Issue 806

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Research and Extension

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# eUpdate

*06/19/2020*

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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## 1. Considerations when harvesting short wheat

In many areas of Kansas, prolonged drought has resulted in short wheat and thin stands. Harvesting wheat in these situations can be a challenge. Special attention needs to be given to cutting height, machine adjustments, and operator control. In short wheat, getting the heads into the combine with less straw will be a challenge. In some cases, the reel may not be able to effectively convey the wheat back from the cutter bar to the auger, nor hold it in place during cutting. Short cutting will also mean more contact potential with the ground and reduced levels of surface residue which will likely negatively impact cropping systems in water-limited environments.

In the case of material conveyance, stripper headers, air reels, and draper headers may be a great help.

**Stripper headers**

Stripper headers allow the grain to be harvested efficiently while leaving the maximum amount of standing residue in the field. Research has shown that this preservation of wheat residue can reduce evaporative losses of water after harvest, aid in the moisture retention of snow, and improve the yields of the next year's crop.

To properly use a stripper header, note the following:

- Operators need to be aware of the stripping rotor height and the relative position of the hood to the rotor. This position needs to be set correctly so that heads approach the rotor at the proper angle for stripping.
- Keep the nose of the hood orientated so that the top of the wheat heads are even with, or slightly below, the forward point of the nose. This may require operating the header with the nose in a slightly lower-than-normal position relative to the rotor. However, it's important to note that running a stripper header lower than necessary will result in increased power consumption and accelerated finger wear.
- Combine ground speeds should be kept high (above 4 mph) to maintain collection efficiency and minimize header losses.
- Several people have reported that adjusting header height with a stripper header is not as critical as it is with a conventional header, and that a stripper header could easily be run by non-experienced people (see step 1).
- Continue to adjust stripping rotor speed throughout the day as conditions change. If rotor speeds are too high, that will result in detachment of the entire head and unnecessary increases power requirements. Rotor speeds that are too slow will result in unstripped grain remaining in the head. In general, rotor speeds will be less in thin short wheat than in better stands.

**Air reels**

Air reels will also aid in the material conveyance from the cutter bar to the auger in reel-type units when crops are light or thin. These units are made in several different types including finger air reels, non-reel, and units that fit over existing reels. Examples of manufacturers are Crary (West Fargo, ND) and AWS (Mitchell, Ontario Canada). Non-reeled units have the advantage of less eye strain from the continuously rotating header reel, but all units have collection efficiencies compared to conventional reels even in sparse or short crops. These units do not control the amount of wheat stubble left in the field and the operator still has to control the cutting height. In short wheat this may mean little to no field stubble will be left for next season's moisture collection and for these reasons stripper headers may be better choice for certain areas of Kansas.

**Draper headers and flex heads**

Draper headers may help with the conveyance of material since they have a very short distance between the cutterbar the conveyance belt. The ability to tip the cutterbar completely back will aid in keeping harvested crop material moving across the cutter bar and onto the belt as well as ensuring some stubble remains standing on the soil surface. Cleats on the belt need to be in good to new condition to maximize conveyance of crop material away from the cutterbar. Set gauge wheels properly to maximize cutting height and leave standing residue.

Flex heads will also help deal with the lower cutting heights and potential ground strikes. In thin stands of wheat it is even more important that sickles and guards are in good condition as there is less crop material pushing into the cutting area, which would normally help ensure cutting by worn sickles and guards. On headers with finger reels, it is quite likely that the short cut wheat will pass in between the fingers rather than being swept backward. Producers may consider adding material over or behind the fingers to act more as a bat to sweep the cutterbar clean. Plastic/vinyl materials or repurposed round baler belting have been successfully used for this purpose.

If harvesting with a draper or flex header, maintain the cutting height as high as possible to preserve standing stubble. Typically, cutting wheat at two-thirds of its full height will result in losses of less than 0.5 percent as any missed heads contain light weight grain that will be lost as tailings during the harvesting process.

**Conventional headers**

For many farmers, new equipment may not be an economical choice and you may have to make do with a conventional head on your combine. In this case, adjust the reel to get the best movement of the heads from the cutter bar to the auger. Combining in slightly damp conditions may help prevent shatter and decrease losses. If wheat heads have flipped out of the header from the top of the auger, an extra "auger stripper bar" may necessary. A small strip of angle iron can be bolted slightly behind and below the auger to help with material conveyance. In thin wheat stands it is even more important that sickles and guards are in good condition as there is not as much crop material to push into the cutting area and ensure cutting by worn sickles and guards.

If harvesting with a conventional header, maintain the cutting height as high as possible to preserve standing stubble. Typically, cutting wheat at two-thirds of its full height will result in losses of less than 0.5 percent as any missed heads contain light weight grain that will be lost as tailings during the harvesting process.

**Combine adjustments**

In addition to material conveyance and cutting height, lower yields and uneven crop flow may also require performing combine adjustments to the concave/rotor cage clearance, cylinder/rotor speed, and fan speed. Follow the manufacturer's recommendations. The leading cause of grain damage under almost any harvesting condition is overly fast cylinder or rotor speed. This will especially be evident in harvesting short wheat as there will be less material in the concave or rotor cage to thresh against, increasing the likelihood of grain damage if cylinder/rotor speed is too high.

On conventional machines it may be necessary to reduce concave clearance to attain good separation. On rotary combines it may be advantageous to maintain a typical clearance to provide a more normal threshing condition while using less threshing area. The use of blanking plates on the rotor cage may improve separation. Fan speeds may need to be reduced slightly in order to minimize grain losses. Once adjusted properly, try to keep material crop flow as constant as possible as most threshing and cleaning units work best under these constant flow conditions. As the amount of material passing through the combine decreases the response to various settings such as cylinder/rotor speed, concave/rotor cage clearance, and fan speed will be more sensitive than under more normal operating conditions.

Performing kill-stops during harvest will be especially critical in evaluating grain losses and identifying which stage of the harvesting process is the source. After performing a kill-stop the operator should look at shattered grain losses before the header, losses after the header and before the spread pattern of the combine, and losses in the tailings behind the combine. Losses can be quickly checked by looking at the number of seeds in the tailings and elsewhere around the combine.

Typically, 20 seeds per square foot is equal to 1 bushel per acre for a sampling area equal to the cutting width of the combine. For the tailings area, where the material is concentrated, multiply the 20 seeds per square foot by the header-to-tailings width ratio. For example, a combine with a 7-foot spreader width and 28-foot header would have a factor of 4 (28 divided by 7), and 80 seeds per square foot (20 x 4) would be the correct number for a bushel-per-acre loss. Also, a normal shoe length is typically one foot, so estimated measurements can be done with your foot. Individual field and header losses are determined by looking at areas before and under the combine. Actual combine threshing losses are determined by subtracting these numbers from the tailing loss.

**Summary**

Although this will be a rough wheat harvest for many farmers, some changes can be made to help maximize harvest efficiencies. If you have ever wanted to try an alternate header (stripper, flex-draper, etc.), this may be the year for you. For those not wanting to buy, renting may also be a viable option.

Producers in dryland production systems need to keep in mind that in very low-yielding wheat years, anything that can be done to preserve what little crop residue is present will have large impacts on evaporative losses and productivity of the next crop.

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## 2. Considerations for applications of over-the-top dicamba formulations

It is that time of year again for post-emergent applications of Engenia, Fexapan, and Xtendimax on dicamba-resistant soybeans. In light of the recent court ruling, it is vital that application restrictions are followed closely to prevent non-target dicamba injury to conventional, Enlist, and Liberty Link soybeans. A brief overview of the application restrictions is provided below and can also be found in a previous eUpdate article here.

**Application date (whichever comes first)**:

- July 31, 2020 **OR…**
- 45 days after planting **OR…**
- R1 growth stage

**Application hours:** Between 1 hour after sunrise and 2 hours before sunset

**Wind Speed**: Between 3 mph and 10 mph

**Do not apply in a temperature inversion**. Check mesonet.k-state.edu/agriculture/inversion/ for conditions around the state.

**Do not apply if sensitive crops or a residential area is downwind**

**Buffer**:

- 110 ft down-wind buffer is always required
- 57 ft buffer on all sides of the field if in county where listed endangered species are present

**Recordkeeping**:

- Must be created within 72 hours of application
- Must include both the planting date and the buffer distance calculation

Exposure of non-dicamba-resistant soybeans to even very low rates of dicamba can cause injury that includes leaf cupping, brittle leaves, stunting, pod curling, and plants becoming a darker shade of green (Figure 1).

**Figure 1. Leaf cupping and crinkling 2 weeks after soybean exposure to 1/100th of a field-use rate of dicamba at V3 growth stage. Photo by Tyler Meyeres, K-State Research and Extension.**

**Growth stage is a critical factor for severity of potential injury**

Research conducted at Kansas State University and funded by the Kansas Soybean Commission has shown that the amount of soybean injury caused by off-target movement of dicamba depends on crop growth stage. Non-dicamba resistant soybeans develop fewer injury symptoms when exposed to dicamba during the early growth stages, like the third trifoliate (V3), than during flowering (R1/R2) and beginning pod (R3). However, observing injury in non-dicamba-resistant soybeans does not mean there will be yield reductions. Yield reductions in our research did not correspond to visual injury. Generally, soybeans exposed to dicamba early in the season will recover by the end of the growing season. However, soybeans exposed later in the season will most likely have injury that will persist to the end of the growing and translate into some degree of yield loss. Exposure during V3 resulted in 6% or less yield loss, while exposure to 1/100$^{th}$ of a field-use rate during flowering resulted in 25% yield loss, and multiple exposures caused up to 50% yield loss (Figure 2).

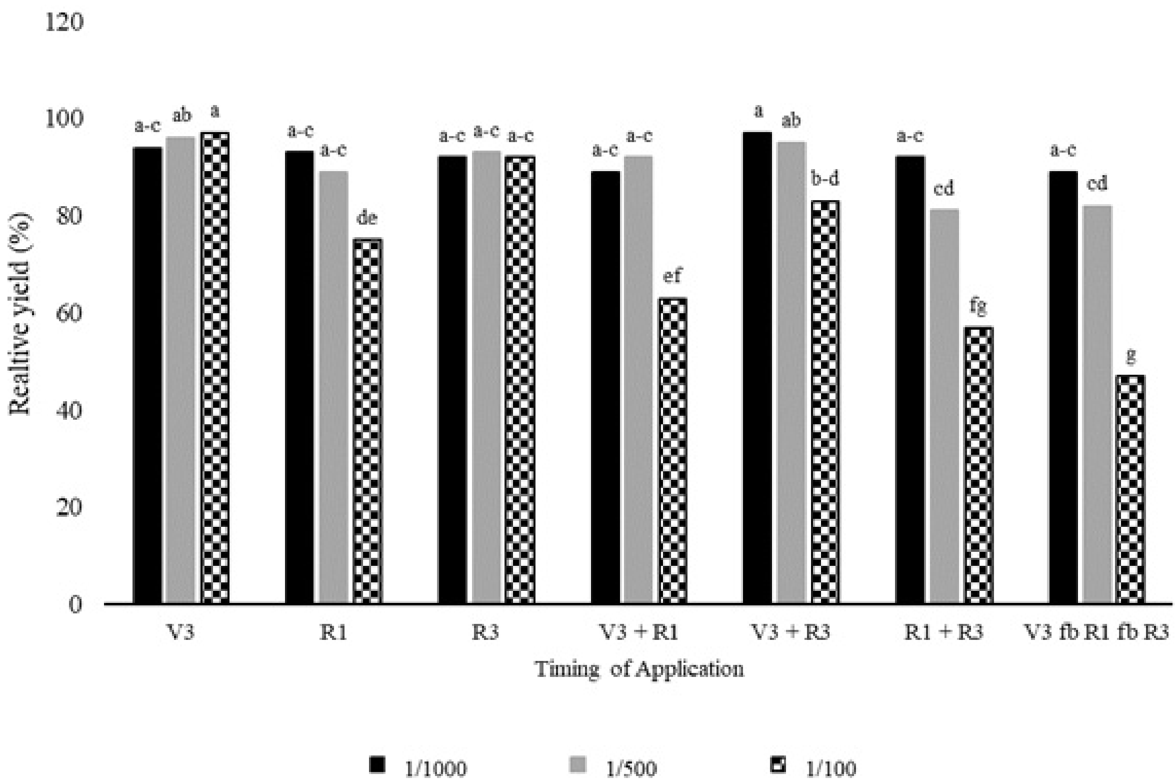


**Figure 2. Soybean yield relative to the non-treated control following exposure to Engenia at 1/1000, 1/500, and 1/100 of a field-use rate when soybeans were at V3, R1, and R3 growth stages. Yield is average of Manhattan 2018, Manhattan 2019, and Ottawa 2019 experiments. Letters over bars indicate statistical differences. Bars with similar letters have statistically similar means.**

It is critical that applicators follow application guidelines to not only protect producers of non-dicamba tolerant soybeans but also to help preserve dicamba-resistant technology.

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## 3. Critical timing of irrigation for maximizing cotton yield potential

Producers are likely familiar with timing of limited irrigation to maximize yield in grain crops, e.g. immediately prior to tassel/silk in corn and boot stage in grain sorghum. These strategies work toward maximizing the most variable yield component and the one typically most sensitive to stress, kernels/ear row in corn and kernels/head in grain sorghum. For cotton, while lint quality and lint/boll can vary due to management, bolls/acre is the most important yield component in cotton production (Figure 1).

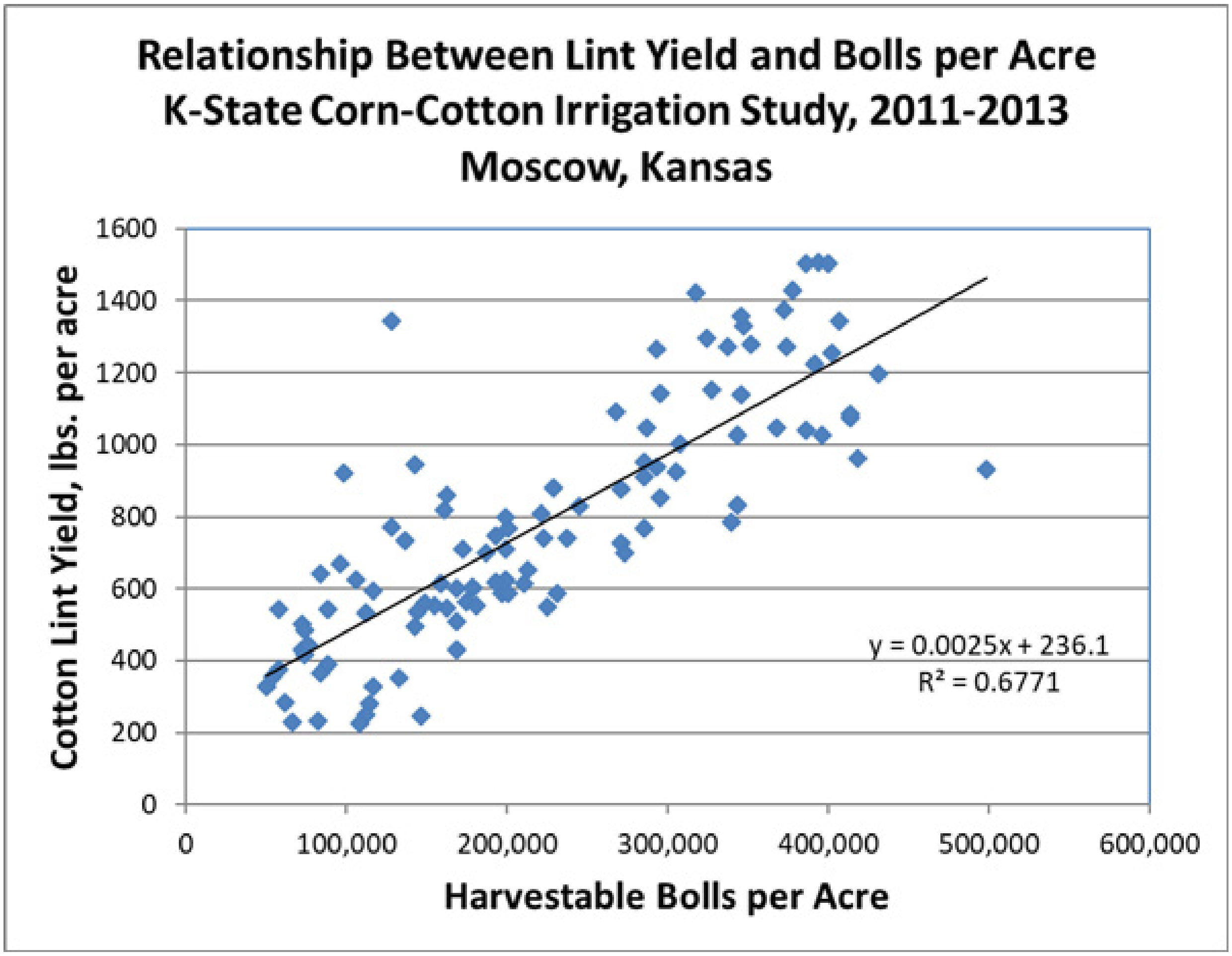


**Figure 1. Relationship between lint yield and bolls per acre across a range of irrigation treatments. Data collected from a K-State corn-cotton irrigation rotation study, Moscow, Kansas, 2011-2013 by L. Haag et al.**

Assuming good stands are established, early season conditions in Kansas typically are conducive to initiating a large number of squares. However, as the season progresses and stress becomes more prevalent, the plant response is to abort squares, thus reducing the plant's maximum yield potential.

K-State research was conducted in Stevens County in southwest Kansas from 2011 through 2015 to investigate the effects of irrigation timing on cotton lint yield and also corn yield when the two crops are grown with a shared water supply. Cotton irrigation treatments include a range of full-season irrigation scenarios where an inch of water was applied every 5, 7, or 10 days throughout the growing season. This simulates full-season irrigation with a standard quarter-section pivot under the constraint of varying well capacities of 500, 350, and 250 GPM. Additional treatments included a dryland treatment (one irrigation to ensure a good stand) and the application of water at selected time periods to maintain the key yield component of bolls per acre.

Targeted timing treatments included:

- 1″ applied at match-head square (MHS)
- 1″ applied 2 weeks prior to MHS + 1″ at bloom
- 1″ applied at MHS + 1″ at bloom

When looking at results across the entire 5 years (Figure 2), under full season irrigation there was no significant yield advantage to irrigating every 5 days as compared to every 7 days, although both of these strategies modestly increased yields compared to irrigation every 10 days. The largest gain in yield per unit of irrigation applied occurred with the targeted timings. When averaged across years, lint yields increased an average of 252 lbs per acre, or 82% over dryland yields with the application of 1″ of water at match-head square (MHS). An additional application of one inch at bloom did not further increase yields. The response to this targeted application of water at MHS varied in magnitude, an increase of 443 lbs per acre compared to dryland was observed in 2013, but an increase of only 34 lbs per acre was seen in 2015, a relatively wet year in which response to all irrigation treatments was reduced.

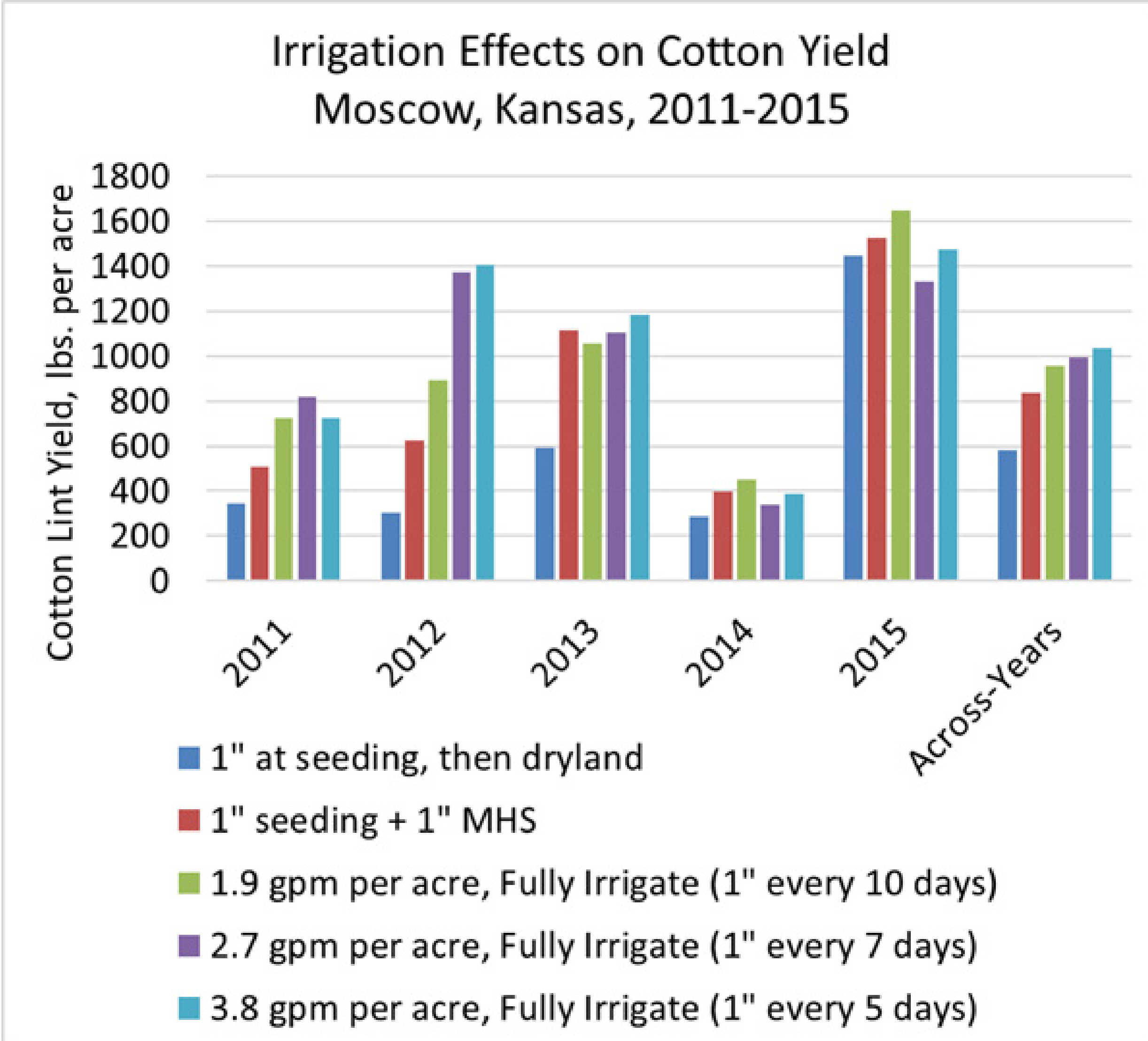


**Figure 2. Cotton lint yield response to targeted irrigation strategies and simulated well capacities in a K-State corn-cotton rotation study at Moscow, Kansas, 2011-2015. Data collected by L. Haag et al.**

Producers can maximize cotton yields by ensuring irrigation occurs at or immediately prior to MHS to maintain the bolls per acre yield component. Data from this study indicates that a very high level of water use efficiency can be attained by targeting a relatively small amounts of irrigation at this critical time period.


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## 4. Plant analysis for testing nutrient levels in corn

Plant analysis is an excellent in-season "quality control" tool. It can be especially valuable for managing secondary and micronutrients that do not have high-quality, reliable soil tests available, and for providing insight into how efficiently you are using applied nutrients.

Plant analysis can be used by Kansas farmers in two basic ways: for diagnostic purposes, and for monitoring nutrient levels at a common growth stage. Diagnostics can be done any time and is especially valuable early in the season when corrective actions can easily be taken. Monitoring is generally done at the beginning of reproductive growth.

**General sampling guidelines:**

- Plants are less than 12 inches tall: Collect the whole plant; cut the plant off at ground level.
- Plants more than 12 inches tall and until reproductive growth begins: Collect the top fully developed leaves (those which show leaf collars).
- After reproductive growth starts: Collect the ear leaves (below the uppermost developing ear), samples should be collected at random from the field at silk emergence.

**Figure 1. Corn sampling during different growth stage. Photos by Dorivar Ruiz Diaz, K-State Research and Extension.**

**Plant analysis for diagnostic sampling**

When sampling for diagnostic purposes, collecting specific plant parts is less important than obtaining comparison samples from good and bad areas of the field.

Plant analysis is an excellent diagnostic tool to help understand some of the variation among corn plants in the field. When using plant analysis to diagnose field problems, try to take comparison samples from both good/normal areas of the field, and problem spots. This can be done at any growth stage.

Along with taking plant tissue samples, it is also helpful to collect a soil sample from both good and bad areas when doing diagnostics. Define your areas, and collect both soil and plant tissue from areas that represent good and bad areas of plant growth. Soil samples can help define why a problem may be occurring. The soil sample may find certain nutrient levels are very low in the soil, helping to explain why a deficiency is occurring. However, other factors can also cause nutrient problems. Soil compaction, or saturation of soils for example, often limits the uptake of nutrients, especially potassium, which are otherwise present in adequate amounts in the soil.

**Plant analysis for nutrient monitoring**

For general monitoring or quality control purposes, plant leaves should be collected as the plant enters reproductive growth. Sampling under stress conditions for monitoring purposes can give misleading results, and is not recommended. Stresses such as drought or saturated soils will generally limit nutrient uptake, and result in a general reduction in nutrient content in the plant.

**How should you handle samples and where should you send the samples?**

The collected leaves should be allowed to wilt over night to remove excess moisture, placed in a paper bag or mailing envelope, and shipped to a lab for analysis. Do not place the leaves in a plastic bag or other tightly sealed container, as the leaves will begin to rot and decompose during transport, and the sample won't be usable. Most of the soil testing labs working in the region provide plant analysis services, including the K-State testing lab.

**What nutrients should be included in the plant analysis?**

In Kansas, nitrogen (N), phosphorus (P), potassium (K), sulfur (S), zinc (Zn), chloride (Cl), and iron (Fe) are the nutrients most likely to be found deficient. Recently, questions have been raised concerning copper (Cu), manganese (Mn), and molybdenum (Mo), though widespread deficiencies of those micronutrients have not been found in the state. Normally the best values are the "bundles" or "packages" of tests offered through many of the labs. They can be as simple as N, P and K, or can be all the mineral elements considered essential to plants. K-State offers a package which includes N, P, K, Ca, Mg, S, Fe, Cu, Zn, and Mn.

**What will you get back from the lab?**

The data returned from the lab will be reported as the concentration of nutrient elements, or potentially toxic elements, in the plants. Units reported will normally be in "percent" for the primary and secondary nutrients (N, P, K, Ca, Mg, S, and Cl) and "ppm" (parts per million) for most of the micronutrients (Zn, Cu, Fe, Mn, B, Mo, and Al).

Most labs/agronomists compare plant nutrient concentrations to published *sufficiency ranges*. A sufficiency range is simply the range of concentrations normally found in healthy, productive plants during surveys. It can be thought of as the range of values optimum for plant growth. The medical profession uses a similar range of normal values to evaluate blood work. The sufficiency ranges change with plant age (generally being higher in young plants), vary between plant parts, and can differ between hybrids. A value slightly below the sufficiency range does not always mean the plant is deficient in that nutrient. It is an indication that the nutrient is relatively low. Values on the low end of the range are common in extremely high-yielding crops. However, if that nutrient is significantly below the sufficiency range, you should ask some serious questions about the availability and supply of that nutrient.

Keep in mind that any plant stress (drought, heat, soil compaction, saturated soils, etc.) can have a serious impact on nutrient uptake and plant tissue nutrient concentrations. A low value of a nutrient in the plant does not always mean the nutrient is low in the soil and the plant will respond to fertilizer. It may be that the nutrient is present in adequate amounts in the soil, but is either not available or not being taken up by the plant for a variety of reasons. Two examples are drought, which can reduce plant uptake of nutrients and cause low nutrient values in the plant, and high-pH soils, which can cause low iron availability.

On the other extreme, levels above "sufficiency" can also indicate problems. High values might indicate over-fertilization and luxury consumption of nutrients. Plants will also sometimes try to compensate for a shortage of one nutrient by loading up on another. This occurs at times with nutrients such as iron, zinc, and manganese.

Table 1 gives the range of nutrient contents considered to be "normal" or "sufficient" for corn seedlings below 12 inches tall and for the ear leaf of corn at silking. Keep in mind that these are the ranges normally found in healthy, productive crops.

**Table 1. Range of nutrient contents considered "normal" or "sufficient" at two growth stages in corn.**

| Nutrient | Unit | Whole Plant <12" tall | Corn Ear Leaf at Green Silk |
|---|---|---|---|
| Nitrogen (N) | % | 3.5-5.0 | 2.75-3.50 |
| Phosphorus (P) | % | 0.3-0.5 | 0.25-0.45 |
| Potassium (K) | % | 2.5-4.0 | 1.75-2.25 |
| Calcium (Ca) | % | 0.3-0.7 | 0.25-0.50 |
| Magnesium (Mg) | % | 0.15-0.45 | 0.16-0.60 |
| Sulfur (S) | % | 0.20-0.50 | 0.15-0.50 |
| Chloride (Cl) | % | Not established | 0.18-0.60 |
| Copper (Cu) | ppm | 5-20 | 5-25 |
| Iron (Fe) | ppm | 50-250 | 20-200 |
| Manganese (Mn) | ppm | 20-150 | 20-150 |
| Zinc (Zn) | ppm | 20-60 | 15-70 |
| Boron (B) | ppm | 5-25 | 4-25 |
| Molybdenum (Mo) | ppm | 0.1-10 | 0.1-3.0 |
| Aluminum (Al) | ppm | <400 | <200 |

**Summary**

In summary, plant analysis is a good tool to monitor the effectiveness of your fertilizer and lime program and as a very effective diagnostic tool. Consider adding this to your toolbox.

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## 5. Summer insect activity - Corn rootworms, click beetles, and bean leaf beetles

Western corn rootworm (WCR) larvae are voraciously feeding on corn roots (Figure 1) and thus continuing to grow and develop as seen in Figure 2. The WCR larva on the right in Figure 1 was collected on June 3, 2020, while the ones on the left were collected from the same field on June 17.

**Figure 1. Western corn rootworm emerging from root. Photo by Cody Wyckoff, K-State Research and Extension.**


**Figure 2. Western corn rootworm larvae collected from the same field on two different dates. Photo by Cody Wyckoff, K-State Research and Extension.**

**Click Beetles**

This photo (Figure 3) is of a click beetle. Wireworms are the larval stage- after they pupate in the soil, they emerge as an adult, which looks nothing like the wireworm. There are several species of wireworms (click beetles) in Kansas, and the one pictured is one of the more common species, all of which are usually well controlled by insecticide seed treatments. However, these seed treatments generally do not offer seed/seedling protection 21-28 days after the seeds were planted.

**Figure 3. Click beetle. Photo by Cody Wyckoff, K-State Research and Extension.**

**Bean Leaf Beetles**

Adult bean leaf beetles are very active throughout north central Kansas at the present time. They typically chew round/oblong holes in leaves (see Figure 4 with bean leaf beetle at the tip of the arrow) and deposit eggs in the soil around the base of soybean plants. There are two color phases of adult bean leaf beetles (Figure 5), a tan phase and a reddish phase, but both have six black spots surrounded by a black border on their backs. Both color types can be seen in Figure 5.

**Figure 4. Soybean leaf damage from beetles. Photo by Cody Wyckoff, K-State Research and Extension.**

**Figure 5. Bean leaf beetles. Photo by Cody Wyckoff, K-State Research and Extension.**

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# 6. 2020 Kansas Corn Yield Contest

Now that corn is in the ground and growing, harvest in Kansas will be here before you know it. Corn producers in the state are encouraged to keep in mind the Kansas Corn Yield Contest before they fire up the combines this year.

Kansas Corn, in conjunction with K-State Research and Extension, will conduct a 2020 Kansas Corn Yield Contest. All Kansas corn producers are eligible to enter the free contest, but they must be active members of the Kansas Corn Growers Association.

The contest is a fun way for producers to showcase their high yielding and high quality corn with other growers in the state, and provide motivation to producers to increase yields. The contest also serves as a vehicle to improve farming operations and increase awareness of best management practices (BMPs) to improve and sustain corn yields.

In addition to grower recognition, cash awards will be awarded at the district and state levels. The districts align with crop reporting districts, plus a NNE district was created to include Doniphan and parts of Brown and Atchison (Figure 1). In addition, one statewide dryland winner and one statewide irrigated winner will be announced. Entries for 2019 contest are presented in Figure 2. District winners will receive $300 and a plaque. Second place entries will receive a $200 prize and third place will receive a $100 prize. The highest yielding dryland and irrigated entries statewide will receive an additional $500 prize. All farmers entering the contest and completing the harvest form will receive a shirt from Kansas Corn, if they have not earned one already through the Corn Challenge. Contest winners will be recognized at the Kansas Corn Symposium in January 2021.

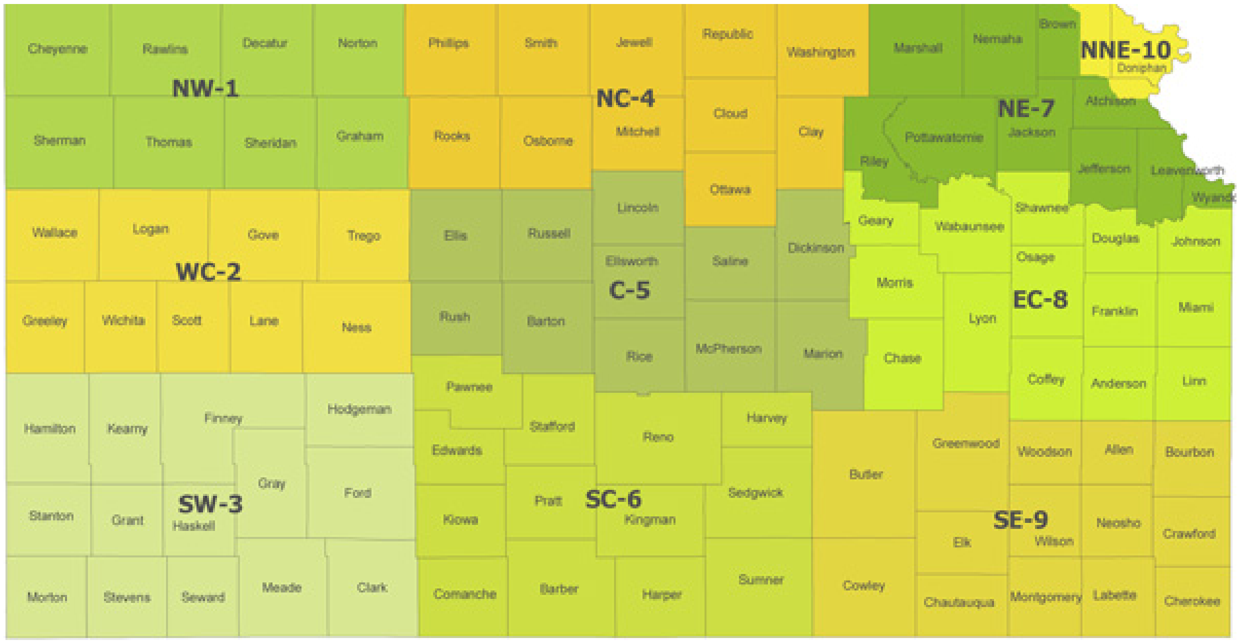


**Figure 1. Dryland and irrigated contest districts. Note: NNE includes only those fields north and/or east of KS Hwy 73 in Brown, Doniphan, and Atchison counties.**

The contest is free of charge to members of the Kansas Corn Growers Association. Registration must be completed online by **August 31, 2020.** If harvest occurs before the August 31 deadline, the registration must be received two weeks prior to harvest**.** Exceptions can be made for late harvest, but must be requested ahead of time. All harvest entry forms must be **received online by December 1, 2020**. Entries submitted to the National Corn Yield Contest qualify to enter the state contest, but entries must be made to both contests.

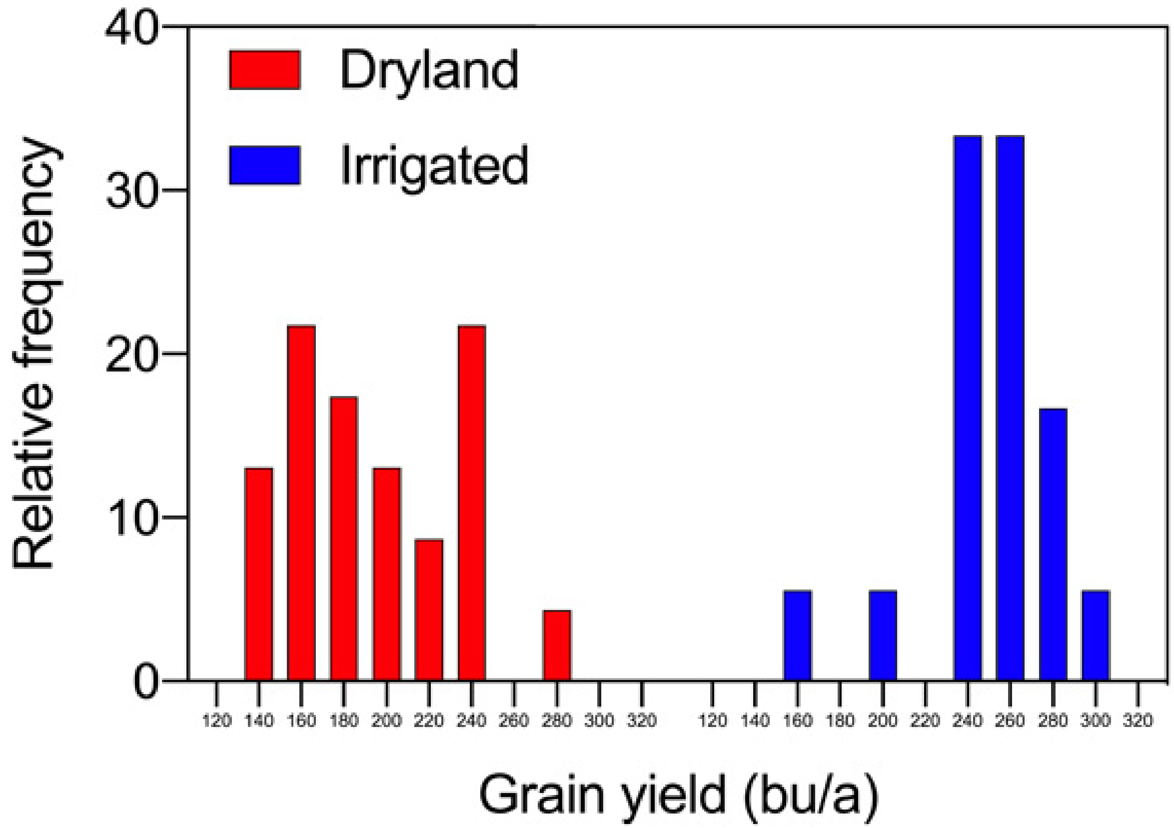


**Figure 2. Kansas contest winner entries to the Kansas Corn Contest from 2019. Relative frequency referred to number of entries in the contest along the y-axis and yield values along the x-axis are in bushels per acre (red bars for dryland and blue bars for irrigated). Graph produced by Ignacio Ciampitti, K-State Research and Extension.**

Results from the 2018 Kansas Corn Yield Contest can be reviewed at: https://bookstore.ksre.ksu.edu/pubs/MF3463.pdf ("Kansas Corn Yield Contest, High Yield Management")

For complete contest rules, forms, and to register, visit kscorn.com/yield.

For more information, call Kansas Corn at 785-410-5009 or email yield@ksgrains.com

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## 7. Kansas weed survey: Producers/ag professionals input requested

Herbicide-resistant weeds are threatening the profitability and long-term sustainability of Kansas cropping systems. To help develop innovative, cost-effective, and integrated weed management practices for controlling herbicide-resistant weeds and to further improve the outreach programs for various regions of the state, the Weed Science group at the K-State Ag Research Center in Hays seeks input from Kansas producers and ag professionals (crop consultants, county agents, certified crop advisors). We invite you to please complete a brief survey related to weed management practices and herbicide-resistant weed problems. The survey will take 5-8 minutes and can be completed using the given link or by scanning the QR code on your smart phone.

If you have further questions on the survey, please contact Dr. Vipan Kumar, Weed Management Specialist at vkumar@ksu.edu.

Survey Link: Kansas Weeds Survey

QR Code: