



Arkansas Plant Health Clinic Newsletter

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Soybean

Charcoal Rot

Many soybean fields are struggling this season, especially dry land beans. The Plant Health Clinic has received numerous samples of beans with Charcoal Rot and Sudden Death Syndrome. Some samples with SDS have also had high numbers of cyst nematodes. Many of us forget that new agents are not necessarily familiar with some of these diseases. Charcoal Rot, caused by *Macrophomina phaseolina*, is a disease favored by plant stresses. Although we see it most often during hot, dry weather, it is also seen in irrigated fields, especially if water is withheld after flowering. When Charcoal Rot attacks seedlings, losses of up to 77% have been reported. The fungus penetrates seed coat tissue and forms microsclerotia in the cracks of the seed coats. Infected seeds may or may not germinate. Seedlings that survive may die later during hot, dry weather. Symptoms on older plants are smaller than normal leaves. Leaflets yellow, turn brown, and the plant dies. The brown leaves remain attached to the petioles. A gray or silver discoloration may be present in the pith or just under the epidermis of root and lower stem

tissue. Black microsclerotia resembling powdered charcoal may be observed. There are no chemical controls. Soybean should be rotated with cereal or cotton crops in fields that have a history of heavy losses from Charcoal Rot. Adequate irrigation, especially during later reproductive growth stages help greatly to reduce losses.

Soybean Charcoal Rot- *Macrophomina phaseolina*



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Soybean Charcoal Rot- *Macrophomina phaseolina*



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

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Sudden Death Syndrome (SDS)

Soybeans grown in hi-yield environments are vulnerable to Sudden Death Syndrome (SDS). This is a soilborne disease caused by the fungus, *Fusarium solani* f. sp. *glycines*, synonym: *Fusarium virguliforme*. Symptoms generally develop during early reproductive stages, although this can vary depending on environmental conditions. Leaf symptoms begin as scattered, interveinal yellow spots, which become necrotic, leaving only the midvein and major veins green. Affected leaflets detach from the petioles which remain attached to the plant. The leaves are sometimes misshapen, puckered or cupped. The roots have gray to brown xylem vessels that may be observed by sectioning the stem lengthwise. Severely affected plants may be easily pulled from the ground. Other diseases may be mistaken for SDS. Brown stem rot, Red crown rot, and stem canker give similar foliar symptoms. However, with Red crown rot, there may be found red perithecia (tiny round fruiting bodies of the fungus) on the stem at the soil line. Brown stem rot has brown discoloration of the pith instead of the xylem, and stem canker produces distinct stem cankers not found in SDS plants. Infestations of cyst nematode can predispose soybeans to SDS by damaging the roots. Control is achieved by planting resistant cultivars, improving drainage in low spots, and controlling nematode populations.

Soybean Sudden Death

Syndrome-*Fusarium solani* f. sp. *glycines*, synonym: *Fusarium virguliforme*



Photo by Amanda Greer, University of Arkansas Cooperative Extension

Downy Mildew

We usually see Downy Mildew on soybeans, caused by *Peronospora manshurica*, earlier in the year during cooler conditions. Nevertheless, the Plant Health Clinic received a sample from Lonoke county this week with Downy Mildew. Downy Mildew is a widely distributed foliar disease that causes minor defoliation, reduced seed quality, and in some cases, lower yields. Symptoms begin on the upper surfaces of young leaves as pale green to yellow spots. Old lesions may be grayish-brown with yellow green margins, finally turning completely brown. During moist weather, the surfaces of lesions on the lower leaves become covered with tufts of grayish to pale purple sporangiophores. Leaves that are severely infected turn yellow, then brown, and drop prematurely. Pods may also be infected. The infections are not apparent until the pods are opened and the interior and the seeds are



examined. A whitish mass of mycelium and oospores may be found. Seeds may appear dull white and may have cracks in the seed coat. Infected seeds lead to small, stunted plants with mottled, gray green leaves that curl downward.

Soybean Downy Mildew- *Peronospora manshurica*



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Soybean Downy Mildew sporangioophores-*Peronospora manshurica*



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Rice

We are seeing Glyphosate damage on rice. Note the shortened curling flag leaf and the head stuck in the boot.

Rice Glyphosate damage-Abiotic



Photo by Sherrie Smith, University of Arkansas Cooperative Extension



Rice Glyphosate damage-Abiotic



Photo by Sherrie Smith, University of Arkansas Cooperative Extension

Corn

Branched ears in corn are due to adverse weather conditions at pollen shed.

Corn Branched Ears-Abiotic



Photo by Sherrie Smith, University of Arkansas Cooperative Extension



This bulletin from the Cooperative Extension Plant Health Clinic (Plant Disease Clinic) is an electronic update about diseases and other problems observed in our lab each month. Input from everybody interested in plants is welcome and appreciated.

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