Extension Agronomy

eUpdate

05/15/2020

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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The most critical planting practices affecting yields in sorghum are: row spacing, row arrangement, seeding rate/plant population, planting date, and hybrid maturity.

Sorghum plants can compensate and adjust to diverse environmental conditions through modifications in the number of tillers, head size, and final seed weight. For sorghum, the final number of seeds per head is the plant component that varies the most; and thus has more room for adjustment than the other plant components (seed weight and number of tillers).

Seeding rate / plant populations

Sorghum population recommendations range from a desired stand of 23,000 to more than 100,000 plants per acre depending on annual rainfall Table 1:

Table 1. Grain sorghum recommended seeding rate, plant population and row spacing at different average annual rainfall.
Source: https://www.bookstore.ksre.ksu.edu/pubs/MF3046.pdf

Avg. Annual Rainfall (inches)	Seeding rate (x 1,000 seeds/acre)*	Recommended Plant Population (x 1,000 plants/acre)	Within-row Seed Spacing (65% emergence)		
			10-inch rows	20-inch rows	30-inch rows
< 20	30-35	23-27	21-18	10-9	7-6
20 to 26	35-64	25-45	18-10	9-5	6-3
26 to 32	50-80	35-55	13-8	6-4	4-3
> 32	70-125	50-90	9-5	4-2	3-2
Irrigated	110-150	80-110	5-4	3-2	2-1

* Assuming 65% field emergence.

Because of sorghum's ability to respond to the environment, final stands can vary at least 25 percent from the values listed above, depending on expected growing conditions, without significantly affecting yields. Lower seeding rates minimize risk of crop failure in dry environments. Sorghum can compensate for good growing conditions by adding tillers and adjusting head size, but yields can be reduced in a dry year if populations are too high. For a high-yielding environment (>150 bu/acre), under narrow rows, high plant populations can be a critical factor for improving sorghum yields.

Higher seeding rates also should be used when planting late. Increase rates by 15-20 percent if planting in late-June or later. Late planting will restrict the time that sorghum plants will have in the season for producing productive tillers, thus decreasing the plants' ability to compensate for inadequate stands.

Recent research in Kansas has confirmed these long-term recommendations. In these studies, sorghum yields were maximized at 25,000 plants per acre (optimum between 20,000 to 30,000 plants per acre) in western Kansas at 17 inches annual precipitation; 40,000 in central Kansas at 30 inches annual precipitation; and 50,000 in eastern Kansas at 32 inches annual precipitation. For western Kansas, final stands of about 20,000 to 30,000 plants per acre can attain yields of 60 to 80 bushels per acre or more. For central and eastern Kansas, final stands of 50,000 to 70,000 plants per acre can maximize yields, with the final objective of having 1 to 1.5 heads per plant.

Having more than the recommended number of plants per acre results in fewer fertile and productive tillers and thinner stems, which will reduce yield in the drier environments and increase susceptibility to drought. On the other side, thin stands can compensate for better-than-expected growing conditions somewhat by producing more and/or larger heads. However, under high-yielding environments, a higher final plant population will be needed to increase yields as much as possible (Table 1).

Planting date

A summary of research data performed in the last several years has confirmed that the optimum planting date for maximizing yields will be around early June (Figure 1). Still, the decision related to the optimum planting date should be timed so plants have the best possible chance of avoiding hot, dry weather at the flowering stage, but can still have sufficient time to mature before the first frost.

Planting date has some effect on seeding rates. Sorghum will tiller more readily in cool temperatures and less readily under warm conditions. As a result, later plantings in warmer weather should be on the high side of the recommended range of seeding rates for each environment since there will be less tillering. The potential for greater tillering with earlier planting dates makes sorghum yields more stable when planted in May and early June compared to late June or July plantings.

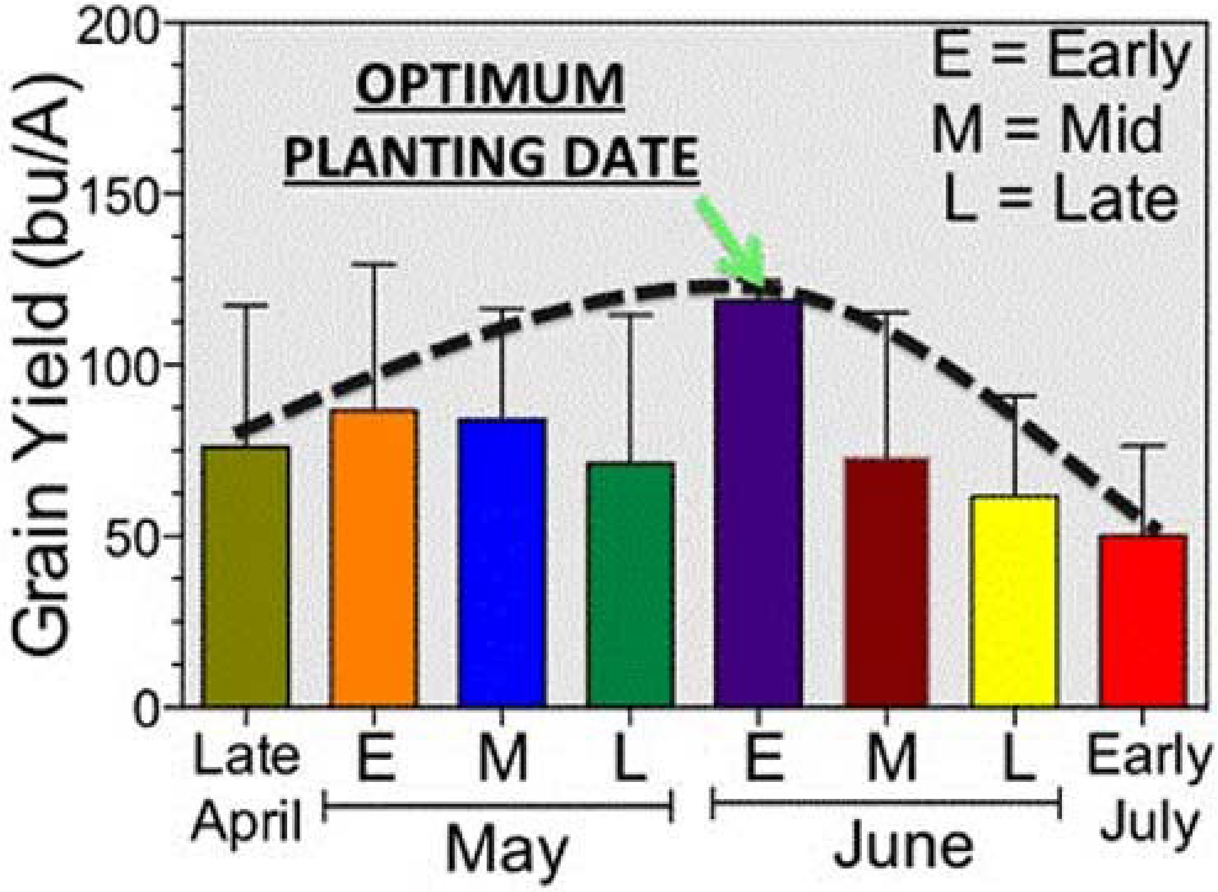

Figure 1. Planting date effect on final sorghum yields (Tribune/ Hutchinson/ Manhattan, Vanderlip; Scandia 1994-96, Gordon; St. John 1993-95, Martin and Vanderlip; Columbus 2000/03, Kelley). From Sorghum: State of the Art and Future Perspectives**, Agronomy Monographs 58, 2016, chapter "Genotype × Environment × Management Interactions: US Sorghum Cropping Systems" doi:10.2134/agronmonogr58.2014.0067, Ignacio A. Ciampitti and P.V.V. Prasad (Eds).**

Planting depth

Seed placement is also a critical factor when planting sorghum. Optimum seed placement for sorghum is about 1-2 inches deep. Shallower or deeper planting depths can affect the time between planting and emergence, affecting early-season plant uniformity. We recently conducted a planting depth study, using late planting (about mid-June) under uniform soil temperatures and three seed placements – shallow, 0.5 inch; optimum, 1.5 inches; and deep, 3 inches. Optimum and deep placement resulted in similar shoot growth while shallower placement resulted in delayed development with fewer number of leaves and less total shoot mass (Figure 2).

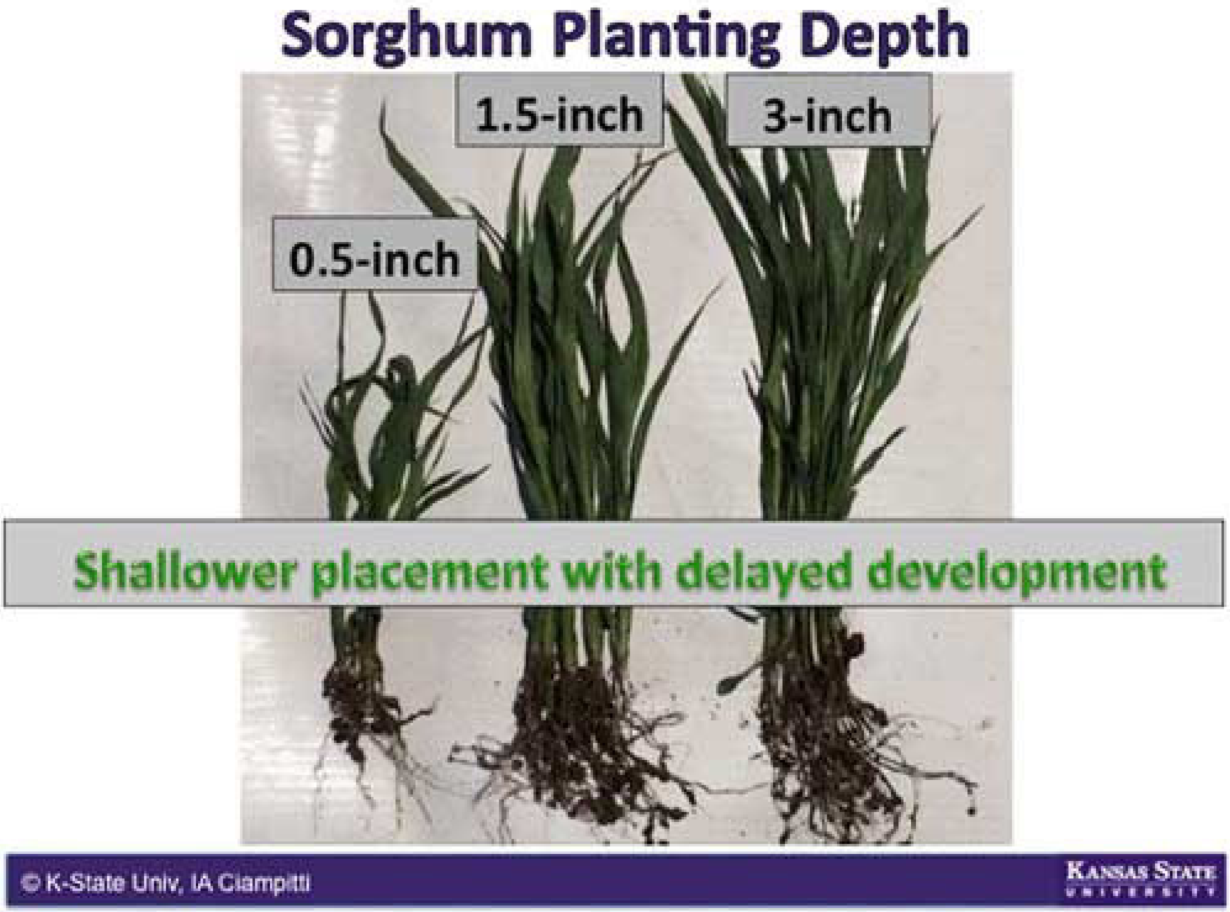

Figure 2. Seed placement effect on early sorghum growth and development, Manhattan, 2014 (Ciampitti et al., 2014).

Row spacing

The other factor that can influence yield is row spacing. The last three columns in Table 1 show that plant spacing within the row becomes greater as row spacing decreases. This greater intra-row plant spacing reduces plant-plant competition early in the growing season when head number and head size are being determined.

A response to narrow row spacing is expected under superior growing environments, when water is a non-limiting factor. Narrow rows increase early light interception, provide faster canopy closure, reduce evaporation losses, can improve suppression of late-emerging weeds (a major issue in sorghum), and maximize yields.

The influence of row spacing on sorghum yield has not been entirely consistent in K-State tests. In a summary of experiments conducted in Kansas, the comparison between wide (30-inch) vs. narrow (15-inch) row spacing shows a close relationship, with an overall yield benefit of 4 bushels per acre with narrow rows. In addition, narrow rows out yielded wide rows in 71 percent of all observations evaluated (Figure 3).

A more consistent response to narrow rows was documented when yields were above 70 bushels per acre, with a greater chance of having higher yields when using narrow rows. In summary, the potential for a positive yield response to narrow rows is greatest in high-yielding environments, but the response is not always consistent. Under low-yielding environments, conventional (30-inch) wide row spacing is the best alternative.

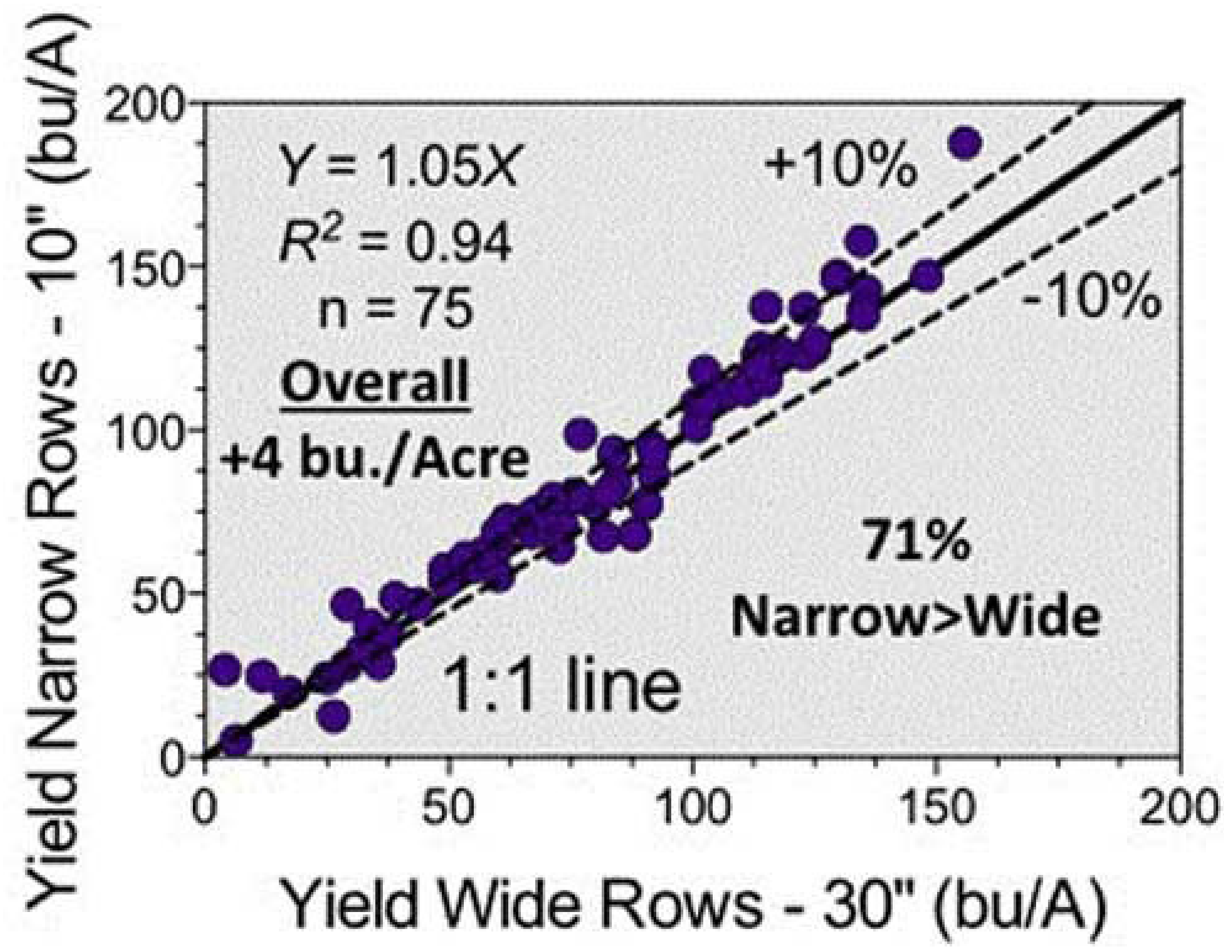

Figure 3. Yield in narrow rows versus yield in wide rows. From a total number of 75 observations, 71% had a greater yield in narrow as compared to wide row spacing.

Should populations be adjusted with narrow rows?

Research results indicate that the population producing the greatest yield doesn't change with different row spacing, but the magnitude of response to population potentially can be greater with narrower row spacing in high-yielding environments.

Planting date seems to have an interaction with row spacing. Over three years at the North Central Experiment Field, there was essentially no difference in yield between 15- and 30-inch rows for late-May plantings, but there was a 10-bushel yield advantage for 15-inch rows for late June plantings. A similar response was observed at Manhattan in 2009 when no difference in row spacing was observed for the May planting, but 10-inch rows had an 11-bushel/acre yield advantage over 30-inch rows with the June planting. The opposite response was seen at Hutchinson in 2009 where narrow rows had a 6 bushel/acre yield advantage with a May planting date, but wide rows had a 6 bushel/acre yield advantage with a June planting date. In all cases, yields were less with the June planting, but the June plantings at Belleville and Manhattan averaged more than 115 bushels/acre, while yields at Hutchinson were less than 92 bushels/acre.

Hybrid selection

The selection of sorghum hybrids should be based not only on maturity, but also on other traits such as resistance to pests, stalk strength, head exsertion, seeding vigor, and overall performance. The selection of a sorghum hybrid based on its maturity should be strictly related to the planting date, expected duration of the growing season, and the probability the hybrid will mature before the first freeze event. Shorter-season hybrids might be a better fit for late planting dates (mid-June to July depending on the regions); while a longer-season hybrid is recommended when planting time is early and the duration of the growing season is maximized.

For the summary of planting date information in Figure 1, hybrid maturity showed a very complex pattern across the diverse locations. Overall, longer-season hybrids showed a better yield at the mid-May planting time, but yields were less than 100 bushels per acre. For medium- and short-season hybrids, the early June planting date produced yields of more than 100 bushels per acre. The goal is to plant a hybrid maturity at each particular site/environment (weather and soil type) so the plants can bloom in favorable conditions, and have adequate grain fill duration before the first fall freeze occurs.

Summary

- Determine your desired population based on average rainfall and expected growing conditions. There is no need to go overboard.
- Make sure you plant enough seed for your desired plant population. About 65-70 percent field germination is a good general rule to use.
- Think about using narrower row spacing to close the canopy sooner and potentially capture greater yields in yield environments of 70 bushels per acre or more.
- Planting data and hybrid selection are tied together and are related to the conditions experienced by sorghum plants during the late summer. Think about this before deciding your planting time and selecting a hybrid.

Suggested Resources from K-State Research and Extension

"Kansas Sorghum Management" – MF3046 https://bookstore.ksre.ksu.edu/pubs/MF3046.pdf

"Narrow-row Grain Sorghum Production in Kansas" – MF2388
https://bookstore.ksre.ksu.edu/pubs/MF2388.pdf

"Sorghum Growth and Development" poster - https://bookstore.ksre.ksu.edu/pubs/MF3234.pdf

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2. Assessing and managing freeze-damaged alfalfa

The hard freezes during the week of April 13-17 could have impacted some alfalfa stands. If so, producers will have to decide how to manage their stands in the coming weeks.

Figure 1. Freeze-damaged alfalfa in Smith County, taken April 20, 2020. Photo by Romulo Lollato, Extension Wheat and Forage Specialist, K-State Research and Extension.

Figure 2. Close-up of freeze-damaged alfalfa. The apical meristems have been killed on some stems. These plants are not tall enough to cut or shred. Regrowth from the crown should begin as soon as it warms up. Photo by Romulo Lollato, Extension Wheat and Forage Specialist, K-State Research and Extension.

Assessing freeze damage to alfalfa

Assessing alfalfa for freeze damage is a two-step process, including an evaluation of the shoots and roots.

Step 1. Analyze the aboveground portion of the plants. Alfalfa plants that are producing several well distributed (symmetrical all around the plant) new shoots are likely healthy and did not suffer freeze damage. If the new shoots are only produced asymmetrically (in one side of the plant rather than all around) and very sparsely, then this plant likely suffered some level of freeze damage and its yield might be compromised. Plants that are not producing any new shoots and/or have been pushed out of the ground (sometimes, frost heaves can uproot alfalfa crowns) might have been killed by the freeze. To decide whether to maintain a field, try to estimate which percent of the plants are healthy, which percent are asymmetrical, and which percent are dead. Ideally an alfalfa stand would have at least about 40 stems per square foot.

Step 2: Evaluate the crown roots of different plants in the field. A healthy root will have an offwhite potato-like color with minimum amount of root rot, and will be turgid. Injured roots have a grey coloration and look water-soaked at first, and they will look dehydrated and with a brown tint to it after the water leaves the root. If more than 50% of the root is blackened, the plant will likely die sometime during that year.

Managing freeze damaged alfalfa

In established stands, the growing point is at the top of each stem, and is protected within a cluster of leaves. The leaves may have freeze damage, but the growing point might not be affected. If it is cold enough for a long period, the growing point may also be killed by freezing temperatures. In the photo, many of the terminal buds are frozen and they have a bleached appearance.

No action is needed if new growth begins emerging from the tips of the stems, or if the plant begins branching out below the tips. In both cases, the new growth means the growing points were unaffected and the plants are recovering. If new shoots are emerging from the crown buds, however, there will be very little regrowth from the damaged stems. In much of Kansas there wasn't enough topgrowth to cut or graze before the freeze, but that is an option, if there is enough growth for it to be worthwhile before the new growth gets tall enough to be damaged by the mowing. Do not cut or damage new regrowth from the crown buds. That could severely damage the stand.

If there is no regrowth occurring at all after 7-10 days of warm weather and the plants are severely wilted without recovery, mow or shred the plants to encourage new regrowth from the crown buds. If you plan to shred or cut the damaged stands, be sure to leave at least 2-3 inches of stubble. This will help encourage regrowth.

Freeze-damaged alfalfa that is only 6-8 inches tall or less will be slower to regrow after mowing or shredding than taller alfalfa because alfalfa plants are depleting carbohydrate reserves from the roots during the first 6-8 inches of growth. With slower regrowth, producers will have to watch especially closely for insect infestations and treat if necessary. Alfalfa taller than 8 inches will have manufactured a new supply of carbohydrate reserves for the root and crown, and will be able to regrow more quickly after mowing or shredding.

Insect control

At this point of the year, alfalfa weevil larvae have pretty much developed to the pupal stage or have already pupated into adults. There are a few larvae around but most have developed into adults and these adults will feed on stems, especially under windrows. This adult feeding is called "barking" and can slow regrowth. After the windrows are picked up, these adults can disperse around the field where they can feed a little, until temperatures get into the 80's, at which time they leave the fields for over-summering sites.

Pea aphids have and are rebounding from the weevil treatments and/or the freeze events. However, they are more of a cool weather pest. Hopefully, the return of warmer weather (in the 80's) and the remaining beneficial insects will control any aphids so they don't buildup into field-wide populations that cause concern. Scouting should continue for weevils and aphids even if an effective insecticide application has already been made. If an insecticide has already been applied, pay attention to the label for the pre-harvest interval (PHI) and number of applications allowed per cutting for the product used.

Disease considerations

As previously mentioned, freeze damage to alfalfa stands several weeks back may have caused significant damage to root systems. Typically, large, uniform patches of damage within a field are not primarily a result of disease. That being said, damaged roots may be more susceptible to secondary infections by root and crown-rot pathogens such as *Fusarium* and *Phytophthora spp.*, which may contribute to decline. Freeze damage may also worsen existing below-ground infections. Splitting tap roots is the best way to identify below-ground disease symptoms.

As a reminder, the Plant Disease Diagnostic Clinic is still accepting samples. More information on sample submission can be found on the clinic website (https://www.plantpath.k-state.edu/extension/diagnostic-lab/) and you can contact the clinic directly with questions (clinic@ksu.edu).

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3. Wheat disease update for Kansas - May 15, 2020

Stripe Rust

As wheat this week in Kansas ranges from Feekes 9 (flag leaf fully emerged) to Feekes 10.5 (full head emergence and flowering), stripe rust continues to be reported. New observations were made in north central Kansas in Jewell, McPherson, Mitchell, Ottawa, and Harper counties (Figure 1). Although incidence (the number of infected plants) and severity (how bad the infection was on each infected plant) were low in fields that were scouted in this region, lesions were found on the upper leaves (Figure 2). Infected upper leaves are most likely to result in yield loss. It is important to remember that there is a lag between when new leaves are infected and when they start to show symptoms. The severity of symptoms is dependent on weather conditions, and favors temperatures between 50-60° F with high humidity (for more information see: https://bookstore.ksre.ksu.edu/pubs/EP167.pdf). We are currently in the window to make a fungicide application to control stripe rust.

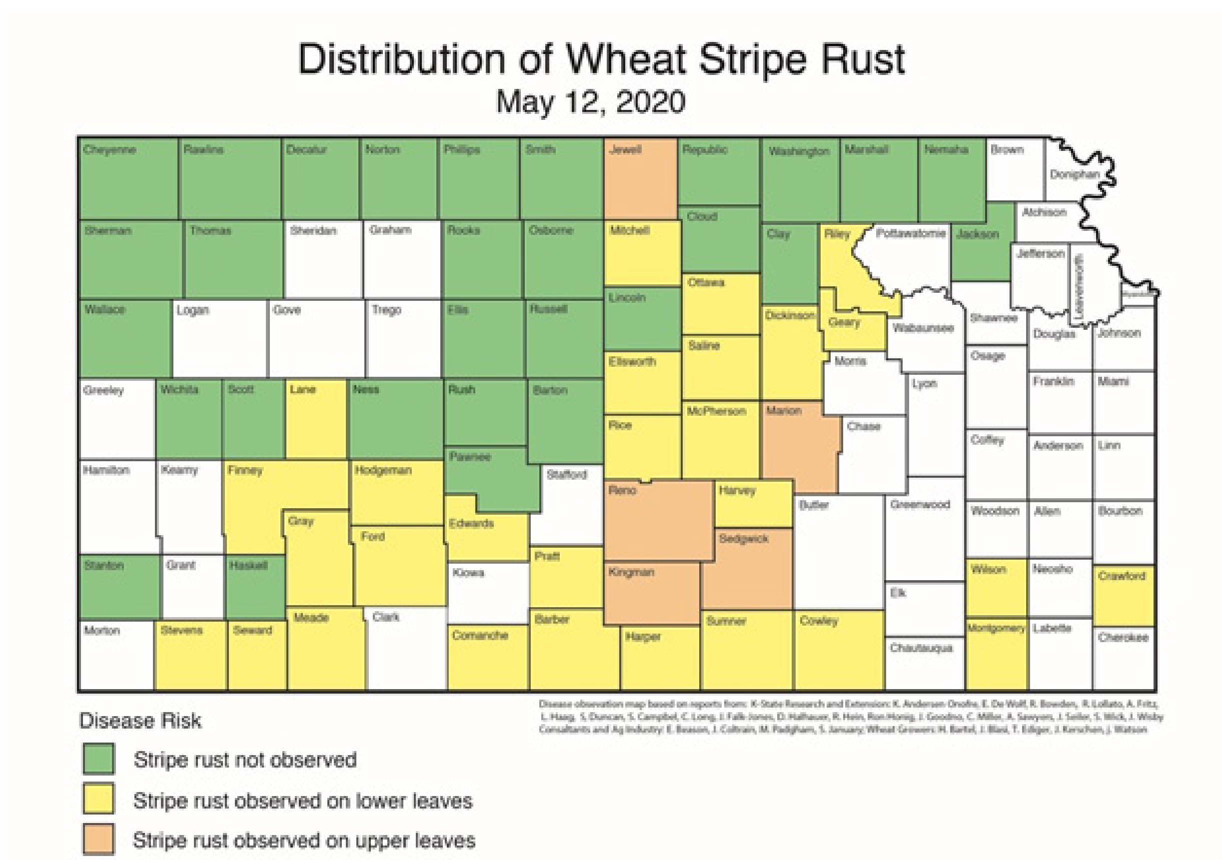

Figure 1. Distribution of stripe rust in Kansas as of May 15, 2020. Map is based on observations of K-State Research and Extension, crop consultants, and wheat producers in the state. Map created by Kelsey Andersen Onofre and Erick DeWolf, K-State Research and Extension.

Figure 2. Low levels of stripe rust found in a commercial field in Jewell County on May 14, 2020. Photo by K. Andersen Onofre, K-State Research and Extension.

Wheat streak mosaic virus

There have also been several reports of wheat streak mosaic virus (Figure 3), mostly in the central and western portions of the state. It is important to remember that fungicide will not provide any control for viral infections. Even for the highly trained eye, it can be difficult to differentiate symptoms of wheat viruses. Wheat streak mosaic virus symptoms can be easily confused with other viruses, such as barley yellow dwarf virus. Multiple viruses can also be present in the same plant, which can make yield loss worse.

Figure 3. Plants infected with characteristic symptoms of wheat streak mosaic virus in north central Kansas. Photos by K. Andersen Onofre, K-State Research and Extension.

Plant Disease Diagnostic Lab

If you would like confirmation of viral diseases in your wheat field, remember that K-State's disease diagnostic lab is still accepting samples! We wanted to share some key reminders for wheat sample submission:

- Because of COVID-19, U.S. Postal Service (USPS) deliveries have been delayed. When shipping wheat samples this may mean that samples are greatly degraded by the time they reach us.
- Instead of USPS, we recommend shipping samples with **UPS (United Parcel Service),** when possible, to the following address:

KSU Plant Disease Diagnostic Lab
1310A Westloop Pl #351
Manhattan, KS 66502

- Wheat samples are best when the full plant is removed from the ground (including roots), soil is removed as much as possible, samples are placed in gallon zip-lock bags, and then into a box or shipping envelope.
- For wheat viruses, it is particularly important to mention the variety of the sample.
- Please note that the lab typically processes virus samples on Wednesday afternoons, so virus samples should be sent early in the week for the quickest turnaround time.

Complete information can be found on the Plant Disease Diagnostic Clinic's website (https://www.plantpath.k-state.edu/extension/diagnostic-lab/) and the diagnostic lab can be contacted by email at clinic@ksu.edu for additional information.

Loose smut

While scouting fields throughout the state, we continue to run into loose smut (Figure 4). As a reminder, infected heads will infect surrounding plants during flowering. This will lead to more infected plants next season if seed is saved. Loose smut can be reduced by purchasing certified seed or by applying a fungicide seed treatment.

Figure 4. Loose smut in a commercial field in north central Kansas. Photo by K. Andersen Onofre, K-State Research and Extension.

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4. Soil temperatures continue a roller coaster pattern in early May

Extension Agronomy has been continually monitoring the roller coaster ride of soil and air temperatures during April and May. For this week (May 7-13), the minimum soil temperature at 2 inches ranged from 45 °F in north central Kansas to 65 °F in the southwest. Temperatures at the 4-inch depth are not much different. Weekly average soil temperatures at the 4-inch depth ranged from 53 °F in the northeast to 77 °F in southwest Kansas (Figure 1).

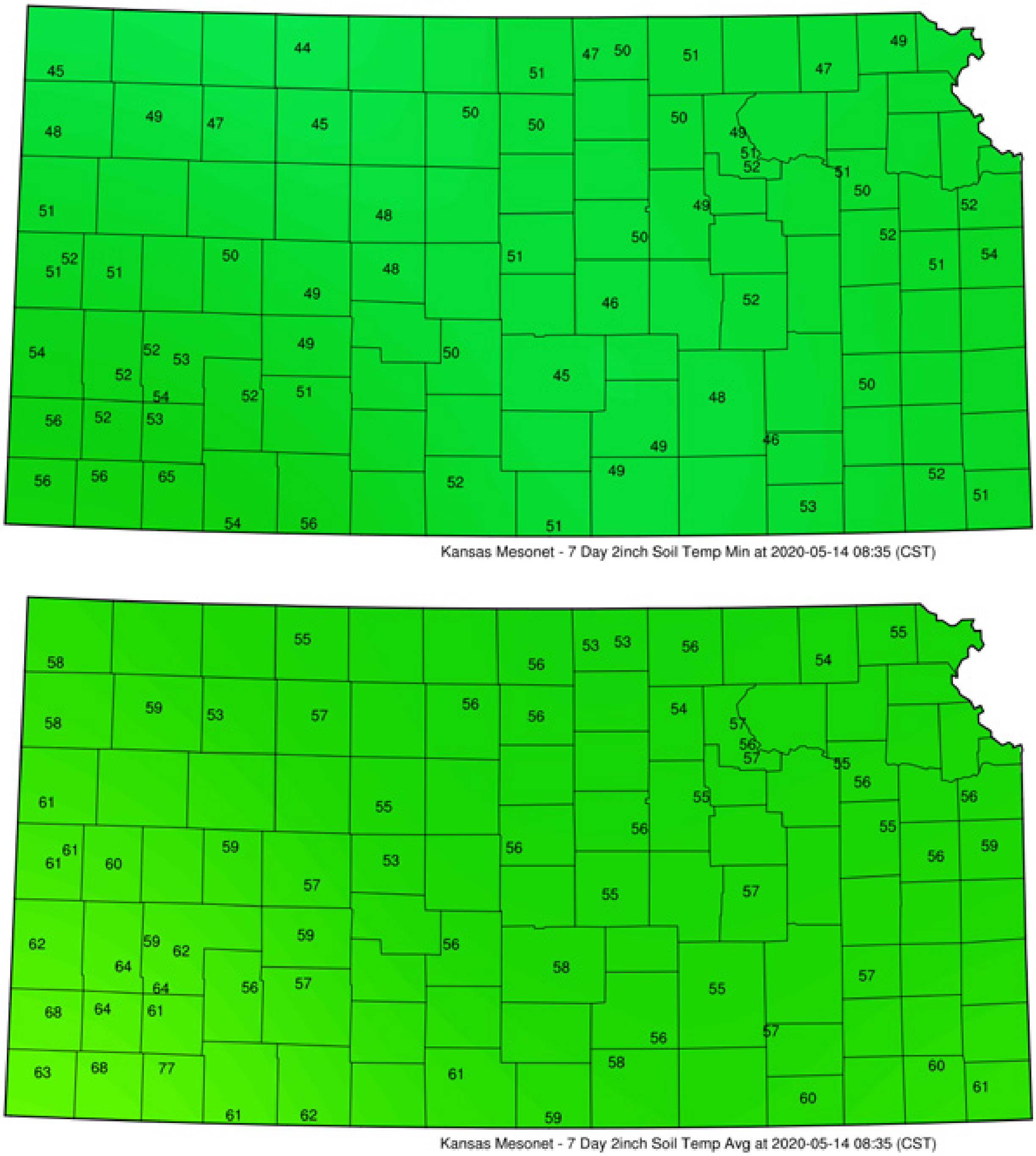
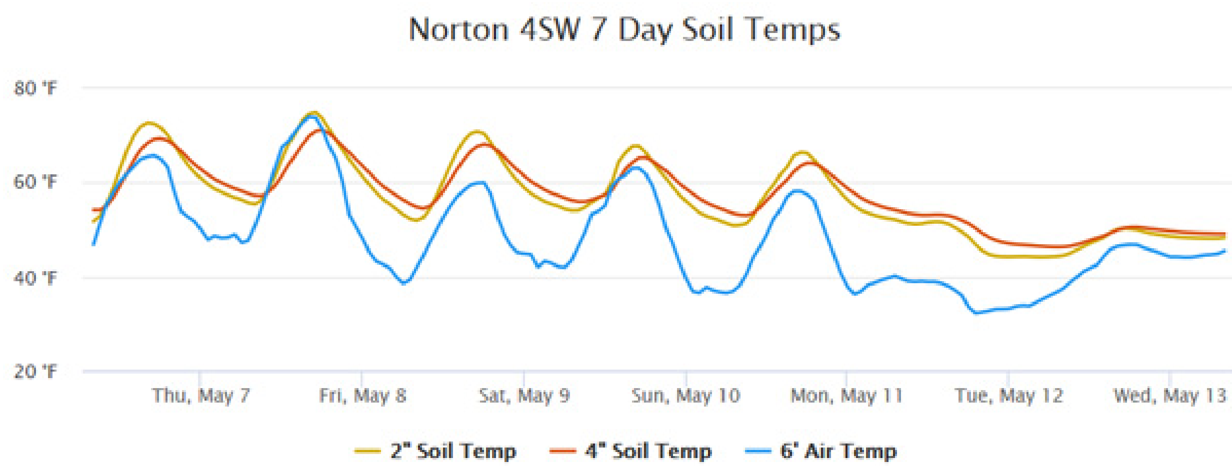
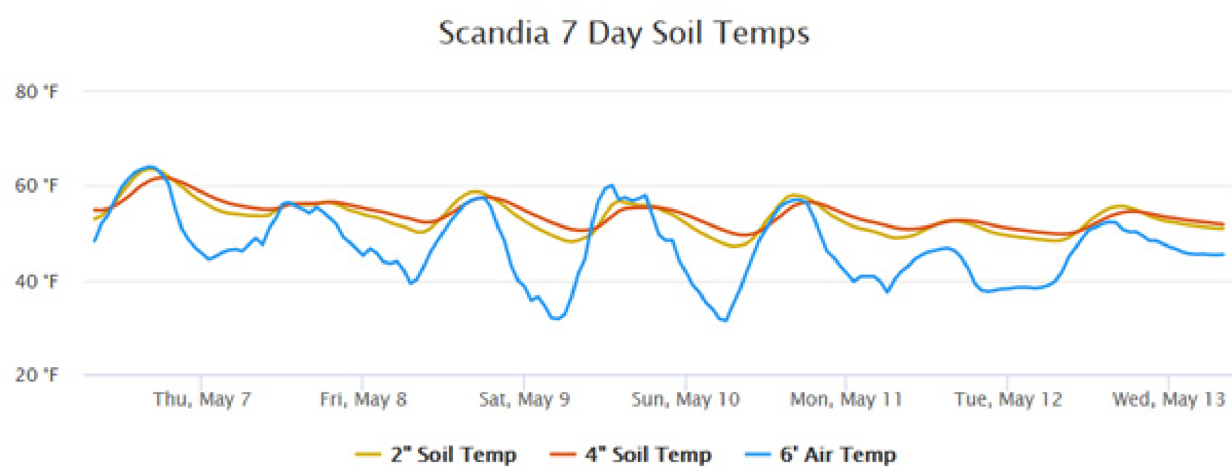
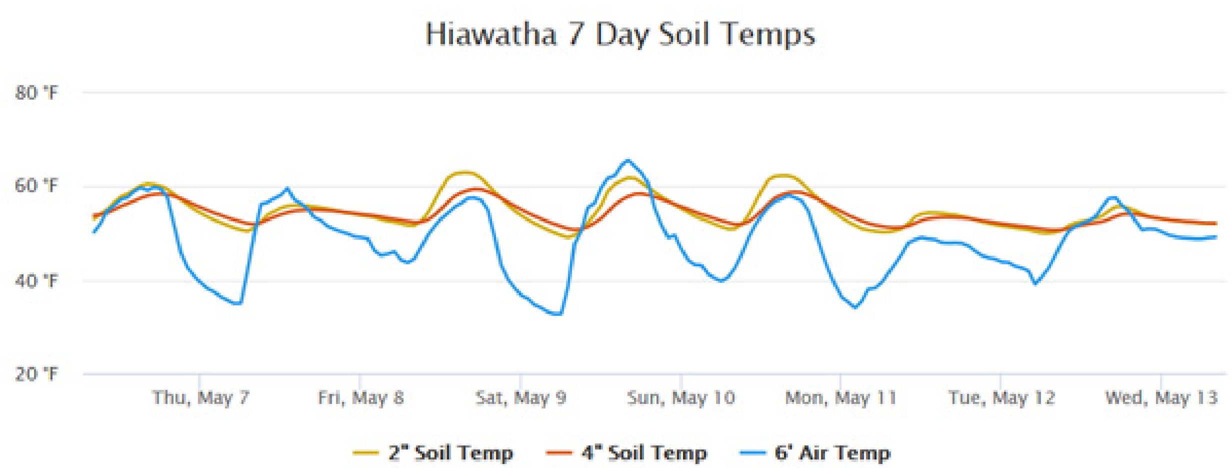


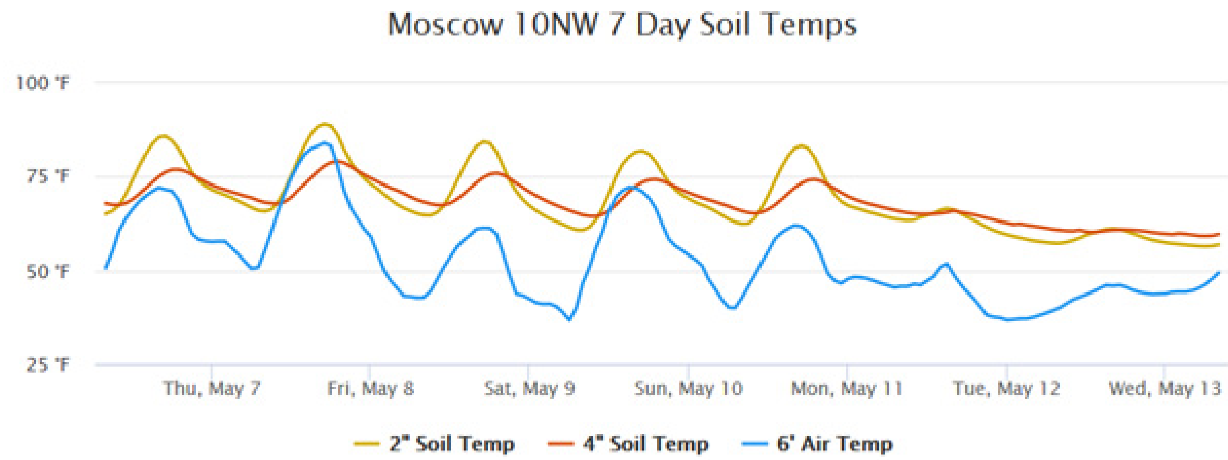
Figure 1. Minimum soil temperatures at 2-inch (upper panel) and 4-inch (lower panel) soil

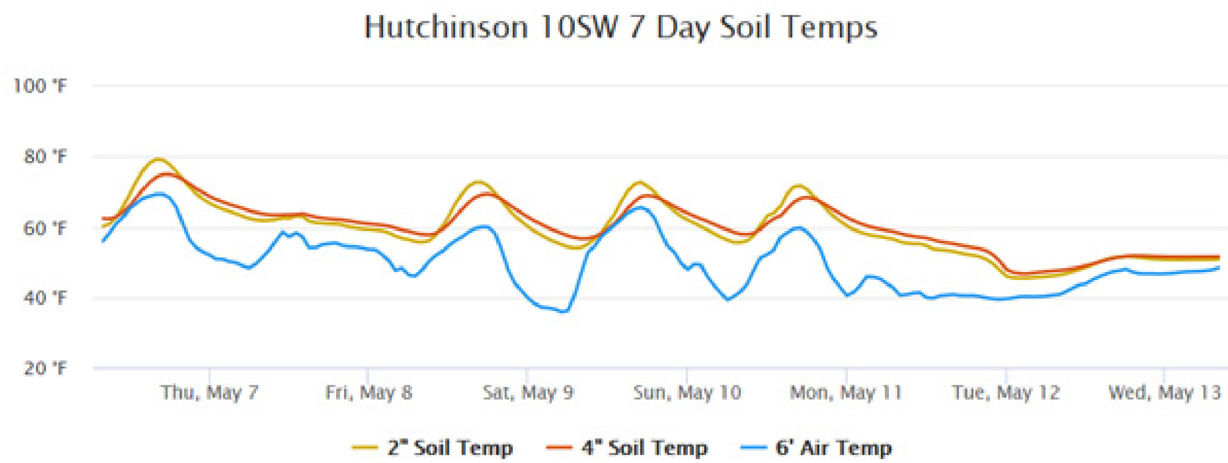
depth for the week ending May 13, 2020.











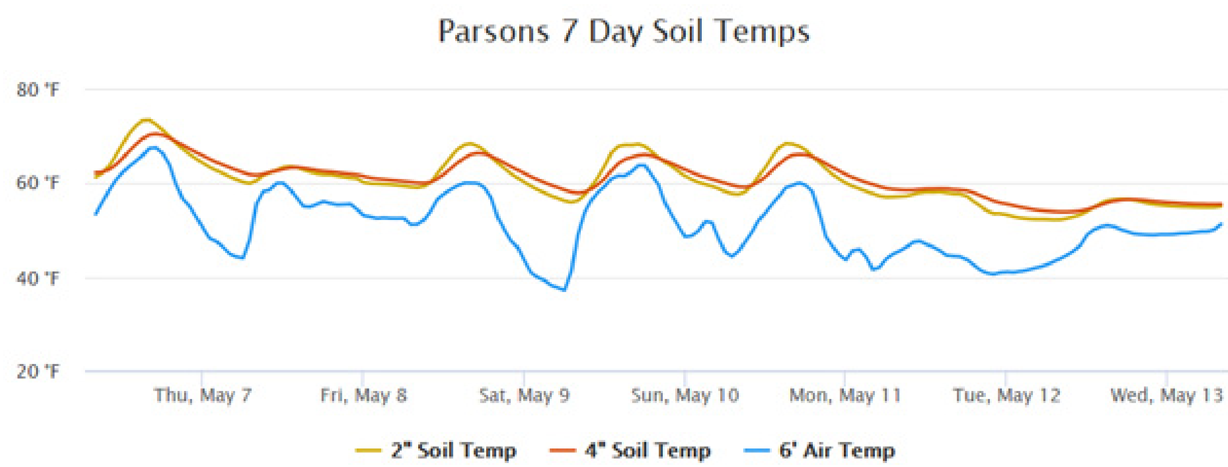


Figure 2. Soil temperatures and air temperature patterns at various Mesonet stations for the week ending May 13, 2020.

Chilling injury to seeds and emerged plants

Cold temperatures can result in injury to the germinating seed as it is absorbing moisture – a problem called imbibitional chilling injury. Damage to germinating seeds can occur when soil temperatures remain at or below 50 °F after planting.

Soil temperatures at the 4-inch depth during the first 24-72 hours after planting are critical. It is during this window that the kernels imbibe water and begin the germination process. Kernels naturally swell when hydrating – taking in water. Injury symptoms may include swollen kernels that fail to germinate or aborted growth of the radicle and/or coleoptile after germination has begun.

Chilling injury to seedlings can result in:

- Reduced plant metabolism and vigor, potentially causing stunting or death of the seminal roots
- Deformed elongation ("corkscrewing") of the mesocotyl
- Leaf burn
- Delayed or complete failure of emergence, often leafing out underground

Chilled seedlings may also be more sensitive to herbicides and seedling blights.

Before making any decisions, fields should be scouted 4-7 days after the cold occurred since the extent of the damage and potential for new growth will be evident during this time.

Comparing chilling injury for soybeans versus corn, emerged soybeans are more susceptible since their growing point is above the soil surface. However, soybeans plants can recovery from freezing injury from growth in the potential growing points from the main shoot or from the two axillary buds.

Warmer weather is expected in the next week. The rapid switch in temperatures will increase stress, particularly in drier areas of the state. Stay tuned!

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5. World of Weeds: Palmer amaranth

This month's article discusses one of the most problematic weeds in Kansas, Palmer amaranth, also called carelessweed.

Ecology of Palmer amaranth

Palmer amaranth (*Amaranthus palmeri*) is native to the American southwest. In recent years, it has spread across much of the United States and become an aggressive weed. Palmer amaranth is an annual plant that grows up to six feet tall or more. It has alternate, hairless leaves (the first true leaves are opposite; Figure 1). Mature leaves are distinctly egg-shaped, but younger leaves may be more oblong (similar to waterhemp). Palmer amaranth petioles are usually longer than the leaf (Figure 2). Palmer amaranth is a very diverse species. Some biotypes have a dark watermark on the upper leaf surface, some have a tiny hair in the notch at the tip of the leaf.

Figure 1. Examples of Palmer amaranth seedlings. Top photo taken by Dallas Peterson, K-State Research and Extension. Bottom photo credit: Bruce Ackley.

Figure 2. Leaf demonstrating petiole length of Palmer amaranth. Photo credit: Ross Recker

Palmer amaranth features are very diverse, due in part that it is a dioecious species, meaning male and female flowers grow on separate plants (Figure 3). Female flowers must be pollinated by wind-blown pollen, which can come from up to 1000 feet away. In addition, Palmer amaranth can hybridize with waterhemp and smooth pigweed, albeit at low rates.

Figure 3. Example of the diversity of Palmer amaranth within the same field. Photo by Dallas Peterson, K-State Research and Extension.

A single Palmer amaranth plant can produce over 500,000 seeds if it emerges early (Figure 4). If it emerges later, after July, a single plant can produce up to 80,000 seeds. Palmer amaranth seeds are small, dark brown, and shiny (Figure 5). Palmer amaranth seed has relatively low rates of dormancy. Eighty percent or more of seeds in the upper ½ of the soil will germinate quickly once moisture and temperature are favorable.

Figure 4. Palmer amaranth seed head. Photo credit: Howard Schwartz

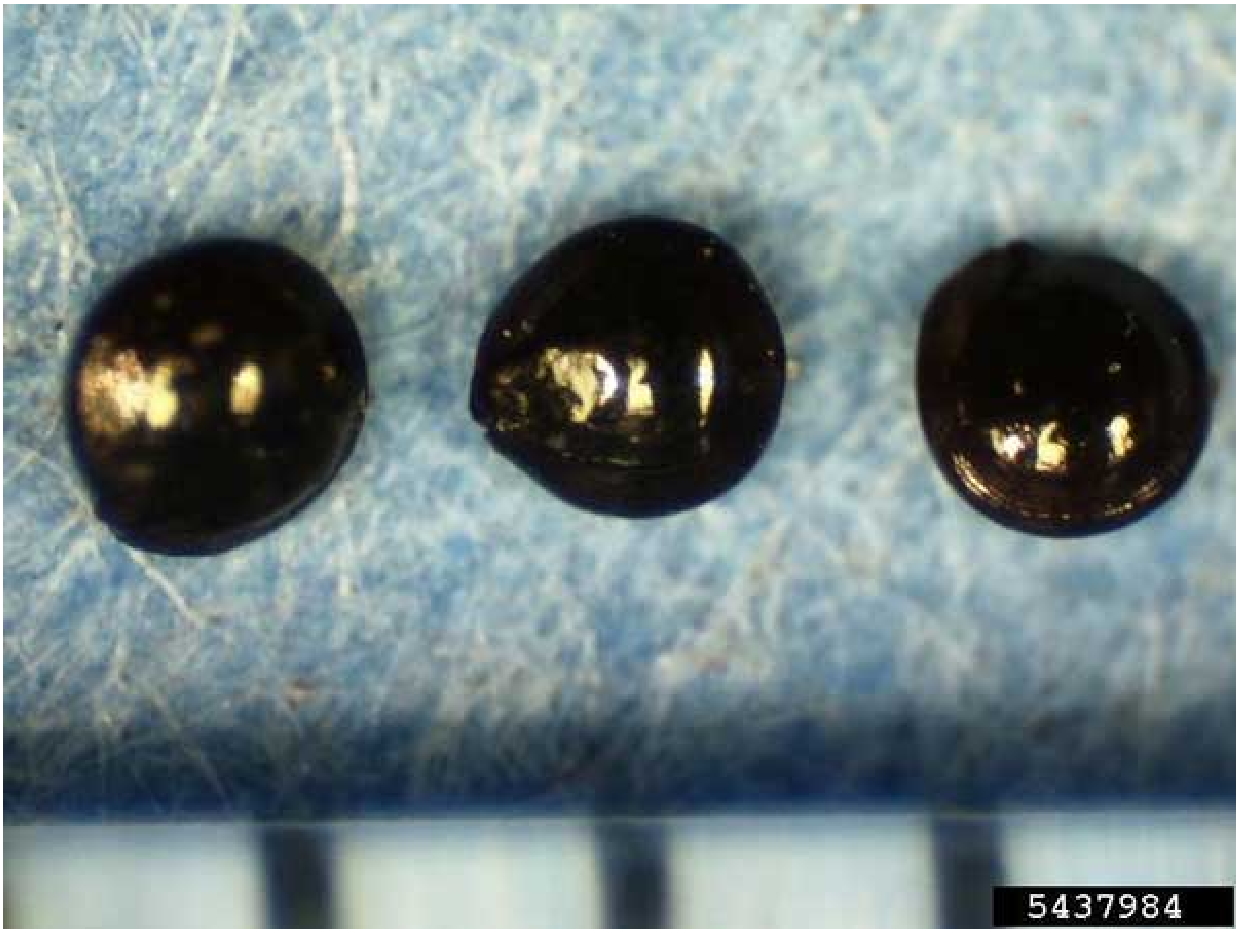

Figure 5. Palmer amaranth seeds. Photo credit: Bruce Ackley

Management

If uncontrolled, Palmer amaranth can reduce yield by up to 90% in corn, 50% in sorghum and 79% in soybean%. Palmer amaranth populations in Kansas have developed confirmed resistance to: Pursuit, Glean, and Harmony (Group 2), 2,4-D (Group 4), atrazine (Group 5), glyphosate (Group 9), and Armezon, Callisto, and Laudis (Group 27).

Resistance to key post-emergence herbicides, coupled with an extended period of emergence, makes residual herbicides critical for Palmer amaranth control. Herbicides with residual activity should be used in combination with other effective herbicides at planting and in-crop. Examples of herbicides that provide excellent control before crop emergence are products that contain metribuzin, flumioxazin (Valor), or sulfentrazone (Authority/Spartan). Examples of herbicides to consider using after crop emergence include acetochlor (Warrant), pyroxasulfone (Zidua), or S-metolachlor (Dual Magnum). Herbicides such as atrazine and mesotrione (Callisto) could be used for Palmer amaranth control either before or after emergence of corn or sorghum. Always read and follow label directions.

Reference

Ward, et al. 2013. Palmer Amaranth: A review.

Did you miss these World of Weeds articles?

Kochia – http://bit.ly/2udtQK1

Common sunflower – http://bit.ly/2wSy8be

Stinging nettle – http://bit.ly/37nOqFC

Mistletoe - http://bit.ly/2QbmXQO

Stay tuned for the next World of Weeds article coming out soon! Feel free to send Dr. Lancaster or Kathy Gehl (kgehl@ksu.edu) an email if you have a special request for a future article.

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6. Make plans to attend the K-State Virtual Wheat Field Day, May 27-28

Kansas State University will host its first-ever live Virtual Wheat Field Day on the evenings of Wed., May 27 and Thurs., May 28.

In a twist on the typical wheat field day that Kansas farmers often attend, K-State Research and Extension will host a two-part wheat field day live on YouTube to update growers and others on the most recent crop advances and challenges while keeping producers safe from COVID-19.

The May 27-28 Virtual Wheat Field Day 2020 is really two "field evenings," with each one to begin at 7 p.m. and end at 9 p.m. Agriculture Today radio host Eric Atkinson will moderate the program. The format will allow for questions from the audience.

Growers are encouraged to attend one or both evenings on YouTube Live at separate links:

May 27 session - https://youtu.be/UnD12lADM3E

May 28 session - https://youtu.be/VrF3F2yqJpc

The program, with each speaker presenting from their own homes, includes:

May 27

- Welcome and introduction – Eric Atkinson, host of Agriculture Today radio show
- State of the 2020 Kansas wheat crop and variety selection in different parts of Kansas – Romulo Lollato, K-State Extension Agronomist
- Diseases in the 2020 Kansas wheat crop; selecting varieties with disease resistance in mind – Erick DeWolf, K-State plant pathologist
- Variety performance and selection in western Kansas - Lucas Haag, K-State Northwest Area agronomist
- Introduction: New K-State extension wheat pathologist – Kelsey Andersen
- Discussion panel with questions from the audience – Eric Atkinson

May 28

- Welcome and introduction – Eric Atkinson
- Current and upcoming K-State varieties for central Kansas – Allan Fritz, K-State wheat breeder;
- Current and upcoming K-State varieties for western Kansas – Guorong Zhang, K-State wheat breeder
- Variety performance and selection in central Kansas – Stu Duncan, K-State northeast area extension agronomist
- Overview of Kansas Wheat Commission-sponsored research - Aaron Harries, KWC
- Discussion panel with questions from the audience – Eric Atkinson

More information is available by contacting Romulo Lollato at lollato@ksu.edu or 785-477-4644.

K·STATE
Research and Extension

KANSAS WHEAT

VIRTUAL WHEAT FIELD DAY

Wednesday, May 27, 2020

YOUTUBE LIVE: https://youtu.be/UnD12lADM3E

7:00 p.m. Welcome | Eric Atkinson

7:10 p.m. Wheat Variety Selection | Romulo Lollato

7:40 p.m. 2020 Wheat Disease Update | Erick DeWolf

8:10 p.m. Variety selection: Western KS | Lucas Haag

8:40 p.m. K-State Extension Pathologist | Kelsey Andersen

8:50 p.m. Discussion Panel | Eric Atkinson

Thursday, May 28, 2020

YOUTUBE LIVE: https://youtu.be/VrF3F2yqJpc

7:00 p.m. Welcome | Eric Atkinson

7:10 p.m. Wheat Breeding: Central KS | Allan Fritz

7:40 p.m. Wheat Breeding: Western KS | Guorong Zhang

8:10 p.m. Variety Selection: Central KS | Stu Duncan

8:40 p.m. KWC-Sponsored Research | Aaron Harries

8:50 p.m. Discussion Panel | Eric Atkinson

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