

D's Notes
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Preparing food for the Fourth of July

The Fourth of July is full of food, fun and fireworks. As family and friends attend gatherings and events, Kansas State University food scientist Karen Blakeslee says food safety should be a top priority during festivities.

The top four tips Blakeslee encourages include:

- Always wash your hands before handling food and eating. Wash them after handling raw meats.
- Keep raw foods away from ready-to-eat foods to prevent cross contamination. Consumer research has shown that 32% of consumers did not thoroughly wash contaminated plates and cutting boards after using them for raw meat. And don't forget spice containers, Blakeslee said. Of those surveyed, 12% had contaminated spice bottles because of unwashed hands.
- Keep hot foods above 140 degrees Fahrenheit during serving. If outside on hot days above 90 F, refrigerate leftovers within one hour.
- Keep cold foods below 40 F. Marinate meats in the refrigerator. Toss the used marinade or boil it to use as a dip. Refrigerate leftovers within one hour on hot days.

Blakeslee, who is also coordinator of *K-State's Rapid Response Center for Food Science*, <https://www.rrc.k-state.edu/>, recommends using a food thermometer when cooking meats. Look for 145 F for steaks and chops, 160 F for ground beef, pork, lamb, and 165 F for all poultry. Hot dogs, hamburgers, grilled foods and barbecue are among the most common foods served at large gatherings.

"Keep it simple. Use ice chests with ice or ice packs to keep foods cold. If using the grill, be sure someone is managing the grill for overall safety," Blakeslee said.

Making an end-of-life plan is not just for the elderly

When young people turn 18, new opportunities come their way, such as the ability to vote in elections, serve in the military, and more. But it also comes with responsibilities now that they are legal adults.

On that to-do list is to make a plan for how they'd like their estate handled upon their death, says K-State Extension Family and Consumer Science agent Renae Riedy, whose specialization is in family resource management and aging.

"Once people turn 18, young adults should make an estate plan, which is more than just what to do with the assets," Riedy said.

Some of the key documents Riedy advises all adults to complete include:

- A durable power of attorney for financial matters as well as health care directives.
- A HIPAA (Health Insurance Portability and Accountability Act) privacy authorization form.
- A living will (if desired) as well as a do not resuscitate directive (if desired).

These forms are available in an online publication titled, *Advanced Health Care Planning in Kansas*, https://bookstore.ksre.ksu.edu/download/advance-health-care-planning-in-kansas_MF3280.

She also advises people to make a plan that addresses what they want done with their assets. This can be set up through a will and by using other tools such as transfer on death deeds, naming beneficiaries directly on the assets or a payable on death designations, depending on the asset.

If an individual has minor children or pets, designating who will care for them is very important. A trust may be appropriate, depending on the circumstance, Riedy said.

“Make sure you have a conversation with the person who you are going to appoint as the power of attorney and executor about your wishes and make sure they know where these important documents are located,” Riedy said.

Along with the formal forms, she encourages everyone to create a list of important assets. To help get the process started, Riedy suggests people refer to another online publication, *Our Valuable Records*, https://bookstore.ksre.ksu.edu/download/our-valuable-records_MF685.

“When writing down everything that is valuable to you, make sure you include how you want your digital assets -- such as your online records and social media accounts -- managed upon your death,” Riedy said.

To ensure your wishes are followed, Riedy said it is important to work with an attorney to write a will.

These topics can be hard to talk about, so Riedy also encourages people write a last letter of instruction to share information about their final wishes regarding what becomes of their body upon death and any other pertinent information that their loved ones need to know.

Riedy said, “By completing these forms and making plans, you are giving your family a gift because knowing your wishes will create less stress for them in a time of intense grief. And if you don’t make a plan, the state will make one for you and it may not be what you want.”

In the Garden: When tops fall over, it’s time to harvest onions

Kansas State University horticulture expert Matt McKernan says gardeners have no need to cry when looking for signs to harvest onions.

He said onions reach maturity when the tops begin to fall over; when at least one-half of the tops have fallen, it’s time to harvest.

“Onions can be pulled or dug up, leaving the tops intact,” McKernan said. “Hang the bunches, or spread them out, but ensure that they have good airflow and are out of direct sun in a warm location.”

McKernan noted that it can take 2-4 weeks for the tops and necks of onions to dry completely. Then, cut the tops and roots to one-half inch from the bulb, and store bulbs in a container that allows air to circulate, such as a loose basket, crate or mesh bag, at 32-40 degrees F with low humidity.

“If the temperature is too warm, the onions will sprout,” McKernan said. “If the room is too moist, roots will develop.”

More information on growing and harvesting onions is available at https://bookstore.ksre.ksu.edu/download/onions_MF761.

Harvesting popular fruit

Blackberries and strawberries make the list of favorite fruits for many Kansas gardeners.

Blackberries should be harvested at peak maturity for best flavor. “They will not continue to ripen after harvest,” McKernan said, “so wait until the blue-black fruit has lost its shine, leaving a duller surface.”

Blackberries should be harvested on a dry day during the cool hours. When the fruit is removed, the receptacle (core) remains attached to the berry. Store freshly harvested blackberries in the refrigerator, unwashed. Blackberries should be harvested every 2-3 days depending on weather and the cultivar.

For more information, see the K-State Extension publication titled, *Raspberries and Blackberries*, https://bookstore.ksre.ksu.edu/download/raspberries-and-blackberries_MF720.

After harvesting fruit from June-bearing strawberries, the beds should be prepped for the next season. Strawberry plants will develop fruit buds in the fall, so renovating the beds now is important to avoid disturbing the plants later, according to McKernan.

Prepping June-bearing strawberry beds includes removing weeds, mowing the plants to 2 inches tall, cultivating the soil and applying fertilizer.

VIDEO OF THE WEEK:

As we saw in last week’s video, tomato plants can experience many challenges. These problems change throughout the growing season, and in this second video in the two-part series, we’ll continue exploring more of the most common tomato problems, including sun scalding, fruit cracking, calcium deficiency, and stink bug damage. This *week’s video continues with part two of some of the most common tomato problems in Kansas*, and in only two minutes, will help you identify more of the common tomato issues to be looking for this summer: <https://kansashealthyyards.org/all-videos/video/common-tomato-problems-part-2>

GARDEN CALENDAR:

- Continue a regular fruit disease and insect control program.
- Plant pumpkins and other summer squash. Late plantings help to avoid some squash bug pressure.
- Remove sucker growth from base of trees and along branches.
- Water and fertilize annual flower plantings regularly to encourage growth and flowering.
- Check annual and perennial plants for insects such as spider mites, aphids, and budworms.
- Let grass clippings fall back to the soil for nutrient recycling. Do not bag grass clippings.
- When mowing, be sure not to damage tree trunks with mowers and string trimmers.
- Repot houseplants as needed in containers that are at least 1" larger than the current pot.

Plant Sweetpotatoes Now:

Sweetpotatoes are a valuable and nutritious crop that can be successfully grown across Kansas with the proper care. Sweetpotatoes are usually planted from late May to the end of June, in order to avoid any chance of cold injury.

Sweetpotatoes will grow in a wide variety of soil types, but produce best on sandy loam soils with good drainage, which promote good root shape and quality. Avoid planting in heavy or poorly drained soils, which can lead to misshapen roots and increased rot problems. Overly rich soils should also be avoided, as they may reduce yield.

Whenever possible, plant sweetpotatoes on raised ridges 10 to 12 inches high. Doing so improves soil drainage in heavy soils and allows soils to remain loose, improving both the size of potatoes and ease of harvest. Plants should be spaced about 12 inches apart in rows, with rows spaced at least three to four feet apart. Sweetpotato vines can easily spread six to eight feet wide.

Unlike most vegetables, sweetpotato plants are established from “slips,” or transplants, produced from sprouted roots in hotbeds or greenhouse benches. Slips should be 8 to 10 inches long with a strong root system at planting. Slips can often be purchased in bundles from your local garden center. In some cases, slips may be sold without roots, but can still be established successfully. Be sure to provide adequate water to new slips at planting. Plants may wilt dramatically after planting, but usually recover and establish rapidly after a few days.

Sweetpotatoes are adapted to grow well in drier weather, but thorough watering is important while the slips are initially being established. Occasional, deep watering in the summer during dry periods will improve yields. Manage weed development early in the growing season. As plants grow, dense vine growth will help to suppress weeds later in the year.

Sweetpotatoes usually require between 90 to 120 days from planting to harvest, depending on the variety. Harvest before freezing weather, usually from mid-September to mid-October. After digging, roots should be cured under warm, humid conditions to improve quality and storage life.

When to Pick Blackberries:

Blackberries should be harvested at peak maturity for the best flavor. Unlike many fruits, blackberries do not continue to ripen after being harvested. The color of the fruit, ease of separation and testing the flavor will provide the best indications of maturity.

As blackberries ripen, the fruit will soften and produce the characteristic flavor. When evaluating color, wait until the blue-black color develops on the fruit, and the fruit loses its shine, leaving a duller surface. The exact time to harvest blackberries varies by cultivar, with thorny blackberries normally ripening earlier than thornless types.

When the fruit is removed from the plant, the receptacle (or core) should remain attached to the berry, unlike with raspberries which leave the receptacles attached to the plant. The receptacle is the part that attaches to the stem and should remain attached to the interior of the fruit when harvested, however it easily separates from the plant if the fruit is ripe. Full color often develops before the berries separate easily.

Preferably, fruit should be harvested on a dry day during the cool morning hours. Pick the berries by gently lifting with the thumb and fingers. Blackberries should be harvested every two to three days, depending on weather and the cultivar, to harvest at peak maturity. It is best to store excess freshly harvested blackberries in the refrigerator unwashed. Take care not to crush the berries or expose them to the hot sun. Whenever possible, avoid picking berries when they are wet.

Visit the *Raspberries and Blackberries* publication for more information on growing and harvesting blackberries in Kansas: https://bookstore.ksre.ksu.edu/download/raspberries-and-blackberries_MF720

Brown Patch Disease Sets In On Tall Fescue Lawns:

As summer weather sets in, conditions of warmer nighttime temperatures and increased humidity occur. These conditions are ideal for the development of brown patch disease on tall fescue lawns. Brown patch disease is now beginning to occur around the state, as these weather conditions extend the amount of time grass blades stay wet, favoring disease development.

Brown patch symptoms develop quickly during warm, humid weather. The fungus becomes highly active when conditions are moist (such as from dew or improper irrigation) and night temperatures are above 68°F. In Kansas, these conditions are already present, and common throughout July and August.

Symptoms of brown patch can vary and be similar to those of drought. From a distance, turfgrass develops a light-brown or tan color. Damage can develop as well-defined circular patches, several inches to several feet in diameter, or as a diffuse browning across the lawn.

To confirm the presence of brown patch, look closely at the individual grass blades in the edges of the symptomatic areas. The disease causes irregularly shaped tan spots on the leaf blade that are surrounded by a dark, reddish-brown border. The lesions usually look water soaked but are always surrounded by a dark brown halo.

The fungus that is responsible for brown patch disease is primarily a leaf pathogen. It does not attack the roots. During severe outbreaks, the fungus may invade the lower leaf sheaths and crown and kill plants. In most cases, however, the turfgrass can recover from brown patch disease when weather patterns change. This recovery may take two to three weeks, depending on the weather.

There is no way to eliminate brown patch from a Tall Fescue lawn. It persists indefinitely in the soil. In almost all cases, the limiting factor for brown patch development is the weather, not the amount of fungal inoculum.

Although the brown patch fungus cannot be eliminated, many cultural practices can help manage it:

- The first and most influential factor in managing brown patch is the lawn's irrigation practices. Do not water lawns in the evening. Instead, water early in the morning to decrease the number of hours the turfgrass leaves remain wet and susceptible to infection. The frequency of irrigation is not as important as the time of day when the lawn is watered.
- When dealing with brown patch, it is also critical not to overfertilize and never to fertilize when brown patch is active. In tall fescue lawns, the majority of fertilizer should be applied in fall (September and November), not in early spring.
- When planting new grass seed, or overseeding thin lawns, be sure not to apply seed at too high of rates. Overly thick lawns are more susceptible to brown patch.
- Shady conditions and poor air flow will also increase humidity and leaf wetness. If feasible, adjust site conditions to reduce shade and improve air flow.

Fungicides to manage brown patch are available, however these products do not cure an infection already present in the lawn, but instead only serve as a preventative measure against new infections. Fungicide applications would need to begin in mid-June and continue through August, during weather that favors the disease. As a result, fungicides are not recommended in most cases. Remember that in many cases of brown patch, the turf recovers on its own within a couple of weeks after a change to cooler, drier weather. Efforts should instead be made to adjust cultural practices and promote lawn recovery.

If preventative fungicides are used, keep in mind that there are significant differences in the products available for homeowners and commercial lawn care companies. Most ready-to-use products available for homeowners contain triadimefon, myclobutanil, propiconazole, or thiophanate-methyl as their active ingredients. The effectiveness of these products is often mixed. Instead, consider hiring a commercial lawn care company. The active ingredients in commercial grade products, such as the active ingredients azoxystrobin, fluazinam, penthiopyrad, pyraclostrobin, or trifloxystrobin, will tend to perform better than the active ingredients available to homeowners.

For more information on brown patch disease and its management, visit the following publications: *Brown Patch in Tall Fescue Lawns: Information for Homeowners*: <https://www.plantpath.k-state.edu/extension/turf/documents/Brown-patch-homeowners.pdf>; *Commercial Management of Brown Patch of Cool season Turfgrasses*: https://bookstore.ksre.ksu.edu/pubs/commercial-management-of-brown-patch-of-cool-season-turfgrasses_EP146.pdf.

Watering Young Trees And Shrubs for Long-Term Success:

Proper watering is one of the most important factors in helping newly planted trees and shrubs survive and thrive in Kansas. Unfortunately, many trees fail after transplanting because they receive either too much or too little water.

Before planting, trees and shrubs should be watered thoroughly. Water again at planting and the following day to settle the soil and eliminate air pockets around the plant roots. During the first month after planting, trees and shrubs will generally need watering one to two times per week when rainfall is lacking. This will be most critical in the first two weeks after planting, which may require additional watering, depending on the time of year and environmental conditions.

After the first month, most newly planted trees and shrubs will benefit from a deep weekly soaking of about 10 gallons of water. Use a tree watering bag or 5-gallon bucket with one or more small holes (1/8 inch diameter) drilled in the side, near the bottom, to help measure the amount of water being applied. Sandy soils may require the water to be split into two partial applications several days apart. Larger trees need additional water based on trunk diameter.

Avoid overwatering. Constantly wet soil can damage roots by limiting oxygen, causing leaves to wilt even when water is available. All parts of the plant require oxygen to survive, so allow soils to dry slightly between waterings. Monitor soil moisture with a trowel, probe, or screwdriver and adjust watering accordingly.

During establishment, young trees and shrubs (planted within the last three to five years) will continue to benefit from supplemental watering during periods of dry weather. Continue to provide at least 10 gallons of water during every soaking but begin to gradually increase the number of days between waterings to every 10 to 14 days if it does not rain.

Building a low berm around the base of these newly planted and young trees and shrubs will help to further retain moisture from waterings. Create a berm 3 to 4 inches high outside the edge of the planting hole using excess soil from planting. This basin will help to retain moisture and avoid runoff, allowing water to soak into the root ball and surrounding soil.

The berm can be further improved by keeping it grass and weed free, and by applying a 2 to 4 inch deep layer of mulch. Mulch will help further conserve soil moisture, moderate soil temperature, and reduce competition from turfgrass and weeds for the available water. All of these will help to increase tree growth. Be sure to always keep mulch a few inches away from the trunk, however. Mulch piled against the tree trunk can eventually kill the tree by developing stem girdling roots.

Visit our *Watering Newly Planted and Young Trees and Shrubs - Best Management Practices* publication for more information about watering and caring for young trees and shrubs: https://bookstore.ksre.ksu.edu/pubs/watering-newly-planted-and-young-trees-and-shrubs_MF2800.pdf

National Mosquito Control Awareness Week:

As summer settles in and warmer weather brings mosquitoes into our daily routines, communities are coming together to celebrate National Mosquito Control Awareness Week (June 21-27, 2026). This annual celebration shines a spotlight on prevention and innovation, and this year explores how communities are turning yesterday's threat into today's solution.

It is important to be able to identify mosquitoes to avoid confusion with other insects such as crane flies, gnats, moth flies, and biting midges. Mosquitoes have a long proboscis, scaled wings and a slender body. Mosquitoes can be identified to genera by their body markings, resting posture, activity patterns and breeding habitats. Common mosquito genera found in Kansas includes *Aedes* and *Culex*.

Mosquitoes are more than just a summertime nuisance, they are also a serious public health threat. These tiny insects can spread diseases such as West Nile virus, Zika virus, dengue fever, and malaria, putting people of all ages at risk. Even one neglected bucket of standing water can become a breeding ground for hundreds of mosquitoes in just a short period of time. This is why everyone needs to take responsibility in mosquito prevention.

Protecting yourself, your family and the community starts with a few simple actions:

- Eliminate standing water by dumping bird baths, flower pots, buckets, tarps, tires, and other containers.
- Clean gutters and downspouts, as these can be overlooked breeding sites.
- Irrigate gardens and lawns carefully to prevent standing water for more than a few days.
- Fill in or drain tree holes, stumps, and puddles.
- When standing or stagnant water cannot be drained, use insecticides such as mosquito dunks to manage mosquito larval populations. Effective products contain the active ingredients *Bacillus thuringiensis* subsp. *israelensis* (Bti), *Bacillus sphaericus* (Bs), or methoprene, and are not harmful to humans or wildlife.
- Avoid outdoor activities at dusk or dawn when mosquitoes are most active.
- Use EPA registered insect repellents containing ingredients such as DEET, Picaridin or IR3535 to protect yourself when outdoors.

Check out the *Mosquitoes in Kansas* publication to learn additional information about mosquitoes and their control: https://bookstore.ksre.ksu.edu/pubs/mosquitoes-in-kansas_MF3668.pdf

Assessing Plant Health Problems:

Many areas in Kansas have recently received consistent rainfall, a welcome relief from drought conditions that persisted throughout the spring. Warm, wet, and humid conditions, however, are favorable for many different diseases in Kansas. It is important to regularly scout gardens for the onset of disease.

Often it can be tricky to identify the exact cause of symptoms of poor plant health. Environmental issues and disease pressure can present similar symptoms. In most situations, plants often decline because of more than one issue occurring at once.

Here are some tips for determining when a plant is in poor health and how to decide if their decline is the result of a disease:

- Know your plant: The first and most important step of diagnosing a plant problem is to know what the plant is and what it is supposed to look like. Most plant diseases are host specific, and only affect a few specific host plants. Knowing what plant you are growing makes it far easier to narrow down the list of possible disease issues. It may also be important to know: the plant name, the native range, preferred soil type and pH, leaf color, variety/cultivar, and age. Without knowing what a healthy plant looks like, there is no basis to determine if it is unhealthy.
- The disease triangle: The core principle of plant pathology is that three necessary conditions must all occur for a disease to be present. The disease organism must be present, the susceptible host plant must be present, and environmental conditions must be favorable for the establishment of the disease. If any one of these conditions is not met, there will not be a disease infection. Many disease management practices involve preventing at least one of these conditions so that a disease infection cannot occur.
- Most issues are abiotic problems: Abiotic problems are plant health issues which arise because of non-living factors in their environment. This list can get quite extensive, but commonly includes: extreme temperatures, weather patterns, drought, soil/site issues, fertility, and human cultural practices like pruning and watering. Abiotic problems are often chronic, such as a plant ill-suited to a specific site. Event injuries can also occur, such as when a specific incident causes a healthy plant to very rapidly enter a state of decline. Common examples include frosts, hail, severe storms, and extreme heat. These problems show up quickly and usually affect the entire plant. Abiotic problems commonly cause similar symptoms across multiple different plant species in an area.
- Fewer issues are biotic problems: Biotic problems are plant health problems which arise because of the action of a living organism. This can include large animals, insects, and microorganisms (like fungi and bacteria). These issues progress over time, starting in one part of the plant and moving through the rest. This progression can occur over a few days to multiple years. Biotic problems usually display a random distribution of symptoms across the plant, rather than a uniform distribution as seen with abiotic problems. These issues will commonly be specific to only a few host plants on a given site.
- Determining impact: When a plant is exhibiting symptoms of any stress, it is important to determine the long-term impacts. This informs the important management decisions that follow. First make an estimate of what percentage of the plant is affected by the problem. With that percentage in mind, think about the recovery potential of the plant. Some questions to ask include: is there any new growth forming to replace the damaged sections, how vigorous is this plant, how much time is left in the growing season, and what are the

management objectives for this plant? If the damage is extensive and recovery potential looks low, consider plant removal or replacement. Alternatively, if damage is extensive but recovery potential looks high, management may be as simple as pruning out the affected portions and waiting for regrowth. Always consider the objectives for the plant and the cost of any management options being considered. A historic tree may be worth a higher management cost than a new planting for example.

If you need help with a problem, K-State offers a variety of resources to assist in identification and management:

- Information about many common garden pests in Kansas can be found here: <https://hnr.k-state.edu/extension/horticulture-resource-center/common-pest-problems/>
- Reach out to your local K-State Extension Office - there is a local office in all 105 counties of Kansas: <https://www.ksre.k-state.edu/about/statewide-locations.html>
- For more specific assistance and disease testing, consider submitting samples to the K-State Plant Disease Diagnostic Lab. For information on how to submit a sample, visit: <https://www.plantpath.k-state.edu/extension/plant-disease-diagnostic-lab/collection-guidelines/>
- Not sure where to start? Email clinic@ksu.edu or hortsupport@ksu.edu for assistance.

Matthew McKernan, Consumer Horticulture Extension Associate; Frannie Miller, Pesticide Safety and Integrated Pest Management (IPM) Program Coordinator; Colton Stefanski, Assistant Diagnostician - K-State Plant Disease Diagnostic Lab

For questions or additional information, contact: hortsupport@ksu.edu

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Battle begins to save sweet corn from earworm

Many home gardeners understand a sad truth about the corn earworm: the little critter loves sweet corn just as much as humans do.

It creates a yearly battle to fight back the pesky insect. The adult corn earworm moth lays eggs on developing corn silks and as soon as the eggs hatch, larval corn earworms go to work.

“Feeding starts at the tip of the ear and works down,” said Kansas State University horticulture expert Matt McKernan.

Corn earworms feed on each other as well as the corn, so even though multiple eggs may hatch on an ear, usually only one caterpillar is found in each ear, McKernan said.

Protecting sweet corn from earworms comes with a couple time-dependent challenges. As corn silks continue to grow, any new silk that is left untreated can be targeted by earworms. McKernan recommends applying insecticides every 2-3 days from when silks first appear until they become brown in order to be effective, “especially in late June to early July, when peak flight of these moths usually appear,” he said.

Additionally, adult earworm moths prefer juicy silks instead of dry silks, so insecticide only needs to be applied the first two weeks of silking.

Which insecticides are most effective? For home gardeners, McKernan recommends Spinosad, an organic insecticide. Spinosad applications will need to completely cover both the end of the ear and the silks, to control larvae as the eggs hatch.

Another organic choice is mineral oil or other light horticultural oils. To treat the corn with oils, fill a medicine dropper $\frac{1}{2}$ to $\frac{3}{4}$ full of the oil, then apply inside the silk end of the corn's ear – where the tips of the silk begin to wilt and brown. McKernan said the oil will kill any earworms present and prevent more earworms from entering the ear.

However, he said, take note that applying oil before the silk has begun to brown may lead to partially unfilled ears, as the oil will interfere with pollination.

“There are several other options for controlling corn earworm, including planting early and experimenting with different cultivars to reduce caterpillar pressure,” McKernan added. “If all else fails, share the bounty - simply cut off the damaged parts of infested ears at harvest, and enjoy the portion not fed on by the caterpillar.”

Deadheading gives plants new life

It may feel a bit gloomy to pick off fading flowers from the yard's plants.

But Kansas State University horticulture expert Matt McKernan said you're actually setting plants up for success by pinching off spent flowers, a process called deadheading.

“Some plants will bloom more profusely if the old, spent flowers are removed,” McKernan said.

“Annuals, especially, focus their energy on seed production to ensure that the species survives. If you remove the old flowers, the energy used to produce seed is now available to produce more flowers.”

Normally, gardeners can deadhead flowers by simply pinching them off with a thumb and finger, but some tougher stems may require scissors or pruning shears.

McKernan said some perennials also benefit from deadheading, which essentially extends the blooming season by encouraging an additional burst of flowers. But in the case of perennials, he said: “Some gardeners actually enjoy the look of spent flowers, such as sedum or purple coneflower. And the seed produced can be a good food source for birds.”

Some of the plants that increase blooms in response to deadheading include: *Hardy geraniums*, *Coreopsis*, *Marigolds*, *Snapdragons*, *Bee Balm*, *Butterfly Bush*, *Roses*, *Campanulas*, *Blanket flowers*, *Rudbeckia*, *Shasta daisy*, *Delphiniums*, *Zinnias*, *Tall Garden Phlox*, *Salvia*, *Scabiosa*, *Annual heliotrope*, *Geraniums (Pelargonium)*, *Yarrow*.

Other plants that do not need to be deadheaded include *sedum (Autumn Joy)*, *melampodium*, *impatiens*, *most flowering vines*, *lantana*, *vinca (Catharanthus)*, *wishbone flower (Torenia)* and some *petunias*.

“More and more a major trend in annual flower breeding is developing flowers that require little to no deadheading,” McKernan added. “Many begonias and petunias, for example, will reflower vigorously without deadheading. This helps minimize the time spent deadheading in the garden, but does not eliminate all of the benefits deadheading can provide.”

Cover Crops Grown Post-Wheat for Forage

The time following wheat harvest presents an opportunity to incorporate cover crops. Parts of Kansas have received enough moisture to grow a cover crop with substantial biomass, which could also serve as forage for livestock.

The following is a summary of “Cover Crops Grown Post-Wheat for Forage Under Dryland Conditions in the High Plains”, a fact sheet produced in collaboration with extension specialists and research scientists at Kansas State University and Colorado State University. The entire fact sheet can be viewed and downloaded at

<https://bookstore.ksre.ksu.edu/pubs/MF3523.pdf>.

Selection of Species

Determining what to plant can be difficult given the varied species available for cover crops. For Kansas producers, local Land Grant Universities, including Kansas State University, and the Midwest Cover Crops Council, have developed a *decision tool*, <https://covercroptool.midwestcovercrops.org/>, to help select species based on specified goals. When cover crops are grazed, one needs to choose species that are palatable and safe as forage for livestock and will benefit soil health. Fortunately, many species currently recommended for use as cover crops are also good for forage production. Factors such as nutritive content and potential toxicities must be considered.

While some potential risks (i.e., nitrates, prussic acid, alkaloids) exist, most can be managed. Members of the sorghum family (sorghum-sudan, sudangrass, grain sorghum, and forage sorghum) and millets are common nitrate accumulators. Environmental stress and excess nitrogen can increase nitrate levels in these plants. Producers should use caution when grazing forages with high nitrate potential and test before grazing. Although a hard freeze does not change nitrate content, prussic acid toxicity can occur when grazing sorghums, particularly young plants, and in the fall following a frost/freeze. For more information, see KSRE publications on *nitrate*, https://bookstore.ksre.ksu.edu/pubs/nitrate-toxicity_MF3029.pdf, and *prussic acid*, https://bookstore.ksre.ksu.edu/pubs/prussic-acid-poisoning_MF3040.pdf, toxicities or consult *Grazing Management: Toxic Plants* (MF3244).

Goals for the timing and length of grazing are considerations in species selection. For early to late summer planting, crops can be grazed late summer through early fall. Warm-season species such as millets, sorghum-sudangrass, sudangrass, forage sorghum, sunflowers, cowpeas, lablab, or sunn hemp should be considered potential species to grow. Sudangrass and sorghum-sudangrass have good regrowth potential and could be grazed a couple of times from summer through fall if ample moisture is available for regrowth and planted early enough in the year. Alternatively, biomass can be allowed to accumulate and grazed 7–10 days after a hard freeze to reduce prussic acid risk. Though cattle may trample significant biomass during late-season grazing, this strategy may support soil health goals by increasing soil cover.

Complex mixtures of 6 or more species, often called “cocktails,” are commonly promoted. Research studies at Kansas State University and other universities have not found a benefit to cocktails compared to single species or simple mixtures of 2 to 4 species. Competitive warm-season grasses typically produce the most biomass, enhancing both forage yield and weed control. While mixtures may provide other benefits, such as nitrogen fixation from legumes or pest suppression from brassicas, measurable increases in soil nitrogen from legumes are rare in High Plains studies. From a grazing perspective, mixtures can produce forage with a range of palatability that can provide benefits and limitations. However,

herbicide options are greatly limited when growing a mixture of grass and broadleaf species as a cover crop.

Variability in Forage Production

Under dryland conditions, forage productivity will vary from year to year, which makes this one of the biggest challenges facing producers who graze cover crops in the High Plains Region because stocking rates will need to be adjusted annually.

Producers have several options to manage this variability in forage production. A flexible herd size where animals can be added or subtracted based on a given year's productivity is the ideal situation. However, it is difficult for most to adjust herd size, so the number of days a field can be grazed will have to be shortened or lengthened to achieve residue goals. In reality, expect to graze cover crops planted post-wheat for about 30 days in most years. This resource should be considered supplemental forage during the late summer and early winter to help relieve dependence on other forage resources such as native rangeland and baled hay.

If excess forage is produced, putting some up as hay or silage to preserve forage for dry years may be a good option. However, removing hay and silage could reduce the amount of residue left in the field, negating soil health goals compared to grazing. Resting native pasture going into the fall is the most critical time for native species to store carbohydrates. This is always a good time to rest native pasture, especially following the drought years. By using summer annuals in the fall, native pasture can be stockpiled and grazed later in the winter after the grass is dormant, reducing winter feed expense.

As a final note, in years with minimal precipitation and forage productivity (i.e. ~1,000 lb/ac or less), the best choice might be not to graze at all if your primary goal is soil protection. Ideally, you want to maintain a minimum of 30% ground cover or approximately 1,000 lb/ac.

Grazing Management

When managing grazing of cover crops, numerous options can be considered. The ultimate strategy chosen will be influenced by your overarching goal(s) for the cover crop. Cover crops are generally grown for more reasons than just achieving high levels of harvest efficiency (i.e., percent utilization of available forage), as you would if this were a dedicated forage crop. You want to leave enough residue to maintain most of the benefits associated with planting cover crops.

Grazing management options include:

- *Continuous grazing:* Calculate a stocking rate based on the estimated yield and put the whole herd in one large field. Advantages are that no fences are moved and only one water source is needed (i.e., labor and inputs are minimal). However, if the field is large, livestock will tend to overgraze the forage closest to the water source while underutilizing the forage farthest from the water, unless you can move the watering location. Harvest efficiency will generally be around 30%.
- *Rotational grazing:* A large field is divided into two or more smaller units, or paddocks, and the animals are rotated from one paddock to the next. This option has some advantages and disadvantages. The more paddocks the field is divided into, the higher the stocking density (i.e., the number of animals per acre). Key concerns include maintaining residue levels and minimizing soil compaction. Frequent fence movement and managing water access are two of the main challenges that discourage the use of rotational grazing.

- *Strip grazing*: This differs from rotational grazing in that there is no back fence, and animals can graze both fresh, residual, and regrowth forage. This is convenient for watering animals as the fence can be set up so they have continuous access to a single water point. One drawback is increased compaction near the water source. Regrowth is limited since animals revisit previously grazed areas.

The next decision to make is when to start grazing your cover crop. The timing of grazing relative to frost is an important consideration for post-wheat-planted cover crops. The biggest concern is with plants in the sorghum family, as frost damage to cell walls can release prussic acid. A forage planted immediately after wheat harvest can provide 30 or more days of grazing before frost. In other cases, delaying grazing until after a hard frost may be easier, particularly when it may be time-consuming to move animals on and off the field and difficult to predict frost timing. Grazing should be suspended for 7 to 10 days after a frost to avoid prussic acid poisoning. For plants with prussic acid potential, delay grazing until plants reach 18 to 24 inches of growth, as prussic acid is highest in small plants or regrowth.

Determining Stocking Rates

Several key pieces of information are needed to estimate a stocking rate. The first is an estimate of the forage yield your field will produce during the period it will be grazed on a dry matter basis. How much forage will be consumed daily depends on animal body weight and forage quality. For green and growing forages, intake will run from 2.5 to 3% of body weight on a dry matter basis. Another key input is the percent utilization desired. In dryland systems, 30% is a conservative starting point unless it appears to be an excellent moisture year with above-average yields. Calculations can be made to estimate days of grazing for a given number of animals or the number of animals for a set grazing period. A *Carrying Capacity Calculator*, <https://www.drylandag.org/resources.html>, is also available to help with these calculations. Example calculations to determine stocking rates are detailed in the full publication linked in the first paragraph of this article.

Example Timeline

Below is an example timeline with suggested planting, start grazing, and end grazing dates for cover crops planted post-wheat. In good moisture years, grazing could occur in September and October. Depending on the species planted, livestock removal before the first hard freeze is recommended. Others may prefer to delay grazing until a week or more after the first killing frost.

Planting date: July 10 – August 10

Start Grazing: October 10 – January 30

End Grazing: 30 – 60 days following start of grazing

Key Points

- Post-wheat plantings would include warm-season species such as *millet*s, *sorghum-sudangrass*, *forage sorghum*, *sudangrass*, *cowpea*, *lablab*, *sunhemp*, or *sunflowers*.
- Planting a cover crop for forage could be grazed late summer through fall.
- Warm-season grasses tend to dominate over broadleaf species when planting cover crop mixtures.
- Cover crops must be planted immediately after wheat harvest to ensure crop establishment before the soil dries out following harvest.

- Yield variability is high when growing cover crops post-wheat under dryland conditions, ranging from under 1,000 lb/ac in dry years to almost 9,000 lb/ac in wet years.
- Stocking rates must be flexible because of the large year-to-year variability in cover crop productivity.
- Cover crops planted post-wheat can provide an average of 30 to 45 days of grazing, but the timing of grazing in relation to frost is an important consideration.
- Take caution for prussic acid and nitrates when growing summer cover crops for forage.
- Be aware of volunteer wheat growing in summer cover crops and manage accordingly for risk of disease and insect pressure carrying over to wheat planted this fall.

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