



## Extension Agronomy

# eUpdate

---

*08/18/2017*

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](mailto:swatson@ksu.edu), or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 [cthompso@ksu.edu](mailto:cthompso@ksu.edu).

Subscribe to the eUpdate mailing list: <https://listserv.ksu.edu/cgi-bin?SUBED1=EUPDATE&A=1>

---

<b>1. Timing the final irrigation of the season.....</b>	<b>3</b>
<b>2. Volunteer wheat control: Protecting the state's wheat crop.....</b>	<b>8</b>
<b>3. Placement of early-season nitrogen for wheat.....</b>	<b>13</b>
<b>4. Starter fertilizers for wheat.....</b>	<b>18</b>
<b>5. Track the total solar eclipse on the Kansas mesonet in real time.....</b>	<b>20</b>
<b>6. Agricultural Research Center-Hays field day, August 23.....</b>	<b>22</b>
<b>7. Southwest Research-Extension Center field day, August 24.....</b>	<b>23</b>
<b>8. Comparative Vegetation Condition Report: August 8 - 14.....</b>	<b>24</b>

## 1. Timing the final irrigation of the season

As the growing season wraps up producers have an opportunity to further improve their water use efficiency by properly timing their final irrigation application. This is an important decision as an early termination of irrigation can result in reductions in grain yield, primarily through reductions in the kernel weight yield component, while a late termination of irrigation results in unnecessary pumping, energy consumption, and increasing the risk of soil compaction at harvest due to increased soil moisture and the risk of water loss through drainage.

With the goal of matching available water to crop needs while avoiding excess, it's important to understand crop water use requirements late in the growing season. The table below shows anticipated water use from various growth stages until physiological maturity.

Stage of Growth	Approximate number of days to maturity	Water use to maturity (inches)
<b>Corn</b>		
Blister	45	10.5
Dough	34	7.5
Beginning dent	24	5
Full dent	13	2.5
Black layer	0	0
<b>Grain Sorghum</b>		
Mid bloom	34	9
Soft dough	23	5

Hard dough	12	2
Black layer	0	0
<b>Soybeans</b>		
Full pod	37	9
Beginning seed	29	6.5
Full seed	17	3.5
Full maturity	0	0
Adapted from K-State MF2174, Rogers and Sothers.		

Research in western Kansas has shown the importance of keeping the management allowable depletion limited to 45% during the post-tassel period. In other words, maintaining available soil water contents above 55%. By knowing anticipated water use from a given growth stage and the remaining soil water in the profile, producers can add just enough irrigation water to meet that demand and maintain profile available soil water content above 55%.

By closely following the growth and development of the crop one can know when physiological maturity, i.e. black layer in corn, has been reached and at that point water use for the production of grain yield has ceased and additional irrigation is certainly unnecessary.

Termination Based on Calendar Dates

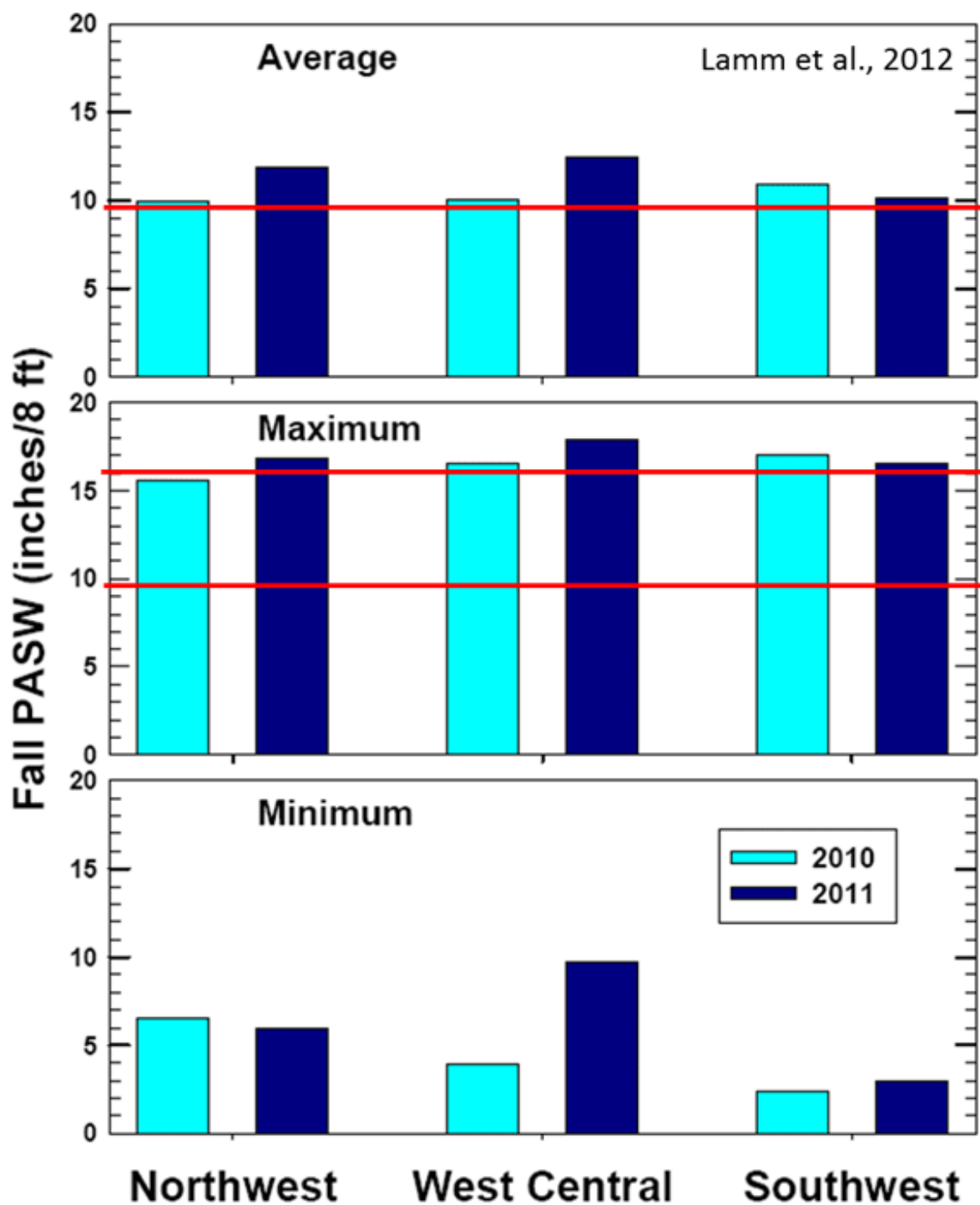
Traditionally many producers have used a fixed calendar date to determine their final irrigation. Long-term studies conducted at the Northwest Research-Extension Center at Colby show the potential danger in this approach. The table below shows silking, maturity, and irrigation termination dates for a long term study in corn. Over the course of this study, the irrigation termination date for maximum grain yield varied from August 12<sup>th</sup> to September 21<sup>st</sup>. This is a significant departure from a general rule of thumb such as using Labor Day as a termination date. As shown, the use of a fixed date on the calendar without regard to crop progress, soil water status, or ET demand would have resulted in both forfeited yield and wasteful pumping across this timeframe.

Year	Date of Anthesis	Date of Maturity	Irrigation Season Termination Date For		
			80% Max Yield	90% Max Yield	MaxYield
1993	20-Jul	30-Sep	5-Aug	5-Aug	15-Aug
1994	20-Jul	15-Sep	5-Aug	15-Aug	15-Aug
1995	20-Jul	29-Sep	5-Aug	13-Aug	18-Aug
1996	20-Jul	3-Oct	17-Jul	17-Jul	29-Aug
1997	23-Jul	1-Oct	23-Jul	23-Jul	27-Aug
1998	20-Jul	28-Sep	20-Jul	20-Jul	24-Aug
1999	23-Jul	6-Oct	24-Jul	13-Aug	20-Sep
2000	12-Jul	20-Sep	14-Sep	20-Sep	20-Sep
2001	16-Jul	29-Sep	30-Jul	22-Sep	22-Sep
2002	22-Jul	30-Sep	4-Aug	30-Aug	7-Sep
2003	22-Jul	23-Sep	3-Aug	3-Aug	18-Aug
2004	19-Jul	28-Sep	8-Aug	21-Aug	27-Aug
2005	20-Jul	28-Sep	2-Aug	9-Aug	29-Aug
2006	17-Jul	25-Sep	30-Jul	13-Aug	13-Aug
2007	18-Jul	19-Sep	14-Aug	21-Aug	28-Aug
2008	24-Jul	10-Oct	31-Jul	6-Aug	27-Aug
<b>Average</b>	<b>19-Jul</b>	<b>27-Sep</b>	<b>2-Aug</b>	<b>13-Aug</b>	<b>28-Aug</b>
<b>Standard Dev.</b>	<b>3 days</b>	<b>6 days</b>	<b>13 days</b>	<b>19 days</b>	<b>13 days</b>
<b>Earliest</b>	<b>12-Jul</b>	<b>14-Sep</b>	<b>17-Jul</b>	<b>17-Jul</b>	<b>12-Aug</b>
<b>Latest</b>	<b>24-Jul</b>	<b>10-Oct</b>	<b>14-Sep</b>	<b>21-Sep</b>	<b>21-Sep</b>
* <i>Estimated dates are based on the individual irrigation treatment dates from each of the different studies when the specified percentage of yield was exceeded.</i>					

#### Consequences of Excess Late-Season Irrigation:

In the silt-loam soil profiles common in western Kansas, drainage of water out of the soil profile starts to occur when the profile water content rises above 60% available soil water. The rate of drainage loss increases rapidly with increasing water content. Late season irrigation in excess of crop water use results in increased accumulation of water in the profile, which is subject to drainage losses. A multi-year survey of irrigated corn fields was conducted in 2010 and 2011. Fields were surveyed after

corn harvest across three east-west transects in western Kansas.



The line at 9.6" of plant-available soil water (PASW) denotes the approximate water content where drainage losses would start to occur. On average most producer fields were near this level of soil water storage indicating a good management strategy as drainage losses had been minimized while yet maintaining adequate soil water to complete grain fill.

Producer fields near the minimum observed values likely did not have adequate soil water to ensure

maximum grain yields. The most concerning scenario however, are the fields at the upper end of soil water values such as the maximum observation. The red line at 16" PASW represents field capacity, the point at which free drainage and significant water losses from the profile would be occurring. In the wettest producer fields, in all three regions, significant amounts of free drainage and water loss would have been occurring at the time of crop maturation and harvest.

Timing of the final irrigation:

1. Determine crop growth stage and anticipated remaining water use
2. Determine soil water status in the field by probe or calibrated soil sensor technology
3. Determine irrigation strategy necessary to meet remaining crop water use while maintaining soil water content at or above 55% (limit depletion to 45%).
4. Be ready to make adjustments based on changes in ET demand, precipitation, etc.

Additional information, including a step by step procedure, can be found in publication MF2174.

<http://www.bookstore.ksre.ksu.edu/pubs/MF2174.pdf>

Lucas Haag, Northwest Area Crops and Soils Specialist  
[lhaag@ksu.edu](mailto:lhaag@ksu.edu)

Freddie Lamm, Irrigation Engineer, Northwest Research-Extension Center  
[flamm@ksu.edu](mailto:flamm@ksu.edu)



## 2. Volunteer wheat control: Protecting the state's wheat crop

What can be done to prevent another widespread occurrence of wheat streak mosaic virus, High Plains virus, and triticum mosaic virus in wheat this coming season? There are several things producers can do: delay planting dates as long as feasible, control any significant stands of green foxtail and barnyard grass near fields that will be planted to wheat, and plant wheat varieties with resistance to wheat streak mosaic.

But getting good control of these virus diseases starts first and foremost with controlling volunteer wheat. Volunteer wheat should be controlled soon to protect the wheat crop that will be planted this fall.

Volunteer wheat within a half-mile of a field that will be planted to wheat should be completely dead at least two weeks before wheat planting. This will help control wheat curl mites, Hessian fly, and wheat aphids (bird cherry oat aphids and greenbugs, etc.) in the fall.

The most important threat from volunteer wheat is the wheat streak mosaic virus complex. These virus diseases cause stunting and yellow streaking on the leaves. In most cases, infection can be traced to a nearby field of volunteer wheat, although there are other hosts, such as corn, millet, and many annual grasses, such as yellow foxtail and prairie cupgrass. Control of volunteer is the main defense against the wheat streak mosaic virus complex.

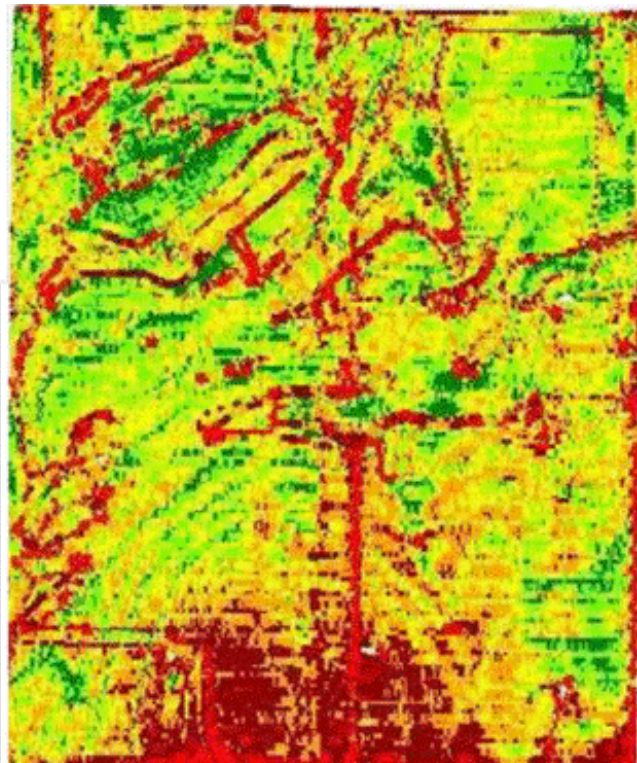
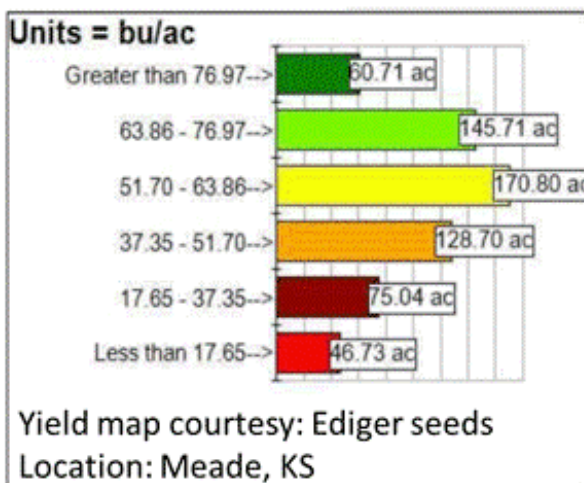


Figure 1. Wheat streak mosaic. Photo by Erick DeWolf, K-State Research and Extension.

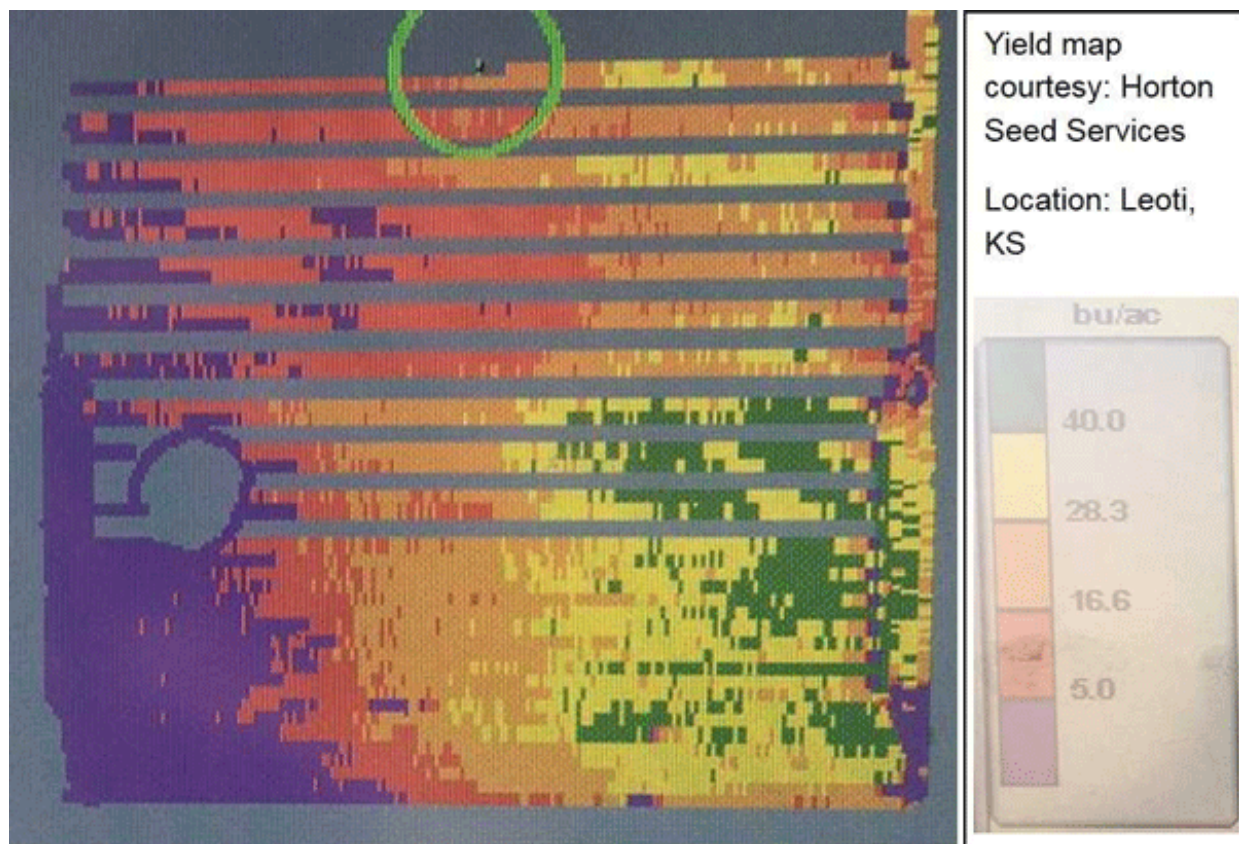


Wheat streak mosaic virus is carried from volunteer to newly planted wheat by the wheat curl mite. These tiny, white, cigar-shaped mites are too small to be seen with the naked eye. The curl mite uses the wind to carry it to new hosts and can travel up to a mile or more from volunteer wheat. The wheat curl mite is the vector for wheat streak mosaic, the High Plains virus, and triticum mosaic virus. In addition, the mite can cause curling of leaf margins and head trapping.

Wheat streak mosaic can cause severe economic damage. Figures 2 and 3 show a yield maps from Meade and Wichita Counties, respectively (courtesy of Ediger Seeds and Horton Seed Services), in which one border of the field had a severe outbreak of wheat streak mosaic virus led by lack of volunteer wheat control in the neighboring field. On Fig. 2 (2015-16 growing season), the average yield in the entire section was approximately 54 bushels per acre and some portions of the field yielded as much as 77 bushels per acre; still, the area where wheat streak mosaic was more severe yielded less than 18 bushels per acre. On figure 3 (2016-17 growing season), the entire field was affected by wheat streak mosaic virus and the field average was close to 25 bushels per acre. While spots where the disease incidence was lower yielded over 40 bushels per acre, the entire southwest corner and west border near the neighboring field hosting the volunteer wheat yielded less than 5 bushels per acre.



**Figure 2. Yield map showing the magnitude of yield loss in a field where the south border was infected with wheat streak mosaic virus. The mean yield of the field was 54 bushels per acre whereas the affected area yielded less than 18 bushels per acre. Yield map courtesy of Tyler and Darwin Ediger, Meade, Kansas. 2015-16 harvest.**



**Figure 3. Yield map showing the magnitude of yield loss in a field where the entire field was infected with wheat streak mosaic virus, and the west border was zeroed out. The mean yield of the field was approximately 25 bushels per acre whereas the affected area yielded less than 5 bushels per acre. Yield map courtesy of Rick and Alec Horton, Leoti, from the 2016-17 harvest.**

Hessian flies survive over the summer on wheat stubble. When the adults emerge, they can infest any volunteer wheat that may be present, which will keep the Hessian fly population alive and going through the upcoming crop season. We have found that Hessian flies have an adult emergence "flush" after moisture events all summer and even into November, depending upon temperatures. So it seems it is really more of a continuous potential for infestation, making it even more critical to destroy volunteer in a timely manner. If there is no volunteer around when these adults emerge they will not be able to oviposit on a suitable host plant. If the volunteer is destroyed while the flies are still larvae, this will help to reduce potential problems.

Hessian flies often cause significant damage, especially in the eastern two-thirds of the state. Hessian fly larvae attack young wheat plants near the soil line. Tillers may be stunted and later may lodge. In heavy infestations, the whole stand may be lost.

Volunteer wheat is a host of barley yellow dwarf virus, and the greenbugs and bird cherry oat aphids which carry it. So in that respect, destroying volunteer helps reduce the reservoir for the barley yellow dwarf viruses. The aphids have to pick up the BYD virus from an infected host plant first in order to become a carrier that can transmit the disease to wheat. Host plants that can carry the

disease include volunteer wheat, corn, and others. However, destroying volunteer will have little effect on aphid populations in the fall and spring since the aphids migrate into the state from southern areas.

Russian wheat aphids may also live over the summer on volunteer wheat. While this insect has wings and can be wind borne for hundreds of miles, the vast majority of fall infestations in Kansas appear to originate from nearby infested volunteer.

A number of other pests are also associated with the presence of volunteer wheat. An example in western Kansas is the Banks grass mite. During some years, infestations become established during late summer and early fall on volunteer wheat. Later, as the quality of the volunteer deteriorates, mites move from the volunteer into adjacent fields of planted wheat or other small grains. Occasionally mites will survive the winter and continue to spread into the planted wheat following greenup in the spring.

A concern in the eastern part of the state is the chinch bug. Occasionally, adult bugs will fly from maturing sorghum fields in late summer to nearby fields where volunteer wheat is growing. Where infested volunteer is allowed to grow right up until seedbed preparation just prior to planting, early planted continuous wheat is likely to become infested. Similarly, volunteer that is allowed to grow through the fall and into the following spring may also serve as an attractive chinch bug host.

Another reason to control volunteer is that volunteer and other weeds use up large amounts of soil moisture.

Destroying volunteer after the new wheat emerges is too late. Producers should leave enough time to have a second chance if control is incomplete. Tillage and herbicides are the two options available for volunteer control.

Tillage usually works best when plants are small and conditions are relatively dry. Herbicide options depend on cropping systems and rotations. Glyphosate can be used to control emerged volunteer wheat and other weeds during the fallow period in any cropping system. However, it has no residual activity and will not control later germinating volunteer wheat or weeds.

If glyphosate is used too close to planting time, volunteer may stay green long enough to transmit diseases and insects to the new crop. It may take as long as one week following glyphosate application before the wheat will die, so that needs to be considered when timing the application to break the bridge for insects and diseases. The optimum time to treat with glyphosate is when most of the volunteer has emerged and is healthy and actively growing. Glyphosate can effectively control volunteer wheat that has tillered.

Atrazine is a relatively inexpensive treatment for volunteer wheat control that can be applied anytime in the summer or fall, if rotating to sorghum or corn. In the September to October time period, using atrazine plus crop oil alone can often control small volunteer wheat that has not yet tillered, as well as later-emerging volunteer wheat and other weeds.

If the volunteer has tillered, most of the roots will have grown deep enough to be out of the reach of atrazine. This is when it helps to add glyphosate to the atrazine plus crop oil. Glyphosate is translocated from the leaf tissue throughout the plant. The combination of glyphosate and atrazine will provide a good combination of burndown and residual control on both volunteer that has

tillered and later-emerging volunteer. Atrazine rates need to be adjusted to soil type and pH, and may not be appropriate for all areas.

In summary, the most important reasons to control volunteer wheat are:

- Wheat curl mite/wheat streak mosaic virus
- Hessian fly
- Russian wheat aphid
- Take-all
- Bird cherry oat aphid/greenbug/barley yellow dwarf virus
- Banks grass mite
- Chinch bug
- Reduces moisture loss

Erick DeWolf, Extension Plant Pathologist  
[dewolf1@ksu.edu](mailto:dewolf1@ksu.edu)

Romulo Lollato, Wheat and Forages Specialist  
[lolato@ksu.edu](mailto:lolato@ksu.edu)

Dallas Peterson, Weed Management Specialist  
[dpeterso@ksu.edu](mailto:dpeterso@ksu.edu)

Jeff Whitworth, Extension Entomologist  
[jwhitwor@ksu.edu](mailto:jwhitwor@ksu.edu)



### 3. Placement of early-season nitrogen for wheat

To save time and cost, some wheat producers may be thinking about adding a little extra nitrogen (N) as urea or UAN to their phosphorus fertilizer through the drill with the seed. This would either be in addition to, or instead of, any preplant N applications.

While a minimum preplant N application of 20 to 40 lbs N per acre is often desirable, especially in no-till production systems, it is important to avoid placing urea containing fertilizers in direct seed contact. We suggest that NO urea or UAN solution be placed in contact with the seed. If the fertilizer N applied at seeding will be separated from seed by 1 inch or more, urea-containing fertilizers can be safely used.

#### Methods of early-season nitrogen applications

If the starter fertilizer can't be "spiked" with urea to add extra N, how can the necessary 20 to 40 pounds of N be applied? Subsurface banding (knifing) of N as either anhydrous ammonia, liquid UAN, or dry product will result in the greatest N use efficiency by the wheat crop. This is especially true for no-till wheat production.

If knifed N applications are not used, the next best application method would be surface banding (dribbling) of UAN solution in streams on 15- to 18-inch centers. Broadcasting urea, ammonium nitrate, or UAN applications are not generally as efficient as subsurface banding, but they are often the best choice due to equipment, logistics, or weed management considerations. Broadcast applications of N will have the most consistent performance if followed by light incorporation, precipitation, or irrigation.

#### Direct seed placement of nitrogen

When placing starter fertilizer in direct contact with wheat seed, producers should use the following guidelines:

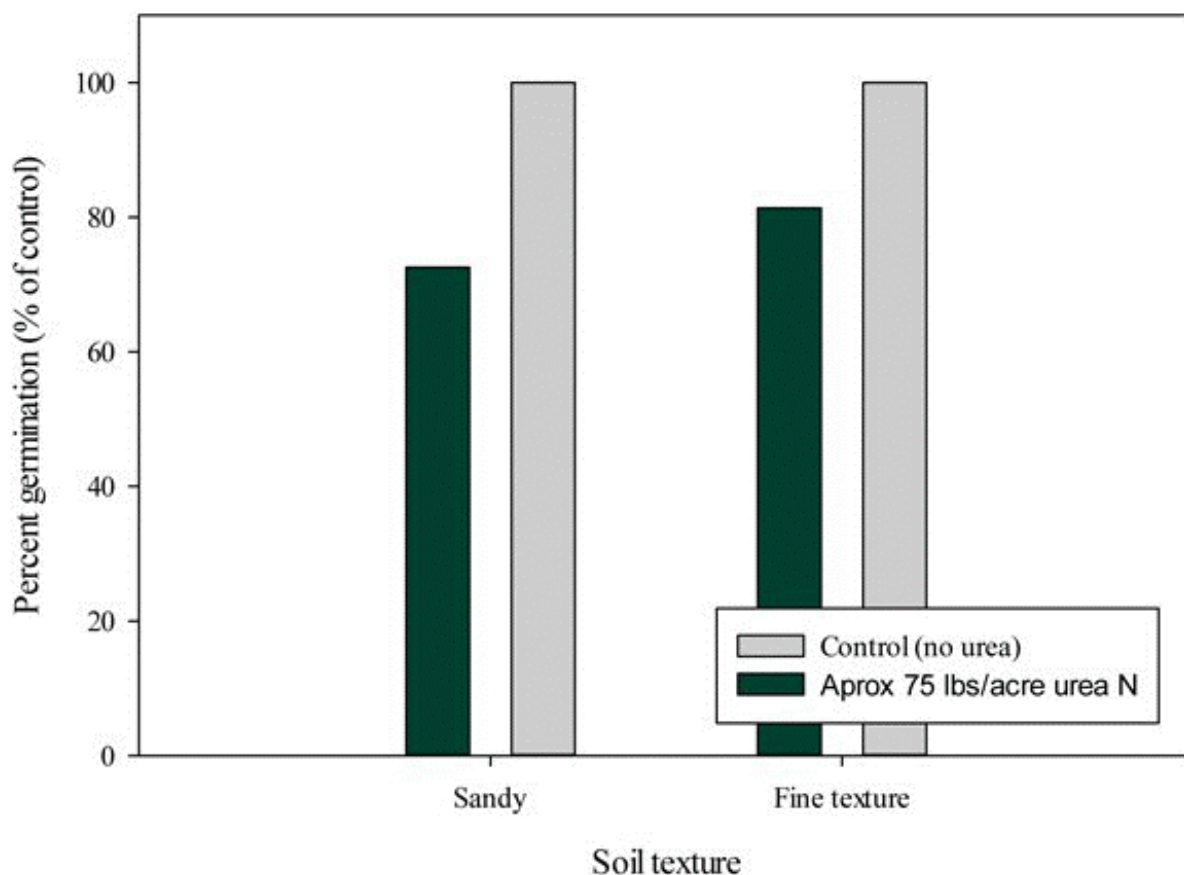
##### Suggested Maximum Rates of Fertilizer to be Applied Directly With Wheat Seed

Row Spacing  (inches)	Pounds N + K <sub>2</sub> O (No urea or UAN)	
	Medium to Fine  Textured Soils	Sandy or Dry  Soils
15	16	11
10	24	17
6-8	30	21

The problem with placing urea-containing fertilizer with the seed is that urea is initially converted to ammonia and may be toxic to plant roots if the wheat seed is placed in direct contact with the fertilizer. Producers may hear of someone who has placed urea in direct seed contact and seemed to have no problems, but there are also many cases where urea-containing N fertilizers have injured the developing seedling and reduced or delayed emergence significantly. The risk of injury is greater in

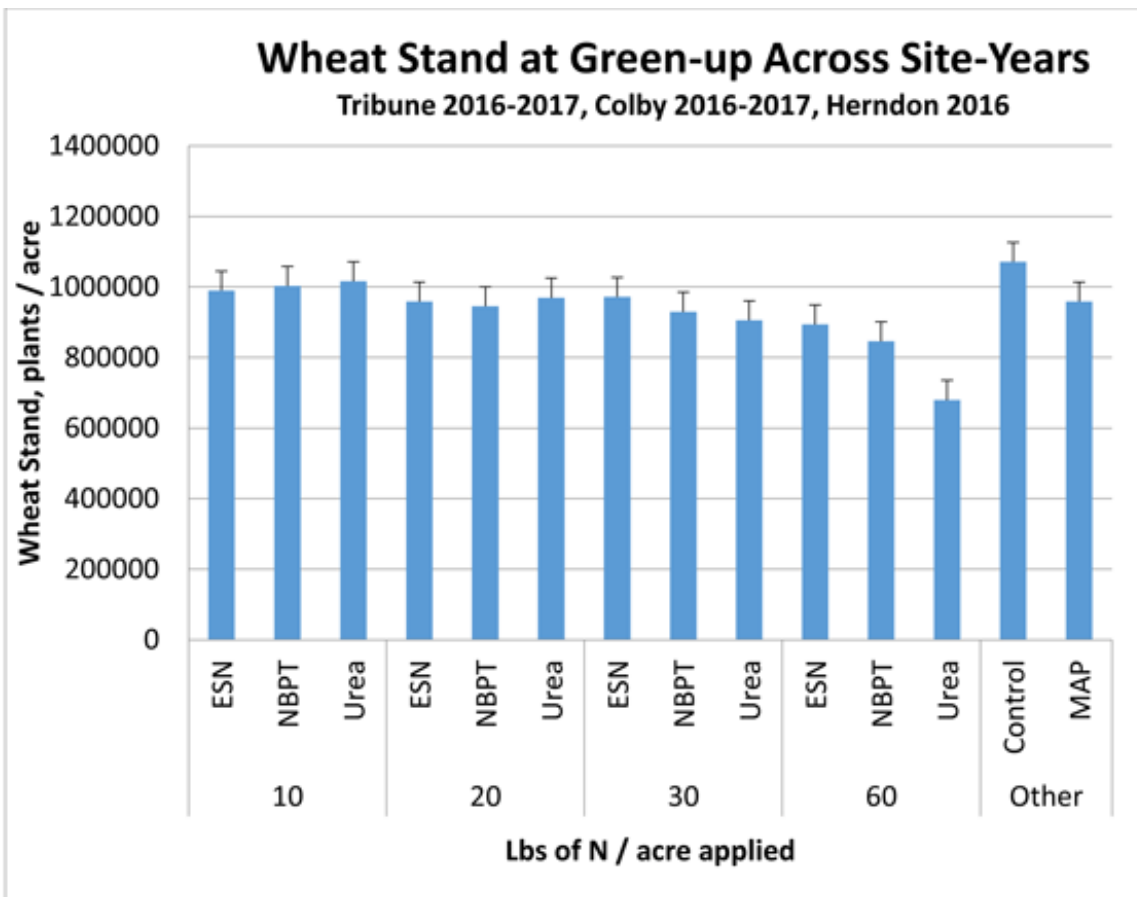
drier soils, at higher soil pH levels, and at higher N rates. High soil pH favors a higher concentration of ammonia as compared to ammonium as urea hydrolyzes. There is significant risk associated with placing urea-containing fertilizers in direct seed contact.

The chart below shows how soil texture affected the level of wheat germination when urea-N was applied with the seed in a K-State greenhouse study. The wheat was well watered in this study, but urea-N placed with the seed still reduced germination, especially in the sandy soil. The readings shown below were taken after 10 days. With the high rates of urea used in this study, it is possible that more damage to the seedlings would occur with time as the urea continues to hydrolyze into ammonia.



**Figure 1. Greenhouse study evaluating the effect on germination of urea placed with the seed. Plant counts 10 days after planting. Source: Dorivar Ruiz Diaz, K-State Research and Extension.**

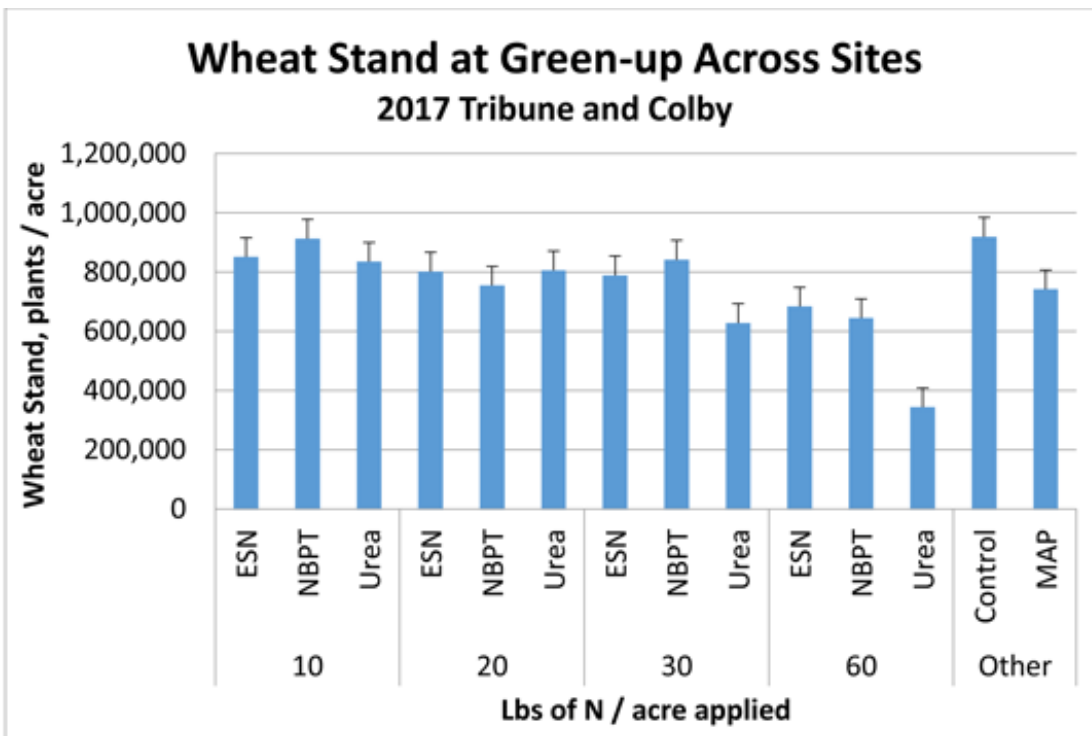
Field studies have also shown reduced wheat stands due to in-furrow placement of urea. Across 5 site-years in western Kansas the placement of urea in-furrow has resulted in decreased stands at spring greenup compared to the control (Figure 2). In the figures below, ESN is a controlled-release, coated form of urea- N. NBPT is a urease inhibitor designed to reduce surface-applied urea-N losses from ammonia volatilization.



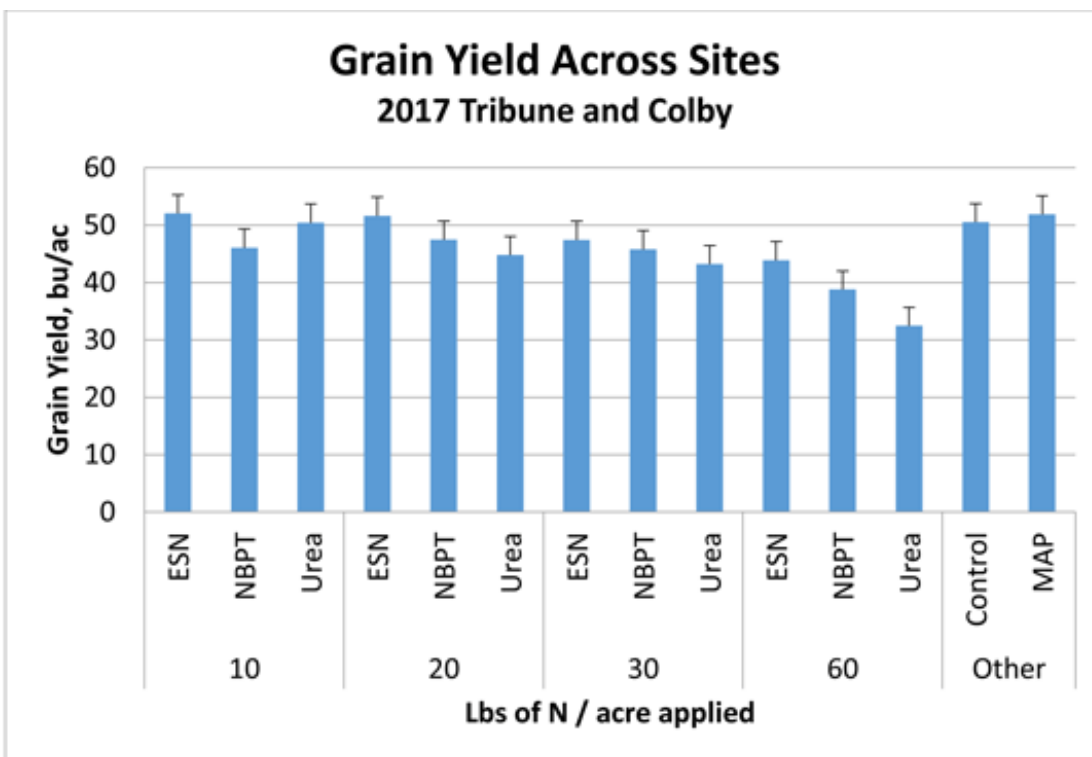
**Figure 2. Wheat stands at spring green-up as affected by nitrogen application with different placements and sources. Average of 5 site-years. Source: Lucas Haag, K-State Research and Extension.**

The stand reduction becomes especially noticable at higher rates of N. One of the challenges in understanding the risk of seedling injury is that the magnitude of injury varies by field conditions and year. In some years very little stand reduction may be evident, even at higher rates of N; while in other years, stand reductions (and the associated impact on yield) is very evident. As an example, at Tribune in 2017, reductions in stand caused by urea placement with seed, and the effect on yield were quite evident (Figures 3 and 4).





**Figure 3. Wheat stands at spring green-up as affected by nitrogen application with different placements and sources. Average of 2 locations in 2017. Source: Lucas Haag, K-State Research and Extension.**



**Figure 4. Wheat grain yield as affected by nitrogen application with different placements and sources. Average of 2 locations in 2017. Source: Lucas Haag, K-State Research and Extension.**

Stands were reduced 32 and 63% compared to the control when 30 and 60 lbs of N as urea were applied in-furrow (Figure 3). This resulted in yield reductions of 14 and 40%, respectively (Figure 4).

If you'd like to apply extra N directly in the seed furrow, one option is to use a controlled-release form of N, such as ESN. As shown in Figure 4, at N application rates of 30 lbs/acre and less, where ESN-N was applied in-furrow, wheat yields were essentially the same as where the N was applied pre-plant -- and higher compared to the same amount of N applied as urea. At the highest rate of application in the study, 60 lbs/acre, even ESN resulted in stand and grain yield reductions.

Air seeders that place the starter fertilizer and seed in a band an inch or two wide, rather than a narrow seed slot, provide some margin of safety because the concentration of the fertilizer and seed is lower in these diffuse bands. In this scenario, adding a little extra urea containing N fertilizers to the starter less likely to injure the seed - but it is still a risk.

Lucas Haag, Northwest Area Crops and Soils Specialist  
[lhaag@ksu.edu](mailto:lhaag@ksu.edu)

Alan Schlegel, Agronomist-in-Charge, Southwest Research-Extension Center, Tribune  
[schlegel@ksu.edu](mailto:schlegel@ksu.edu)

Dorivar Ruiz Diaz, Nutrient Management Specialist  
[ruizdiaz@ksu.edu](mailto:ruizdiaz@ksu.edu)

#### 4. Starter fertilizers for wheat

Wheat is considered a highly responsive crop to starter fertilizers, particularly phosphorus (P) and nitrogen (N). Application of P as starter fertilizer can be an effective method for part or all the P needs. Wheat plants typically show a significant increase in fall tillers and better root development with the use of starter fertilizer (phosphorus and nitrogen). Winterkill can also be reduced with the use of starter fertilizers, particularly in low P testing soils.

Phosphorus fertilizer application can be done through the drill with the seed. This would either be in addition to, or instead of, any preplant P applications depending on soil test and recommended application rate. The use of dry fertilizer sources with air seeders can be a very popular and practical option, however, other P sources (including liquid) are agronomically equivalent and decisions should be based on cost and adaptability for each operation.

When applying fertilizer with the seed, rates should be limited to avoid potential toxicity to the seedling. When placing starter fertilizer in direct contact with wheat seed, producers should use the following guidelines:

<b>Suggested Maximum Rates of Fertilizer to be Applied Directly With Wheat Seed</b>		
	Pounds N + K <sub>2</sub> O (No urea, UAN, or KTS)	
Row Spacing	Medium to Fine	Sandy or Dry
(inches)	Textured Soils	Soils
15	16	11
10	24	17
6-8	30	21

Air seeders that place the starter fertilizer and seed in a band an inch or two wide, rather than a narrow seed slot, provide some margin of safety because the concentration of the fertilizer and seed is lower in these diffuse bands. In this scenario, adding a little extra N fertilizer to the starter is less likely to injure the seed - but it is still a risk.

What about blending dry 18-46-0 (DAP) or 11-52-0 (MAP) directly with the seed in the hopper? Will the N in these products hurt the seed? The N in these fertilizer products is in the ammonium-N form, not the urea-N form, and is much less likely to injure the wheat seed, even though it is in direct seed contact. As for rates, guidelines provided in the table above should be used. If DAP or MAP is mixed with the seed, the mixture can safely be left in the seed hopper overnight without injuring the seed or gumming up the works.

Although the response of wheat to these starter fertilizer products is primarily from the P, the small amount of N that is present in DAP, MAP, or 10-34-0 may also be important in some cases. If no preplant N was applied, and the soil has little or no carryover N from the previous crop, then the N from these fertilizer products could benefit the wheat, in addition to the P.

Dual-placement of N and P (anhydrous ammonia or UAN plus 10-34-0 applied in the same band below the soil surface) is a fertilizer application method usually used in preplant applications. Ammonium-N has long been known to increase P uptake by crops, and dual-placement can be very effective. Sometimes, producers will use this method at planting time, trying to position the band to the side of each row of wheat seed. Use caution, however.

If adequate separation of fertilizer and seed is accomplished, this is a good method of application that fits into many farmers' overall no-till system. If adequate separation of the ammonia/UAN and seed is not accomplished, wheat germination/stand establishment can be severely affected.

Dorivar Ruiz Diaz, Nutrient Management Specialist  
[ruizdiaz@ksu.edu](mailto:ruizdiaz@ksu.edu)

## 5. Track the total solar eclipse on the Kansas mesonet in real time

A solar eclipse happens between two and five times a year. Why is the August 21, 2017 eclipse considered so extraordinary?

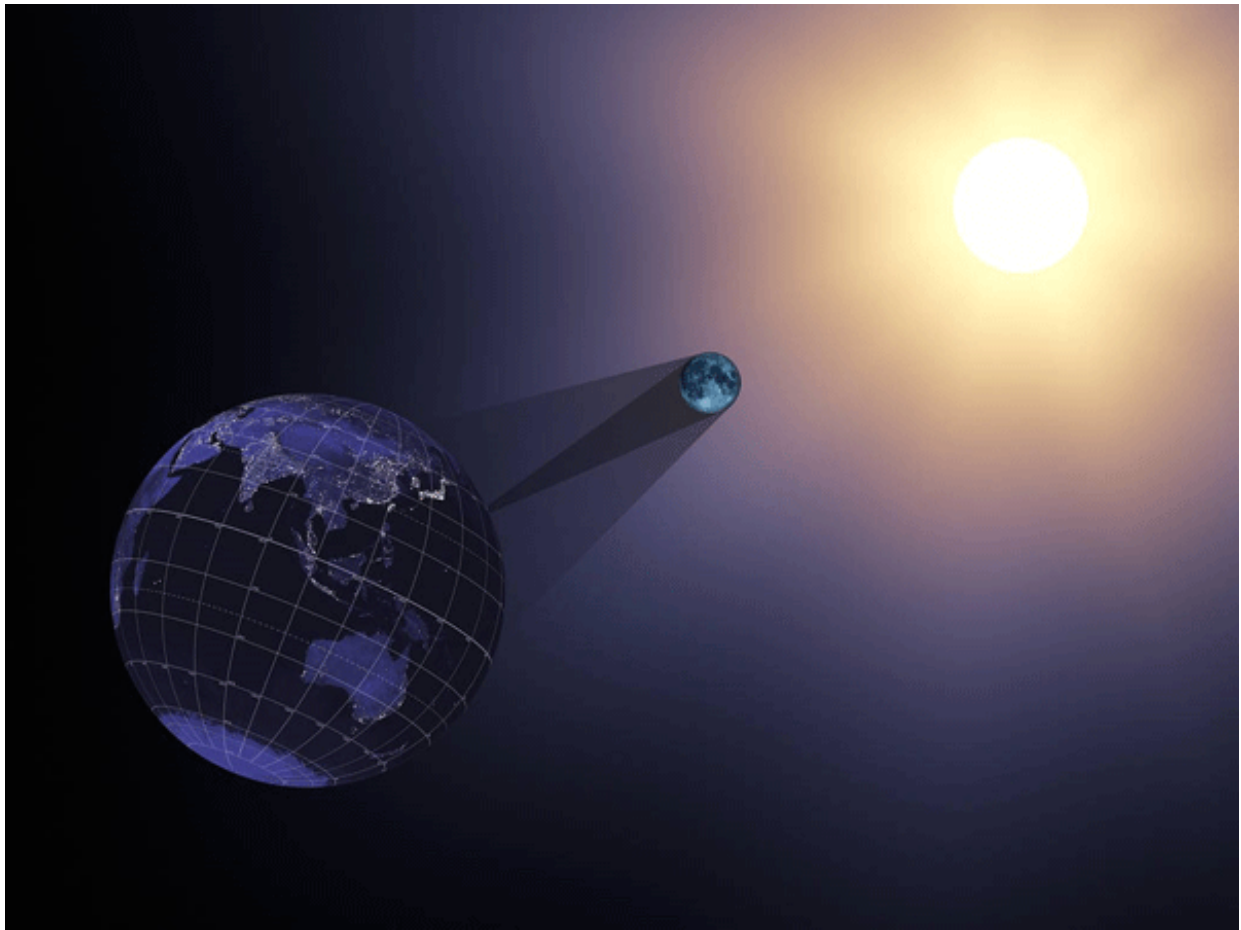
There are four types of solar eclipses: partial, annular, total, and the extremely rare hybrid of an annular/total. Most eclipses fall in the partial category. The ability to see an eclipse is limited to an extremely narrow path for any given event. To be in the path of a total eclipse is even more limited. The last time the path of a total eclipse crossed Kansas was in 1918. The next time a total eclipse will cross Kansas won't be until August 12<sup>th</sup>, 2045.

The Kansas mesonet will be tracking meteorological parameters at 6 mesonet locations nearest to the path of totality. To watch how the temperature and incoming solar radiation change during the eclipse, check out the Kansas mesonet page: <http://mesonet.k-state.edu/special/eclipse>

After the event, the complete one-minute data set will be available online.

We also plan on archiving photographs of general sky conditions and the surrounding landscape during the event. We won't be trying to photograph the actual eclipse, as that requires specialized equipment that we don't have. To watch the eclipse online and to view images of the eclipse, check the NASA eclipse page: <https://www.nasa.gov/eclipselive>

Mary Knapp, Weather Data Library  
[mknapp@ksu.edu](mailto:mknapp@ksu.edu)



**Eclipse Visualization (NASA)**

## 6. Agricultural Research Center-Hays field day, August 23

Row crops, including the latest research into crop selection, tillage and pest management, will take center stage at the Agricultural Research Center's Row Crop Roundup Fall Field Day in Hays Aug. 23.

The day starts with registration at 9 a.m. with the program beginning at 9:30 a.m. The Center is at 1232 240th Ave. in Hays. A complimentary lunch will be served.

Field tours include:

- Occasional Tillage in Long-Term No-Till
- Management of Sugarcane Aphid in Sorghum

Indoor presentations include:

- Sorghum Early Planting: Perspectives and Challenges
- Managing Palmer Amaranth in Corn and Sorghum
- Crop Selection Considerations in West Central Kansas
- Sorghum vs. Corn vs. Soybean: Economic Returns in a Challenging Market
- Selection of Wheat Varieties: Lessons from the 2017 Harvest

K-State speakers include:

- Augustine Obour, Soil Scientist, Agricultural Research Center-Hays
- JP Michaud, Entomologist, Agricultural Research Center-Hays
- Ram Perumal, Sorghum Breeder, Agricultural Research Center-Hays
- Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist
- Dallas Peterson, Weed Management Specialist
- Lucas Haag, Northwest Area Crops and Soils Specialist
- Dan O'Brien, Northwest Area Agricultural Economist
- Romulo Lollato, Wheat and Forages Specialist

More information is available at [www.hays.k-state.edu](http://www.hays.k-state.edu) or by calling 785-625-3425.



## 7. Southwest Research-Extension Center field day, August 24

The Southwest Research-Extension Center hosts its annual fall field day on Thursday, Aug. 24 at 4500 E. Mary St. in Garden City.

The field day includes field tours, seminars, and commercial exhibitor displays, plus a sponsored lunch. Registration begins at 8 a.m. with the program starting at 9:15 a.m.

One credit hour and one core hour will be available for commercial pesticide applicator licensing.

Field tour and seminar topics include:

- Corn and Sorghum Insect Control Update
- Weed Control in Irrigated Corn
- Weed Control in Dryland Sorghum
- The Effect of Humic Products on Sorghum Yield and Nitrogen Use Efficiency
- Integrating Cover Crops and Annual Forages into Wheat-Sorghum-Fallow Cropping Systems
- Wheat Health Management
- Core Hour for Commercial Pesticide License

More information is available by contacting Randall Currie at [rscurrie@ksu.edu](mailto:rscurrie@ksu.edu) or by calling the center at 620-276-8286.

## 8. Comparative Vegetation Condition Report: August 8 - 14

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 27-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.

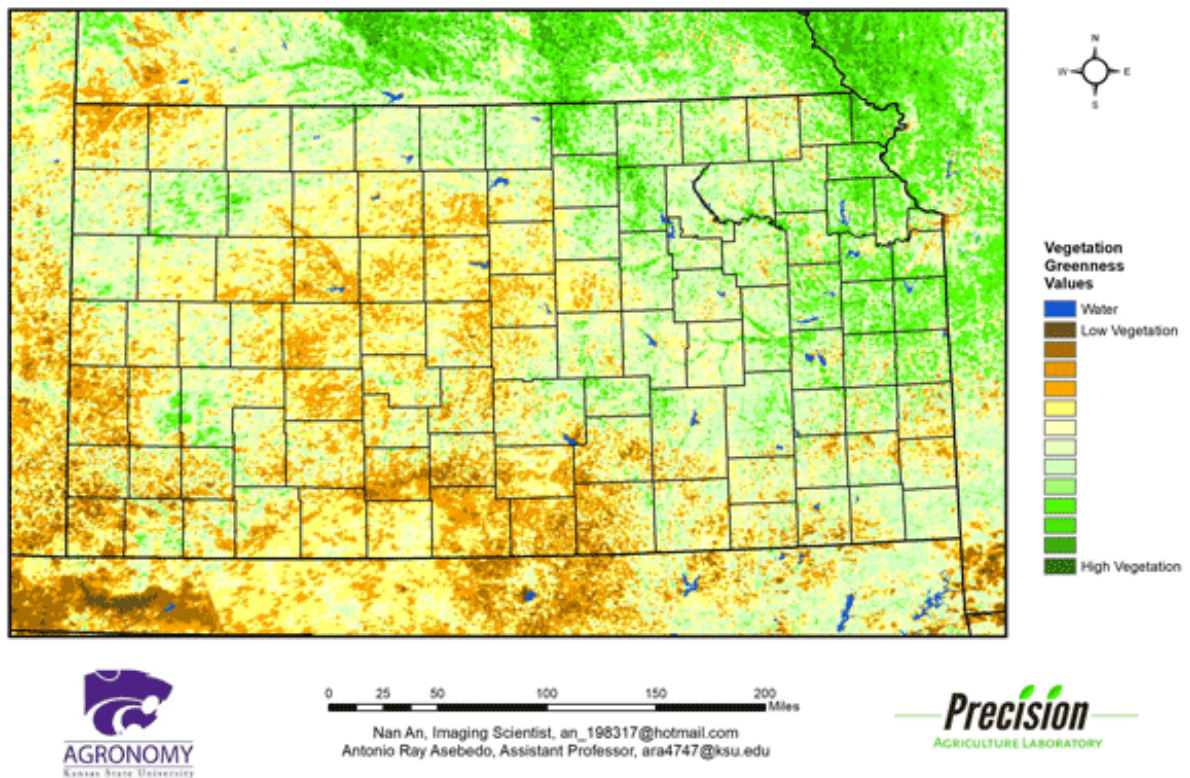
The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new 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:

## Kansas Vegetation Condition

Period 33: 08/08/2017 - 08/14/2017



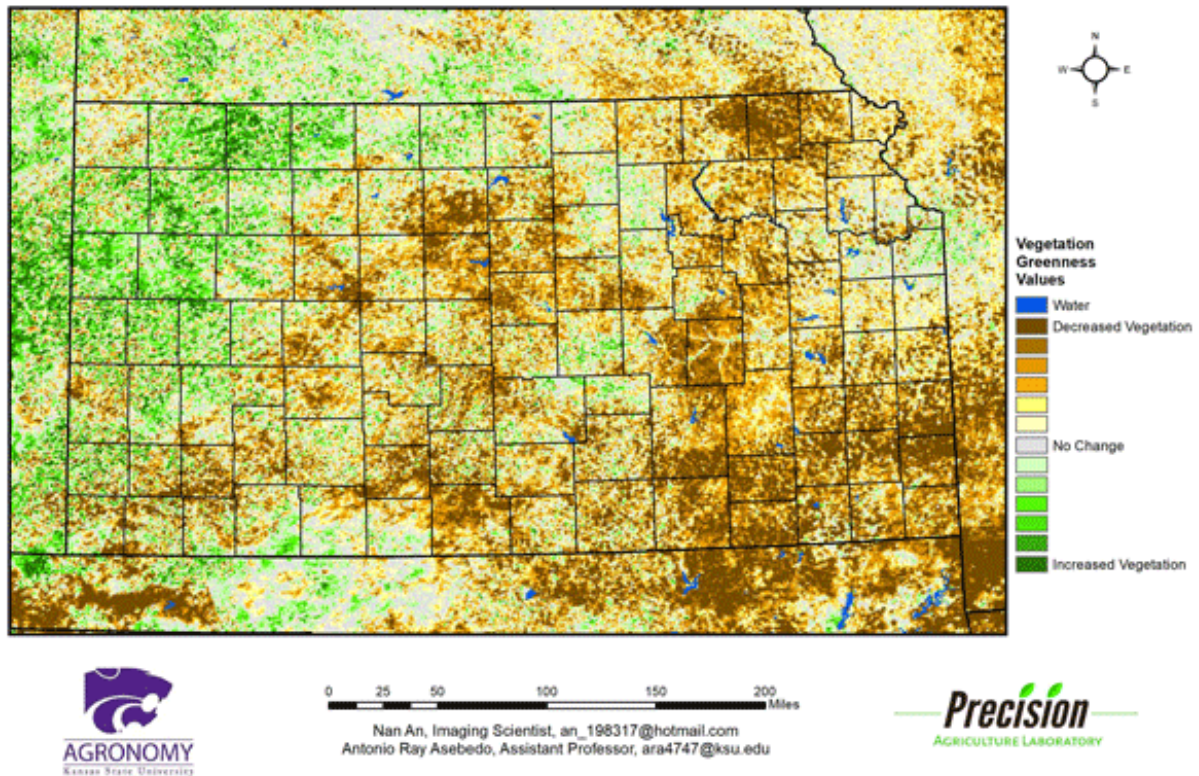
**Figure 1. The Vegetation Condition Report for Kansas for August 8 – August 14, 2017 from K-State’s Precision Agriculture Laboratory shows the area of greatest vegetative activity continues to be in eastern Kansas, particularly in extreme northeast Kansas. The impacts from the recent rains have begun to be visible, although the moisture in the South Central Division has yet to produce a response.**

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

## Kansas Vegetation Condition Comparison Early-August 2017 compared to the Early-August 2016

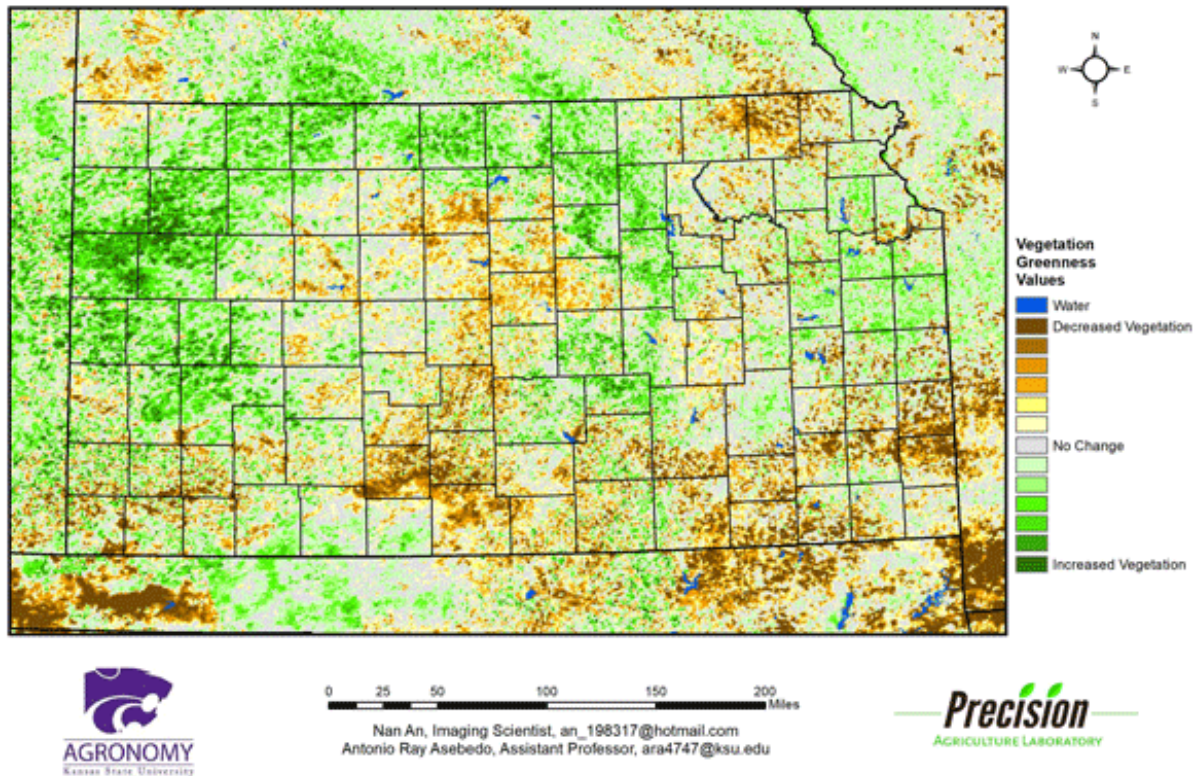


**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for August 8 – August 14, 2017 from K-State’s Precision Agriculture Laboratory shows the greatest change in vegetative activity is in the southwest, where rainfall has been more consistent this year. In contrast, much of the eastern half of the state has lower vegetative activity. Although August has been running cooler, this summer has been hotter and much drier than last year in this area.**



# Kansas Vegetation Condition Comparison

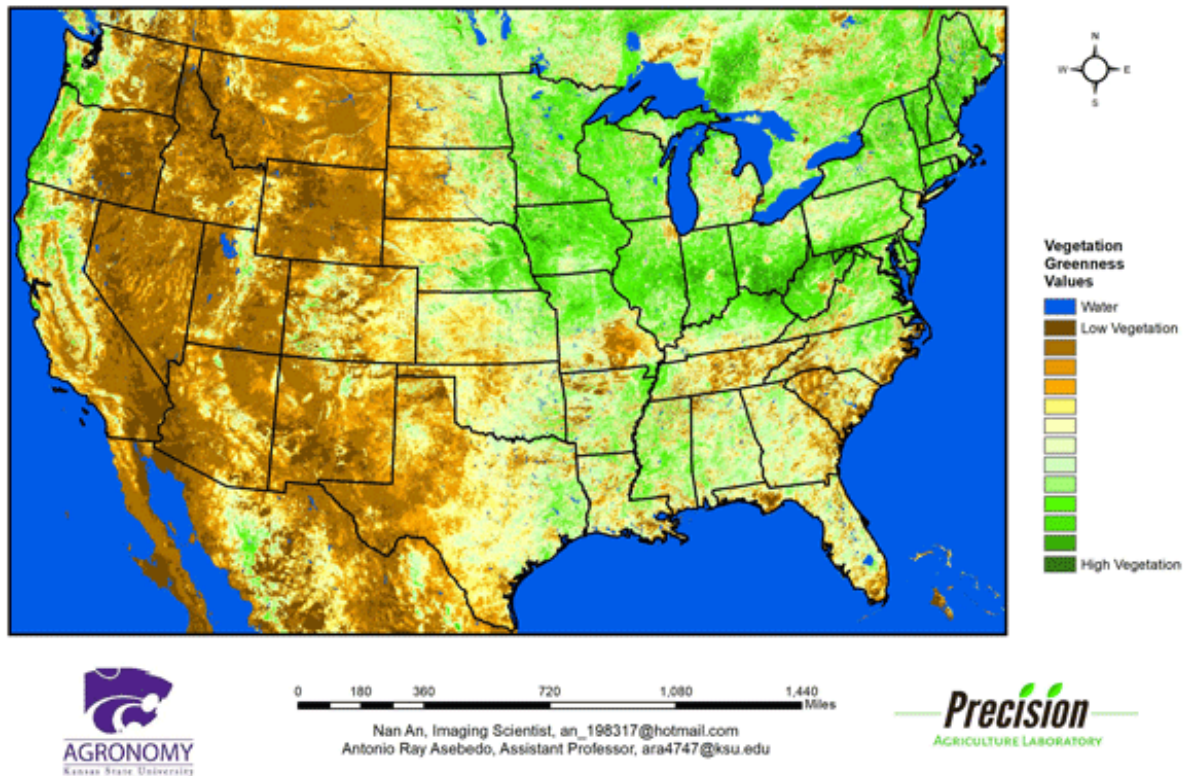
Early-August 2017 compared to the 28-Year Average for Early-August



**Figure 3. Compared to the 28-year average at this time for Kansas, this year's Vegetation Condition Report for August 8 – August 14, 2017 from K-State's Precision Agriculture Laboratory above-average activity in the western parts of the state. Wetter-than-normal conditions have favored parts of the west, particularly Wallace County. Meanwhile continued hot, dry weather has stressed vegetation in the central parts of the state.**

## Continental U.S. Vegetation Condition

Period 33: 08/08/2017 - 08/14/2017



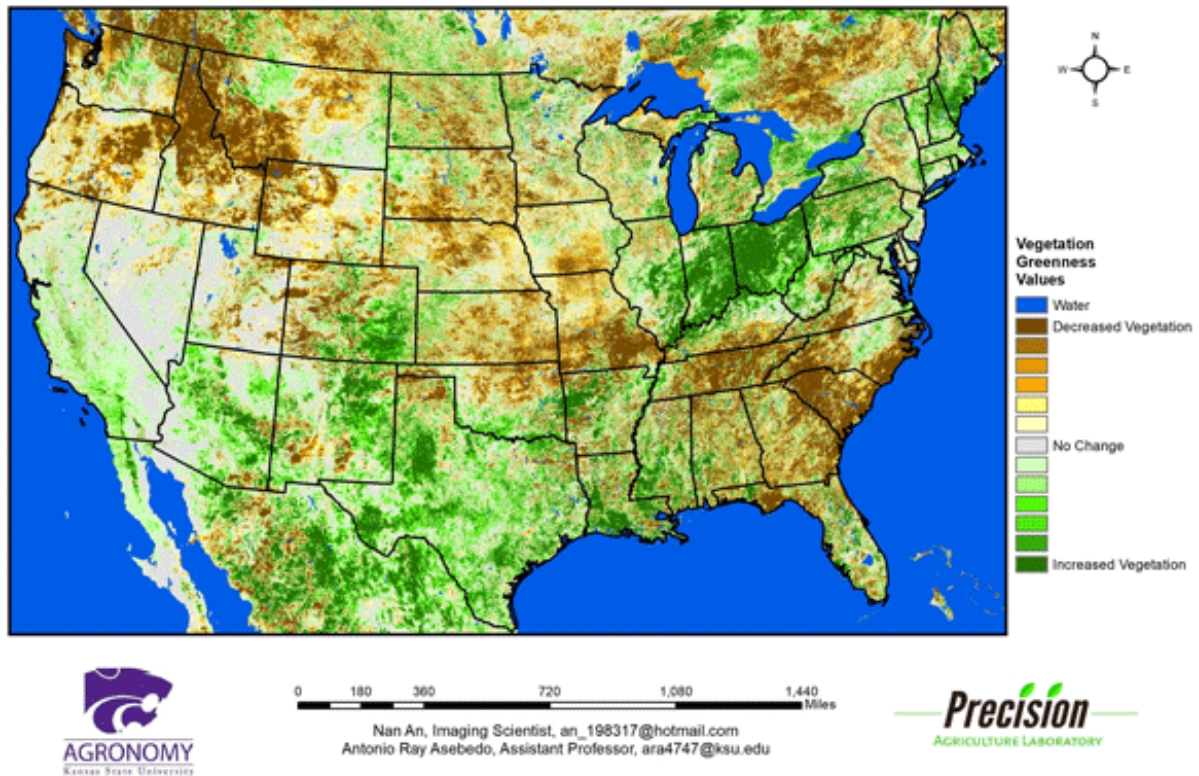
**Figure 4. The Vegetation Condition Report for the U.S for August 8 – August 14, 2017 from K-State’s Precision Agriculture Laboratory shows an area of high NDVI values centered in the Midwest, particularly in Tennessee and parts of Kentucky. A second area of high vegetative activity is also visible 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.**

Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

[www.agronomy.ksu.edu](http://www.agronomy.ksu.edu) | [www.facebook.com/KState.Agron](https://www.facebook.com/KState.Agron) | [www.twitter.com/KStateAgron](https://www.twitter.com/KStateAgron)

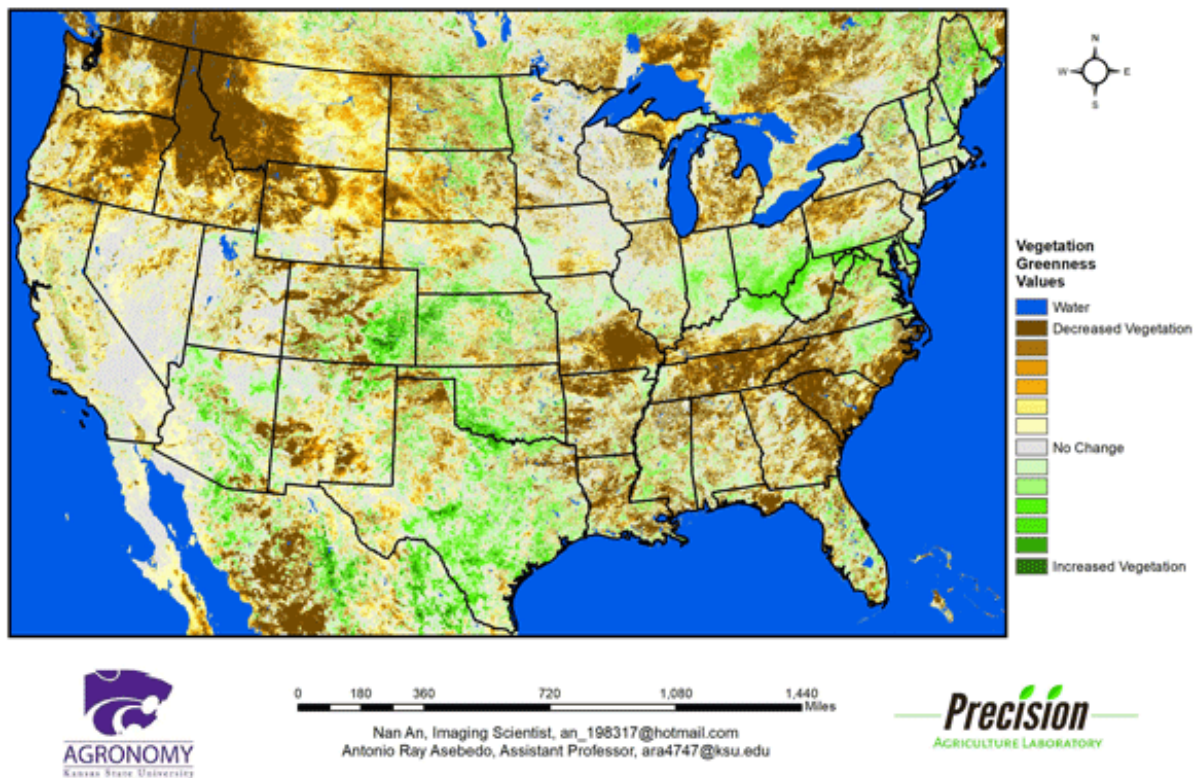
Continental U.S. Vegetation Condition Comparison  
Early-August 2017 Compared to Early-August 2016



**Figure 5. The U.S. comparison to last year at this time for August 8 – August 14, 2017 from K-State's Precision Agriculture Laboratory again shows the impact that the split in moisture has caused this year. Much lower NDVI values are visible in Montana and Idaho, 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.**



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



**Figure 6. The U.S. comparison to the 28-year average for the period of August 1 – August 7, 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. Parts of the area have been under flood advisories most of the week.**

Mary Knapp, Weather Data Library  
[mknapp@ksu.edu](mailto:mknapp@ksu.edu)

Ray Asebedo, Precision Agriculture  
[ara4747@ksu.edu](mailto:ara4747@ksu.edu)

Nan An, Imaging Scientist  
[an\\_198317@hotmail.com](mailto:an_198317@hotmail.com)