.

7. STING NEMATODE: *Belonolaimus longicaudatus.* The sting nematode is one of the most devastating nematodes that attack soybeans. Fortunately, this parasite is generally limited to sandy soils of the southeastern and southern coastal plain. This nematode causes inhibition of normal root development. Above ground symptoms are stunting, accompanied by a dull light green coloration. The sting nematode has a wide host range making crop rotation impractical. Fumigants may be used for control but are not economically feasible at present.

8. LANCE NEMATODE: *Hoplolaimus* species. Several other nematodes are also capable of attacking soybeans. Of these, the lance nematode is one of the more common. This parasite can attack both external and internal root tissues. Typical symptoms produced on the roots are dark brown, discolored lesions. Stunting and light green discoloration on the above ground parts is common. Successful control can be achieved with fumigation but it is presently uneconomical.

9. PURPLE SEED STAIN: *Cercospora kikuchii.* Several different fungi are capable of causing this disease, although the above mentioned one is the most common. This disease occurs wherever soybeans are grown. Typical symptoms are a reddish-brown to purple discoloration of the seed coat. The amount of discoloration is important from the grading standpoint, and the value of the seed may be lowered considerably by excessive amounts of purpling. The amount of disease varies widely from year to year which suggests its dependence on weather conditions. The organism also attacks the leaves of soybean plants producing reddish-brown spots which grow together and cause premature leaf drop. Resistant varieties and seed treatment are the most efficient methods of controlling purple seed strain.

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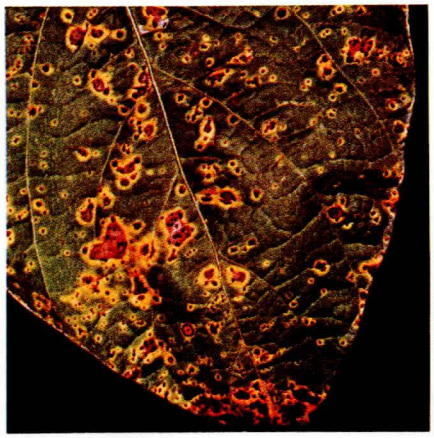
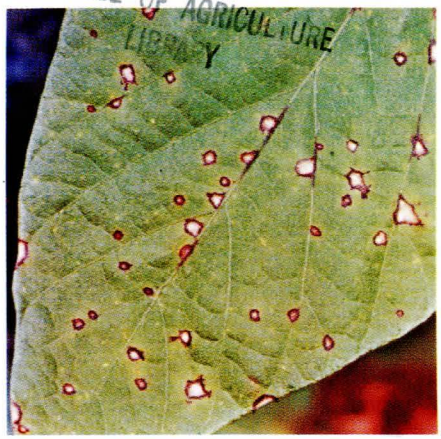
SOYBEAN DISEASES

An Aid to Identification and Control



1. BACTERIAL LEAF DISEASE

2. DOWNY MILDEW

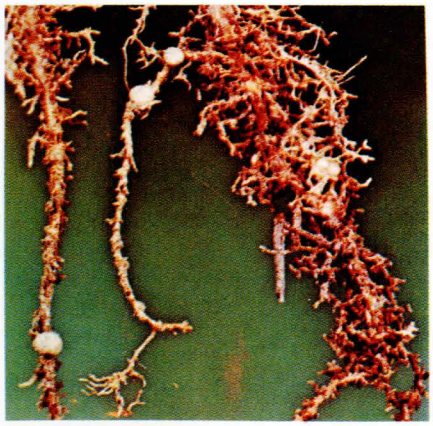


3. CERCOSPORA LEAF SPOT

4. STEM AND POD BLIGHT

5. SOUTHERN STEM BLIGHT

6. ANTHRACNOSE ON STEM



7. STING NEMATODE DAMAGE TO ROOTS

8. LANCE NEMATODE DAMAGE

9. PURPLE SEED STAIN

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