



# Pest e-alerts



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## Yellow Soybean Plants

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We have received several reports via pictures, samples, and personal farm visits of soybean fields that have developed various degrees of leaf yellowing showing up during August when soybeans were in the early reproductive stages. The yellowing occurs around the margins of the leaves (left), progresses inward, and affected leaves may crinkle and die inward from the margins (Fig 1). The symptoms resemble potassium (K) deficiency except that K deficiency generally begins first in the lower leaves and the youngest leaves on K-deficient plants remain green the longest. The symptoms of leaf

yellowing that we are seeing appear first in the upper leaves. The distribution of the yellowing in the fields may be limited to isolated patches or larger areas often with a streaked pattern (Fig 3). In one affected field that was visited, soybean cyst nematode was also a problem. Soybean cyst nematode can reduce yields. When soybean cyst nematode is a problem, symptoms should progress over the course of the season rather than suddenly appear late in the season; severe, above-ground symptoms of cyst nematode are known to resemble K-deficiency, further complicating matters. All of the reports of the disease are coming from eastern Oklahoma where K deficient soils occur. Soil tests for two of the fields were low in K and recommended potash fertilizer for soybeans, but neither tested very low or deficient levels.

I called colleagues in the neighboring soybean growing states of Kansas and Iowa where they see this problem to varying degrees from time to time. In Iowa, the problem has been given the name of "top dieback". What is known about top dieback and its causes are covered nicely in a newsletter article from Iowa State University:

<http://www.extension.iastate.edu/CropNews/2008/0822yangsawyer.htm>





**Fig 1.**



**Fig 2.**

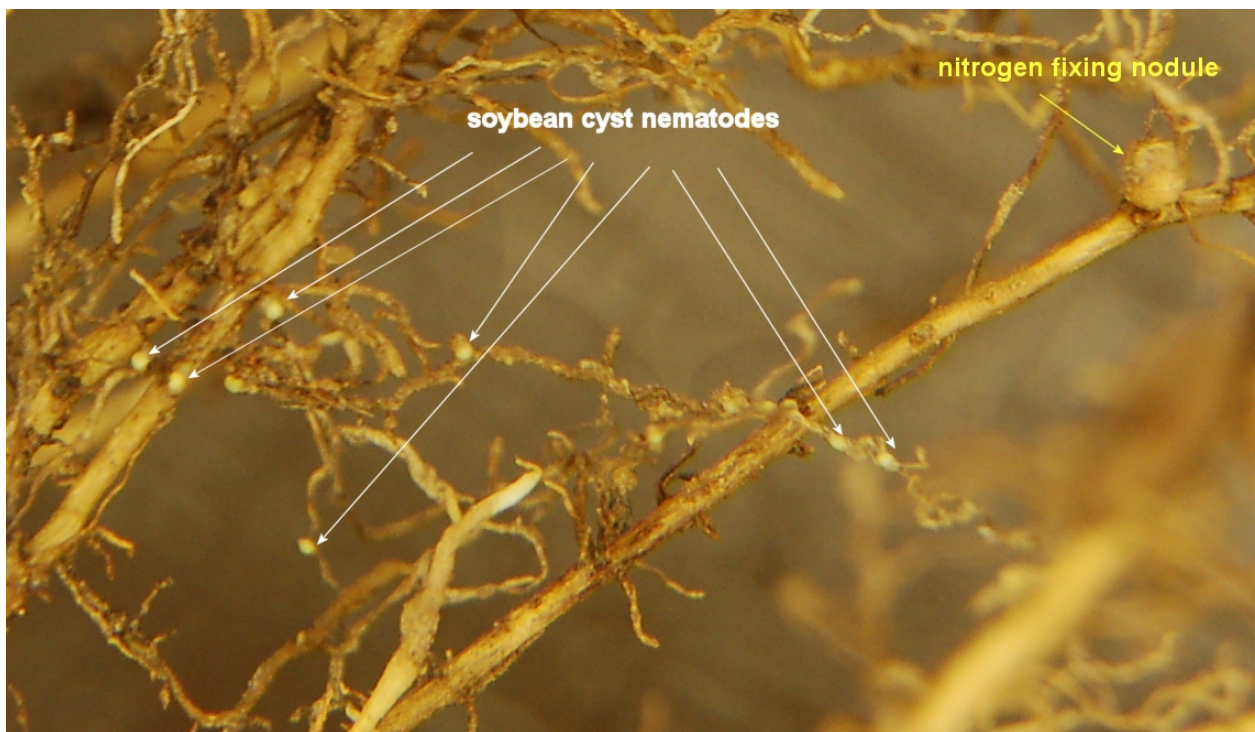


I believe they are describing the same problem we are seeing in Oklahoma. In Kansas, they see the problem periodically in southwestern and central Kansas, mostly during years with weather extremes.

Because the cause(s) of top dieback is (are) not clear, we should focus efforts on managing factors that may be involved and are known to limit soybean fields:

1) Soil test and correct soil nutrient deficiencies indicated by applying recommended fertilizer for next years crop.

2) Determine if the field is infested by taking a soil sample and submitting it to the Plant Disease and Insect Diagnostic Laboratory and/or examining roots for the presence of cysts. Plants (5-10/field) should be uprooted with a spade, shaken free of soil, washed in a bucket of water if necessary and examined. Cysts are white to yellow and much smaller than nitrogen-fixing nodules (see arrows below). They can be seen with the naked eye or a weak magnifying lens. Feel free to include the roots if sending soil to the diagnostic laboratory. If the field is infested with cyst nematode, manage the field accordingly (see pages 349-350 in the 2009 OSU Extension Agents' Handbook - Circular E-832).



3) Plant a different soybean variety. Although varietal ratings for top dieback are not available, evidence suggests that varieties differ in susceptibility.

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## Effect of Planting Date and Seed Treatment on Diseases and Insect Pests of Wheat

Bob Hunger, Extension Wheat Pathologist, Jeff Edwards, Small Grains Extension Specialist, Tom Royer, Extension Entomologist, Terry Pitts, SW Area Extension Specialist – IPM,

Approximately 40 to 60% of the winter wheat in Oklahoma is sown with the intent of being used as a dual-purpose crop. In this system wheat is grazed by cattle from late October to early March and harvested for grain in early summer. In a grain-only system, wheat is generally planted in October, but in a dual-purpose system wheat is planted in early to mid-September to maximize forage production. Planting wheat this early significantly increases the likelihood that diseases such as wheat streak mosaic virus, high plains virus, the aphid/barley yellow dwarf virus complex, and root and foot rots will be more prevalent and more severe.



**Wheat streak mosaic virus (WSMV), the high plains virus (HPV), and Triticum mosaic virus (TrMV):** WSMV and HPV are transmitted by the wheat curl mite (WCM). Within the last 2-3 years, Dr. Dallas Siefers with Kansas State University at Hays, KS identified a third virus, TrMV that also is transmitted by the WCM. TrMV causes the expression of symptoms similar to those caused by WSMV and HPV.

WCMs and these viruses survive in crops such as wheat and corn, as well as many grassy weeds and volunteer wheat. In the fall, WCMs spread to emerging seedling wheat, feed on that seedling wheat, and transmit the virus to the young wheat plants. Wheat infected with WSMV, HPV, or TrMV in the fall is either killed by the next spring or will be severely damaged. No seed treatments are effective in controlling these viruses. However, planting later in the fall (after October 1 in northern OK and after October 15 in southern OK) and controlling volunteer wheat are two practices that provide some control. It is critical to completely destroy volunteer wheat at least two weeks prior to emergence of seedling wheat because WCMs have a life span of 7-10 days. Thus, destroying volunteer wheat at least two weeks prior to emergence of seedling wheat should greatly reduce mite numbers in the fall. In addition to these cultural controls, two winter wheat varieties (RonL from Kansas and Mace from Nebraska) now have resistance to WSMV; however, their adaptation to production in Oklahoma is not known. For more

information on WSMV and HPV, see OSU Extension Facts 7636 or go to the Entomology and Plant Pathology website: <http://entopl.okstate.edu/ddd/hosts/wheat.htm>.

**Aphid/barley yellow dwarf virus (BYDV) complex:** BYDV is transmitted by many cereal-feeding aphids. Fall infections by BYDV are the most severe because the virus has a longer time to damage the plant as compared to infections that occur in the spring.

Several steps can be taken to help control BYDV. **First**, a later planting date (after October 1 in northern Oklahoma and after October 15 in southern Oklahoma) helps to reduce the opportunity for fall infections. **Second**, some wheat varieties (e.g., 2174, Duster, Endurance, Overley) seem to tolerate aphids and/or BYDV better than other varieties; however, be aware that no wheat variety has absolute resistance to the aphid/BYDV complex. **Third**, control the aphids that transmit BYDV. This can be done by applying contact insecticides to kill aphids, or by treating seed before planting with a systemic insecticide. Unfortunately, by the time contact insecticides are applied, aphids frequently have already transmitted BYDV. Systemic seed-treatment insecticides including Gaucho (imidacloprid) and Cruiser (thiamethoxam) can control aphids during the fall after planting, but in some years aphids are sparse in the fall and planting insecticide-treated seed in a year with no or sparse aphids in the fall would not be as beneficial as in years when aphids are numerous. Be sure to thoroughly read the label before applying any chemical. For more information on the aphid/barley yellow dwarf virus complex, go to the Entomology and Plant Pathology website: <http://entopl.okstate.edu/ddd/hosts/wheat.htm>.

**Hessian fly:** Hessian fly infestations occur in the fall and spring. Fall infestations arise from over-summering pupae that emerge when climate conditions become favorable. Delayed planting (after October 1 in northern Oklahoma, and after October 15 in southern Oklahoma) can help reduce the threat of Hessian fly, but a specific “fly free date” does not exist for most of Oklahoma as it does in Kansas and more northern wheat-growing states. This is because smaller, supplementary broods of adult flies emerge throughout the fall and winter. Some wheat varieties are either resistant (e.g. Duster) or partially resistant (e.g. Shocker, 2174, Chisholm, Centerfield, Ike, OK 102 and Okfield) to Hessian fly infestations. Hessian fly infestations can be reduced somewhat by destroying volunteer wheat in and around the field at least two weeks prior to emergence of seedling wheat. Seed treatments that contain imidacloprid or thiamethoxam will also help reduce fly fall infestations, especially if combined with delayed planting and volunteer destruction.

**Root and foot rots:** These include several diseases caused by fungi such as dryland (*Fusarium*) root rot, *Rhizoctonia* root rot (sharp eyespot), common root rot, take-all, and eyespot (strawbreaker). Controlling root and foot rots is difficult. There are no resistant varieties, and although fungicide seed treatments with activity toward the root and foot rots are available, their activity usually involves early-season control or suppression rather than control at a consistently high level throughout the season. Often, there also are different “levels” of activity related to different treatment rates, so again, **CAREFULLY read the label of any seed treatment to be sure activity against the diseases and/or insects of concern are indicated, and be certain**

**that the seed treatment(s) is being used at the rate indicated on the label for activity against those diseases and/or insects.**

Later planting (after October 1 in northern Oklahoma and after October 15 in southern Oklahoma) also can help reduce the incidence and severity of root rots, but planting later will not entirely eliminate the presence or effects of root rots. If you have a field with a history of severe root rot, consider planting that field as late as possible or plan to use it in a “graze-out” fashion if that is consistent with your overall plan.

For some root rots, there are specific factors that contribute to disease incidence and severity. For example, a high soil pH (>6.5) greatly favors disease development of the root rot called take-all. OSU soil test recommendations factor in this phenomenon by reducing lime recommendations when continuous wheat is the intended crop. Another practice that can help limit take-all and some of the other root rots is the elimination of residue. However, elimination of residue by tillage or burning does not seem to affect the incidence or severity of eyespot (strawbreaker). For more information on wheat root rots, take-all and eyespot (strawbreaker), see OSU Extension Facts F-7622 or go to the Entomology and Plant Pathology website: <http://entopl.okstate.edu/ddd/hosts/wheat.htm>.

**Seed treatments:** There are several reasons to consider planting treated seed including:

1. Control of common bunt (also called stinking smut) and loose smut. The similarity of these names can be confusing. Both affect the grain of wheat, but whereas common bunt spores carryover **on** seed or in the soil, loose smut carries over **in** the seed. Seed treatments are highly effective in controlling both diseases. If common bunt was observed in a field and that field is to be planted again with wheat, then planting certified wheat seed treated with a fungicide effective against common bunt is strongly recommended. If either common bunt or loose smut was observed in a field, grain harvested from that field should not be used as seed the next year. However, if grain harvested from such a field is to be used as seed wheat, treatment of that seed at a high rate of a systemic or a systemic + contact seed treatment effective against common bunt and loose smut is strongly recommended. For more information on common bunt & loose smut, see: <http://entopl.okstate.edu/ddd/hosts/wheat.htm>, consult the “2009 OSU Extension Agents’ Handbook of Insect, Plant Disease, and Weed Control (OCES publication E-832),” and/or contact your County Extension Educator.
2. Enhance seedling emergence, stand establishment and forage production by suppressing root, crown and foot rots. This was discussed above under “Root and Foot Rots.” Refer to Table 1 for a more detailed description.
3. Early season control of the aphid/BYDV complex and Hessian fly. This can be achieved by using a seed treatment containing an insecticide. Refer to Table 1 for a more detailed description of seed treatments with insecticidal activity.

4. Control fall foliar diseases including leaf rust and powdery mildew. Seed treatments are effective in controlling foliar diseases (especially leaf rust and powdery mildew) in the fall, which may reduce the inoculum level of these diseases in the spring. However, this control should be viewed as an added benefit and not necessarily as a sole reason to use a seed treatment.
5. Partial control of Hessian fly. This was also discussed previously, see Table 1.

Often a combination of chemicals is present in seed treatments, which can include a combination of fungicides for a broader spectrum of activity, or a combination of fungicides with an insecticide so activity against diseases and insects is achieved. One such seed treatment is Gaucho XT, which is composed of an insecticide and fungicides so control of aphids (and hence BYDV), Hessian fly, wireworms, smuts and bunts, and seedling root rots is available in one treatment (Table 1). Other seed treatments such as Raxil MD, Dividend Extreme and Charter PB contain only fungicides, but can easily be mixed with an insecticide such as Gaucho 600 or Cruiser to obtain activity against bunts, smuts and seedling root rots as well as insects. Therefore again, I would emphasize that if a seed treatment is used, **be sure to carefully read the label to ensure that the treatment is intended (and labeled) for your desired goal, and that it is applied at a rate labeled for the desired activity.** For more information on seed treatments, their intended uses and rates consult the “2009 OSU Extension Agents’ Handbook of Insect, Plant Disease, and Weed Control (OCES publication E-832),” and/or contact your County Extension Educator.

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