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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. Management adjustments when sowing wheat late

According to the most recent USDA report released on October 18, about 75% of Kansas wheat has been planted this fall, which is above the 5-yr average of 68%. However, some producers may have delayed planting for different reasons, including harvesting a summer crop during late October or, especially during this growing season, dry soils and waiting for significant precipitation to occur. Planting wheat in late October-early November is within the acceptable range in southeast and far south-central Kansas. In other areas of the state, this is later than desirable, and later than the cutoff date for full crop insurance benefits. Although good yields may still be reached when wheat is planted outside the optimal planting window, late-planted wheat is often subjected to colder fall temperatures and has less time to tiller prior to winter dormancy, which can reduce wheat yield potential and increase the risks of winter injury. Under these circumstances, some management adjustments can be made to try to compensate for the consequences of late planting. These adjustments include:

Increase seeding rate

Late-planted wheat tends to produce fewer tillers during the fall than wheat planted at the optimal time. Fall tillers are generally more productive than spring tillers, contributing more to the crop's yield potential. Therefore, there is a need to compensate for the reduced tillering by increasing seeding rates. Wheat seeding rates for Kansas vary depending on the precipitation zone, and increase from west to east (Table 1). Likewise, every week planting is delayed from the end of the range of optimal planting date, seeding rates should be increased by about 150,000 – 225,000 seeds per acre (or 10 to 15 lb/acre) in western Kansas, or 225,000 – 300,000 seeds per acre (15 – 20 lb/acre) in eastern Kansas. Final seeding rate should not be above 90-100 pounds per acre in western Kansas and 120-130 pounds in eastern and central Kansas for grain-only wheat production, as extremely high seeding rates can increase the potential for lodging.

Table 1. Seeding rates for different Kansas regions when planted during optimum planting dates and in grain-only systems. Upwards adjustments to these rates are needed when planting wheat late.

Region within Kansas	Seeding rate for grain-only wheat production, assuming optimum planting date			
	seeds/acre		seeds/sq. ft.*	
	Min.	Max.	Min.	Max.
Western	750,000	900,000	17	21
Central	900,000	1,125,000	21	26
Eastern	1,125,000	1,350,000	26	31
Irrigated	1,200,000	1,500,000	28	34

*To determine row length needed for one square foot based on row spacing, divide 12 by the row spacing of your field. For example, if row spacing is 7.5 inches, 12/7.5 = 1.6 feet, or 19.2 inches of row

are needed to be equivalent to one square foot.

Maintain the optimal planting depth (1 to 1.5 inch deep)

Wheat needs at least 4-5 leaves and 1-2 tillers prior to winter dormancy for maximum cold tolerance. Late-planted wheat will most likely have fewer tillers and leaves than wheat planted at the optimal timing, and therefore will be more susceptible to winter kill. It is important to plant wheat at the normal planting depth (1 to 1.5 inches below the soil surface) to ensure good root development and anchorage, as well as good crown insulation by the soil during the winter, increasing the chances of winter survival. Shallow-planted wheat is at greater risk of winter injury. If the seed is placed too deeply, it may not have enough vigor in cold soils to emerge well.

Place starter phosphorus (P) fertilizer with the seed

Phosphate-based starter fertilizer promotes early-season wheat growth and tillering, which can help compensate for the delayed sowing date. Additionally, P is less available under colder soil temperatures, which can result in P deficiency under cold weather conditions. When planting late, producers should strongly consider using about 20-30 lbs/acre of P fertilizer directly with the seed, regardless of soil P levels. This placement method is more effective at that time of year than other application methods. The later the planting date, the more fall root development is slowed. The closer the fertilizer is to the seed, the sooner the plant roots can get to it.

Use fungicide seed treatment or plant certified seed

Late-planted wheat is sown into colder soils, which generally increases the time needed for germination and emergence to occur. As a consequence, there is increased potential for seed and soil-borne diseases that affect seedlings and early-season wheat development. Fungicide seed treatment can protect the seed and seedling during the extended time it is subjected to potential seedling diseases, improving stand establishment under poor growing conditions. It is important that the seed treatment thoroughly coat the seeds to ensure good protection. For fungicide seed treatment options, please refer to the most current version of K-State fungicide seed treatment chart available at: https://www.bookstore.ksre.ksu.edu/pubs/MF2955.pdf

Variety selection

It is probably too late to make any changes as far as which wheat variety to plant this fall. However, a few points to consider when it is known that wheat will be planted late (e.g. when planning to sow wheat following soybeans) are tillering ability and maturity. A variety that has good tillering ability may offset some of the consequences of late planting, as it might still be able to produce one or two tillers during the fall whereas a low-tillering variety may produce none. Also, late-planted wheat is typically behind in development going into the winter, which might translate into slower development in the spring. This delay can result in plants being exposed to moisture stress and especially heat stress during grain filling, reducing the duration of the grain filling period. Thus, selecting an early-maturity variety with good yield potential may offset to some extent the consequences of late planting by decreasing the chances of a grain filling period subjected to warmer temperatures.

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2. Replanting decisions for winter wheat

As wheat growers evaluate their wheat stand, some may be considering replanting fields yet this fall. The potential causes of poor or uneven emergence or stand establishment are many and may differ from field to field. For example, many growers reported severe army worm infestation this fall, which may have led to poor wheat stand establishment. Likewise, lack of precipitation was detrimental to wheat germination in parts of the state during most of September, and to other parts of the state during part of October. If dry soils are the cause of the problem, replanting will not bring many benefits unless the seed has partially germinated and perished before emerging. It is very important to dig into the soil and evaluate the seed to determine the cause of poor emergence. Wheat seeds may still be germinating and emergence may occur in the next few days, depending on temperatures. Thus, if seed are still hard and viable, or if germination started to occur recently and there are very short coleoptile emerging from the seed (Figure 1), the best advice is to leave the field alone.

Figure 1. Wheat seed with elongating coleoptile visible below ground. Photo by Romulo Lollato, K-State Research and Extension.

When deciding whether to replant wheat fields it is helpful to consider these factors: stand uniformity, percent stand compared to the target stand, replanting date, weed control, and insurance cutoff date.

Stand uniformity

In fields in which topsoil moisture was variable at time of planting, some seeds might have germinated and emerged where soil moisture was sufficient, while others might have started the germination process but perished where soil moisture was too low, while others might not have started the germination process at all. This will cause poor wheat emergence across the field, with sometimes recognizable field patterns associated with the moisture distribution in the soil. In this case, stands might be relatively uniform in poorer-drained areas where moisture might have accumulated, but non-existent in better-drained areas, leading to a high within-field variability. In this case, growers should check for seed viability in areas with poor emergence. If the seed is still viable, then the field should be left alone. If the seeds imbibed water, started to germinate but perished, then these portions of the field should have top-priority for replanting. If a stand is sparse in areas that already emerged, producers should also consider replanting these areas with lower seeding rates to bring final population closer to the desired stand, as discussed below.

Percent stand compared to the goal

In areas with suboptimal and thinner stands than desired, counting the number of emerged plants per row foot and comparing the observed stand to target populations (Table 1) is a good place to start.

The target number of plants per row foot (Table 1) is influenced by seeding rate, seed size, and row spacing, and considering 80% emergence. If seed size is not known, 14,000 to 16,000 seeds per pound can be used for most wheat varieties in Kansas, except those with rather large or small kernels. To determine the average number of plants per foot of row, several random plant counts across the field should be taken, given a more or less uniform emergence throughout the field. If the average number of plants is about 50 percent or more of normal and the stand is evenly distributed, the recommendation is to keep the stand. Wheat's tillering ability can greatly compensate for poor stand provided soil fertility is adequate and the weather is favorable. With less than 40 percent of normal stand, the recommendation is to replant the field. If possible, replanting should be done at a 45-degree angle to the original stand to minimize damage to the existing stand.

Table 1. Target plants per row foot (80% emergence) based on seeding rate, seed size, and row spacing.

Seeding rate	Seed size	Row spacing (inches)				
		6	7.5	8	10	12
lb/ac	seeds/lb	Target plants per row foot (80% emergence)				
45	12,000	5	6	7	8	10
	14,000	6	7	8	10	12
	16,000	7	8	9	11	13
	18,000	7	9	10	12	15
60	12,000	7	8	9	11	13
	14,000	8	10	10	13	15
	16,000	9	11	12	15	18
	18,000	10	12	13	17	20
75	12,000	8	10	11	14	17

	14,000	10	12	13	16	19
	16,000	11	14	15	18	22
	18,000	12	15	17	21	25
90	12,000	10	12	13	17	20
	14,000	12	14	15	19	23
	16,000	13	17	18	22	26
	18,000	15	19	20	25	30
120	12,000	13	17	18	22	26
	14,000	15	19	21	26	31
	16,000	18	22	24	29	35
	18,000	20	25	26	33	40

Replanting date and seeding rate

As of late October, most of the state has passed the optimum sowing date, with maybe the exception of south-central or southeast Kansas. For portions of the field with no established stand (the entire stand will need to be replanted), producers should plan to increase their seeding rates by 10-15% for every week past the optimum sowing date.

In areas where a partial stand was achieved but for a total of about 50% stand, or parts of the field that did not emerge evenly, or that the seedlings have perished after planting, producers should make the decision about replanting immediately to avoid further compromising the yield potential.

In portions of the field where stand is below optimum, producers can cross-drill at the rate of 30-40 pounds per acre in western Kansas and 40-60 pounds per acre in central and eastern Kansas, using a double-disc opener drill, if at all possible, to minimize damage to the existing stand. If the replanting is done in November or later, increase the seeding rates to 60-75 pounds per acre in western Kansas and 75-90 pounds per acre in central Kansas. If stands are less than 30 percent of normal, increase these seeding rates by 20-30 pounds per acre. The higher seeding rates are needed because the cool soil temperatures encountered by late planted wheat will likely slow emergence, favor seedling diseases and reduce the potential for fall tillering. Using a fungicide seed treatment can reduce the potential for seedling disease and help achieve the target populations.

Weed control – Pay attention to application timing

A thin wheat stand can increase the potential for weed and grass infestations. In fields with a history of severe weed problems, the wheat stand should probably be replanted or thickened. Keep in mind that the uneven wheat stands can also influence herbicide timing due to different staging of the crop within the same field. Herbicides, such as 2,4-D and dicamba, have very specific application guidelines and attention must be paid to the herbicide label to avoid injury to the wheat crop. Paying attention to wheat leaf staging when controlling weeds can help minimize the consequences of applying these herbicides outside the labeled recommendations. Potential problems due to improper application timing include trapped heads, missing florets, or twisted awns. More-developed plants during the fall often hold the best yield potential; thus, this factor might be considered if a decision needs to be taken between risking some herbicide injury to more developed plants versus those that emerged late in uneven wheat fields.

Insurance cut-off dates

Finally, some producers might also consider insurance cut-off dates, as they need to ensure their crop is planted prior to this date.

For insurance purposes, crops planted before the final planting dates as specified by the USDA are insured with no reduction in coverage or adjustment to premium. The final plant date is already past for parts of western Kansas, which means that producers replanting after this date will have a reduction in 1% coverage per day until the end of the late-planting period. For wheat, the late-planting period often occurs about 15 days after the final plant date.

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3. Sorghum midge update from Southwest Kansas

The recent freeze and a lack of flowering sorghum has ended adult sorghum midge activity in the area. Adult midges were observed on station grounds in Garden City starting the first week of July and were still present on late flowering panicles into the first week of September. As sorghum reaches maturity, it is easy to find evidence of midge activity even if you did not see adults when the fields were blooming. Simply look for flattened, blank zones on the heads. These seeds never developed because the maggots consumed them from the inside.

A general recommendation for avoiding losses due to midge is to make sure the field blooms uniformly and before mid to late August. For comparison, in the Texas panhandle, growers are encouraged to have fields blooming no later than the first of August to avoid issues with sorghum midge.

Beginning the last week of July, sorghum at the Garden City station this year bloomed over a long period of time which allowed some general observations to be made regarding blooming time and midge damage once heads reached maturity. Plants that began blooming on July 25 were free of noticeable midge damage. Those that began blooming around August 5 experienced damage to the upper 1/5th of the panicles. A final location that bloomed very unevenly starting August 11 experienced significant losses with most panicles being almost completely blank (Figure 1). While midge damage is very easy to spot on varieties with red panicles, it might be more challenging to see on varieties with white panicles, however damage will show up the same regardless of color (Figure 2).

Figure 1. From left to right: Undamaged panicle from plants that began blooming July 25; slightly damaged panicles from plants that began blooming August 5; and severely damaged panicle from plants that began blooming August 11. Photo by Anthony Zukoff, K-State Research and Extension.

Figure 2. White panicle variety: undamaged head on the left severely damaged head on the right from a plant blooming the first week of September. Photo by Anthony Zukoff, K-State Research and Extension.

In addition to midge damage, headworm and bird damage were prevalent in the later-blooming field but are easy to differentiate (Figure 3). One more pest that could cause midge-like damage is Lygus bugs. Lygus bug damage can be difficult to distinguish from midge, especially when it is extensive. Lygus bug damage tends to be confined to very distinct bands across the head (or all at the top, or all at the bottom), because they are very fussy about feeding only on milk stage grain.

Usually, midge damage is more distributed up and down the head, almost always with some full grains interspersed between all the blanks. That is because the midge will not lay an egg in every flower, but the adult lygus bug is much more systematic in feeding behavior.

If you have observed midge damage this season anywhere in the state, please consider sending a report to the email list below that includes an estimate of acreage impacted and panicle damage. For additional information and control options, please refer to the Sorghum Insect Pest Management Guide.

Figure 3. Various types of damage to sorghum heads. Left to right: undamaged head, severe sorghum midge damaged head, a head with heavy bird damage and on the right, a head exhibiting headworm damage. Photo by Anthony Zukoff, K-State Research and Extension.

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4. Kansas Forage and Grassland Council and K-State to Host Winter Forage Conference, Dec. 8

The Kansas Forage and Grassland Council and Kansas State University will host their annual Winter Forage Conference from 9 a.m. to 3 p.m. on Thursday, December 8 at the Harvey County 4-H Building, Newton, Kansas.

Agricultural specialists will speak on a variety of topics such as alfalfa production, crabgrass production potential, ration supplementation with high grain prices, combating woody encroachment on native range, and a farmer panel discussing their progressive approaches and alternative forage sources that are helping them to extend the grazing season.

Featured speakers include:

- Justin Waggoner, KSU Southwest Extension Specialist
- Romulo Lollato, KSU State Forage Specialist
- Bruno Pedreira, KSU Southeast Extension Agronomist and Forage Specialist
- Doug Spencer, NRCS State Grazing Specialist.

The event is free for current KSFGC members and $45 for non-members (which includes a membership to KSFGC and lunch).

To learn more, go to https://ksfgc.org/upcoming-events/. To join KSFGC, go to https://ksfgc.org/join-us/.

Please RSVP to Ryan Flaming, Agriculture Extension Agent, (316) 284-6930 or flaming@ksu.edu.

The first 30 audience members through the door will get a free KSFGC cap.

KSFGC
Kansas Forage and Grassland Council

The Kansas Forage and Grassland Council was organized in 1988 to strengthen the forage base for the

livestock industry through more efficient production and utilization. KSFGC serves to provide education and programs to strengthen the forage industry in Kansas.

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5. 2021 Kansas Soybean Yield and Value Contests

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

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

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

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

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

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

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

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

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