Issue 903

K-STATE Research and Extension

Extension Agronomy

eUpdate

04/21/2022

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. Control of later-emerging kochia in wheat or wheat stubble

Getting kochia under control in any cropping system that includes wheat begins with the wheat crop during the spring, and shortly after wheat harvest. This is not always easy, even if early spring herbicide applications for kochia control were made.

Figure 1. Kochia in wheat stubble. Photo by Dallas Peterson, retired K-State Research and Extension.

Later-emerging kochia in wheat

While a majority of kochia emerges early in the spring, emergence can extend over a period of weeks or months. A herbicide applied early in the spring will need to have residual activity to be effective on later-emerging kochia. Group 2 herbicides that contain thifensulfuron (Harmony, others) or tribenuron (Express, others) have good residual activity on kochia, but are ineffective on ALS-resistant kochia. Most kochia populations in Kansas are now ALS-resistant.

Similarly, some kochia populations are resistant to Group 4 herbicides, specifically dicamba and fluroxypyr (Starane, others). If sensitive populations are targeted for control, dicamba must be applied before the jointing stage of wheat and fluroxypyr can be applied through flag leaf emergence. Pixxaro (halauxifen + fluroxypyr) is a combination of two Group 4 herbicides and can be applied up to flag leaf emergence. No kochia populations resistant to halauxifen (Elevore) have been reported in Kansas, however halauxifen is generally less effective on kochia than fluroxypyr.

Huskie is a combination of a Group 27 herbicide (pyrasfulotole) with a Group 6 herbicide (bromoxynil). It is effective on emerged kochia and can be applied up to flag leaf emergence in wheat. Talinor (bicyclopyrone + bromoxynil) is a similar product that can be used to control kochia. Both of these products should be applied with adjuvants as directed on the labels.

Control in wheat stubble after harvest

If kochia has not been completely controlled in the wheat crop, then it may be present at the time wheat is harvested. In most cases, the kochia plants will get "topped" by the combine as the wheat is harvested. If kochia has been topped, producers should wait until some regrowth has occurred before applying herbicides in the wheat stubble to control it.

A combination of glyphosate plus either dicamba or fluroxypyr may be the most effective treatments to control kochia in wheat stubble. Even if kochia populations are resistant to glyphosate, the tank-mix combinations with dicamba or fluroxypyr will probably provide good control, as long as the kochia aren't too big, too stressed, or resistant to dicamba and/or fluroxypyr. Some 2,4-D can be added to the mixture to help with control of other broadleaf weeds, although 2,4-D generally will not help much in controlling kochia. Dicamba or fluroxypyr tanked mixed with a pound of atrazine and 2 oz of saflufenacil (Sharpen) have provided excellent control of kochia following harvest. However, only corn or sorghum may be planted the following spring if atrazine is used.

Paraquat (Gramoxone, others) can also be used to control kochia after wheat harvest. Paraquat activity will be increased if applied with a Group 5 herbicide like atrazine. Metribuzin (Dimetric, others) can be used instead of atrazine if soybeans will be planted the following spring. Wheat can be planted 4 months after a metribuzin application. Paraquat is a contact herbicide that requires thorough coverage, which can be achieved by selecting nozzles to apply medium- to coarse-sized droplets and using spray volumes of 15 to 20 gallons per acre.

To improve kochia control after wheat harvest, apply the postharvest treatments in the morning hours or after the field has received some moisture, not when the kochia plants are under maximum stress. If kochia has been severely drought stressed before treatment, waiting a couple days following a good rain may increase control.

For more detailed information, see the "2022 Chemical Weed Control for Field Crops, Pastures, and Noncropland" guide available online at https://www.bookstore.ksre.ksu.edu/pubs/CHEMWEEDGUIDE.pdf or check with your local K-State Research and Extension office for a paper copy.

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he use of trade names is for clarity to readers and does not imply endorsement of a particular product, nor does exclusion imply non-approval. Always consult the herbicide label for the most current use requirements.

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2. Considerations on adjusting seeding rate for soybeans

Soybeans acreage projections in Kansas are up 3% this season over the previous year (USDA prospective planting report). As seed cost is a critical economic factor, selecting the proper seeding rate is a key management practice. This article provides a summary of the main factors in determining soybean seeding rates.

1. **Seeding rate versus plant density**

There are three important terms: (1) "Seeding rate" refers to the target number of planted seeds per acre. (2) "Plant population" or "plant density" refer to the effective number of plants growing in a field. (3) "Seed survival rate" refers to the percent seed germination and emergence Normally, we may expect that about 80% percent of the seeds planted will survive to become part of the final plant density. It's best to start by knowing the final plant density you want, then using the expected survival rate to calculate back to the number of seeds per acre you'll need to plant. Below is an example:

$$\text{Seeding rate}\left(\frac{seeds}{acre}\right) = \frac{\text{Plant density target}\left(\frac{plants}{acre}\right)}{\text{Survival rate}\left(\frac{plants}{seeds}\right)}$$

Example of seeding rate calculation with a plant density target of 100,000 plants/acre, and expected survival rate of 80% (0.8 plants/seed):

$$\frac{100{,}000\ \cancel{plants}/acre}{0.8\ \cancel{plants}/seed} = 125{,}000\ \frac{seeds}{acre}$$

Note: The seed survival rate varies depending on specific environmental conditions and quality of the planting practice. Thus, before deciding the seeding rates, it is necessary to consider potential soil and weather conditions that could affect the success of the final stand establishment, to achieve the proper plant density required.

2. **Interaction with row spacing and planting date**

Soybean seeding rate is tied to other practices such as row spacing and planting date. The final number of seeds per linear foot of row decreases as row spacing narrows. For example, at a target plant density of 105,000 plants per acre and 85 percent germination, 30-inch rows will have twice the number of seeds per linear foot as 15-inch rows (6 vs. 3 seeds per linear foot). However, the seeding rate per acre would remain the same for both row spacings, as only the number of seeds per linear foot would change, not the seeding rate per acre.

From a planting date standpoint, seeding rate will need to increase at later planting dates to compensate for the reduction in the length of the growing season and reduced potential for branches to contribute to yield.

3. **Adjusting by yield environment**

Identifying yield potential for each environment in your field is a good practice to use when refining the soybean seeding rate decision. A recent study by Carciochi, Ciampitti and collaborators published in Agronomy Journal evaluated soybean yield performance in a database of hundreds of experiments across the Midwest. Seeding rates ranged from 69,000 to 271,000 seeds/a, and final plant density and seed yield data were considered for the analysis. The data was classified by yield environments as follows: **Low** (<60 bu/a), **Medium** (60-64 bu/a), and **High** (>64 bu/a).

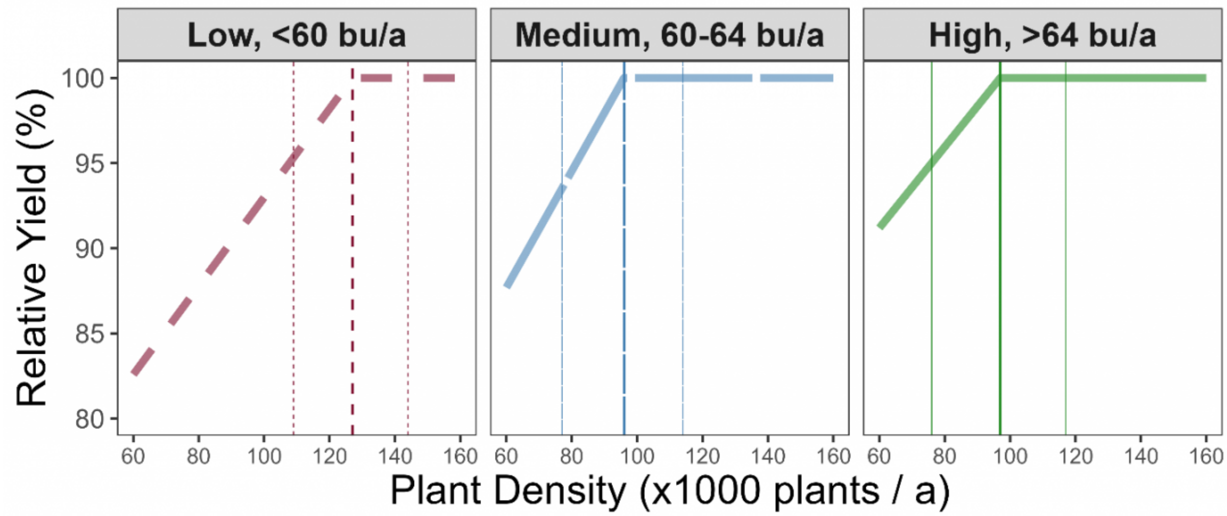

Figure 1. Expected soybean relative yield (%) with respect to the optimal plant density by yield environment. Vertical lines indicate expected optimal plant densities (Low: 127,000 plants/a; Medium: 96,000 plants/a; High: 97,000 plants/a) and their corresponding uncertainty (95% intervals). Adapted from Carciochi et al. (2018). (We'll need to put this citation at the end of the article.)

The main outcomes from this study were:

- **Most probable values**. On average, optimum plant densities were:
    - Low yield environments: 127,000 plants/a,
    - Medium yield environments: 96,000 plants/a
    - High yield environment: 97,000 plants/a.
- **Expected uncertainty**. In 50% of cases, optimum plant densities ranged from:
    - Low yield environments: 109,000 - 144,000 plants/a
    - Medium yield environments: 77,000 to 114,000 plants/a, and
    - High yield environments: 76,000 to 117,000 plants/a.
- In low yield environments, the need for higher optimal plant density was not related to a low plant survival rate, but to a reduced potential growth rate per plant.
- Another reason for the need for higher plant density in low yield environments is that there is often less precipitation during the reproductive period in these environments, reducing the crop's reproductive ability (reduction in yield contribution from branches).

4. **Expected Profit Simulation**

For site-specific management, the previous information can be used to generate prescriptions for variable rate seeding. Within a field, seeding rates can be adjusted for different zones within the field. This can improve profitability in various ways. For example, lower seeding rates could be used in certain zones, thus improving profitability by reducing seed costs and/or reducing the risk of unnecessary risk of lodging and disease development. Maintaining a fixed seeding rate for the whole field can reduce profitability compared to using a variable seeding rate. Figure 2 shows a simulation of potential lost profit ($/a) for not adjusting seeding rate by yield environment. The simulation comprises different scenarios with yield environments ranging from 40 to 70 bu/a, three survival rates (0.7, 0.8, and 0.9), two soybean grain market prices of ($12 and $16/bu), and three potential costs per bag of 140,000 seeds ($40, $55, $70/bag).

For a given field, the potential lost profits ($/a) will increase when using fixed seeding rates for the whole field compared to using optimal rate for each yield environment zone (vertical lines). Regardless of the environment, conditions that reduce the survival rate will increase the seed costs, as they increase the seeding rate needed to achieve the optimal plant density.

On the one hand, a farmer may be using a fixed seeding rate for the whole field that is "below" the optimal rate for some of the yield environment zones within the field. In that case, adjusting the seeding rate for each zone will reduce the potential lost profit since achieving the extra-yield will more than compensate for the additional seed cost. On the other hand, if a farmer is currently using a fixed seeding rate for the whole field that is "above" the optimal rate for a some of the yield environment zones within the field, reducing the seeding rate to the optimal for each zone will reduce the potential lost profit due to investing in unnecessary seeds.

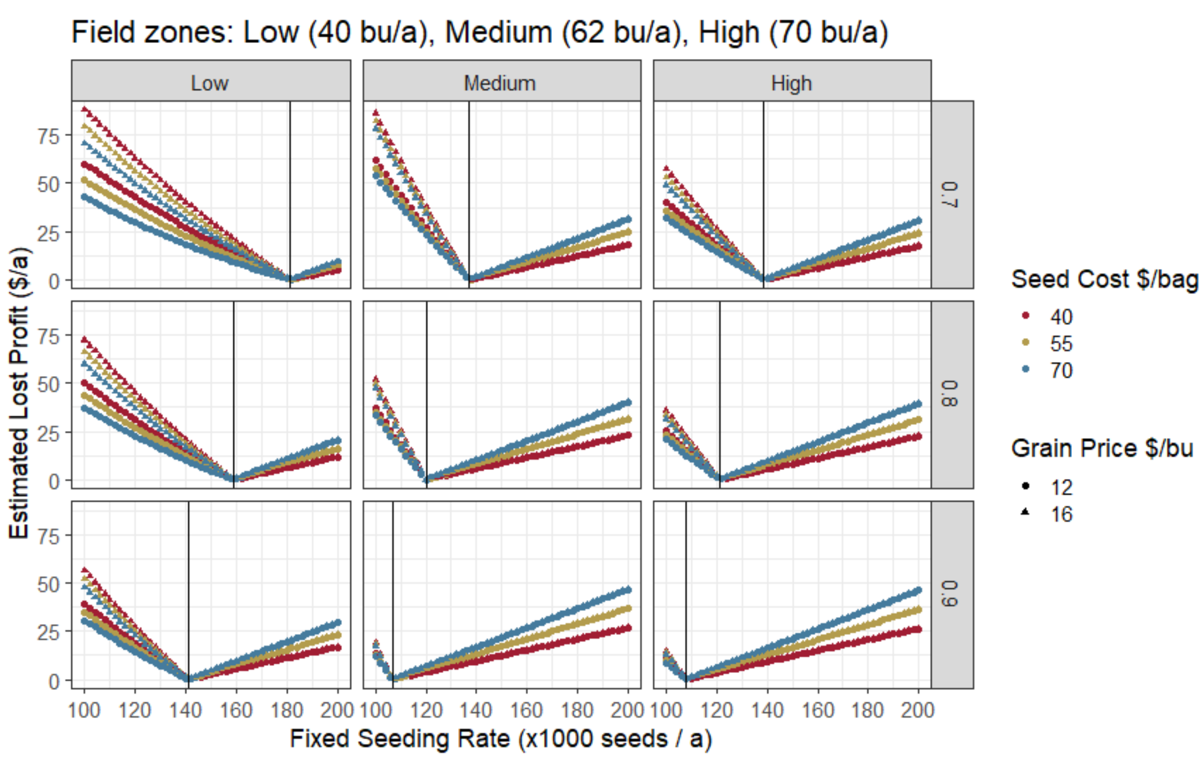

Figure 2. Simulation of lost profit per acre for NOT adjusting seeding rates by yield environment (Low, Medium, High) at three plant survival rates (0.7, 0.8, 0.9) and six combinations of seed cost ($40, 55, 70/bag) and grain price ($12, 16/bu). Hypothetical yield environments range from 40 to 70 bu/a. Hypothetical seed costs are based on 140,000 seeds per bag. The vertical lines indicate the optimal seeding rate for each situation.

For more information about the optimal soybean seeding rates and optimal plant densities, please, consult https://bookstore.ksre.ksu.edu/pubs/MF3460.pdf

5. **Final considerations**

- In summary, adjusting seeding rates based on plant survival rates, soil conditions, and planting dates can reduce the risk of yield and profit losses due to suboptimal densities in a low yield environment, while limiting higher seed costs due to supra-optimal densities, especially for medium and high yield environments. Moreover, soybean plant density levels above the optimal plant density increase the risk of lodging and disease development without adding a yield benefit.
- If planting early, try to maximize plant survival and reduce threatens to emergence by:
    - Avoiding planting when soil temperatures are below 60°F. If planted into soils cooler than 60°F, seedlings may eventually emerge but will have poor vigor.
    - Treating seeds with fungicide and insecticide.
    - Selecting varieties with resistance to soybean cyst nematode and sudden death syndrome.

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3. Alfalfa weevil and aphid populations in alfalfa - update as of April 21

Alfalfa weevil and certain aphid populations are now active in Kansas. The following is an update as of April 21.

Alfalfa weevil

Alfalfa weevil larvae continue to be very active. Larvae started hatching about 3 weeks ago, and are still doing so (Figure 1), thus the disparity in size in this picture. Many alfalfa fields have been treated in the last 2 weeks but larvae continue to emerge from eggs. Thus monitoring should continue, but only after the reentry interval (REI) for the insecticide used on that field. Most insecticides used for alfalfa weevil control will also kill any aphids present, along with the beneficials. So, monitoring for aphids should continue also.

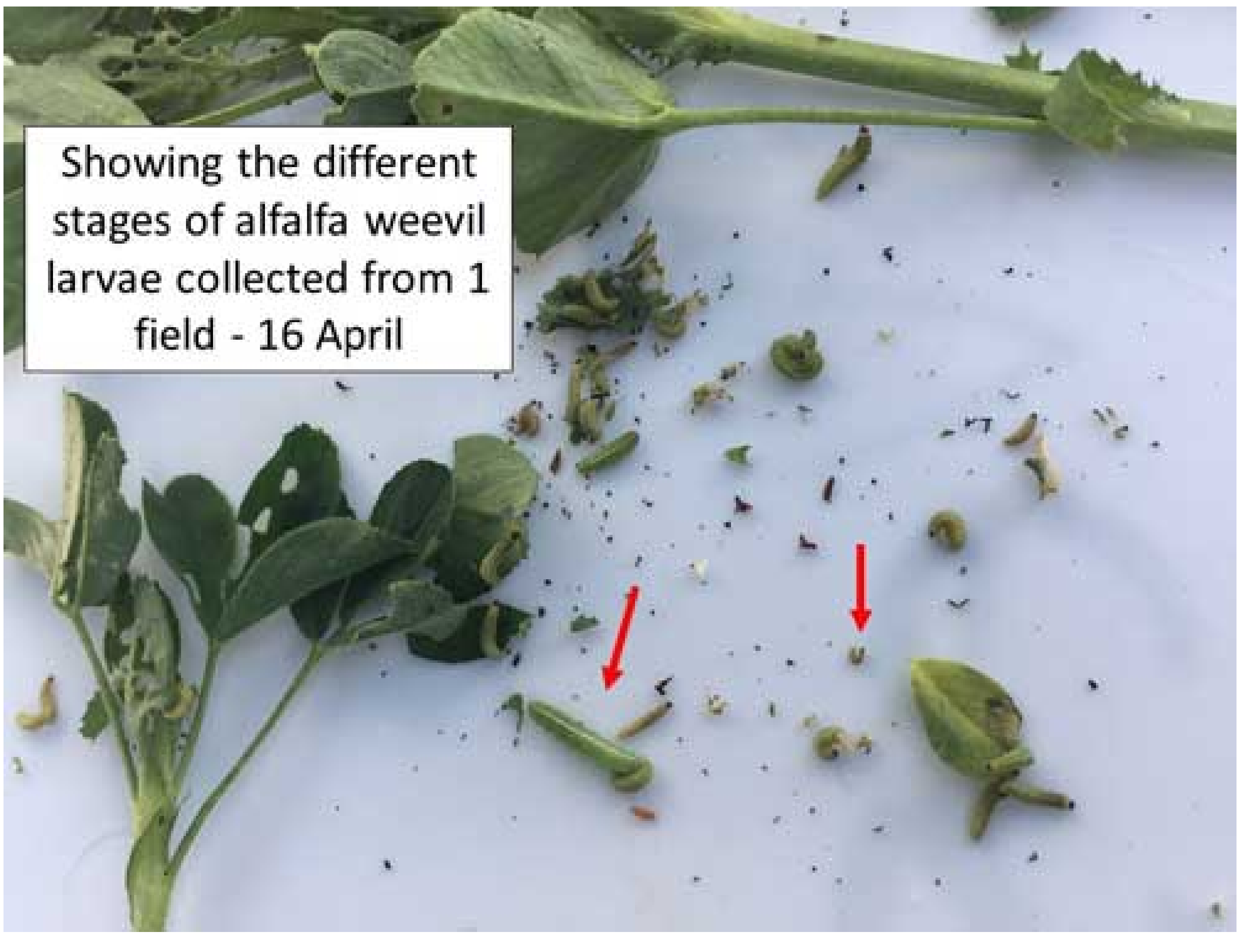

Figure 1. Different stages of alfalfa weevil larvae. Photo by Extension Entomology, K-State Research and Extension.

To sample using the "shake bucket" method, randomly select individual alfalfa stems and quickly and vigorously shake them into a small white bucket. Then, count the number of dislodged larvae in the bucket and divide by the number of stems to get the infestation level. For example, 15 larvae from 10 stems = an average of 1.5 larvae/stem. Do this in several areas throughout each field to get a good indication of the alfalfa weevil infestation level and the stage of development of the weevil. One of the problems with the shake bucket method is that some stems have several larvae/stem while others have none (yet). Thus, the infestation level may appear to be higher than the actual infestation.

However, in north central Kansas, with as many larvae as there are already (with more to come probably) and as much damage as we are starting to see in spots (Figure 2), it may be prudent to treat fields as soon as possible.

Producers should treat for alfalfa weevils once the weevils are found on at least 50% of the alfalfa plants.

Figure 2. Visual signs of damage by alfalfa weevils. Photo by Extension Entomology, K-State Research and Extension.

For information on insecticides registered for use for alfalfa weevil control, please see the K-State Alfalfa Insect Management Guide: https://www.bookstore.ksre.ksu.edu/pubs/mf809.pdf

Aphids

Cowpea and pea aphids have also been found in some alfalfa fields. These aphids are not normally found at current levels until June or July, usually with the second or third alfalfa cutting.

Alfalfa is a good host for beneficial insects, such as lady beetles. They will feed on cowpea aphids and pea aphids. Because of that, I have a hard time recommending treating for cowpea aphids or pea aphids.

Many producers worry about the honeydew on alfalfa plants that cowpea aphids produce. There is no specific percentage that creates the need for the aphids to be treated, however.

If a producer decides to treat for aphids, they may want to consider one of the new insecticides that are labeled for alfalfa aphids. If producers leave them untreated, beneficial insects will find them and start helping to control them to some extent.

Spraying for alfalfa weevils will also kill the aphid populations.

(Information in part provided by Shelby Varner, K-State Research and Extension.)

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4. Wheat disease update: April 21, 2022

Wheat in the southeast and southcentral part of the state is at or approaching the flag leaf stage of growth and many are wondering about the need for a foliar fungicide.

With dry conditions throughout the state, disease pressure has been below average in most scouted locations. At the time of publication of this article, there have been no reports of either stripe rust or leaf rust in Kansas. Additionally, there have been reports of low rust pressure in both Oklahoma and Texas. Dry conditions in the region may be suppressing disease development. As a reminder, stripe rust development requires periods of cool, wet weather and periods of time where the canopy is wet. These conditions have only been met recently in parts of eastern Kansas. We will continue to scout for both stripe and leaf rust and report on risk of yield limiting infections.

Additionally, there have been very few reports of wheat streak mosaic virus. We may start to see additional reports of this disease as the weather warms and wheat in western Kansas starts to joint.

If you are seeing wheat streak mosaic virus or other diseases that you are unsure of, please reach out to your local K-State extension agent and they can help you submit a sample to the K-State diagnostic lab.

Use this link for the sample submission form:

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

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

- Fill out the above form (PDF) as completely as possible, including variety.
- Send a plentiful amount of fresh plant material (including roots). It is best to include the entire plant when possible. Shake off most of the soil.
- Send a plant sample that is characteristic of the problem (exhibits a range of symptoms).
- Dig (do not pull) up the plant, so the roots remain intact.
- Do not add water or wet paper towels to the sample!
- Seal the plant material in an appropriately sized plastic bag and pack in a crush-proof container.
- Put the form into a separate plastic bag to keep it dry.

Shipping address:

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

Contact information for K-State Plant Disease Diagnostic Lab:
clinic@ksu.edu

785-532-1383

Kelsey Andersen Onofre, Extension Plant Pathologist

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5. Emergency tillage for wind erosion concerns

Cropland can be quite susceptible to wind erosion under some conditions. Cooler-than-normal temperatures and drought conditions may limit vegetative growth and cover. Burning or removing crop residues for forage creates a particularly serious hazard. Winter wheat and other fall-planted crop fields also may be susceptible during periods of low cover in the winter and early spring. This is particularly true during drought. Marginally productive cropland may not produce sufficient residue to protect against wind erosion. In addition, overgrazed or poorly vegetated rangeland may also subject to wind erosion. Recent wind conditions have been conducive to erosion (Figure 1), given the numerous days with significant peak wind gusts recorded over much of Kansas (Figure 2).

Figure 1. Example of how blowing soil can darken the skies. This photo was taken in Colby on October 11, 2020. Photo taken by Lucas Haag, K-State Research and Extension.

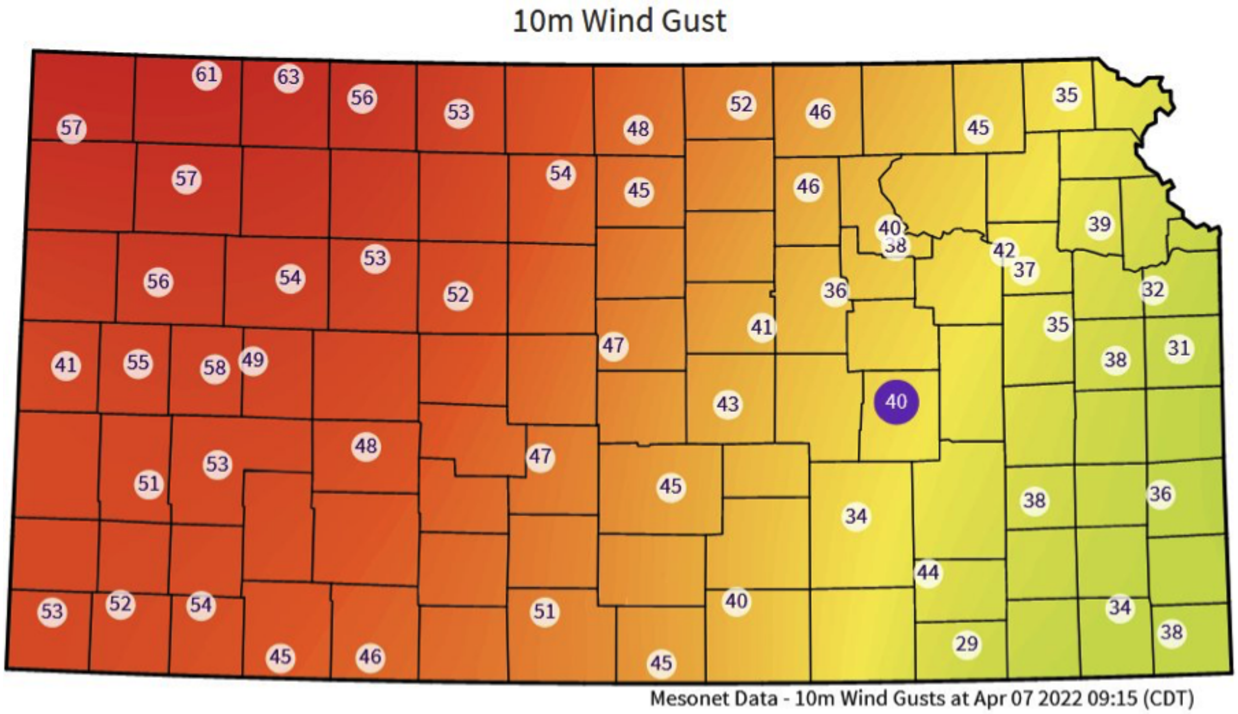

Figure 2. Peak 24-hour wind gusts measured at 10 meters for April 7, 2022. http://mesonet.k-state.edu/weather/maxmin

It is important to monitor field conditions and identify fields that are in a condition to blow. Such conditions include low vegetation cover and a high proportion of erodible-sized clods (less than 1 mm in size, or about the thickness of a dime). It is better to be proactive and treat potential problems before they occur than to try to react and catch up once a field is actively eroding. Once soil movement has started, it is difficult to completely stop further damage. However, prompt action may prevent a small erodible spot from damaging an entire field or adjacent fields.

Emergency control measures

Mulching. If wind erosion has already started, it can be reduced by mulching with manure or other anchored plant materials such as straw or hay. To be effective, at least 1.5 to 2 tons per acre of straw or grass or 3 to 4 tons per acre of corn or sorghum stover are needed to control areas of erosion, and the straw or hay must be anchored. Residue can be spread by hand, spreader or other mechanical equipment.

A stubble puncher or disk set straight may be used to anchor residue and prevent it from being blown away. Wet manure application should be 15 to 20 tons/acre and not incorporated into the soil. Care should be taken to not add wheel paths parallel to the wind direction as the mulch is applied. Traffic areas and wheel paths can contribute to wind erosion.

Generally, mulches are practical only for small areas, so mulching is most effective when applied before the soil starts to move. Producers should scout fields to identify areas that might be susceptible to wind erosion (low vegetation cover and a high proportion of erodible-sized clods less than the thickness of a dime) if they plan to use mulch or manure to controls.

Emergency tillage. Emergency tillage is a last-resort method that can be effective if done promptly and with the right equipment. The goal of emergency tillage is to make the soil surface rougher by producing resistant clods and surface ridges (Figures 3 and 4). A rough surface reduces wind speed. The larger clods and ridges resist movement and provide traps to catch the moving soil particles.

Chisels with single or only a few tool ranks are frequently used to roughen the soil surface. The combination of chisel point size, speed, and depth that produces the roughest surface with the firmest, most resistant clods should be used for emergency tillage.

Research has shown that a narrow chisel (2 inches wide) on 24- to 54-inch spacing, operated 3 to 6 inches deep will usually bring enough resistant clods to the surface to control erosion on fine-textured (clay-based) soils. A medium shovel (4 inches wide) can be effective for medium-textured soils (loamy soils). Spacings should typically be narrower where there is no cover and wider in areas of partial cover, such as a growing crop or plant residue.

If the erosion conditions recur or persist, a second, deeper chiseling should split the first spacing. Tillage passes should be made perpendicular to the direction of the prevailing wind causing the erosion.

Figure 3. Emergency tillage across 50 percent of the field. Photo courtesy of USDA-ARS Engineering and Wind Erosion Unit, Manhattan, Kansas.

Figure 4. Widely spaced shanks used for emergency tillage, making clods to roughen the soil surface. Photo courtesy of University of Nebraska.

If emergency tillage is to be used in growing crops that are covered by crop insurance, producers should check with their crop insurance providers regarding emergency tillage insurance rules. Emergency tillage does not significantly reduce wheat yields of an established crop. Studies in southwest Kansas and Manhattan demonstrate that the use of a chisel on 40-inch spacing reduced wheat yields by 5.5 bushels per acre on the emergency tillage area, due to direct injury caused by the tillage action. Since the entire field is rarely tilled when performing emergency tillage, the overall yield reduction for the field will be less than 5.5 bushels per acre. In fact, yields in the untilled portion of the field actually can be increased by the use of emergency tillage since that tillage will reduce the amount of damage to wheat caused by wind erosion. The overall reduction in yield for fields that have received emergency tillage has been as little as 1 bushel per acre in the studies mentioned above.

Performing emergency, clod-forming tillage across the field is effective in reducing wind erosion. The degree of success of emergency tillage is highly dependent on climatic, soil, and cover condition. It is often not necessary to till the entire field, but rather, it is very effective to perform emergency tillage passes across 50% of the field (till a pass, leave a pass, repeat). Narrow chisel spacing (20 to 24 inches) is best for this method.

If 50% of the area has been tilled and wind erosion persists, the omitted strips can be emergency-tilled in a second operation to make result in full-cover tillage. If a second tillage pass is needed, it should be at a greater depth than the first pass. Wide-chisel spacings are used in the full-field coverage method. The space between chisel grooves can be chiseled later should wind erosion persist.

All tillage operations should be perpendicular or across the direction of the prevailing or eroding wind. For most of Kansas, this means that an east-west direction of tillage is likely best.

The best wind erosion control is created with maximum surface roughness when resistant clods cover a major portion of the surface. Research shows that lower travel speeds of 2 to 3 mph generally produce the largest and most resistant clods. However, speeds of 5 to 7 mph produce the greatest roughness. Because clod resistance is usually reduced at higher speeds, the effect may not be as long-lasting as at lower speeds. Thus, higher speeds are recommended where erosion is already in progress, while lower speeds might be a better choice in anticipation of erosion.

Depth of tillage usually affects clod stability more than travel speed, but optimum depth is highly dependent on soil conditions (such as moisture level) and compaction. Deeper tillage passes can produce more resistant clods than shallow passes.

If the problem is severe and the wheat has already been destroyed or the ground is bare, chisels 4 to 6 inches wide on a 24- to 30-inch spacing will generally provide enough clods to control erosion. Operating depth should be 4 to 6 inches.

Controlling wind erosion on sandy soils

Loose sandy soils require a different tillage approach to effectively control erosion. Clods cannot be formed at the surface that will be sufficiently resistant to erosion on sandy soils. Erosion resistance is achieved through building ridges and furrows in the field to provide adequate protection.

A 14-inch moldboard lister spaced 40 to 50 inches apart (or an 8-inch lister on 20- to 24-inch spacing) is needed to create sufficient surface roughness. The first listing pass should be shallow, not more than about 4 to 5 inches deep. Then, when additional treatment is needed, the depth should become progressively deeper. Alternatively, for the second treatment, the original ridge may be split.

The addition of manure to the ridged surface may also be beneficial in these situations.

Tips for effective emergency tillage

- Watch the weather forecast for periods of high winds, particularly when soils are dry.
- Assess residue and plant cover prior to the wind blowing, and take preventive action with emergency tillage. It is much easier to prevent the problem from starting than to stop erosion after it begins. If you wait, the soil only gets drier and some moisture is needed to form clods.
- Use the combination of tractor speed, tillage depth, and chisel point size that will produce the roughest surface with the most resistant clods. If wind erosion is anticipated, do some test tillage prior to an erosion event to see what tillage tool, depth, and speed will provide adequate clods and surface roughness.
- Always start at the upwind location when the field is blowing. A sufficient area upwind of the eroding spot should be tilled, in addition to the area presently blowing.
- Till in a direction perpendicular to the prevailing wind direction. For row crop areas it may be necessary to compromise direction and follow the row pattern. Maintain as much anchored stubble in the field as possible.

For more information, see K-State Research and Extension publication MF2206, *Emergency Wind Erosion Control*, at: http://www.ksre.ksu.edu/bookstore/pubs/MF2206.pdf

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6. Soil Health Workshop, Hays, KS, May 18-19, 2022

Extension educators, conservation specialists, and agricultural professionals are invited to a soil health workshop at the Agricultural Research Center on May 18-19.

The two-day workshop will teach participants about soil health principles, soil management, and carbon credits. In addition, attendees will have opportunities for hands-on experiences conducting field demonstrations and field assessments.

The workshop begins at 9 a.m. at the Western Kansas Agricultural Research Center Auditorium. The first day will feature expert speakers on topics such as cover crop management in dryland systems and how soil health is connected to water. Soil health demonstrations will also take place on day one.

On day two of the workshop, participants will learn how to conduct in-field soil assessments, interpret soil health test results, and make soil health recommendations. Specialists will be available during the entire workshop to answer questions and give advice. Meals will be provided to attendees on both days of the event.

Interested participants should RSVP to Augustine Obour (aobour@ksu.edu) or Stacie Minson (sedgett@ksu.edu) no later than May 15. The event flyer and agenda are available online from the Kansas Center for Agricultural Resources and the Environment.

This event is organized by K-State Research and Extension, the Soil Health Nexus, and the Kansas Natural Resources Conservation Service (NRCS).

UPCOMING SOIL HEALTH WORKSHOP

MAY 18-19, 2022
K-STATE AGRICULTURAL RESEARCH CENTER IN HAYS

Join us to learn about soil health principles, soil management, and carbon credits and get hands on experience conducting field demonstrations and field assessments!

WEDNESDAY MAY 18TH: 9:00AM - 8:00PM

- *Principles of soil health*
- *Soil health and water connection*
- *Cover crop management in drylands*
- *Soil health and carbon credits*
- *Rapid-fire topics and discussions*
- *Soil health demonstrations: active carbon, soil texture, slake test, bulk density, aggregate stability and more!*

THURSDAY MAY 19TH: 8:00AM - 3:00PM

- *In-field soil assessments*
- *Interpreting soil health test results*
- *Making soil health recommendations*

RSVP to Stacie Minson at 785-769-3297 or sedgett@ksu.edu by May 15th

Photo from Ted Banister's farm, Alexander, KS

K·STATE Research and Extension | KCARE | North Central SARE | SOIL HEALTH NEXUS | USDA United States Department of Agriculture, Natural Resources Conservation Service