



Extension Agronomy

eUpdate

09/01/2017

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 any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. The passing of the baton: New eUpdate editor

Issue 649 marks a passing of the baton from Steve Watson (now retired) to Kathy Gehl as our new eUpdate editor. As Kathy assumes her new role, we welcome her back to the Agronomy Department and the K-State family. Kathy originally joined the department in 1999 as an M.S. graduate student with Chuck Rice, University Distinguished Professor of Agronomy, researching the forms and amounts of nitrogen in runoff water from integrated agriculture management systems.

Kathy grew up on a small farm in east Tennessee and received her B.S. in plant and soil science from the University of Tennessee, Knoxville. After completing her M.S. in 2003, she continued on at K-State as a research assistant in soil chemistry under the direction of Gary Pierzynski, department head and University Distinguished Professor of Agronomy, and later as an assistant scientist working for John Blair, University Distinguished Professor of Biology. Since 2005, Kathy has instructed numerous courses in Chemistry, Soil Science, and Environmental Science at various colleges in Michigan, North Carolina, and Kansas. Kathy, her husband Ron (2004, Ph.D. in Agronomy from K-State), and their 3 children moved back to Manhattan in 2014.

Kathy brings a unique perspective to the eUpdate editor position being able to draw on her background in agronomy and experience teaching and communicating a range of sciences in a clear and understandable manner. As Kathy has worked with Steve during the past two weeks, she has taken care to understand the process of working with authors to develop articles, the timing of content, and many other details of the process to ensure the eUpdates remain timely and relevant.

As we look back over the last 649 issues and look ahead to the future, we welcome your feedback, content ideas, and suggestions which can be sent to Kathy (kgehl@ksu.edu).

With the publishing of today's eUpdate issue, Kathy and Steve have executed a flawless transfer of the baton. Please help me welcome Kathy.

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2. Aflatoxin in corn: A potential concern in dry years

Aspergillus ear rot is being found at levels not seen since 2012. As a result, aflatoxin is likely to be a problem again this year on drought-stressed corn in Kansas. Aflatoxin, produced by the fungus *Aspergillus flavus*, is a greenish-yellow, dime- to quarter-sized mold that grows on corn ears between the kernels (Figure 1). In severe cases, the mold may cover much larger portions of the ear (Figure 2).



Figure 1. *Aspergillus* ear rot colony. Photo by Doug Jardine, K-State Research and Extension.



Figure 2. Severe case of Aspergillus ear rot. Photo by Doug Jardine, K-State Research and Extension.

It tends to be favored by hot, humid, and droughty conditions and for that reason, is more often found in eastern Kansas rather than in the less-humid western counties.

Most elevators now use one of several commercial quantitative tests that can be performed in a very short period of time right at the point of delivery, rather than the outdated black light method. Samples testing at less than 100 parts per billion (ppb) are usually accepted without penalty. Levels over 100 ppb may be docked a percentage or not accepted at all.

The FDA has established 20 ppb or higher as the level deemed unsafe for human consumption. However, buyers of corn for consumption by humans or pets typically have much more stringent standards and may require levels to be 10 ppb or less. Ethanol plants may also refuse aflatoxin contaminated grain since the toxin is heat stable and can concentrate as much as three- to four-fold in the distiller's grains. Aflatoxin contaminated corn at any level should not be fed to lactating dairy cows because it can be passed through to the milk.

At 20 to 100 ppb, corn can still be fed to breeding cattle, swine, and mature poultry. Grain testing at 100 to 200 ppb can be used for finishing swine over 100 pounds and for beef cattle. For levels between 200 and 300 ppb, uses are limited to finishing beef cattle only.

Grain with aflatoxin levels higher than 300 ppb cannot be used as feed unless it has been cleaned or blended to safe levels. Blended corn can only be used for direct feeding on the farm where it is

blended. It cannot be sold unless a specific blending exemption from the FDA is granted, such as occurred during the 2012 outbreak.

Drought stressed corn harvested for silage may also contain aflatoxin. Producers wishing to have silage tested for aflatoxin can do so through the Veterinary Medicine Diagnostic Lab at the University of Missouri. See their website at <http://www.vmdl.missouri.edu/services.html> for information on pricing and sample submission.

Once the fungus is detected in grain, the affected corn should be separated from “sound” corn and extra care used in cleaning bins that held contaminated corn.

Producers can reduce the incidence of aflatoxin and other mycotoxins after harvest by taking the following precautions:

- Harvest when moisture content allows minimum kernel damage (24 to 26 percent).
- Adjust equipment for minimum kernel damage and maximum cleaning.
- Dry shelled grain to at least 15 percent moisture, 24 to 48 hours after harvest.
- Dry grain to below 13 percent moisture for long-term storage.
- Cool the grain as quickly as possible after drying to 35 to 40 °F, realizing that with current weather conditions, this is not feasible.
- Aerate and test for "hot spots" at one- to four-week intervals during the storage period.

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3. Considerations when harvesting drought-stressed corn for grain

Corn harvest is slowly beginning in parts of Kansas. Harvest may present some challenges when drought is a major factor.

Aflatoxin

Drought-stressed corn may have high levels of aflatoxin (see article below). Aflatoxin levels may increase in storage if the corn is held very long at moisture levels above 14 percent. Growers intending storage for more than a week or two should have the corn tested for aflatoxin. Corn testing above 100 ppb should probably not be stored long-term.

Ear Drop

Ears may drop more easily in corn that has gone through drought, especially during grain fill. Some causes of increased ear drop include:

- The ear shank may not develop normally in stressed conditions.
- Rapid drydown may result in brittle tissue where the ear attaches.
- A “pinched shank” or constriction on one side of the shank may occur. This is usually associated with missing kernels on the butt of the ear on the same side as the pinch.
- Hybrid differences. For example, some hybrids may have a smaller-diameter shank attachment.
- Fusarium stalk rot (pink stalk rot) may infect the ear shank, causing deterioration of the tissues and greater numbers of dropped ears.

Stalk Lodging

Droughty conditions, especially during grain fill, can predispose corn to a number of stalk rots, which in turn may result in stalk lodging. Stalk lodging in corn occurs when the stalk weakens and breaks at some point below the ear. When this occurs, it results in harvest losses and slows down harvesting considerably. Grain moisture levels may also be unacceptably high in lodged corn.

We often find stalk rot disease organisms (charcoal rot, Fusarium, Gibberella, anthracnose, and others) on corn with stalk lodging. Although stalk rot is often the ultimate cause of lodging, in most cases, the stalk rot diseases were only able to infect the plants because certain other factors predisposed the plants to disease infection. Such factors include:

** Hybrid differences in stalk strength or stalk rot susceptibility.* Some hybrids have genetically stronger stalks than others. This is often related to a hybrid’s yield potential and how it allocates carbohydrates during grain fill. But there are also genetic differences in stalk strength due to other reasons, including better resistance to stalk rot diseases. If a field of corn has stalk lodging problems, it could be due in part to hybrid selection.

** Poor root growth and other stresses.* Cold, waterlogged soils early in the season; severe drought; and soil compaction all can result in small, inadequate root systems. Under these conditions, the roots may not be able to effectively extract enough water and nutrients from soil to support plant growth and carbohydrate production. When carbohydrate production is below normal during any part of the growing season, the ears will continue to take what they need during grain fill, which can leave the

stalks depleted even under average yield conditions. The developing ear always has priority for carbohydrates within the plant.

* *Poor leaf health.* Any factor that results in poor leaf health will reduce carbohydrate production during the season. If overall carbohydrate reserves in the plants are low when grain fill begins, stalk integrity will often suffer as the available supply of carbohydrates moves into grain production. Maintaining good leaf health is important in minimizing stalk rots. The more photosynthesis, the less need for the plant to tap stalk reserves. Stay green characteristics in hybrids are highly correlated to stalk rot resistance and reduced lodging.

* *High plant densities.* Plants can become tall and thin when plant densities are too high, which can result in thin stalks with inadequate strength. In addition, plant-to-plant competition for light, nutrients, and water enhances the competition for carbohydrates between the stalk and ear within the plant, thus reducing the vigor of the cells in the stalk and predisposing them to invasion by stalk rot.

* *Nutrient imbalances and/or deficiencies* predispose corn plants to stalk rot and stalk lodging. Both potassium and chloride deficiency have been shown to reduce stalk quality and strength, and stalk rot resistance. High nitrogen coupled with low potassium levels increase the amount of premature stalk death, and create an ideal situation for stalk rot and lodging. Soil chloride levels should be maintained above 20 lbs per acre.

* *Corn rootworm and corn borers.* Damage caused by corn rootworm and the European corn borer can predispose the corn plant to invasion by stalk rotting organisms, as well as lead to outright yield loss.

* *Mid-season hail damage.* Similar to the damage caused by insects, the physical damage caused by mid-season hail can set up the plant for invasion by stalk rotting organisms. Stalk bruising and the resulting internal damage may also physically weaken corn stalks, making them more likely to lodge later in the season.

Summary

Where corn has been under drought stress, there is increased likelihood for small kernels, dropped ears, stalk lodging, and grain toxins. In this situation, it is especially important that corn is harvested in a timely manner and with a well-adjusted combine after a dry growing season.

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4. Basal bark and cut-stump herbicide applications for control of woody plants on rangeland

Late summer and fall can be an excellent time to treat unwanted stands of woody plants. Scattered stands of individual trees should either be treated individually using the basal bark method (for labeled plants less than 4-6 inches in diameter) or the cut stump treatment method. The basal bark and cut stump treatments will not be effective if the plants cannot be treated down to the soil line. Avoid conditions where water (or snow later in the season) prevents spraying to the ground line.

Producers can treat smaller diameter susceptible woody plants individually this fall by spraying the basal stem parts with triclopyr plus diesel fuel. The lower 12-15 inches of the stems or trunks of susceptible small trees should be thoroughly wetted on all sides with a triclopyr-diesel mixture. Triclopyr goes by the tradenames Remedy Ultra and Pathfinder II. Remedy Ultra is a 4 lb/gallon product.

The labeled recommendations for Remedy Ultra are 20-30% solution in diesel. Pathfinder II is a ready-to-use product and does not have to be mixed with diesel. PastureGard HL is a premix of triclopyr and fluroxypyr, and can be applied as a basal bark or cut-stump treatment as a 25% solution in diesel. Crossbow, a mixture of triclopyr and 2,4-D, can also provide control of certain woody plants as a 4% solution in diesel. Milestone, with the active ingredient aminopyralid, is effective on black and common honeylocust. Mix Milestone 5% v/v with a compatible basal oil; e.g. Dyne-Amic from Helena Chemical. Before selecting a basal oil, do a jar test by mixing Milestone and basal oil to determine compatibility.

If the woody plant is greater than 6 inches in diameter, the best method is to:

- Cut it off at ground level.
- Treat the cut surface with triclopyr and diesel fuel within 30-60 minutes, before the sap seals over the exposed area.
- Spray the cambium and light-colored sapwood to insure translocation of the herbicide.
- Treat any exposed trunk or exposed roots.

The stump of ash, cottonwood, elm, oaks, persimmon, and Russian olive can be treated with a 1:1 ratio of dicamba (Banvel, Clarity) in water instead of triclopyr if desired. The stumps of Eastern red cedar do not need to be treated since, unlike many woody plants, this species does not root sprout. Simply cutting Eastern red cedar below the lowest green branch will kill it. Common trees in Kansas that resprout after cutting include ash, cottonwood, elm, oaks, osage orange (hedge), persimmon, black and common honey locust, saltcedar, and Russian olive. In sprouting species, new shoots arise from dormant buds at or below the ground often resulting in a multi-stemmed clump.

Table 1. Cut-Stump Herbicides

Herbicide	Active ingredients per gallon	Rate
Crossbow ¹	2 lb 2,4-D + 1 lb triclopyr	4% in diesel
Remedy Ultra	4 lb triclopyr	20-30% in diesel
Pathfinder II	0.75 lb triclopyr	Ready to use
PastureGard HL	3 lb triclopyr + 1 lb fluroxypyr	25% in diesel

Milestone	2 lb aminopyralid	10% in water
Banvel/Clarity	4 lb dicamba	25-50% in water
Roundup PowerMax	5.5 lb glyphosate	50-100% in water
Arsenal	2 lb imazapyr	10% in water

¹ Trade names are used to help identify herbicides. No endorsement is intended, nor is any criticism implied of similar products not mentioned.

Common honeylocust can resprout from a wide diameter area around the main plant because of root suckers. One option is to make a basal bark treatment with triclopyr-containing products to kill the entire plant in the fall. Then the main plant can be cut down in subsequent years once the tree is dead. Cut-stump applications of Milestone as a 10% solution in water has been more effective than triclopyr on common honeylocust.

Table 2. Cut-Stump Treatments

Species	Herbicides
Ash	Crossbow, Pathfinder II, Banvel/Clarity, Arsenal
Common honeylocust	Remedy Ultra, Pathfinder II, PastureGard HL, Milestone, Banvel/Clarity
Cottonwood	Crossbow, Remedy Ultra, Pathfinder II, Banvel/Clarity, Arsenal
Elm	Crossbow, Remedy Ultra, Pathfinder II, PastureGard HL, Banvel/Clarity, Arsenal
Oaks	Remedy Ultra, Pathfinder II, PastureGard HL, Banvel/Clarity, Roundup PowerMax, Arsenal
Osage orange (hedge)	Remedy Ultra, Pathfinder II, PastureGard HL
Persimmon	Remedy Ultra, Pathfinder II, PastureGard HL, Banvel/Clarity, Arsenal
Russian olive	Crossbow, Pathfinder II, Banvel/Clarity, Arsenal
Salt cedar	Remedy Ultra, Pathfinder II, PastureGard HL, Roundup Power Max, Arsenal

Tordon RTU and Pathway can be used on cut surfaces in noncropland areas such as fence rows, roadsides, and rights-of-way. However, Tordon RTU, and Pathway are not labeled for use on range and pasture. Glyphosate labels vary on what sites are labeled for cut-stump application on rangeland. Roundup PowerMax can be applied on any terrestrial site. Roundup WeatherMax can only be applied as a cut-stump treatment on non-cropland. Be sure to check the label as rangeland is sometimes included as a site under non-cropland on some glyphosate labels.

Application equipment for cut-stump application includes pressurized hand sprayers, small backpack sprayers, sprayer mounted on ATV with handheld gun, hydraulic tree shears or saws with an attached spray nozzle, or even a paint brush. Two of the more common pieces of equipment for cutting the woody plants are the turbo saw and the hydra clip.



Figure 1. Turbo saw on left and hydra clip on right.

Although exposure to animals is reduced by basal and cut-stump treatments, grazing and haying restrictions still need to be followed. There are no restrictions before grazing with any of the herbicides discussed. Check labels for restrictions for use prior to hay harvesting, removal of animals before slaughter, and for use around lactating dairy animals.

Application tips for using cut-stump treatments:

- Always follow directions on the herbicide label.
- Before spraying, brush any sawdust or debris off cut surface.
- Apply herbicide to freshly cut stump.
- Spray cut surface and stump to ground level.
- Spray exposed roots above soil surface.
- The cambium layer is the critical area to spray.
- Apply enough liquid that it pools on cut surface.

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5. Accessing National Weather Service forecasts from mobile devices and the internet

(Note: The following is an edited excerpt from K-State Research and Extension Publication MF3337, [National Weather Service Forecasts: Serving Agriculture](#). – Kathy Gehl, Agronomy eUpdate Editor)

The Great Plains is known for rapidly changing weather. Checking weather forecasts is a daily ritual for residents of the central United States as they determine if they should prepare for calm seasonable weather, or for severe storms, extreme blasts of cold, deadly blizzards, roller-coaster temperatures, blistering hot days, extended droughts, and torrential downpours.

With today's instant communication, individuals can directly access National Weather Service's (NWS) weather and forecast products from a mobile device or the internet. These forecasts provide farmers, ranchers, and land managers the information they need to make decisions regarding safety in severe weather, help maximize the use of farm inputs, and minimize production risks.

Forecasts

NWS forecast products predict weather conditions ahead for the next seven days. Forecasts contain multiple weather variables, including: air temperature, dew point temperature, relative humidity, wind speed, wind direction, rainfall or frozen precipitation, and sky cover. Forecasts predict a value or indicate the probability of precipitation for specific geographical areas.

For example, what does a chance of rain mean?

The "chance" is the likelihood of measurable precipitation that is at least 0.01 of an inch of rain at a location during a specific time period (usually 3, 6, or 12 hours). The "chance of rain" is also called probability of precipitation.

A 40 percent chance of rain means there is a 40 percent chance your location will receive at least 0.01 of an inch of rain during the specified time period.

A minimum of 0.01 of an inch is needed. If the conditions are right, a location could receive as much as several inches of rain with only a forecast of 20 percent chance of rain.

Mobile Device Access: mobile.weather.gov

To access NWS forecasts on a mobile device, enter "mobile.weather.gov" into your mobile device's browser app. On the landing page, enter a city and state or ZIP code. Entered locations are automatically saved for quick forecast access. Touching the "Go" button brings up the location, any special weather statement or hazardous weather advisory, and current conditions (Figure 1). The statement or advisory includes a warning symbol that provides detailed information. The "+" symbol in the "Current Conditions" box brings up additional weather data and details about the observed location.

Scroll down to see next viewable box, "Forecast" (Figure 1). It includes forecast information for the next 36 hours, navigation arrows to advance or backup the forecast, plus symbols to go to hourly forecasts, and a "Detailed Forecast" that provide more information.

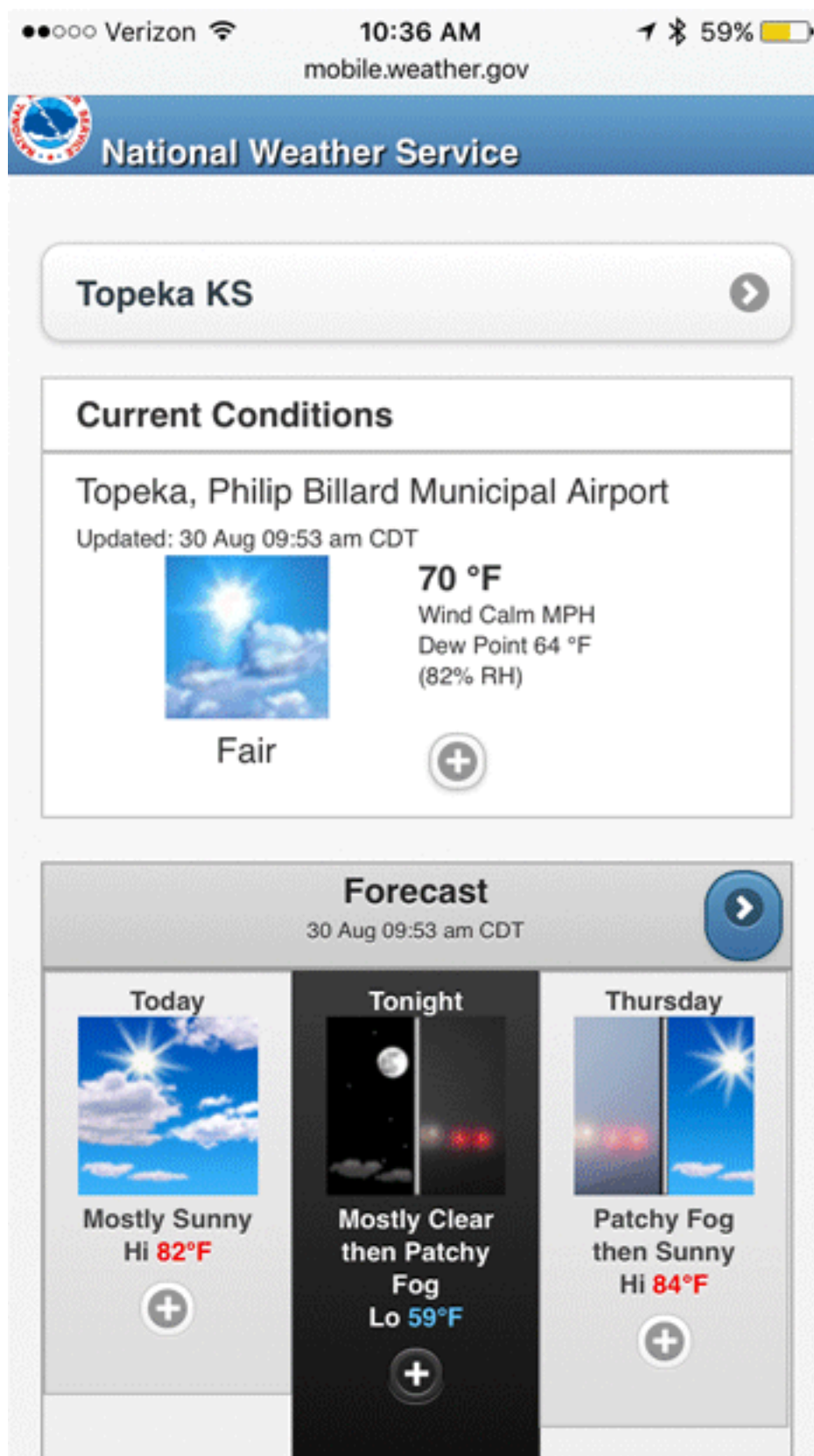


Figure 1. NWS mobile.weather.gov

To dig deeper into the forecast, the “Forecast” box offers a number of options. Use the arrows to move forward to see day and night forecasts for up to 7 days. Touching the “+” button in the box for any day or night displayed brings up the hour-by-hour forecast (Figure 2). The hourly forecasts include: general weather, temperature, wind direction, and wind speed.



Figure 2. NWS - mobile.weather.gov - Local hour-by-hour screen

Internet: Weather.gov

The NWS's full website is weather.gov. Users have the choice of viewing point forecasts for a single location or seeing nationwide forecast maps. The *weather.gov* homepage shows all active watches and warnings on maps of the United States (Figure 3).

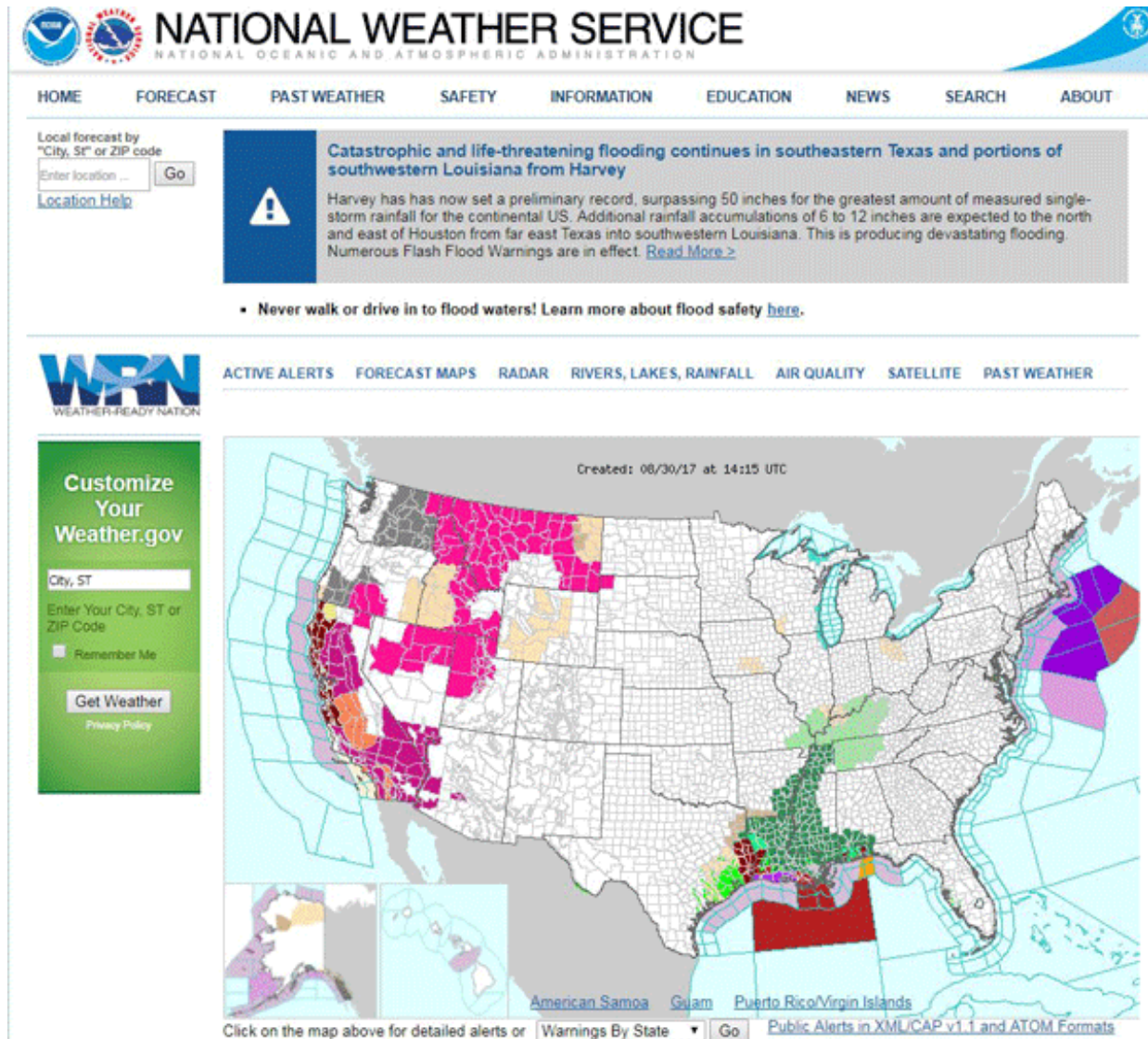


Figure 3. NWS homepage on August 30, 2017 - weather.gov

The *weather.gov* homepage is an interactive map that allows users to select their local NWS office's forecast homepage. Select an area on the map to go to the home webpage for that local office (Figure 4). There are 122 local forecast offices across the continental United States. Local NWS office forecast office homepages vary. The page may include one or more "Graphicasts" or "Weather Story" items. These are regional weather graphics that highlight weather of note or concern. Other products on the page include local radar, weather maps, and text and icon product selection.

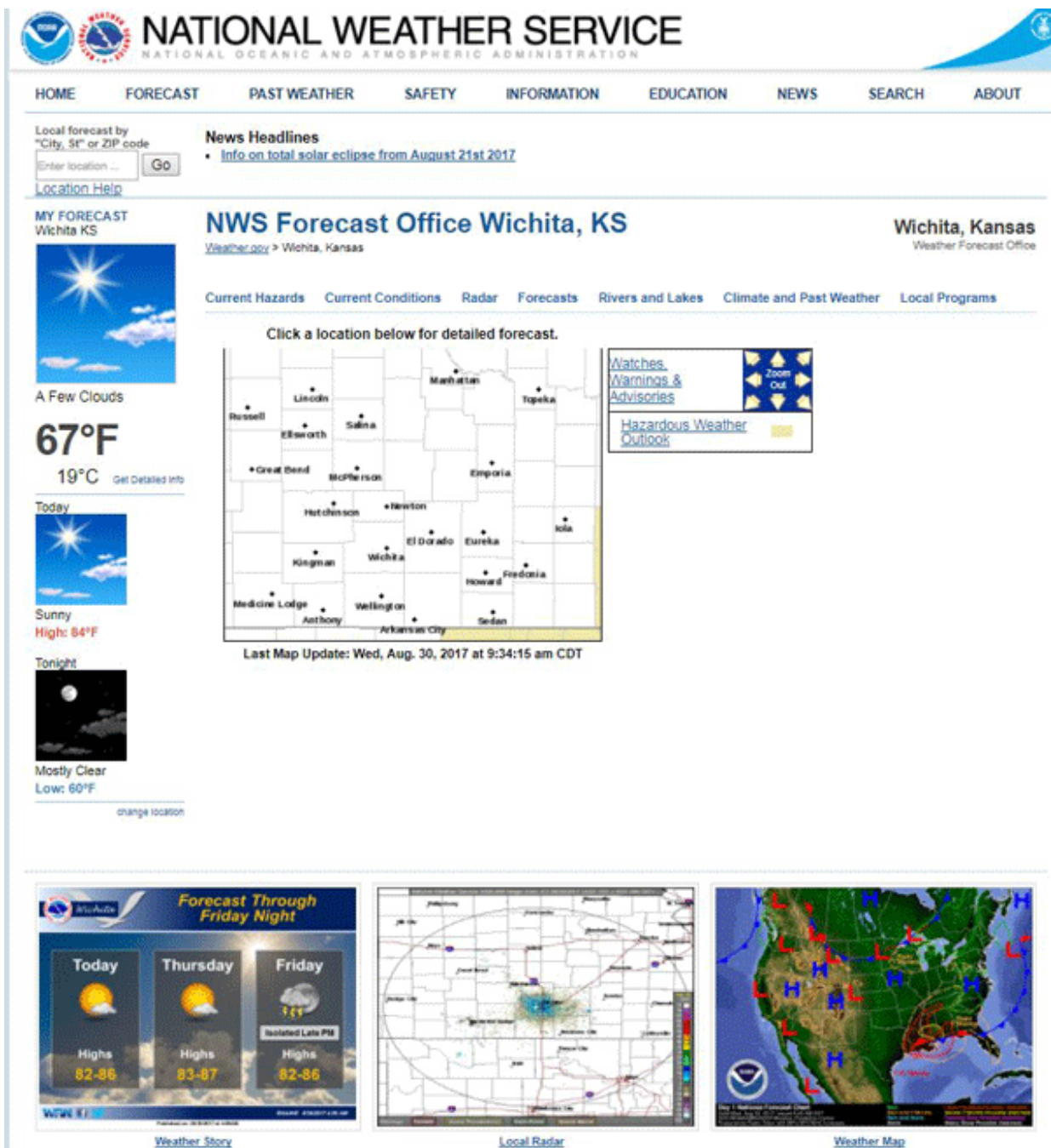


Figure 4. NWS - Local office webpage

Users can click a specific area on local office’s interactive map to access a “Point Forecast” webpage.

The “Point Forecast” webpage lists the local office toward the top of the page. If there are any hazardous weather statements or advisories, they are listed next in red highlights. Below that are weather data from the closest National Weather Service weather station. After that is a day and night

capsule forecast covering the next 5 days and nights (Figure 5).

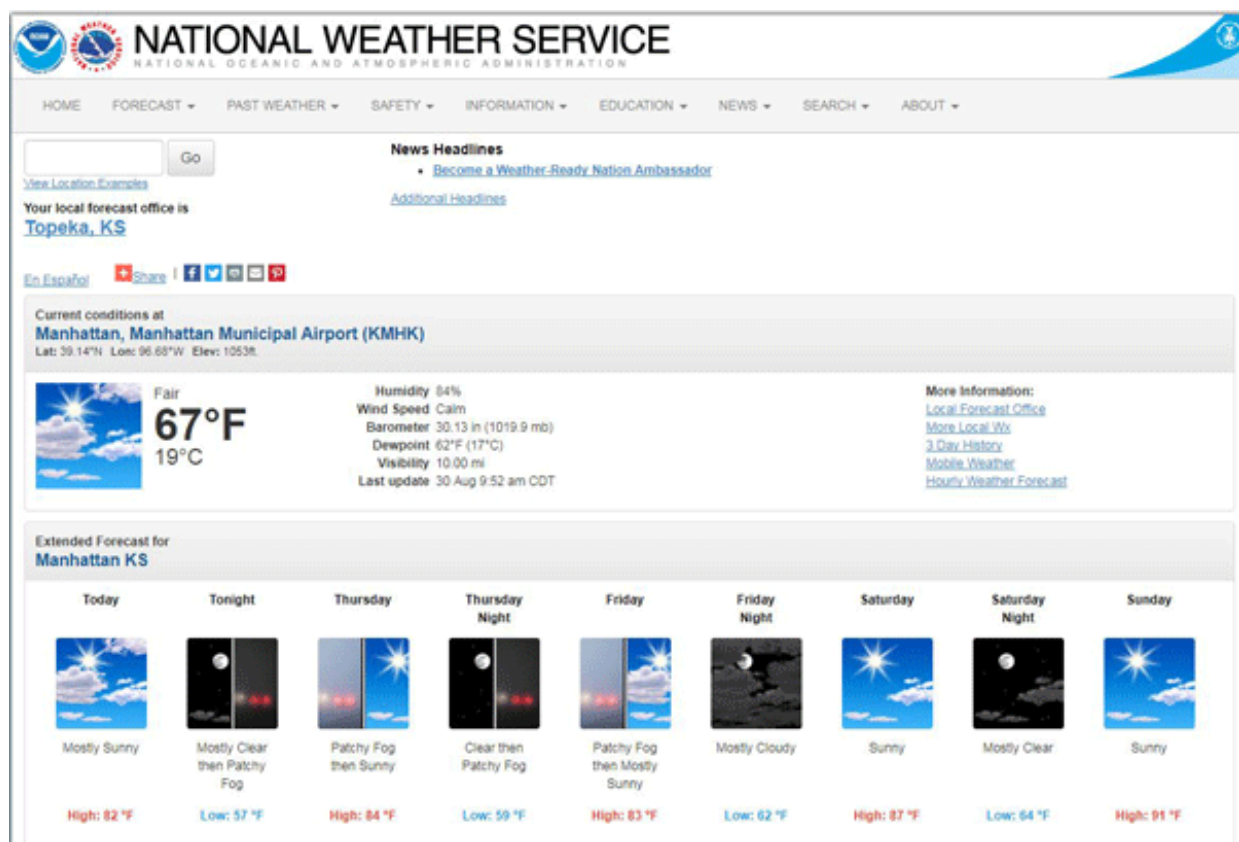


Figure 5. NWS - Point Forecast webpage

Scrolling down the page brings up the “Detailed Forecast” for the next 7 days. This is a text forecast that often includes information on wind speeds, gusts, precipitation timing, precipitation amounts, and changes from rain to frozen precipitation.

Farther down the page are the “Hourly Weather Forecast” graphs (Figure 6). This is one of the most powerful forecast tools available. It provides time series graphs of hourly forecast weather variables over a 48-hour period. Variables that can be graphed, include: temperature, wind, relative humidity, rain, thunder, and other types of selected weather variables. An interactive time and date box can be used to start the graph from any date and hour to view hourly forecasts for as long as 7 days. Users can turn off or on weather variables or conditions listed above the graphs or graph legend.

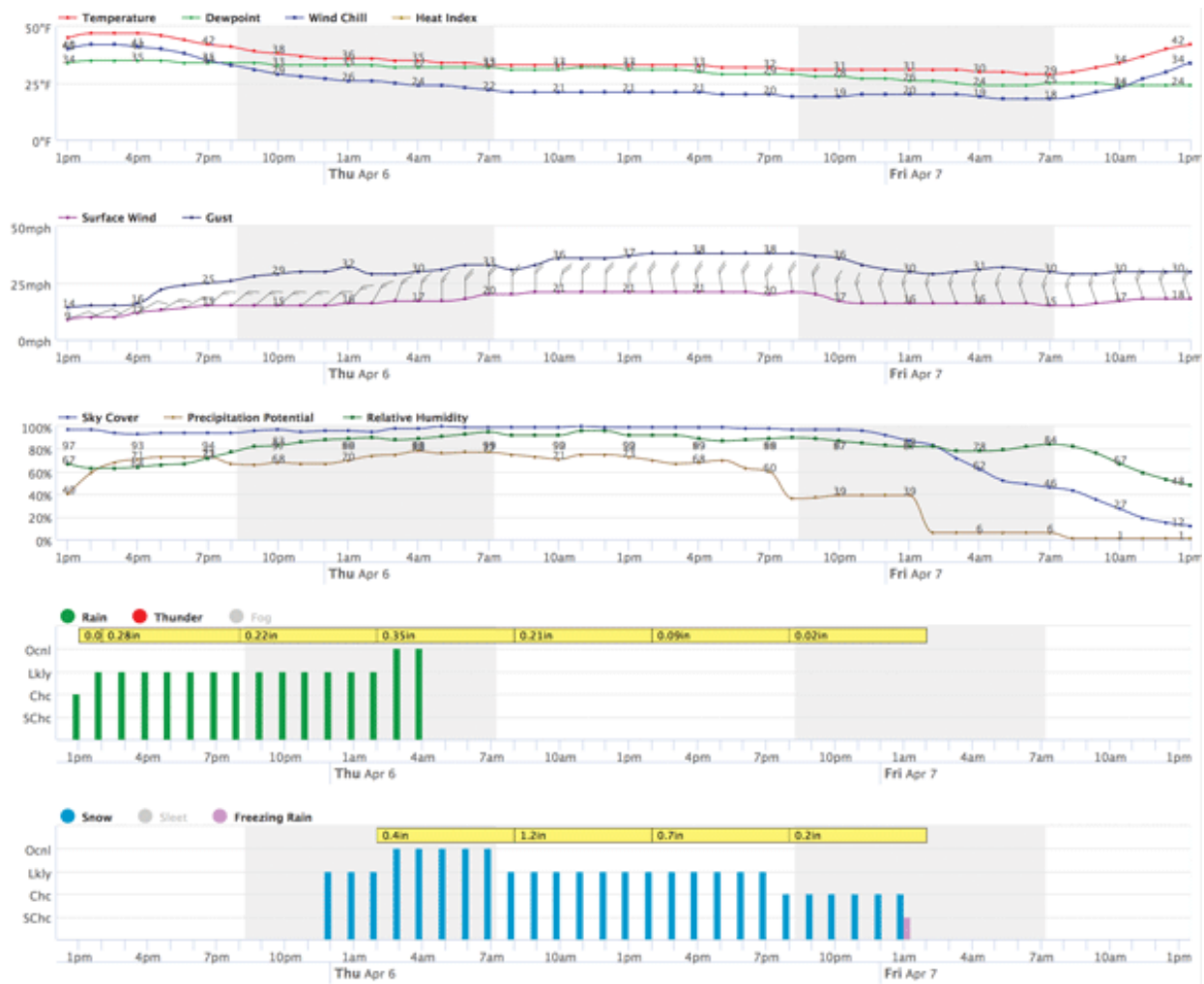


Figure 6. NWS - Hourly weather graphs

The time series shows how temperatures will change over the day or when a cold front is coming through. The wind graph shows shifts and if the change occurs during times of high wind speed. Graphs show when there is a chance of precipitation and whether it will come as rain or as frozen precipitation. Yellow shaded boxes show likely rainfall or frozen precipitation amounts over hours covered by each box, if precipitation occurs. Grey shading indicates nighttime hours and white, daytime hours.

The NOAA NWS is constantly seeking to improve forecast accuracy and weather product delivery. They produce a wide variety of quality products that can help farmers and ranchers improve their operation's management.

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6. Update on sugarcane aphids and other pests of sorghum

The sugarcane aphid problem is more limited in scope this year in Kansas than in 2016, but there is still a need for vigilance in later-planted fields in central and western Kansas for a few more weeks. Grain that is now turning color is probably safe from damage. Be sure to check the myFields web site for the latest information: myfields.info/pests/sugarcane-aphid

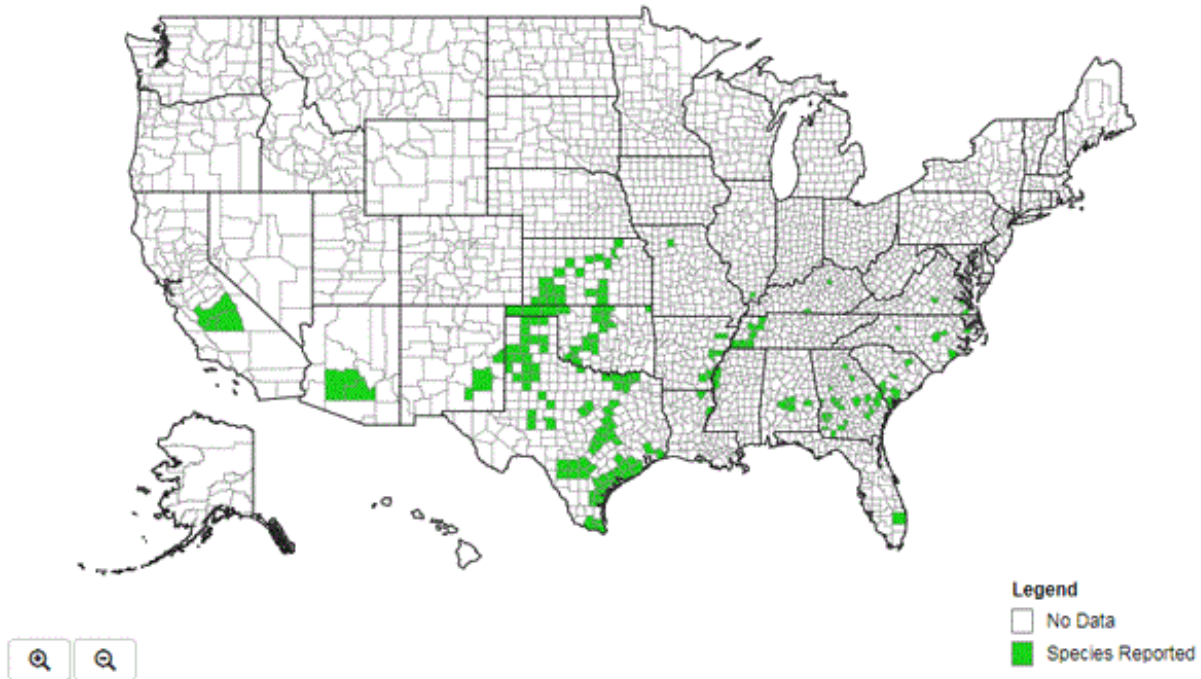


Figure 1. Current status of the SCA. The map indicates only the counties in which the SCA has been found, and does not indicate how many or how few aphids were found in that county.
Source: www.myfields.info/pests/sugarcane-aphid

Other potentially destructive insects active in Kansas sorghum this year include headworms (corn earworms), chinch bugs, false chinch bugs, and lygus bugs. Grain is most at risk from these insects during soft stages.

One of the biggest challenges for sorghum producers is how to control these other insect pests without making potential sugarcane aphid problems worse by killing their natural predators. For example, we are concerned that farmers will spray headworms with broad-spectrum insecticides because these products are cheap, and in so doing, reduce natural enemy populations and flare the aphids.

We are recommending only selective insecticides for the headworms now. Two currently registered would be Prevathon and Blackhawk (Dow/Dupont). Test have shown these insecticides to be compatible with the selective aphicides recommended for sugarcane aphid control – Transform (Dow/Dupont) and Sivanto (Bayer) – and can be tank-mixed, if needed.

The threshold for the headworms hasn't changed, but we have updated the scouting card for the SCA this year.

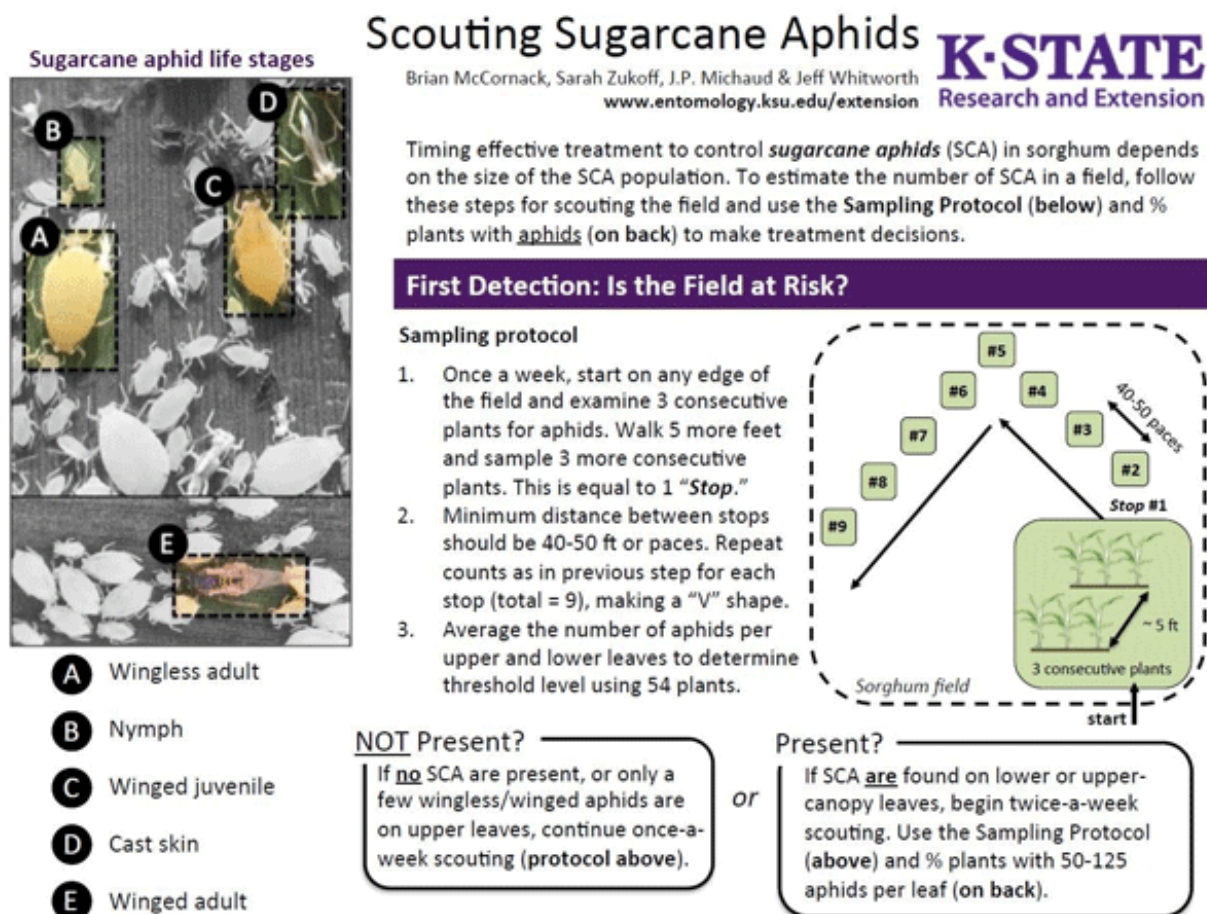


Figure 2. Revised scouting recommendations for sugarcane aphids in Kansas.

SCA Threshold by Growth Stage

Estimate the percentage (%) of infested plants with 50-125 sugarcane aphids (SCA) per leaf to help time **foliar insecticide** (Sivanto @ 4 oz/acre or Transform @ 1 oz/acre) applications.

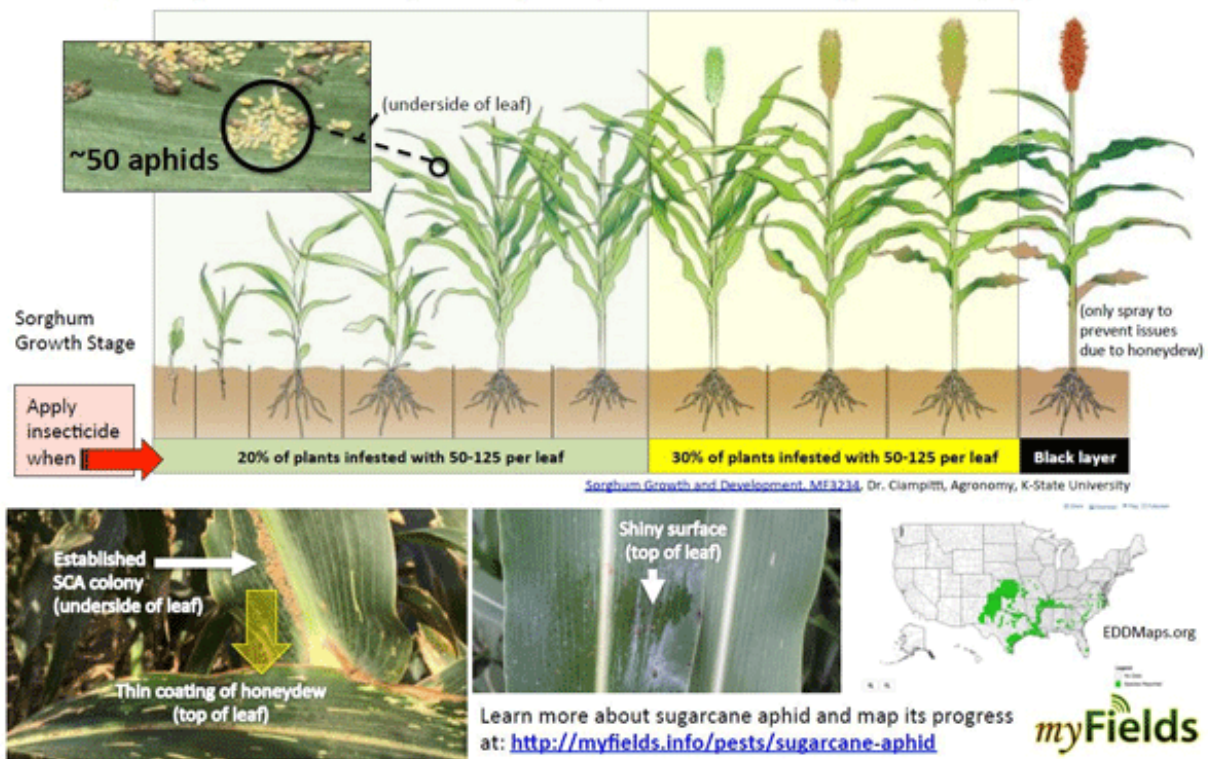


Figure 3. Revised thresholds for sugarcane aphids in Kansas.

The myFields web site: Keeping updated on SCA in Kansas and report findings

For ongoing current information on SCA in Kansas, check out the myFields web site often in the coming weeks: www.myfields.info/pests/sugarcane-aphid

It would be helpful if producers would report findings of SCA in their fields on the myFields web site as soon as the insects are found. Reports are used in developing the map seen in Figure 1.

The reports used to develop each map are, in part, those submitted through the myFields web site from account holders that have special permissions as "Verified Samplers." Only reports submitted by these verified samplers get mapped so that we can account for data quality. However, all account holders are encouraged to report their observations on the SCA, as uploaded pictures can be verified by specialists, a great way to get an early detection in new areas. Web site visitors will need to: 1) sign up for an account, 2) log in, 3) to get access to the 'Scout a Field' feature to make reports. The *Scout a Field* tool is easy, you just map the observation location and select yes or no for SCA presence.

Here is the sign up page: <https://www.myfields.info/user/register>

Also, if sorghum producers are interested in receiving alerts, which are triggered by new reports submitted by verified samplers, they just need to sign up for a myFields account. Signing up for an account automatically signs them up for SCA alerts, but they can also opt out of them in their user preferences. The alerts include a statewide email notice when SCA is first detected in the state, and then are localized by county as SCA moves into the state. The notices will also contain latest recommendations and contact info for local Extension experts.

The question of whether to spray

The question of whether to spray is a difficult one, given the current low grain prices. Consider the stage of the crop first. If your grain is already turning color, you are probably OK, but sorghum at all stages up until hard dough will be at risk from this complex of pests.

Applications costs (assuming either Transform or Sivanto is used) will range from about \$12 an acre (Transform from the ground) to about \$22 an acre (Sivanto from the air). There is a good chance this cost will not be recovered unless the field yields 80 bushels per acre or better – not a very encouraging proposition.

Transform and Sivanto should also control the seed bugs, which have the potential to inflict much greater losses than the aphids, but will not control headworms, which are also having a late generation in southern regions of the state.

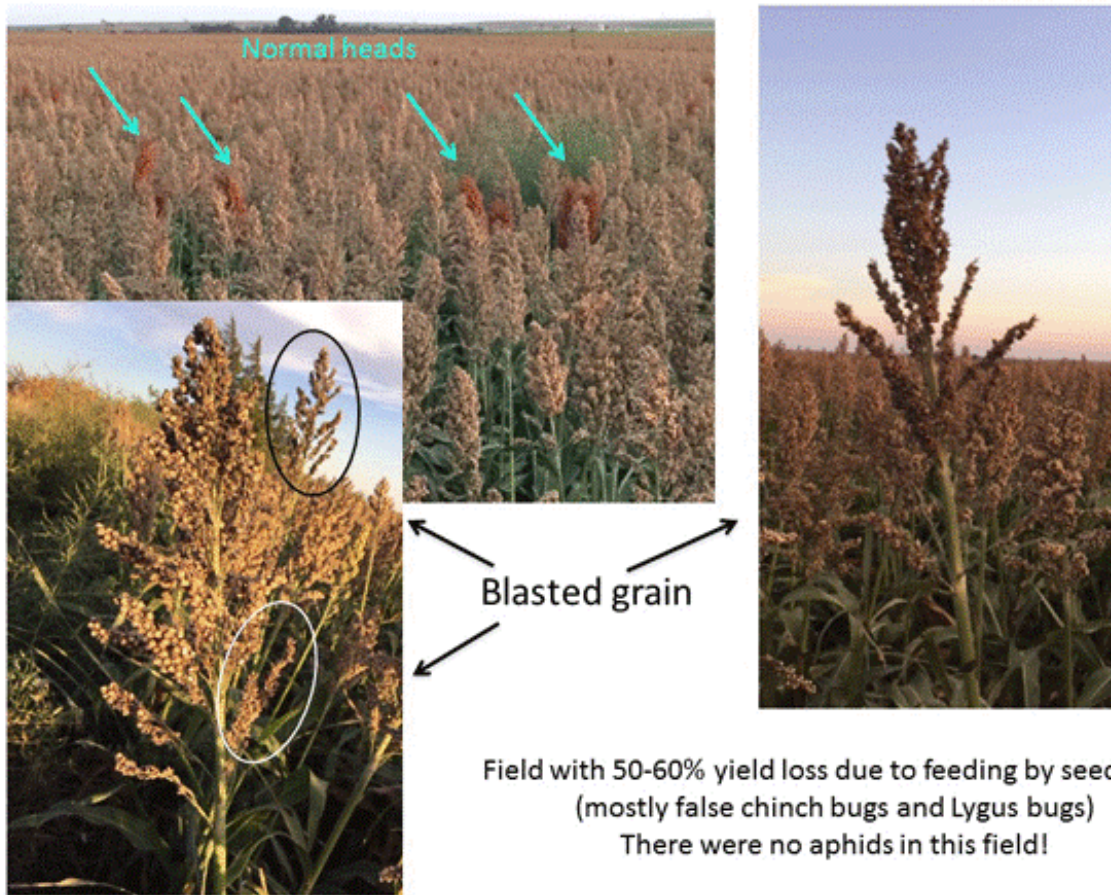
Growers need to consider not only the yield potential of the field, but also how much is invested in the crop. If the field is in earlier stages of development (say, just beginning grain fill), a treatment may be considered for sake of preserving the grain and the investment already made in the crop, even if it appears unlikely the cost will be fully recovered. Even in later stages of grain fill, an application may be warranted if a majority of plants are heavily infested with lots of aphids in the heads, given the risk of harvesting problems.

It is important to use a minimum of 5 gallons per acre of carrier in aerial applications, or 15-20 gallons per acre from a ground rig, in order to get good coverage of the plants. Transform and Sivanto will both penetrate the leaves and kill the aphids on the undersides. Residual activity is only about 10-14 days for Transform, but can be three weeks or longer for Sivanto. A single treatment with either product should be enough to preserve yield in plants that are in any stage of grain fill, but one should also consider that the efficacy of these materials will be significantly reduced at lower temperatures. Cooler overnight temperatures will substantially slow aphid feeding (and thus their growth and reproduction), but they can remain alive on plants as long as any green tissue remains available, even surviving successive overnight freezes. In other words, they will not die off completely until the plants do, even though they are no longer causing economic damage.

Note that aphid feeding does not 'blast' the grain, but seed size and weight is reduced.



The panicles on the left were impacted by sugarcane aphids + corn leaf aphids, with a bit of seed bug damage also. Damaged panicles weighed 70% less than those from a less-affected portion of the field, although none was without some damage.



The Culprits



Lygus bug, *Lygus lineolaris*

False chinch bug, *Nysius rufanus*

Chinch bug
Blissus leucopterus

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7. Start scouting now for sorghum headworms

It is important to monitor flowering/heading sorghum fields for corn earworm, also known as sorghum headworm. Flowering sorghum heads sampled so far this year indicate that headworm populations are just getting started throughout north central Kansas.

There are multiple generations of this pest each summer and later generations will infest sorghum heads. The head capsule is light brown, and the body color varies from pink to green to brown with light and dark stripes along the length of the body. Larvae can be 1.5 inches long at maturity.



Figure 1. Sorghum headworm (corn earworm). Photo by K-State Research and Extension.

Infestations are common throughout Kansas, and sorghum is vulnerable to infestation from bloom through milk stages. Larvae are active from August to October. Generally, expect a loss of 5% yield per larva, per head. So, one larva per head will result in 5 percent yield loss, two in larvae per head, 10% loss, and so on.

Producers should begin scouting fields now to detect headworms while they are still small. The decision to treat should balance the expected yield and crop value against treatment cost and the amount of damage that can be prevented. The average size of larvae at detection is a key

consideration, because less will be gained by treating older, larger larvae.

Please refer to the [2017 Sorghum Insect Management Guide](#) for specific control recommendations.

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8. New K-State publication on the interaction between corn plant density and yield environment

A new publication, titled *"Plant Density and Yield Environment Interaction,"* is now available through K-State Research and Extension as a part of the "Corn Fact Sheet Series." This publication is supported by Kansas Corn Commission. The lead author is K-State agronomist Ignacio Ciampitti.

This publication presents the outcomes of a collaboration established between K-State Research and Extension and Dupont Pioneer on investigating the optimal seeding rate by yield environments for corn.

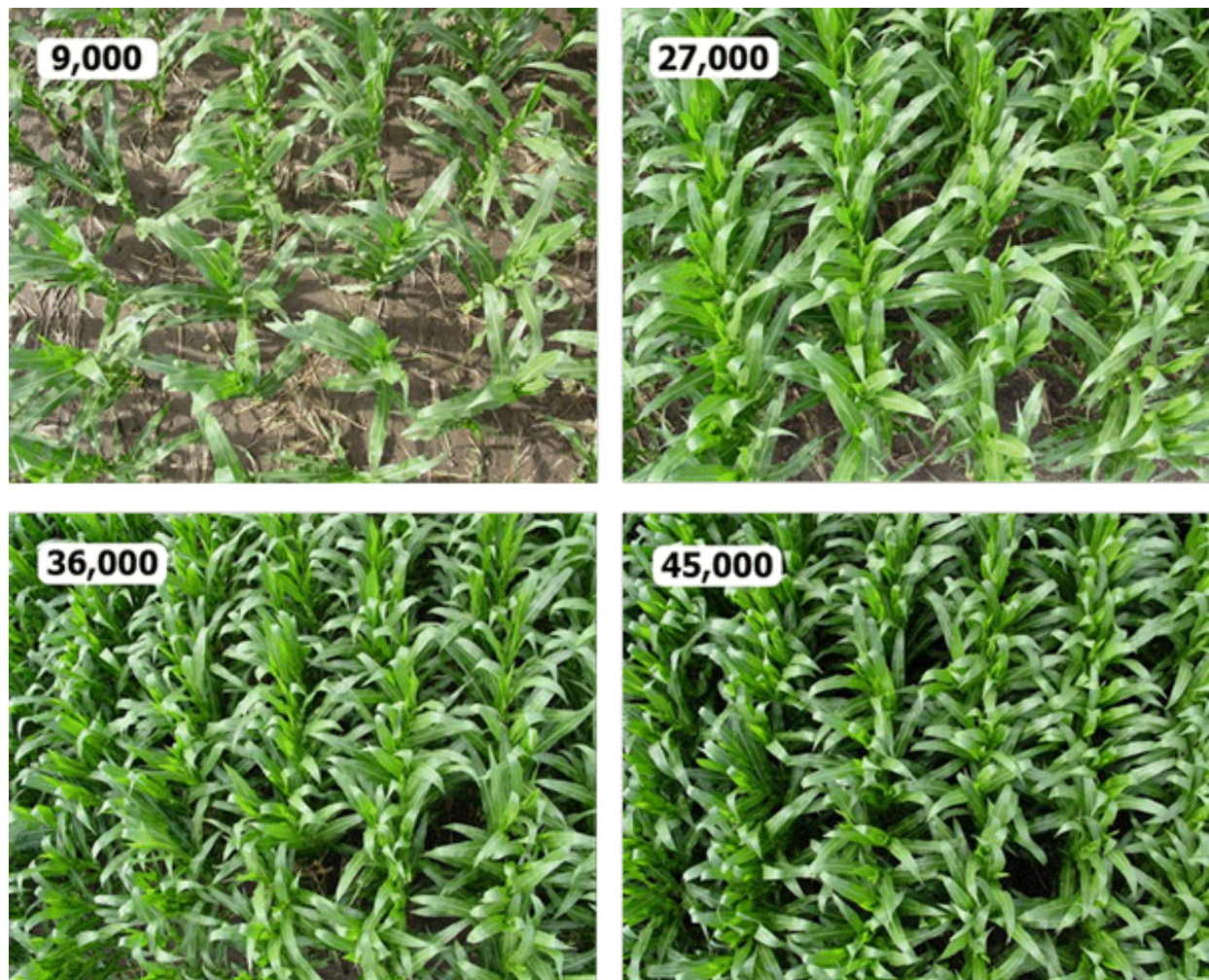


Figure 1. Plant density studies performed from 2000 to 2014 for Dupont Pioneer investigating the corn yield response to seeding rate with plant density factor ranging from less than 10 to more than 40 thousand plants per acre in 22 states in the U.S. and 2 provinces in Canada. Photo by Dupont Pioneer Seed Company.

The main points of this study are:

- Optimal plant density varies with yield environment.
- Low-yielding environments (less than 100 bushels per acre) require about 20,000 plants per acre when yield limitations are caused by water supply. High- yielding environments (greater than 200 bushels per acre) generally need at least 30,000 plants per acre.
- Optimal plant density to maximize yield is not the same as the economically optimal density. See statements below for background.
- Optimal density varies not only between but within-field based on yields.

Plant density for highest possible yield does not always coincide with the economically optimum plant density. Hybrid agronomic factors such as lodging potential, plus grain prices and seed costs also should be considered.

Producers should consider experience and performance in previous growing seasons to determine if the seeding rate previously employed in their different fields was adequate for their respective yield environments.

This publication can be found at: <https://www.bookstore.ksre.ksu.edu/pubs/MF3389.pdf>



Corn Fact Sheet Series

Plant Density and Yield Environment Interaction

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Crop Production
and Cropping Systems Specialist

Yared Assefa
Post-doctoral Researcher
KSUCROPS Production Lab

Paul Carter
Senior Agronomy Sciences Manager
Dupont Pioneer



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9. Preliminary August weather summary plus the September outlook for corn, soybeans, and sorghum

The preliminary data shows that August tied for the 7th coolest on record. The statewide average temperature was 72.7 °F, which was matched in August of 2004. All divisions were cooler than normal with departures ranging from -3.6 °F in the Northwest to -5.0 °F in the Southeast.

The cooler-than-normal temperatures were coupled with near-normal rainfall. The statewide average precipitation was 3.45 inches, which falls on the wetter side of the middle range of the distribution. Unfortunately, the rainfall was spread unevenly, with much higher-than-normal precipitation in the East Central and Southeastern divisions.

The updated outlook from the National Oceanic and Atmospheric Administration for September calls for an increased chance of drier-than-normal conditions statewide. The temperature outlook is split, with cooler-than-normal temperatures in the east and warmer-than-normal temperatures in the west. The central part of the state has equal chances of warmer- or cooler-than-normal conditions.

Corn is reaching the late stages of the reproductive period, with only 15% mature at the state level, but overall temperatures will slow down the rate of drydown and result in a longer period before the corn reaches harvest. For soybeans, the main factor in the coming weeks will be the lack of rain – potentially compromising seed filling and final yields. Lastly, for sorghum, development in August was slower than normal due to the below-average number of sorghum growing degree days (see below figure). This can potentially lower the probability of maturing before the first freeze.

Further details and information will be presented in future Agronomy eUpdate articles. Stay tuned!

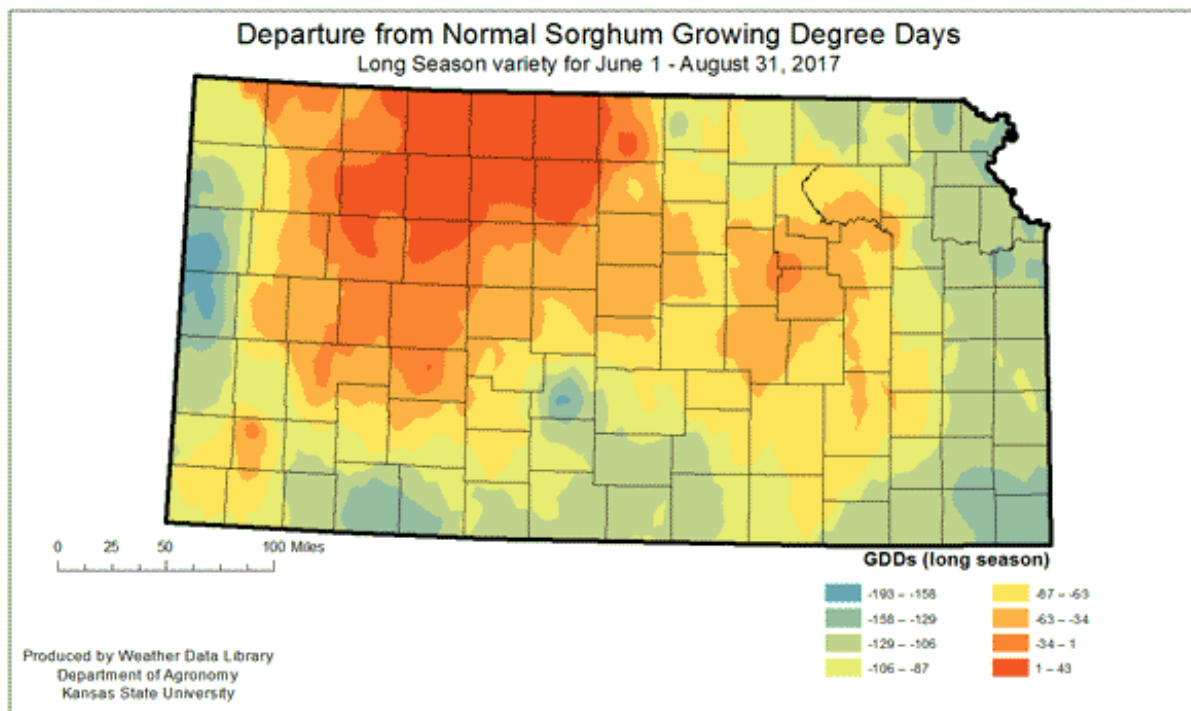


Figure 1. Departure from normal sorghum GDDs (based on data from <http://mesonet.k-state.edu/agriculture/degreedays/>)

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10. Comparative Vegetation Condition Report: August 22 - August 28, 2017

The weekly Vegetation Condition Report maps below can be a valuable tool for making crop selection and marketing decisions.

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 28-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.

The Vegetation Condition Report (VCR) maps were originally developed by Dr. Kevin Price, K-State professor emeritus of agronomy and geography, and his pioneering work in this area is gratefully acknowledged.

The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new VCR development. Multiple improvements have been made, such as new image processing algorithms with new remotely sensed data from EROS Data Center.

These improvements increase sensitivity for capturing more variability in plant biomass and photosynthetic capacity. However, the same format as the previous versions of the VCR maps was retained, thus allowing the transition to be as seamless as possible for the end user. For this spring, it was decided not to incorporate the snow cover data, which had been used in past years. However, this feature will be added back at a later date. In addition, production of the Corn Belt maps has been stopped, as the continental U.S. maps will provide the same data for these areas. Dr. Asebedo and Dr. An will continue development and improvement of the VCRs and other advanced maps.

The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, and the continental U.S., with comments from Mary Knapp, assistant state climatologist:

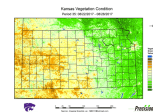


Figure 1. The Vegetation Condition Report for Kansas for August 22 – August 28, 2017 from K-State’s Precision Agriculture Laboratory shows the greatest vegetative activity continues in eastern Kansas, particularly in extreme Northeastern KS. The impact from the recent rains continue to be visible, and the flooded areas of Wyandotte and Johnson counties show reduced photosynthetic activity. In central and south central Kansas the lower rainfall shows the continued stress on vegetation.

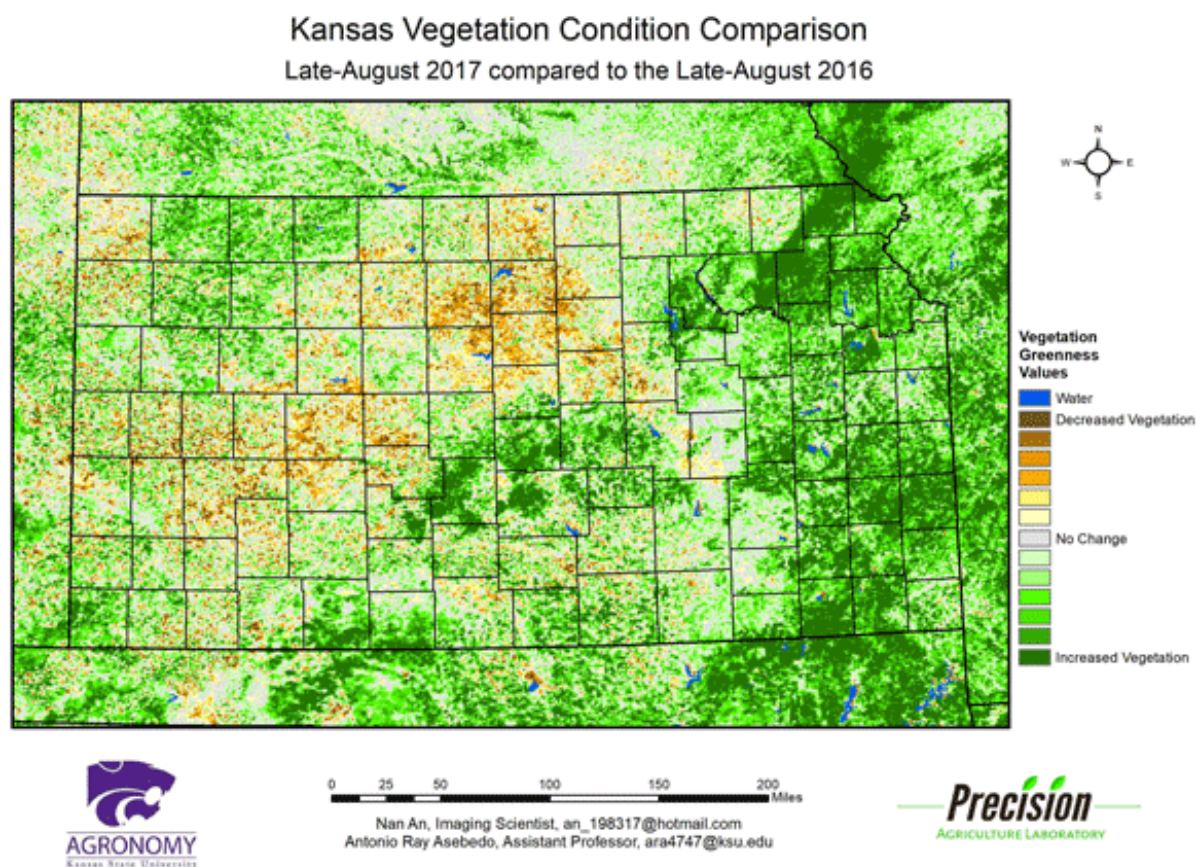


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for August 22 – August 28, 2017 from K-State’s Precision Agriculture Laboratory shows much of the state has higher vegetative activity. Rainfall was higher this year and was coupled with cooler temperatures.

Kansas Vegetation Condition Comparison

Late-August 2017 compared to the 28-Year Average for Late-August

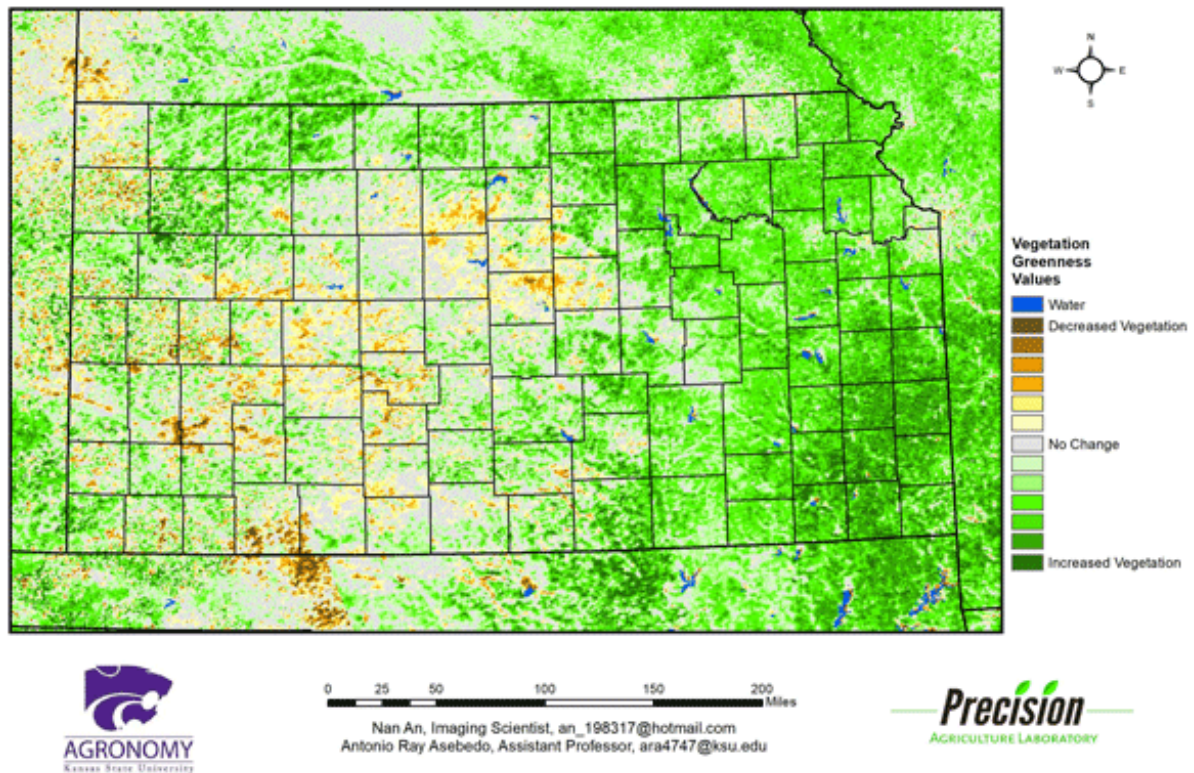


Figure 3. Compared to the 28-year average at this time for Kansas, this year's Vegetation Condition Report for August 22 – August 28, 2017 from K-State's Precision Agriculture Laboratory above-average activity in much of the state. The mild, wet weather has particularly favored the east central and southeastern divisions, while lingering drought has reduced the average vegetative activity in parts of central Kansas.

Continental U.S. Vegetation Condition

Period 35: 08/22/2017 - 08/28/2017

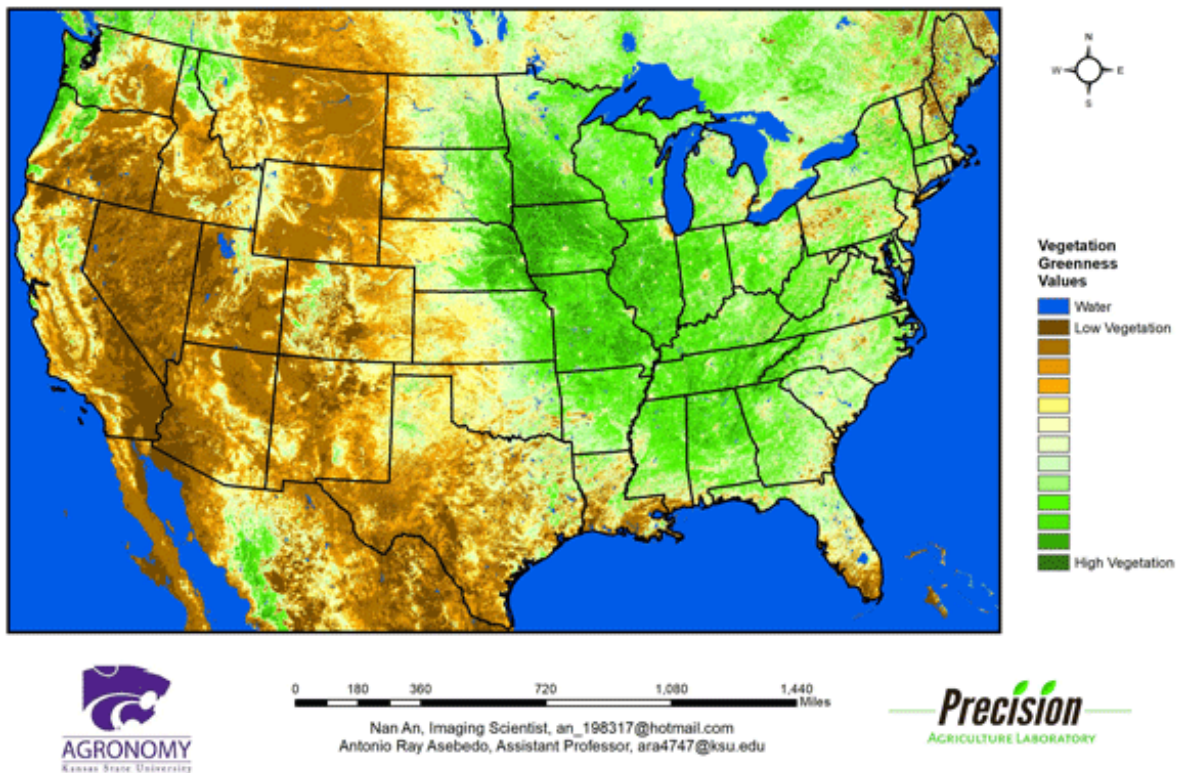


Figure 4. The Vegetation Condition Report for the U.S for August 22 – August 28, 2017 from K-State’s Precision Agriculture Laboratory shows an area of high NDVI values centered in the Midwest, particularly in eastern Nebraska and western Iowa. A second area of high vegetative activity is also visible along the West Coast, where the recent warm weather has yet to have a visible impact. Extremely low NDVI values continue to highlight the severe drought in eastern Montana and western South Dakota, while the excess rainfall along the Gulf Coast is beginning to show visible impacts.

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Continental U.S. Vegetation Condition Comparison Late-August 2017 Compared to Late-August 2016

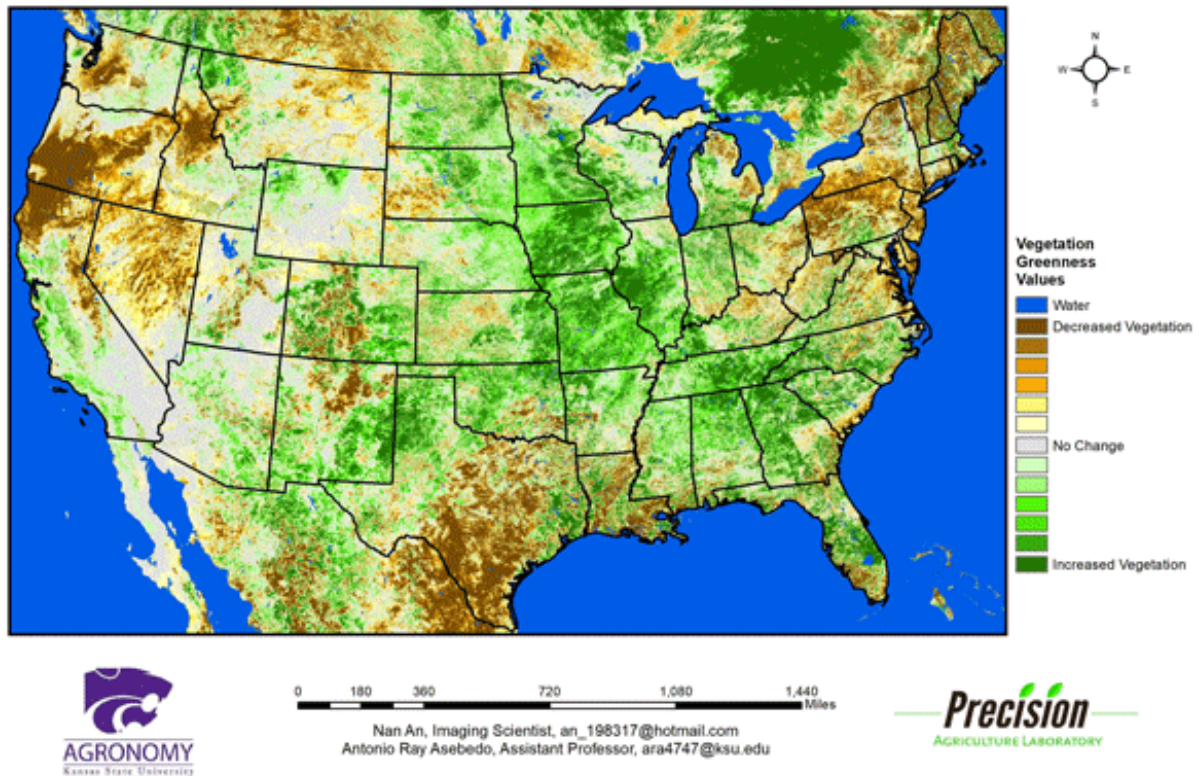


Figure 5. The U.S. comparison to last year at this time for August 22 – August 28, 2017 from K-State’s Precision Agriculture Laboratory again shows the impact that split in moisture has caused this year. Much lower NDVI values are visible in Montana and South Dakota, with slightly lower values in the Plains and into the Oklahoma Panhandle. In contrast, the desert Southwest has much higher NDVI values than last year at this time. Parts of Texas are showing the impacts of the excessive moisture from Hurricane Harvey.

Continental U.S. Vegetation Condition Comparison
Late-August 2017 Compared to 28-year Average for Late-August

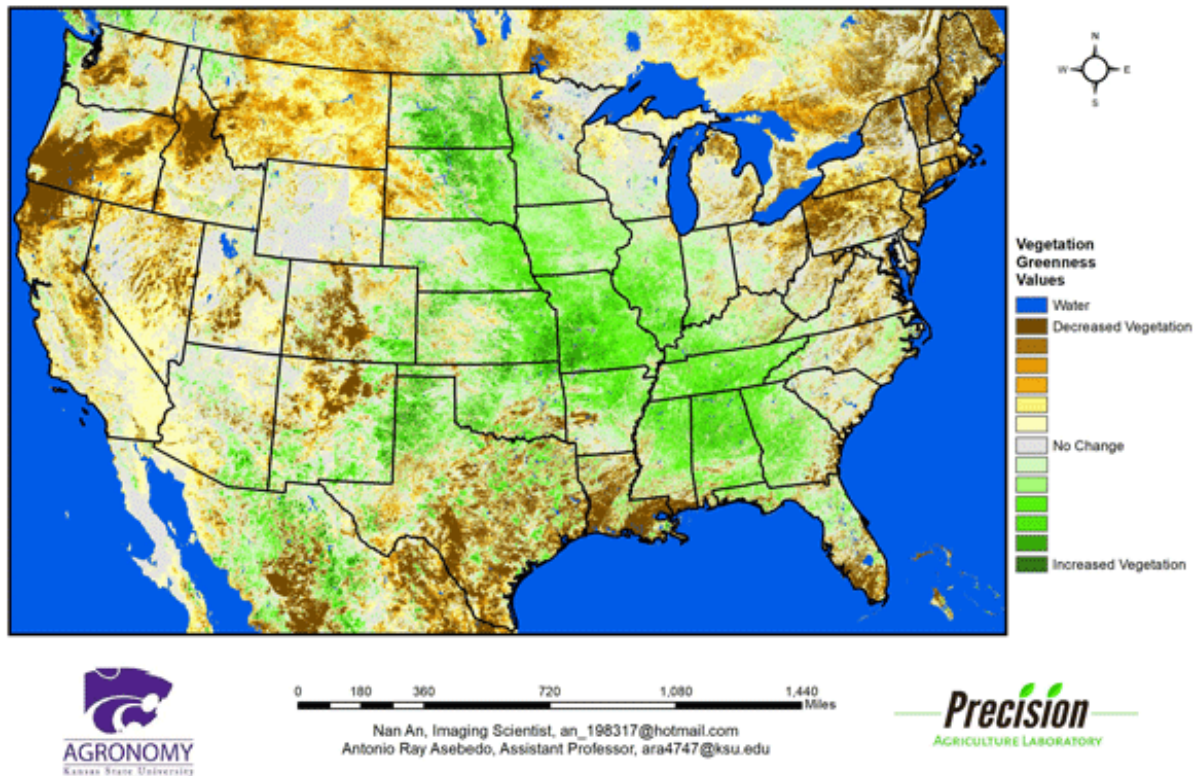


Figure 6. The U.S. comparison to the 28-year average for the period of August 22 – August 28, 2017 from K-State’s Precision Agriculture Laboratory shows the drought impacts in the Northern Plains are visible as below-average NDVI values. In Colorado, parts of Idaho, and the Sierra Nevada of California, the below-average NDVI values are due to clouds associated with monsoon moisture. Wetter-than-normal conditions continue in parts of Arizona, with excessive moisture visible in Texas and Louisiana.

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