Issue 834

K-STATE Research and Extension

Extension Agronomy

eUpdate

01/14/2021

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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1. Extension Weed Science launches a new podcast on battling weeds

Are you interested in keeping up with the latest weed management information? If so, you'll want to add the "War Against Weeds" podcast to your weed management toolbox. This podcast is a brand new outreach effort from Sarah Lancaster, K-State Extension Weed Science Specialist, Mandy Bish, Extension Weed Scientist at the University of Missouri, and Joe Ikely, Extension Weed Scientist at North Dakota State.

In the first episode, released this week, the audience will get to "meet" the three hosts of the podcast. All podcast episodes will be posted at https://waragainstweeds.libsyn.com/ and will also be freely available on Spotify, a digital streaming service. Additional ways to access the podcast will be available in the future. The first full length episode will be available the week of January 18 and is titled "Silver Bullets are for Werewolves". Future episodes will feature guests with expertise in a variety of aspects of weed science as we discuss key topics like integrated weed management, herbicide resistance, and others.

We are looking forward to sharing our conversations about current issues in weed management. If you have any feedback, please let us know!

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2. Summer row crop disease summary for Kansas in 2020

Corn diseases

In 2020, disease pressure was generally below the long-term average for corn, largely driven by atypically dry conditions in August and September. An active tropical storm season pushed southern rust (Figure 1) into the state earlier than normal. It was first reported in Kansas on July 15. This arrival was around the same time as last year, which is earlier than historic reports. In northeast and southeast Kansas, southern rust incidence was high but severity on the ear leaf was generally low. This was likely due to lack of adequate leaf surface wetness, which is necessary for infection. Greater loss was observed in central Kansas where moisture was present during grain fill.

Figure 1. Southern rust of corn disease symptoms. Photo: Rodrigo B. Onofre, K-State Research and Extension.

Gray leaf spot was observed in northeast and northwest Kansas, although lit did not reach high levels due to low moisture at critical growth stages. Where gray leaf spot was present, it mainly remained in the lower canopy.

Bacterial leaf streak (*Xanthomonas vasicola* or Xvv) was reported in western Kansas. It was most

common in no-till, continuous corn that was under irrigation. Foliar symptoms can be confused with gray leaf spot. Bacterial leaf streak has been common in Kansas corn production areas since it first showed up in 2016.

Reports of stalk rots were lower than in previous years. There were a few reports of Diplodia and Fusarium ear rot throughout the state. Diplodia ear rot can cause entire ears to appear white and moldy and can result in kernel shrinkage and cracking.

Soybean diseases

In 2020, soybean disease reports were lower than in previous years. In general, very little frogeye leaf spot was reported. In northeast Kansas, sudden death syndrome (Figure 2) was observed, but overall prevalence was low.

Figure 2. Sudden death syndrome symptoms development. Photo: Rodrigo B. Onofre, K-State Research and Extension.

Charcoal rot was severe in some locations, particularly in the central part of the state and was likely due to unseasonable dry weather during critical reproductive stages in August and September. Phytophthora root rot was present in eastern Kansas. This disease has been increasing in importance in recent years, particularly in soils with high clay content and poor drainage. Stem canker, pod and stem blight, and Septoria brown spot were occasionally present, but rarely at yield limiting levels.

Sorghum diseases

The 2020 Kansas sorghum crop disease pressure was low overall. Across the state, leaf diseases were present in very low levels. There were some reports of bacterial leaf streak in northwest Kansas. As usual, sooty stripe was present across the state, and levels were high in north-central Kansas (Figure 3). Drought conditions late in the season led to increased presence of stalk rots. Overall, stalk rot conditions were lower than in previous years.

Figure 3. Sooty stripe of sorghum. Photo: Rodrigo B. Onofre, K-State Research and Extension.

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Doug Jardine, Emeritus Plant Pathologist

3. Look back at Kansas weather for each month of 2020

This article from our team of scientists at the Kansas Mesonet and the Weather Data Library offers a short month-by-month summary of the weather across Kansas in 2020. Looking back serves as a reminder of how variable the weather can be across the different regions of Kansas. Climate and weather is the driver behind many agricultural management decisions. The Kansas Mesonet and the Kansas Weather Data Library offers many resources and tools to help make the best decisions possible when dealing with the ever-changing Kansas weather.

January

Mild and wet were the characteristics of January 2020. Despite the overall warmer-than-normal pattern, winter weather was an important feature for the month. There were significant travel issues due to freezing fog and freezing rain on almost a weekly basis. Statewide average precipitation was 1.67 inches, 17th wettest in 126 years. Two locations set 24-hour precipitation records for January: White City, with 1.14 inches on the 11th and Liberal with 1.42 inches on the 28th. Liberal also set a 24-hour snowfall record for January with 10.5 inches on the 24th.

Figure 1. Freezing fog. Photo by Mary Knapp, K-State Research and Extension.

February

A Valentine Day storm was one of the highlights of the month. The storm began on the 12th and continued through the 14th, bringing snow and freezing rain across much of the state. Relatively mild temperatures were displaced by a vigorous Artic front. In Manhattan, the high for the 13th was 34°F and the low was 3°F. On the 14th, the high was just 16°F.

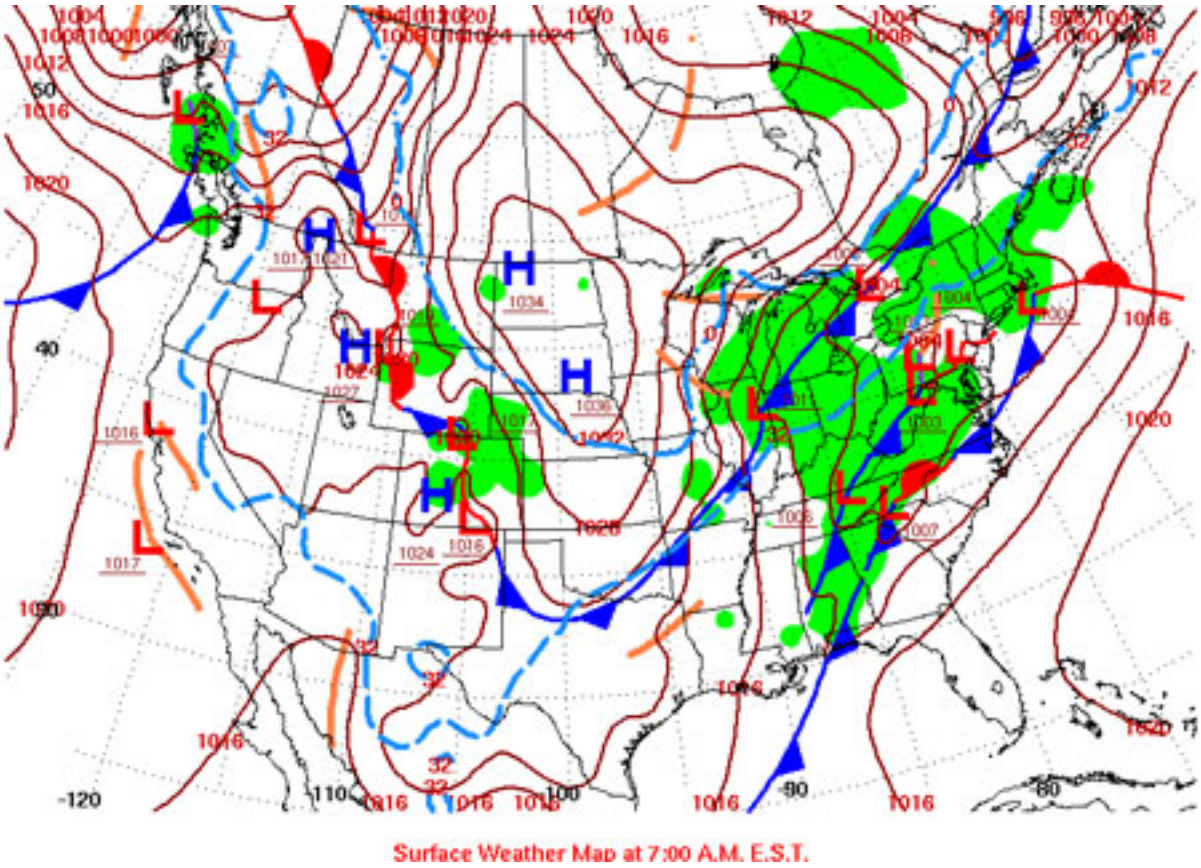

Figure 2. Surface weather map for February 13, 2020 (NOAA).

March

Hail events are not always dominated by large hailstones. While there were some large stones in the March 30th event in western KS, the most notable feature was a large swath of small stones near Wallace, KS. The swath was so large that it was visible from satellite. At ground level, the stones covered the highway and had to be plowed – similar to a winter snow event.

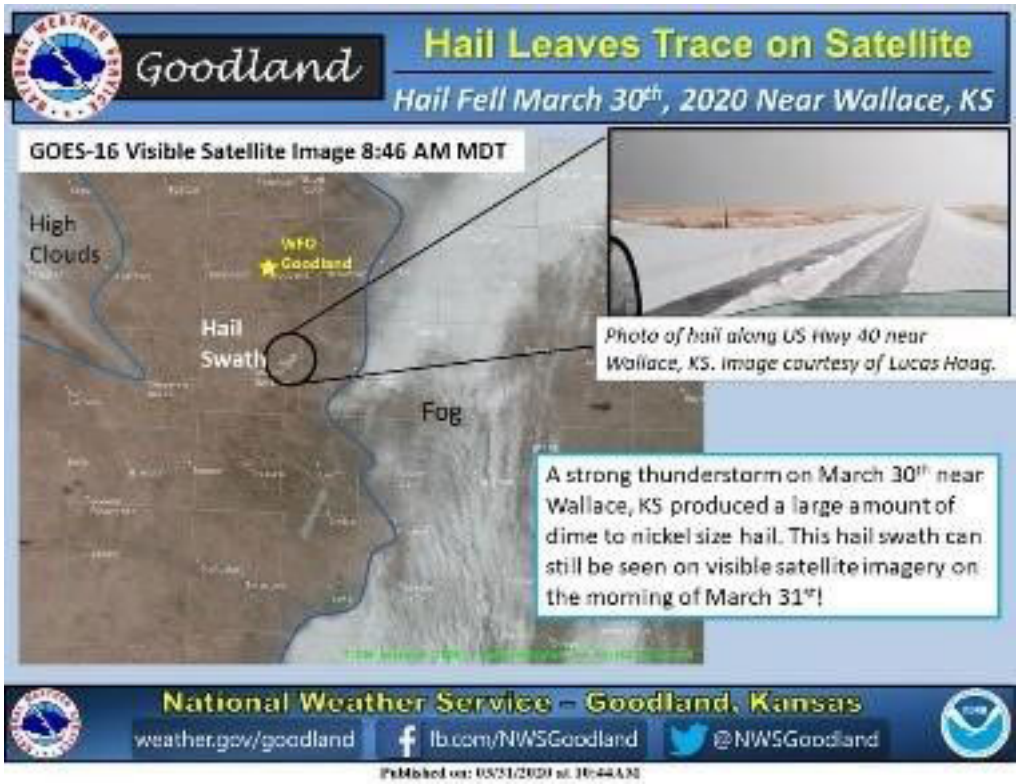

Figure 3. Satellite image of a hail swatch near Wallace, KS. Source: NWS, Goodland

April

Freezing temperatures are not unexpected in April. However, the cold temperatures observed during the week of April 13-17, 2020 were particularly unwelcome. Mild temperatures in the first three months of the year meant that winter wheat had emerged from dormancy. Areas where the wheat had begun to head were particularly vulnerable to damage as the low temperatures dipped into the 20s. Actual losses that can be attributed to the event are difficult to determine, given all the other challenges the crop faced this season.

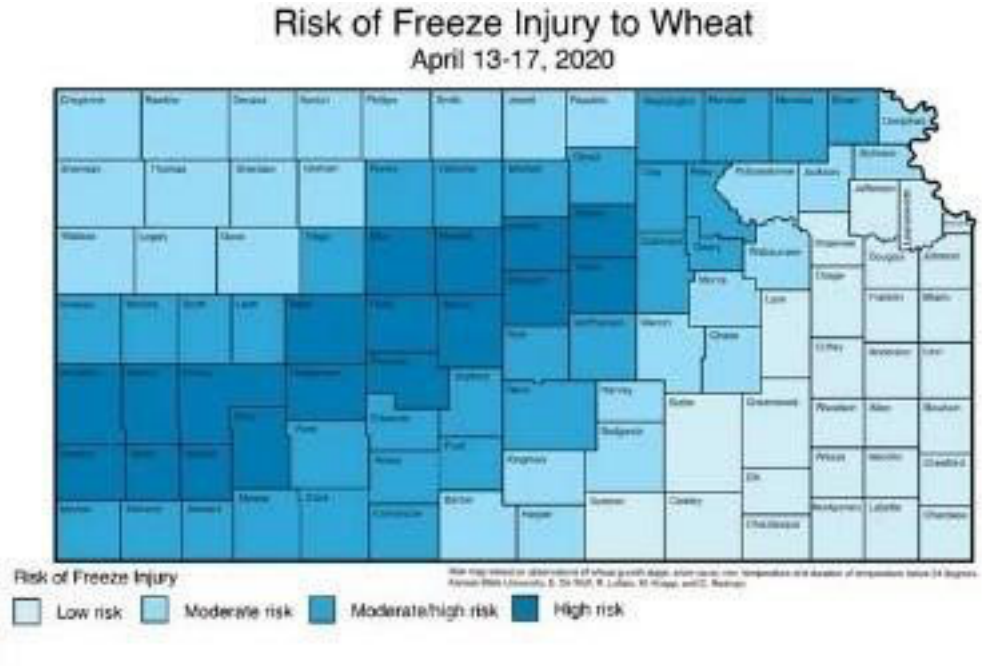

Figure 4. Freeze injury risk to wheat during April 13-17, 2020. Map by Romulo Lollato, K-State Research and Extension.

May

A split rainfall pattern divided the state in May. The western divisions received very little precipitation. In contrast, the Southeast Division had the 17th wettest May in the 126-year record (since 1895). This added to the already wet start to the year, with 2020 ranking as the 3rd wettest. The continued moisture, following the wet years of 2018 and 2019 meant continuing problems with flooding and planting in the spring.

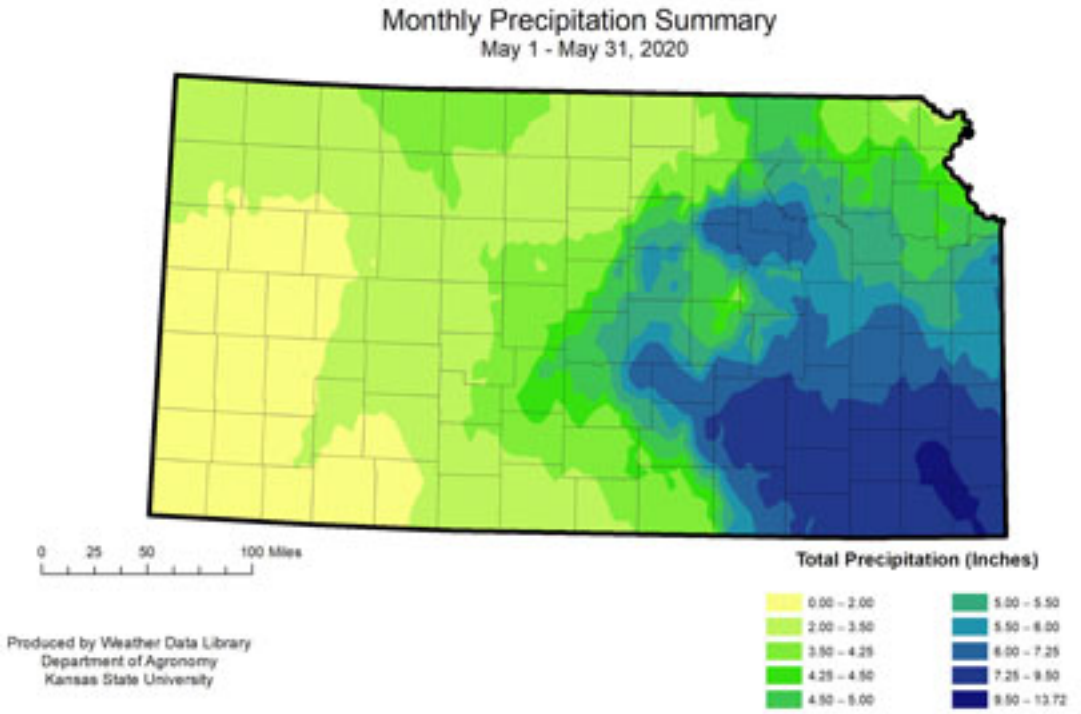

Figure 5. Rainfall summary for May 2020 (Weather Data Library).

June

June was hot and dry across the state. It ranked as the 17th warmest and 25th driest June since available instrument records (since 1875 or 126 years). The temperatures were driven by warm overnights, many of which set records and an early month heat wave. Statewide there were 19 new daily record high temperatures. In contrast, there were 48 new record warm minimum temperatures.

Figure 6. Rolled corn in response to water/heat stress. Photo by Ignacio Ciampitti, K-State Research and Extension.

July

During a relatively quiet storm season, July 11th will stand out. On that day, thunderstorms started along the KS/NE border and marched south to OK. Golf ball to grapefruit size hail was reported along the way. By the end of the event, 49 severe hail reports were recorded in Northeast Kansas. A severe hailstone is one that is greater than 1 inch in diameter. The largest stone had a measured diameter of 4.5 inches.

Figure 7. Hail damage from an event on July 11, 2020. Photo by JT VanGilder.

August

August marked the beginning of a downward trend for precipitation for much of the state. This drought reached full capacity in November with as much as 69% of the state in drought. While drought continues for many parts of the state at the end of the year, this was a poorly timed drought for crops. Late maturity corn/sorghum struggled especially in the southwest. In addition, poor soil moisture availability for the winter wheat establishment led to variable stands going into overwintering with overall performance rated poor.

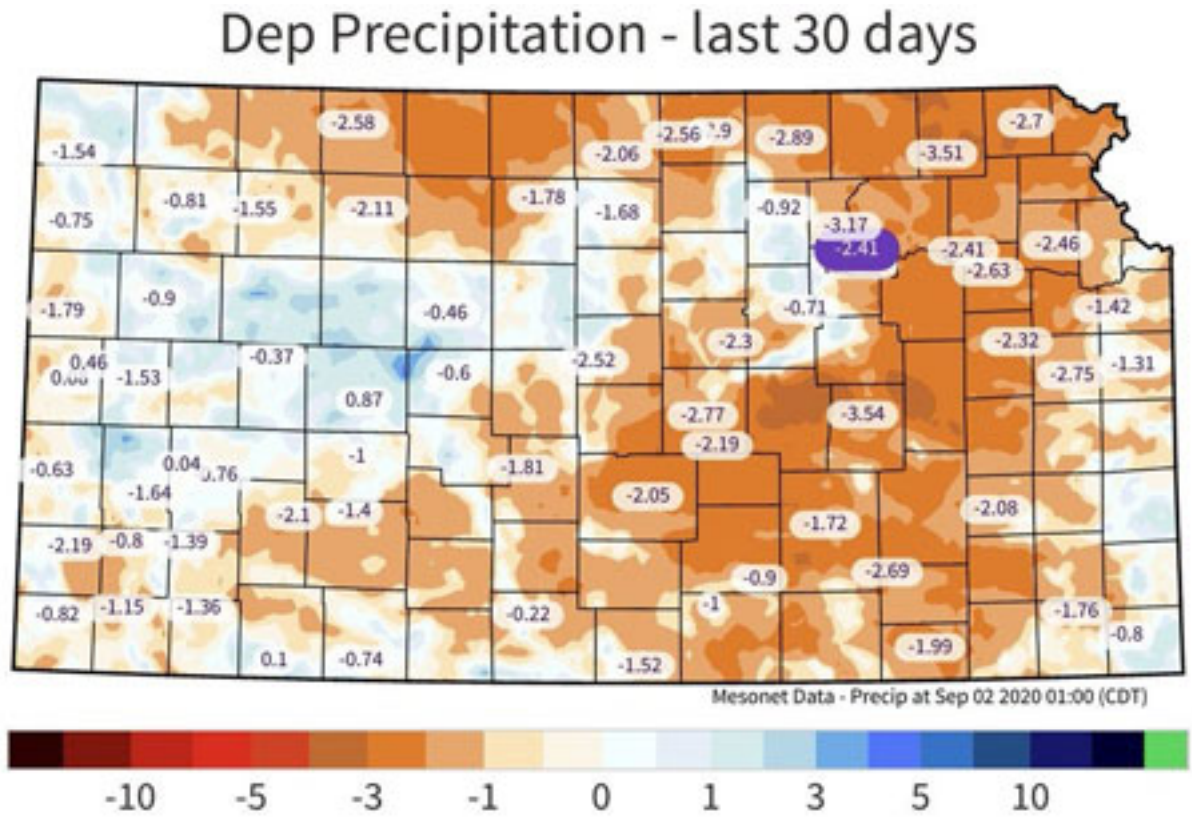

Figure 8. Departure from normal precipitation for August 2020 (KS Mesonet).

September

A potent storm system provided much needed rain to portions of central/east Kansas but also much below normal temperatures and even snow to northwest Kansas. Temperatures set record lows at several locations with as much as nine hours spent below freezing – critical for immature corn/sorghum crops. This was the earliest freeze on record for some locations as well. The next period of freezing temperatures wasn't observed until the end of the month.

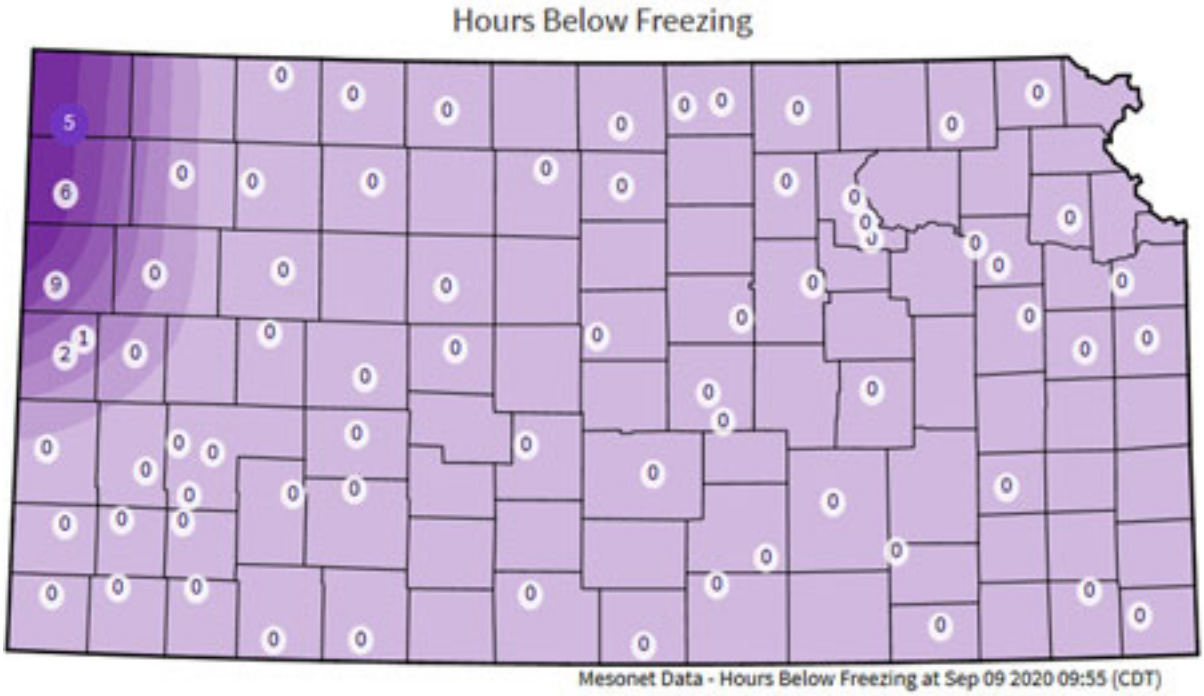

Figure 9. Hours below freezing on September 9 (KS Mesonet).

October

Dry conditions dominated the month, with the only significant moisture arriving with a strong cold front at the end of the month. That front brought a rapid switch from highs above 90 to lows below zero in a 48-hour period. Twenty-nine locations set October daily snowfall records. The southeast saw the first frost of the season, accompanied by freezing rain.

Figure 10. Ice on the Mesonet station, Howard14NW. Photo by R. Mai.

November

Strong winds and warmer temperatures were headliners. Several strong wind events associated with vigorous cold fronts produced widespread 55-60mph winds (7th and 14th). In addition, severe thunderstorms in south central Kansas produced damage and 70mph winds on the 24th. Temperatures for the month were well above average with many record high temperatures broken on the 4th.

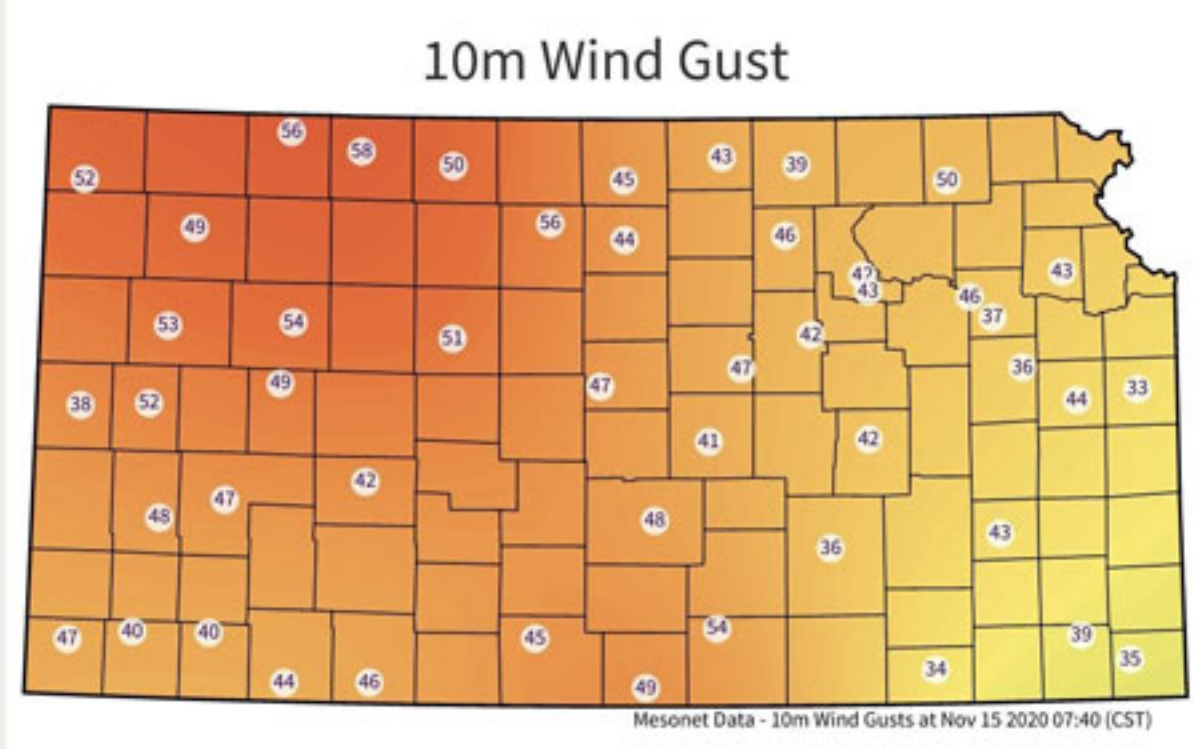

Figure 11. Strong winds recorded by Mesonet stations on November 14, 2020 (KS Mesonet).

December

Dual southern Kansas snowstorms occurred in early December (3rd and 12th). Both dropped significant amounts of heavy wet snow with highest totals of 12-14" in Meade Co with 5-6" in surrounding areas per storm. Some areas near Ashland saw over 24" of snow total. A final, weaker system dropped another widespread 2-3" across much of the same regions on the 15th.

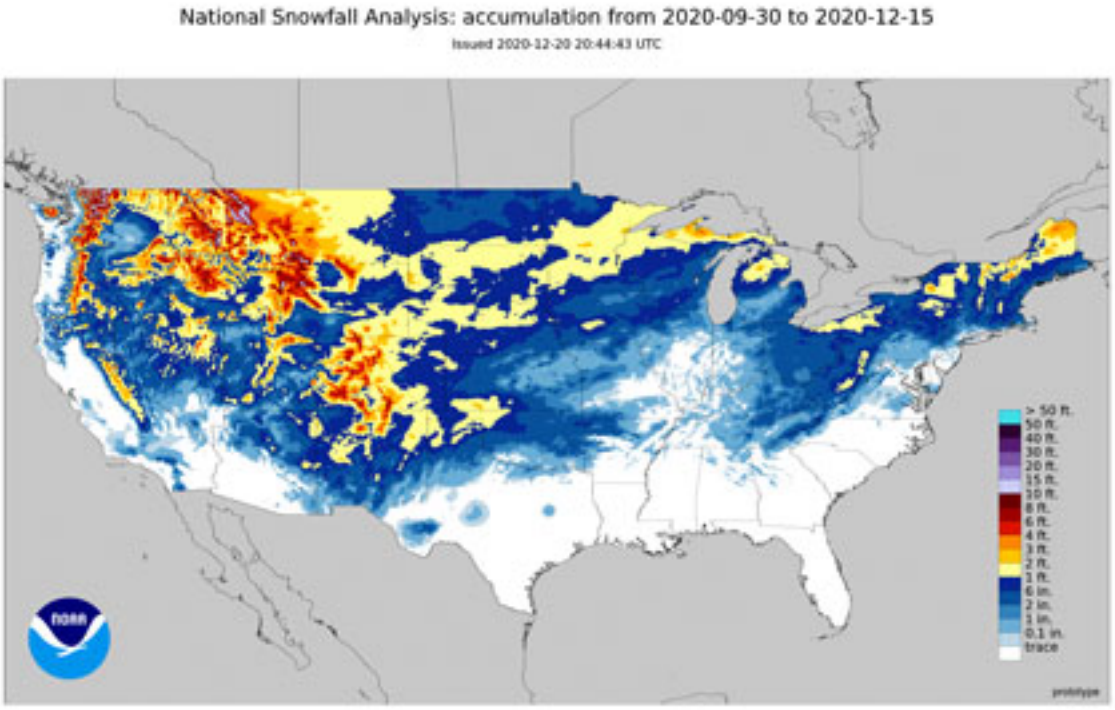

Figure 12. Seasonal snow accumulation ending on Dec. 15 with over 2 feet of snow in Meade County. (NOAA).

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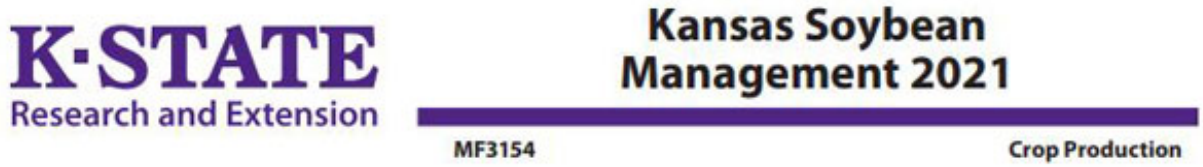
4. Two new soybean publications are available online

Two K-State Research and Extension publications dealing with soybean production have been released online. The first is the *Kansas Soybean Management* (MF3154) revised for 2021. Each publication is discussed briefly below with links.



This publication offers advice to producers, crop consultants, and agronomists to help manage Kansas soybean crops as efficiently and profitably as possible. Recommendations provide guidelines and must be tailored to the diverse conditions found in cropping systems across the state.

Visit the KSRE Bookstore to view and download this publication:
https://bookstore.ksre.ksu.edu/pubs/MF3154.pdf

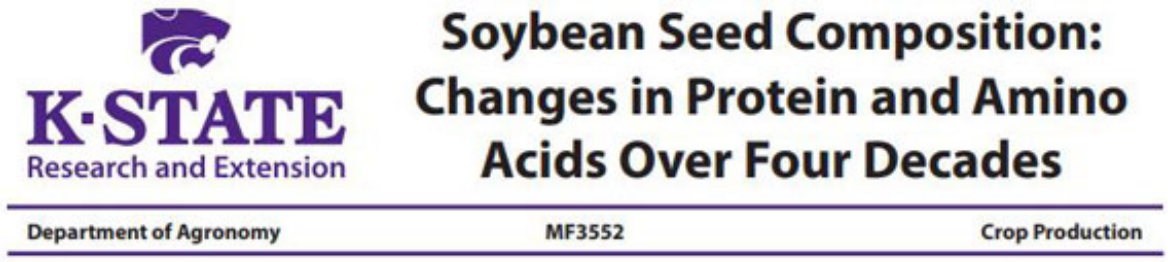
This comprehensive guide is written specifically for Kansas and includes valuable, up-to-date information on:

- Tillage and rotations
- Variety selection
- Planting practices
- Trend on yield and seed protein concentration over time
- Seed quality management and potential uses
- Tillering (New section for 2021)
- Weed management
- Fertilizer requirements
- Diseases
- Insects
- Irrigation

Contributors to the 2021 version of this publication include:

Ignacio Ciampitti, Crop Production and Cropping Systems
Andre Froes De Borja Reis, Crop Production and Cropping Systems
Sarah Lancaster, Weed Management
Dorivar Ruiz Diaz, Soil Fertility and Nutrient Management
Jonathan Aguilar, Bio and Ag Engineering – Irrigation
Doug Jardine, Plant Pathology
Rodrigo Onofre, Plant Pathology
Stu Duncan, Area Agronomist
Jeff Whitworth, Entomology

The second is a brand new publication, *Soybean Seed Composition: Changes in Protein and Amino Acids Over Four Decades* (MF3552).



Soybeans are a major protein source and provide 70% of global plant-based protein meal for animal feed. Soybean meal quality is defined by seed protein concentration and the relative composition of essential and nonessential amino acids. Many years of breeding efforts have increased soybean yield potential. However, yield improvements have been linked to a reduction of seed protein concentration (Figure 1).

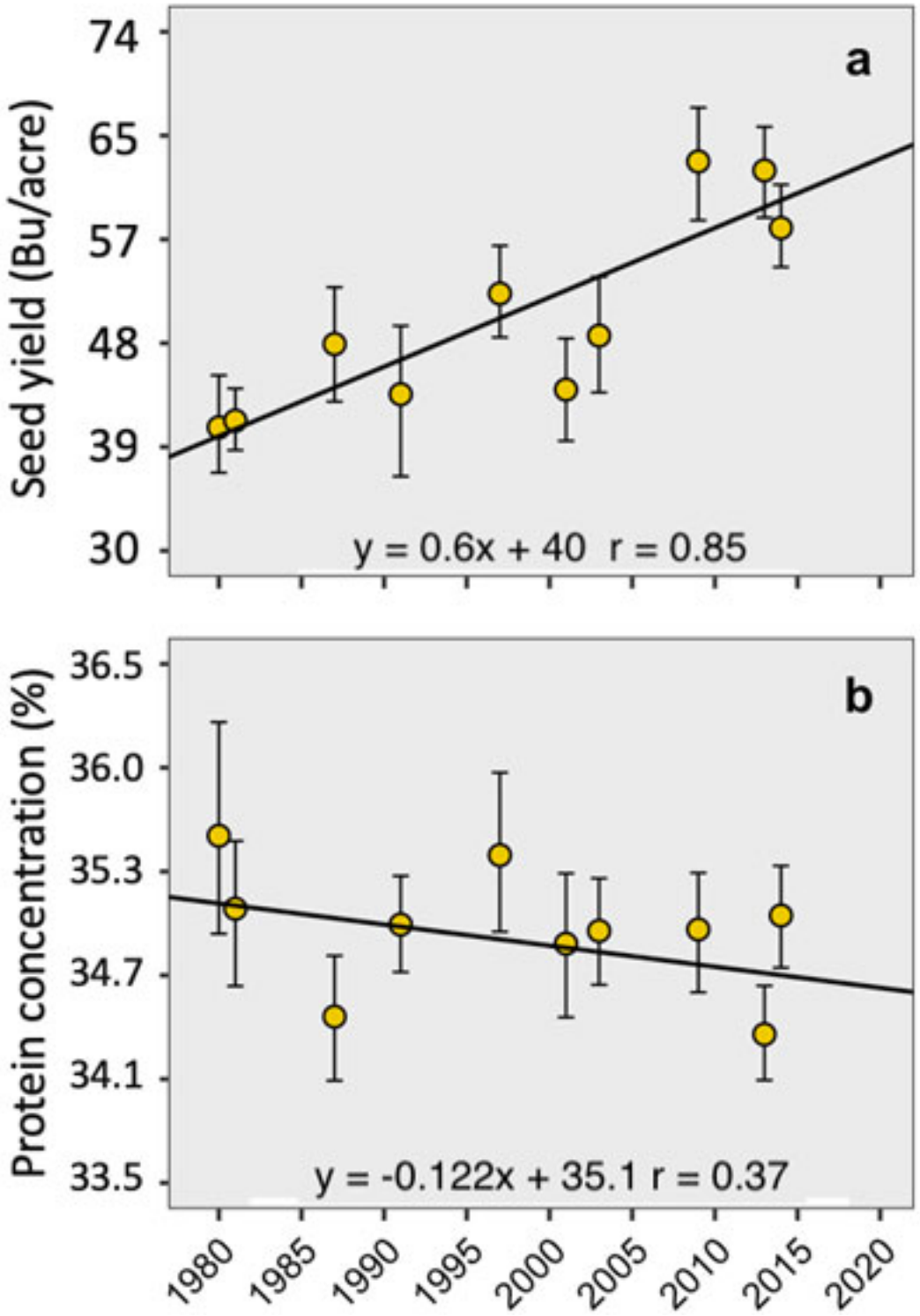


Figure 1. Relationship between seed yield (a) or protein concentration (b) with the year of release of varieties from 1980 to 2014. From MF3552, Ciampitti et al., 2021)

This publication discusses how soybean varieties released over the last four decades have displayed a yield increase linked to a reduction in protein concentration and why future progress in yield should not overlook seed nutritional value (see below figure, relationship for yield and protein concentration over the last four decades).

This publication is available online at: https://bookstore.ksre.ksu.edu/pubs/MF3552.pdf

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Seth Naeve, Soybean Agronomist – University of Minnesota

Andre F.B. Reis, Post-doctoral researcher – K-State Agronomy Dept.

Luiz Rosso, Graduate student – K-State Agronomy Dept.

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5. 2021 Kansas Corn School webinar series

Kansas Corn is partnering with K-State Research and Extension to offer winter learning sessions for Kansas corn farmers. Due to COVID-19 concerns, the Kansas Corn Management Schools will be held virtually in a series of three webinars. Each webinar will start at 7 p.m. and include two presentations with a question-and-answer session. Participants will have the opportunity to hear the latest research and production information and hear updates on markets and corn policy issues. These sessions are free for farmers to attend.

Webinar dates and presentations:

- **Thursday, January 21, 2021**
  - Nutrient Management Considerations for Corn in 2021, Dr. Dorivar Ruiz Diaz, K-State
  - Management Practices in Corn, Dr. Ignacio Ciampitti, K-State
- **Thursday, Feb. 4, 2021**
  - Weed Control, Dr. Sara Lancaster, K-State
  - Planter Technology—Lessons Learned for Corn, Dr. Ajay Sharda, K-State
- **Thursday, Feb. 11, 2021**
  - Markets and Futures Prices, Dr. Dan O'Brien, K-State
  - KCGA Policy Achievements and Ambitions – Josh Roe, Kansas Corn

"Despite today's current challenges with COVID, participating online provides an opportunity for corn farmers to learn the latest research findings on key topics and what challenges to watch out for in agronomy, markets, and policy," said Kansas Corn V.P. of Market Development and Policy Josh Roe.

"The schools will cover a number of issues facing corn producers including nutrient management, management practices, weed control, planter technology, markets, and policy. These events have a long-standing tradition and reputation in offering a solid set of topics of great relevancy to our corn growers in Kansas," said Ignacio Ciampitti, associate professor in the K-State Department of Agronomy.

The webinars are offered at free for growers thanks to support from premier sponsor Pioneer Seeds, and supporting sponsor Compass Minerals. Participants are asked to pre-register online to receive the information and links to the webinar.

Get more information and register online at kscorn.com/cornschool or by phone by calling Kansas Corn at 785-410-5009.

6. North Central Experiment Field Winter Update - January 27

Save the date to attend the virtual North Central Experiment Field Winter Update on January 27 from 11:00 am to 1:00 pm via Zoom. Meet the new Agronomist-in-Charge, Scott Dooley, as he discusses current research at the North Central Experiment field. The update will also feature presentations by Extension Weed Science Specialist, Sarah Lancaster, and Wheat Specialist, Romulo Lollato. There will be time after each presentation for questions from the online attendees.

The event is free to attend. Please register online at www.rivervalley.k-state.edu/upcoming_meetings.html. After registering, a Zoom link will be sent to the email address provided. Contact Scott Dooley at 785-706-8450 or sjdooely@ksu.edu with any questions.

North Central Experiment Field Winter Update

January 27, 2021
11:00 AM – 1:00 PM
via Zoom

Join us for an update on activities at the North Central Field. Meet Scott Dooley, the new Agronomist-in-Charge, as well as listen to presentations by Sarah Lancaster, Extension Weed Management, and Romulo Lollato, Wheat Extension Specialist.

Please register at: www.rivervalley.k-state.edu/upcoming_meetings.html

After registration a Zoom link will be sent to the email address provided. Contact Scott Dooley at 785-706-8450 or sjdooley@ksu.edu with any questions.

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Scott Dooley, Agronomist-in-Charge, North Central Experiment Field
sjdooley@ksu.edu

7. Cover Your Acres Winter Conference goes virtual on January 19

K-State Research and Extension will host the 18th annual Cover Your Acres Winter Conference for crop producers and consultants on January 19 from 1:00 to 5:00 pm (CST) in an online format.

Cover Your Acres is a producer-driven meeting focused on new ideas and research-based updates in crop production in northwest Kansas and the central High Plains region.

The conference, which typically draws more than 400 attendees from Kansas and other states, highlights the latest technology, methods, and conservation practices to improve crop production in the region. This year it will feature a shorter, half-day format with university specialists discussing the following topics:

- **Water Use of Weeds in Dryland Systems**,
  Jourdan Bell, Texas A&M Panhandle Agronomist, Amarillo
- **Current Weed Control Research in Western Kansas**
  Vipan Kumar, Weed Scientist, K-State Ag Research Center, Hays
- **Managing the Highs and Lows of Soil pH**
  Dorivar Ruiz Diaz, Soil Fertility Specialist, K-State Dept. of Agronomy, Manhattan
- **Economics of Dryland Rotations and Tillage Systems**
  Lucas Haag, Area Agronomist, K-State Northwest Research-Extension Center, Colby
- **New Frontiers in Sorghum Weed Control**
  Sarah Lancaster, Weed Management Specialist, K-State Dept. of Agronomy, Manhattan

The sessions will be streamed live via Zoom and YouTube from 1:00 to 5:00 pm CST. Attendees will be able to submit questions on those platforms and via email. Additionally, locations have been established where attendees can participate in the conference while taking appropriate COVID precautions:

- Finney County – Fairgrounds, Grandstands Meeting Room
- Scott County – Fairgrounds, Wm. Carpenter 4-H Building

Additional locations are likely to be added, please check the conference website for updates.

There is no charge for the conference thanks to our sponsors, however **attendees do need to register** regardless if they are participating at the own home/office or at one of the watch locations.

To view the conference details and for online registration, visit www.northwest.ksu.edu/coveryouracres. For questions, call 785-462-6281.

Premier sponsors of this year's conference include American Ag Labs, Hoxie Implement, Bayer Crop Science, Lang Diesel, National Sunflower Association, AKRS Equipment Solutions, and SureFire Ag Systems. CCA credits have been applied for.

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