



Extension Agronomy

eUpdate

07/25/2014

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, Jim Shroyer, Crop Production Specialist 785-532-0397 jshroyer@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

1. Canola summary for the 2013-2014 growing season	3
2. Some basic concepts of liming	5
3. Canola conferences scheduled for July 29 and 30.....	8
4. Comparative Vegetation Condition Report: July 8 - 21	9
5. Forecasted corn yield potential and attainable yields.....	19

1. Canola summary for the 2013-2014 growing season

It was a year of many challenges for winter canola in Kansas. Ironically, this is how I started last year's summary of the growing season in the Agronomy eUpdate. While 2013-2014 was a repeat of many of those challenges, we did learn a great deal about the adaptability and resiliency of winter canola to the environmental conditions of Kansas and the southern Great Plains.

For a second year in a row, we started with producers seeding record acres of canola in Kansas and the southern Great Plains. August was anything but dry in parts of central Kansas; however, September turned out hot and dry. Areas that did not receive the August rains had canola fields that failed to germinate and/or had very erratic emergence. This was a particular problem in the south central counties and most of Oklahoma. Nonetheless, some producers received timely rains that aided germination and establishment.

Dry soil conditions led to delayed planting. As a result, aboveground biomass was limited going into what was a record cold winter. Aboveground biomass is important because the plant needs a large leaf area, a thick stem, and an extensive root system to survive our winters. Snow cover can benefit survival too, but what snow fell did not last long.

In 2013, soil moisture conditions improved in the spring. This did not happen for many in 2014. Dry conditions, coupled with the cold winter and a slow start to the growing season, severely limited plant biomass production and this is what ultimately reduced yields across the southern Great Plains. Plant height, branching, pods per plant, and pods per area were all reduced because of reduced biomass production.

Additionally, several late spring freezes affected the crop in the bolting and early flowering stages. Because of its indeterminate growth, canola has the ability to recover from these freeze events but dry soil conditions resulted in poorer recovery compared to the freeze events of 2013. In many fields, producers observed blank areas on the main and secondary branches where pods were aborted by the freezes. This significantly reduced yield potential.

Where the spring rains fell, the crop recovered better and resulted in fair to good yields. However, where the crop was severely drought stricken, the rains fell too late. This resulted in significant secondary growth and flowering just before and after swathing in June. From previous years' observations, regrowth appears to be worse when rains fall later in the growing season on a crop that has been negatively affected by drought. The regrowth potential of canola can be a benefit, for instance, after an early spring hail event, but it can also be a challenge to manage. Regrowth of secondary branches is generally less productive than the initial branches, resulting in lower yields.

Producer canola yields in Kansas averaged around 20 bushels/acre, with a yield range of about 5 to 35 bushels/acre. There were producer fields that yielded 0 bu/acre from the combined effects of drought, winterkill, and late spring freezes.

Yield trials that included commercial winter canola varieties were harvested at Belleville, Garden City, Hutchinson, and Manhattan. Kiowa was lost to delayed emergence and winterkill. Erratic fall stands and poor survival led to abandonment of the Andale plot. A five-year yield summary is provided in Table 1.

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Kansas State University Department of Agronomy

2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506

www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron

Location	2010	2011	2012	2013	2014	4-yr Avg (2014 excluded)
	Yield (bushels per acre)					
Andale	36	12*	26*	58	Winterkill	33
Belleville	N/A	N/A	80	59	10	70
Garden City	47	46	46	Hail	(In process)	46
Hutchinson	41	Herbicide damage	Drought	42	23	42
Kiowa	Herbicide damage	21*	42	Drought	Drought	32
Manhattan	41	46	44	67	35	50
Marquette	41	42	15*	Freeze	N/A	34
Average by year	42	34	42	57	23	
*Trial negatively affected by drought or severe weather						

Table 1. Summary of yields (bushels/acre) of K-State Research and Extension trials including commercial winter canola cultivars, 2010-2014.

We reinitiated canola testing at Belleville in 2011-2012 to test how far we have come in improving winter survival. Two mild winters resulted in very high seed yields and a two-year average of 70 bushels/acre. We got the winter hardiness test we were seeking this growing season, with winter survival ranging from 0 to greater than 90%. Five of the top 10 varieties for both yield and winter survival originate from the K-State canola breeding program. While the site averaged 10 bushels/acre, the top K-State experimental line, KS4506, averaged 31 bushels/acre.

Hutchinson was impacted by drought and winterkill. Spring rains arrived before and after swathing and caused problems with getting the crop out in a timely manner. Nonetheless, average yields ranged from 0 to 58 bushels/acre, with a site average of 23 bushels/acre. Although winterkill was observed in Manhattan, the trials that survived benefited from timely rains and cool temperatures at grain fill. This resulted in a site average of 35 bushels/acre.

Careful variety selection is very important for harvesting a successful winter canola crop, and that has never been more apparent than in the 2013-2014 growing season. Watch future eUpdates for a review of winter canola varieties and suggestions to help with variety selection. In addition, with a little assistance from the weather and the use of good farming practices, producers will realize the full potential and profitability of winter canola. Even though weather had a huge impact on the 2013-2014 crop, many producers are encouraged by the resilience of winter canola and the benefits it provides to our cropping systems.

Mike Stamm Canola Breeder
mjstamm@ksu.edu

2. Some basic concepts of liming

Correcting acid soil conditions through the application of lime can have a significant impact on crop yields, especially with alfalfa. Liming is one of the most essential, but often overlooked, management decisions a producer can make.

One important aspect of liming is the time required for pH change to occur. It can take some significant time for lime to react and raise soil pH. The exact amount of time is generally a function of lime particle size, and soil moisture. Smaller particles have more surface area, and react faster in the soil. So when time is of the essence, using finely ground lime materials will result in a quicker pH increase.

Research has shown that the fine particles in ag lime, generally those which are smaller than 60 mesh, will react within 30 days. As particle size increases, the rate of reaction slows, since the relative surface area decreases as particle size increases. Particles between 30 and 60 mesh size may take as long as 1-2 years to react, while those between 8 and 30 mesh may take as long as 5 years or more. This is especially important when liming for new alfalfa seedings. Since seeding alfalfa is expensive and a stand is expected to last for several years, getting lime applied early enough to get the acidity problem corrected before seeding is critical.

Unfortunately lime is not always available close to where it may be needed. In many cases trucking and spreading costs may be more than the cost of the lime itself. Lime quality can also vary widely and no one wants to apply more than is necessary. So to make the best decisions on how much and what kind of lime to apply, it is useful to know how lime recommendations are made.

Crop sensitivity to pH and regional differences in target pH

A routine soil test will reveal the pH level of the soil, and this will determine whether lime is needed on the field. Crops differ in their sensitivity to low pH. In most cases, our crops are tolerant to pH levels in the higher ranges, as long as they don't exceed pH 7.0. So it is generally best to lime to satisfy the needs of the most acid-sensitive crop commonly grown on that field.

Alfalfa is the crop most sensitive to acidity, and requiring the highest pH. Soybeans and red clover are intermediate, doing best at pH 6.0-6.4 in most areas; and wheat and corn are the most acid-tolerant crops. Generally, east of the Flint Hills, lime is recommended for alfalfa if the pH drops below 6.4, with a target pH for liming of 6.8. In the Flint Hills and west, lime is recommended for alfalfa and all other crops when the pH drops below 5.8, with a target pH of 6.0. Target pH is simply the pH goal once the lime reacts with the soil.

Why are the target pH levels different for the two areas of Kansas? They differ because of the pH of the subsoil. East of the Flint Hills, especially south of the Kansas River, the subsoil tends to be acidic, and a higher target pH is used to assure adequate pH conditions in the surface root zone, and provide sufficient amounts of calcium and magnesium. From the Flint Hills west, most soils have high-pH, basic subsoils that can provide additional calcium and magnesium to meet crop needs.

Lime recommendations

Lime rates are given in pounds of effective calcium carbonate, ECC, per acre. Soils with more clay and organic matter (higher cation exchange capacity) will have more reserve acidity at a given pH, and

will require more ECC to reach a target soil pH, than will a sandy soil. This is why two soils may have the same soil pH but have quite different buffer pHs, and different lime requirements.

So, how does ECC relate to ag lime and how much lime to apply? Lime materials can vary widely in their neutralizing power. All lime materials sold in Kansas must guarantee their ECC content and dealers are subject to inspection by the Kansas Department of Agriculture. The two factors that influence neutralizing value and are used in determination of the ECC content are the chemical neutralizing value of the lime material relative to pure calcium carbonate, and the fineness of crushing, or particle size, of the product. The surface area of the particles is critical for neutralizing to occur.

Expressing recommendations as pounds of ECC allows fine-tuning of rates for variation in lime sources, and avoids under or over applying lime products. This is important for two reasons; excessively high pH can lead to micronutrient availability problems, especially iron and zinc in Kansas. It is not universally true that all high-pH soils will have iron chlorosis or zinc deficiency. The availability of these metals is also strongly influenced by soil organic matter and other factors. But with little or no crop response to raising pH above the recommended target pH, why take a chance of creating a problem which is very difficult to undo?

Lowering soil pH is a natural process which we accelerate with nitrogen fertilizers. But to decrease pH rapidly can be very expensive.

Sources of lime and their effectiveness

Research has clearly shown that a pound of ECC from any lime source -- ag lime, pelletized lime, water treatment plant sludge, fluid lime, or other sources -- is equally effective in neutralizing soil acidity. All lime sources have a very limited solubility and must be incorporated and given time to react with and neutralize the acidity in the soil.

What about the calcium and magnesium contents? Most ag limes found in Kansas contain both calcium and magnesium, though the relative concentrations of the two essential plant nutrients varies widely. While the advantages and disadvantages of using a dolomitic, magnesium-containing, lime versus a calcitic lime (low-magnesium, high-calcium lime) have been cussed and discussed for years, the differences are very, very slight unless your soil is deficient in magnesium. In Kansas, both dolomitic lime and calcitic lime are suitable for use on cropland.

Therefore under most circumstances, the cost per pound of ECC applied to your field should be a primary factor in source selection. Such factors as rate of reaction, uniformity of spreading, and availability should be considered, but the final pH change, and subsequent crop growth, will depend on the amount of ECC applied.

With no-till or limited-till systems, lower rates of lime have been shown to be cost-effective in many cases. This is because lime is relatively immobile and will only react with the top 2 or 3 inches of soil. Current K-State lime recommendations suggest that "traditional" rates should be reduced by 50 to 60% when surface applied in no-till systems, or when applied to existing grass or alfalfa stands.

Summary

Liming to reduce the toxic effects of soil acidity on crop growth is important in many areas in Kansas.

Determining the appropriate lime rate requires soil testing, and sampling should take into consideration soil variability since soil texture and organic matter content will impact the lime need. Lime rates are given in pounds of effective calcium carbonate per acre, which adjusts for differences in chemical purity, calcium carbonate equivalent, and fineness. Finally, changing pH takes time. So be sure to allow plenty of time for lime to react before seeding acid-sensitive crops such as alfalfa on acid soils.

For more information, see K-State publication "Soil Test Interpretations and Fertilizer Recommendations," MF-2586: <http://www.ksre.ksu.edu/bookstore/pubs/MF2586.pdf>

Dave Mengel, Soil Fertility Specialist
dmengel@ksu.edu

Dorivar Ruiz-Diaz, Nutrient Management Specialist
ruizdiaz@ksu.edu

3. Canola conferences scheduled for July 29 and 30

The 10th annual Winter Canola Conferences offer producers an in-depth look at the latest research in production practices and economics from canola specialists at K-State and Oklahoma State University. There are two conferences scheduled:

- July 29, Enid Convention Hall -- Enid, Oklahoma
- July 30, Western Oklahoma State College – Altus, Oklahoma

Topics at each conference include:

- Year-end review
- Market outlook
- Weather and climate outlook
- Variety and hybrid performance
- Advanced agronomics
- U.S. Canola Association updates
- Great Plains Canola Association updates and awards
- Risk management and crop insurance update
- Weed management
- Disease management
- Insect management
- Great Plains Canola Association meeting

There is no charge for attending the conference. A free lunch and door prizes will be offered. Sponsors include the Oklahoma Oilseed Commission and Great Plains Canola Association.

Contact me at 785-532-3871 (mjstamm@ksu.edu) or your local Extension office for more information.

Mike Stamm, Canola Breeder
mjstamm@ksu.edu

4. Comparative Vegetation Condition Report: July 8 - 21

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

Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:

<http://www.youtube.com/watch?v=CRP3Y5Nlggw>

<http://www.youtube.com/watch?v=tUdOK94efxc>

The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 24-year average. The report is used by individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

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

The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, the Corn Belt, and the continental U.S. Usually these maps are accompanied by comments from Mary Knapp, state climatologist, but she is currently out of the office. Her comments will resume in two weeks with eUpdate No. 469.

Kansas Vegetation Condition

Period 29: 07/08/2014 - 07/21/2014

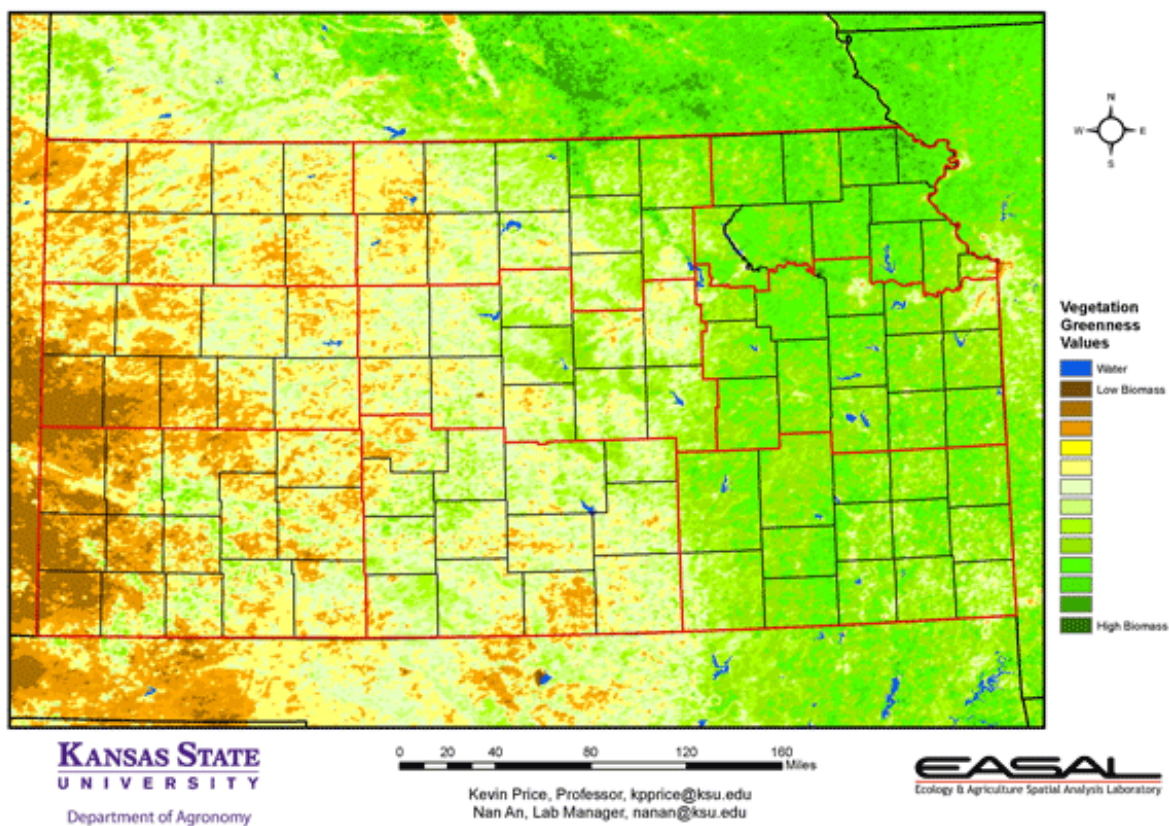


Figure 1. The Vegetation Condition Report for Kansas for July 8 – 21 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory.

Kansas Vegetation Condition Comparison

Mid-July 2014 compared to the Mid-July 2013

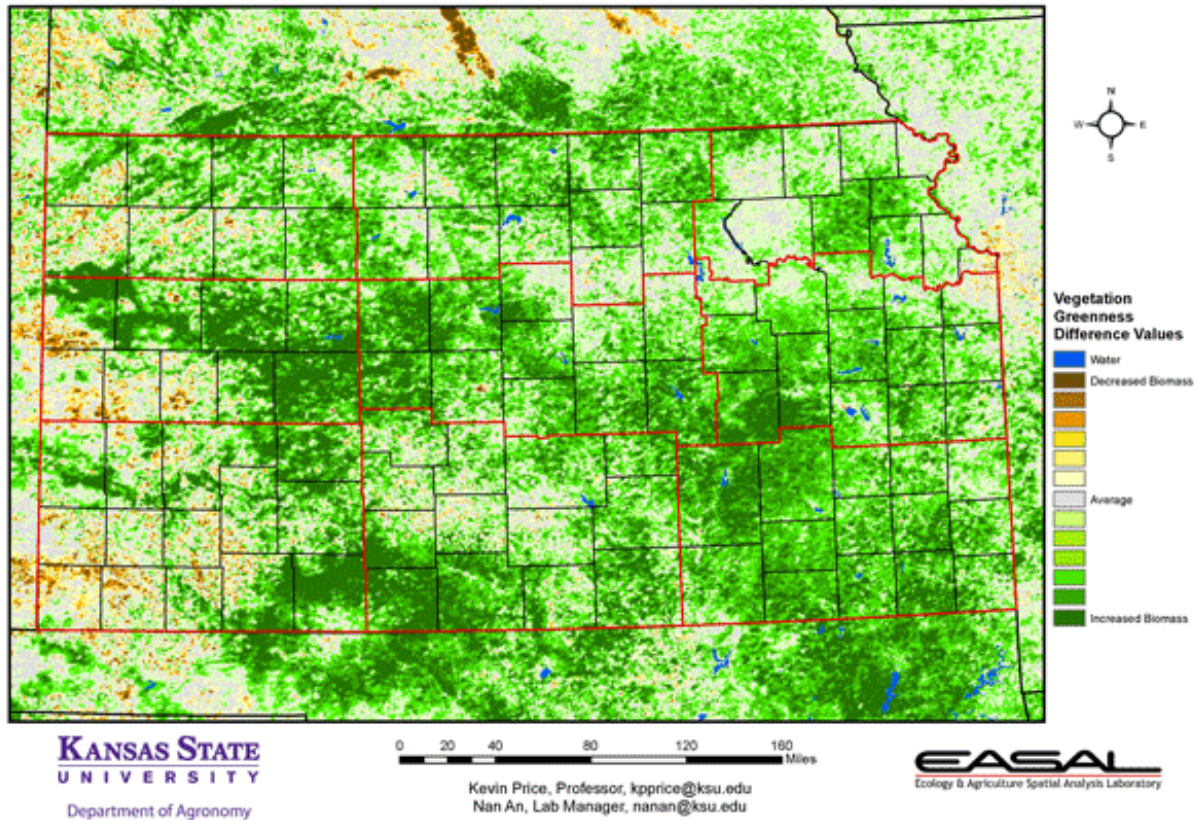


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for July 8 – 21 from K-State's Ecology and Agriculture Spatial Analysis Laboratory.

Kansas Vegetation Condition Comparison
Mid-July 2014 compared to the 25-Year Average for Mid-July

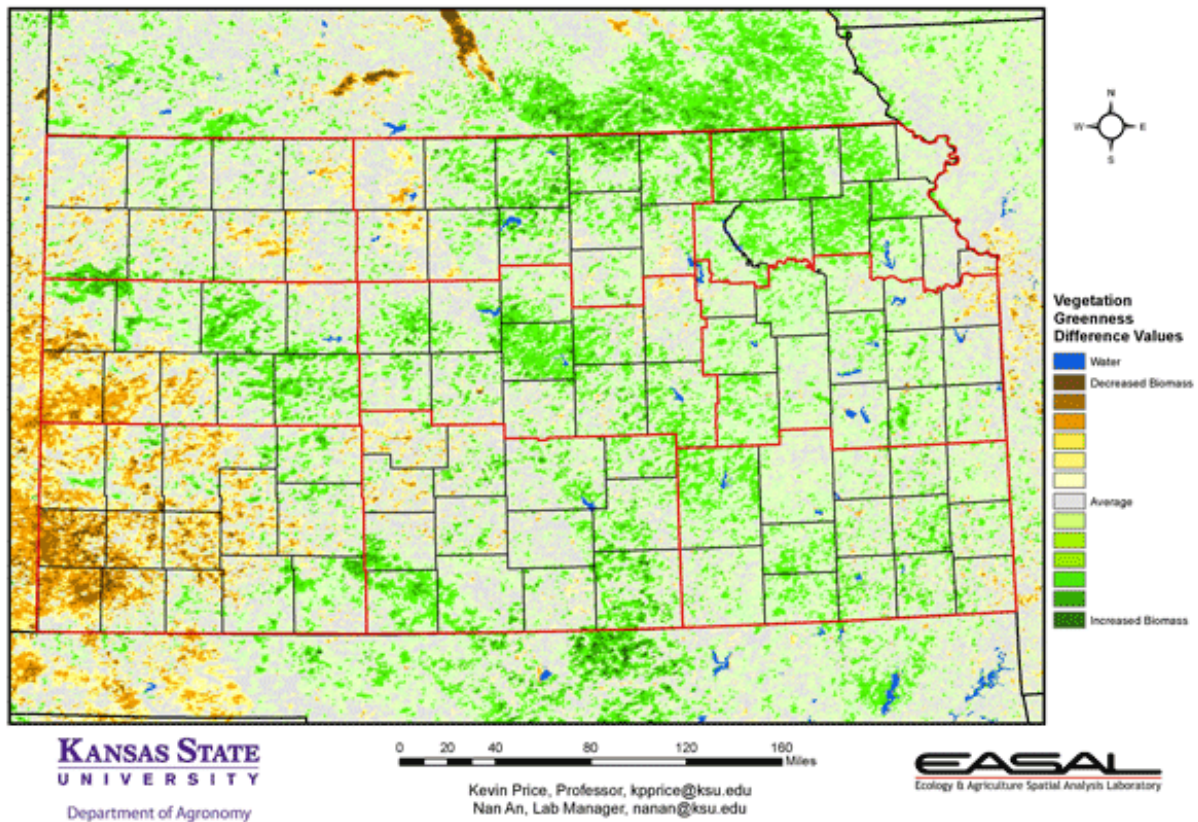


Figure 3. Compared to the 25-year average at this time for Kansas, this year's Vegetation Condition Report for July 8 – 21 from K-State's Ecology and Agriculture Spatial Analysis Laboratory.

U.S. Corn Belt Vegetation Condition

Period 29: 07/08/2014 - 07/21/2014

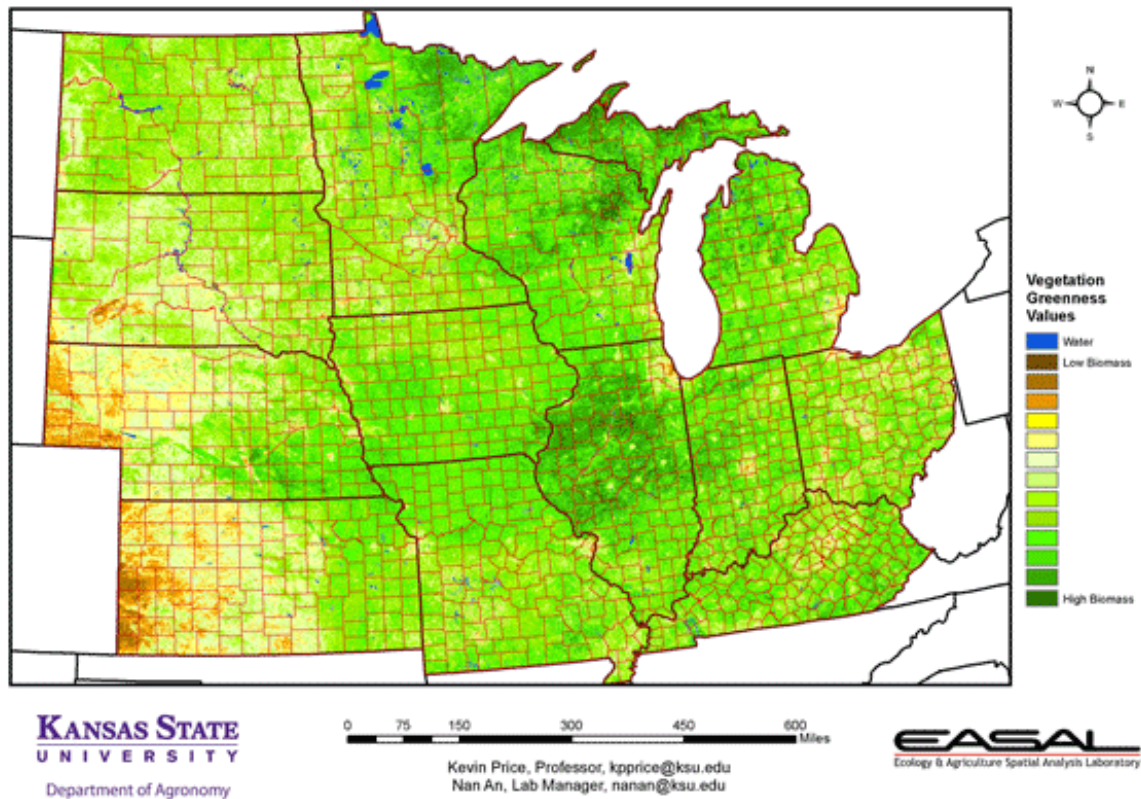


Figure 4. The Vegetation Condition Report for the Corn Belt for July 8 – 21 from K-State's Ecology and Agriculture Spatial Analysis Laboratory.

U.S. Corn Belt Vegetation Condition Comparison
Mid-July 2014 Compared to Mid-July 2013

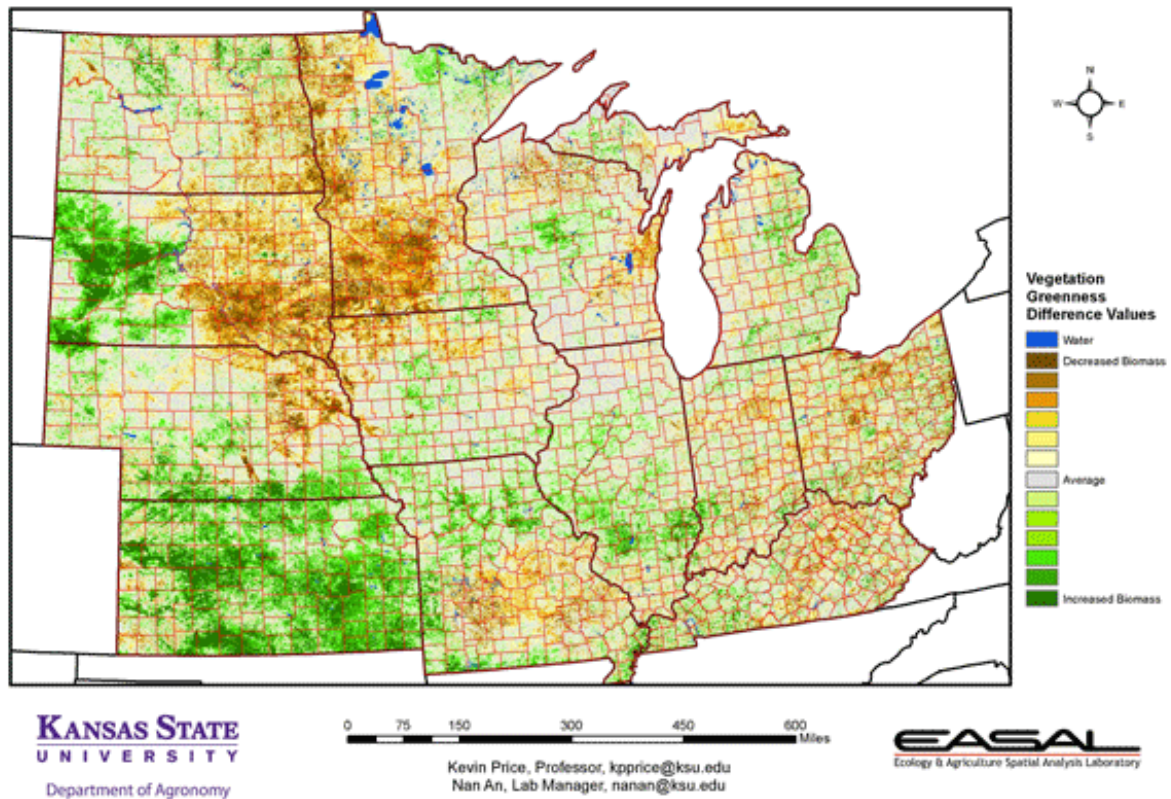


Figure 5. The comparison to last year in the Corn Belt for the period July 8 – 21 from K-State's Ecology and Agriculture Spatial Analysis Laboratory.

U.S. Corn Belt Vegetation Condition Comparison
Mid-July 2014 Compared to the 25-Year Average for Mid-July

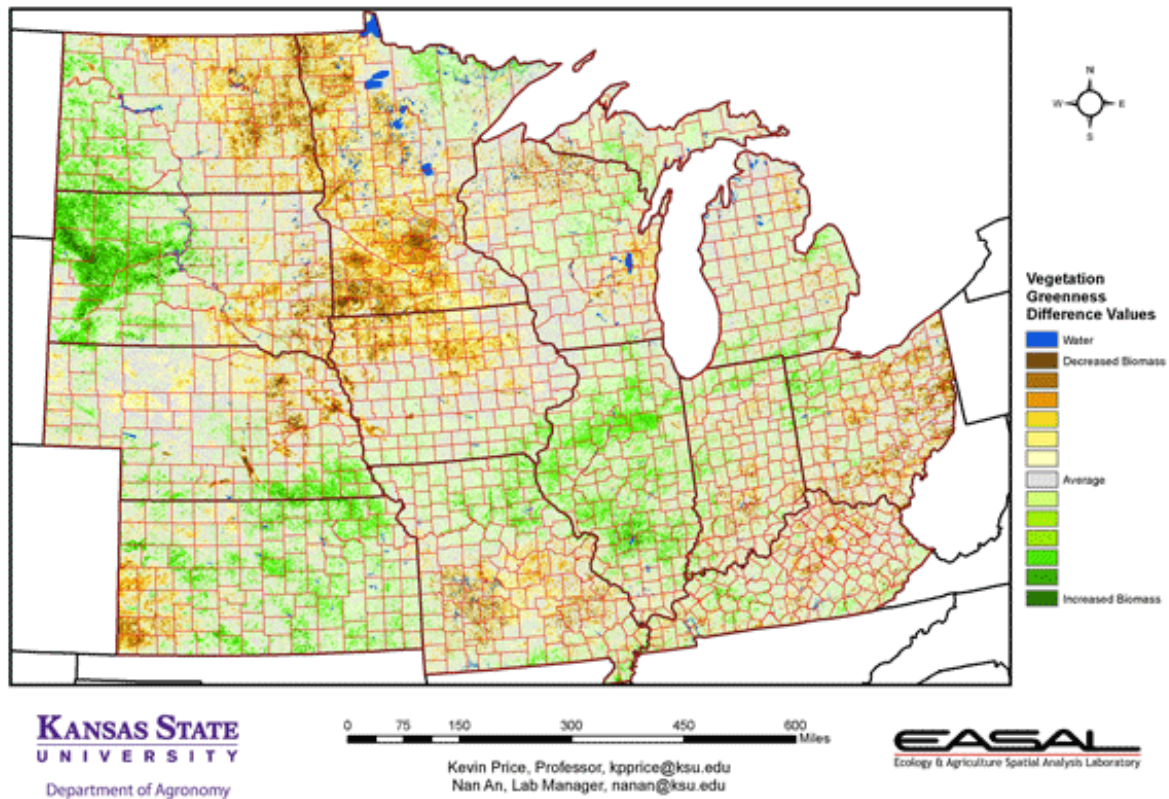


Figure 6. Compared to the 25-year average at this time for the Corn Belt, this year's Vegetation Condition Report for July 8 – 21 from K-State's Ecology and Agriculture Spatial Analysis Laboratory.

Continental U.S. Vegetation Condition

Period 29: 07/08/2014 - 07/21/2014

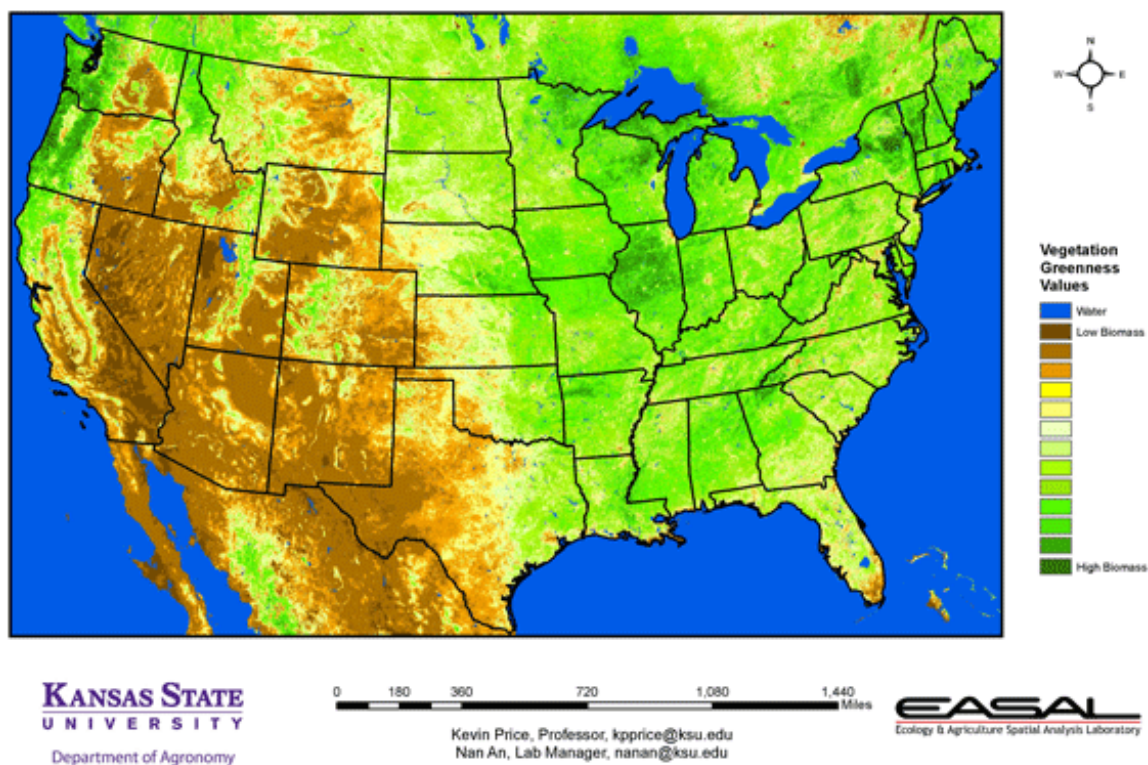


Figure 7. The Vegetation Condition Report for the U.S. for July 8 – 21 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory.

Continental U.S. Vegetation Condition Comparison
Mid-July 2014 Compared to Mid-July 2013

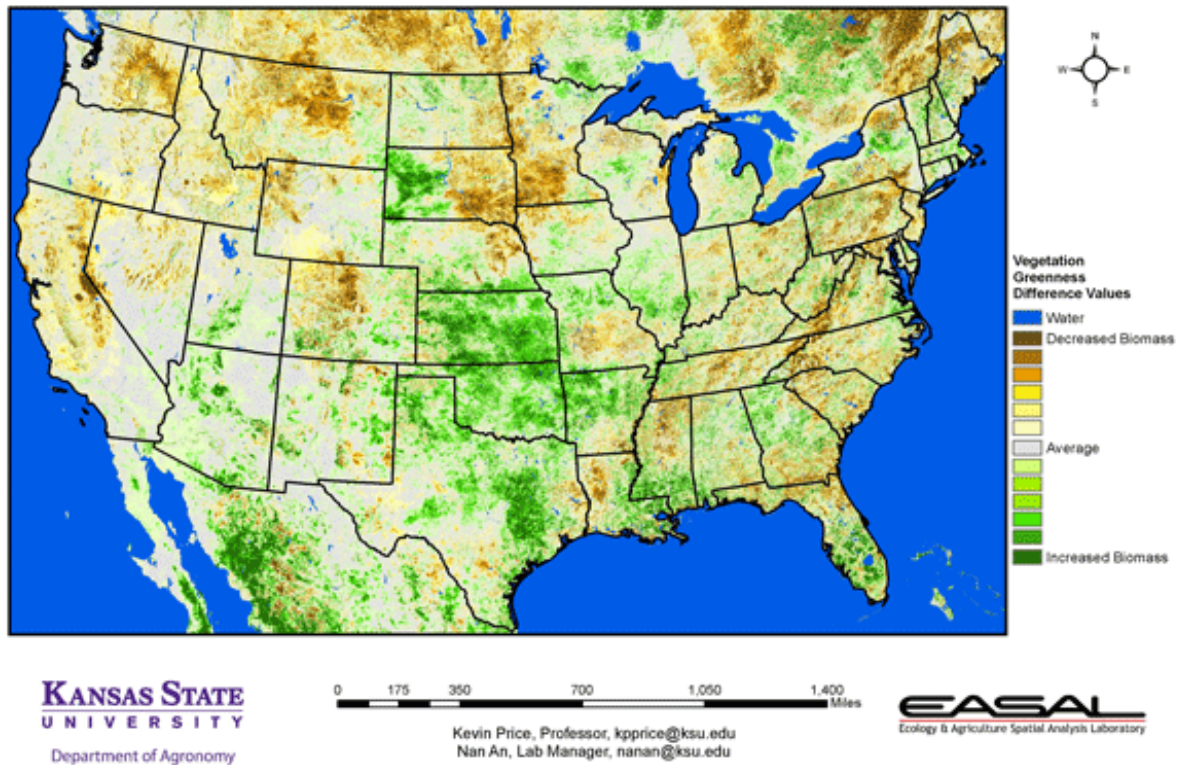


Figure 8. The U.S. comparison to last year at this time for the period July 8 – 21 from K-State's Ecology and Agriculture Spatial Analysis Laboratory.

Continental U.S. Vegetation Condition Comparison
Mid-July 2014 Compared to 25-year Average for Mid-July

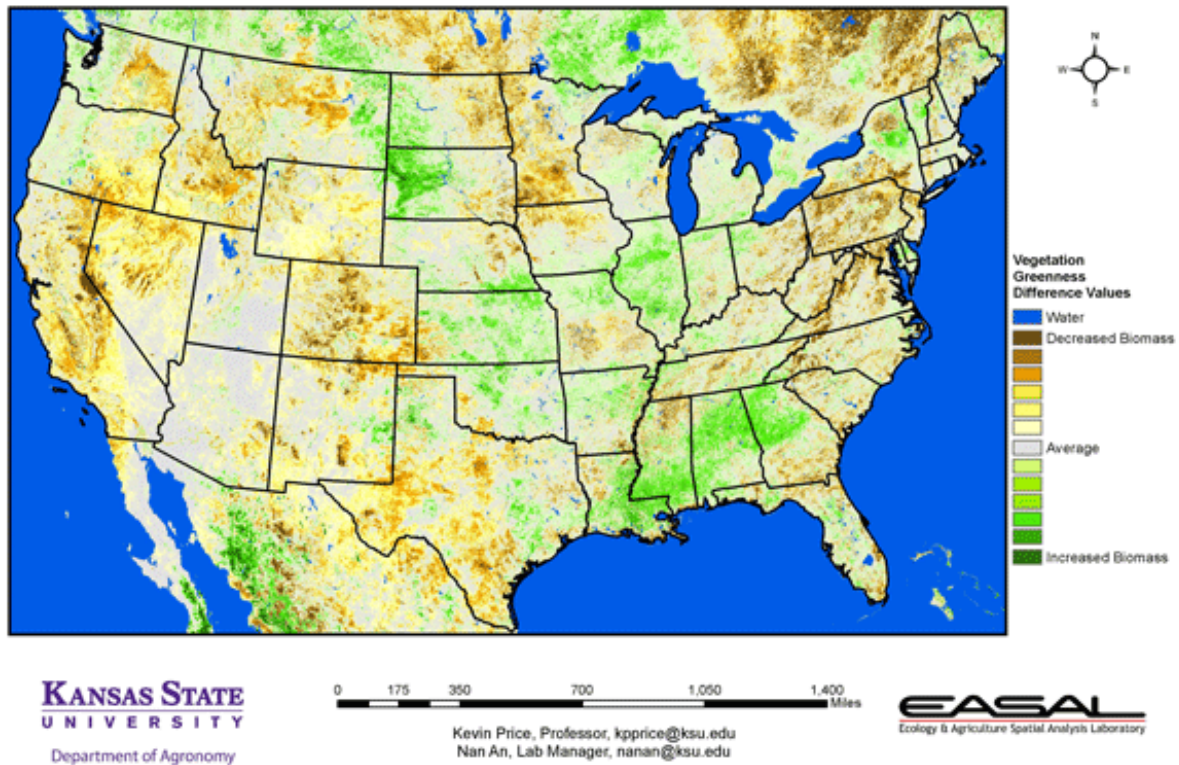


Figure 9. The U.S. comparison to the 25-year average for the period July 8 – 21 from K-State's Ecology and Agriculture Spatial Analysis Laboratory.

Mary Knapp, State Climatologist
mknapp@ksu.edu

Kevin Price, Agronomy and Geography, Remote Sensing, Natural Resources, GIS
kpprice@ksu.edu

Nan An, Graduate Research Assistant, Ecology & Agriculture Spatial Analysis Laboratory (EASAL)
nanan@ksu.edu

5. Forecasted corn yield potential and attainable yields

At this point in the season, a larger proportion of Kansas corn is at the reproductive stages than at this time last year. The most recent Kansas Agricultural Statistics Service crop progress report (July 21) projected that almost 75% of the Kansas' corn crop is at the silking stage and 22% of the crop is already at the dough stage, well ahead from last year. Overall, close to 50% of the corn crop in Kansas was classified by the USDA as good and 15% as excellent. Pollination conditions around the state were very good for most of the corn planted before May 1 and the potential for high yields (close to 200 bu/acre) seemed attainable a couple of weeks ago. However, weather conditions have changed over the past week, with less rain and heat -- exerting a certain degree of stress and imposing uncertainty about the conditions until harvest time.

Potential corn yield estimation

Estimation of potential corn yields can help to understand the maximum yield attainable if management is optimal and in absence of unmanageable adversities, such as hail or flooding. A research team based at the University of Nebraska and The Water for Food Institute (professors Patricio Grassini, Roger Elmore, Haishun Yang, and Ken Cassman) is leading a project for forecasting corn yield using historical and current weather and management information.

The corn simulation model -- Hybrid-Maize Model (<http://hybridmaize.unl.edu>) -- was developed by researchers in the Agronomy and Horticulture Department at UNL and takes into consideration several factors such as weather, plant population, hybrid relative maturity, planting date, and soil type, among other factors. The model assumes optimal management, with no limitation imposed by nutrients or biotic factors (weeds, insect pests, pathogens) and no adversities such as flooding and hail. Therefore, the values depicted by the model provide an overall guideline of the maximum yield attainable if management is near optimal. Likewise, the model does not account for yield losses due to large kernel abortion that results from severe heat and water stress during pollination. The "yield gap" between the value predicted by the model and the harvested yield will increase if management was sub-optimal or there were other adverse factors not accounted by the model that may reduce corn yield.

Simulations can be performed to forecast current-season corn yields. Factors such as site-specific weather conditions from planting until the simulation date and historical weather information to simulate the rest of the 2014 growing season are used for the simulation. Myriad yield scenarios could be produced depending on the growing conditions from the simulation date until harvesting time, but forecasts are more accurate and reliable as the simulation time approaches corn maturity.

Simulation results for Kansas

For Kansas, the estimation of corn yields for the current growing season was performed at five different locations around the state (Fig. 1). Sites include Garden City, Hutchinson, Silver Lake, Manhattan, and Scandia. A separate yield forecast was performed for irrigated and dryland corn for Scandia, while only irrigated crops were simulated at Garden City and Silver Lake. Only rainfed corn was simulated for Manhattan and Hutchinson.

Daily weather data used for simulating these locations were retrieved from the High Plains Regional Climate Center (HPRCC <http://www.hprcc.unl.edu/>). For each location, local agronomists provided information about soil properties and crop management (hybrid maturity, plant populations, and historical and 2014 planting dates) required for the simulations. The following agronomists should be properly acknowledged for investing their time and providing their expertise: Eric Adee, Agronomist-in charge, Kansas River Valley Experimental Research Field, Topeka; Gary Cramer, Agronomist-in charge, South Central Kansas Experimental Field, Hutchinson; and John Holman, Southwest Research-Extension Center Cropping Systems Agronomist, Garden City.

Forecasted corn yield potential ("Yp" in Table 1) was calculated first as long-term yield potential, based on 25+ years of weather data. The model then calculated 2014 forecasted yield potential, utilizing current-season weather. The 2014 forecasted yield potential is presented under favorable (25%), average (50%), and unfavorable (75%) weather scenarios from now until crop maturity.

At almost all sites simulated in Kansas, there is a 75% probability of achieving above-normal irrigated and rainfed corn yields this year.

Under irrigated conditions, the median estimated yield for 2014 is forecast to be 20+ bushels per acre higher than the long-term average from 25+ years of weather data. An exception is at Garden City where the forecasted 2014 yields under median conditions is only 10 bu/acre higher than the yield using long-term averages.

Under rainfed conditions, a similar benefit of 20+ bushels per acre is forecast at all locations compared to the long-term average. However, if the conditions until harvesting worsen, the forecasted yield advantage will narrow to 10+ bushel per acre for 2014 as compared with the long-term average. Still, it should be emphasized that forecasted yield for corn regardless of the weather scenario is showing some promising yield expectation for this growing season.

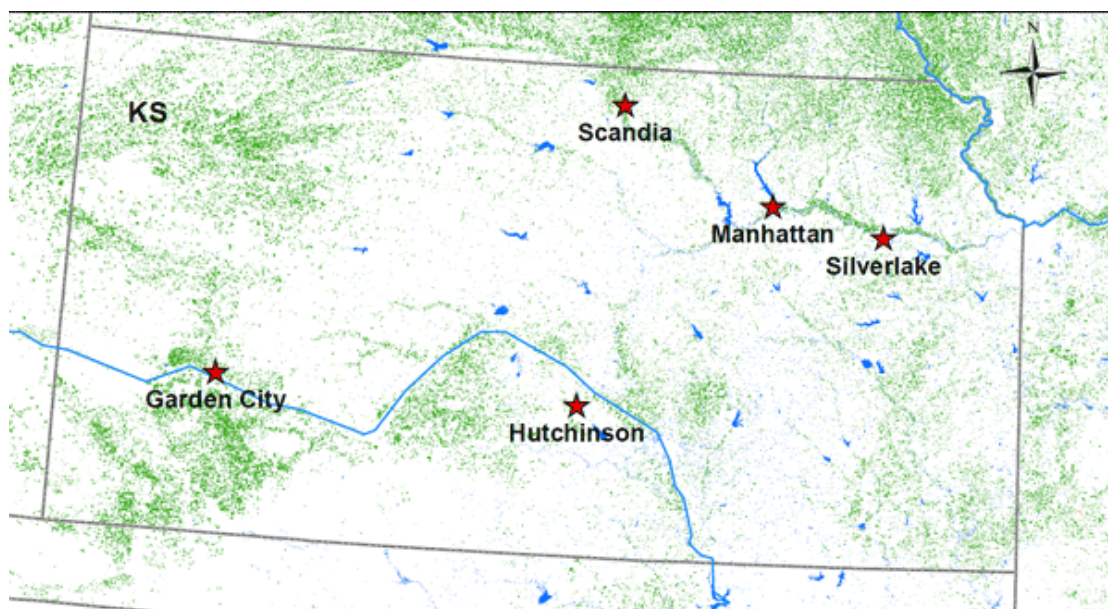


Figure 1. Locations utilized for simulation purposes for Kansas.

Table 1. 2014 In-season Yield Potential Forecasts for Kansas.

Location	Water regime	Soil type	Plant density (ac ⁻¹)	Relative maturity (days)	2014 planting date [†]	Long-term average Yp (bu/ac) [‡]	2014 forecasted Yp (bu/ac) [‡] 25%* Median 75%**		
KANSAS									
Manhattan	Dryland	Silty clay loam	22k	107	April 27	138	170	159	146
Scandia	Irrigated	Silt loam	30k	107	May 4	187	226	208	194
	Dryland		24k			151	193	178	166
Silverlake	Irrigated	Silt loam	30k	107	April 22	172	225	205	191
Hutchinson	Dryland	Sandy loam	20k	115	April 24	123	167	147	134
Garden City	Irrigated	Silt loam	26k	107	May 4	176	201	186	172

[†] Date at which 50% of final corn area was planted. [‡] Average (25+ years) simulated yield potential (Yp) based on dominant soil series, historical (last 10 yrs.) average planting date, plant density and relative maturity of most widespread hybrid at each location. Soil water balance was initialized around crop harvest in the previous year, assuming 50% available soil water. ^{*} Yield forecast based on 2014 planting date. ^{**} 75% probability of obtaining a yield equal to or higher than the value shown based on long-term weather data to finish the season. ^{***} 75% probability of obtaining a yield equal to or higher than the value shown based on long-term weather data to finish the season.

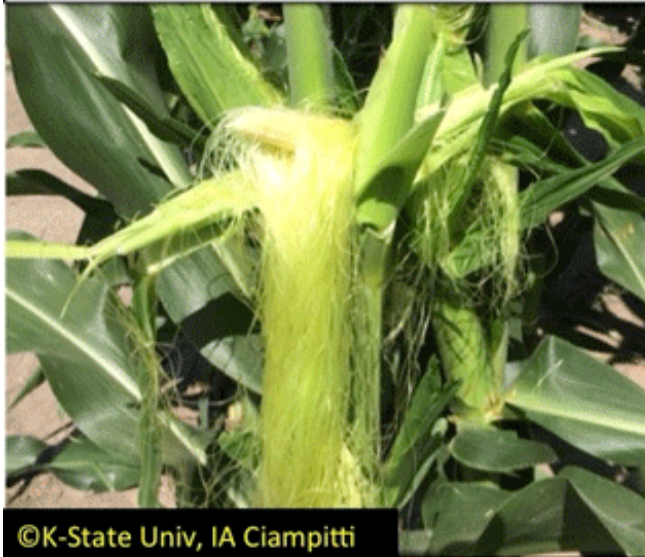
Attainable yield and yield-limiting factors

The final attainable yield will be ultimately defined by the growing conditions from silking until harvesting. Thus, the forecasted yield potential can differ from the final attainable yield if the following “yield-limiting factors” occur in the coming weeks:

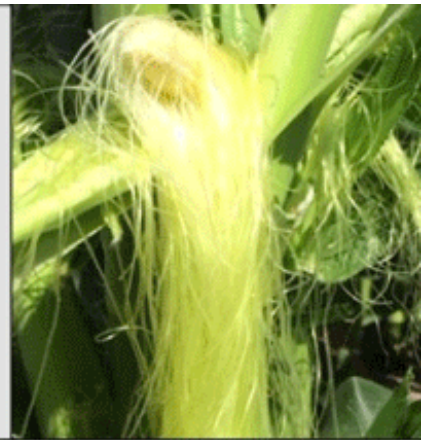
- **Abiotic stress** (e.g., heat and drought conditions): Stress during pollination can increase asynchrony between pollen shed and silk extrusion; increasing the probability of poor fertilization and a reduction in final kernel number. A visible symptom for the lack of effective pollination is when silks are green and keep elongating (“long silks issue”). This occurs when silks have not encountered pollen and ovules are not fertilized, resulting in a lack of kernel formation (Fig. 2).

CORN – LONG SILKS

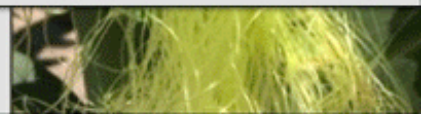
(floral asynchrony)



©K-State Univ, IA Ciampitti



Silks attached to the ear indicates that kernels will not develop (not fertilized).



LONG SILKS ISSUE = silks elongate approx. 1 inch/day until pollen is encountered and the ovule is fertilized. Long silks indicate that pollen was not intercepted – kernels unfertilized

Figure 2. Lack of effective ovule fertilization in corn due to combined heat + drought stresses at pollination. Photos by Ignacio Ciampitti, K-State Research and Extension.

Post-silking kernel abortion can be related to insufficient water supply and heat conditions. Corn is actually more affected at this stage of development by a lack of variation between day and night temperatures than high heat alone. Also, corn has a high demand for water during pollination and grain-filling processes. An example of kernel abortion occurring at different stages in corn can be seen in Figure 3.

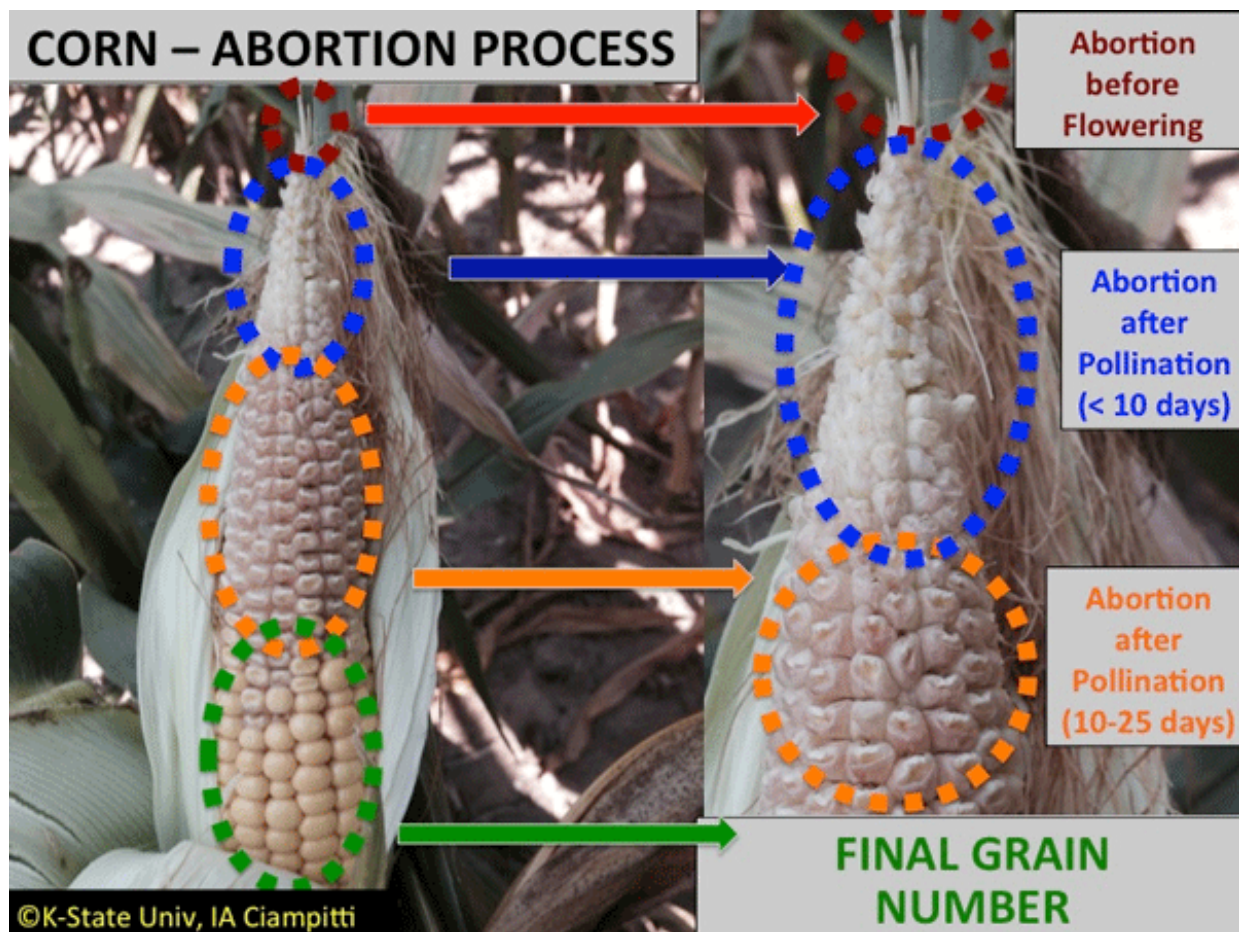


Figure 3. Kernel abortion process in corn affected by combined heat + drought stresses, before and after pollination. Photos by Ignacio Ciampitti, K-State Research and Extension.

- **Biotic stresses** (e.g., insect and diseases): Insect damage and foliar diseases can severely impact attainable yield. In Saline Co., the presence of stinkbugs early during the ear elongation process affected the final number of kernels due to a restriction in cob growth and elongation on the side that those insects were feeding from. The consequence of this infestation was fewer number of kernels in banana-shaped and exposed ears (the ear is outgrowing the husk). In addition, the ears affected by this insect damage are more susceptible to weather and pests in general (Fig. 4).

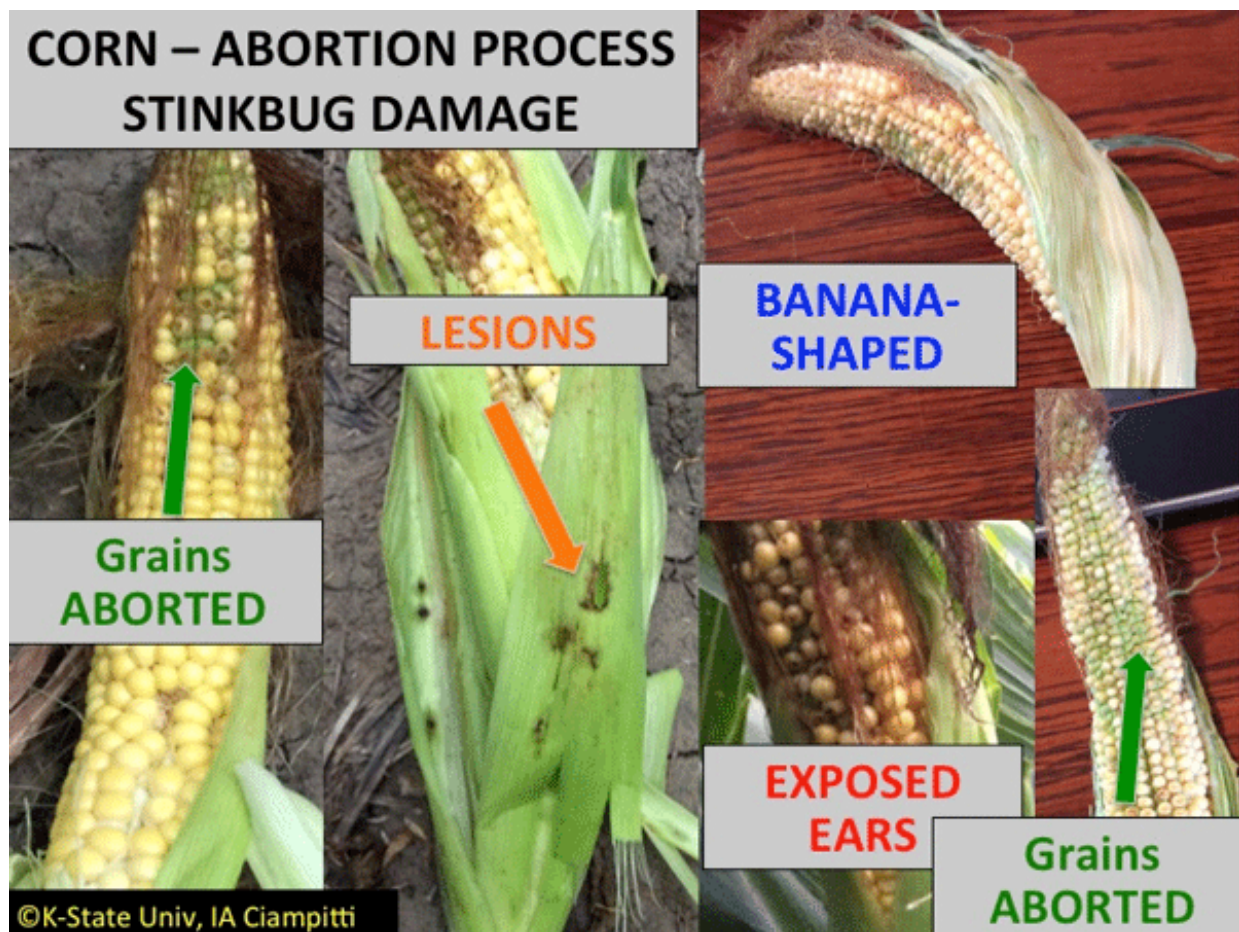


Figure 4. Kernel abortion process in corn affected by insect damage early during ear development. Photos by Garrett Kennedy, Pioneer Hi-Bred International.

Conclusions

For Kansas, yield forecasts from 5 locations indicate above-average yield potential for well-managed dryland and irrigated corn. Yield forecasts can go down (represented by the 75% scenario in Table 1) if stress conditions are evident during the coming weeks until maturity. However, if adequate rainfall and moderate temperatures resume through the end of July and early to mid-August, we the forecasted yield can go up (represented by the 25% scenario in Table 1).

Related to the growth stages, past experience shows that when corn is in the reproductive stages, biotic or abiotic stress conditions (e.g. high temperature, drought, pests, hailstorm, etc.) can exert high impact on yields due to the effect on final kernel number and kernel weight -- reducing the final number of grains and/or shortening the dry matter accumulation period. Thus, there is still a portion of the yield that remains to be determined in the coming weeks in many fields. Information from

research experiments showed that short periods of drought stress (4-7 days) during early reproductive stages could reduce yields close to 50%. Later in the reproductive stage, stress has less impact on yields.

The most important task from this point to the end of the season is to scout the fields for the presence of biotic and abiotic stress conditions for deciding, and determine what steps can be taken to protect the potential yield expected for this corn season.

You can find the full paper related to forecasted yields in 25 locations around the Corn Belt (prepared by UNL faculty), at:

http://cropwatch.unl.edu/archive/-/asset_publisher/VHeSpfv0Agju/content/2014-forecasted-corn-yields-based-on-hybrid-maize-model-simulations-as-of-july-20th

Ignacio Ciampitti, Cropping Systems and Crop Production Specialist
ciampitti@ksu.edu