Plant Disease and Insect Advisory

Entomology and Plant Pathology
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Update on Curly Top Virus

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Beet Curly Top Virus (BCTV), which has been a problem in tomatoes this year, is also showing up in the hot chili peppers being grown near Hydro. Symptoms on pepper (Figure 1) are not as characteristic as those on tomato. Plants become pale yellow and are stunted, but do not show the dramatic leaf curl or vein purpling that is so distinctive on tomato. Brian Olson has confirmed the problem to be BCTV using the PCR test developed at UC Davis. In the 40-acre field I visited, about 10-15% of the plants were affected, but isolated areas of the field had a much higher level of virus-infected plants (Figure 2).

In talking with Natalie Goldberg, my counterpart in New Mexico, peppers are not damaged by curly top to the degree that tomatoes are. She indicated that the disease is cyclic in New Mexico. They have had as much as 50% in the chili's grown near Las Cruces, but are only seeing about 10% infection this year. However, nearly all of the tomatoes in gardens there are infected this year. They have been studying the biology of the beet leafhopper, the vector of curly top, and have found that it overwinters in the desert. They feel that they can predict the severity of the curly top outbreak in a given year by winter weather in the overwintering areas. Curly top has been more severe following "wet" winters. They believe this is related to growth of alternate weed hosts such as wild mustards and thistles.

There has been some work done in New Mexico looking at insecticides to control the vector in hopes of reducing incidence of the virus. There are some there who believe that treatments with imidacloprid (Admire), a systemic insecticide that is very active on sucking insects, have been effective. She indicated that some growers have tried it, but levels of the virus in surrounding, untreated fields have been too low to draw any conclusions. She was not convinced that imidacloprid was effective.

It is of little practical value, but the PCR product (band) from positive samples submitted from Oklahoma has been sequenced at UC Davis and identified as the "Worland" strain of BCTV (named after a town in Wyoming). This is currently the most common strain of the virus in California. Virus taxonomists who work on BCTV have found three predominant strains. They have elevated the strains to species status and now refer to the old Worland strain as beet mild curly top virus (BMCTV). The term mild refers to its reaction on sugar beet. Unfortunately, BMCTV causes severe symptoms on tomato and pepper.

Fig 1. Yellowing and stunting of chili peppers caused by beet curly top virus.

Fig 2. Damage in chili peppers from curly top.

Peanut Disease Update

John Damicone, Extension Plant Pathologist

The hot and dry weather has brought early leaf spot of peanuts to a halt across most of the state. In field trials we have located in various parts of the state, the symptoms that occurred during June have not progressed. In rotated fields that I have visited, there are no signs of the disease. We are rapidly closing in on a time (early Sep) when fungicide applications to control early leaf spot will not longer be needed for fields of runner varieties which are free or nearly free of the disease. However, growers that are carrying some leaf spot in the field should be wary of any infection periods that might

occur between now and then.

Likewise, I have not seen or heard reports of southern blight developing in peanut field. Most fields I have visited look great! However, we have observed over the last few years that southern blight has occurred later and later in the season each year. It is too early to write off these diseases this year. Some growers I have visited with have made applications of Abound or Folicur in fields with a history of these diseases. Its not too late to make such applications.

Of course it has been way too hot for Sclerotinia blight. However, as vines lap, irrigation can trigger this disease when temperatures cool into the upper 60's at night. We are a long way from peanut harvest and Sclerotinia still has time to become a problem. My recommendation is to monitor problem fields closely and apply Omega shortly after the disease first appears. We have found that this is an effective way to use this fungicide and growers are able to limit the number of applications required for Sclerotinia blight control in dry years such as this.

I learned this week that Endura (nicobifen) a new fungicide from BASF has just been registered on peanut for control of Sclerotinia blight. Unfortunately, there is no product available to sell this year and there will be no anticipated price war for the Sclerotinia fungicide market. BASF will be putting out some demonstration plots this year. I have referred to this product as the "secret fungicide" because it was being tested under a secrecy agreement with BASF until last year. It has a different disease spectrum than Omega. Endura is also effective on early leaf spot and web blotch. Unlike Omega which also controls southern blight, Endura has no activity on this disease. Based on our research, about two applications of Endura at 9 oz/A are similar in performance to a single Omega application.

Planting Date & Wheat Diseases – Be Aware of the Relationships

Bob Hunger, Extension Wheat Pathologist

Wheat frequently is used in Oklahoma as a dual-purpose crop to provide forage for cattle during the late fall to early spring with grain being harvested the following May or June. Although this practice enhances the economics of farming wheat and cattle in Oklahoma, the early planting date associated with grazing can greatly increase the incidence and severity of several wheat diseases including wheat streak mosaic virus, the aphid/barley yellow dwarf virus complex, and the root and foot rots.

Wheat streak mosaic virus (WSMV): WSMV (Fig 1), which is transmitted by the wheat curl mite (Fig 2) is most commonly observed in northwestern Oklahoma. Corn, grassy weeds, and volunteer wheat all can serve to propagate the mites and the virus through the summer. Mites infected with WSMV spread to emerging seedling wheat in the fall, and transmit the virus to the young wheat plants. Wheat infected with WSMV in the fall is either killed by the next spring or is damaged severely. Planting wheat late 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 of WSMV. It is imperative to destroy volunteer wheat for more than two weeks prior to emergence of seedling wheat because the wheat curl mites have a life span of 10-14 days. Thus, destroying volunteer wheat at least two weeks prior to emergence of seedling wheat will reduce or eliminate mite numbers in the fall. For more information on WSMV, see OSU Extension Facts 7636 or go to the web page for the Plant Disease and Insect Diagnostic Laboratory at: http://entoplp.okstate.edu/ddd/hosts/wheat.htm.

Fig 1. Symptoms of wheat streak mosaic virus typically seen in the spring.

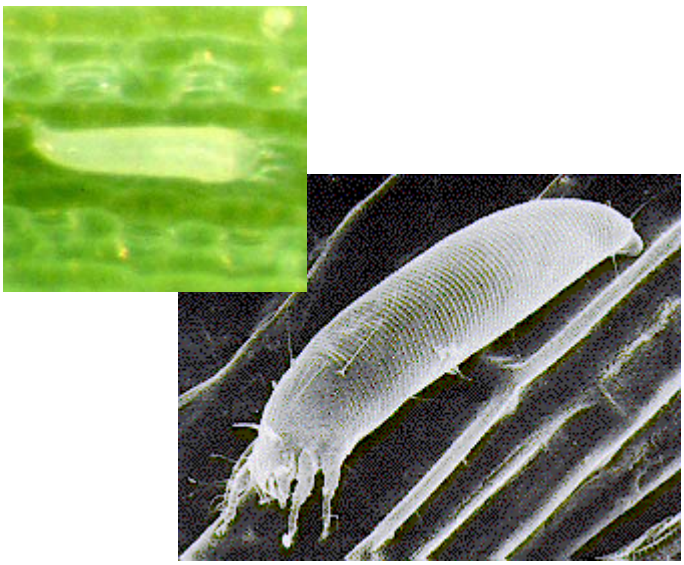

Fig 2. A wheat curl mite (63X magnification, top) responsible for transmitting wheat streak mosaic virus.

Aphid/barley yellow dwarf virus (BYDV) complex: BYDV (Fig 3), which is transmitted by many aphids (Fig 4), should be thought of as a complex because both aphids and virus can damage wheat. Fall infestations are the most damaging because seedling wheat is more susceptible to aphid damage and wheat infected with BYDV in the fall has a longer time for the virus to damage the plant as compared to infections that occur in the spring.

Several measures can be taken to help control the aphid/BYDV complex. Planting wheat later (after October 1 in northern OK, and after October 15 in southern OK) reduces the opportunity for fall infections. Planting a variety (e.g, 2174) that tolerates aphids and/or BYDV also is helpful; however, be aware that this is a "tolerance," and not an absolute resistance to the aphid/BYDV complex. Finally, insecticides can be used to control the aphids that transmit BYDV. This can be done by applying contact insecticides, 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 such as

Gaucho effectively control aphids for up to 70 days after planting, but in some falls no aphids occur and hence the treatment was not necessary. 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 web page for the Plant Disease and Insect Diagnostic Laboratory at: http://entoplp.okstate.edu/ddd/hosts/wheat.htm.

Fig 3. Foliar symptoms of barley yellow dwarf virus typically seen in the spring include (L) yellowing and/or (R) purpling of leaves from the tip to the base.

Fig 4. Two of the most common aphids in Oklahoma known to spread barley yellow dwarf virus are the (L) bird-cherry oat aphid and the (R) greenbug.

Root and foot rots: There are many root and foot rots of wheat caused by fungi, which include sharp eyespot, common root rot, dryland root rot, take-all, and eyespot (strawbreaker or footrot) (Figures 5A-E). Controlling the root and foot rots is difficult because there are no resistant varieties or highly effective fungicide treatments. Late planting (after October 1 in northern OK, and after October 15 in southern OK) helps to control the root and foot rots, but planting late will not entirely eliminate these diseases. If you have a field with a history of severe root rot, plant that field as late as possible or plan to use it in a "graze-out" fashion. Take-all is greatly favored by a high soil pH (>6.5), so when liming fields to correct for acid soils, be sure not to raise the pH above this level. Elimination of residue and crop rotation to a non-host can help control take-all, and also may be somewhat helpful in reducing the other root rots. 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 web page for the Plant Disease and Insect Diagnostic Laboratory at: http://entoplp.okstate.edu/ddd/hosts/wheat.htm.

Fig 5. Root and foot rots that occur in Oklahoma including (top row L to R) sharp eyespot caused by *Rhizoctonia*, common root rot caused by *Bipolaris* (note the darkened sub-crown internode of the seedling on the far right, take-all caused by *Gaeumannomyces,*, (bottom row L to R) dryland root rot caused by *Fusarium* (note the reddish-purple discolorationand (E) eyespot (strawbreaker or footrot).

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