Issue 881

K-STATE Research and Extension

Extension Agronomy

eUpdate

11/11/2021

These e-Updates are a regular weekly item from K-State Extension Agronomy and Kathy Gehl, Agronomy eUpdate 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 Kathy Gehl, 785-532-3354 kgehl@ksu.edu, or Dalas Peterson, Extension Agronomy State Leader and Weed Management Specialist 785-532-0405 dpeterso@ksu.edu.

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1. Plan now for weed management in 2022

Harvest is always a great time to start planning weed management strategies for the next spring because you can note weed escapes from the combine. Things to take note of include what weed species are present, where weed escapes are present, and any changes in the size or location of weed escapes. Some of your observations might be the result of soil or environmental conditions, while others might suggest problems with herbicide selection or application equipment. However, some of these escapes might indicate the presence of herbicide-resistant weeds in your field – especially if you have used the same herbicide program for a number of years. All of these factors can be addressed for the next growing season – and now is a good time to get started!

Helpful tips when dealing with herbicide shortages

Acting now to address needs for next spring is especially important this fall, due to the anticipated shortages of key herbicides. We have been discussing this topic since the spring and anticipate issues lingering as far as 2023. For example, prices for some glyphosate products are currently as much as 2.5 times higher than last fall. Herbicide concerns are also compounded by shortages of other inputs. Here are some things to consider as you make plans for 2022.

- **Take delivery of herbicides as soon as practical**. However, be sure you have adequate storage to maintain the quality of the products. One consideration that could simplify storage concerns would be to opt for dry formulations rather that liquids when possible.

- **Use the available products in ways to maximize efficacy**. This includes generally maintenance of pumps, hoses, etc. This also includes making sure nozzles are right for the job and are functioning properly. It is also a good idea to reconsider application parameters like spray volume and driving speed. Greater spray volumes generally increase the effectiveness of post-emergence products, especially contact herbicides like glufosinate (Liberty, others). Slower driving speed can also increase herbicide deposition on target weeds, increasing the effectiveness of your applications.

- **Re-evaluate residual herbicides**. Residual herbicides are the foundation for excellent weed control; but this year, you may want to consider updating your pre-emerge program to make sure you have multiple, effective herbicides that will provide extended weed control. Adding layered or over-lapping residuals to your post-emerge program to reduce the need for additional passes will also be more important this year.

- **Pay attention to agronomics**. Good crop production practices that result in a healthy, competitive crop can go a long way toward managing weeds. Consider how you can optimize crop rotations, planting patterns, and other agronomic practices to promote weed suppression.

- **Consider cover crops**. Cover crops aren't for everyone, but this might be a year when added weed suppression could be a factor in favor of planting cover crops. I don't want to minimize the concern of termination, which is often accomplished with glyphosate. Winter cereals generally provide the best weed suppression, and they can be terminated with Group 1

herbicides like clethodim (Select, others) or quizalofop (Assure II, others). In addition, some farmers may want to consider 'planting green', so they can use the same application for cover crop termination and applying residual herbicides.

- **Be flexible**. Know what you will do if your preferred product is not available. Is there an alternative with the same or similar active ingredient? What other active ingredients are effective on your key weed species? When looking for alternatives, don't forget premixes that contain glyphosate and glufosinate. The *Chemical Weed Control Guide* (https://bookstore.ksre.ksu.edu/pubs/SRP1162.pdf) can be a valuable reference to identify alternative products.

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The use of trade names is for clarity to readers and does not imply endorsement of a particular product, nor does exclusion imply non-approval. Always consult the herbicide label for the most current use requirements.

2. Nutrient availability in poultry manure

Poultry litter can provide a significant and important supply of nutrients for crop production in areas of Kansas where a supply of litter is available. Although Kansas is not a major producer of poultry, there is an abundant supply of litter from the nearby states of Arkansas, Missouri, and Oklahoma, which rank among the largest producers of poultry in the U.S. The acreage available to receive poultry litter has been declining in Arkansas, Missouri, and Oklahoma in recent years because of environmental concerns and nutrient management regulations, thus the availability of litter to areas such as southeast Kansas has been on the rise.

Figure 1. Poultry litter. Photo by Dan Donnert, K-State Research and Extension.

Poultry litter should serve as an excellent complement to commercial nitrogen (N) fertilizers. Phosphorus content in poultry litter is usually high, and applications rates should be based on P levels to avoid potential surface water contamination.

Moisture content and nutrient concentration in poultry litter can be highly variable and depends mainly upon production conditions, storage, and handling methods. Therefore, laboratory analysis is the best way to determine the level of N and P in the material to be applied. Average values for the different types of poultry manure collected over a period of time are shown in Table 1. Actual laboratory analysis of 213 poultry manure samples from southeast Kansas are shown in Figure 1. There is a large range in nutrient values, likely due to the source of the litter. However, a good sample average to expect would be a 56-53-46.

Table 1. Types and nutrient content of poultry litter

Litter Source	Typical moisture content	Typical nutrient content (lbs/ton)		
		N	P_2O_5	K_2O
Layer	High	35	40	20
Pullet	Low	40	45	40
Breeder	High	40	60	40
Turkey	Low	60	60	55
Broiler	Low	60	60	55

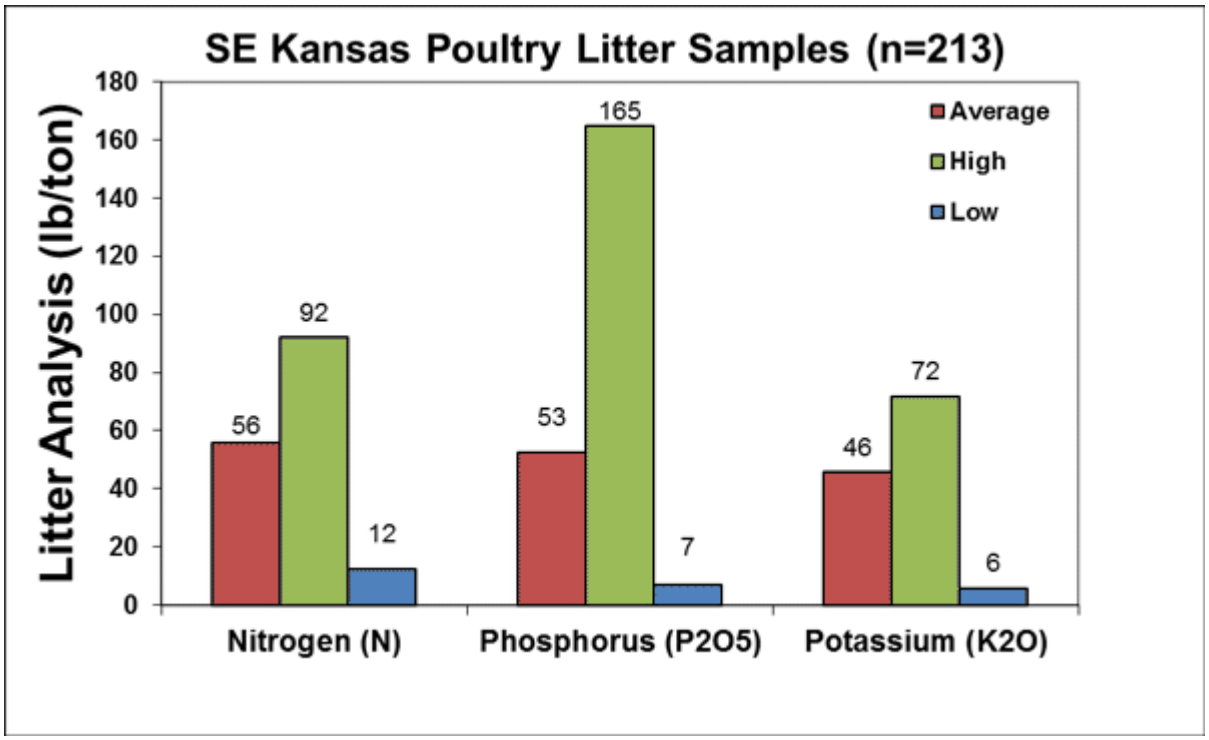

Figure 1. Results of analysis of 213 samples of poultry manure from southeast Kansas. Sources: K-State Research and Extension.

For maximum efficiency of manure use, it is essential to know the nutrient content of the manure. A laboratory analysis should be done on the poultry litter before applying it to land. A laboratory analyses provides information regarding nutrient levels, as well as the chemical forms of these nutrients. This information is necessary for an adequate estimation of nutrient availability and application rates.

For more information, see K State Extension publication MF-2562, "Estimating Manure Nutrient Availability," at: http://www.ksre.ksu.edu/bookstore/pubs/MF2562.pdf

Nitrogen availability

What is the crop availability of N shortly following poultry litter application?

In the case of N, it is important to consider that this nutrient is primarily in the organic form in poultry litter (up to 75-80% organic N). Organic N needs to mineralize before becoming available to crops. A fraction of this organic N may become part of the soil organic matter pool and unavailable to crops in the short term.

Field and laboratory studies suggest the fraction of total nitrogen that becomes plant available the first year of application is approximately 45-55%, which includes both the inorganic N in the manure and a percentage of the organic N. This value varies depending upon components in the litter, and the method of handling and application. For example, poultry litter that contains a large fraction of bedding material will tend to have lower N availability the year of application. Reduction in N availability may also occur when litter is aged, and has undergone some level of composting. Nitrogen lost from the volatile ammonium fraction at the time of application on the soil surface can also reduce plant available N. Ammonium volatilization is typically higher during windy and warm days. Incorporation of litter immediately after application will reduce volatilization and potential nutrient loss by water runoff in case of a rainfall event, in addition to reducing the odor of the litter.

If the manure is applied to pastures, the percentage of N utilized by the forage the first year will depend on whether the pasture consists of cool-season or warm-season grasses. For cool-season grasses, such as fescue pasture, N utilization will likely be less than 50% the first year. Most of the growth in cool-season pasture occurs early in the year. The microbial community will not mineralize as much N early in the spring as they will later in the summer. Fall applications may result in better N utilization for fescue than winter or spring applications. For warm-season grasses, such as bermudagrass pasture, nitrogen utilization from manure will likely be close to 50%. In both cases, producers should base application rates on the P and K needs of the grass, and supplement additional N fertilizer to meet the N needs of the grass.

Phosphorus and potassium availability

When manure is applied to the soil, what percentage of the phosphorus and potassium is available to the crop during the first year?

A large fraction of the P in manure is considered to be plant available immediately after application. The fraction that is not plant available shortly after application will become available over time.

Estimated values of P availability are from 50 to 100%. This range accounts for variation in sampling and analysis, and for P requirements with different soil test levels. Use the lower end of the range of P availability values (50%) for soils testing “Very Low” and “Low” (below 20 ppm). In these situations, large yield loss could occur if insufficient P is applied and soil P buildup is desirable.

On the other hand, use 100% availability when manure is applied to maintain soil test P in the “Optimum” soil test category, and when the probability of a yield response is small.

Several studies have shown that manure P is a valuable resource, comparable to inorganic fertilizer P for crop production. These two P sources are similarly effective when the manure P concentration is known and the manure is applied properly. Nevertheless, excessive application of manure P (e.g.,

applying manure at rates sufficient to meet the crop's N needs) often results in excessive soil P buildup, resulting in higher risk of surface water contamination.

This problem of excessive P buildup in the long-term can be minimized by:

- Applying manure to meet the P needs of the crop and using inorganic sources of fertilizer to complement nitrogen needs,
- Constantly monitoring soil test P levels, and
- Using the P-index to assess potential impact of P buildup on water quality.

Producers should think in terms of actual P application rates and not just tons per acre of manure being applied. Uniform application of manure at precise rates can also be difficult. Careful calibration of manure applicators is needed. If these aspects are not considered, the efficiency of manure P compared with inorganic fertilizer P may be reduced. Careful management pays off.

Availability of potassium (K) is usually near 100% with proper application. Poultry litter can also provide significant amounts of secondary and micronutrients.

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3. Some areas in Kansas are still waiting for the first freeze

An eUpdate article published in mid-October discussed the average freeze dates for Kansas. Since then, those in western Kansas have observed substantial time at or below 32°F. While some areas in the central/east have observed a freeze, they haven't spent much time below the threshold and it is mostly in localized areas. Areas of Kansas that haven't had a freeze yet this fall have had a growing season around 200 days (Figure 1). These locations sit on higher terrain, while the lower valleys around them have a colder microclimate (for example, Jewell in north central compared to Scandia and Belleville).

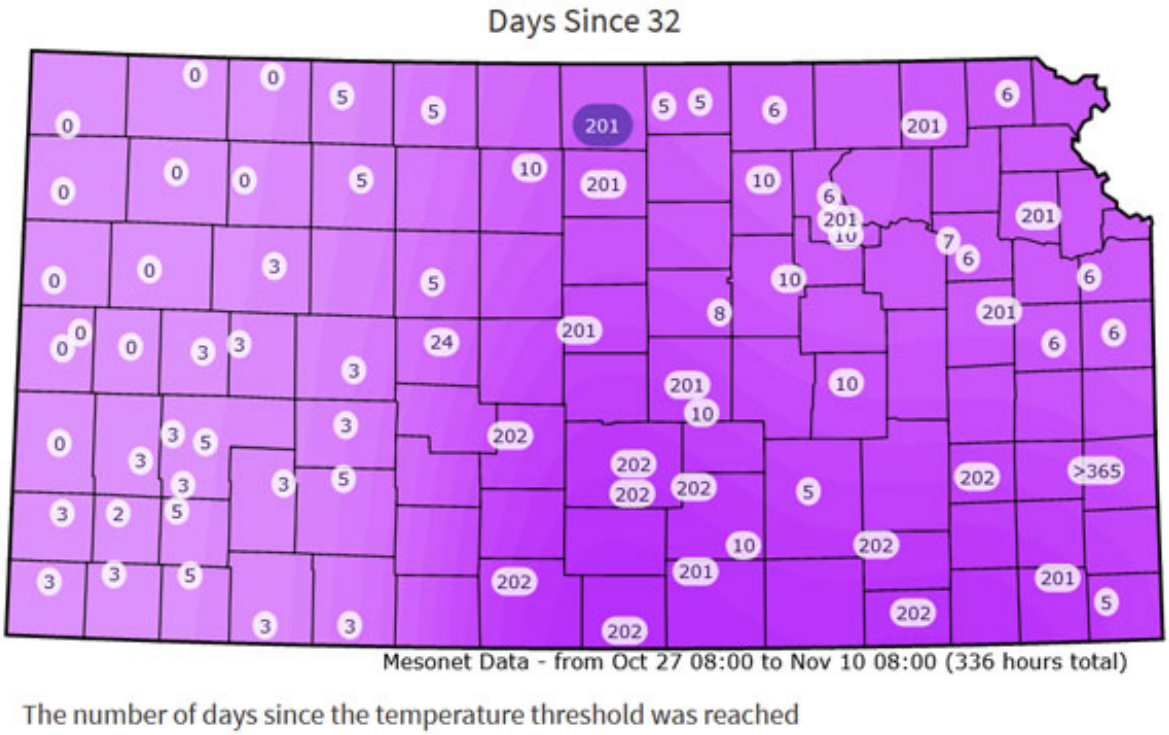

Figure 1. Days since last freeze as tracked by Kansas Mesonet as of November 10, 2021 (http://mesonet.k-state.edu/airtemp/min/hoursbelow/#mtIndex=6&tab=download-tab**).**

As of November 10, 2021, 20 stations on the Mesonet have yet to record a freeze (Table 1). The furthest right column in Table 1 shows the climatological latest freeze on record from the nearest climate station from the National Weather Service Cooperative Observer (NWS COOP) network. These NWS COOP stations must have at least a 30-year record to be considered a climate station. Of note, Lorraine and Jewell are already beyond the latest freeze on record. In addition, Corning 2NW, Lake City, Mount Hope, Hutchinson 10SW, Pretty Prairie, and Manhattan have their latest freeze on record from the 11-15th of November, a time frame rapidly approaching.

Table 1. Freeze climatology from the Kansas Mesonet. Data found by scrolling down to the "table" option on this webpage: http://mesonet.k-

state.edu/airtemp/min/hoursbelow/#mtIndex=6&tab=table-tab.

Station	Days Since 32°F		This Fall	Fall Freeze Climatology		
	Days	Date	First 32°F	Average Date	Record Earliest	Record Latest
Mitchell	199	2021-04-23		10-16	1912-09-22	1900-12-01
Sedan	200	2021-04-22		10-23	1995-09-22	1902-11-26
McPherson 1S	199	2021-04-23		10-21	1995-09-22	1944-11-20
Parsons	199	2021-04-23		10-26	1983-09-23	1944-11-22
Lorraine	199	2021-04-23		10-14	1980-09-23	1947-11-05
Howard 14NW	200	2021-04-22		10-19	1995-09-22	1951-12-04
Jewell	199	2021-04-23		10-14	1995-09-22	1965-11-04
Harper	200	2021-04-22		10-27	1912-09-26	1983-11-21
Corning 2NW	199	2021-04-23		10-13	1995-09-22	1998-11-11
St John 1NW	200	2021-04-22		10-24	1995-09-22	1998-11-20
Viola	199	2021-04-23		10-29	1917-10-08	1998-12-08
Lake City	200	2021-04-22		10-21	1995-09-22	2002-11-15
Oskaloosa 1SE	199	2021-04-23		10-19	1995-09-22	2004-11-24
Uniontown 3NW	>365	M		10-24	1995-09-22	2009-11-25
Woodson	200	2021-04-22		10-24	1995-09-22	2015-11-21
Overbrook	199	2021-04-23		10-24	1983-09-23	2015-11-22
Mount Hope 3NE	200	2021-04-22		10-19	2000-09-26	2016-11-10
Hutchinson 10SW	200	2021-04-22		10-20	1995-09-22	2016-11-12
Manhattan	199	2021-04-23		10-16	1995-09-22	2016-11-12
Pretty Prairie	200	2021-04-22		10-20	1995-09-22	2016-11-12

Tracking growing season duration

At many locations in Kansas, growing season lengths have been slowly increasing in recent decades. On average, seasons have increased as much as 20-30 days over the last 100 years. Granted, a longer growing season requires an early last spring freeze - so both fringe seasons need to be warmer than normal to extend the growing season. While spring 2021 consisted of an almost exactly average last freeze, the fall has been much warmer. Statewide both September and October averaged 3-4°F warmer. This has resulted in several locations likely to see their latest freeze on record, including Manhattan, and top 5-10 longest growing season on record for other locations. These longer warm seasons result in continued growth, increased moisture demands, and additional pest concerns. One good example is the recent armyworm infestations. The late fall freeze allowed for another entire growth cycle by this nuisance pest that presented issues to yards and crops in the east.

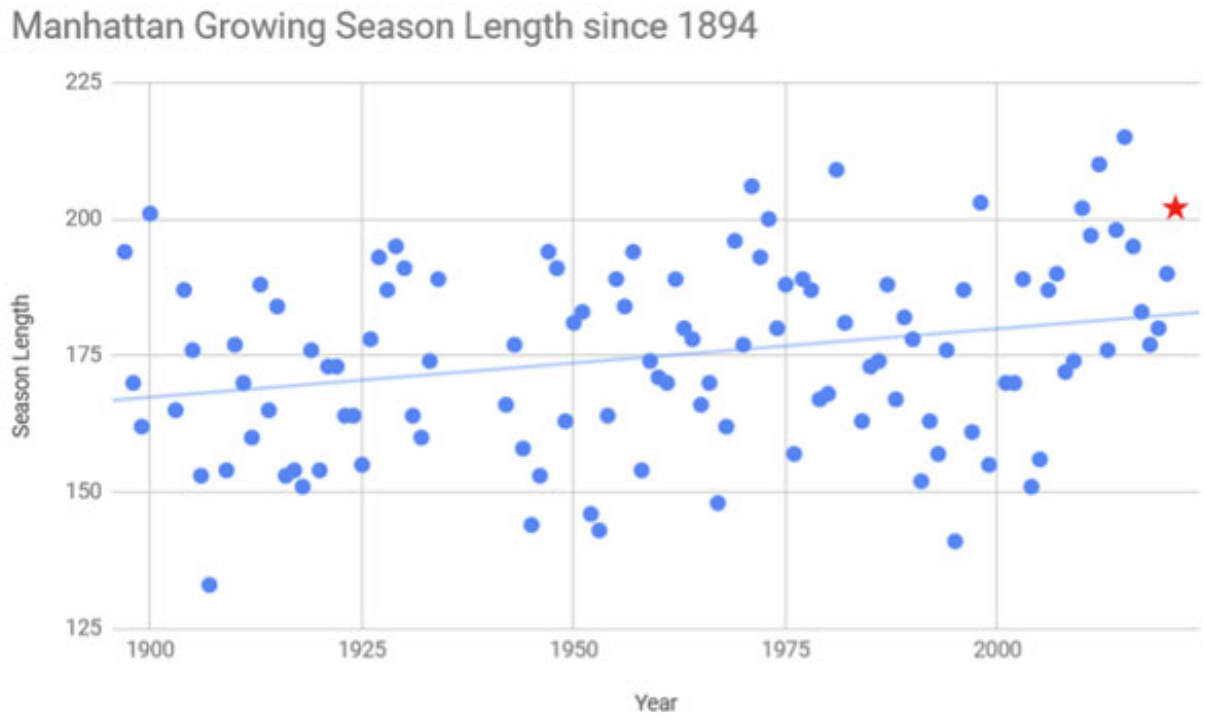

Figure 2. Growing season lengths since 1894 at Manhattan, Kansas. The current year, as of November 10, is highlighted with a red star. 100+ year trend overlaid. Source: ACIS, NWS COOP.

Will a freeze record be broken in your area?

Colder temperatures are on the horizon though! While some areas have been doing everything possible to avoid the freezing mark, the seasonal decrease in temperatures have continued across the state. As a result, it will be easier to reach the freezing mark as we approach mid-November. The forecast (Figure 3) calls for freezing temperatures statewide as early as this coming Saturday morning, November 13. A freeze on this date would close the growing season before it could be the longest for several locations. However, it would be the latest freeze on record for Corning 2NW, Mount Hope, Hutchinson 10SW, Pretty Prairie, and Manhattan. This isn't the first time sub-freezing temperatures have been forecasted this fall. Previous forecasts however, were all influenced by wind and clouds which often keep temperatures warmer. Neither are forecasted for Friday night. Will all the stations observe their first freeze this weekend? Stay tuned to the Mesonet Freeze Monitor (http://mesonet.k-state.edu/airtemp/min/hoursbelow/#mtIndex=6) to find out!

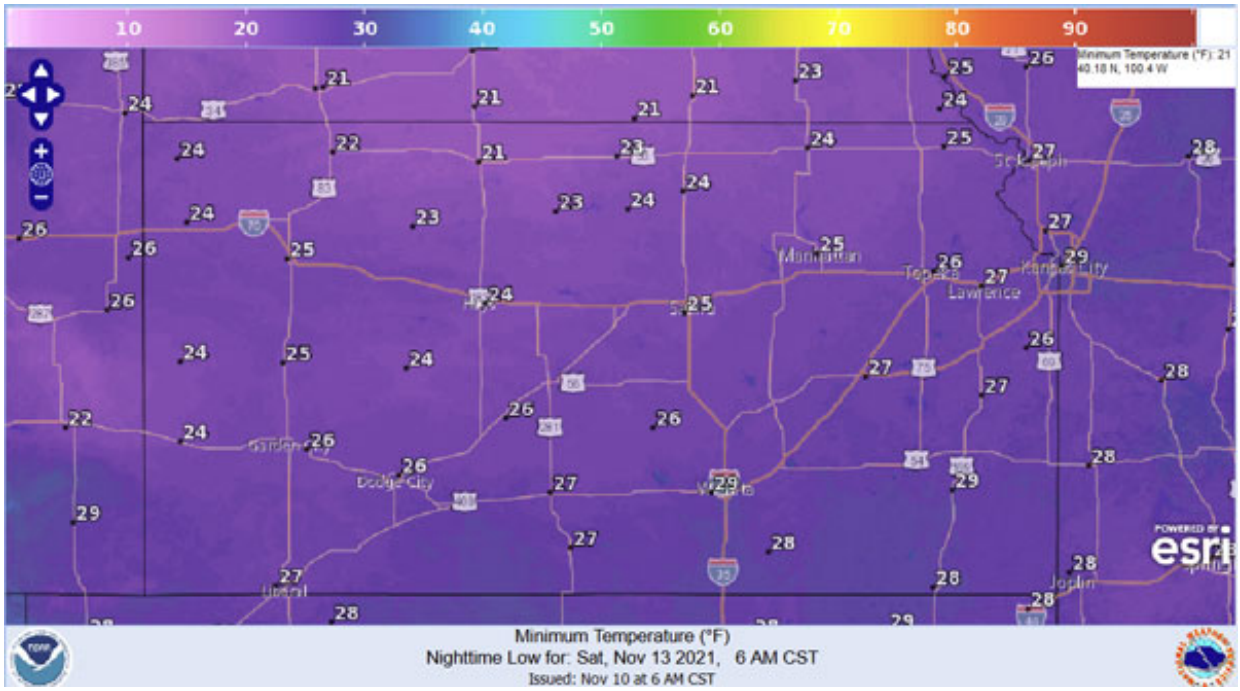

Figure 3. Saturday morning (6am) November 13 forecasted low temperatures from the National Weather Service issued at 6am November 10 (https://digital.weather.gov/).

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4. Kansas Ag-Climate Update for October 2021

The Kansas Ag-Climate Update is a joint effort between our climate and extension specialists. Every month the update includes a brief summary of that month, agronomic impacts, relevant maps and graphs, 1-month temperature and precipitation outlooks, monthly extremes, and notable highlights.

October 2021: A precipitation dipole but warm planting dates for winter wheat

Statewide average temperature for the month was 59 °F, which is 2.8 °F warmer than normal, the 24th warmest October during the past 127 years. This month was the warmest October since 2016, following three consecutive below average Octobers from 2018 to 2020 (Figure 1). A higher temperature departure from normal was observed in eastern Kansas. There were 84 record high daytime temperatures and 9 record high nighttime temperatures observed, mostly in eastern Kansas.

Precipitation amount was slightly wetter on average (27th wettest month in 127 wet rankings), however, there was a dipolar distribution across Kansas. The eastern regions, especially in the southest, were quite wet at +2.6 inches above normal, which contrasts with western Kansas being dry at 0.6 inches below normal. Statewide average precipitation for the month was 3.2 inches, about 1 inch wetter than normal.

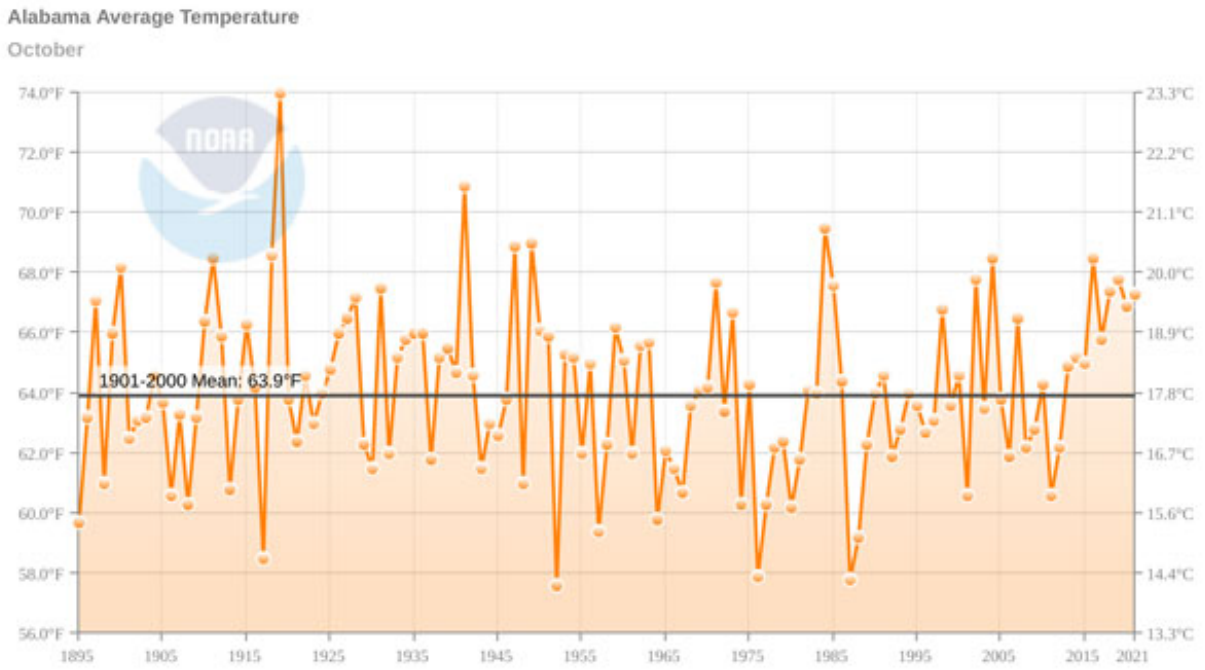

Figure 1. Long-term average temperature during October for Kansas. Source: NOAA

View the entire October Ag-Climate Update, including the accompanying maps and graphics (not shown in this short article), at http://climate.k-state.edu/ag/updates/.

5. 2021 Crop Pest Management Schools - December 8, 9, and 21

Be sure to get registered to attend one of the 2021 Crop Pest Management Schools scheduled in

December. This year, two schools will be offered in the traditional, in-person format.
A third school will be delivered in a virtual format.

Each school will start at 7:50 am with registration and conclude at 5:00 pm. A lunch will be provided to all participants that attend an in-person school. The cost to attend either of the in-person events is $50 if registered by Dec. 1. After Dec. 1, the cost will be $75. The virtual school fee is $75 and you must be registered by Dec. 17.

Each school will feature a variety of topics on weed control, insects, and diseases. Detailed agendas for each school can be viewed at: https://www.sunflower.k-state.edu/agronomy/

The dates and locations of each school are:

December 8 –Colby, KS
City Limits Convention Center
2227 S. Range Ave.

December 9 – Great Bend, KS
Knights of Columbus Hall
723 Main St.

For the in-person schools, please register by December 1 at https://www.sunflower.k-state.edu/agronomy/ . After December 1, you can register at the door.

December 21 – Virtual Program

If you choose to attend virtually, you will need an internet-connected device, such as a laptop, desktop, or tablet at your home and/or at your workplace.

The following is required:

- only one person per computer
- good internet connection
- audio (from the computer speakers, microphone port, or via telephone)
- downloaded application of Zoom on your device (to download, visit https://zoom.us/)

For the virtual school, please register by December 17 at https://www.sunflower.k-state.edu/agronomy/ .

Commercial applicator and Certified Crop Advisor credits have been applied for.

K-State Crop Pest Management Schools

December 8 – Colby
City Limits Convention Center
2227 S Range Ave

December 9 – Great Bend
Knights of Columbus Hall
723 Main Street

December 21 – Virtual

Register at www.sunflower.ksu.edu/agronomy
December 8 and 9 Schools
Cost is $50, if registered by December 1. After Dec 1, cost is $75 and register at the door
December 21 School
Cost is $75

Credits:
1A Commercial Applicators: 7 credits and 1 core hour have been applied for
Certified Crop Advisors: 8 pest management credits have been applied for

Topics and Speakers

Getting the Most from Your Herbicide Application	Dr. Sarah Lancaster
Identifying and Controlling Common Corn Insects	Anthony Zukoff
Combatting Corn Diseases	Dr. Rodrigo Onofre
Weed Research Update	Dr. Vipan Kumar
Common Weeds – Identification and Characteristics	Jeanne Falk Jones
Wheat Diseases And their Prevention/Control	Dr. Kelsey Andersen Onofre
Research Update on Herbicide Applications	Dr. Ajay Sharda
Kansas Regulations	KDA Representative

Schedules for each school:
www.sunflower.ksu.edu/agronomy

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