D's Notes
02/15/21

2021 KSU Cattlemen's Day

Watch for more details coming soon on the 2021 KSU Cattlemen's Day to be hosted virtually on Friday, March 5, 2021. For more information, contact Dale Blasi (dblasi@ksu.edu; 785-532-5427.)

K-State Garden Hour Webinar Series Begins This Week

We are very excited for the K-State Garden Hour webinar series that begins this week on Wednesday, February 17th. We will kick off the spring series with the topic, "Planning Your Vegetable Garden" by Tom Buller. These webinars will be held live the first and third Wednesday of each month, from noon to 1:00 pm CST.

Presentations will also be recorded and available online to watch following the event. This year, there is only one registration required. This one-step registration will allow participants to participate in any of the featured topics within the 2021 K-State Garden Hour. It will also remind past participants / registered participants of the upcoming live event, as well as notify them when the recording is available.

To register and see a listing of upcoming webinars as well as links to previous webinars, go to http://ksre-learn.com/KStateGardenHour.

REMINDERS

1. Draw vegetable garden layout.
2. Replace or add mulch as needed.

The Difference Between Determinate, Semi-Determinate and Indeterminate Tomatoes

Tomatoes are often classified as determinate, semi-determinate or indeterminate. Determinate plants produce one large crop and then virtually nothing thereafter. They are favored by commercial growers that want to harvest most of the fruit from one picking. They then use succession plantings where a new crop is planted on a set schedule to have fruit production throughout the season. Mature plants are smaller than other types and can be planted closer together to get the most tomatoes from a set space. Primo Red is a variety that is strongly determinate.

Indeterminate plants are the traditional tomatoes that never stop growing. They are capable of producing fruit throughout the season unless disease stops production or until frost kills the plant. They do best with support as they can reach six feet tall when staked or caged.

Semi-determinate plants are more compact than inderminate types but are also capable of producing fruit throughout the season.

Most of the varieties available to home gardeners are either indeterminate or semi-determinate. Though both are capable of producing fruit throughout the season, our hot Kansas summers often cause a dry spell in production of both types. Tomatoes are less

likely to set fruit when night temperatures remain above 75 degrees and day temperatures are above 95. Hot, dry winds make the situation worse.

Gardeners with limited space will likely prefer indeterminate or semi-determinate types to stretch out the harvest season. If there is space, you may want to grow a combination of all three with the determinates used to produce a large harvest for canning or tomato juice and the remainder for fresh eating. (Ward Upham)

Recommended Vegetable and Tomato Varieties

Here are some publications to the help you decide what varieties of vegetables and tomatoes to plant.

From K-State bookstore the Vegetable varieties publication is https://bookstore.ksre.ksu.edu/pubs/l41.pdf. The bookstore also has a separate publication for tomatoes https://bookstore.ksre.ksu.edu/pubs/MF312.pdf.

Another tomato publication available is from Sedgwick County Extension, https://www.sedgwick.k-state.edu/gardening-lawn-care/documents/Variety%20Recommendations%202016.pdf.

Tomato Trials

Each year we have our Master Gardeners plant and rate a number of tomato varieties. We also give a set to Tom Fowler with the University of Missouri Extension Service. Tom also tests a number of other varieties in addition to those in our study. The results below are from Tom Fowler's study. We list the top 10 slicers by yield (lbs) and by average fruit size (oz).

We include this article early in the year so that those who grow tomatoes from seed have time to receive their order before it is time to start their transplants.

Variety	Lbs/Plant	Type
Anna Russian	21	Open-pollinated
Cherokee Purple	17.6	Open-pollinated
German Johnson	17.2	Open-pollinated
Beef Master	16.7	Hybrid
Early Girl	16.5	Hybrid
Big Boy	16.1	Hybrid
Brandywine Black	16.1	Open-pollinated
Jet Star	15.3	Hybrid
Celebrity	15	Hybrid
Big Beef	15	Hybrid

Variety	Oz/Fruit	Type
Amana Orange	12.11	Open-pollinated
Beef Master	11.62	Hybrid

Brimmer Pink	11.20	Open-pollinated
Brandy Boy	10.34	Hybrid
German Pink	10.24	Open-pollinated
Green Giant	9.78	Open-pollinated
Mortgage Lifter	9.60	Open-pollinated
Black Krim	8.83	Open-pollinated
Box Car Willie	8.62	Open-pollinated
German Johnson	8.60	Open-pollinated

What is surprising about these results is how well the open-pollinated varieties produced. Heirloom varieties are open-pollinated. Open-pollinated varieties will come true from seed but hybrids will not. Usually hybrid varieties will outyield open-pollinated varieties but our top three varieties by yield were open pollinated in 2020. Also, open-pollinated varieties are often considered more flavorful than hybrids. So why aren't more commercial growers using open-pollinated varieties? There are actually several reasons for this including:

- hybrids often have much better disease resistance
- open-pollinated fruit are often tender-skinned and do not ship well
- open-pollinated fruit are often fluted with a recessed stem attachment that consumers may not like
- hybrids often have smaller vines so that more tomatoes can be planted per acre resulting in higher per acre yields

We would suggest you continue to grow varieties that have done well for you in the past but consider including one or more of these on a trial basis. (Ward Upham)

Fungus Gnats

Fungus gnats are small insects (1/8 to 1/10 inch long) that are common in high-organic-matter houseplant soils that are kept moist. Though adults are mosquito-like in appearance, they do not bother humans or pets. It is actually the larvae or maggots that can injure plants by feeding on the roots. Symptoms include sudden wilting, loss of vigor, poor growth and yellowing leaves. Use of sterile media and avoiding overwatering can help prevent infestations. Existing infestations can be controlled Bacillus thuringiensis v. israelensis which is sold under the names of Gnatrol and Knock-Out Gnats. (Ward Upham)

Bringing Houseplants Down to Size

We sometimes receive calls from gardeners who wish to donate houseplants that have outgrown their location. In most cases, we don't have room to accept plants and suggest that people bring them down to size by air-layering. Air-layering is a process where a branch or the main stem is encouraged to form roots while still attached to the parent plant. After rooting, the original plant is discarded and the newly rooted one is potted as a replacement. Though this propagation technique cannot be used on all

houseplants, it does work well on many that tend to outgrow their boundaries including croton, dracaena, dieffenbachia, Norfolk Island pine, rubber plant and schefflera.

It is best to choose wood that is about 1 year old. Older or more immature wood often roots poorly, if at all. Any place on the stem that is of the proper maturity can be used, but a convenient location is often about 12 inches from the tip. Following are the steps required for air-layering:

* Leaves should be removed around the area to be air-layered.

* Wound the stem. This can be done by making a slanting cut upward, an inch or more in length and halfway through the stem. Place a portion of a toothpick in the cut so it cannot close and heal. If the stem is seriously weakened, use a stick or dowel "splint" to prevent breakage.

Another method that works well is to strip the bark completely around the stem in a band one-half to one inch wide.

* Apply rooting hormone to the wounded surface of the cut or the stripped portion of the branch.

* Pack a baseball-sized wad of moist, unmilled sphagnum peat moss around the wounded area so it forms a ball. This is where new roots will form. It is important to use the long, stringy unmilled peat moss rather than the more common milled material so peat moss does not fall away from the stem when released. Even unmilled peat moss may need to be secured with string to keep it in place.

* Wrap the ball of sphagnum peat moss with clear plastic wrap. Be sure to use enough wrap so that the plastic overlaps and prevents the ball from drying out. Secure the top and bottom edges of the wrap closed with electrical tape, string or other convenient fastener.

Roots may appear in as little as a month though it may take much longer for the plant to be ready for transplanting. Check periodically to be sure peat moss remains moist. Water if needed. When roots have filled the peat moss, the plant is ready to be severed from the parent and transplanted. (Ward Upham)

Plants Recommended for Kansas

If you have had trouble finding a listing of plants recommended for Kansas, visit our web page devoted to this topic. We have links to a wide variety of plants including iris, daylilies), fruit, vegetables, turfgrass, low-maintenance roses and tree recommendations. The tree recommendations are broken out by areas of the state. We also list recommended low water use plants. You can find this page at http://hnr.k-state.edu/extension/info-center/recommended-plants/

We also have images of hundreds of the following:

- Varieties of iris, daylilies, roses and peonies found in the University Gardens Collection Gardens at http://www.k-state.edu/gardens/gardens/collections/ (Ward Upham)

Poisonous Plants

Some of the plants we commonly use in our homes, gardens and landscapes are poisonous. We often have requests from parents who want to make sure their plants are safe for young children.

The following poisonous plant list came from various University websites.

Flowers

caladium (all parts)
cardinal flower (all parts)
castor bean (seeds and leaves)
daffodil (all parts)
flowering tobacco {Nicotiana} (leaves and flowers)
four-o-clock (roots and seeds)
foxglove (all parts)
hellebore (all parts)
iris (all parts)
lantana (unripe fruits and leaves)
larkspur {Delpinium} (all parts)
lily of the valley (all parts)
lupine (all parts)
monkshood(all parts)
poppy (all parts except ripe seeds)
snowdrop (bulb)
spurge (milky sap)
star-of-Bethlehem (all parts)
sweet pea (seeds, seedlings, and pods)
tulip (bulbs)

Houseplants

Chinese Evergreen
anthurium (all parts)
aloe (sap if ingested)
calla lily (all parts)
croton (seeds, leaves, and stems)
crown-of-thorns (milky sap)
dieffenbachia (all parts)
elephant ear (leaves, fruits, and sap)
Jerusalem Cherry (all parts)
mistletoe (all parts)
Philodendron (all parts)

Fruits

apple (bark, leaves, seeds)
pear (bark, leaves, seeds)
apricot (bark, leaves, seeds, pits)
peach (bark, leaves, seeds, pits)
nectarine (bark, leaves, seeds, pits)
plum (bark, leaves, seeds, pits)
cherry (bark, leaves, seeds, pits)
avocado (leaves, unripe fruit, bark, and seeds)

Landscape plants

azalea (leaves and flowers)
black locust (all parts)
Boston ivy (berries)
boxwood (leaves and twigs)
buckeye (leaves, shoots, bark, flowers, and seeds)
burning bush (all parts)
cherry (leaves, twigs, bark, and seeds)
clematis (leaves)
elderberry (roots, stems, bark, leaves, and unripe fruits)
English ivy (all parts)
golden chaintree {Laburnum} (all parts)
holly (berries and leaves)
horsechestnut (all parts)
hydrangea (leaves and buds of some species)
Kentucky coffee tree (seeds, fruit pulp,

leaves, twigs)
oak (acorns, leaves, and young shoots of some species)
poison sumac (all parts)
privet (all parts)
rhododendron (leaves and flowers)
Virginia creeper or woodbine (berries)
yew {Taxus} (all parts except the fleshy red cover on the seed)
wisteria (all parts)

Vegetables

potato (green skin, buds, and sprouts on tubers, also fruits and foliage)
rhubarb (leafy blade, not the leaf stalk)

For more information, consult the following references.
Common Poisonous Plants and Mushrooms of North America, Turner and Szcawinski, Timber Press, Inc. ISBN 0-88192-179-3 Potentially Poisonous Plants in the House and Garden, http://www.northcarolinahealth.com/poisonous-house-plants-and-vegetables.php (Ward Upham)

Coldframes and Hotbeds

Uses of Coldframes Hotbeds

These mini-greenhouses can be useful for serious gardeners. Though often used for hardening off seedlings, they can also be helpful in extending the growing season in the fall for cool-season vegetables such as lettuce, kale, green onions, and radishes. You may also want to start pansies in the fall, overwinter them in the cold frame, and set out large plants that give immediate color in the spring. Cold frames also can be used to overwinter nursery plants or give the cold treatment needed to force bulbs. In these last two cases, the cold frame is covered with a tarp or something similar late in the fall just before the ground freezes so that the temperature hovers just above freezing. During the summer, you can remove the top and use the structure as a nursery. A hotbed can function like a coldframe if not heated. Adding heat allows plants to be started earlier.

Cold frames and hotbeds used to require almost constant attention during the day due to venting requirements. Venting is absolutely necessary on bright, sunshiny days, even if the outside temperature is relatively cool. If the frames are not vented in a timely manner, the plants can easily overheat. Venting in normally done by having the sash hinged to the main structure. This sash is propped open to let excess heat escape whenever temperatures demand. Though sashes can be propped open by hand, today we have automatic ventilators that use a temperature-sensitive compressed gas to automatically open sashes. These are often called solar vents as they rely on the sun to heat up the interior of the coldframe or hotbed to activate the vent. Solar vents do not require an external power source and can be set to open at different temperatures. An important feature that many solar vents do not have is the ability to release quickly so the lid on the

coldframe or hotbed can be opened completely. This makes watering much easier. As mentioned, many solar vents do not have the quick release feature. Two that do are the Univent Standard and Agetc Automatic Vent Opener. If you know of any others, let me know and we can list them in a later newsletter.

Basic Design of Cold frames and Hotbeds

The structure of both cold frames and hotbeds is the same. Basically it's a box covered with glass, plastic or clear fiberglass sash. The box size varies but is often 5 to 6 feet deep and 6 to 12 feet wide. Height also varies but is often about 18 inches in the back and 12 inches in the front. The slope should face south so that rays from the winter sun can be captured more easily.

The only difference between a cold frame and a hotbed is that hotbeds contain a heat source. In the early part of last century, that heat source was often 12 to 24 inches of fresh, straw-laced horse manure placed in a pit under the structure. Today, electric heating cables are often used. Hotbeds are more versatile than cold frames and allow young, tender plants to be started earlier in the year.

Cold frames and hotbeds can be purchased, or you may want to build your own. Plans for constructing either structure can be found at: https://extension.missouri.edu/media/wysiwyg/Extensiondata/Pub/pdf/agguides/hort/g06965.pdf (Ward Upham)

Lawn Calendar for Cool-Season Grasses

The following suggestions are for cool-season grasses such as Kentucky bluegrass or tall fescue. Zoysiagrass, bermudagrass, and buffalograss are warm-season grasses and require a different maintenance regime. A warm-season grass calendar will be covered in a later newsletter.

March - Spot treat broadleaf weeds if necessary. Treat on a day that is 50 degrees or warmer. Rain or irrigation within 24 hours of application will reduce effectiveness.

April - Apply crabgrass preventer when redbud trees are in full bloom, usually in April. The preventer needs to be watered in before it will start to work. One-quarter inch of water will be enough to water in any of the products commonly available. Remember that a good, thick lawn is the best weed prevention and may be all that is needed.

May - Fertilize with a slow-release fertilizer if you water your lawn or if you normally receive enough rainfall that your turf doesn't go drought-dormant during the summer. If there are broadleaf weeds, spot treat with a spray or use a fertilizer that includes a weed killer. Rain or irrigation within 24 hours of application will reduce effectiveness of the weed killer, but the fertilizer needs to be watered in. If you are using a product that has both fertilizer and weed killer, wait 24 hours after application before watering in. If grubs have been a problem in the past, apply a product containing imidacloprid or chlorantraniliprole during May or anytime from May through June for

imidacloprid. These products work to prevent grub damage. If rainfall does not occur within 24 hours, irrigate with 1/4" of water.

June through Mid-July - Apply second round of crabgrass preventer by June 15 – unless you have used Dimension (dithiopyr) or Barricade (prodiamine) for the April application. These two products normally provide season-long control with a single application. Remember to water it in.

Late-July through August - If you see grub damage, apply a grub killer that contains Dylox. Imidacloprid and chlorantraniliprole are effective against young grubs but may not be effective on late instar grubs. The grub killer containing Dylox must be watered in within 24 hours or effectiveness drops.

September - Fertilize around Labor Day. This is the most important fertilization of the year. Water in the fertilizer if rainfall does not occur.

November - Fertilize. This fertilizer is taken up by the roots but is not used until the following spring. Water in fertilizer. Spray for broadleaf weeds even if they are small. Broadleaf weeds are much easier to control in the fall than in the spring. Try to spray on a day that is at least 50 degrees. Rain or irrigation within 24 hours reduces effectiveness. Use label rates for all products! (Ward Upham)

Planting Asparagus

Though it is too early to plant asparagus, it is not too early to make plans and prepare the soil. This crop is a perennial and will survive for many years if given proper care. It prefers full sun and a well-drained soil and is usually placed on the edge of the garden area so that there is no need to till around the area to plant other crops.

Proper soil prep is especially important for perennial crops. Take a soil test to ensure proper levels of nutrients. See the accompanying article on how to take a soil test for the correct procedure.

Work the soil as early in the spring as possible but do not work wet soil as clods will form. Then add two inches of organic matter to the surface and the fertilizer and work again so the organic matter and fertilizer are blended into the soil.

Asparagus can be propagated from seed but is more often started from 1-year-old crowns. These crowns are planted deeply; 6 to 8 inches deep either in a hole for each crown or in a trench with shallower planting recommended for soils with more clay. Space plants 18 to 24 inches apart. Fill in the trench gradually over the growing season to encourage growth.

March 15 to April 15 is the best planting time. Adapted varieties include Jersey Giant, Jersey King, Jersey Knight, Jersey Supreme and Purple Passion. These are all male hybrids that will produce three times as much as our old Martha or Mary Washington varieties. Males have a number of advantages over females in that they live longer, emerge earlier in the spring, are more productive and eliminate potential volunteer plants that can reduce the productivity of a planting.

Weed control is very important. Competition with weeds results in slow establishment. A shallow hoeing should be all that is needed. (Ward Upham)

Fertilizing Spring-flowering Bulbs

The best time to fertilize spring-flowering bulbs is when foliage emerges in the spring rather than at flowering. Traditionally, gardeners have applied fertilizer during bloom or a bit after, but because bulb roots start to die at flowering, fertilizer applied at bloom is wasted. Roots are active when the foliage first pokes through the ground.

Nutrients applied then help the plant produce flowers the following year. If bulbs have been fertilized in the past, there is often plenty of phosphorus and potassium in the soil. It is best to take a soil test to be certain.

If the soil needs phosphorus and potassium, use a complete fertilizer (such as 10-10-10, 9-9-6, etc.) at the rate of 2.5 lbs. per 100 square feet. This would equal 1 rounded teaspoon per square foot. If phosphorus and potassium are not needed, blood meal makes an excellent fertilizer. It should be applied at the rate of 2 lbs. per 100 square feet or 1 teaspoon per square foot. Lawn fertilizers such as a 27-3-3 or 30-3-3 can be used, but cut the rate to a third of that applied for blood meal. Also make sure the lawn fertilizer does not contain a weed preventer or weed killer.

Remember to leave the foliage until it dies naturally. The energy in the foliage is transferred to the bulb as the foliage dies and will help the bloom for the next year. (Ward Upham)

Soil Testing

Most gardeners think that soil tests are done only to find out what nutrients are deficient. However, it is just as important to know if you have adequate levels of nutrients so you don't add unneeded fertilizer. The most basic soil test checks pH and the levels of phosphorus and potassium. Most of the lawn and garden soil tests that come out of our soil-testing lab show more than adequate levels of both phosphorus and potassium. If those nutrients are not needed, applying them is a waste of money and can be a source of pollution. In extreme cases, excess phosphorus can interfere with the uptake of micronutrients. So, if you haven't taken a soil test in several years, take one this spring.

Begin by taking a representative sample from a number of locations in the garden or lawn. Each sample is composed of about 8 sub-samples that go from the surface to 6 to 8 inches deep. Mix the sub-samples together in a clean container and select about 1 pint of soil. For more detail on taking a soil test, click hhhh and choose "Soil Analysis" in the left column.

Take the soil to Servi-Tech or the Hodgeman County Extension Office to have tests done at the K-State soil-testing laboratory. A soil test determines fertility problems, not other conditions that may exist such as poor drainage, poor soil structure, soil borne diseases or insects, chemical contaminants or damage, or shade with root competition

from other plants (see accompanying article). All of these conditions may reduce plant performance but cannot be evaluated by a soil test. (Ward Upham)

Soil Tests When Soils are Wet

If your soil is wet, it would be best to wait until the soil dries before taking samples. Though it is possible to take soil tests when soils are wet, there are precautions.

Soil samples should be air-dried before being submitted for testing. Do NOT use artificial means of drying such as an oven or microwave as such treatment may result in inaccurate readings of nutrient levels. Also, be sure to use a clean container to collect the sample. Wet samples are more likely to absorb foreign materials adhering to the container, which may also influence soil test results.

For more detail on taking a soil test, click here and choose "Soil Analysis" in the left column. Then click "Sample Collection" at the bottom of the center column.

Take the sample to Servi-Tech or the Hodgeman County Extension Office. (Ward Upham)

Gardening Calendar

The Kansas Healthy Yards website has a gardening calendar that many gardeners find helpful. It lists all the months of the year and the chores that can be done during that month. Each month is divided into separate sections such as Vegetables and Fruits, Flowers, Lawns, Trees and Shrubs and Houseplants. Not all suggestions will be helpful each year but are important to have included. For example, one of the January tips is on removing snow and ice on limbs. You may brush off the snow, if desired, but ice should be allowed to melt naturally.

To find the gardening calendar, go to http://kansashealthyyards.org/ and click on "Gardening Calendar" in the gray bar at the top of the page. (Ward Upham)

What a Soil Test Does Not Tell You

Though soil tests are useful for identifying nutrient deficiencies as well as soil pH, they do not tell the whole story. We often receive soils from gardeners that are having a difficult time growing crops even though the soil test shows the pH is fine and nutrients are not deficient. Here are some factors that can affect plant growth that are not due to nutrient deficiencies or pH.

Not enough sun: Plants need a certain minimum amount of sun before they will grow well. As a general rule, flowering (and fruiting) plants need at least 6 to 8 hours of full sun per day. There are, of course, exceptions such as impatiens that bloom well in shade. Move sun-loving plants into more sun or use plants that are better adapted to shady conditions.

Poor soil physical characteristics: Roots need oxygen as much as they need water. A tight clay soil or excessive water can restrict soil oxygen levels as well as make root

penetration of the soil difficult. Increasing the organic matter content of clay soils can help rebuild good structure. Add a 2-inch layer of organic matter and till it in.

Walnut trees: Walnuts give off a natural herbicide that interferes with the growth of some plants such as tomatoes. Vegetable gardens should be at least 50 feet away from walnut trees if possible. For a listing of plants that are susceptible to walnut, go to: http://www.omafra.gov.on.ca/english/crops/facts/info_walnut_toxicity.htm Tree roots: Trees not only compete with other plants for sun but also for water and nutrients. Extra water and nutrients may be needed.

Shallow soils: When new homes are built, the topsoil is often stripped off before the soils are brought to grade. Though the topsoil should be replaced, it sometimes is not or is not replaced to the same depth as it was originally. You are left with a subsoil that usually does not allow plants to grow well due to a lack of soil structure. Adding topsoil to a depth of 8 to 12 inches would be best but this often is not practical. In such cases, try to rebuild structure by adding organic matter and working it into the soil.

In other cases, a thin layer of soil may be spread over rock or construction debris. Plantings in shallow soils will wilt and die more quickly than other plants that are on a deeper soil. Use a soil probe to find such obstructions.

Too much phosphorus: Most Kansas soils are naturally low in phosphorus. However, soils that have been fertilized for a number of years may have phosphorus levels that are quite high. As a matter of fact, the majority of soil tests we receive show phosphorus levels in the "high" category. Extremely high phosphorus levels can interfere with the uptake of some micronutrients such as iron, manganese and zinc.

High phosphorus soils should only be fertilized with fertilizers that have no or relatively low amounts of phosphorus.

Improper watering: Roots develop where conditions are best for growth. Shallow, frequent watering leads to roots developing primarily near the surface of the soil where the soil is moist. Such shallow root systems are easily damaged by heat and any interruption in the watering schedule. It is better to water less frequently and to a greater depth to encourage a deeper root system that is less sensitive to heat and water stress.

Watering during the evening can also be detrimental to plants if the irrigation wets the foliage. Many diseases are encouraged by free water on the leaves. Watering late in the day often will keep the foliage wet until dew forms. Dew will keep the foliage wet until it evaporates the next morning. It is better to water early in the morning so leaves do not stay wet as long. If you must water late in the day, use drip irrigation if practical (such as in a vegetable garden).

Overwatering: Roots need to breathe. In other words, they must have oxygen in order to survive. Be careful to not water so heavily that the soil remains saturated. Water deeply but allow soil to dry somewhat between waterings. (Ward Upham)

Late winter kochia control in fields going to corn or grain sorghum

Last week, we shared some general information about applying pre-emergence herbicides for kochia control. This week, we are going to focus on specific recommendations for fields going to corn or grain sorghum this growing season. Next week, we'll discuss fields going to soybean, sunflower, and wheat.

Kochia control in fields going to corn

Kochia start emerging in mid-February to early March and continue its emergence through spring into summer (Figure. 1). Any effective kochia control plan for fields going to corn should include early spring application of a burndown herbicide with an effective soil-residual herbicide for controlling early flushes. For example, an application of dicamba alone can control kochia; however, a combination of atrazine and dicamba will provide extended residual activity and address dicamba-resistance biotypes. Tank mixing 8 to 16 oz. of dicamba with 1 to 2 pints of atrazine will control existing broadleaf and grass weeds, and will provide extended pre-emergence control of kochia often into May.

Figure 1. A mat of kochia seedlings emerged before corn planting in early March at K-State Ag Research Center in Hays, KS. Photo by Vipan Kumar, K-State Research and Extension.

A study published in 2019 by weed scientists from across the Great Plains reported excellent control (99%) of glyphosate-resistant kochia can be attained in corn by Degree Xtra followed by Impact, Verdict followed by Status, or Balance Flexx followed by

Laudis + atrazine. Adding atrazine to group 27 herbicides like Balance Flexx is likely to improve control.

Data collected by Dr. Kumar at Hays, KS is shown in Figure 2. All of the treatments evaluated provided acceptable control, except for Acuron applied pre-emergence followed by Liberty + Status + Atrazine. Corn yields ranged from 88 to 111 bushels/acre with the greatest yields obtained in Verdict + atrazine pre-emergence followed by: Liberty + Atrazine, Roundup + Armezon Pro + atrazine, Liberty + Status + atrazine, or Roundup + Status + atrazine; Resicore + atrazine applied pre-emergence followed by Durango + atrazine; and Acuron applied pre-emergence followed by Roundup + atrazine. Pre-emergence programs based on Verdict plus atrazine could also be considered for fields going to grain sorghum.

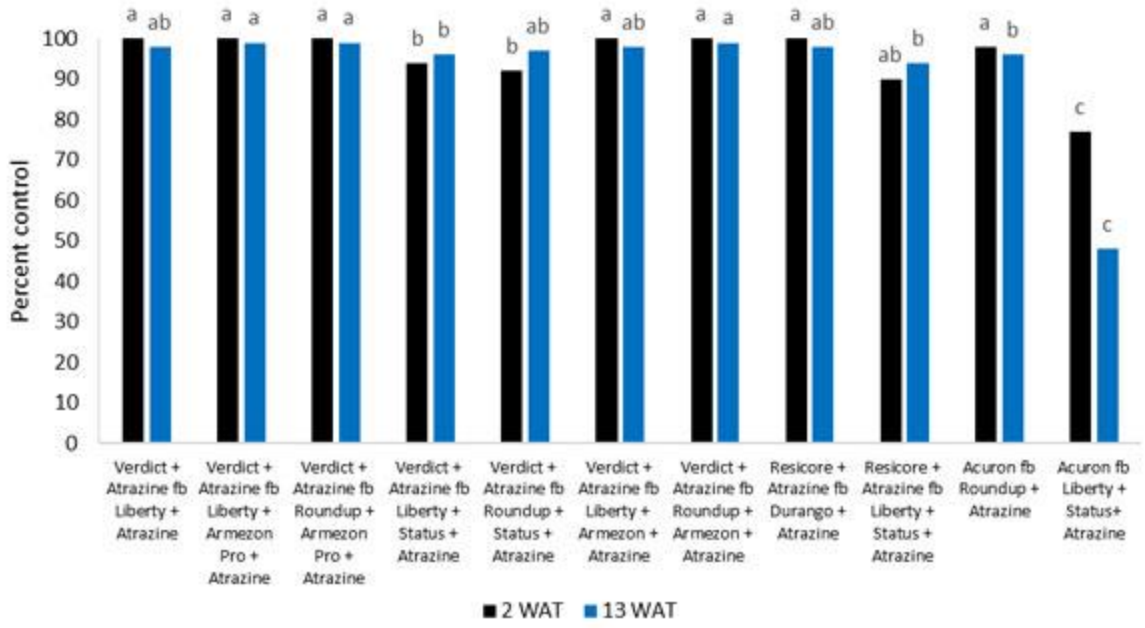

Figure 2. Kochia control in field studies conducted at Hays, KS. PRE, EPOST, and LPOST treatments were applied on April 23, June 11, and June 23, respectively. Similar letters indicate similar weed control.

Kochia control in fields going to sorghum

As sorghum planting in western Kansas generally resumes in mid-May, conserving soil moisture by controlling kochia and other weeds prior to sorghum planting is utmost important. Just like corn, kochia control in fields going to sorghum can be achieved with tank-mix application of dicamba (8 to 16 oz/a) with atrazine (1 to 2 pints/a) in early spring. If fields are infested with glyphosate- and/or dicamba-resistant kochia, Sharpen (2 oz/a) or Gramoxone (2 to 4 pints/a) can also be used to control resistant kochia biotypes. An application of PRE herbicides such as DegreeXtra (64 to 96 oz/a) or Lexar (96 oz/a) at planting can help controlling kochia in sorghum for 4-5 weeks.

Reference: Sbatella et al. 2019

Sarah Lancaster, Weed Management Specialist, slancaster@ksu.edu
Vipan Kumar, Weed Scientist, vkumar@ksu.edu

2020 Kansas Performance Tests with Corn Hybrids report now available

The *2020 Kansas Performance Tests with Corn Hybrids* report is now online and in print form. In this report, you will find a review of the 2020 corn crop, with a detailed discussion summarizing the statewide growing conditions and impacts from diseases and insects. More importantly, the results of the 2020 corn hybrid performance tests are also shown. Corn performance tests are conducted each year by the Kansas Agricultural Experiment Station. The results from these tests provide producers, extension agents, and industry professionals with unbiased agronomic information on many of the corn hybrids marketed in Kansas.

Producers and crop consultants can use this resource to help select corn hybrids for their operation by checking for varieties that show a consistently good performance in their region.

The online version of the corn hybrid performance test results can be found at: https://bookstore.ksre.ksu.edu/pubs/SRP1159.pdf. Paper copies can be ordered from the K-State Research and Extension Bookstore at www.bookstore.ksre.ksu.edu/.

Jane Lingenfelser, Crop Performance Testing Coordinator, jling@ksu.edu

Beef Body Condition Scoring: A Herd Management Tool

Body Condition Scoring is one of the most valuable management tools at the disposal of the cattle manager. This one number gives us a direct indication of an individual cow's previous plane of nutrition and future reproductive capability. Although the individual body condition scores are important, we don't necessarily manage individual cows, we manage groups of cows. Thus, it is important for us to look beyond the individual scores and look at the distribution of body condition scores within the herd.

If we have a herd (Herd 1) with an average body condition score of 5 that is essentially characterized by the classic bell curve, with a few thin cows (3's), the bulk of cows in the middle (4's and 5's) and few over-conditioned cows (7's), everything is good.

Alternatively, we could have a herd (Herd 2) with an average body condition score of 5 that is essentially the result of a few thin cows (3's) and some over conditioned cows (6's and 7's). Body conditioning scoring also has more value when it is done on the same group of cows at multiple times during the production year.

If Herd 2 was scored at calving and had been previously scored at weaning and had an essentially normal distribution (similar to Herd 1), we need to ask ourselves what happened. Did we change anything? Although these examples are somewhat extreme, they illustrate that we have to look beyond the individual body condition scores of cows at one point during the production year to get the most of body condition scoring.

We have several resources on body condition scoring available on the web that may be accessed at https://www.asi.k-state.edu/research-and-extension/beef/feedandwater.html including the quick reference guide to body condition scoring shown below.

Body Condition Scorecard for Cattle

		Physical Attribute					
	BCS	Spine	Ribs	Hooks/ Pins	Tailhead	Brisket	Muscling
Thin	1	Visible	Visible	Visible	No fat	No fat	None/atrophy
	2	Visible	Visible	Visible	No fat	No fat	None/atrophy
Borderline	3	Visible	Visible	Visible	No fat	No fat	None
	4	Slightly visible	Foreribs visible	Visible	No fat	No fat	Full
Optimum Condition	5	Not visible	1 or 2 may be visible	Visible	No fat	No fat	Full
	6	Not visible	Not visible	Visible	Some fat	Some fat	Full
Over-Conditioned	7	Not visible	Not visible	Slightly visible	Some fat	Fat	Full
	8	Not visible	Not visible	Not visible	Abundant Fat	Abundant Fat	Full
	9	Not visible	Not visible	Not visible	Extremely Fat	Extremely Fat	Full

Adapted from Herd & Sprott, 1986; BCS = body condition score

For more information, contact Justin Waggoner at jwaggon@ksu.edu.