1. Late-emerging volunteer wheat

Recent rains in much of Kansas have brought on a flush of volunteer wheat. Any field of volunteer should be killed as soon as possible at this time of year so that it is completely dead at least two weeks before any wheat is planted within a half-mile of it.

The main threats from late-emerging volunteer wheat, however, are a little different than the main threats from volunteer that emerged in early or mid-summer.

Normally we think of wheat curl mites and the diseases vectored by these mites (wheat streak mosaic, High Plains Virus, and triticum mosaic virus) as being the main threats from volunteer wheat. The threat of wheat streak mosaic is greatest from volunteer wheat that emerges early. That’s because wheat curl mites leave their main host, wheat, as the green tissue on the host is dying. In Kansas, that typically occurs in June. Wheat curl mites can also live on corn and a few other summer grasses. The mites on corn will leave as the corn plants begin to die.

Once the wheat curl mites leave their hosts, they can spread to other areas in the wind, normally within about a half-mile radius. But they only survive for about a week unless they find another living, green host plant on which they can survive. Volunteer wheat that emerges early in the summer provides an ideal oversummering host for mites. The mites can land on volunteer and multiply over the summer until the volunteer is either killed or they leave for other reasons. If there are fields of newly planted wheat nearby when the mites leave the volunteer, these new fields have a good chance of being infested with wheat curl mites – and becoming infected with wheat streak mosaic or a similar mosaic disease.

What about late-emerging volunteer? It is much less likely that volunteer wheat that came up after the rains on August 24-26 will get infested with wheat curl mites, unless there are other fields of volunteer within a half-mile that had come up earlier in the summer.
That doesn’t mean there are no problems associated with volunteer that just came up, however. It is still several weeks before most fields of wheat will be planted. That is plenty of time for this late-emerging volunteer wheat to become infested with either Hessian fly or greenbugs and oat bird cherry aphids.

The heavy rains some areas of Kansas received recently will not only bring up the volunteer, they will also cause adult Hessian flies to emerge from the oversummering pupae found in the old crowns and residue of last season’s wheat crop. The Hessian fly adults and volunteer wheat will both have emerged at about the same time due to the same rain events, meaning the volunteer stands a chance of becoming infested with Hessian fly where there were fields with wheat residue nearby. If newly emerged volunteer becomes infested with Hessian fly, the life cycle of the Hessian fly population will continue and could re-infest nearby planted wheat later this fall or early winter. Killing this newly emerged volunteer now will minimize the chances that Hessian fly can gain a foothold in the area.

Finally, newly emerged volunteer will be an ideal landing site for early waves of greenbugs and bird cherry oat aphids blowing in during September from southern areas. If these aphids find fields of volunteer wheat to land on, they will likely become established and multiply. They can then move on to infest planted wheat after it emerges in October. Greenbugs and bird cherry oat aphids can be vectors of barley yellow dwarf virus – an increasing problem in much of Kansas. By controlling any new stands of volunteer now, producers can help prevent these insect pests from becoming established in the immediate areas of those fields of volunteer. This will not guarantee that planted wheat will not become infected with barley yellow dwarf from aphids coming in from other locations, or at other times of the year, but it will help.

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2. Stalk rots in grain sorghum

Hot, droughty conditions are favorable for the development of stalk rots in grain sorghum, so obviously, we are looking at a potential banner year for stalk rots.

Annual losses are difficult to determine, because unless lodging occurs, the disease goes mostly unnoticed. The best estimates are that at least 5 percent of the sorghum crop is lost each year to stalk rot. The incidence of stalk rot in individual fields may reach 90 to 100 percent with yield losses of 50 percent. The most obvious losses occur when plants lodge. More important may be the yield losses that go unnoticed.

In sorghum, these losses are caused by reduced head size, poor filling of grain, and early head lodging as plants mature early.

In grain sorghum, the two most common types of stalk rot are charcoal rot and Fusarium stalk rot. Although caused by many different organisms, the symptoms of the various stalk rots are somewhat
similar. Symptoms generally appear several weeks after pollination when the plant appears to prematurely ripen. The leaves become dry, taking on a grayish-green appearance similar to frost injury. The stalk usually dies a few weeks later. Diseased stalks can be easily crushed when squeezed between the thumb and finger and are more susceptible to lodging during wind or rainstorms. The most characteristic symptom of stalk rot is the shredding of the internal tissue in the lowest internodes of the stalk, which can be observed when the stalk is split. This shredded tissue may be tan colored (Fusarium stalk rots); red or salmon, (Fusarium and Gibberrella stalk rots); or grayish-black (charcoal rot).

**Charcoal rot**

Hot, droughty weather with soil temperatures in the range of 90 degrees or more are ideal for the development of charcoal rot. Drought does not cause the problem, but it weakens the plants’ defenses to the disease. Charcoal rot is usually less severe if drought stress is reduced.

While it is difficult to separate the effects of charcoal rot from simple drought stress, a good rule of thumb is that plants infected with charcoal rot will die about two weeks earlier from dry weather than plants that do not have charcoal rot. Grain fill that would have occurred during this period is the amount of yield loss that can be attributed to charcoal rot.

The plants will die prematurely. When stalks are split, the typical shredded appearance in the lower stalk associated with all stalk rots will be present. Additionally, there will be a gray to black discoloration of the inner stalk caused by numerous sclerotia (small, black reproductive structures of the fungus) forming on the vascular bundles and decaying tissue.
Close-up of charcoal rot in grain sorghum. Photo by Doug Jardine, K-State Research and Extension.

Lodging from charcoal rot in grain sorghum. Photo courtesy of the University of Missouri.

**Fusarium stalk rot**

Fusarium root and stalk rot is generally found in the same areas where charcoal rot develops. The pith of Fusarium stalk rot infected plants will have a shredded appearance and is typically tan in
color, but in some hybrids the pith in the lower stalk may be pink to red in color. Plants may die prematurely or lodge.

Fusarium stalk rot is favored by dry conditions early in the season, which decreases nutrient solubility, making the nutrients unavailable to the plant. Later in the season, following pollination, warm (82 to 86 degrees), wet weather can leach remaining nutrients from the soil resulting in late-season nitrogen stress and an increase in stalk rot.

General considerations

Stalk rot is a stress-related disease. Any stress on a crop can increase both the incidence and severity of stalk rot. Research has indicated that when the carbohydrates used to fill the grain become unavailable due to nutrient shortage, drought stress, leaf loss from insects, hail, disease or reduced sunlight, the plant uses nitrogen and carbohydrate reserves stored in the stalk to complete grain fill.
This loss of nitrogen and carbohydrate reserves weakens stalk tissues and results in increased stalk rot susceptibility. Early maturing hybrids are generally more susceptible than full-season hybrids.

Other than irrigation or rain, there is little that can be done to prevent stalk rot by late summer. No hybrid has complete immunity to the stalk rotting pathogens. When choosing a hybrid, a grower should select a hybrid that is not only a high yielder, but one that has good standability and “stay-green” characteristics. This will help assure that if stalk rot does occur, losses due to lodging will be minimal. A balanced nutrition program based on soil tests should be used. Overall fertility levels should be adjusted to fit the hybrid, plant population, soil type, environmental conditions and management program. An excess as well as a shortage of nitrogen can lead to increased stalk rot problems.

Producers can check their sorghum for stalk rots by squeezing the lower stem with their thumb and fingers. If the stalks crush easily, they are probably infected with one of the stalk rot organisms and may lodge at any time. Check 100 plants across the field to determine the percent of affected plants. If the percentage of stalk-rot-infected plants is high, sorghum should be harvested as soon as possible, even if it hasn’t dried down adequately in the field. If the stalks are firm, the plants will probably be able to stand just fine in the field for several more weeks if necessary.

Rotation with nonsusceptible crops, such as small grains and alfalfa will reduce the severity of stalk rot but will not eliminate it. A good insect control program is a must in limiting losses to stalk rot. Pathogens may enter stalks or roots through wounds created by insects. Hail damage will generally increase the amount of stalk rot damage.

For more information, see “Stalk Rots of Corn and Sorghum,” K-State publication L-741, at: http://www.ksre.ksu.edu/library/plant2/L741.pdf

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3. Kansas climate, August 2012: Slight improvement

Slightly cooler-than-average temperatures, along with some moisture, has led to some improvement in the drought situation in parts of Kansas during August. The North Central and Central Divisions had above normal precipitation. The Northwest Division fared poorly, with only 49 percent of normal precipitation. The remainder of the divisions averaged between 73 and 96 percent of normal.

There weren’t as many high temperature records broken this month. The highest temperature was 112 degrees F at Ashland on August 2. In contrast to earlier summer months, August was the 78th warmest August, placing it on the cool side of average. The average temperature was -0.2 degrees below normal. The lowest reading this month was 42 degrees F at Brewster on the 19th.

Preliminary statewide average precipitation was 2.76 inches, which was 87% of normal. This makes it the 71st driest August since 1895. The Northwest Division was the driest in overall precipitation at an average of 1.18 inches, or 49% of normal. The Central division was wettest with an average of 3.46 inches, or 119% of normal. Four days saw no reports of precipitation, and on 8 days the
statewide average was zero, with only isolated reports of moisture. Only three days had an average precipitation greater than a half-inch.

The heaviest rains occurred over two periods. August 24th through the 26th saw widespread rains, with the heaviest amounts in southwest Kansas and parts of northeast Kansas. The second round came at the end of the month as remnants of the tropical system Isaac moved north. These heavy rains were confined to a very narrow area of Johnson and Miami counties. Drought conditions lessened slightly in the areas with the heaviest rains, but persist across the state.

The latest Drought Monitor showed the entire state in severe drought or worse. Extreme drought now covers 90 percent of the state, with more than 55 percent of the state in exceptional drought. Despite the rain over the last several days, the area of exceptional drought is likely to expand, particularly in northwest Kansas, which saw little of the precipitation. The latest Drought Outlook indicates drought conditions are expected to continue through October.

The La Niña has ended and conditions favor the development of an El Niño by fall. For September chances are equally likely for above- or below-normal precipitation statewide. Temperatures are expected to continue above average in all except the southwest corner of the state, where normal temperatures are expected.
Table 1  
Aug-12  
Kansas Climate Division Summary

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<td>Jan thru August 2012</td>
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1. Departure from 1981-2010 normal value
2. State Highest temperature: 112 degrees F at Ashland (Clark County) on 2nd.
3. State Lowest temperature: 42 degrees F at Brewster (Thomas County) on the 19th.
4. Greatest 24hr rainfall: 4.60 at Ness City, Ness County on the 24th (NWS); .65 at Trego Center 16.4 SW, Trego County on the 24th (CoCoRaHS).

Source: KSU Weather Data Library

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4. Comparative Vegetation Condition Report: August 21 – September 3

K-State’s Ecology and Agriculture Spatial Analysis Laboratory (EASAL) produces weekly Vegetation Condition Report maps. These maps can be a valuable tool for making crop selection and marketing decisions.

Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:  
http://www.youtube.com/watch?v=CRP3Y5NIggw  
http://www.youtube.com/watch?v=tUdOK94efxc

The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as
comparisons to the previous year and relative to the 21-year average. The report is used by individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

NOTE TO READERS: The maps below represent a subset of the maps available from the EASAL group. If you’d like digital copies of the entire map series please contact Kevin Price at kprice@ksu.edu and we can place you on our email list to receive the entire dataset each week as they are produced. The maps are normally first available on Wednesday of each week, unless there is a delay in the posting of the data by EROS Data Center where we obtain the raw data used to make the maps. These maps are provided for free as a service of the Department of Agronomy and K-State Research and Extension.

The maps in this issue of the newsletter show the current vegetation conditions in Kansas, the Corn Belt, and the continental U.S, with comments from Mary Knapp, state climatologist:

Map 1. The Vegetation Condition Report for Kansas for August 21 – September 3 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that there has been a slight increase in photosynthetic activity in north central and northeast Kansas. Brown and Republic counties show the highest NDVI values. This is particularly true along the Republican River Valley, where subsoil moisture is more available.
Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for August 21 – September 3 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that southwest Kansas has the biggest improvement. Eastern Finney County stands out as an active spot compared to last year. This is not so much an indication of particularly high NDVI values this year, as it is that last year’s production was extremely limited across the southwestern portions of Kansas.
Map 3. Compared to the 23-year average at this time for Kansas, this year’s Vegetation Condition Report for August 21 – September 3 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that most of the state has much below average NDVI values. East Central Kansas through the Flint Hills continues to show particularly low biomass production. Only a small portion of southeastern Jewell County has near-average NDVI values. This area had timely rains in late July and early August, favoring row crops in the area.
Map 4. The Vegetation Condition Report for the Corn Belt for August 21 – September 3 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that greatest photosynthetic activity continues to be confined to northeastern Minnesota, Northern Wisconsin, and the Upper Peninsula of Michigan. The western High Plains continues to have the lowest NDVI values.
Map 5. The comparison to last year in the Corn Belt for the period August 21 – September 3 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that only a small portion of southwest Kansas and a single county in southern Indiana have higher NDVI values this year. The contrast from northern Kansas through North Dakota is particularly dramatic. Last year, these areas were benefiting from a favorable winter and spring moisture pattern. In addition, the temperatures were more favorable in these regions. Soybeans in Nebraska are running 20% good to excellent this year in contrast to last year when 80% of the crop was in good to excellent condition.
Map 6. Compared to the 23-year average at this time for the Corn Belt, this year’s Vegetation Condition Report for August 21 – September 3 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that conditions in the center of the region continue to be well below average. Poor conditions in the eastern portion of the region are not as visible as the season progresses and photosynthetic activity naturally declines.
Map 7. The Vegetation Condition Report for the U.S. for August 21 – September 3 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that highest photosynthetic activity is in New England and the Pacific Northwest. Reduced NDVI values are notable along the border between North Dakota and Canada.
Map 8. The U.S. comparison to last year at this time for the period August 21 – September 3 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the Southern Plains is faring better this year than last, while the Northern Plains has lower biomass production. Given the extremely poor conditions that dominated the Southern Plains last year, this year represents only an incremental improvement in vegetative condition.
Map 9. The U.S. comparison to the 23-year average for the period August 21 – September 3 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the South has the biggest area of above-average photosynthetic activity. Repeated tropical systems have provided a favorable moisture situation in Mississippi, Alabama, and Georgia. Excessive moisture in southern Louisiana has limited the productivity in that region. The center of the country continues to be the area with biggest decrease in biomass production. More than 70 percent of Nebraska is in exceptional drought according to the latest Drought Monitor.

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These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time.
If you have questions or suggestions for topics you’d like to have addressed in the weekly updates, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader 785-532-0397 jshroyer@ksu.edu