Issue 848

K-STATE Research and Extension

Extension Agronomy

eUpdate

04/01/2021

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 | 04/01/2021 | Issue 848

1. Soil temperature and moisture update in Kansas - April 1, 2021

For the week of March 25-March 31, average weekly soil temperatures at 2 inches among crop reporting districts ranged from 43°F to 54°F (Figure 1). Differences can be quite large, based on local soil moisture, residue, and soil types. For instance, the weekly average at Hill City is 50°F, while it is 44°F at the Sheridan mesonet.

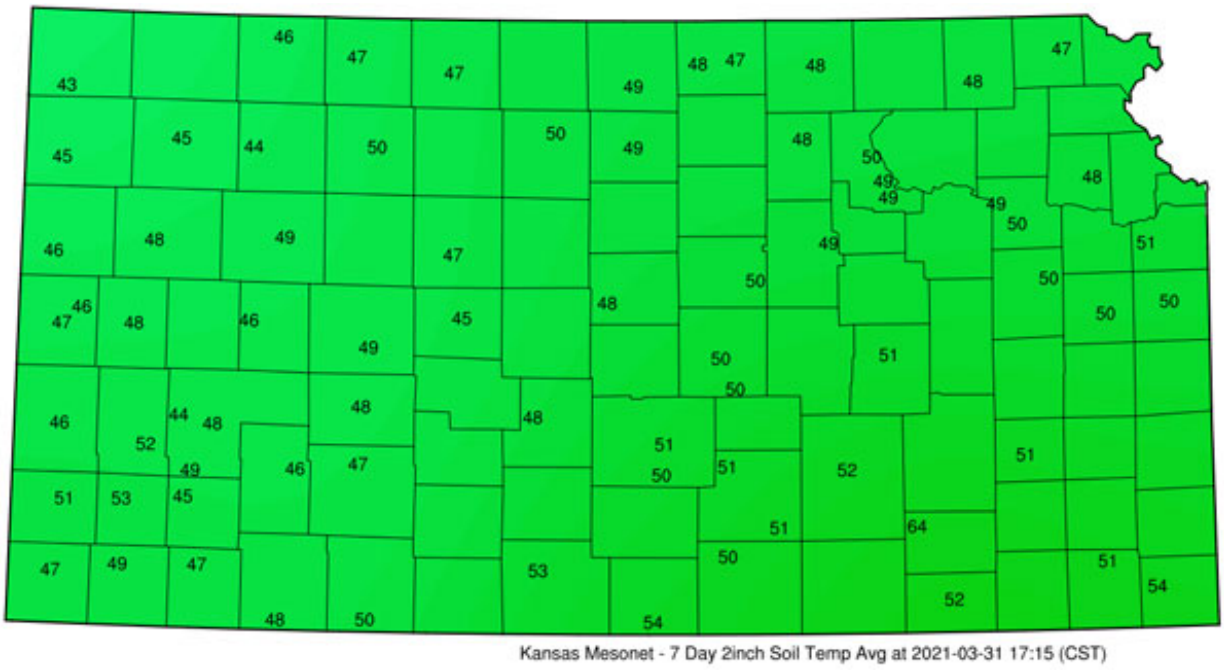

Figure 1. Average soil temperatures at 2-inch soil depth for the week of March 25-March 31, 2021 (http://mesonet.k-state.edu/).

Climatological normal 2-inch soil temperatures typically reach 55°F by April 12 for Parsons, Since the February cold spell, temperatures have been tracking near-to-slightly above normal (Figure 2). The typical 55°F timeframe becomes later with northwest extent across the state. At Colby, temperatures have been below average for the last several weeks with a climatological normal 55°F date of April 20 (Figure 3).

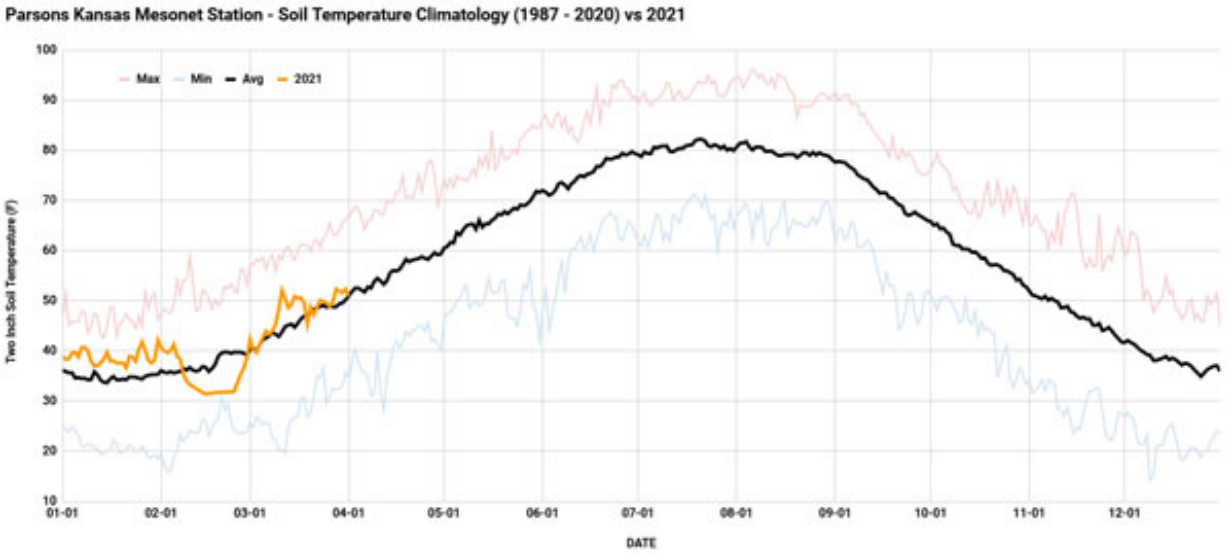

Figure 2. The 2-inch soil temperatures measured at Parsons in 2021 (orange line) compared to the climatological normal for that location (black line represents the average). Source: Kansas Mesonet

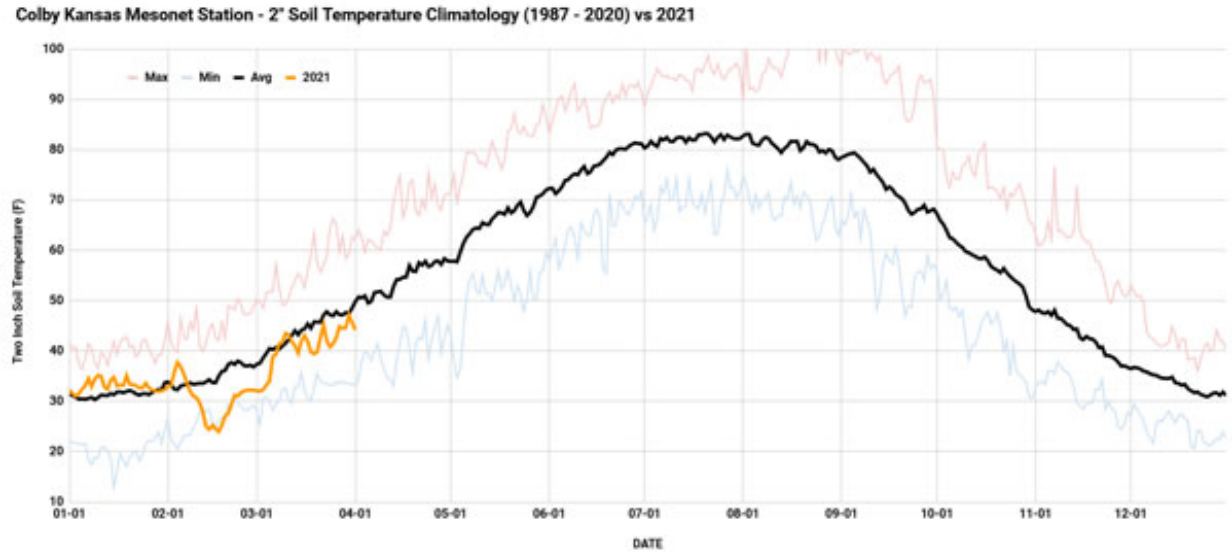

Figure 3. The 2-inch soil temperatures measured at Colby in 2021 (orange line) compared to the climatological normal (black line represents the average) for that location. Source: Kansas Mesonet

Average air temperatures ranged from 44°F to 51°F, with the coolest temperatures in the northwest and the warmest in the southeast (Figure 4).

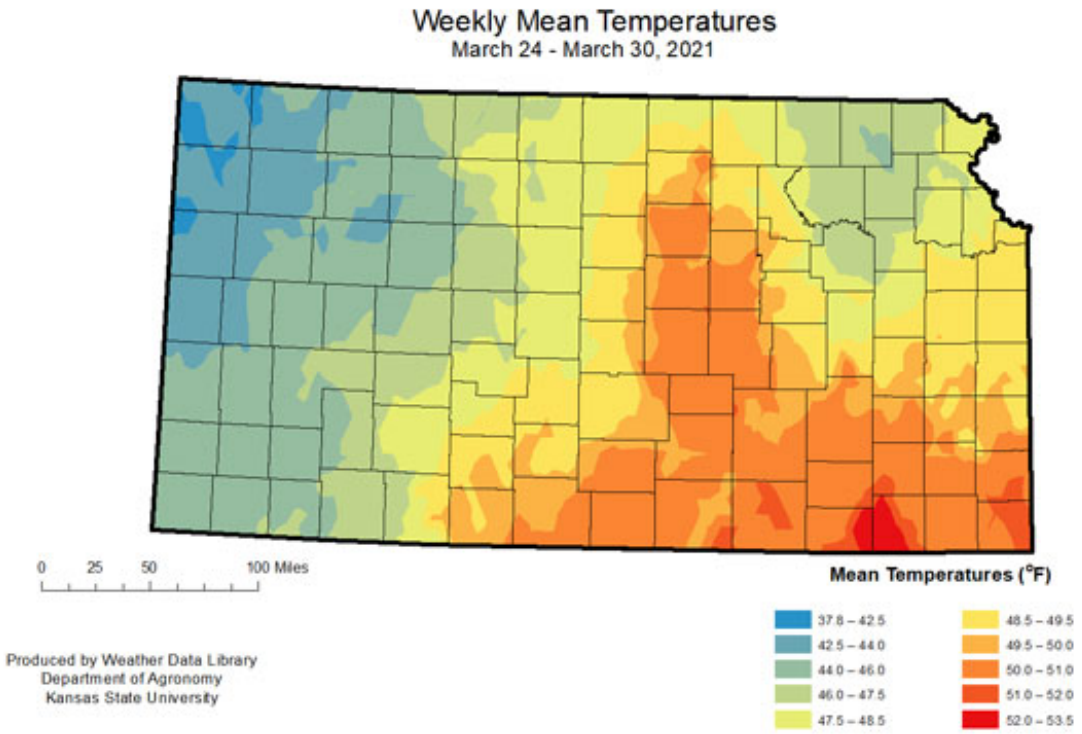

Figure 4. Weekly mean air temperatures for the week of March 24 – March 30, 2021.

Projections for the coming weeks call for warmer-than-normal temperatures statewide (Figure 5). In addition, less moisture than normal is expected, with next week expected to be dry (Figure 6). This will speed the process of warming up the soils (Figure 7).

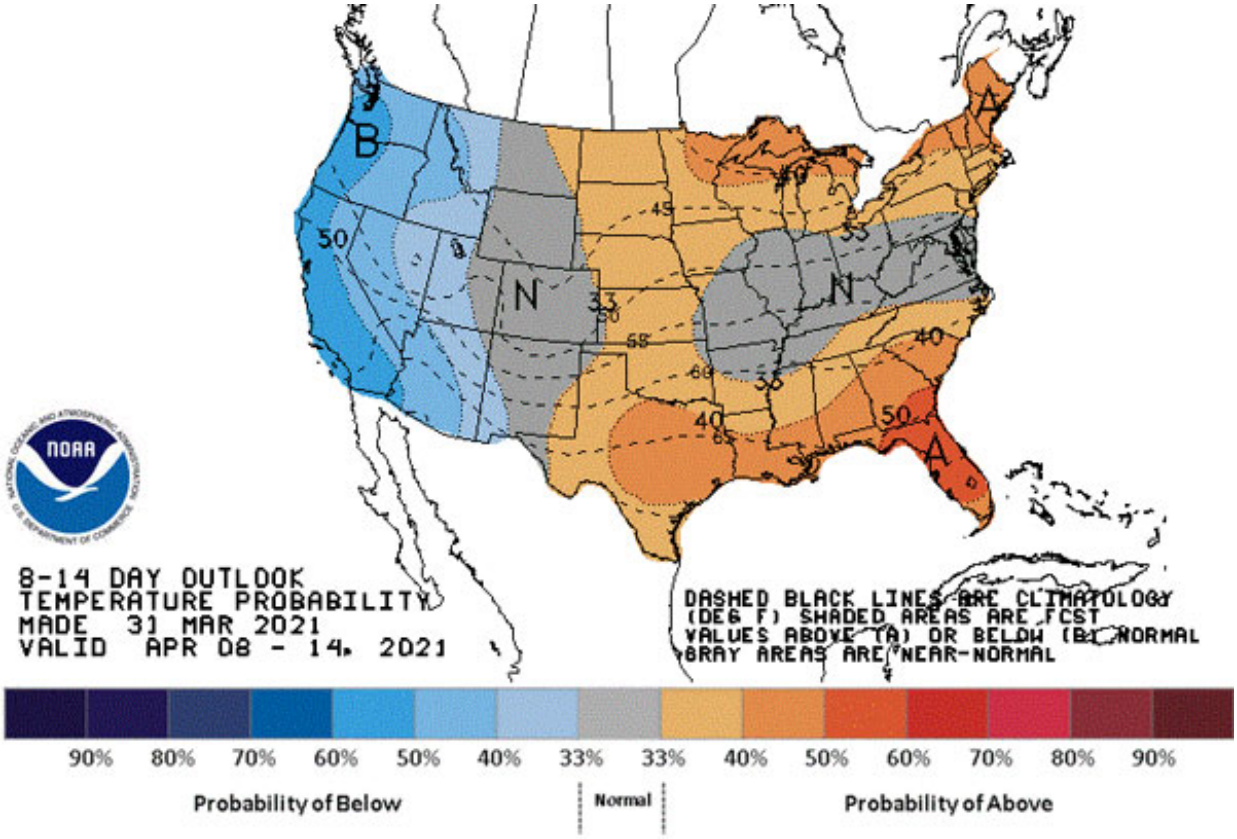

Figure 5. 8 to 14-day outlook temperature probability for April 8 – April 14, 2021 (NOAA).

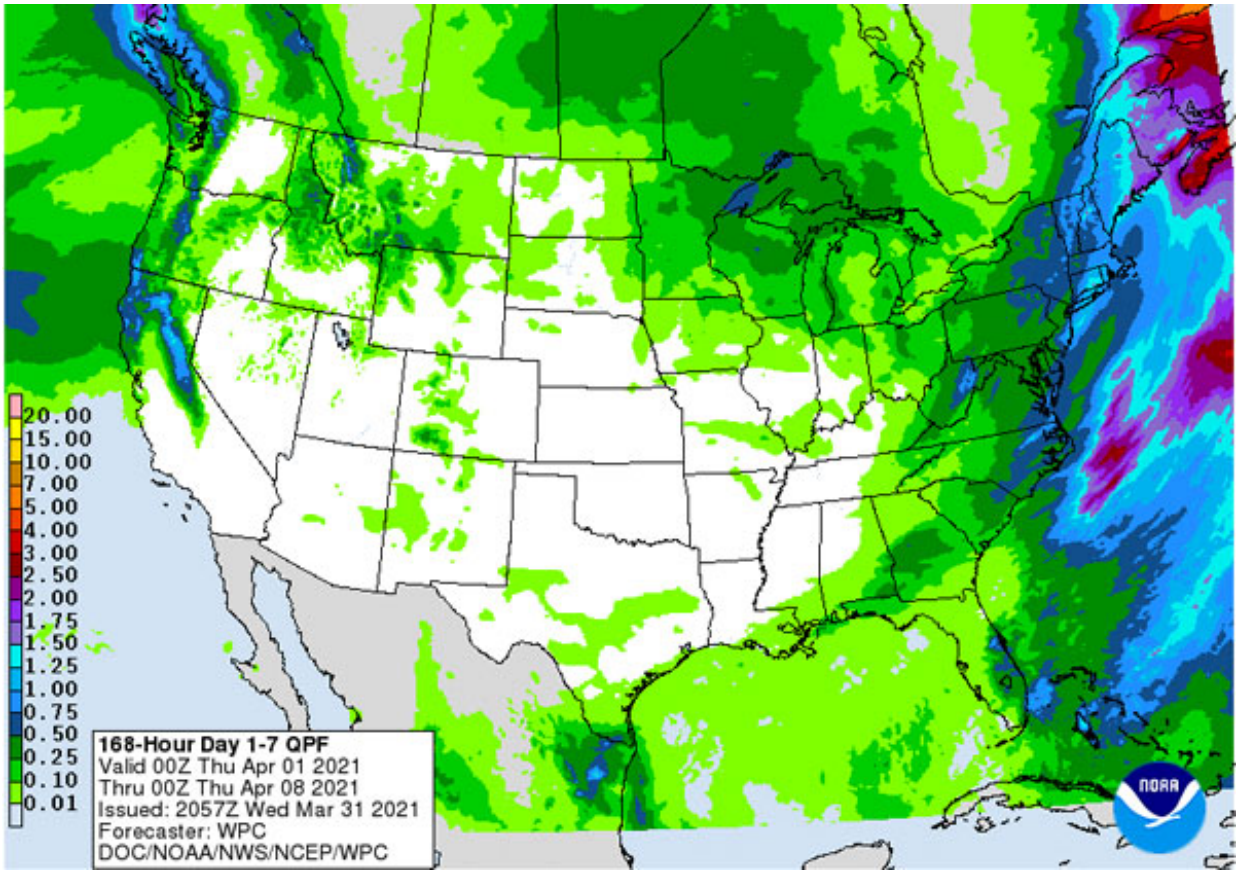

Figure 6. Quantitative Precipitation Forecast for April 1 – April 8, 2021 (WPC)

The actual change in soil temperatures in any given field will be affected by amount of residue cover, soil moisture, and landscape position. Wet soils under a no-tillage system will be slower to warm. Dry soils will fluctuate more rapidly, matching air temperatures, particularly if skies are clear.

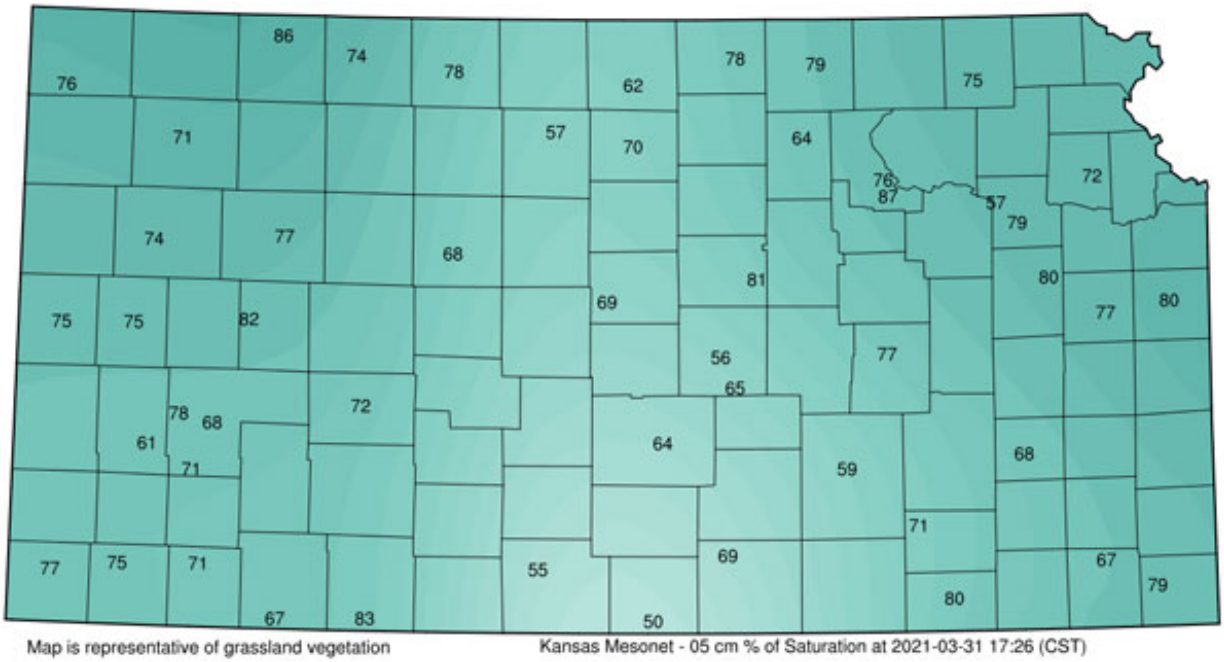

Figure 7. Soil moisture as of March 31, 2021 (Kansas Mesonet).

Current moisture status across Kansas is moderately wet, with the largest departures in precipitation in the southwest corner (Figure 8). Projections for the start of April are for precipitation to be below-normal for most of Kansas (Figure 9).

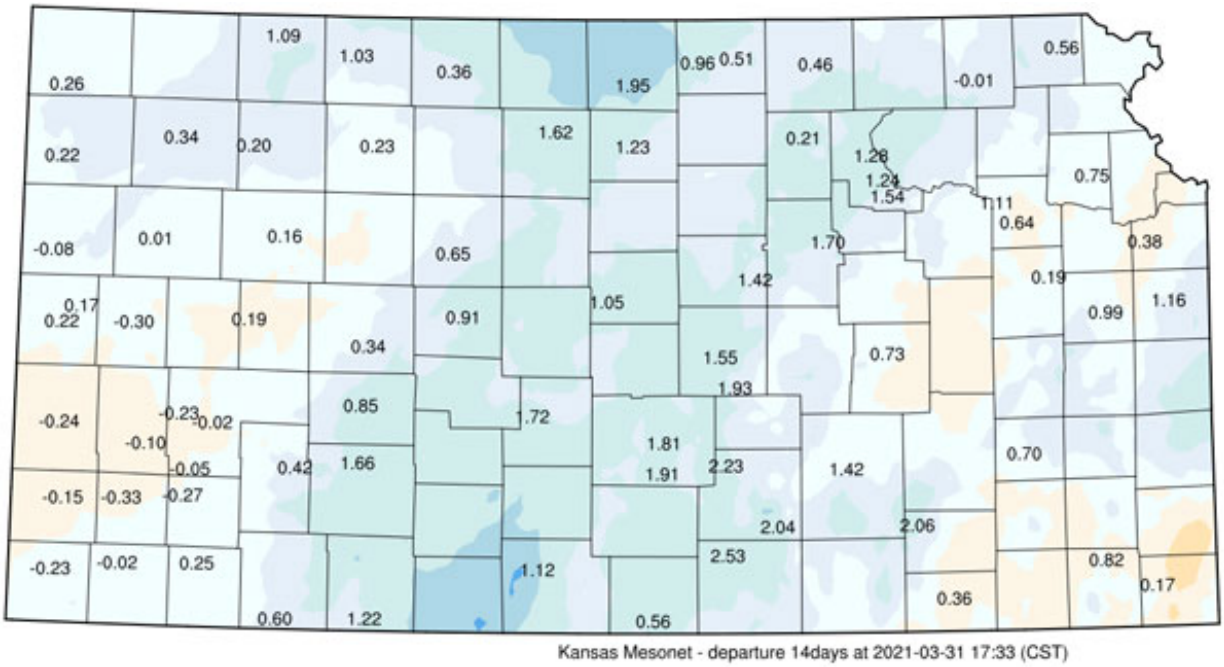

Figure 8. Departure from normal precipitation for the 14 days ending March 31, 2021.

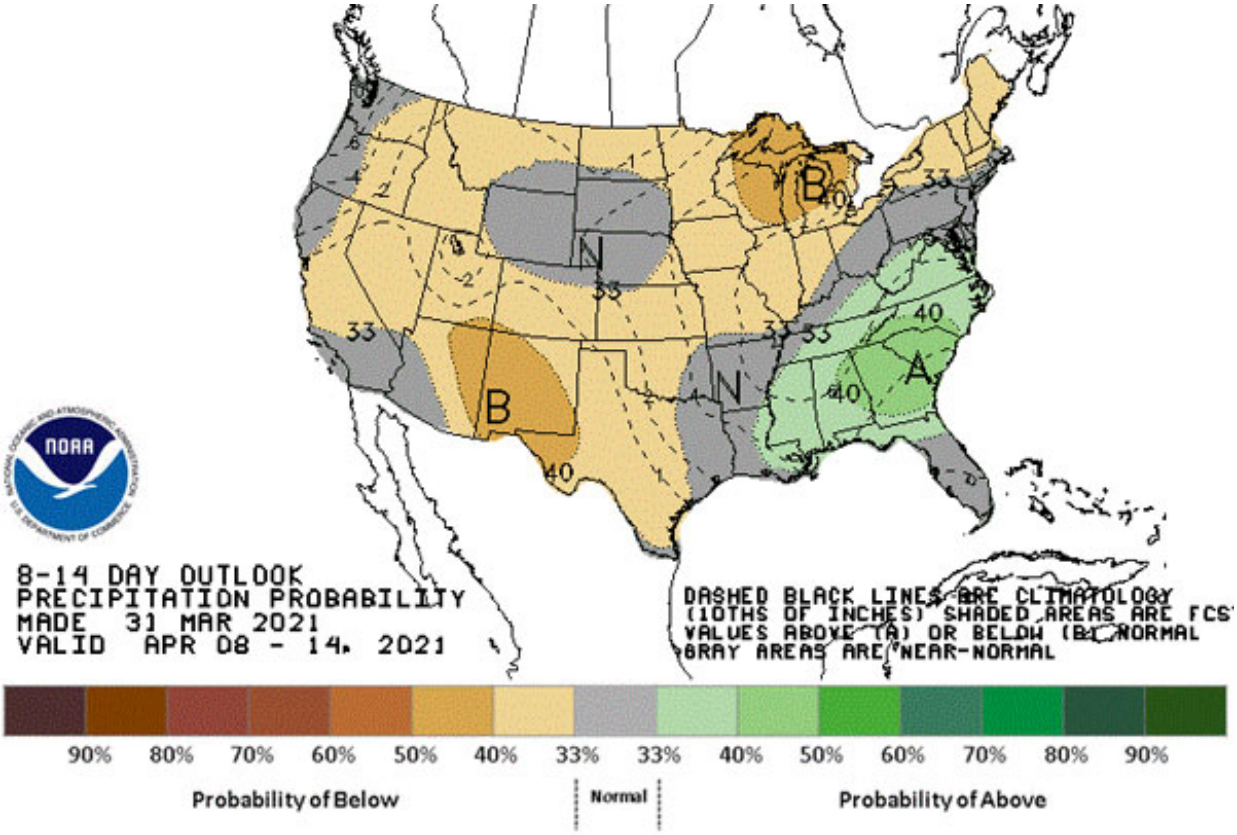

Figure 9. 8 to 14-day outlook precipitation probability for April 8 – April 14, 2021 (NOAA).

Optimal soil temperature for crop emergence

Every summer row crop has an optimal soil temperature for emergence. A minimum for corn is 50°F for germination and early growth. However, uniformity and synchrony in emergence is primarily achieved when soil temperatures are above 55°F. Uneven soil temperatures around the seed zone can produce non-uniform crop germination and emergence. Lack of uniformity in emergence can greatly impact corn potential yields. This is particularly true for corn, since it is the earliest summer row crop planted. When soil temperatures remain at or below 50°F after planting, the damage to germinating seed can be particularly severe.

Impact of a hard freeze on corn

Corn is also more likely than other summer crops to be affected by a hard freeze after emergence if it is planted too early. The impact of a hard freeze on emerged corn will vary depending on how low the temperature gets, the intensity and duration of the low temperatures, field variability and residue distribution, tillage systems, soil type and moisture conditions (more severe under dry conditions), and the growth stage of the plant. Injury is most likely on very young seedlings or on plants beyond the V5-6 growth stage, when the growing point is above the soil surface.

The average day for last spring freeze (32°F) is quite variable around the state (Figure 10). The largest variability is from southeast to northwest Kansas; with the earliest last spring freeze date for the southeast region (April 5-15) and latest for the northwest area (>May 3). Corn planting dates before April 15 in the southeast region would increase the likelihood of the crop suffering from a late spring

freeze. Similar conditions can be projected for northwest Kansas if corn is planted before May 3.

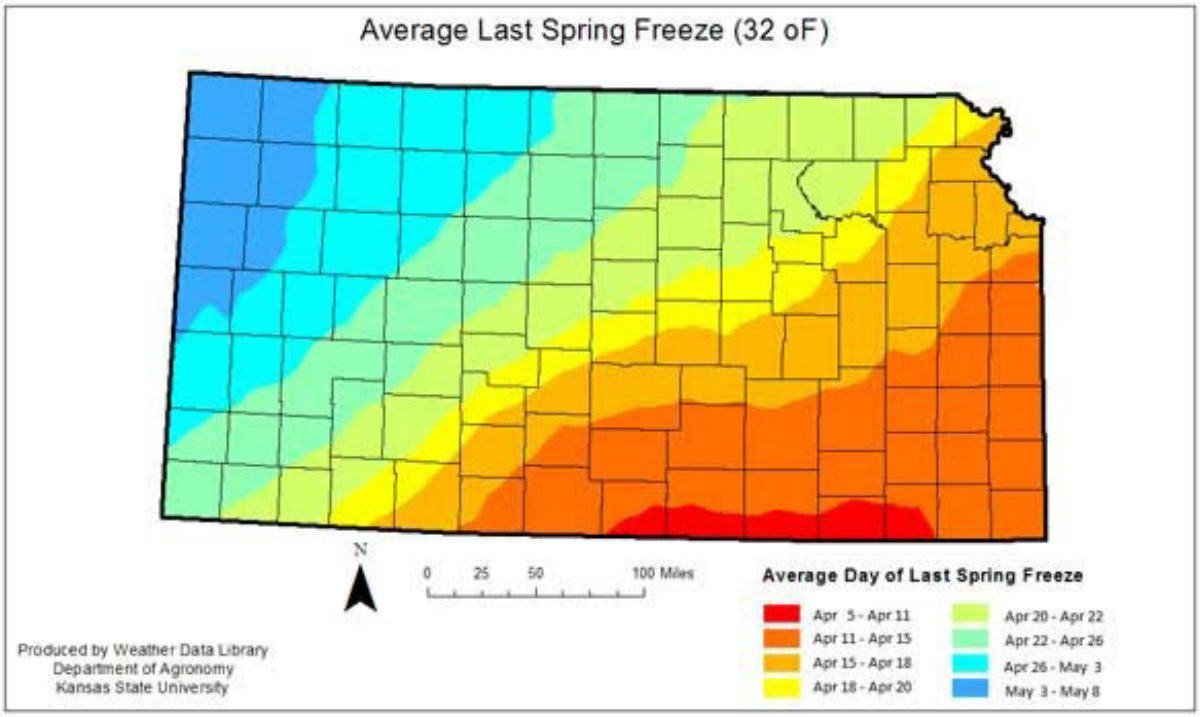

Figure 10. Average last spring freeze (32 degrees F) for Kansas.

Producers should consider all these factors when deciding on the optimal planting time.

More information about the planting status of summer row crops will be provided in upcoming issues of the Agronomy eUpdate. Stay tuned!

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2. First hollow stem update: April 1, 2021

Cattle should be removed from wheat pastures when the crop reaches first hollow stem (FHS). Grazing past this stage can severely affect wheat yields (for a full explanation, please refer to the eUpdate article "Optimal time to remove cattle from wheat pastures: First hollow stem").

First hollow stem update

In order to screen for FHS during this important time in the growing season, the K-State Extension Wheat and Forages crew measures FHS on a weekly basis in 34 different commonly grown wheat varieties in Kansas. The varieties are in a September-sown replicated trial at the South Central Experiment Field near Hutchinson. Ten stems are split open per variety per replication (Figure 1), for a total of 30 stems monitored per variety. The average length of hollow stem is reported for each variety in Table 1.

Figure 1. Ten main wheat stems were split open per replication per variety to estimate first hollow stem for this report, for a total of 30 stems split per variety. Photo by Romulo Lollato, K-State Research and Extension.

Table 1. Length of hollow stem measured 6 days throughout March 2021 of 34 wheat varieties sown mid-September 2020 at the South Central Experiment Field near Hutchinson. The critical

FHS length is 1.5 cm (about a half-inch or the diameter of a dime). Value(s) in bold indicate varieties that have reached FHS.

Variety	First hollow stem					
	3/3/2021	3/8/2021	3/16/2021	3/22/2021	3/25/2021	3/31/2021
	cm					
10BC329-17-5	0.00	0.01	0.03	0.42	0.36	**3.30**
AP EverRock	0.00	0.00	0.46	0.98	2.10	**.**
AP Roadrunner	0.00	0.13	0.21	0.42	0.69	**3.27**
Buckhorn AX	0.01	1.16	2.76	.	.	**.**
Canvas	0.00	0.00	0.07	0.02	0.38	**2.60**
Crescent AX	0.00	0.00	0.14	0.15	0.91	**4.97**
High Country	0.00	0.01	0.03	0.69	1.27	**4.47**
KS12DH0156-88	0.00	0.00	0.02	0.12	0.43	1.10
KS13DH0041-35	0.01	0.00	0.00	0.21	0.95	**1.77**
KS Dallas	0.00	0.00	0.12	0.78	0.84	**2.93**
KS Hamilton	0.00	0.00	0.01	0.00	0.15	1.37
KS Hatchett	0.00	0.00	0.10	0.18	1.02	**4.60**
KS Silverado	0.01	0.00	0.01	0.00	0.05	1.33
KS Western Star	0.00	0.01	0.13	0.34	0.35	**1.90**
LCS Atomic AX	0.00	0.00	0.00	0.14	0.58	**1.93**
LCS Helix AX	0.00	0.00	0.06	0.30	1.23	**3.33**
LCS Julep	0.00	0.00	0.03	0.29	0.41	**2.87**
LCS Photon AX	0.00	0.00	0.34	0.68	1.96	**.**
LCS Revere	0.00	0.00	0.19	0.50	1.08	**5.00**
Long Branch	0.00	0.03	0.54	1.66	.	**.**
MS Maverick	0.00	0.00	0.12	0.31	0.39	**2.47**
NUSAKA15-3	0.00	0.03	0.19	0.46	1.22	**4.27**
OCW04S717T-6W	0.00	0.01	0.13	0.49	0.71	**2.70**

OK12912C-138407-2	0.00	0.00	0.00	0.07	0.06	1.23
OK16D101089	0.00	0.01	0.26	0.79	1.31	**3.87**
OK Corral	0.00	0.02	0.08	0.56	0.67	**2.83**
Paradise	0.00	0.01	0.02	0.51	0.40	**2.83**
Rock Star	0.00	0.00	0.04	0.24	0.17	0.87
Showdown	0.00	0.00	0.07	0.20	0.30	**2.53**
Smith's Gold	0.00	0.11	0.14	0.82	0.61	**2.53**
WB4269	0.00	0.06	0.18	0.38	0.69	**2.90**
WB4401	0.00	0.09	0.38	0.62	1.15	**4.30**
WB4699	0.00	0.03	0.03	0.08	0.13	0.73
Zenda	0.00	0.02	0.31	1.04	1.72	**.**
Variety effect	ns	<0.01	<0.01	<0.01	<0.01	<0.01

The majority of the varieties had reached first hollow stem as of March 31, 2021, with the exception of KS12DH0156-88, KS Hamilton, KS Silverado, OK12912C-138407-2, Rock Star, and WB4699. However, these lines and varieties have started to elongate the stem and should reach first hollow stem soon. We will report first hollow stem over the next few weeks on these selected genotypes that have not yet reached first hollow stem.

The intention of this report is to provide producers an update on the progress of first hollow stem development in different wheat varieties. Producers should use this information as a guide, but it is extremely important to monitor FHS from an ungrazed portion of each individual wheat pasture to take the decision of removing cattle from wheat pastures.

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3. What are the causes of yellow wheat?

During this time of the year, it is normal to start seeing some wheat fields turn yellow. The pattern may vary from field to field, sometimes as large areas, small patches, or streaks of yellowish wheat in some fields this spring. What are some of the main causes of yellow wheat in the spring?

Nitrogen deficiency. As the crop starts to grow in the spring, its nitrogen (N) demand increases and it is common to see an N deficiency, especially while the temperatures are lower and not much N is mineralized from the soil organic matter. Nitrogen deficiency causes an overall yellowing of the plant, with the lower leaves yellowing and dying from the leaf tips inward (Figure 1). Nitrogen deficiency also results in reduced tillering, top growth, and root growth. The primary causes of N deficiency are insufficient fertilizer rates, application problems, applying the nitrogen too late, leaching from heavy rains, denitrification from saturated soils, and the presence of heavy amounts of crop residue, which immobilize nitrogen.

Figure 1. Nitrogen deficiency on wheat. The lower leaves are the first to become chlorotic (yellow). Photo by Dorivar Ruiz Diaz, K-State Research and Extension.

Sulfur deficiency. Similar to nitrogen, the crop's sulfur requirement increases in the spring as it takes off on reproductive growth. Due to a decrease in sulfur deposition in the rainfall, there has been an increasing number of fields with sulfur deficiency symptoms in Kansas in recent years. Deficiencies can be more common in areas where organic matter levels are low -- especially on sandier soils or eroded areas of a field. Sulfur deficiency can also occur where soils are cold in the spring due to a reduced rate of release of sulfur from organic matter. The symptoms of sulfur deficiency are very similar to nitrogen deficiency. However, sulfur deficiency differs from N deficiency in that the whole

plant is pale, with a greater degree of chlorosis (yellowing of plant tissue) in the young/upper leaves (Figure 2). The pattern of chlorosis may show gradation in intensity with the younger leaves at the tip yellowing first because sulfur is not easily translocated within the plant. But the entire plant can quickly become totally chlorotic and take on a light yellow color. Symptoms often become more pronounced when plants begin growing rapidly while soil conditions are such that organic matter mineralization and sulfur release rates are low. Symptoms may disappear as the temperature warms up and moisture conditions improve, which increases the rate of mineralization of sulfur from organic matter and the rate of root growth.

Figure 2. Sulfur deficiency in wheat, with symptoms appearing first on the younger leaves. Photo by Romulo Lollato, K-State Research and Extension.

Poor root growth. Many potential causes exist for reduced root growth: dry soils, later sowing, waterlogging, or elevated crown height caused by shallow planting depth or excessive residue in the root zone (Figure 3). If the plants have a poor root system, then the root systems are not extensive enough to access enough nutrients causing the plant to turn yellow.

Figure 3. Left panel shows the lack of development of the crown rooting system of a wheat field due to drought conditions in the topsoil. Photo taken by Romulo Lollato, K-State Research and Extension. Right panel shows a slightly more developed but also extremely shallow rooting system, likely due to a restrictive dry topsoil layer. Photo taken by Tyler Ediger, wheat producer in Meade County, KS.

Cold weather injury at the tillering stage. A sudden drop in temperatures after the wheat has greened up but before it reaches the jointing stage will burn back the top-growth, often giving the field a yellowish cast but not necessarily reducing yield potential (Figure 4). This injury is likely cosmetic, provided the growing point is still healthy. Variety release from winter dormancy can also affect the extent of the symptoms, as early varieties would have been less cold hardy and thus likely sustain more injury.

Figure 4. Yellowing wheat from cold weather injury at the tillering stage. Wheat variety on the left (WB-Grainfield) has a later release from winter dormancy as compared to WB-Cedar (variety depicted in the right). Thus, WB-Cedar sustained more leaf injury. Photo by Romulo Lollato, K-State Research and Extension.

Freeze injury at the jointing stage. Jointing wheat can usually tolerate temperatures in the mid-to-upper 20's with no significant injury. But, if temperatures fall into the low 20's or below for several hours, the lower stems, leaves, or developing head can sustain injury (Figure 5). This has not been a problem this year yet, but in cases there are severe temperature drops in the near future as the crop greens up and joints, producers should scout their fields to assess the yield potential. If the leaves of tillers are yellowish when they emerge from the whorl, this indicates those tillers have been damaged.

Figure 5. Comparison between a healthy developing wheat head (left hand side, typically light green and firm) versus a developing wheat head that sustained freeze injury (right hand side, whitish/brown and mushy). Photo by Romulo Lollato, K-State Research and Extension.

While the extent of potential freeze damage depends on minimum temperatures achieved, duration of cold temperatures, and stage of wheat development; other factors such as crop residue, position on the landscape, wind speed, snow cover, and soil temperatures also play a role. Figure 6 shows an example of the effect of heavy residue on potential wheat damage. In this photo, parts of the field with a heavier layer of residue show greater cold damage than lighter residue. This can be partially explained because under a thicker layer of residue, the wheat crown tends to form closer to the surface and therefore is more exposed to freezing temperatures.

Figure 6. Effect of soil residue on wheat freeze damage. Wheat is showing more damage from freezing temperatures in thicker residue layers. Photo by Tyler Ediger, wheat producer in Meade County, KS.

Leaf senescence and opportunistic leaf spotting diseases. After the winter, it is normal for some of the leaves in the lower canopy to go through senescence and perish, sometimes translocating nutrients to the new growth and sometimes just due to different natural reasons. This causes a yellowing of the lower wheat canopy. Some opportunistic saprophytic fungi or fungal diseases such as leaf spots (Septoria tritici blotch, Stagonospora nodorum leaf blotch, and tan spot), may colonize these dying tissues as shown in Figure 7. For the most part in Kansas, these diseases do not cause economic damage as long as they remain on the lower leaves, especially if they occur in tissue that is dying already. They might become a problem and warrant a fungicide application in specific

situations, such as when a susceptible variety is planted into heavy wheat residue, and when symptoms appear in the upper canopy after the flag leaf has emerged (see Stagonospora nodorum leaf blotch, in Figure 8).

Figure 7. Septoria tritici blotch (leaf spot) colonizing tissue from the lower wheat canopy that was already senescing. Photo by Romulo Lollato, K-State Research and Extension.

Figure 8. Stagonospora nodorum leaf blotch symptoms in the upper wheat canopy. Photo by Romulo Lollato, K-State Research and Extension.

Iron chlorosis. Iron chlorosis is not common in wheat in Kansas, but does occur on certain high-pH, calcareous soils in western Kansas. Newly emerging leaves will have green veins, with yellow striping between the veins. Eventually, the entire leaf may turn yellow or white.

Soilborne mosaic or spindle streak mosaic. Soilborne mosaic and spindle streak mosaic are viral diseases that occur primarily in eastern and central Kansas, but are rare in western Kansas. These diseases are most common in years with a wet fall, followed by a cool, wet spring. These diseases are often most severe in low areas of a field where soil conditions favor infection. Symptoms are usually most pronounced in early spring, then fade as temperatures warm. Leaves will have a mosaic of

green spots on yellowish background. Infected plants are often stunted in growth.

Wheat streak mosaic complex. This viral disease is vectored by the wheat curl mite. Yellow areas in field will appear in spring around that jointing stages of growth; usually on field edges adjacent to volunteer wheat. Leaves will have a mosaic of yellow streaks, stripes, or mottling (Figure 9). Plants infected with wheat streak mosaic are often smaller than healthy plants. There are two additional viruses, Triticum mosaic virus and high plains mosaic virus, that also result in similar symptoms.

Figure 9. Typical symptoms of wheat streak mosaic virus. Photo by Kelsey Andersen Onofre, K-State Research and Extension.

Barley yellow dwarf. This viral disease is vectored by bird cherry oat aphids and greenbugs. Small or large patches of yellow plants will occur, typically around boot stage. Leaf tip turns yellow or purple, but midrib remains green. The yellowing caused by barley yellow dwarf are less botchy than the yellowing caused by other viral diseases. Plants infected by barley yellow dwarf are often stunted.

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4. Spring-emerged volunteer wheat: Should producers worry about wheat streak mosaic virus and the green brid

The wet weather has resulted in the emergence of volunteer wheat over the last few weeks in some parts of Kansas (Figure 1). There have been questions about the risk that this wheat poses for wheat streak mosaic virus (WSMV) to the surrounding emerged crop (see Figure 2 for a photo of WSMV symptoms). Here we walk through some considerations, as well as termination strategies.

Figure 1. Volunteer wheat that has emerged in wheat residue. Photo by Sarah Lancaster, K-State Research and Extension.

What is the green bridge?

As a reminder, the term "green bridge" is used to describe the volunteer wheat that emerges in the summer after wheat harvest. That is because at harvest time wheat curl mites are abandoning mature wheat in search of green tissue to survive on. If there is volunteer wheat around, and that wheat is not terminated, the curl mites can hitch a ride on that wheat until the crop emerges after planting in the fall. In the fall, those mites will migrate from volunteer (and other weedy hosts) to the new wheat crop. This cycle completes the green bridge

Volunteer wheat that emerges very close to planting, or in the spring, is technically not considered part of the 'green bridge'. This is because the fall wheat crop has already emerged on a much higher area than volunteer wheat. The fall crop itself can serve as a sufficient host for curl mites that have

survived the summer.

Figure 2. Typical symptoms of wheat streak mosaic virus. Photo by Kelsey Andersen Onofre, K-State Research and Extension.

Is spring-emerged volunteer wheat as risky as summer-emerged volunteer wheat for WSMV spread?

No. For the reasons we mentioned above, spring-emerged volunteer wheat is less risky than summer-emerged volunteer wheat, because it essentially acts as a (much smaller) neighboring wheat crop. That being said, if curl mites have survived locally, they can still reproduce on this volunteer wheat, just as they would in wheat production fields. If WSMV is a concern, terminating this volunteer crop can avoid successive cycles of mite reproduction. Volunteer from fields with high WSMV levels in 2020 would be of highest concern. When making the decision to terminate this spring-emerged volunteer, the desire to control curl mite populations should be balanced with other agronomic factors.

Are there other agronomic considerations for volunteer wheat that has emerged in the spring?

Potential uses:

- Depending on the amount of volunteer wheat emerged in the spring, it can serve as a potential grazing option for livestock, as young wheat is a very high quality forage.
- Volunteer wheat that emerged in the spring can be used as a cover crop to help reduce wind or water erosion and increase carbon (organic matter) returning to the soils, if it is terminated prior to a summer crop similar to cereal rye or spring oats.

Potential risks:

- Volunteer wheat may complicate the management of other weed species that may also be present.
- Volunteer wheat may consume use water that could be conserved for a summer crop.

What are the best termination strategies for spring-emerged volunteer, prior to summer crop planting?

Glyphosate is an inexpensive option to control volunteer winter wheat that will have little to no impact on the following summer crop. Applications of a formulation that contains 4.5 pounds per gallon at a rate of 24 to 44 fl oz/A will be effective, assuming weather conditions are appropriate. No herbicides will work well when temperatures are below 60°F during the day and/or 40°F overnight.

Other herbicides that will control volunteer winter wheat include Group 1 herbicides such as Assure II (fluazifop) or Select (clethodim). Group 1 herbicides do have rotation restrictions when applied before corn or grain sorghum. Residual herbicides such as atrazine, Canopy (chlorimuron + metribuzin), or Sharpen (saflufenacil) can also be included. However, these products also have rotation restrictions to various crops. It is important to consult product labels to determine application rates and rotation restrictions for your specific situation.

What should I do if I think I have WSMV?

Contact your local K-State Extension Office. They will work with you to send photos of the problem (close-up, whole plant, field shot) and plant tissue samples to the K-State Plant Disease Diagnostic Lab.

Use this link for the sample submission form:

https://www.plantpath.k-state.edu/extension/diagnostic-lab/documents/DiseaseLabChecksheet.pdf

Here are guidelines that can help get a good sample to the lab:

- Fill out the accompanying Plant Diagnostic Lab Form (PDF) as completely as possible.
- Send a plentiful amount of fresh plant material (including roots). It is best to include the

entire plant when possible. Shake off most of the soil.

- Send a plant sample that is characteristic of the problem (exhibits a range of symptoms).
- Dig (do not pull) up the plant, so the roots remain intact.
- Do not add water or wet paper towels to the sample!
- Seal the plant material in an appropriately sized plastic bag and pack in a crush-proof container.
- Put the accompanying information sheet in a separate plastic bag to keep it dry.
- **Note that samples that arrive prior to Thursday will be completed the week they arrive, while those that arrive after Thursday will be placed in the virus testing panel for the following Thursday.**

Shipping address:

K-State Plant Disease Diagnostic Lab
4032 Throckmorton PSC
1712 Claflin Road
Manhattan, KS 66506

Contact information for K-State Plant Disease Diagnostic Lab:
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5. A classic March wind storm in Kansas

This week in March started out with significant wind across Kansas. On Monday, strong southerly winds developed across the state and persisted through the entirety of the day. After sunset, a strong cold front entered the northwest and rapidly moved across the state overnight. This front shifted winds to the north and developed significant wind gusts along/behind the front. Although impactful, strong winds are not atypical for March - one of Kansas' windiest months of the year (Figure 1).

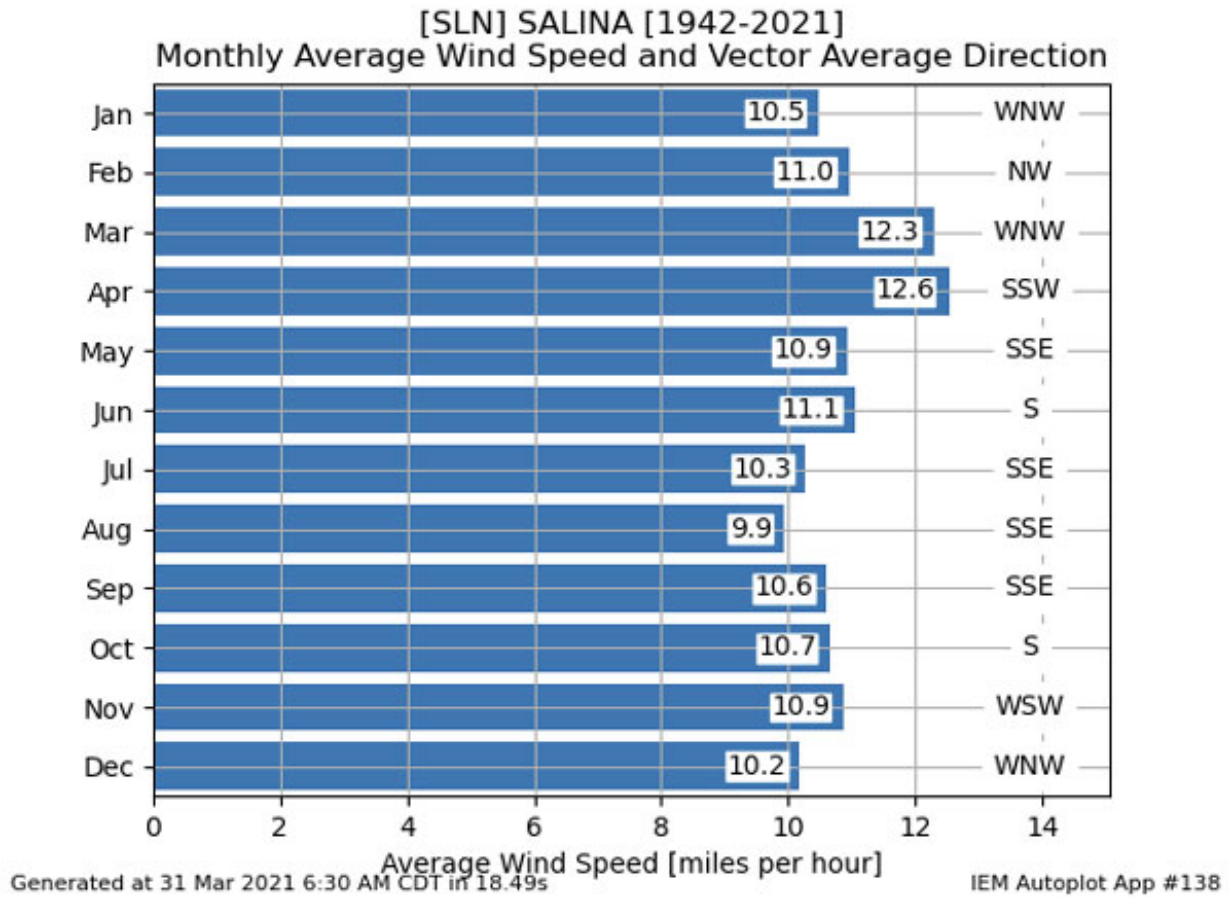

Figure 1. Average wind speed and direction for Salina, KS (Source: Iowa Environmental Mesonet).

The unusual aspect of this event was the wind direction. Often March consists of strong northwesterly winds that are ushered in after a strong storm system. However, the main low pressure tracked along the United States and Canada border - a track that is normally observed later in the spring (Figure 2). The associated cold front did develop northwest winds associated with the strongest wind gusts (in excess of 70mph; Figure 3 and Figure 4) just after sunset Monday, but they were generally less impactful for Kansas due to the shorter duration. In addition, these northwest winds generally weakened as they spread east.

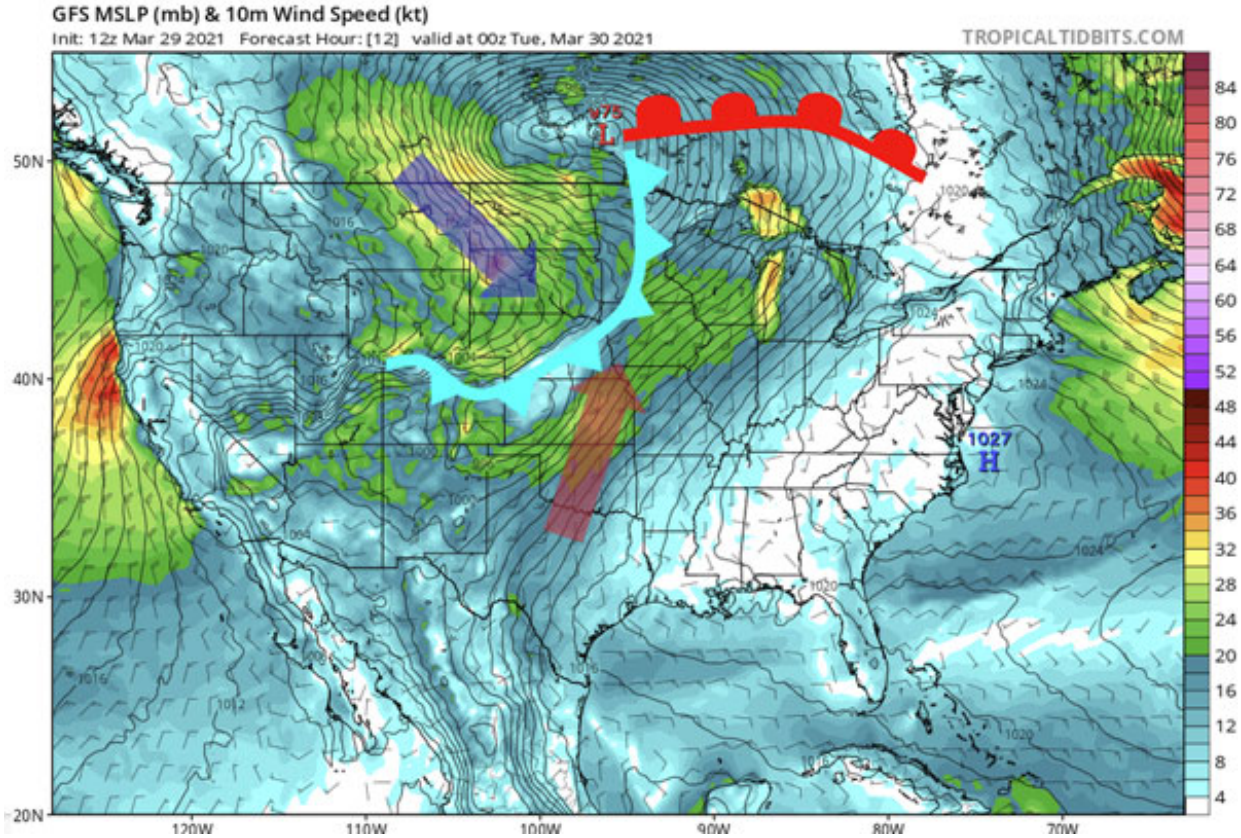

Figure 2. Forecast model depiction of surface winds and magnitude with annotated low pressure and cold (blue)/warm (red) fronts (Source: Tropicaltidbits.com).

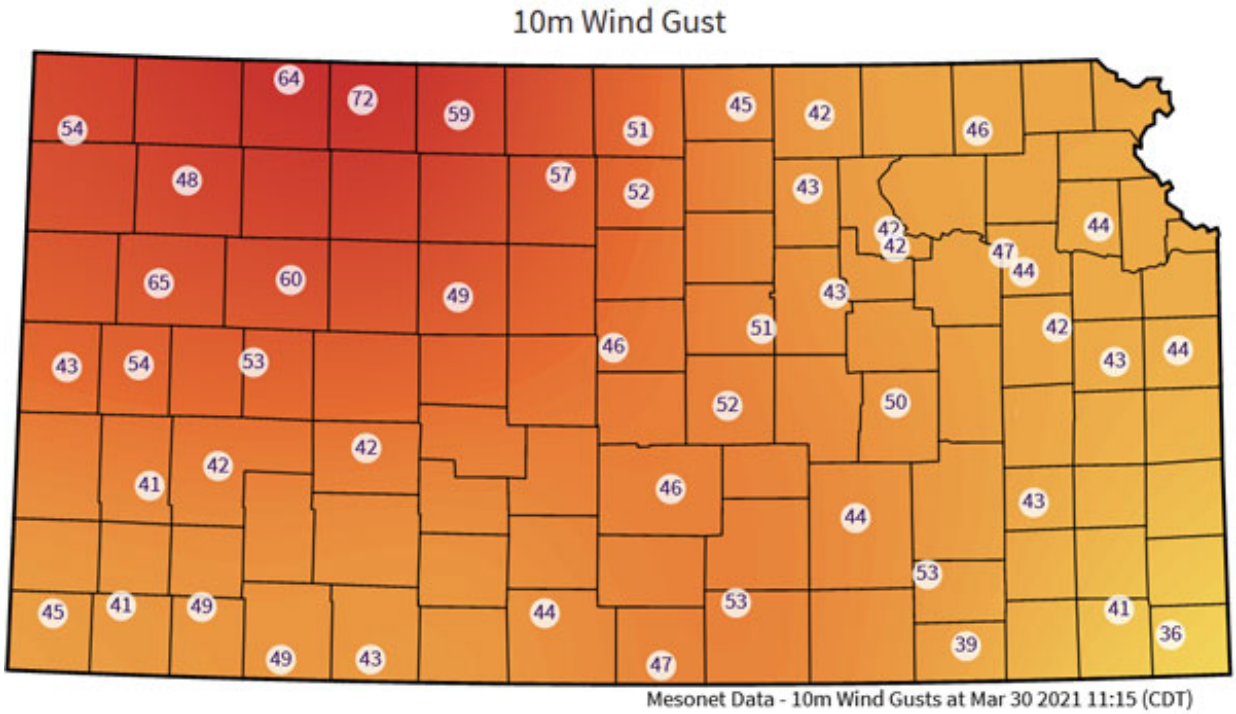

Figure 3. Strongest recorded wind gusts at 10m (30 feet) for March 29-30, 2021 (Source:

mesonet.ksu.edu/weather/maxmin).

Data as of Tue Mar 30 2021 11:15 (CDT) -- Click column headers to sort data

Station	2m Wind Gust		10m Wind Gust	
	Gust (mph)	Time (CST)	Gust (mph)	Time (CST)
Oberlin 7NE	61	03-29 20:05	64	03-29 20:05
Wallace	58	03-29 20:15		2m tripod
Norton 4SW	54	03-29 20:40	72	03-29 20:40
Russell Springs 3SW	51	03-29 20:25	65	03-29 20:25
Phillipsburg 1SW	50	03-29 21:20	59	03-29 21:20
Hill City	49	03-29 21:10		2m tripod
Sherman	48	03-29 19:45		2m tripod
Sheridan	47	03-29 20:55		2m tripod
Gove 5SE	47	03-29 20:50	60	03-29 20:50
Howard 14NW	46	03-29 15:00	53	03-29 13:20
Osborne	45	03-29 22:15	57	03-29 22:40
Mount Hope 3NE	45	03-29 14:20		2m tripod
Hays	45	03-29 23:35	49	03-29 22:05
Cheyenne	45	03-29 20:10	54	03-29 20:05
Viola	44	03-29 14:20	53	03-29 12:55
Leoti	44	03-29 21:05	54	03-29 21:05
Pretty Prairie	43	03-29 17:05		2m tripod

Figure 4. Strongest wind gusts measured on the Kansas Mesonet in list form including 2m (~6 feet) (Source: mesonet.ksu.edu/weather/maxmin**).**

Climatologically, storm systems in March track further south. The anomalous upper level pattern (Figure 5) sticks out with lower heights along the Canadian border.

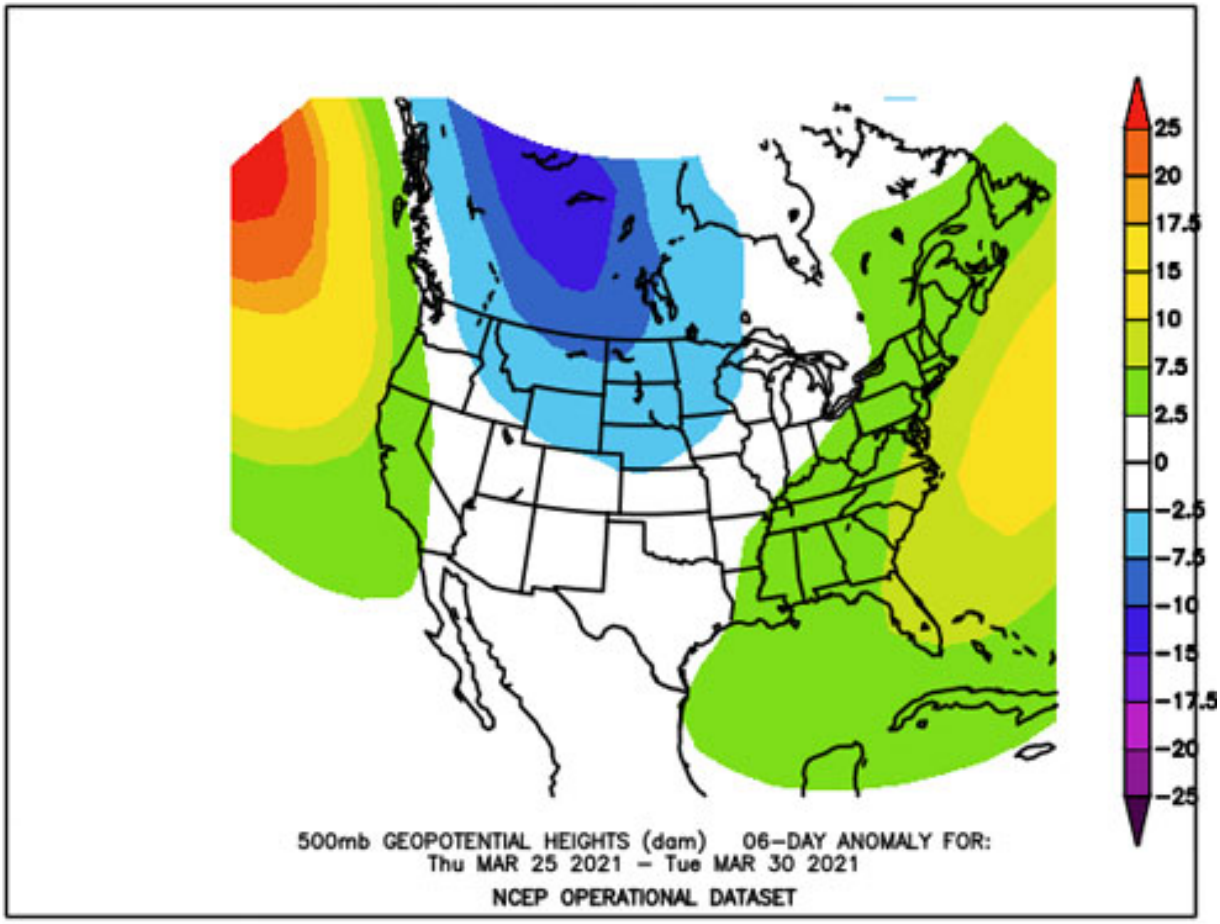

Figure 5. Geopotential height anomalies for the March 25-30 time period compared to climatological normal (Source: NCEP).

Impacts of this event were felt in numerous ways. Blowing dust and wildfires were the highest magnitude events that occurred. Despite recent rainfall, wildfires were reported in numerous counties including Reno, Harvey, Saline, and Wabaunsee (Figure 6). Several of these fires forced evacuations. Blowing dust was common, especially in northwest Kansas along the cold front in the evening. Additional impacts included downed trees and blown over semi-trucks (Figure 7).

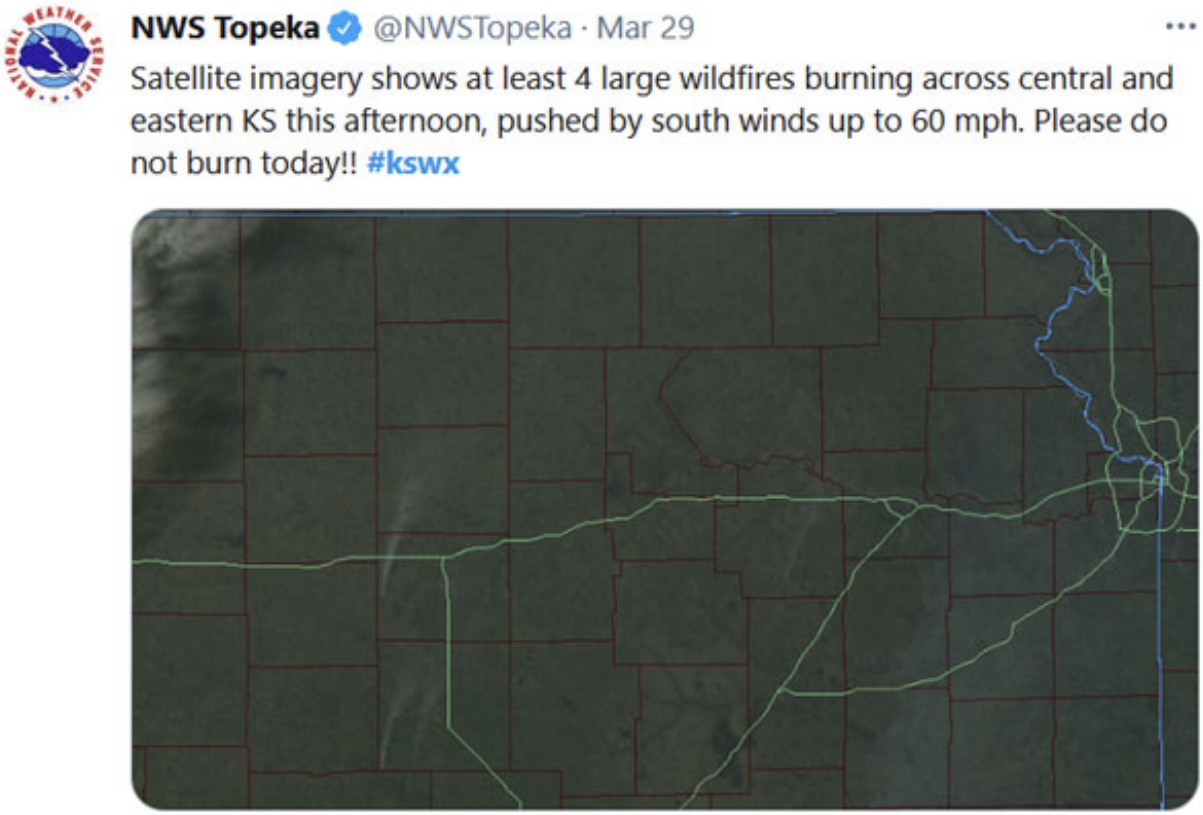

Figure 6. Satellite imagery showing smoke columns from several wildfires (Source: NWS and Twitter).

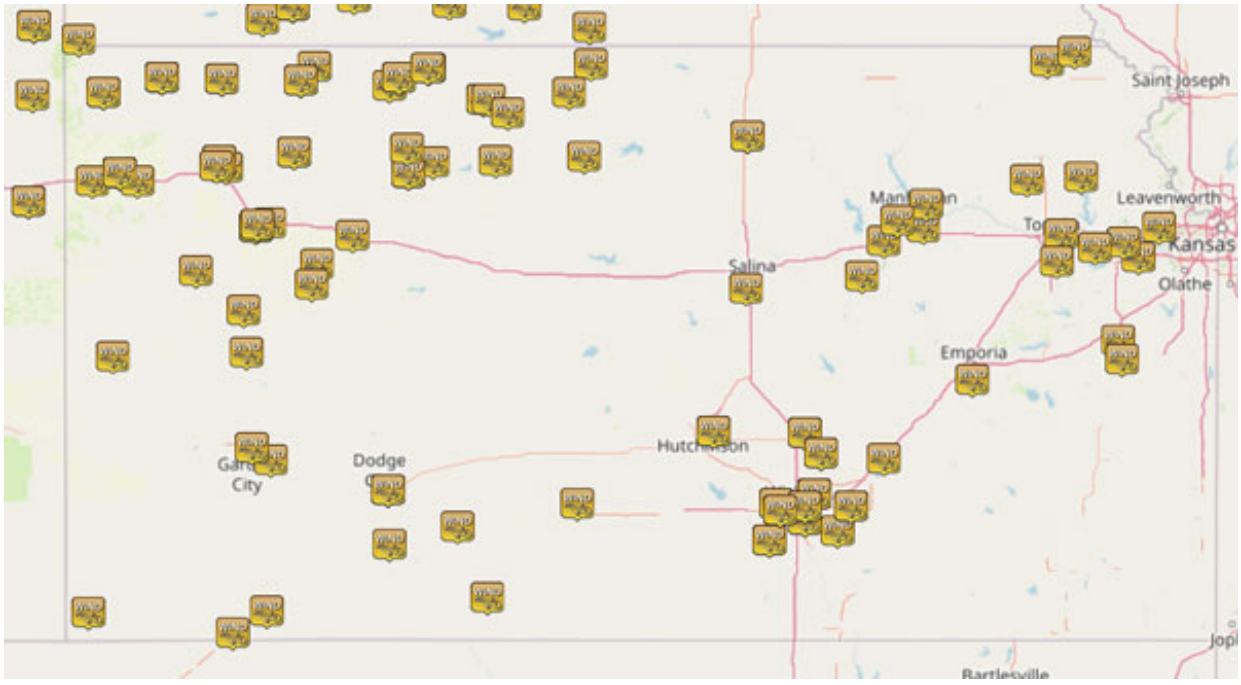

Figure 7. Reports of wind damage, sustained winds of 40+ mph and gusts over 50mph (Source: NWS and Iowa Environmental Mesonet).

Looking ahead for April

Breezy winds are expected to continue through the weekend as several additional storms are expected to cross the Central US (Figure 8). With these, much warmer temperatures are forecasted into early April with a high probability of drier than normal temperatures (Figure 9). As we move into the windiest month of the year, the pattern looks to return towards stronger storms and increased wind again. Probabilities of precipitation are forecasted to be below normal for the western half of the state and near-to-above normal for the east (Figure 9). This would suggest a pattern typical of strong storms that are associated with a dryline front or similar - favorable for an increase in wind events and likely severe weather into mid-April. As we continue to be in a weakening La Niña regime, we can expect continued active weather into May.

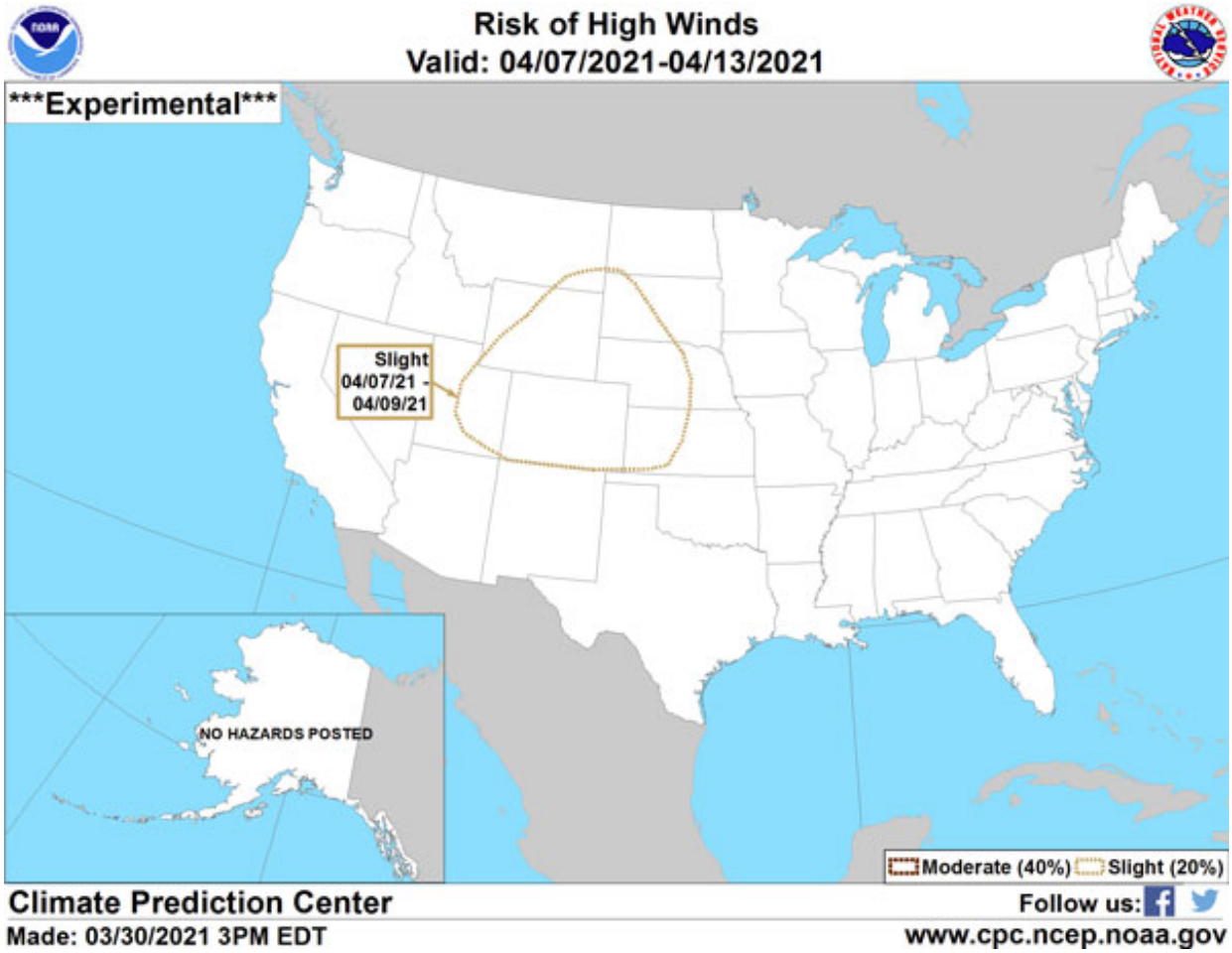

Figure 8. Experimental product from the Climate Prediction Center forecasting a slight chance of high winds again on April 7-9, 2021 (Source: CPC).

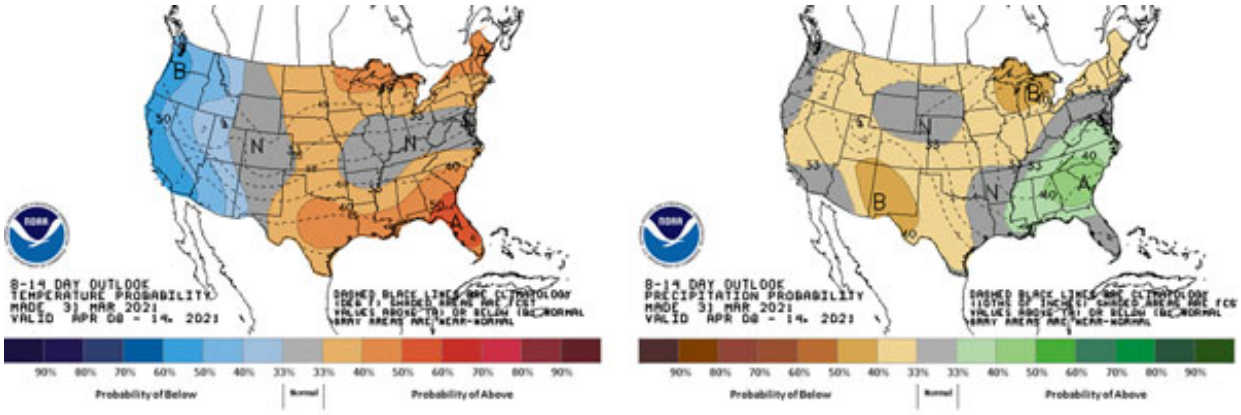

Figure 9. Climate Prediction Center outlooks for April 8-14, 2021 for temperature (left) and precipitation (right) (Source: CPC).

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6. Spring soybean cyst nematode sampling

Soybean cyst nematode (SCN) is a major problem in soybean fields throughout eastern and central Kansas (Figure 1). It is important to monitor SCN levels regularly to determine if management strategies, such as variety resistance and crop rotation, have been successful.

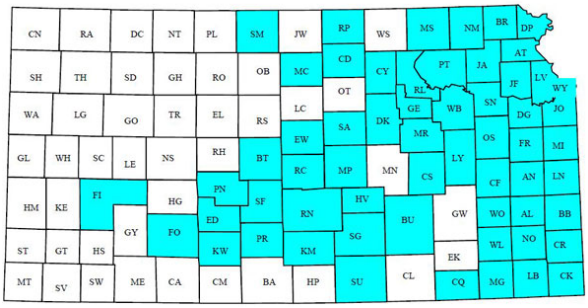

Figure 1. As of January 1, 2021, SCN was identified in 59 Kansas counties that produce >85% of Kansas soybeans. SCN has been detected in counties highlighted in blue. Map courtesy of Timothy Todd.

Confirming the presence of SCN and determining population levels is the basis for a successful integrated management program. Here we discuss the recommended strategy for SCN sampling.

Need help submitting a SCN sample?

Contact your local K-State Extension Office. They will work with you to collect and submit the samples to the K-State Plant Disease Diagnostic Lab. Here are guidelines that can help get a good sample to the lab:

1. A soil probe (or sharpshooter spade)
2. A bucket
3. A labeled bag. Label should include the following information:
    a. Field identification (*i.e.* Field ID: North Farm, near Doe Creek)
    b. Size of the area being sampled (*i.e.* 20 acres)
    c. Crop history (*i.e.* soybean, corn, and soybean)

Recommended field pattern for sample collection

If your field is fairly uniform, divide it into quadrants for your SCN sample collection. Sections of the field that have had different cropping histories or have a different soil type should be sampled separately. **For each quadrant or area of the field, you will collect 10 to 20 cores to a depth of 6 to 8 inches.**

It is important that when collecting soil cores you walk in a systematic pattern, such as a "Z" pattern (Figure 2). Collect a total of 10 to 20 soil cores, emptying each into the bucket after collection. All core samples should be mixed well, to account for any minor variation between cores. After mixing, collect 1 pint of soil, approximately 2 cups, in a labeled plastic bag and seal.

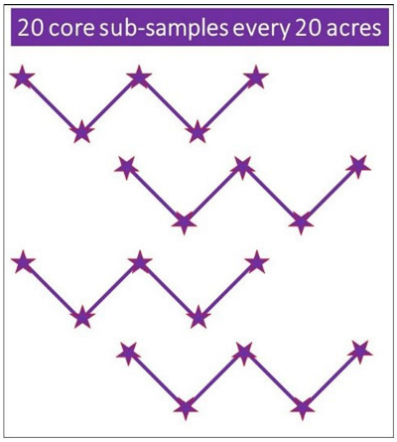

Figure 2. Example of a good sampling pattern for collecting soil to test for SCN within a field.

When sending your samples to the diagnostic lab make sure to:

1. Keep samples refrigerated until shipping
2. Send overnight or as fast as possible (time is crucial)
3. Avoid leaving bags in the sun (which can kill nematodes)
4. Send the samples to the Plant Disease Diagnostic Lab in the K-State Plant Pathology Department.
5. You can find the **Plant Disease Diagnostic Check sheet** at https://www.plantpath.k-state.edu/extension/diagnostic-lab/documents/DiseaseLabChecksheet.pdf

Shipping address:

K-State Plant Disease Diagnostic Lab
4032 Throckmorton PSC
1712 Claflin Road
Manhattan, KS 66506
clinic@ksu.edu
785-532-1383

Remember, your results will only be as good as the sample that you send to the lab!

Check out this short, informative video from our lab: Soybean Cyst Nematode-SCN Sampling 2020: https://youtu.be/b6Eo0isI1I0 .

For more information, feel free to contact us at the K-State Plant Pathology Department.

Timothy Todd, Nematologist
nema@ksu.edu

Rodrigo Onofre, Postdoctoral Research & Extension Fellow

onofre@ksu.edu

7. Spring insect activity in Kansas - Alfalfa weevils and army cutworms

The K-State Extension Entomology newsletter is back! The first issue of 2021 brings some old pests up for discussion. This newsletter is typically published each Friday during the growing season. Articles are targeted for agribusiness, applicators, consultants, extension personnel, and homeowners. When the topics cover an agronomic pest, the Extension Agronomy eUpdate will share those articles with the eUpdate audience.

Alfalfa Weevils

Alfalfa weevil larvae have been hatching throughout south central and north central Kansas for the last couple of weeks. First larvae/feeding reported from south central Kansas on March 15 and on March 21 from north central parts of the state. The easiest way to find new larvae is to note small, pinprick sized holes in leaves and/or brooming feeding damage on the tips of new terminals (Figure 1). Larval hatching and subsequent feeding will only increase as temperatures increase. It takes temperatures in the mid to low 20's(°F) for a couple hours to actually adversely affect young larvae (remember 2018- and last year, 2020, in mid-April). Also, please remember-- utilize whatever treatment threshold that has been successful for you in the past (hopefully-not just spray because your neighbor is--we use a 33-50% infestation level using the "stem count bucket "sampling method). In addition, it is really important to spray with an adequate amount of carrier, i. e. water, to achieve good coverage. After application, and the reentry interval (REI) for the product used, continue monitoring as eggs may continue to hatch for another few weeks, or until swathing. Also, always check the pre-harvest interval (PHI) for your product of choice.

Figure 1: Visual sings of leaf feeding and 1-day old larva. Photo by Cody Wyckoff, K-State

Research and Extension.

Army Cutworms

Army cutworms are again relatively common this year, however, thus far, not nearly as destructive as last year (2020). This could be because infestations are much reduced compared to 2020 - or that growing conditions have been much better than last year for both alfalfa and wheat. However, birds (and/or skunks) feeding in alfalfa or wheat fields are still the easiest way to detect army cutworm larvae.

If you would like to receive Extension Entomology Newsletter, in addition to the eUpdate, you can visit the following website: http://entomology.k-state.edu/extension/newsletter/subscriptionpage.html

You can view past issues of the Extension Entomology Newsletter at: http://entomology.k-state.edu/extension/newsletter/index.html

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8. Commercial applicator training offered in April

Are you an applicator that is still short some hours to renew your 2020 commercial applicator license or just want to get credits to renew this year? If your license expired during the COVID-19 State Disaster Emergency (2020), it shall remain valid until 90 days following the termination of the emergency declaration (date yet to be determined).

The Kansas State Pesticide Safety Program is providing a training opportunity this April for several of the categories to help individuals renew. This training will be offered in a virtual format via Zoom. These will be the only trainings offered by the program this spring. In order to hold the training, we must have at least 20 registered participants.

Training dates and categories:

April 21-22 Right-of-Way, Industrial Weed, and Noxious Weed (7 hours 6, 7C & 9A plus core)

April 28-29 Forestry, Ornamental, Turf and Interiorscape (5 hours 2/3C, 7 hours 3A/3B plus core)

April 30 Ag Plant (7 hours 1A plus core)

Training information is available at https://www.ksre.k-state.edu/pesticides-ipm/commercial-applicator.html or e-mail fmiller@ksu.edu to have the flyer e-mailed to you!

K-STATE Research and Extension | Integrated Pest Management and Pesticide Safety Education

Frannie Miller, Pesticide Safety and IPM Coordinator
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