



The Wisest Pursuit



MARSHALL COUNTY RESEARCH EXTENSION

May/June/July 2017

Important Dates to Remember

June 8:	Wheat Plot Tour	July 13-18:	Marshall County Fair
June 15:	Livestock Nominations Due	July 13:	Horse Show
June 16:	Fair Pre-Entries Due	July 15:	Beef/ Bucket Calf Show
June 28:	Cat Show	July 16:	Swine/Poultry Show
July 7:	Pre-Fair Judging	July 17:	Sheep/Goat/Rabbit/Dairy Show

2017 Wheat Plot Tour

The Marshall County Extension Service in cooperation with Dan and Alex Matson of Centralia will be holding the Annual Marshall County Wheat Plot Tour on **Thursday, June 8**. The tour will begin at **6:00 P.M.** at the plot. From Home go East on Hwy 36 to just over 2 miles. The plot is on the South side of the highway. There will be 16 wheat varieties and blends to see at the tour. At the tour, there will refreshments served by the Happy Go Lucky 4-H Club and sponsored in part by Kansas Wheat Alliance.

During the wheat plot tour, you will be able to hear about the latest wheat varieties and latest wheat production practices from KSU Extension and industry personnel.

If you plan on attending the Marshall County Wheat Plot Tour, please contact the Marshall County Extension Office at (785) 562-3531, or by email at anastasia@ksu.edu and let us know you are attending by Monday, June 5.

If it rains, listen to KNDY 1570 AM/95.5 FM for postponement information.

Bagworms

From about mid-May through the end of June, larvae hatch. In a short time, seemingly overnight, heavy populations of large larvae may completely defoliate a tree. The best time to remove bags is during the winter when bags stand out and should be completed by late April or early May before larvae hatch and begin to feed. Handpicking any small caterpillars (along with their accompanying bag) and placing them into a container of soapy water will kill them directly. Typically bagworm larvae will begin emerging from the overwintering bag by mid- to late May.

Once a bagworm outbreak has reached damaging levels an insecticidal application is needed to eliminate bagworm larvae. The key to dealing with

bagworms when using insecticides is to make applications early and frequently enough in order to kill the highly susceptible young caterpillars that are feeding aggressively on plant foliage. Applications can begin now with repeat applications occurring 2-3 weeks later to kill any newly hatched larvae.

Thorough spray coverage of all parts of the tree is essential to reduce bagworm populations. Insecticides must be applied with sufficient sprayer pressure and in adequate amounts of water to ensure penetration of dense foliage. Currently there are over 500 products registered in Kansas for use against bagworms. Users should visit local stores for availability.

How Healthy is My Tree?

One of the most important clues in determining the health of your trees is the amount of new growth that tree produces. A healthy tree should have a minimum of 4 to 6 inches of new growth each year. Check branches with the tips in the open and not shaded by the tree itself. Anything less than 4 inches on the majority of branches suggests the tree is under a great deal of stress.

So, how do you tell where the new growth stops? Look for a color change in the stem. New growth is often greener than that from the previous

year. There is also often an area of what looks like compressed growth where growth transitions from one year to the next.

Lastly, look at leaf attachment. Leaves are only produced on current seasons' growth. Therefore, new growth stops where leaves are no longer attached directly to the twig but to side branches. However, pay attention as leaves may appear to be attached directly to last year's growth but are actually borne on short spurs. If you look closely, you can tell the difference.

Vinegar as a Herbicide

We often hear of home remedies that have not been scientifically tested. Vinegar has been suggested as an effective herbicide, but until recently it had not been studied for effectiveness. The USDA's Agricultural Research Service has finally put vinegar to the test. They used concentrations of varying strengths including 5, 10 and 20 percent. Household vinegar is close to a 5 percent solution. Weeds tested included lambs-quarters, giant foxtail, velvetleaf, smooth pigweed and Canadian thistle.

Weeds were hand-sprayed so that the leaves were uniformly coated with material. Young plants within the first two weeks of life were killed with the 5 and 10 percent solution. Higher concentrations

provided 85 to 100% percent kill regardless of the size of the weed. Canada thistle proved to be exceptionally susceptible to vinegar. The 5 percent solution gave 100 percent kill of top growth. Vinegar sold as a herbicide is most often a 20% solution.

Note that all weeds tested were annuals except the thistle. Vinegar is not translocated, so it would burn the top growth of perennials but would be unlikely to kill established plants. Vinegar is commonly made from wine, cider or malt, though a wide variety of materials can be used. This study included only vinegar made from fruits or grains, so it conforms to organic farming standards.

Tomato Leaf-Spot Diseases

Septoria leaf spot usually appears earlier in the season than early blight and produces small dark spots. Spots made by early blight are much larger and often have a distorted "target" pattern of concentric circles. Heavily infected leaves eventually turn yellow and drop. Older leaves are more susceptible than younger ones, so these diseases often start at the bottom of the plant and work up.

Mulching, caging, or staking keeps plants off the ground, making them less vulnerable. Better air circulation allows foliage to dry quicker than in plants allowed to sprawl. Mulching also helps prevent water from splashing and carrying disease spores to the plant. In situations where these diseases have been a problem in the past, rotation is a good strategy.

If rotation is not feasible, fungicides are often helpful. Be sure to cover both upper and lower leaf surfaces, and reapply fungicide if rainfall removes it. Plants usually become susceptible when the tomato fruit is about the size of a walnut. Chlorothalonil is a good choice for fruiting plants because it has a 0-day waiting period, meaning that fruit can be harvested once the spray is dry. Chlorothalonil can be found in numerous products including Fertilome Broad-Spectrum Landscape and Garden Fungicide, Ortho Garden Disease Control, GardenTech Daconil and others. Be sure to start protecting plants when the disease is first seen. It is virtually impossible to control this disease on heavily infected plants.

Nutrient Deficiencies in Soybeans

In late July, soybeans may begin showing signs of chlorosis or other leaf discoloration in all or parts of the field. There may be many causes of discoloration. Nutrient deficiencies are one possibility.

The following is a brief description of the symptoms of some of the most common nutrient deficiencies in soybeans.

Nutrient deficiency symptoms

Nitrogen. Lower leaves are chlorotic or pale green. Within the plant, any available nitrogen (N) from the soil or from nitrogen fixation within nodules on the roots goes to the new growth first. Soybeans prefer to take up N from the soil solution as much as possible, since this requires less energy than the nitrogen fixation process. Both sources of N are important for soybeans since they are a big user of N.



Iron. Iron chlorosis, occurs in calcareous soils with high soil pH. The classic symptom is chlorosis (yellowing) between the veins of young leaves. Iron is not mobile within the plant. A side effect of iron deficiency can be N deficiency, since iron is necessary for nodule formation and function. If iron is deficient, N fixation rates may be reduced. Iron deficiency occurs on calcareous soils because at high levels of calcium, iron molecules become tightly bound to the soil particle and unavailable for plant uptake. In addition to high pH, plant stress can favor the development of iron chlorosis, and therefore the severity can vary significantly from year to year in the same field.

Magnesium. Lower leaves will be pale green, with yellow mottling between the veins. At later stages,



leaves may appear to be speckled bronze. This deficiency may occur on very sandy soils.

Manganese. Stunted plants with interveinal chlorosis. Can be a problem in soils with high pH (>7), or on soils that are sandy or with a high organic matter content. Manganese activates enzymes which are important in photosynthesis, as well as nitrogen metabolism and synthesis. Symptoms are hard to distinguish from iron chlorosis.



Molybdenum. Plants turn a light green color due to lack of nitrogen fixation. This deficiency is not common, but can occur on acidic, highly weathered soils. Symptoms are similar to nitrogen deficiency.

Sulfur. Stunted plants, pale green color, similar to nitrogen deficiency except chlorosis may be more apparent on upper leaves. Plant-available sulfur is released from organic matter. Deficiency is most likely during cool wet conditions or on sandy soils with low organic matter content.

Phosphorus. Phosphorus deficiency may cause stunted growth, dark green coloration of the leaves, necrotic spots on the leaves, a purple color to the leaves, and leaf cupping. These symptoms occur first

on older leaves. Phosphorus deficiency can also delay blooming and maturity. This deficiency may be noticeable when soils are cool and wet, due to decrease in phosphorus uptake.

Potassium. Soybean typically requires large amounts



Potassium Deficiency
Photo by Dave Mengel, K-State Research and Extension.

of potassium. Like phosphorus deficiency, potassium deficiency occurs first on older leaves. Symptoms are chlorosis at the leaf margins and between the veins. In severe cases, all but the very youngest leaves may show symptoms.

General considerations

Mobile Nutrients: These nutrients can be transferred from older tissues to youngest tissues within the plant. Symptoms are noticeable first on lower, oldest leaves.

Nitrogen Phosphorus
Potassium Magnesium

Immobile Nutrients: These nutrients are not easily transferred within the plant. Therefore, symptoms occur first on upper, youngest leaves.

Boron Calcium
Copper Iron
Manganese Molybdenum
Sulfur Zinc

Possible causes of nutrient deficiencies:

1. Low soil levels of the nutrient.
2. Poor inoculation (in the case of nitrogen deficiency).
3. Unusually low or high soil pH levels.
4. Roots are unable to access sufficient amounts of the nutrients. This can be due to poor growing conditions, excessively wet or dry soils, cold weather, or soil compaction.
5. Root injury due to mechanical, insect, disease, or herbicide injury.
6. Genetics of the plant.

For more information, see K-State Research and Extension publication MF-3028, *Diagnosing Nutrient Deficiencies in the Field* at: <http://www.ksre.ksu.edu/bookstore/pubs/MF3028.pdf>

Corn leaf diseases in Kansas

There are several leaf diseases that can infect corn in Kansas in any given year. They can all be controlled with some combination of hybrid selection, tillage management, crop rotation, planting dates, or foliar fungicides.

The primary corn leaf diseases of concern in Kansas are listed in the order that they appear:

Anthracnose leaf blight: Symptoms are tan, irregular-shaped lesions on the lower leaves as early as V3 to V4. Lesions may reach a half-inch in length, with a red, reddish brown, or yellow orange border.

Anthracnose is most common in fields with old corn debris present. High temperatures and cloudy, rainy weather favor infection.

Resistant hybrids can be used to control this disease, but producers should be sure that the hybrid is resistant to anthracnose leaf blight, not just anthracnose stalk rot, since the two types of

resistance are different. Producers can also help reduce this disease by using rotation or tillage to eliminate crop debris. Use of foliar fungicides to control early anthracnose has not been demonstrated to be profitable.



Anthracnose leaf blight
Photo Courtesy of Ohio State University

Gray leaf spot: Symptoms develop on the lowest leaves first and progress upward. The first symptoms are tiny lesions surrounded by a yellow halo. These eventually elongate into pale brown or gray rectangular lesions ranging from less than an inch to two inches in size. The entire leaves may become blighted.

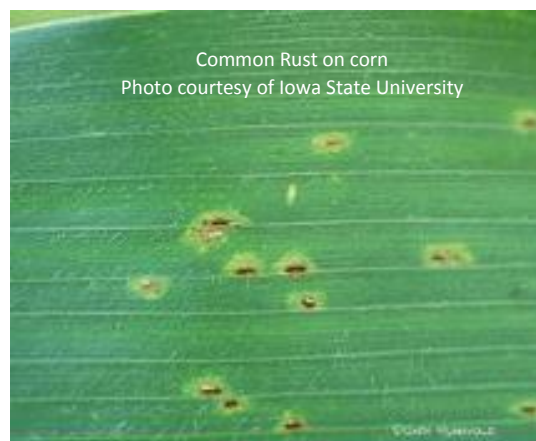


Gray leaf spot survives in infested plant debris on the soil surface. In Kansas, initial infections occur in late June and early July. Cloudy weather accompanied by prolonged periods of leaf wetness and high humidity favor disease development. Severe damage often occurs in low spots or in fields bordered by trees or streams where air circulation is poor.

To control gray leaf spot, producers can use a crop rotation that is long enough to eliminate corn debris. Producers can also till under the old corn debris. There are many hybrids available with at least partial resistance. Producers can also use foliar fungicides when the economic threshold is exceeded. Application of a fungicide prior to full tasseling is not recommended as crop damage can occur prior to this stage of development.

Common rust: This disease is typically less serious in Kansas than the other leaf diseases. Symptoms are small, round to elongated pustules that start out golden brown then turn darker later in the season. Common rust pustules commonly form on both sides of the leaf and are sparser than those of southern rust.

This disease can occur wherever corn is grown. Infection is favored by moderate temperatures (60 to 77 degrees) and high relative humidity (greater than 95 percent for at least six hours).



Common rust is easily controlled by using resistant hybrids. Fungicides are not recommended for this disease alone since common rust causes only minimal yield loss.

Northern corn leaf blight: Symptoms are gray, elongated lesions 1 to 6 inches long. The lesions appear on the oldest leaves first, and progress upward. Lesions may become tan as they mature.

Northern corn leaf blight is most common in continuous corn where crop debris remains on the surface. Conditions that favor infection are temperatures of 65 to 80 degrees with extended periods of dew.



There are several hybrids with resistance to northern corn leaf blight. Producers can also help reduce this disease by using rotation or tillage to eliminate crop debris.

Goss's bacterial wilt: This disease is caused by a bacterial, not a fungal, infection. Symptoms are gray to light yellow stripes with wavy margins that follow the leaf veins. Within these lesions, dark green to black, water-soaked spots that take on the appearance of freckles usually appear and are an excellent diagnostic symptom.

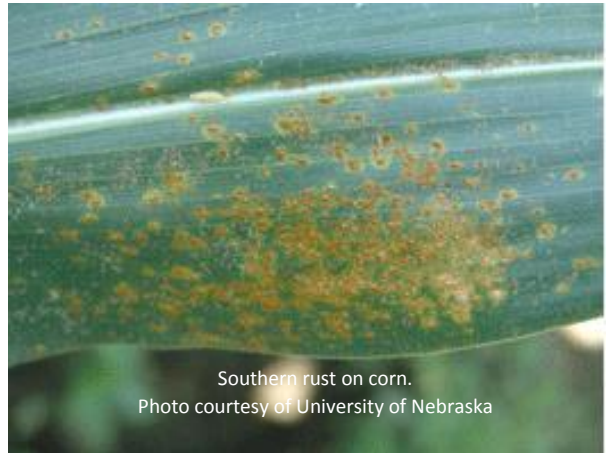


Goss's bacterial wilt on corn.
Photo courtesy of University of Nebraska

This disease occurs primarily in northwest Kansas, northeast Colorado, and southwest Nebraska. It can be controlled with resistant hybrids and crop rotation.

Southern rust: Southern rust pustules look similar to common rust, but there are usually a lot more of them and they occur only on the upper leaf surfaces. This often gives the upper leaves a dusty appearance. Southern rust does not overwinter in Kansas. Spores blow up from southern production areas in mid- to late-July. Warm, humid weather favors infection.

Resistant hybrids are the best choice for management. If susceptible hybrids are planted late, and disease conditions are favorable, applications of a systemic foliar fungicide may be warranted.



Southern rust on corn.
Photo courtesy of University of Nebraska

Summary

The following are leaf diseases that can occur in certain situations:

Continuous corn, with residue on the surface:

All diseases

Continuous corn, no residue on the surface:

Common rust, southern rust

Rotated corn:

Common rust, southern rust

The following lists leaf diseases according to how commonly they occur in Kansas:

1. (Most common) Common rust
2. Gray leaf spot
3. Southern rust
4. Anthracnose leaf blight
5. Goss's wilt
6. (Least common) Northern corn leaf blight

The following lists corn leaf diseases in order of the potential yield loss they typically cause under moderate to severe infections:

1. (Most severe yield loss) Gray leaf spot
2. Southern rust
3. Goss's wilt
4. Anthracnose leaf blight
5. Northern corn leaf blight
6. (Least severe yield loss) Common rust

The Marshall County Fair Book can be found at: <https://tinyurl.com/2017mscofairbook>

Find this newsletter at: <http://www.marshall.k-state.edu/news/>

Be sure to like the "Marshall County Extension Service" Facebook page for timely information regarding crops, horticulture, 4-H, nutrition, and other topics.