

Are Old Canning Recipes Safe?

Many people have canning recipes that are passed down from generation to generation. However, with current research, many of those recipes may be unsafe. This may be because of improper acidity, improper processing method for the type of food, too short processing time, no processing, etc.

Always use updated, tested recipes to ensure the safety of the food. Recommended sources for recipes include:

- *USDA Complete Guide to Home Canning*, <https://cba.k-state.edu/academics/departments/center-advancement-entrepreneurship/accelerator.html>
- *So Easy to Preserve* – University of Georgia Extension, <https://www.fcs.uga.edu/extension/so-easy-to-preserve>
- *Kansas State University Food Preservation*, <https://www.rrc.k-state.edu/preservation/>
- *Other Universities and Non-Extension Sources*, <https://www.rrc.k-state.edu/preservation/recipes.html>

Is it Safe to Can “Low Acid” Tomatoes?

This question is asked frequently. It is safe to use tomatoes described as “low acid” in canning. Follow the same procedures as with regular tomatoes. When *canning tomatoes*, they must be acidified with either bottled lemon juice, citric acid, or vinegar with 5% acidity.

According to Kansas State University Extension Horticulture: “Flavor in tomatoes is a complicated process. Flavor is regulated by the balance of acid, sweetness (or sugar), and some 37 other compounds found in tomatoes that are known to have a taste or flavor. Slight differences in any of the flavor compounds and differences among the balance of these compounds can make pronounced differences in taste. As the tomato ripens, some of the acidic flavor is replaced so that it becomes milder in flavor.

It has been shown, in several USDA tests, however, that tomato acidity varies very little among tomato varieties. There is some decline in acidity when the tomatoes reach a very complete ripeness--approaching overripe.

In flavor evaluations of tomatoes, we asked 50 people to rate over 20 varieties of tomatoes for flavor (including sweetness and acidity), texture (firmness or softness), as well as visual appearance. We asked them to rate these factors on a 1 to 10 scale. It was interesting to note that there were ranges for all these factors from 2 to 10. What one person reacted to with a low rating, another reacted with a high rating. As we began to look at the results, there was much more variability among the raters than there was among the tomatoes.”

More information can be found at:

- *The Influence of Different Tomato Varieties on Acidity as it Relates to Home Canning* – Journal of Extension, <https://open.clemson.edu/joe/vol48/iss6/21/>
- *Acidifying Tomatoes When Canning* – National Center for Home Food Preservation, <https://nchfp.uga.edu/how/can/how-do-i-can-tomatoes/canning-tomatoes-introduction/#gsc.tab=0>
- *Preserving Tomatoes pdf* – Kansas State University Extension, <https://www.bookstore.ksre.ksu.edu/pubs/MF1185.PDF>

What is the Yellow Liquid on Top of My Tomato Juice?

Making tomato juice using a blender or food processor to blend the tomatoes before heating will speed up the enzymatic breakdown of natural pectin in the tomatoes and cause the juice to separate.

Heating tomatoes quickly helps prevent separation. The yellow liquid contains pectin from the tomatoes plus some red color pigments which when combined with light gives a yellow color. The enzymatic breakdown of pectin will occur when the tomatoes are crushed before they have been thoroughly heated and when the product sets too long before being put into jars. That is why heating quickly will inactivate the enzymes and the pectin remains intact in the tomatoes.

To prevent juice from separating, quickly cut about 1 pound of tomatoes into quarters and put directly into saucepan. Heat immediately to boiling while crushing. Continue to slowly add and crush freshly cut tomato quarters to the boiling mixture. Make sure the mixture boils constantly and vigorously while you add the remaining tomatoes. Simmer 5 minutes after adding all pieces. If juice separation is not a concern, simply slice or quarter tomatoes into a large saucepan. Crush, heat, and simmer for 5 minutes before juicing.

The separation is harmless but is not appealing. Also, it is best to prepare one canner load at a time and process quickly. Source: *National Center for Home Food Preservation*, <https://nchfp.uga.edu/how/can/how-do-i-can-tomatoes/tomato-juice/>

Can I Use Lemon Juice Instead of Vinegar in Salsa?

Preserving salsa requires using vinegar, bottled lemon juice or bottled lime juice. Adding acid will prevent the growth of *Clostridium botulinum*. Use vinegar that has 5% acetic acid. Do not use homemade vinegar. Do not substitute vinegar for lemon juice unless the recipe gives that substitution. Vinegar is less acidic than lemon or lime juice and will result in an unsafe salsa.

You *may* safely substitute an equal amount of bottled lemon or lime juice for vinegar in recipes using vinegar.

Sources: *Canning Salsa Safely* pdf – University of Wisconsin, <https://learningstore.extension.wisc.edu/products/canning-salsa-safely-p939>; *Sassy Safe Salsa at Home* pdf – Kansas State University, <https://www.bookstore.ksre.ksu.edu/pubs/MF3171.pdf>

What Causes Canning Lids to Buckle?

Buckled lids look warped, bulged, or creased near the outer edge. Two-piece vacuum lids are made to release pressure by venting air from the jar after processing and during cooling. When the lid does not vent, pressure build-up, warps the lids and prevents a good seal.

There are several potential reasons for this to occur:

- Applying the screw bands too tightly. Buckling may become apparent immediately after processing. Screw on bands just until resistance is felt, or fingertip tight.
- Boiling the lids softens the sealing compound too much, resulting in a premature seal. *Today's Ball® and Kerr® lids do not require preheating. Research shows preheating them will cause seal failure.* Simply wash in hot soapy water, dry, and use.
- Food spoilage due to incorrect processing produces gases inside the jar that force the lid to buckle or unseal. Use current processing methods and guidelines.

NOTE: Never reuse lids. They will not form a good seal. According to the USDA Complete Guide to Home Canning, the rubber gaskets in unused lids should work well for at least five years from date of manufacture. It is best, however, to only buy the quantity of lids intended to use within a year.

Source: *Frequently Asked Preservation Question: Buckling Lids* – Penn State Extension, <https://extension.psu.edu/frequently-asked-preservation-question-buckling-lids>

How Can I Remake Runny Jam or Jelly?

There are many reasons why jam or jelly does not gel. It could be from overcooking or undercooking, too much added water, incorrect proportions of sugar and juice, or insufficient acid content. Always use the pectin recommended in the recipe. Double check the use-by date on pectin packages as expired pectin may not gel. [Liquid pectin and powdered pectin are not interchangeable](https://nchfp.uga.edu/how/make-jam-jelly/jams-jellies-general-information/jellied-product-ingredients/), <https://nchfp.uga.edu/how/make-jam-jelly/jams-jellies-general-information/jellied-product-ingredients/>.

Instructions to *remake runny jam or jelly* can be found at the National Center for Home Food Preservation, <https://nchfp.uga.edu/how/make-jam-jelly/jams-jellies-general-information/remaking-soft-jellies/>. Instructions vary by type of pectin used in the original product.

Be aware that remaking the product may not give a desirable product. To save time and expense, simply use the runny product for ice cream topping, pancake syrup, or mix into a smoothie!

To help solve other problems when making jellied fruit products, a *list of causes and solutions* is available from the National Center for Home Food Preservation, <https://nchfp.uga.edu/how/make-jam-jelly/jams-jellies-general-information/causes-and-possible-solutions-for-problems-with-jellied-fruit-products/>.

K-State food safety expert shares tips for packing school lunches

As school resumes, so does packing kids' lunches. Following food safety procedures is essential for parents in helping to prevent foodborne illness, said Kansas State University food scientist Karen Blakeslee.

"Start by washing your hands," Blakeslee said. "This can prevent many food safety issues. If taking lunch to school, keep cold food cold, and hot food hot."

Blakeslee said parents should remind their kids to not share their lunches with other kids because of the risk of food allergens. She also suggests packing foods that don't require temperature control to keep them safe.

"Many whole fresh fruits, single serve fruit cups, whole grain crackers, peanut butter or other nut butters, and dried meat sticks are safe to pack," Blakeslee said. "If packing cold or hot food, use ice packs and insulated lunch containers to keep them cold. If taking hot food, use a separate insulated container or bottle to keep that food hot."

Additionally, Blakeslee encourages parents to ask kids to help plan school lunches, and take them grocery shopping.

"If they help choose and prepare the lunch, they will be excited to eat it," she said.

How to increase bloom production of peonies

While dividing peonies is not required, Kansas State University horticulture expert Matt McKernan said doing so can increase bloom production, reduce disease and provide more peony plants for the garden.

“If you choose to divide your peonies, it needs to be done this time of year,” McKernan said.

To start dividing peonies, McKernan said gardeners should cut the stems just above the soil surface. Next, dig up the entire root system and remove soil from the roots.

“Divide the root clump into small sections using a sharp knife,” McKernan said. “Ensure each section has 3-5 buds as well as healthy roots.”

When preparing to replant peonies, the planting location should receive sunlight at least half the day. Dig a hole large enough to fit the roots of the divided peonies so the buds will be covered by 1-2 inches of soil.

“Peony plants buried too deep underground may not flower,” McKernan said. “This is the most common mistake Kansas gardeners make, so ensure the soil is packed firmly under the peony roots when replanting so that the plant does not settle deeper into the ground after planting.”

After planting, water thoroughly. This helps not only hydrate the roots, but to further settle the soil around the roots. Check bud depth on the roots again after watering.

Space dwarf peonies at least two feet apart and standard peonies four feet apart. To protect the newly divided peonies in cold weather, add a layer of straw, leaves, mulch or compost over the crown of the plant after the soil freezes.

McKernan warns that it may take a couple years for divided plants to return to full bloom productivity.

VIDEO OF THE WEEK:

Watering trees and shrubs during periods of summer drought is important for plant health, but few people enjoy braving the heat to provide the water needed. Using drip irrigation to water trees can be a very effective way to provide the necessary water, without spending much time outside doing it. *This week's video covers the water-wise way to irrigate trees*, and discusses a simple way to provide effective and efficient irrigation to trees during drought. Review the components you'll need, and the basics of drip irrigation design for watering trees:

<https://www.youtube.com/watch?v=jM5QORMwSCg>

GARDEN CALENDAR:

- Plant transplants of broccoli, cauliflower, and cabbage outdoors for fall production.
- Fertilize spring-bearing strawberry plants in early to mid-August to stimulate plant growth and increase fruit bud development for the next year's crop.
- Make the last application of fertilizer to roses by mid-August.
- Deadhead annuals to encourage late season blossoms.
- Mow turfgrass only as needed, depending on summer growth.
- Apply the last application of fertilizer to zoysia and bermudagrass lawns by mid-August.
- Check the depth of mulch layers around trees and shrubs. Add more mulch as needed to maintain a 2 to 4 inch layer of mulch. Be sure to pull mulch away from the trunk of the plant.
- Check young trees and shrubs for girdling wires and ropes from planting or staking.

- Wash houseplant leaves to remove dust layers.

Grasshoppers In The Garden:

Grasshoppers are a familiar sight in Kansas. Although there are over 115 species of grasshoppers found in the state, only a few pose serious threats to vegetable crops and gardens. The differential, two-striped, and redlegged grasshopper are the most common species encountered by gardeners.

Grasshopper populations and garden damage can vary greatly from year to year. Most species produce one generation annually and overwinter as eggs deposited in the soil. Egg development resumes when spring soil temperatures reach 50 to 55°F, and newly emerged nymphs begin feeding immediately.

Garden damage is most likely when grasshopper numbers are high and drought reduces the availability of natural vegetation. Under these conditions, grasshoppers leave weedy areas, field margins, roadsides, and other hatching sites in search of fresh food sources, often moving into gardens and landscapes. Winged adults can travel considerable distances to locate suitable feeding areas.

With how easily adult grasshoppers can move, the management of grasshoppers is difficult. Not all plants are equally attractive to grasshoppers. Select plants that are less desirable food sources for grasshoppers, such as euonymus, forsythia, juniper, lantana, and tomato. In the vegetable garden, purchase floating row covers to protect vegetable crops. The row cover can also be sprayed with an insecticide to enhance its effectiveness and prevent grasshoppers from chewing through row covers.

Poultry, especially guinea hens, can be effective predators for grasshoppers, and may help gardeners living in rural areas.

Insecticides applied directly to grasshoppers are usually effective, but most have limited long-term residual control. This can require multiple applications in order to directly contact grasshoppers with sprays as new grasshoppers arrive in the garden. Insecticides work best against wingless nymphs, which are concentrated and unable to fly away from treated locations. Target grasshopper hatching areas whenever possible. Direct contact with insecticides is essential for control, and applications made just before or at sunrise may improve effectiveness because grasshoppers are less active and more exposed on plants at that time.

Insecticides labeled for grasshopper control on the widest variety of crops include products with active ingredients such as bifenthrin, lambda-cyhalothrin, cyfluthrin, or permethrin.

Ultimately, grasshopper populations in the garden can be lowered, but likely not eliminated. Consider planting bait crops, searching for egg-laying areas in the fall, and creating habitat where insects, birds, coyotes, and other wildlife visit to feed on grasshoppers, helping to control these insects rather than relying on insecticide sprays.

Visit the *Grasshoppers In The Lawn & Garden* publication for more information on grasshoppers and their control: https://bookstore.ksre.ksu.edu/pubs/grasshoppers-in-the-lawn-and-garden-home-and-horticultural-pests_L868.pdf.

Fertilize Strawberries In August:

The warm, sunny days of summer (from June through August) are ideal for promoting strawberry plants to develop runners and daughter plants. In September and October, as the days grow shorter and temperatures begin to cool, spring-bearing strawberry plants begin to develop the flower buds that produce next year's fruit crop. To promote good fruit set, steps should be taken now to boost plant growth. One important way to do this is by fertilizing spring-bearing strawberry plants in early to mid-August.

To help stimulate fruit bud development, apply a nitrogen fertilizer to boost plant growth. When using a high nitrogen fertilizer, such as a urea fertilizer (46-0-0), apply at a rate of approximately 1/4 to 1/3 pound of fertilizer per 25 feet of row. If using a balanced fertilizer, (such as a 12-12-12 or something equivalent), apply at a rate of approximately 3/4 to 1 pound of fertilizer per 25 feet of row.

Complete all fertilizer applications with a light watering to activate the fertilizer and begin making nitrogen available in the soil for plant roots to absorb. Apply at least 1/2 inch of water through sprinklers or well-timed rainfall events.

Visit our *strawberries publication* for more fertilization and growing information:
https://bookstore.ksre.ksu.edu/download/strawberries_MF598

Dividing Daylilies:

For healthy daylilies, plants need to be divided every three to five years to maintain good vigor. Though they may be divided in early spring before growth starts, it is more common to divide them at this time of year.

To help make dividing daylilies easier, many gardeners start by cutting back the tops (leaves) to about 6 to 8 inches, or half their original height. This makes plants easier to divide and handle.

Next, use a shovel or spading fork to dig around the entire daylily plant, and lift the entire clump out of the ground. Daylilies have a very tough root system that grows together, making it more practical to divide the plant after the entire clump has been dug, rather than while growing in place.

Shake off excess soil from the root ball or use a stream of water from a garden hose to wash the soil from the roots. Although it is possible to cut the clump apart with a sharp spade, more daylily roots can be saved by carefully cleaning off the roots.

Once clean, roll the root clump back and forth until the individual divisions (called a daylily fan) separate. Each section should be about the size of a head of cauliflower and contain both roots and a fan of leaves.

Mix in 2 or 3 inches of compost into the planting bed before replanting.

Select the three to five largest fans to replant in a sunny location with well-drained soil. Space divisions in groups of 3 to 5 fans in a triangle or ring pattern. Space fans at least 12-18 inches apart within each group, and with at least 24 inches in between groups to give plants room for future growth. Set each fan at its original planting depth, burying the crown of each fan no more than 1 inch below the soil surface. Cover the roots with soil. Water newly divided daylily plants well to help settle the soil around plant roots after replanting.

The number of flowers will be reduced the first year after division but will return to normal until the plants need to be divided again.

Mimosa Webworm Damage On Honey Locust Trees:

Many homeowners across Kansas may be noticing their honey locust trees developing brown, scorched-looking foliage near the ends of branches this time of year. From a distance these trees look heat scorched, but closer inspections reveal white, silken webbing that binds the leaves together. These symptoms are the characteristic damage of the mimosa webworm (*Homadaula anisocentra*), a caterpillar insect pest that feeds on the leaves of honey locust and mimosa trees.

Originally native to Asia, the mimosa webworm was first reported in the United States in 1940 and is now a common landscape pest. In Kansas, there are two generations of mimosa webworm each year. These generations often overlap, so that larvae may be found from June through September in Kansas. The first generation of mimosa webworm larvae feed mid-June through early July, and reach their maturity toward the latter part of July to early August. Then, the second generation appears in late August to early September, causing the most noticeable damage.

During its lifecycle, the mimosa webworm undergoes four life stages: egg, larva (caterpillar), pupa, and adult. Female moths lay eggs on new foliage from spring into summer. After hatching, young caterpillars feed on leaves and begin webbing foliage together near branch tips. As the caterpillars grow, they remain protected inside these webbed nests, making management more challenging.

Caterpillar feeding skeletonizes leaves, leaving only portions of the leaf tissue behind. Damaged foliage eventually turns brown and dies, while accumulations of frass (insect waste) can be found within the webbing. Heavy infestations may defoliate trees, leaving them covered with webbing and brown foliage.

Honey locust cultivars differ in their susceptibility to mimosa webworm, and in many cases, light feeding damage is primarily an aesthetic damage. Successive years of caterpillar feeding, however, combined with drought and environmental extremes may cause long-term damage to tree health and predispose a tree to other issues.

Management of mimosa webworm begins with regular scouting in spring to detect young caterpillars before webs form. Small, localized infestations can often be controlled by pruning out and disposing of affected branches. Insecticides may be effective when applied against young caterpillars before webbing develops. Once extensive webs are present, insecticide treatments become much less effective. At this time of year, it is likely too late to apply an insecticide for the first generation of caterpillars. Monitor for the beginning of second generation caterpillars to emerge, and only consider high pressure sprays of *Bacillus thuringiensis*, Spinosad, acephate, cyhalothrin, or permethrin if caterpillars can be sprayed before they develop leaf webbing which shields them from insecticide sprays.

Visit our Mimosa Webworm - Insect Pest of Honey Locust and Mimosa Trees publication for more information on this pest:

https://bookstore.ksre.ksu.edu/download/mimosa-webworm-insect-pest-of-honey-locust-and-mimosa-trees_MF3722

Watering Guidelines As Droughts Return To Many Parts Of Kansas:

In recent weeks, much of the state has been under severe weather warnings for the intense heat and humidity. Coupled with strong, drying winds, these conditions have allowed drought stress to become very pronounced in many portions of the state, especially western and southern Kansas.

Signs of drought stress include plants with: Wilted or droopy leaves; Leaves that begin to roll, cup, or curl; Browning that occurs along the edges of the plant leaf or in areas between leaf veins; Discoloration of the leaves (often a silverish-blue color, especially in turfgrass); Footprints left behind in the lawn when turfgrass does not pop up quickly after being walked across.

These can all be signs that plants need some supplemental irrigation to combat drought stress.

Whether you are in an area of the state that is just beginning to see drought stress, or whether drought stress has been present for several weeks, it is important to know the approximate water needs of our plants:

- Newly Planted Trees & Shrubs: 10 gallons of water per week for plants with a trunk caliper (diameter) of 2" or smaller
- Well Established Trees & Shrubs: Soaking the soil 12 inches deep every 3-4 weeks
- Cool Season Lawns: 1 to 1.5 inches of water per week
- Warm Season Lawns: 1 inch of water every 10-14 days (soaking the ground six inches deep)
- Flowerbeds & Vegetable Gardens: 1 inch of water per week

Regardless of where you are in the state, or what plants you have growing in your garden, efficient watering practices are always important. Good watering practices will benefit both your plants and the environment. Some recommendations to keep in mind while watering include:

- Do not overwater. Too much water can be just as damaging as not enough water.
- Check soil moisture before adding water rather than watering on a set schedule. Use a soil probe, shovel, metal rod, or screwdriver to evaluate moisture in the root zone and add water accordingly.
- Water early in the morning to prevent water loss through evaporation or strong winds.
- Group plants with similar water requirements together to prevent overwatering species that are more drought tolerant.
- Eliminate weeds and turfgrass around the bases of desirable plants (such as trees) to reduce competition for limited soil moisture.
- Water slowly, so that water can filter deep into the soil to benefit plant roots. Watering too frequently or too quickly can lead to runoff and wasted water.
- Allow soils to dry slightly in between waterings. Do not water every day.
- Measure the water you apply. For lawns, use a tuna can, upside down frisbee, or Tupperware with flat sides to measure the inches of water applied. For trees and shrubs, use a 5-gallon bucket with a small hole drilled in the side near the bottom to measure water.
- Avoid planting a ring of flowers at the base of trees. This pairs together plants that require regular, shallow watering with plants that need less frequent, deeper watering. This combination leaves one set of plants over or under watered each time, resulting in shallow tree root growth and the potential for basal decay.

Matthew McKernan, Consumer Horticulture Extension Associate; Mention of trade names, brand names or commercial products in this newsletter is solely for identification purposes and does not imply recommendation or endorsement by Kansas State University, nor is criticism implied of similar products not mentioned. Although every attempt is made to produce information that is complete, timely, and accurate, the pesticide user bears responsibility of

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Lawn Stressed? September is time for relief

Cool-season grasses, like the tall fescue and Kentucky bluegrass lawns common to many parts of Kansas, have had about enough of summer.

The state's high temperatures – 100 degrees and higher in many parts – and sporadic rainfall often cause cool-season varieties to become thin by summer's end. September typically signals a good time to replenish those stands, said Kansas State University horticulture expert Matt McKernan.

“When overseeding, start by mowing the grass short (1 to 1 ½ inches) and removing the clippings,” he said. “This will make it easier to achieve good seed-soil contact and increase the amount of light that will reach the young seedlings.”

Then, he says, check the lawn's layer of thatch – an organic layer of dead and living shoots, stems and roots that develops between the zone of green vegetation and the soil surface.

“Normally, we'd want ¼ inch of thatch or less when overseeding,” McKernan said. “If the thatch layer is ¾ inch or more, it is usually easier to use a sod cutter to remove it and start over with a new lawn. A power rake can be used to reduce a thatch layer that is less than ¾ inch, but more than ¼ inch.”

Preparing the soil

Once thatch is under control, McKernan said homeowners can use a hand rake to roughen up soil in small areas. For larger areas, he suggests either a verticutter, slit seeder or core aerator machine.

“A verticutter machine has solid vertical blades that can be set to cut furrows into the soil that seed can later be broadcast into,” he said. “A slit seeder is a verticutter machine with a seed hopper added so the soil prep and seeding operation are combined.”

By contrast, a core aerator literally punches holes in the soil, depositing the cores on the surface of the ground.

“Each hole produces an excellent environment for seed germination and growth,” McKernan said. “Make 3-4 passes with the core aerator to ensure enough holes for the seed, with holes ideally spaced approximately every 3 inches.”

A core aerator also reduces the amount of water needed to germinate the seed. Aeration increases the water infiltration rate, decreases compaction and increases the amount of oxygen in the soil.

“Of the three methods (for large areas), the slit seeder is favored for obtaining good seed to soil contact,” McKernan said. “However, if watering is difficult or soil conditions are poor, core aeration may be a better option.”

McKernan noted that fertilizer should be applied to the lawn at rates suggested on the bag, regardless of which overseeding method is used.

K-State Accelerator program now accepting applications-Up to \$60,000 in cash awards available for innovative startups and aspiring entrepreneurs

Kansas State University's College of Business Administration is now accepting applications for the fall 2026 Accelerator program, a premier outreach initiative designed to

support aspiring entrepreneurs and early-stage innovative startups in Kansas. Entrepreneurs are encouraged to apply by Sunday, September 13.

The program, hosted by the college's Center for the Advancement of Entrepreneurship, gives participants a choice of two accelerator tracks: a six-week idea track designed to help aspiring entrepreneurs transform business ideas into proven business models and an eight-week growth track for early-stage startups looking to accelerate their growth and economic impact.

"We designed the tracks to meet Kansas-based aspiring and current entrepreneurs wherever they are on their entrepreneurial journey, providing them with the right resources to help them reach their next milestone," said Rachel Mui, acting director of the Center for the Advancement of Entrepreneurship.

As part of the program, participants gain access to faculty-led courses, hands-on student consulting research teams, a world-class K-State alumni mentor network and up to \$60,000 in equity-free grants.

The program charges no participation fees; however, the selection process will be competitive. Applications are open to Kansas-based existing and aspiring founders of scalable, for-profit businesses or ideas.

Selection criteria include identifying a meaningful problem and offering an innovative solution, demonstrating drive and adaptability, and showing a strong commitment to the venture.

For more information about the Accelerator program or to apply, visit the application page, <https://cba.k-state.edu/academics/departments/center-advancement-entrepreneurship/accelerator.html>.

As the nation's first operational land-grant institution, Kansas State University has served the people of Kansas, the nation and the world since its founding in 1863 — and it continues to set the standard as a next-generation land-grant university. K-State offers an exceptional student experience across three physical campuses and online offerings, meeting students where they are and preparing them to achieve their personal and professional goals. The university is committed to its mission of teaching, research and service through industry-connected programs, impactful research-driven solutions, and a sharp focus on community engagement and economic prosperity.

Consider Early Weaning, Even if Pasture Conditions Have Improved

Justin Waggoner, KSU Extension Beef Cattle Specialist, Garden City, KS

Although many areas of Kansas have received some precipitation in recent weeks. The drought monitor (released 06/18/2026) indicates that in excess of 60% of the state is experiencing abnormally dry (D1) to exceptional drought (D4) conditions. Recent rains have likely improved pasture conditions and “green up”; however total forage production may be lower than normal due to lack of moisture earlier in the grazing season. Thus, cattle producers in these regions should closely monitor pasture and cow body condition and may want to consider early weaning as management tool to maintain (potentially improve) cow condition and reduce daily forage demand on pastures.

Early weaning is not well-defined but generally refers to weaning calves at less than 200 days of age (conventional weaning 180-220 days of age). Calves reared in extensive environments have a functional rumen at approximately 45 days of age and are capable of using dry feeds. Various research suggests that weaning calves no earlier than 90 days of age,

with 120-150 days of age being suggested as the ideal minimum age to implement early weaning. The removal of the calf and cessation of lactation reduces cow energy requirement by 25-30%. The nutrients consumed by the cow previously being biologically allocated to support lactation are now available to support cow body weight gain.

A study designed to evaluate preconditioning duration conducted at K-State documented that cow body condition scores of cows grazing native grass pastures improved from 5.5 to 6.0 in 60 days following weaning calves at 100 or 115 days of age. The results of this study indicate the potential improvement in cow body condition that may be achieved by early weaning. There are many production benefits associated with improving cow body condition post-weaning especially if cows are managed to maintain that condition through calving. Early weaning can be especially beneficial for young cows which are more vulnerable to environmental stressors (i.e. reduced forage availability) due the increased nutrient demands associated with growth.

In addition, the removal of calves from pastures reduces daily forage demands on the pasture. Nursing calves (100-150 days of age) are capable of consuming 1.5 to 2.0% of their bodyweight in dry forage per day. Thus a 450 lb calf is capable of consuming approximately 7 lbs of dry forage per day. A dry 1400 lb cow consumes approximately 28 lbs of dry forage per day (2% of bodyweight). If we divide the 28 lbs of forage needed to maintain the cow by the 7 lbs of forage spared by removing the calf; for every 4 days that a calf is not grazing, one additional grazing day for the cow is gained. Alternatively, for every 30 days a calf is weaned and removed from the pasture, one week (7.5 grazing days) is gained to support the cow.

Cattle producers often express concerns regarding the performance potential and ability of early weaned calves to utilize feedstuffs in dry lot environments. However, early weaned calves ranging in age from 113 to 144 days in studies conducted at K-State have gained in excess of 2.0 lb/day with feed conversions ranging from 4.0 to 5.0 Feed:Gain (Bailey et al., 2013; Preedy et al., 2014). If managed appropriately and provided adequate nutrition, early weaned calves perform well and often exhibit a tremendous capacity for feed conversion. Additionally, early weaned calves may be managed to target value-added calf sales or preconditioning programs.

Early weaning is a herd management practice that can be implemented to manage the nutrient demands associated with lactation, reduce forage demands on pastures, and improve cow condition and market-ready calves if managed appropriately.

Planning Your Wheat Fertility Program: Start Now with Soil Testing

Wheat planting is just around the corner, so now is the time to complete your soil sampling. This ensures you have solid information to base fertilizer decisions on, especially important following drought conditions and lower-than-expected yields in some areas of the state.

Which nutrients should be tested?

The most important nutrients to focus on this year will depend on your location, nitrogen application strategy, and tillage system. Statewide, the nutrients most likely to generate a wheat yield response are *nitrogen (N) and phosphorus (P)*.

Wheat is the most P-responsive crop grown in Kansas. While P removal by wheat is lower than with corn or soybeans, the relative yield response is often greater. As such, knowing your soil test P levels and corresponding fertilizer needs is key.

Additionally, *low soil pH* is becoming an increasing concern, particularly in fields with a history of high N application and low cation exchange capacity (CEC).

Beyond the “Big 3” (pH, N, and P), *potassium (K)* deficiency can occasionally be an issue, especially in southeast and south central Kansas. While wheat is less prone to K deficiency than crops like corn, soybeans, or grain sorghum, deficiencies can still occur. In most cases, K fertilization is focused on those rotation crops; meeting their higher K needs often reduces the risk of deficiency in wheat.

The 0-6 inch soil sample: Non-mobile nutrients and pH

A standard 0-6-inch surface sample is normally used to evaluate pH and non-mobile nutrients such as P and K. Phosphorus and K availability are buffered processes in Kansas soils. This means the soil contains significant quantities, and the K-State soil tests provide an index value of the amounts available to the plant, not a direct measure of total soil content. In most Kansas soils: 1. It takes 18 pounds of P₂O₅ to raise soil test P by 1 ppm. 2. It takes 8 pounds of K₂O to raise soil test K by 1 ppm.

The buffering value for both nutrients varies with CEC and existing soil test levels:

- High CEC soils, especially those high in clay, buffer changes more, so soil test values shift slowly.
- Low CEC soils have a lower buffer capacity and can show more rapid changes in soil test levels.
- Likewise, soils with initially low P or K will need more fertilizer to raise levels than those already testing high.

In addition to pH, P, and K, consider testing for *soil organic matter (SOM)* and *micronutrients like zinc (Zn)*:

- Zinc is not commonly deficient in wheat, but it's crucial for corn and grain sorghum. Including Zn in your test package can support crop rotation planning.
- SOM is an important source of nutrients like N and S. When calculating the fertilizer needs for these nutrients, each 1% of SOM contributes a credit of *10 lbs of available N and 2.5 lbs of S*.

The 0-24 inch soil sample: Mobile nutrients

While pH, SOM, P, K, and Zn are non-mobile and tend to accumulate in surface soils, the mobile nutrients nitrogen, sulfur, and chlorine (Cl) move through the soil and accumulate in the subsoil. For this reason, a 24-inch profile sample is strongly recommended before planting wheat, corn, or grain sorghum.

Nitrogen is likely to produce a yield response across Kansas. Contrary to popular belief, soil N accumulation isn't limited to western Kansas. Our dry winters mean N can accumulate throughout the state. Since rainfall typically peaks in June and July and drops off in fall and winter, N losses tend to be limited after harvest.

Wheat takes up most of its N before flowering — typically April in southeast Kansas and early May in north central Kansas. Following dry years, significant residual N may be present at planting. On the other hand, strong yields may leave behind less residual N than assumed. Either way, adjusting N fertilizer rates based on soil tests is critical.

Sulfur deficiency in wheat is increasing across Kansas, largely due to: 1. Reduced atmospheric S deposition over the past 2–3 decades. 2. Lower S content in many modern P fertilizers.

Though not as soluble as nitrate, S is still mobile and tends to collect in the subsoil. A 24-inch profile test is a good way to evaluate S needs.

Chlorine (chloride is the plant-available ionic form) is the third essential mobile element to consider. Chloride deficiency is normally found in the eastern half of the state on soils that do not have a history of potash (KCl) application. This includes many areas north of the Kansas River and across central Kansas wheat-producing regions.

Cl deficiency affects *grass crops* like wheat, corn, and grain sorghum, and is linked to reduced disease resistance. Kansas has well-calibrated Cl soil tests, so a profile sample can help determine whether application is needed.

Summary

Kansas wheat producers should use soil testing to guide fertilizer decisions, especially in a year with tight margins and variable yields.

- Use 0–6 inch surface samples to assess pH, P, K, Zn, and SOM.
- Use 0–24 inch profile samples to evaluate N, S, and Cl.

Sampling now allows ample time to analyze the results and adjust your fall fertilizer plan accordingly.

For more information on soil sampling or to submit samples to the K-State Soil Testing Lab, visit: <http://www.agronomy.k-state.edu/services/soiltesting/>. Dorivar Ruiz Diaz, Nutrient Management Specialist