Issue 877

K-STATE Research and Extension

Extension Agronomy

eUpdate

10/14/2021

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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eUpdate Table of Contents | 10/14/2021 | Issue 877

1. Musk thistle control in the fall

Musk thistle (*Carduus nutans*) is one of 12 noxious weeds in Kansas infesting nearly 500,000 acres. Musk thistle has been reported in nearly every county in Kansas (Figure 1) and is found primarily in pastures, rangeland, hay meadows, alfalfa, fallow, roadsides, and waste areas. Under the new Noxious Weed Law (March 2021), musk thistle is considered a Category C weed. That means that musk thistle is well established within the state and has extensive populations.

Control efforts should be aimed at reducing or eliminating new populations and established stands should be managed with any accepted control method. Accepted control methods include mechanical, chemical, and biological approaches. Mechanical control involves removing the entire plant or just the reproductive parts to prevent the plants from producing flowers/seeds. Mowing, digging, and hoeing are common mechanical methods of controlling musk thistle. A number of herbicides are labeled for use on musk thistle and will be discussed below. Biological control requires a permit and needs to be integrated with other methods. Head and crown weevils are found in the state, but cannot be transported across state lines. A flower fly (*Cheilosia corydon*) is a new candidate species for biological control of musk thistle.

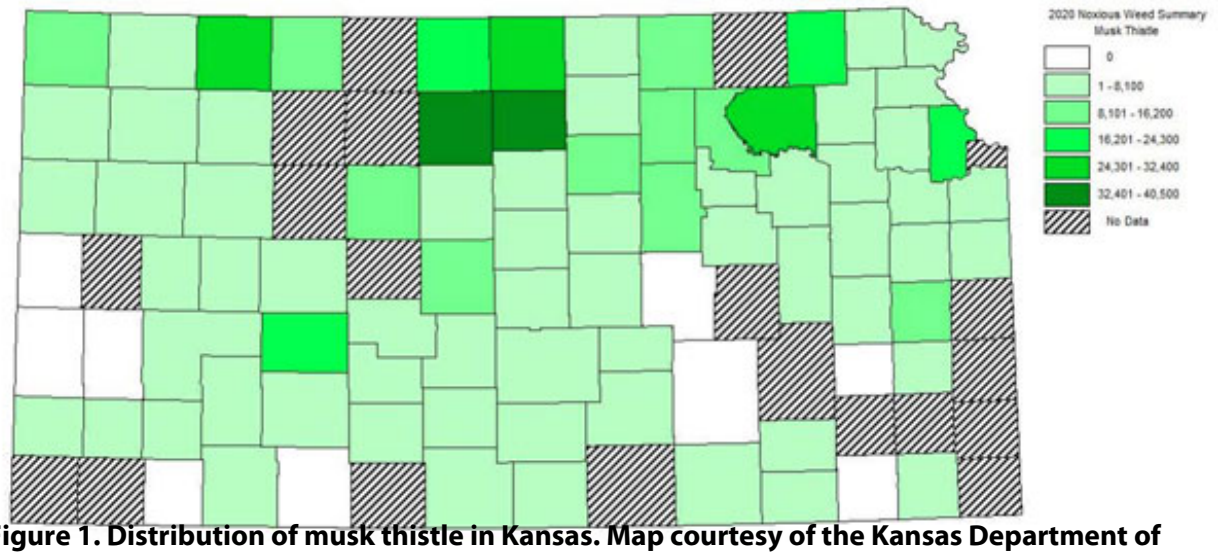

Figure 1. Distribution of musk thistle in Kansas. Map courtesy of the Kansas Department of Agriculture.

Musk thistle is primarily a biennial or winter annual species. Biennials take two growing seasons to complete their life cycle. Thistles that germinate in the spring will spend the entire summer as a rosette, live through the winter, and bolt the next year in May and June. Winter annual plants will germinate with moisture and warm temperatures in the fall, live through the winter, and bolt the following year.

Most people recognize musk thistle during the early summer when the plants are actively blooming (Figure 2, top photo). However, musk thistle control is easiest as a rosette (Figure 2, bottom photo).

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Figure 2. Musk thistle in flowering and rosette stages of growth. Photos courtesy of Walt Fick, K-State Research and Extension.

Fall is an excellent time to spray musk thistle as all are in the rosette stage of growth. Another advantage for treatment in the fall is reduced risk of off-target drift. Waiting until most deciduous trees have lost their leaves and most crops are harvested will greatly reduce the likelihood of damage from herbicide drift. A wider window of opportunity for treating musk thistle also exists in the fall. The spraying window in the fall probably extends until the ground is frozen and the musk thistle plants have shut down activity until warmer temperatures in the spring. Freezing temperatures will start to damage musk thistle plants, with some yellowing and curling of leaves. However, the plants are susceptible to herbicides as long as green tissue exists.

Dry conditions in the fall can reduce control of musk thistle with certain herbicides, but studies in Kansas indicated that a fall application of 2,4-D LVE at 2 lbs per acre was more effective (80% control) than a similar rate of 2,4-D amine (49% control). Dicamba + 2,4-D amine at 0.25 + 0.75 lbs per acre and picloram at 0.125 lbs per acre were also effective (>90% control) on musk thistle treated in the fall. Other herbicides that have proven effective include 3-5 fl oz/acre aminopyralid (Milestone) and aminopyralid + metsulfuron (Chaparral at 1.5 oz/acre). Products containing picloram and aminopyralid will not only control rosettes treated in the fall, but will have enough carryover to control emerging seedlings the following spring.

If you need to treat musk thistle this fall, select the proper herbicide for the job. If possible, select a warm, sunny day to spray. Scattered rosettes can be mechanically removed by digging below the crown.

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2. Fall soil testing of hayfields and pastures

Knowing the soil nutrient status is a requirement to establish an adequate soil fertility program for forages. Soil testing can be done in either spring or fall on hayfields and pastures. Given a choice, fall would be the preferred time because it allows more time for any needed lime applications to have an effect before the main growing season begins, and it gives the producer some flexibility for planning nutrient applications.

Figure 1. Fertility management effect in bermudagrass pastures. Photo by Bruno C. Pedreira, K-State Research and Extension.

Soil sampling on a regular basis (every 3 – 4 years) can keep you from applying excessive and unnecessary amounts of fertilizer or manure, and can increase yields by revealing exactly which soil nutrients are too low for optimum productivity. By doing this practice properly, producers can save money and reduce environmental impacts.

Tips for collecting a representative soil sample

To take accurate soil samples, it is best to use a soil probe. You can borrow a probe from many county Extension or NRCS offices. A shovel or spade can be used, but make sure to dig a hole first and then take a nice even slice to the correct depth. A shovel or spade that angles to a point at the bottom can easily result in misleading soil test results because the sample is biased by having more soil from the surface and less from lower depths.

When taking soil samples, it is important to have a representative composite soil sample from the field by combining several soil cores (in a clean container, avoiding contamination) and mixing thoroughly. Ideally, one composite soil sample should represent a uniform and treatable area and should not exceed 40 acres, and for more variable fields, no more than 10 acres. On these areas, take 15 to 20 cores or subsamples to make up your representative composite sample. If the field has areas where different forages or crops have been grown or has different soil types, then soil sampling from these areas should be done separately.

Sampling depth for pastures and hayfields should be 3 to 4 inches for pH evaluation. For phosphorus and potassium, a 6-inch depth is preferred when submitting samples to the K-State Soil Testing Laboratory since that is the depth we have used to calibrate recommendations.

Soil pH is important

One key soil property for forage production, especially with legumes, is soil pH. The optimal pH level is 6 to 7, depending on the forage species. Grasses such as brome or fescue do well at a lower pH. But legumes, especially alfalfa, require a near-neutral pH (~pH 7). If the soil pH is too low or too high, nutrient uptake of macro- and micronutrients can be reduced. Especially important for legumes such as alfalfa and clover is the impact of pH on nodulation and nitrogen fixation. At low soil pH, aluminum toxicity can also be an issue.

When you lime a new pasture, it is important to apply the lime 6 to 12 months before planting legumes. If you want to get a more rapid response from liming, use fine-ground liming materials with a high effective calcium carbonate (ECC). Fields that will be planted to alfalfa next spring should also be evaluated for phosphorus and potassium levels and make corrections before planting.

For more information on soil sampling and submitting samples to the K-State Soil Testing Laboratory, visit their website at http://www.agronomy.k-state.edu/services/soiltesting/. You can also access two previous eUpdate articles discussing fall soil sampling and collecting a representative soil sample in Issue 767, September 27, 2019.

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3. The Mesonet Freeze Monitor is back with new features

The morning of October 14th saw the first fall freeze in the state occurring in northwest Kansas. The Kansas Mesonet's Freeze Monitor (http://mesonet.k-state.edu/airtemp/min/hoursbelow/) is now available for the 2021 fall frost/freeze season. The Freeze Monitor is a handy tool to check conditions in your area. Have freezing conditions been recorded? How does it compare to average? How many hours below freezing was your area?

The average freeze date in northwest Kansas is as early as the last week in September. However, southeast Kansas does not usually see freezing temperatures until the end of October (Figure 1). Average dates for the first occurrence of 24 °F temperatures are even later (Figure 2).

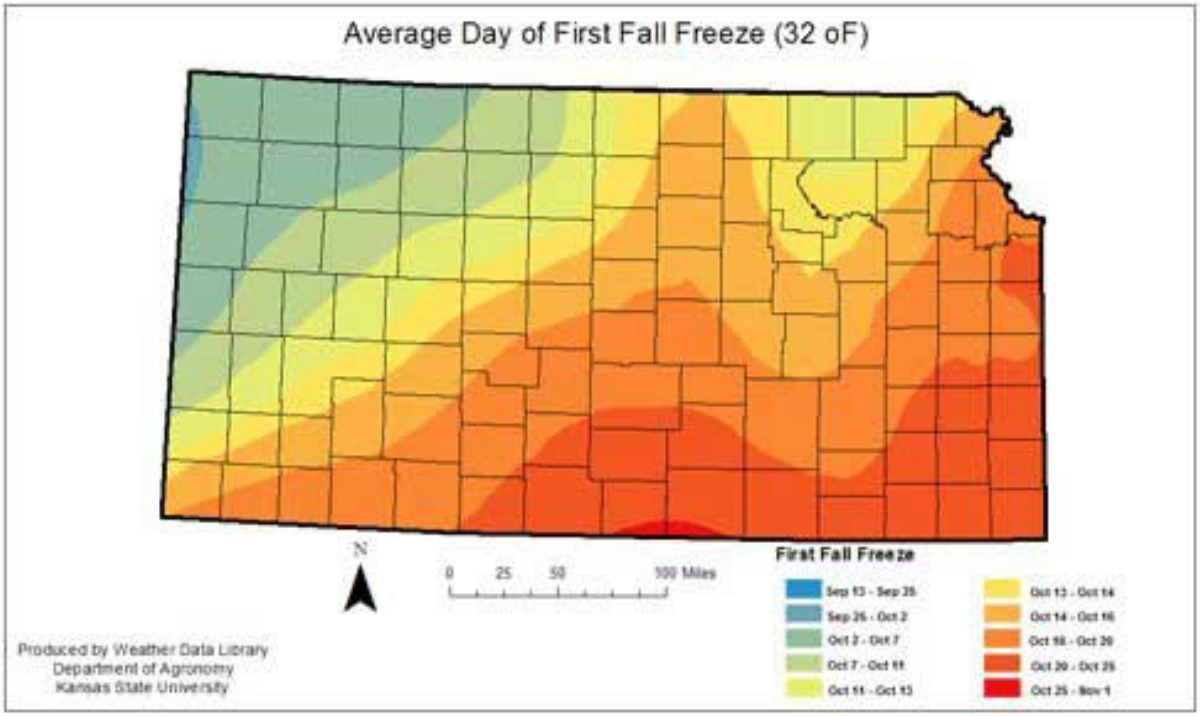

Figure 1. Average fall freeze dates (Weather Data Library).

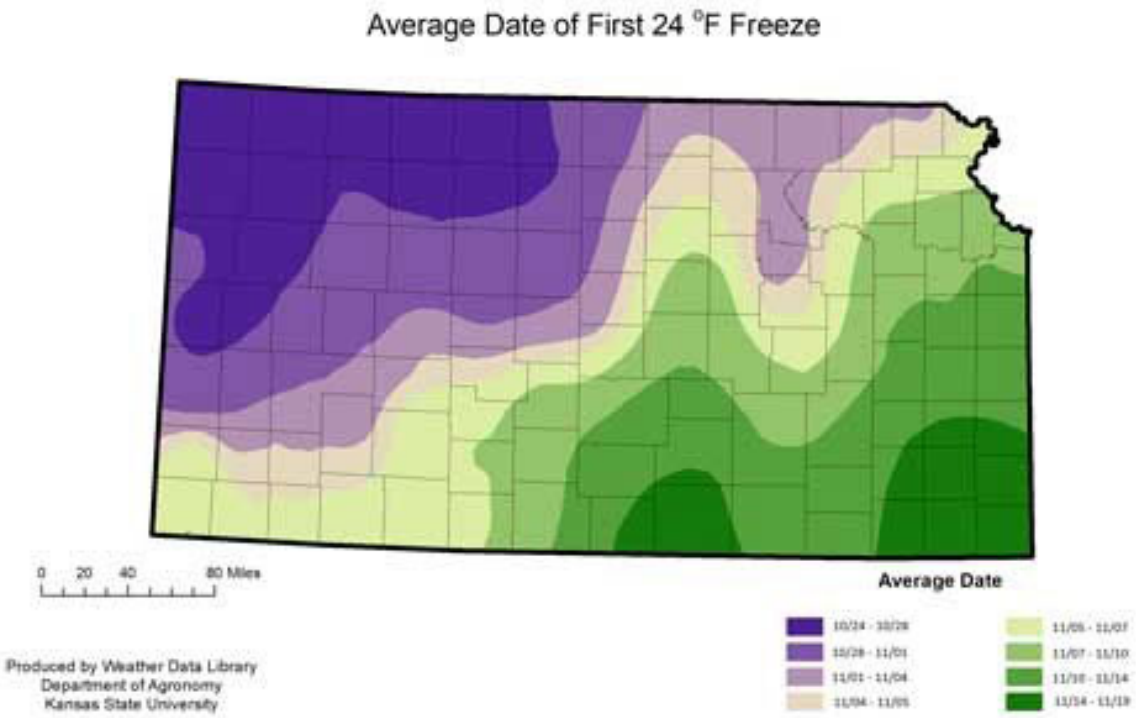

Figure 2. Average 24 °F freeze dates (Weather Data Library).

Historically, almost all parts of the state have recorded freezing temperatures as early as September. Earliest first freeze on record in Kansas is September 3, 1974, when many stations dropped below freezing. This year, the first freeze is actually a running a few weeks to days behind schedule.

The Freeze Monitor tool displays the coldest temperatures observed across Kansas during the previous 24 hours. It answers the frequent question: How cold did it get last night**?** It also tracks the first fall freeze date for each station for comparison to local climatology in a table (http://mesonet.k-state.edu/airtemp/min/hoursbelow/#tab=table-tab&mtIndex=6). Data updates every twenty minutes on both the map and the table (Figure 3).

Another tool important for producers and gardeners is the duration below freezing, as some crops and commodities have lower thresholds for damage. This feature allows users to select options to view maps/data of the "hours below 32°F", "hours below 24°F", and the "hours below 12°F"). While all three are of interest, the lower two thresholds are of great importance to wheat growers later into the fall/winter season.

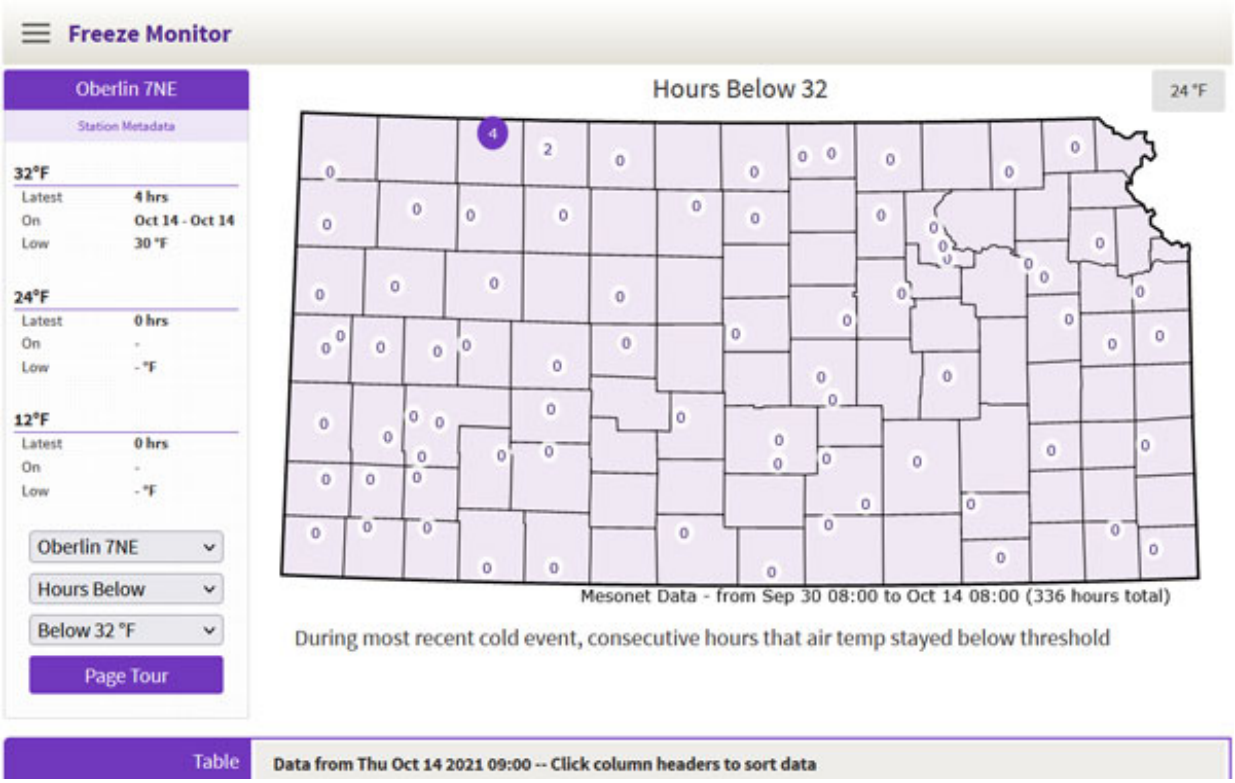

Figure 3. View of the Freeze Monitor webpage for October 14, 2021, with the Oberlin 7NE station selected as an example. Source: http://mesonet.k-state.edu/airtemp/min/hoursbelow/#tab=table-tab&mtIndex=0

New Feature for 2021

A new addition for 2021 is the ability to track the duration of days since the last freeze or respective threshold. This is great for the first freeze and determining the length of the growing season. You can find "days since" using this link: http://mesonet.k-state.edu/airtemp/min/hoursbelow/#tab=table-tab&mtIndex=6. Much of the state hasn't seen a freeze since late April or early May in the state of Kansas – a growing season between 153-175 days for 2021 (Figure 4).

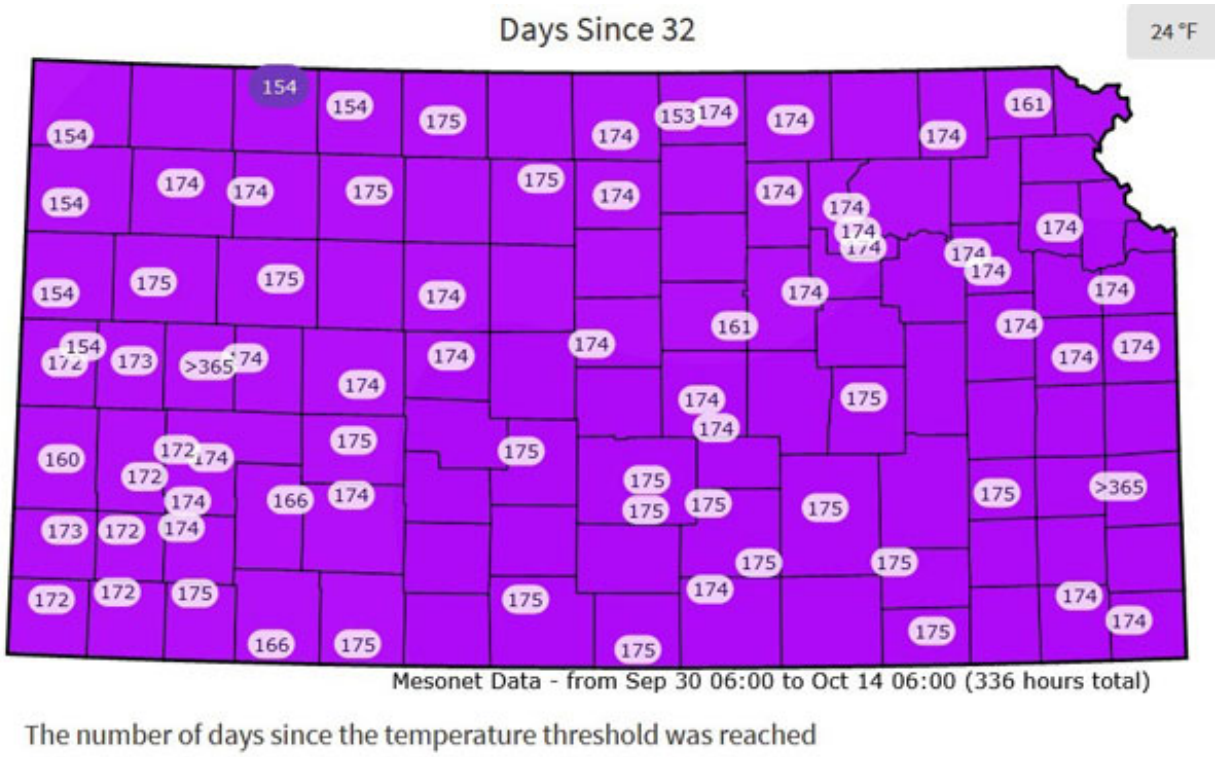

Figure 4: Number of days since last freeze as of October 14, 2021. Find this information here: http://mesonet.k-state.edu/airtemp/min/hoursbelow/#tab=table-tab&mtIndex=6**.**

The data displayed in the tables below the maps can be sorted. Clicking on the header of a particular column will sort the table by that column. This makes it much easier to see what area was the coldest in the state, as well as the earliest freeze and earliest climatological freeze data. There are a number of download options, including table and chart data, and images of the maps (Figure 5).

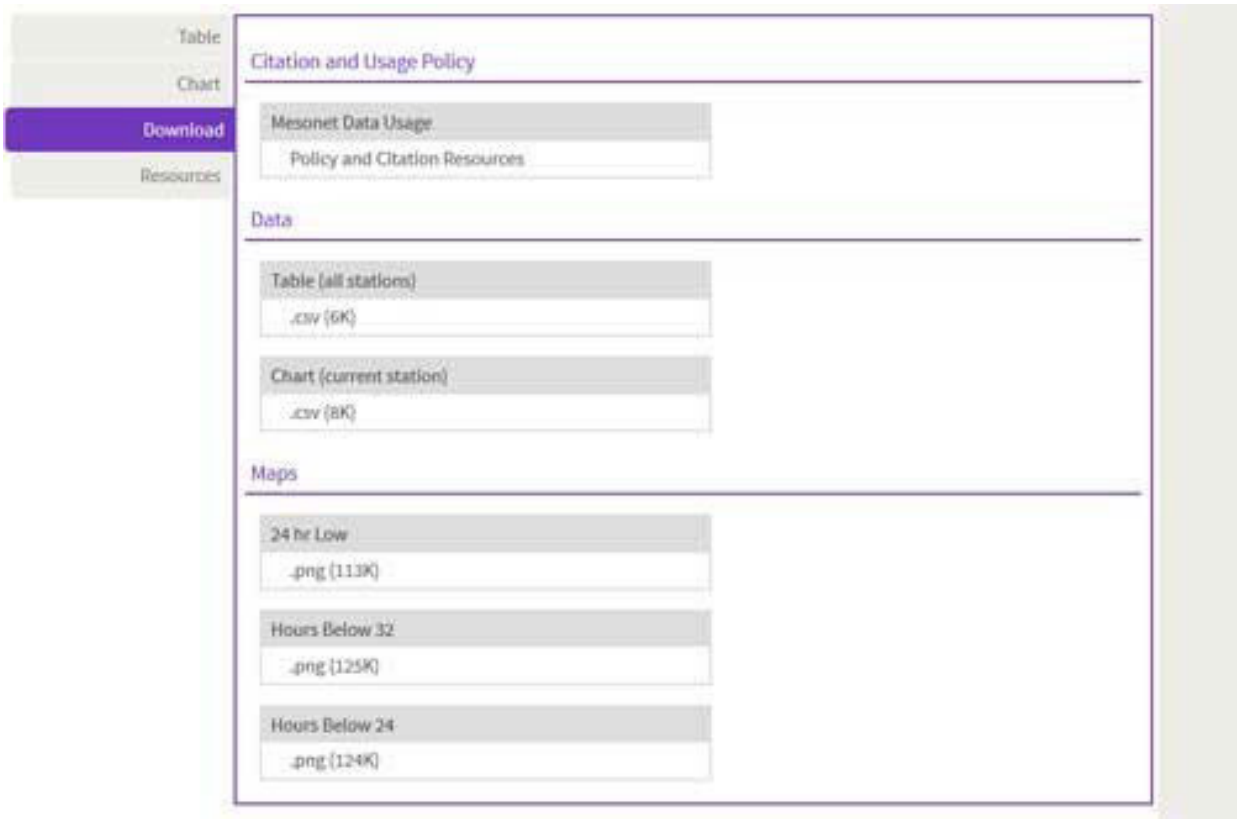

Figure 5. Download options on the Freeze Monitor website.

The Freeze Monitor is updated in the spring, as a new growing season arrives, to show the spring freeze climatology.

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4. Kansas Ag-Climate Update for September 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.

September 2021: Warm September for Corn Harvest

Statewide average temperature for the month was 73 ^{o}F, which is 4.3 ^{o}F warmer than normal. This ranks as the 10th warmest Septemper since 1895. Western Kansas had the warmest departure with an average of 5.0 ^{o}F warmer than normal. Precipitation was nearly normal (59th wettest month in 127 wet rankings). Moisture was distributed within the central portion of Kansas. Statewide average precipitation for the month was 2.85 inches, about 0.3 inches wetter than normal at the state scale.

Global temperature continues to increase even with La Niña events in the equatorial Pacific churning up cooler-than-normal waters. Globally, this was the second warmest September on record (Figure 1). The most probable drought areas in October are three districts in Kansas (northwest, north central, and northeast), which could become worse as the one-month temperature outlook is above normal. However, the precipitation outlook seems to provide precipitation needed to end such light drought signals in northern Kansas.

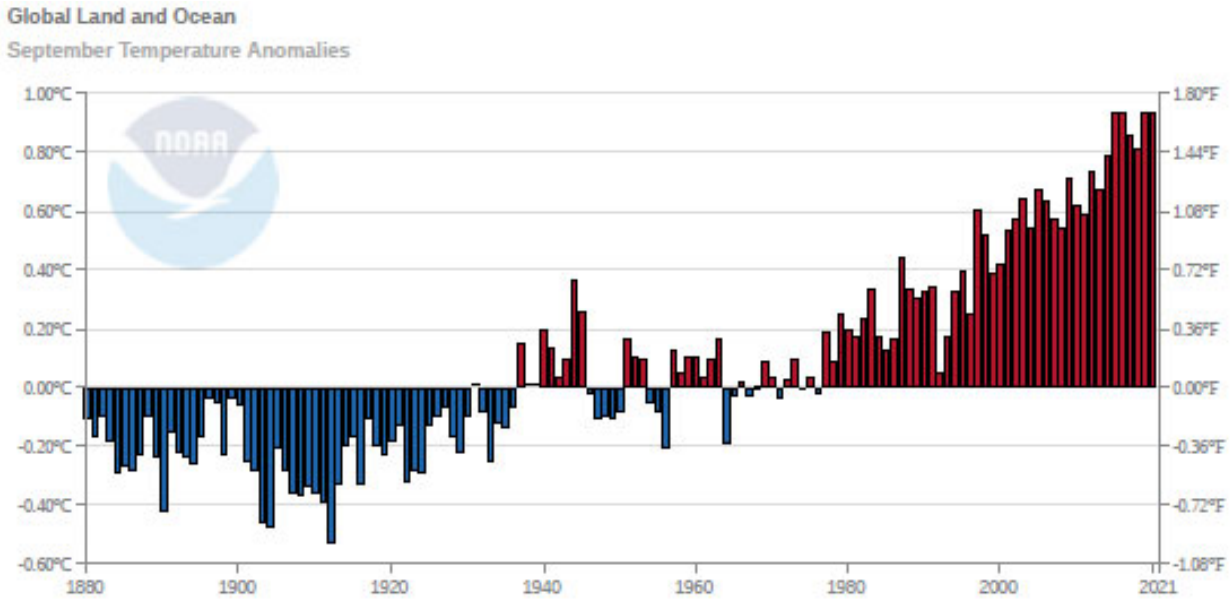

Figure 1. Global temperature anomalies for September. Source: NOAA

View the entire September 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 Kansas Soybean Yield and Value Contests

The Kansas Soybean Association is calling all soybean farmers in Kansas to enter their competitive soybean crop into the Kansas Soybean Yield Contest by December 1.

Aside from recognition for high-yielding soybeans, participants are eligible for monetary awards. The Kansas Soybean Commission sponsors a prize for the top three finishers in each district, as well as an additional $1,000 for the overall dryland and irrigated winners and any entries that top the 114.3 bushel-per-acre record. The prize amounts per district are first place receives $300, second will earn $200, and third will receive $100.

Districts are determined by region, tillage method and irrigation status, with a total of 18 districts in consideration. No-till on the Plains supplies additional awards in the no-till categories. Farmers may enter multiple categories, but only one entry per field.

Eligible fields must consist of at least five contiguous acres as verified by the Farm Service Agency, GPS printout or manual measurement. A non-relative witness, either Kansas State Research and Extension personnel or a specified designee, must be present at harvest and should ensure that the combine grain hopper is empty prior to harvest. Official elevator-scale tickets with moisture percentage and foreign matter included must accompany entries to be considered.

The statewide Kansas Soybean Value Contest that analyzes protein, oil and other soybean qualities is also open for entries. Entrants submit 20-ounce samples, which are evaluated by Ag Processing, Inc. to determine the value. Monetary awards are also given to the three highest-value entries. Farmers may enter both the yield and value contests.

Results of the contests will be shared January 12, 2022, at the Kansas Soybean Expo during the luncheon portion of the event.

A full guide of contest rules and regulations are available at kansassoybeans.org/contests, as well as a newly-available online entry form.

Questions may be directed to the Kansas Soybean office by phone at 877-KS-SOYBEAN (877-577-6923) or to local KSRE offices.

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