D's Notes
06/15/26

Gardening also provides food safety lesson for children, says K-State expert

Summer gardening offers children a chance to learn where their food comes from, but a Kansas State University food scientist says it also provides an important opportunity to teach food safety.

Karen Blakeslee, coordinator of *K-State's Rapid Response Center for Food Science*, https://www.rrc.k-state.edu/, aid young gardeners often become excited about growing fruits and vegetables but may not realize the importance of handling produce safely before eating it.

Citing an *online gardening toolkit available from the Partnership for Food Safety Education*, https://fightbac.org/, Blakeslee said the timing is ideal to highlight food safety practices because many children are out of school and spending more time outdoors, including in gardens at home, in communities and at schools.

"One of the reasons for this toolkit is to encourage kids to try new foods, especially ones they grow in their garden," Blakeslee said. "But handling the garden produce safely is just as important."

The Garden Food Safety Toolkit is a hands-on educational resource designed to help young gardeners learn proper harvesting, handling and preparation techniques for fruits and vegetables.

She said the toolkit is intended primarily for students in grades three through five, though modifications can be made for younger and older children. The curriculum includes activities and lessons designed to make food safety concepts easier for children to understand.

According to Blakeslee, fresh produce remains a leading source of foodborne illness in the United States. She cited a Centers for Disease Control and Prevention study that analyzed a decade of foodborne illness outbreaks and found leafy vegetables were the most common source.

"Because fruits and vegetables are often eaten raw, it's especially important for young gardeners to learn how to handle them safely," Blakeslee said.

She added that many children become focused on the excitement of gardening and harvesting crops without thinking about the risks associated with improper food handling.

"I'm guessing that kids don't often think of food safety first — favoring such things as growing cool stuff," Blakeslee said when asked about the challenge of reaching young gardeners.

Her advice begins with one simple step: rinse produce before eating it, even when it comes directly from the garden.

"While it is tempting to eat produce right off the plant, it is best to rinse it with water first," Blakeslee said. "Be sure the water for the garden is potable, or safe to consume. This is also important when preparing the produce to eat."

She also emphasized proper handwashing during both harvesting and food preparation.

"Always wash your hands," Blakeslee said. "This is important when harvesting produce and when preparing the produce to eat."

Blakeslee said gardeners also should inspect fruits and vegetables carefully before consuming them.

“When harvesting, examine the produce for any insect damage, mold, decay or rot and (if found), the product should not be consumed,” she said.

In addition, she encourages gardeners to keep produce clean by using sanitized equipment.

“Use clean tools and containers to keep produce as clean as possible,” Blakeslee said.

Blakeslee said teaching children these habits early can help reduce the risk of illness while encouraging healthy eating habits that may last a lifetime.

Healthy habits start at home: K-State specialist offers summer nutrition tips for children

Summer break often brings a more relaxed schedule for children, but a Kansas State University nutrition specialist says maintaining structure around meals and hydration is one of the most important ways families can support healthy habits during the warmer months.

Priscilla Brenes, a K-State Extension nutrition expert, said children benefit from continuing a regular eating schedule even when school is out.

“During the summer months, when children are out of school, it's important to maintain a quality diet and consistent hydration, as well as the timing of meals,” Brenes said. “We want to prevent children from grazing throughout the day.”

Instead of frequent snacking on ultra-processed foods, Brenes recommends modeling summer meal routines after the school day.

“We want to imitate the school schedule of meals and offer at least three big meals during the day, and a couple of snacks throughout the day,” she said. “We want to ensure that children get the nutrition they need, including vitamins, minerals, fiber, whole grains and high-quality protein.”

Smart shopping can help families build healthy meals and snacks while staying within budget. Brenes encourages shoppers to seek out fruits and vegetables that are in season, noting they are often less expensive and more flavorful.

Common summer produce in Kansas includes cabbage, broccoli, green beans, summer squash, peaches, berries, okra, corn, cucumbers and watermelon. Many of those foods also have high water content, helping children stay hydrated while providing important nutrients.

“Snacking is very important for children,” Brenes said. “We want to prevent having a lot of snacks at home that are high in sugar, high in fat. It's not that we cannot have them at home, but we want to prevent them from being the most abundant thing at home.”

Hydration is another key focus during hot summer months. Brenes said children wake up slightly dehydrated after a night of sleep and should begin the day with water.

“If you want to start your day as best as you can, have your children drink a glass or two of water as soon as they wake up,” she said.

Parents can encourage hydration by making water more appealing. Brenes suggests adding slices of fruit, berries, cucumbers or lime to water, or allowing children to decorate their water bottles with stickers. Sweetened sparkling water can also provide a fizzy alternative to soda while containing much less sugar.

Breakfast offers another opportunity to establish healthy habits. Brenes recommends using Harvard University’s Kids’ Healthy Plate as a guide, with half the plate consisting of fruits and vegetables, one-fourth whole grains and one-fourth protein.

Oatmeal is one breakfast option she frequently recommends because of its fiber content. Adding berries can boost vitamins and minerals, while adding Greek yogurt or peanut butter can increase protein.

When choosing breakfast cereals, Brenes advises parents to read nutrition labels carefully.

"Not all cereals are made the same," she said. "Try to choose breakfast cereals that have whole grains in them, have a good amount of fiber in them, and are low in added sugars."

For lunch, Brenes recommends simple meals such as wraps that can be prepared ahead of time and packed with fruits and vegetables. She also encourages families to involve children in meal planning, grocery shopping and food preparation.

"The more you engage children in choosing recipes, grocery shopping, planning the meals at home, the more likely they are to try new foods," she said.

Brenes said parents and caregivers should remember that children often model the behaviors they observe.

"If we start drinking more water, and they see us drinking more water or making healthier choices, then they're more likely to follow that pattern as well," she said.

For more information, Brenes recommends three publications: *The Kansas Seasonal Local Foods Poster*, https://bookstore.ksre.ksu.edu/download/kansas-seasonal-local-food-poster_MF3712; *The Value of Fluids to Your Health;* https://bookstore.ksre.ksu.edu/pubs/liquid-assets-the-value-of-fluids-to-your-health-fact-sheet_MF2739.pdf; *Buying Guide for Kansas Grown Fruits and Vegetables*, *https://bookstore.ksre.ksu.edu/pubs/buying-guide-for-kansas-grown-fruits-and-vegetables_MF2647.pdf*.

Ultimately, Brenes said successful summer nutrition comes down to a few simple principles: maintaining structure, encouraging hydration, choosing nutritious foods and involving children in the process.

"Think of quality diet, consistent hydration, structure, engaging children, and available programs around you," she said.

Kansas officials urge vigilance after New World screwworm detected in Texas calf

Kansas agriculture and animal health officials are urging livestock producers, veterinarians and pet owners to remain vigilant following confirmation of a New World screwworm infestation in a calf in Texas, marking the first detection of the pest in the United States in decades.

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service confirmed June 3 that a three-week-old calf in Zavala County, Texas, was infected with New World screwworm, a parasitic fly whose larvae feed on the living tissue of warm-blooded animals.

Kansas officials emphasized that while the case is a serious concern, the state remains at low risk and has spent months preparing for the possibility of the pest reaching U.S. soil.

"While this new confirmed case in Texas is a serious concern, we have been preparing for this scenario for over a year, and we have confidence in the response plan that is in place," said Justin Smith, Kansas animal health commissioner. "We appreciate the awareness across the

state and the help of livestock owners, veterinarians, pet owners and other stakeholders who are important partners in preventing NWS in Kansas."

K-State Extension livestock entomologist Cassandra Olds said the greatest concern is the larval stage of the fly.

"What we're concerned about is the maggot stage, or the larval stage of the New World screwworm fly," Olds said. "It needs to live inside a living organism, such as humans, cattle, dogs, cats or other."

Unlike many pests, screwworm larvae cannot create wounds. Instead, female flies lay eggs in existing wounds, where the larvae hatch and feed on living tissue.

"It's important to know that they can't initiate a wound," Olds said. "The only place where it can live is if a wound already exists."

Animals infested with screwworm larvae often experience significant pain and behavioral changes.

"Often we'll see that animals will lick or rub the area because it's quite painful," Olds said. "They can often sequester themselves because they feel so miserable. It is incredibly painful."

Because New World screwworm larvae can resemble other fly maggots, Olds said producers and pet owners should report any suspicious infestations in living animals to state veterinary authorities for proper identification.

"Anybody who sees maggots in a living animal should call state veterinary authorities," she said.

Olds stressed that Kansas remains in the same risk category as it was before the Texas detection. Federal officials are treating infected animals, monitoring surrounding areas and restricting animal movement where necessary.

"We want to stay vigilant, but not panic," Olds said. "We are just as safe as we were three weeks ago."

She encouraged livestock owners to inspect animals regularly, monitor wounds closely and treat injuries promptly. However, she cautioned against treating entire herds with such antiparasitic drugs as ivermectin and doramectin as a preventive measure unless an infestation has been confirmed in the area.

"We really need to make sure that we do not prophylactically treat animals in Kansas when there's no indication that we have any infestations," Olds said. "Wait for an infestation to be confirmed in your animals before you treat them for New World screwworm fly."

Olds said surveillance remains the key to containment. Federal officials can release sterile male flies to suppress populations, but success depends on quickly identifying infested areas.

The Kansas Department of Agriculture continues to provide updates to veterinarians and livestock producers and is reminding anyone traveling with animals to Texas or other areas near the Mexico border to be aware of additional movement requirements that may be in place.

Heather Lansdowne, spokesperson for the Kansas Department of Agriculture, said the agency also wants pet owners to understand that New World screwworm is not limited to livestock.

"We're trying to emphasize that any warm-blooded animal with an open wound would be a possible host for this pest," Lansdowne said. "A lot of the information coming from USDA is

referring to cattle or livestock, but we're trying to include the reference to pets as much as possible."

More information about New World screwworm and current response efforts is available at screwworm.gov, a website maintained by USDA's Animal and Plant Health Inspection Service.

It's Fair season: Keeping animals cool at county shows

It's county fair season in Kansas, and while local events are a great way to enjoy the sun and time with friends, heat can be an invisible fun bandit for livestock.

Kansas State University beef extension veterinarian A.J. Tarpoff said it's important for youth showing livestock to watch animals closely and know the symptoms of heat stress.

All animals – as well as people -- can experience heat stress, which occurs when the body cannot get rid of excessive heat, either through sweating or other means.

Tarpoff said cattle handle heat differently than other animals. In particular, they struggle with the ability to sweat, which makes them reliant on getting rid of heat through their respiratory system, such as breathing the heat out. Cattle will accumulate heat during the day, then dissipate the heat load during the night when it's cooler.

"It takes 4-6 hours to return cattle to regular temperature," Tarpoff said.

He added that one way to tell if a show steer or heifer is affected by heat stress is to look for unusual behavior from that animal. Symptoms may include reduced feed intake, increased time standing and crowding around water. In the show barn, animals may also display an increase in breathing rate.

One way to keep animals cool is to make sure barns get plenty of ventilation. Tarpoff said that heat stress mitigation strategies should be planned with cattle comfort in mind, and each strategy will be unique to the housing situation. Other factors to consider include whether the animal has its winter or summer hair coat; hair color; and past health issues.

Tarpoff said youth should consider reducing animal handling during heat intervals, and having those handling events completed by 10 a.m.

"Weighing, processing, sampling and shipping cattle are all necessary tasks but they should be strategically conducted during the very early morning hours to ensure cattle comfort," Tarpoff said.

Another way to avoid heat stress is to provide plenty of water to cattle. Tarpoff said the amount of water cattle need doubles as the heat increases from 70 to 90 degrees Fahrenheit.

Tarpoff also encourages youth to consider moisture levels from the washing areas. Some locations can artificially increase the humidity and cause unneeded stress on livestock.

"Monitoring conditions and preparing for heat stress is a must when caring for your animals," he said.

The *Kansas Mesonet*, https://mesonet.k-state.edu/, a network of Kansas weather stations which has offices on the K-State campus in Manhattan, provides an *Animal Comfort Index*, https://mesonet.k-state.edu/agriculture/animal/forecast, to help producers and youth monitor care for livestock. The online service is free to the public.

Cattle Chat: Building better cows

Building a productive cow herd does not begin when a heifer is bred for the first time. According to experts on *Kansas State University's Beef Cattle Institute Cattle Chat podcast*, the foundation for long-term success is established much earlier through genetics, health management and nutrition decisions made from the first days of life.

On a recent episode of *Cattle Chat*, https://ksubci.org/2026/06/08/building-better-cows/, K-State experts were joined by veterinarian Lee Jones to discuss strategies for developing replacement heifers that remain productive and profitable throughout their lives. The conversation focused on defining herd goals, protecting animal health and ensuring heifers reach key reproductive milestones.

"If we want productive cows five or six years from now, we have to start making those decisions when those heifers are young," Jones said. "Every management decision builds on the next one."

The experts emphasized that successful heifer development begins with selecting genetics that fit the operation's goals. Whether producers prioritize maternal traits, growth performance or longevity, understanding those objectives can help guide replacement heifer selection and future breeding decisions.

They also emphasized that health management also plays a significant role in setting heifers up for success.

"One-size-fits-all health programs rarely fit every operation," Jones said. "The most effective plans are designed around the specific risks and management practices of that herd."

The experts noted that heifers must receive adequate nutrition throughout development to support growth while also reaching puberty early enough to be successfully bred.

"The goal is not just getting a heifer bred," Jones said. "The goal is developing a female that breeds early, calves successfully and stays in the herd for years."

The conversation also explored whether heifers should calve for the first time at 24 or 30 months of age. While calving at 24 months is common and can improve economic efficiency, the beef cattle experts noted that each operation must evaluate its available resources, labor and management capabilities before deciding which approach best fits their system.

Ultimately, the experts agreed that developing replacement heifers requires a long-term mindset.

"Good cows do not happen by accident," Jones said. "They are the result of intentional planning, consistent management and making decisions today that will pay off for years to come."

The full discussion is available on the *Beef Cattle Institute's Cattle Chat podcast*, https://ksubci.org/2026/06/08/building-better-cows/. If you have a question, you can send an email to bci@ksu.edu.

Selecting The Right Bagworm Control:

Bagworms are currently active and feeding on plants across Kansas. They commonly feed on evergreens and plants in the rose family. Bagworms are an insect caterpillar pest that can consume large amounts of plant material in a short period of time.

Young bagworm caterpillars typically emerge (eclose) from eggs from mid-May to mid-June in Kansas. However, emergence varies every year, and is contingent on weather conditions. This year (2026), bagworm caterpillars have emerged (eclosed) from eggs as early

as mid-April. After emergence, the caterpillar creates a silken bag they carry with them when feeding. As they develop, they add plant material to the bag, which provides camouflage and protection from predators (both invertebrate and vertebrate). The bags vary in appearance depending on the plant fed upon. By late summer, the bags are 1 to 2 inches long and noticeable hanging from trees and shrubs. In August, bagworms cease feeding and attach the bags to branches. Males become winged moths that emerge from the bottom of the bag (you will notice a brown papery case) and fly to female bags. The male and female mate and then the male dies. Female bagworms remain in the bags and produce between 500 to 1,000 eggs, which is how they overwinter.

As bagworms develop throughout the summer months, they increase in size, which enhances their potential to cause plant damage. The strategies to manage bagworm populations include hand removal and applying insecticides. Hand remove bags and place them into a container of soapy water to kill the caterpillars. Although effective, the strategy is not practical when dealing with bagworms that have infested large trees or windbreaks. In these cases, insecticides may be needed to prevent or minimize bagworm caterpillar feeding damage. However, bagworm caterpillars must be actively feeding for insecticides to be effective in managing bagworm populations below plant damaging levels.

As bagworms grow, the insecticides used for managing bagworm populations must also change. To select the appropriate insecticide, it is important to determine the size of the bags when insecticides are applied:

- *If bagworm bags are 1/8 to 1/4 of an inch in length:* use selective insecticides with the following active ingredients: *Bacillus thuringiensis* subspecies *kurstaki* (*Btk*) or spinosad. Products containing these active ingredients will require repeat applications every 7 to 10 days for up to four weeks. These are usually applied from mid-May to mid-June in Kansas, while bagworms are small. These selective insecticides will be more environmentally friendly to beneficial insects and pollinators, but not as effective against larger sized bagworms.
- *If bagworm bags are 1/2 of an inch in length or larger:* a general, broad-spectrum insecticide will need to be applied. These insecticides are not selective, however, and may pose a greater risk to beneficial insects and pollinators, including honeybees and bumble bees. Consequently, make applications when pollinators are not active, which would be early morning or late evening. Use broad-spectrum insecticides with the following active ingredients: malathion, acephate, cyfluthrin, bifenthrin, or permethrin. Insecticides with these active ingredients generally require one or two applications per year and are usually applied from late-June to late-July. These insecticides must be applied before bagworms cease feeding in the fall.

When using insecticides to manage bagworm populations, it is also important to remember:

- Timing of application depends on what insecticide product you select and how frequently you plan to spray. If you spray only one or two times, use a broad-spectrum insecticide after all the bagworm caterpillars have emerged from the eggs. If you plan to spray multiple times, use selective insecticides that have a lower risk of harming beneficial insects and pollinators.

- The selective insecticides recommended for use against bagworms must be ingested by the caterpillar to be effective. This is why bagworms must be actively feeding for the insecticide to kill them. The non-selective insecticides recommended for use against bagworms work by contact, so bagworms must be outside the bag for the insecticide to contact the caterpillars. In all cases, thorough coverage of plant parts, such as leaves is important to ensure the effectiveness of the insecticide application.
- Prioritize treating for bagworms on evergreen plants. Most deciduous trees and shrubs can tolerate bagworm feeding damage because they produce new growth each year. Evergreens, however, may be killed by extensive bagworm feeding because they retain their needles/leaves for multiple years.

Visit the *Bagworm - Insect Pest of Trees and Shrubs publication* for more information on bagworms and their control: https://bookstore.ksre.ksu.edu/download/bagworm-insect-pest-of-trees-and-shrubs_MF3474

Cool Ideas: K-State expert urges farmers to follow safety tips on hot days

Summer's hottest days are likely still ahead in Kansas, but Tawnie Larson knows that "farm and ranch work won't stop during hot weather."

So, Larson -- a program manager in Kansas State University's *Carl and Melinda Helwig Department of Biological and Agricultural Engineering* and the *Kansas Agriculture Safety and Health Program* – is putting in some sound advice for farmers this summer.

"Wear lightweight, long-sleeved, light-colored clothing, or a cooling vest and take short, frequent breaks in a shaded or cool area to stay cool while working outdoors," Larson said.

She said that technical cooling vests "are essentially like wearing air conditioning."

"The vests use specialized fabric and fibers to circulate cooling products to keep body temperatures low during hot days," she said.

Larson also suggests using equipment with a canopy, such as a *Rollover Protection Structure, known as ROPS,* https://www.ropsr4u.org/, with a sunshade.

"Usually, the ROPS with canopies cannot be folded down, which in turn provides more safety for operators because the ROPS is always activated," Larson said. "Equipment that has an enclosed cab often times comes with air conditioning and has a built-in ROPS. Both of these options provide safety from rollovers and can help prevent heat-related illness."

Larson notes that each individual reacts to hot days different, so it's important to listen to your body. "Take frequent breaks and stay inside during the hottest part of the day," she said.

"Medication may also play a role in affecting one's body's ability to stay cool, making it harder to handle the heat," Larson said. "Before working outside this summer, check with your doctor to see if you're at higher risk for heat-related illness and whether you should take extra-precautions due to medication."

According to the *Kansas Mesonet*, https://mesonet.k-state.edu/, the hottest part of the day in Kansas is between 3 p.m. and 6 p.m.

The U.S. Centers for Disease Control and Prevention, https://www.cdc.gov/, recommends drinking 1 cup of water every 15-20 minutes, and before becoming thirsty. The CDC also recommends keeping sugary and alcoholic drinks to a minimum. Replace salt and minerals with snacks or a sports drink.

Heat stroke symptoms include high body temperature; hot, dry, red or damp skin; fast, strong pulse; headache; dizziness; nausea; confusion; and lack of consciousness. Larson said that if a person is suffering from heat stroke: Call 9-1-1 immediately; Move the person to a cooler place, Lower the person's temperature with cooler clothes.

Do not give the person anything to drink.

"Heat exhaustion is different and usually not as serious," Larson said, noting that symptoms of exhaustion may include heavy sweating; cold, pale and clammy skin; fast, weak pulse; nausea; tiredness; headache; and fainting.

"If this occurs, take action by moving to a cool place, loosen clothing, get cool, sip water and seek medical attention if symptoms last longer than an hour or get worse," Larson said.

VIDEO OF THE WEEK:

The Eastern Mole is a small mammal that feeds on underground insects and invertebrates. While in search of food, moles can create large amounts of underground tunneling, which can damage lawns and landscapes. To control mole damage, trapping is the most effective solution. This week's *video discusses how to trap moles* in order to prevent plant damage in your lawns and flowerbeds: https://www.wildlife.k-state.edu/species/moles/

GARDEN CALENDAR:

- Plant another crop of sweet corn and green beans to extend the harvest.
- Harvest radish and turnips soon, if not already completed. Overmature plants may develop harsh flavors and undesirable textures.
- Mulch vegetable garden crops for moisture conservation and weed control.
- Deadhead spent rose blossoms.
- Pinch chrysanthemums, asters, and other fall blooming flowers for development of a bushy plant with increased flowers.
- Raise mowing height on tall fescue and Kentucky bluegrass lawns between 3" to 4" for summer heat resistance and increased drought tolerance.
- Check lawnmower blades for sharpness. Sharpen blades as needed.
- Water newly planted and young trees and shrubs as needed. Most young trees and shrubs will benefit from at least 10 gallons of water per week during the summer months.
- Prune and shape houseplants for improved aesthetic beauty.

Fertilizing Tomato Plants:

For healthy tomato plant growth with maximum yields, tomato plants should be fertilized at planting and then several times throughout the growing season. To maximize the number of tomatoes produced by a plant, research shows that tomatoes benefit from additional applications (sidedressings) of nitrogen fertilizer at very specific times during the growing season.

The first fertilizer application should be applied when the tomato fruits reach full size but are still green, usually one to two weeks prior to fruit ripening. Two weeks after the first fruits are ripened and harvested, it is time for the second fertilizer application. The third round of fertilizer should be applied one month after the second. Basically, there should be one month of time between each application.

Do not over fertilize tomatoes. Fertilizing more often than this often encourages excess leaf growth at the expense of fruit production.

The following products are some of the common sources of nitrogen fertilizers. Apply only one of the fertilizers listed below at the rate provided on the bag:

- Nitrate of soda (16-0-0): 2/3-pound (1.5 cups) fertilizer per 30 feet of row
- Ammonium Sulfate (21-0-0): 0.5 pounds (1 cup) fertilizer per 30 feet of row
- Urea (46-0-0): 4 ounces (1/2 cup) fertilizer per 30 feet of row
- Blood meal (12-0-0): 14 ounces (1.75 cups) fertilizer per 30 feet of row

Alternatively, lawn fertilizers that do not contain weed killer/preventer, can be also used at a rate of 1/3 pound (¾ cup) fertilizer per 30 feet of row. Choose a fertilizer that is ~30% nitrogen (first number of three on the bag).

Always follow the recommendations of a soil test for the best recommendations specific to your garden soil. Keep in mind that tomatoes grown on sandy soil may require additional fertilization. *Visit our Tomatoes publication* for more information on fertilizing and growing tomatoes in Kansas: https://bookstore.ksre.ksu.edu/pubs/tomatoes_MF312.pdf. *Matthew McKernan, Consumer Horticulture Extension Associate,*

Be Bed Bug Aware!:

As Bed Bug Awareness Week (June 7-13) is being promoted by the National Pest Management Association (NPMA) and the Professional Pest Management Alliance (PPMA), now is a good time to educate yourself to be bed bud aware. Here are 5 things you should know about bed bugs:

1. *Bed bugs can live anywhere humans frequent.* Bed bugs prefer indoor conditions with relatively stable temperatures and easy access to blood meals from humans or warm-blooded hosts. Typical hiding locations indoors include: beds, bedding, furniture, clothing, walls, floors, luggage, electrical outlets, and behind wall hangings. Most people tend to think of bed bugs as an issue in hotels or locations where humans sleep, but they can thrive in single-family houses, apartments, hospitals, college dorm rooms, office buildings, schools, buses, movie theaters, libraries, buses, cruise ships, and retail stores and just about anywhere that human activity occurs.

2. *Bed bugs could have a degree in anesthesiology.* People often wonder why they do not feel bed bugs biting them. The saliva produced by bed bugs contains an anesthetic and promotes increased blood flow at the bite site allowing the feeding process to be quick and painless.

3. *Bed bugs can live for several months without a blood meal.* Adult bed bugs can live two to five months without a blood meal under average room conditions, making them extremely resilient pests. This fact means you cannot simply leave a room vacant to eliminate an infestation. Nymphs require blood to molt and progress through their developmental stages, so they typically can only survive a few weeks without feeding.

4. *Bed bugs do not transmit diseases to humans.* It is interesting to note that bed bugs can carry over 40 pathogens, like MRSA, Chagas and Hepatitis B, but that does not mean they transmit these pathogens to humans. Luckily, bed bug mouthparts are not structured to transmit pathogens to the bloodstream. Their intermittent piercing and sucking feeding behavior limits the possibility of pathogen transmission between hosts. The health concerns related to bed bug

infestations include allergic reactions, skin infections from scratching, and psychological distress.

5. The average cost to exterminate bed bugs can be high. To exterminate bed bugs, professionals must inspect every potential hiding spot and apply treatments to multiple zones or locations in the home. The cost for control might seem high, but it reflects the complexity, amount of time required, and the specialized methods that are required to eliminate bed bugs. People will find a wide variety of do it yourself products in stores that say they control bed bugs, but this is a pest that really requires professional services to obtain eradication.

To prevent bed bugs from becoming an issue in the first place, remember these smart home and travel habits. Inspect all furniture, mattresses, box springs, and bed frames for bed bugs before allowing these items into your home. Do not store backpacks, purses, or bags on beds, couches or other resting areas. Do not put guests' coats or bags on your beds. Clean out a front closet to store these items for your guests. When traveling leave your luggage on the bathroom counter because bed bugs rarely inhabit bathroom tiles or porcelain. When returning home, unpack your clothes directly into the washer using high heat. Clean any luggage and store it away from the bed.

Visit our Bed Bugs – Structural Pests publication to learn more about bed bugs and how to protect your home: https://bookstore.ksre.ksu.edu/pubs/bed-bugs-structural-pests_MF2926.pdf. *Dr. Raymond Cloyd, Professor and Extension Specialist in Horticultural Entomology*

Safety first: Prepare now for safe home canning this summer

Canning, as a method of preserving food by placing foods in jars or cans and heating them to a temperature that destroys microorganisms that could be a health hazard or cause the food to spoil, has been around for more than two centuries.

Today's methods often have been passed down and evolved through generations, but Kansas State University food scientist Karen Blakeslee says all have one thing in common: Preparation. "Preparing now can help prevent problems when in the middle of canning," said Blakeslee, who is also coordinator of K-State's Rapid Response Center for Food Science.

Blakeslee's list of tips include:

- Inspect equipment for parts that need replacing, such as rubber seals on pressure canners. Many parts can be ordered from the canner manufacturer.
- Canning jars can be reused, so check for cracks or scratches that could lead to broken or unsealed jars.
- Canning rings can be reused, but once they get rusty or corroded, they should be replaced.
- Canning lids can be used only once. Buy lids now.

Blakeslee said home canning parallels the garden harvest. "So, in June, strawberries and cherries are available," she said. "In July, green beans and other early vegetables are ready. In August, tomatoes and sweet corn are popular vegetables to preserve."

A list of summer foods commonly available in Kansas gardens, https://www.rrc.k-state.edu/preservation/recipes.html, is available.

More tips

Blakeslee cautions against canning tips and recipes that are found online.

"Not all of them are safe or accurate," she said. "Using untested or unsafe methods can increase the risk of foodborne illness, particularly botulism, a potentially fatal illness caused by improper canning practices."

She encourages following tested recipes, or those proven by research to be safe. "By doing so," she said, "you ensure safe preservation techniques that protect your health and prevent contamination by dangerous microorganisms." Most of all, she adds, "be smart about preserving food."

Blakeslee said some states offer online classes at little to no cost. In addition, K-State's Rapid Response Center for Food Science has published several *videos*, available online, https://www.rrc.k-state.edu/preservation/recipes.html,

Management Options for Control of Field Bindweed

Field bindweed, a perennial vine in the morningglory family, is a persistent weed that infests millions of acres across the Great Plains. Previous research conducted over 12 years in Hays, Kansas, has shown that dense field bindweed infestations can reduce cereal crop yields by 20-50% and row crop yields by 50-80%.

Because field bindweed has long seed viability and tremendous food reserves stored in roots, a long-term management program is required for successful control. A single herbicide application will not eradicate established stands. An effective long-term control program should prevent seed production, kill roots and root buds, and prevent infestation by seedlings. A good control program will include chemical, mechanical, and cultural strategies.

Prevention

Because field bindweed can be spread by seed, root fragments, farm implements, infested soil, and animals, prevention of infestations is critical and requires: Use of weed-free seed; Avoiding the introduction of field bindweed seeds in manure; Thoroughly cleaning harvesting, tillage, and other machinery before moving from infested to non-infested fields; Timely control of new infestations; and Keeping field borders free from field bindweed infestation.

Competitive crops and early canopy closure as a management tool

Field bindweed requires high amounts of light. It cannot tolerate shading from tall competitive crops and is found primarily in crops with lower plant densities or with low leaf area indexes. Planting forage sorghum or sudangrass in narrow rows around mid-June, after top growth of field bindweed has been controlled provides excellent competition in areas where adequate soil moisture enhances rapid crop growth. Even though grain sorghum is usually less effective than taller forage crops, narrow-row grain sorghum can also be used as a competitive crop. Combining closely-drilled, vigorously growing crops with herbicide treatments may increase control.

Chemical control

Several herbicides help manage field bindweed, even though a single herbicide application rarely eradicates established stands. Instead, multiple herbicide applications will generally be needed to reduce and suppress dense stands over several years. Because of its deep root system and perennial nature, long-term chemical control depends on movement through the root system to kill the roots and root buds.

The systemic herbicides most commonly used are glyphosate (Roundup, others), auxin-type herbicides 2,4-D, dicamba (Clarity, others), picloram (Tordon, others), quinclorac (Facet,

others), and their mixtures. Research in a winter wheat-fallow rotation with treatments applied in late summer showed that quinclorac + 2,4-D and picloram + 2,4-D consistently performed better than glyphosate + 2,4-D or 2,4-D alone. Other studies in a winter wheat-fallow system showed that about one year after application, herbicide mixtures containing picloram provided the best control.

Recent research has shown that a premixture of 2,4-D+dicamba+dichlorprop (Scorch EXT) provided 93% bindweed control at 8 months after treatment, and was similar to picloram+2,4-D. This product has the added advantage of having shorter recropping intervals for many of our common crops when compared to picloram. Studies with this three-way mixture are ongoing.

Using contact herbicides such as paraquat or pyraflufen (Vida) will desiccate plant tissue contacted by the herbicide. Such products will provide short-term control of top growth but will not replace a systemic herbicide application.

Seedling control

Because seedlings develop a deep taproot and numerous lateral roots about six weeks after emergence and can re-establish under favorable conditions following top growth removal, it is advisable to control seedlings before this stage. Seedlings can be controlled by: Applications of 2,4-D or dicamba at 0.25 to 0.5 lb ai/acre in herbicide-tolerant crops; Timely inter-row cultivation; Hand removal within rows to prevent their establishment as perennial plants.

Tillage

Tillage may be used to destroy top growth and is most effective when sweep-type implements cut shoots from the roots approximately 4 inches below the soil surface. However, repeated tillage passes at three-week intervals are required to deplete root carbohydrate reserves, making this practice less desirable than herbicides, given soil and water conservation concerns. According to previous research, tillage can influence herbicide control of field bindweed, but field bindweed vigor is also important, as summarized below.

Chemical control improved when vigorous plants are sprayed, but it is affected by tillage timing

Research in the Texas panhandle sought to determine when tillage could be resumed after an herbicide application for field bindweed control. When they evaluated field bindweed stands 10 months after application, they found that, in general delaying tillage increased field bindweed control. They also considered plant vigor (as affected by soil moisture) had a greater effect on field bindweed control than tillage timing when glyphosate, dicamba, or 2,4-D were applied. When picloram + 2,4-D was applied, control was more consistent across both plant vigor categories and tillage times.

Fallow preceding wheat: Tillage or an herbicide application immediately after harvest could reduce seed production, weaken the plant, and increase the effectiveness of follow-up herbicide applications in the fall or spring. Picloram + 2,4-D at 0.25 + 0.5 lb/A should be applied at least 60 days prior to seeding winter wheat.

A *preharvest application* of 2,4-D ester can be used in wheat, oats, and barley crops after small grains have reached the soft dough stage.

Postemergence to corn and grain sorghum. Dicamba and 2,4-D may be applied in corn or grain sorghum, and products that contain quinclorac can be applied in a grain sorghum crop. Crop tolerance to these herbicides varies depending on the hybrid, environmental conditions,

and growth stage at the time of application. Always check the relative tolerance of particular hybrids to herbicides prior to use.

For more detailed information, see the "*2026 Chemical Weed Control for Field Crops, Pastures, and Noncropland*" guide at https://www.bookstore.ksre.ksu.edu/pubs/CHEMWEEDGUIDE.pdf or stop by the KSU/HG CO Extension office for a paper copy.

The 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 and follow all label instructions. Jeremie Kouame, Weed Scientist, Agricultural Research Center – Hays; Sarah Lancaster, Weed Management Specialist; Logan Simon, Southeast Area Agronomist – Garden City; Patrick Geier, Weed Scientist, Southwest Research & Extension Center