Issue 609

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eUpdate

01/27/2017

These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 swatson@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. Late-winter preplant applications for kochia control

Producers should begin soon in planning their program for controlling kochia. The spread of glyphosate-resistant kochia populations throughout western Kansas, and the difficulty growers have had controlling these populations, suggest that control measures should begin prior to emergence of kochia.

Major flushes of kochia emerge in late February to early March and into April. If allowed to emerge, postemergence herbicide applications often will not provide adequate control. Incomplete control of these dense populations (Figure 1) is likely in these situations. When the kochia is glyphosate-resistant and complete herbicide coverage is not possible, results can be very poor when trying to use postemergence products to control dense populations. The dense populations may also be stressed, which reduces the effectiveness of postemergence herbicide applications.

The choice of herbicides for effective preemergence control of kochia in February and early March will vary depending on subsequent cropping intentions. Various cropping scenarios are discussed below.

Note: All charts in this article are based on data from irrigated plots at the K-State Southwest Research-Extension Center at Tribune, and with populations of kochia that are susceptible to triazines. The kochia at this site and is a mixed population of glyphosate-resistant and susceptible plants.

Figure 1A. Untreated kochia seedlings amid residue. Photo by Curtis Thompson, K-State Research and Extension.

Figure 1B. Kochia and Russian thistle "tumbleweeds" in a sorghum stubble field. This will spread kochia seed into what otherwise may have been a relatively clean field, making a preplant treatment advisable. Photo by Curtis Thompson, K-State Research and Extension.

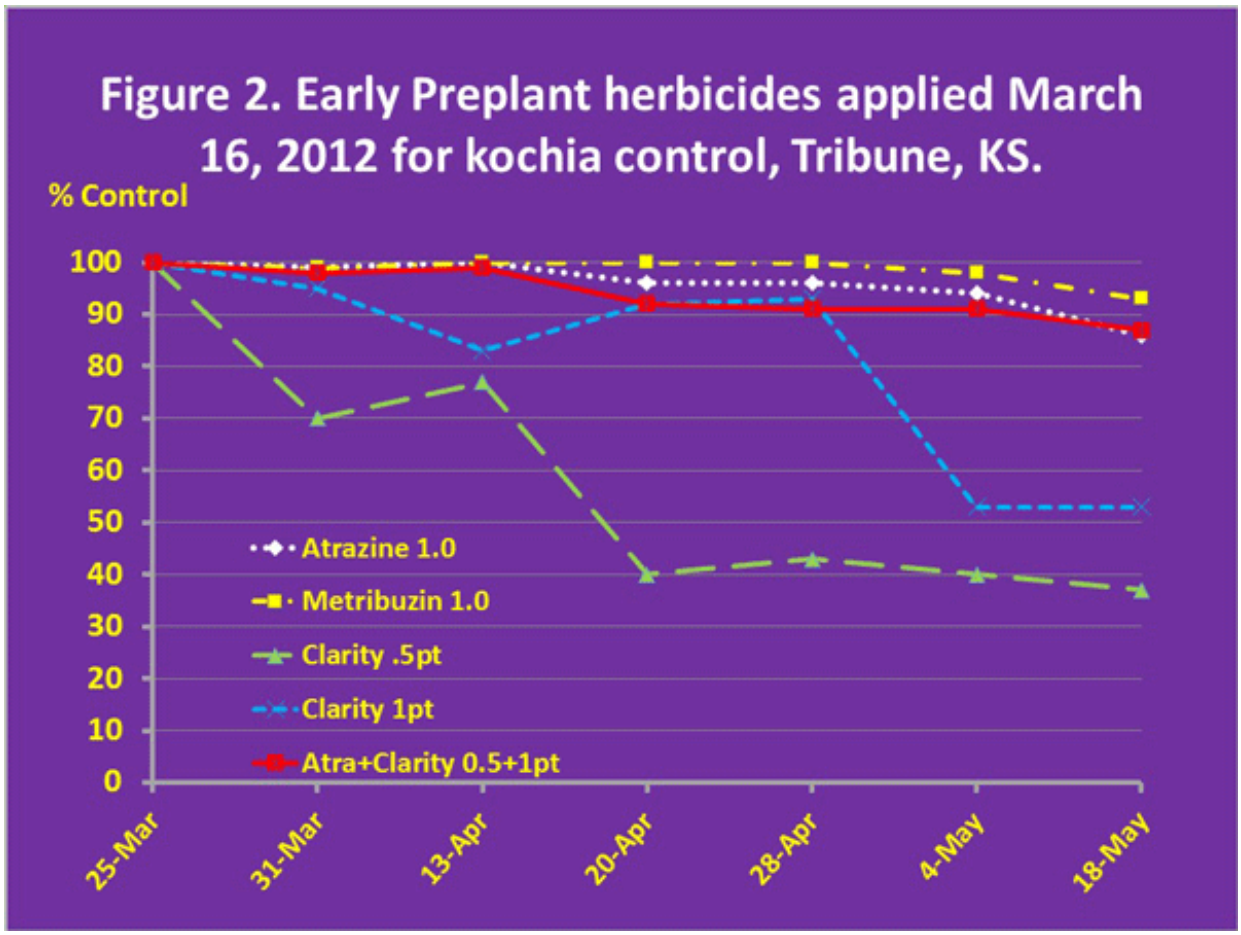
Fields going to corn or sorghum this spring

For fields that will be planted to corn and sorghum this spring, a combination of glyphosate (using a minimum of 0.75 lb ae/acre) with herbicides that have PRE and POST activity on kochia is most valuable. 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 preemergence control of kochia often into May as shown in Figures 2 and 3. An application of Clarity alone, shown in Figure 2, suggests that a pint provides better control than 8 oz. However, a combination of atrazine and Clarity is better than Clarity alone.

December applications have also been effective in managing manage kochia. Corvus+atrazine, Scoparia+atrazine, and Atrazine+Clarity were among the best treatments in the experiment shown in

Figure 3B. February applications shown in Figure 3C generally benefit from the addition of Banvel, as previously discussed. All dicamba treatments are shown with a broken line pattern and solid lines represent herbicides without dicamba. If atrazine is included only corn or sorghum can be planted. If atrazine+ Scoparia or Corvus are applied, only corn can be planted in the spring. Note: The 24c Special local need label for use of Scoparia to control kochia in fallow or ecofallow has 4-month plantback restriction to corn and 6-month plantback restriction to sorghum.

The best timing for this application is January through the first week of March but prior to kochia emergence. The later it gets, the more likely it is there will be some small, emerged kochia, which increases the risk of control failure. If producers wait until later to apply the burndown and preemergence herbicide in the same application, the kochia will be larger and most likely will not be controlled. If that occurs, the surviving plants will go on to cause problems throughout the growing season. Note the photos of very small kochia on March 10 and March 20 of 2015 (Figures 4 and 7) and the corresponding less-than-adequate control of the small emergence kochia shown in the figures.



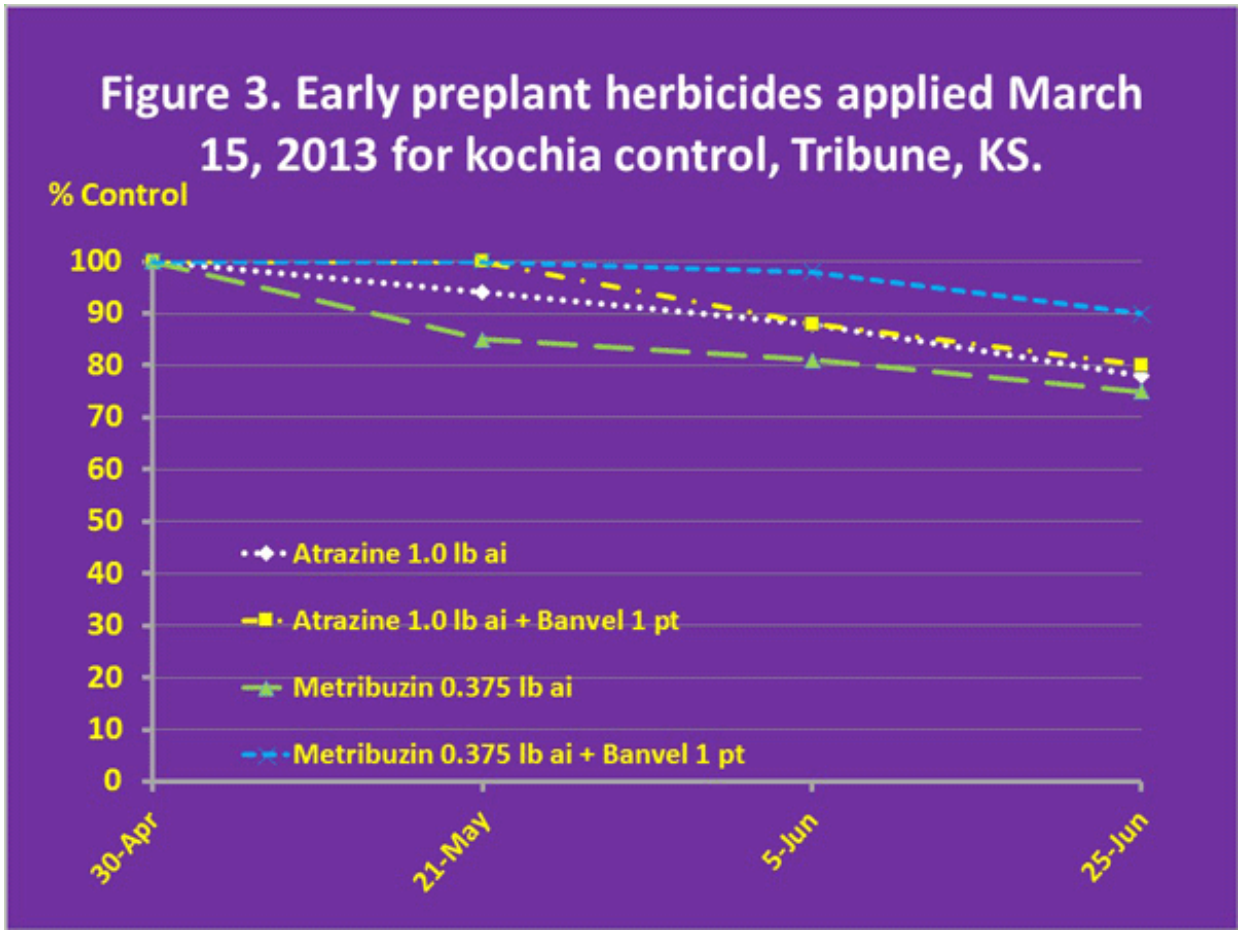


Figure 3. Early preplant herbicides applied March 15, 2013 for kochia control, Tribune, KS.
% Control
100
90
80
70
60
50
40
30
20
10
0
Atrazine 1.0 lb ai
Atrazine 1.0 lb ai + Banvel 1 pt
Metribuzin 0.375 lb ai
Metribuzin 0.375 lb ai + Banvel 1 pt
30-Apr
21-May
5-Jun
25-Jun

Figure 3B. Dec 20th applied herbicide treatments for kochia control, Tribune KS 2015-16.

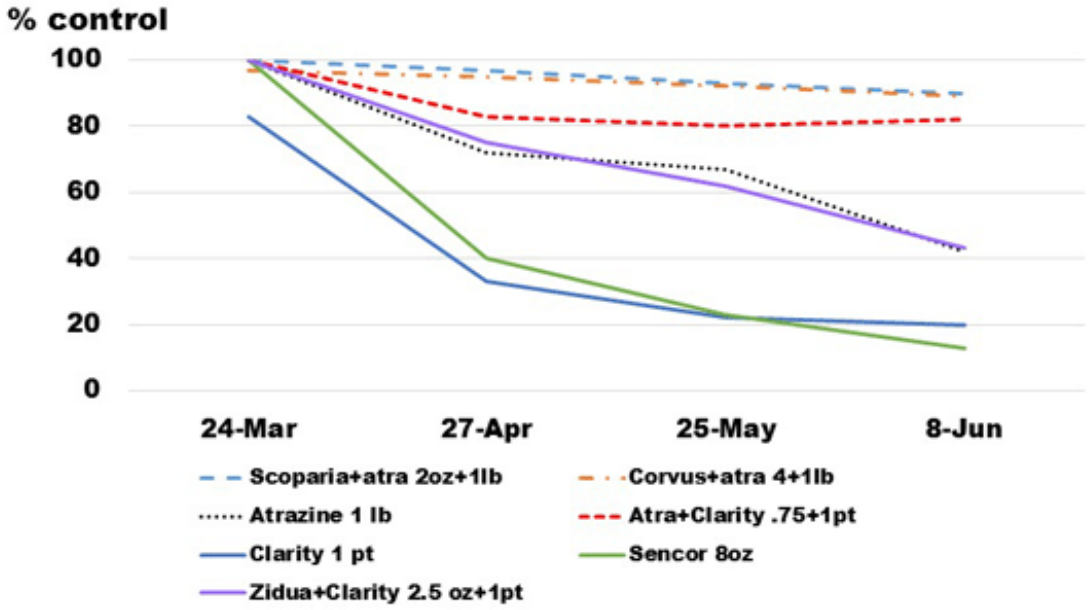


Figure 3C. February 15th applied herbicide treatments for kochia control. Tribune KS 2016.

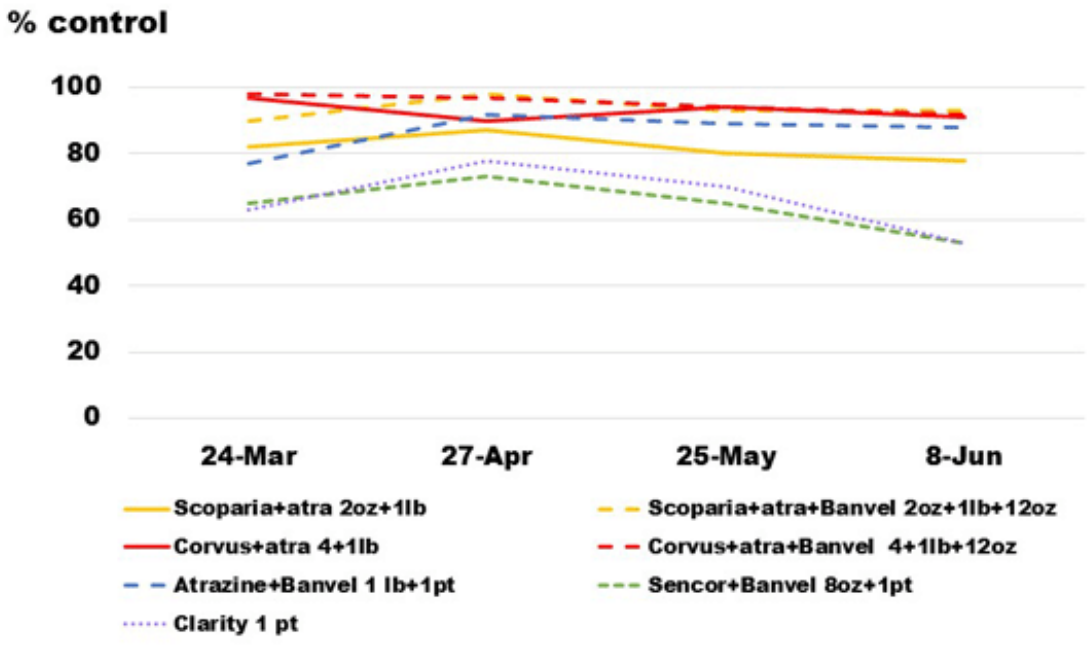


Figure 4. Application of herbicides was made to these kochia on March 10, 2015. Photo by Curtis Thompson, K-State Research and Extension.

Figure 5. EPP/POST herbicides applied March 10,2015 for kochia control, Tribune, KS. Kochia at cotyledon stage

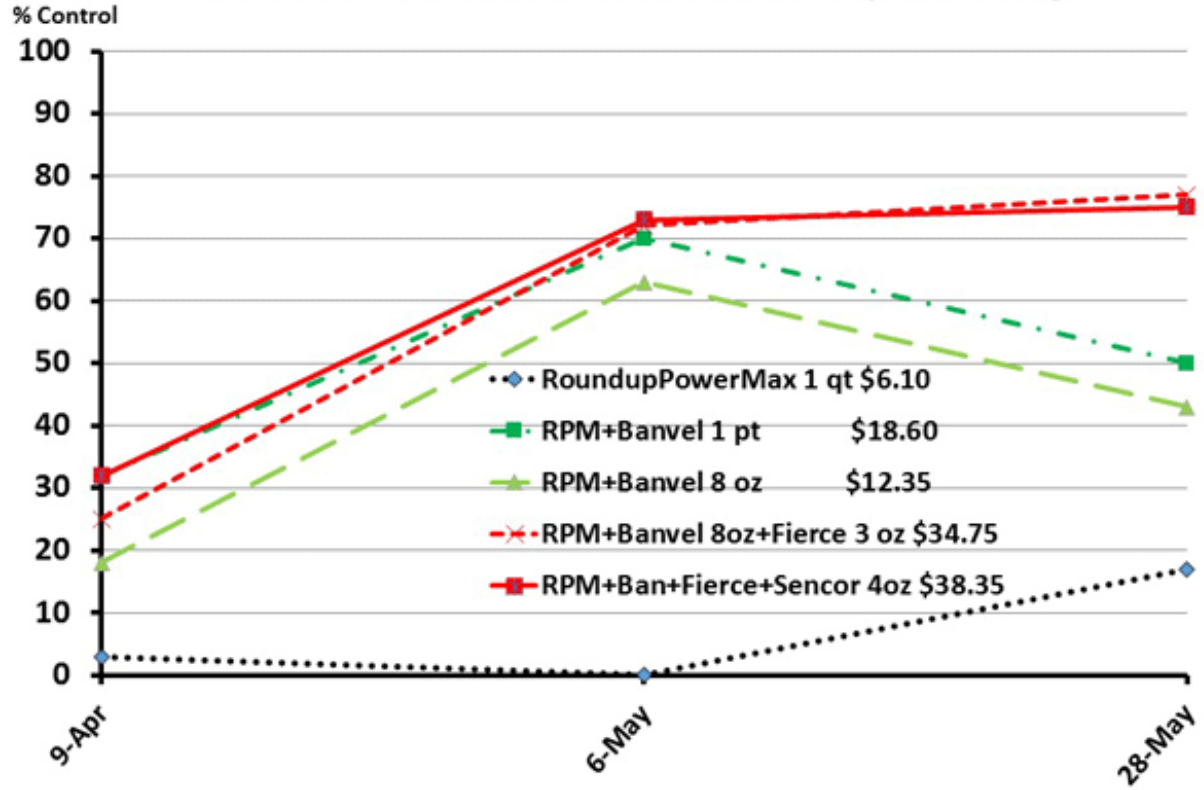


Figure 6. EPP/POST herbicides applied March 10,2015 for kochia control, Tribune, KS. Kochia at cotyledon stage

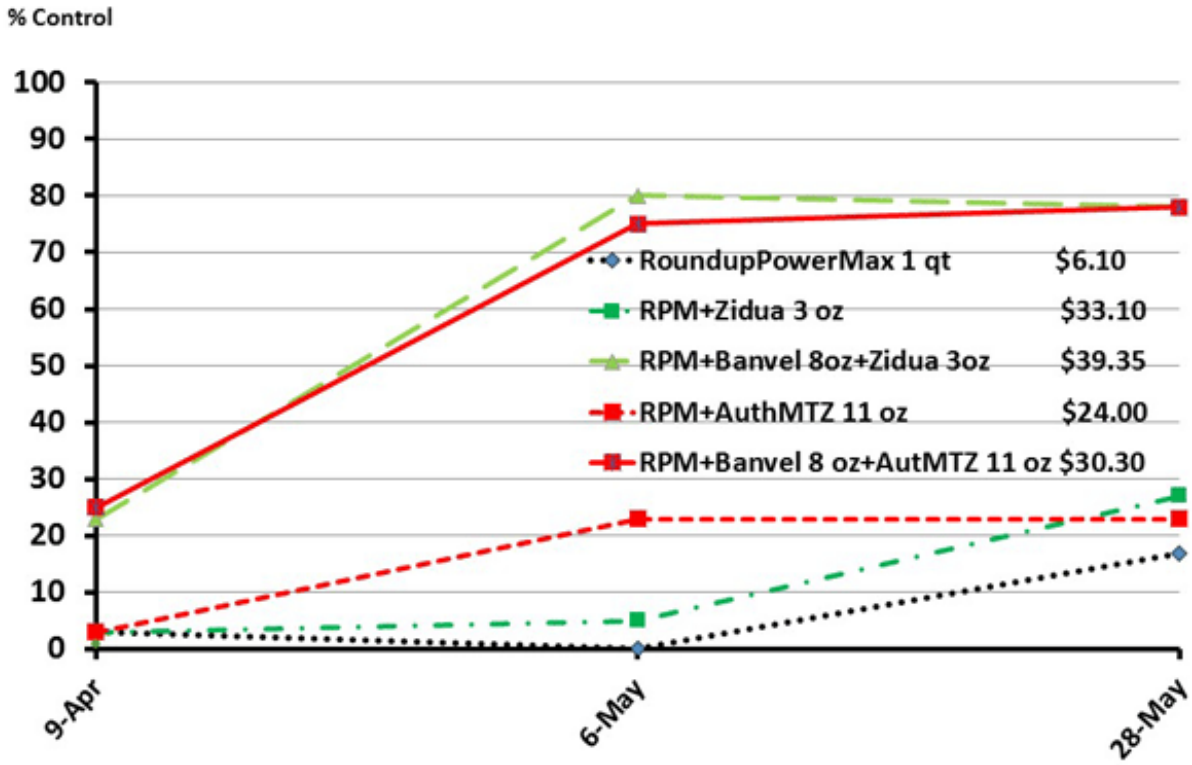
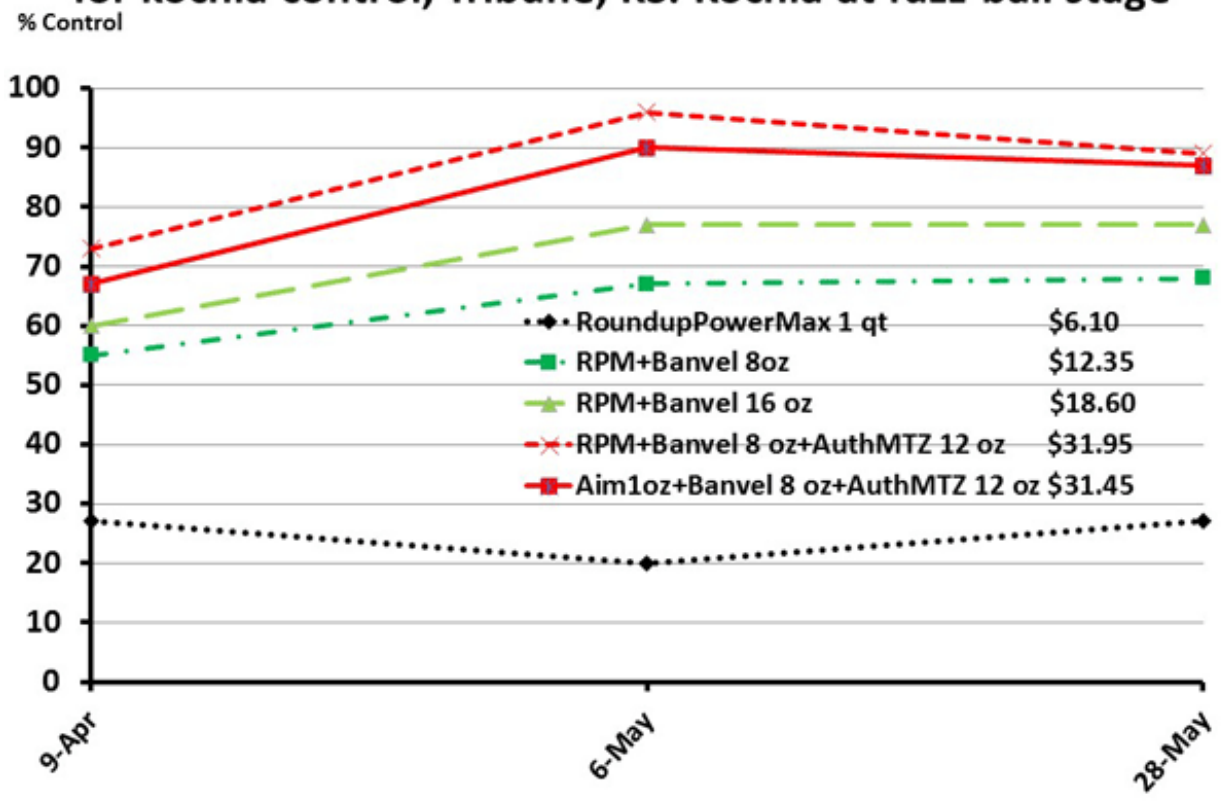


Figure 7. Application of herbicides was made to these kochia on March 20, 2015. Photo by Curtis Thompson, K-State Research and Extension.

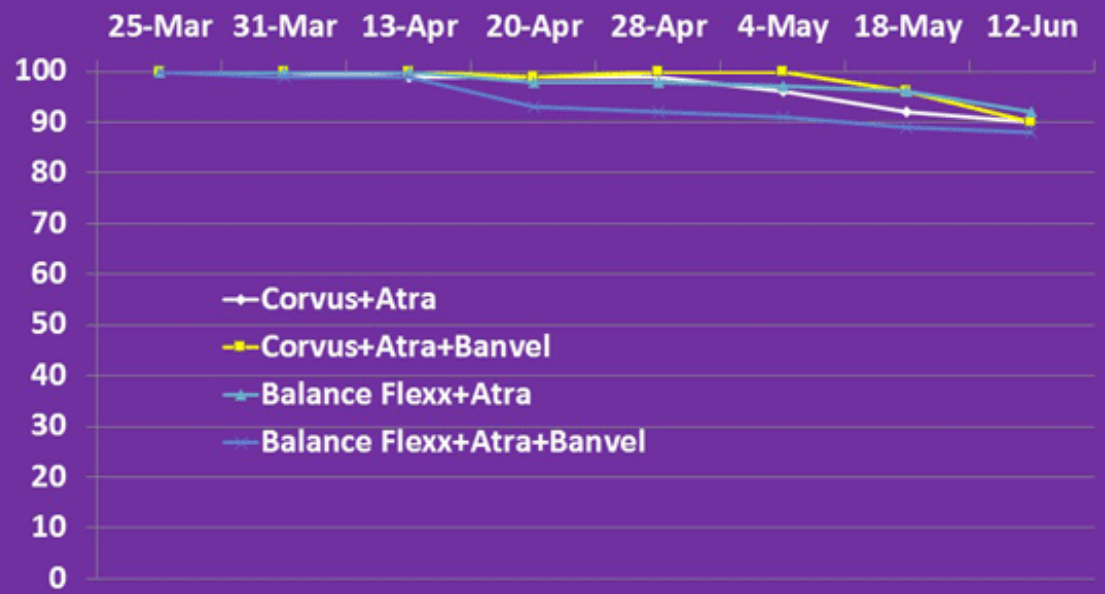
Figure 8. EPP/POST herbicides applied March 20,2015 for kochia control, Tribune, KS. Kochia at fuzz-ball stage

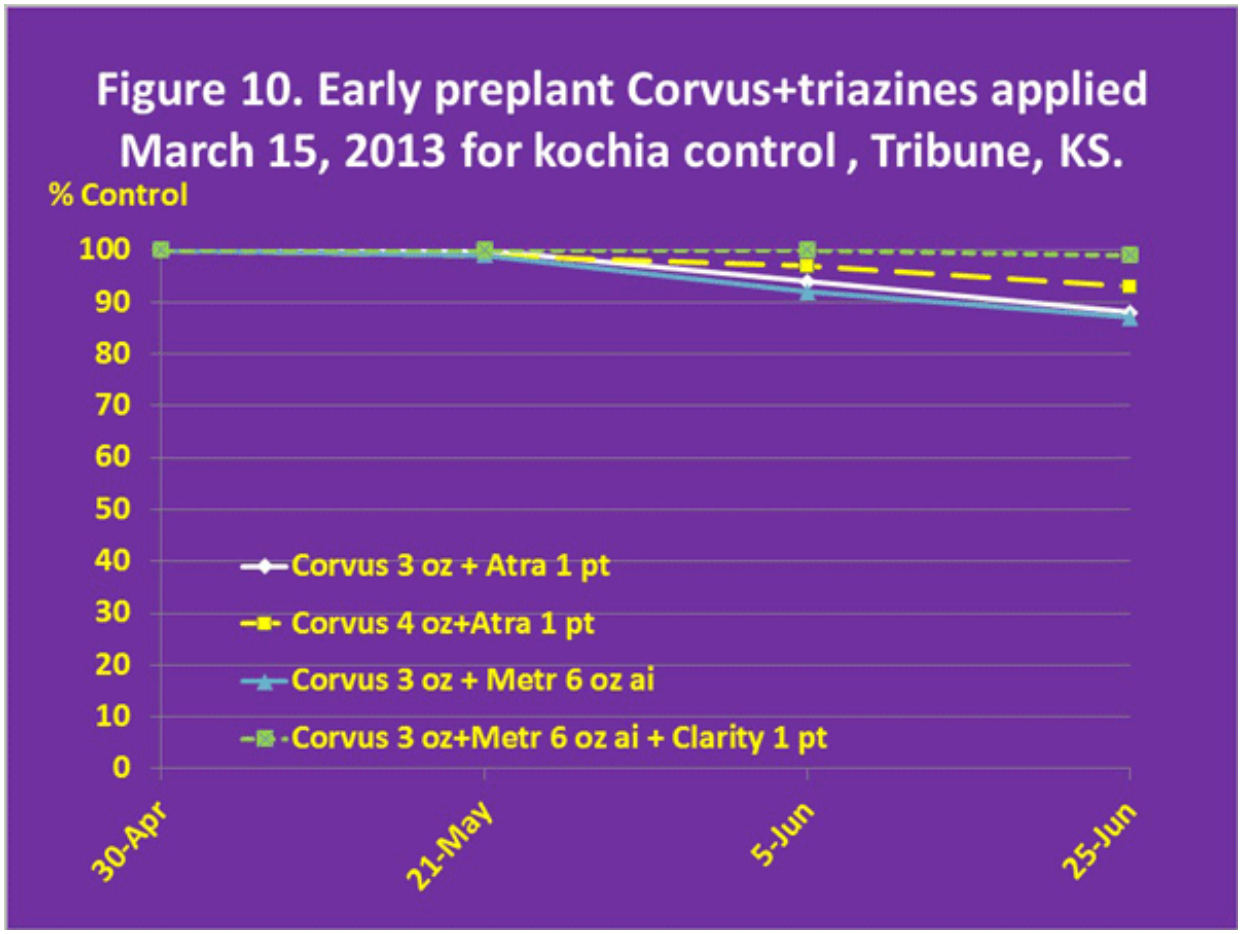


Other herbicides that could be tankmixed with the glyphosate ahead of corn or sorghum include Lexar EZ or Lumax EZ, or for corn only 3 to 4 fl oz of Corvus, Balance Flexx (Figures 3A & B, 9 and 10) or 1.5 to 2.5 oz of Scoparia herbicide. As mentioned previously, the 24c Special local need label for use of Scoparia to control kochia in fallow or ecofallow has 4-month plantback restriction to corn and 6-month plantback restriction to sorghum.

The addition of atrazine is key for most effective control with these herbicides. The addition of Banvel did not increase kochia control with Corvus+atrazine or Balance Flexx+atrazine in 2012, Figure 9, but did increase control with Scoparia+atrazine in Feb 2016, Figure 3A. When marginal rainfall is received for the initial activation, Banvel, which is very soluble, is still able to be activated and provide significant kochia control while atrazine and other herbicides may not be activated. This buys time for additional rainfall and full activation of all the herbicides.

Figure 9. Early preplant herbicides applied March 16, 2012 for kochia control , Tribune KS.

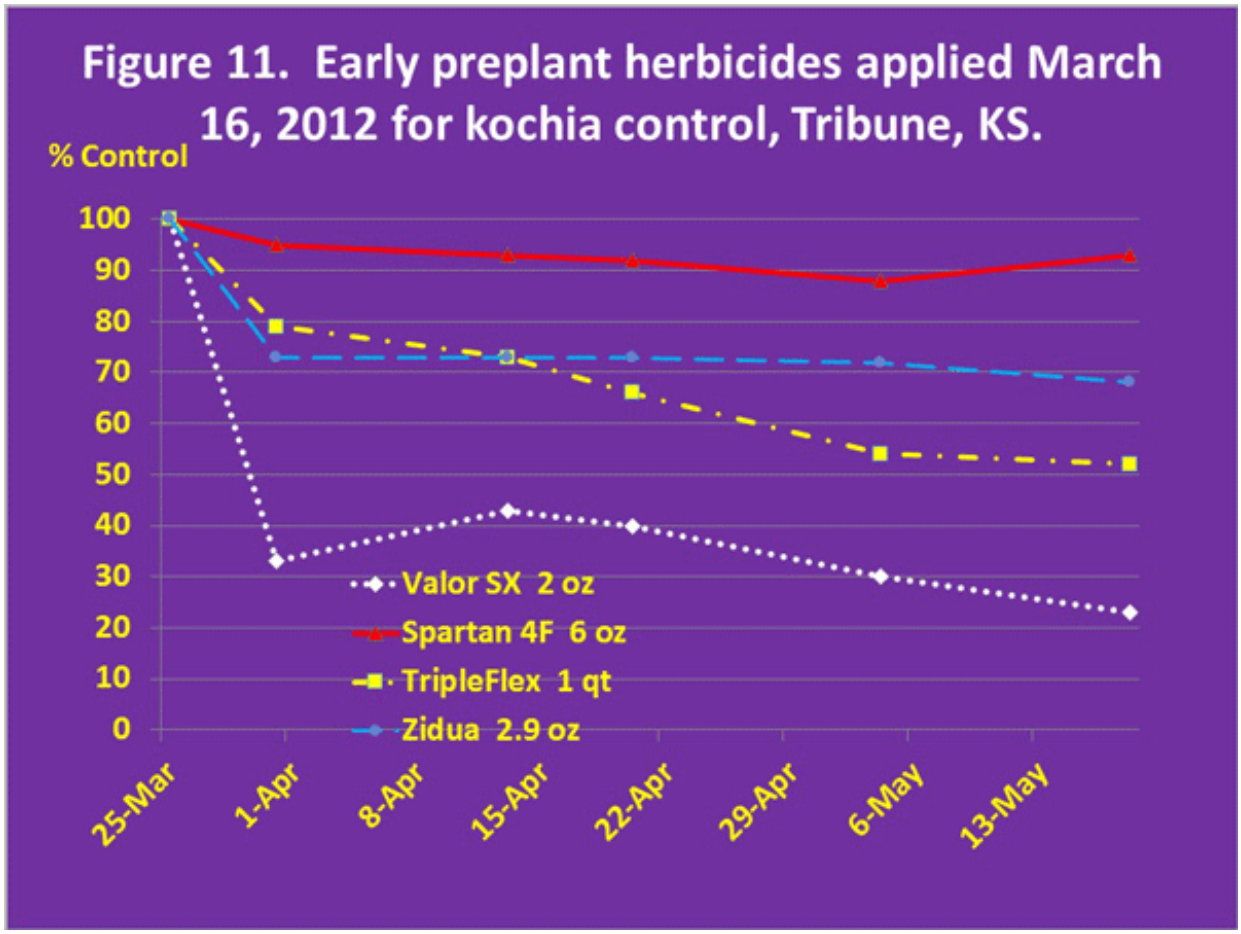




Fields going to sunflowers this spring

Planting sunflower into a clean seedbed is a key step to getting good season-long control of all broadleaf and grassy weeds. But it is especially important for getting good control of any weed populations, such as kochia, that are resistant to glyphosate or ALS-inhibitor herbicides and cannot be controlled with POST applied herbicides in sunflower.

The best approach to kochia control in sunflower is to start in February/March with a tankmix of glyphosate (using a minimum of 0.75 lb ae/are) and Spartan (sulfentrazone), Spartan Charge (sulfentrazone+Aim), or Broadaxe (sulfentrazone+Dual Magnum) before kochia begin to germinate. The sulfentrazone will provide excellent preemergence control of kochia ahead of sunflower planting. Figure 11 indicates that 6 oz of Spartan controlled kochia very effectively in the Tribune experiments up to early June. It is very possible that as little as 4 oz could have done a similar job at the Tribune location because of the 7.8 pH and 1.8% organic matter soil. The label does not allow a March application of dicamba when intending to plant sunflower. Monitor fields closely as additional glyphosate or Gramoxone SL treatments maybe required prior to sunflower planting. Select preemergence products that are effective on kochia and apply at planting to extend control of kochia and other weeds.



Fields going to soybeans this spring

The best management strategy for controlling kochia in soybeans is similar to the control strategy for sunflower, but there are more herbicide options in soybeans than in sunflower. Start in February or early March with a tankmix of glyphosate (using a minimum of 0.75 lb ae/acre) and 8 to 16 oz/acre of Clarity prior to kochia emergence. The use of Clarity requires a minimum accumulation of 1 inch of rain and then 28 days prior to planting soybeans. As indicated in the label, Clarity cannot be used as a preplant treatment in soybeans in areas with less than 25 inches of annual rainfall.

Gramoxone Inteon tankmixed with metribuzin (Dimetric, Metribuzin, Sencor) will provide extended residual control of kochia, as long as the population of kochia is susceptible to triazine herbicides.

Figure 2 shows the effectiveness of a full pound of metribuzin, which is not practical for western Kansas. Figure 3 shows the effectiveness of 3/8 lb of metribuzin alone or with dicamba which provided residual kochia control into May, especially when dicamba was added. Metribuzin can injure soybeans depending on soil texture, organic matter and soil pH, so be sure to follow label guidelines regarding soil characteristics and rate guidelines regarding use rate on soybeans.

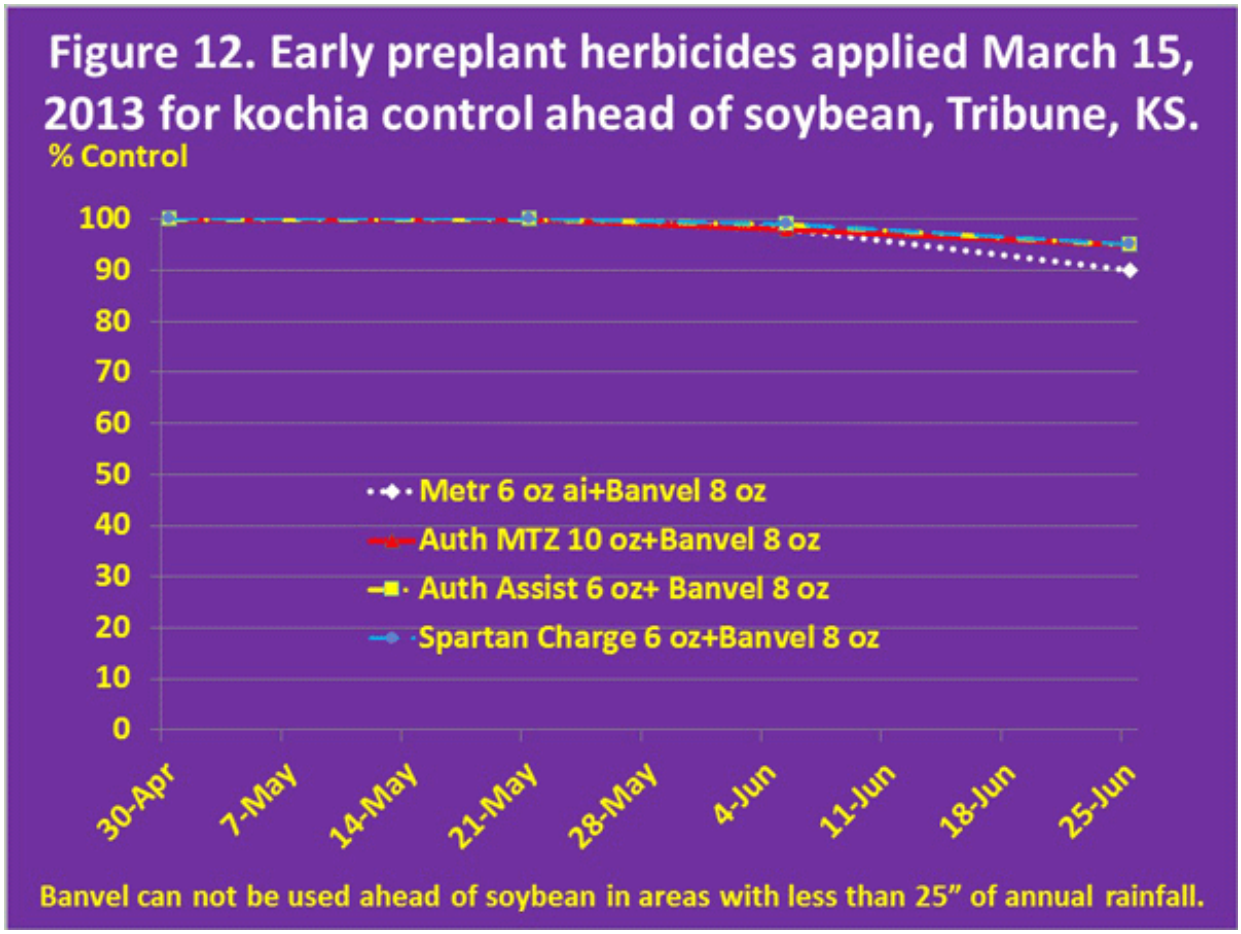
Authority-based herbicides that contain sulfentrazone could be considered for use prior to kochia emergence to manage an early flush of kochia. It's important to note the crop rotation restrictions on these products, however. The Valor-based products have not provided adequate control of kochia

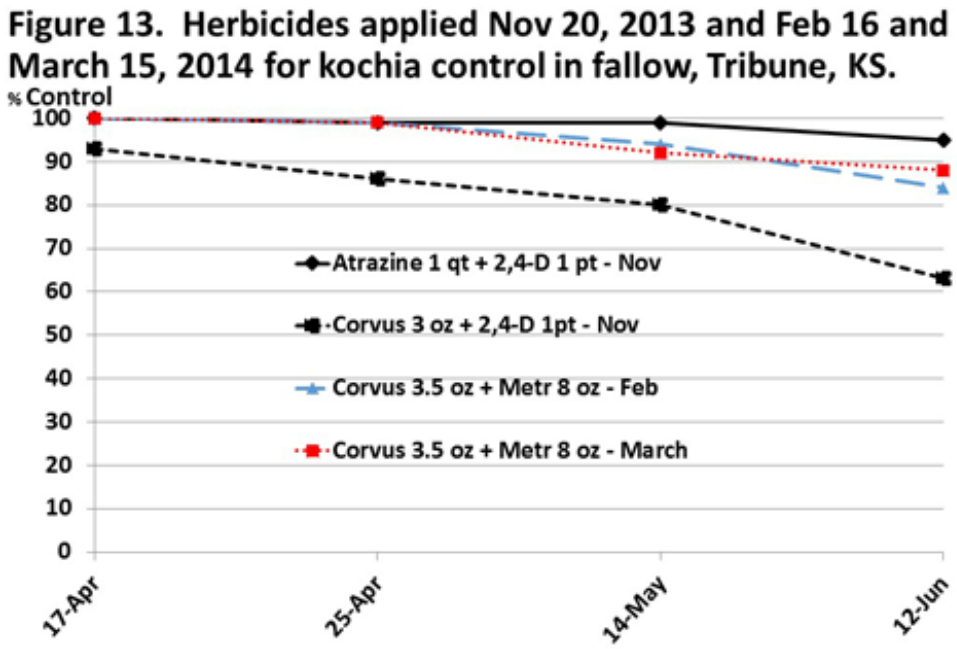
(Figure 11). Other Authority-based products did provide excellent control of kochia well into June (Figure 12). Also, Zidua has activity on kochia. It appears that more rain is required for activation of Zidua; however, once activated, no additional kochia emerged. For adequate kochia control with Zidua, using maximum labels rates for your soil type would be recommended.

Fields going to wheat this fall

If kochia is emerging in row crop stubble intended to be planted to wheat this fall, herbicide options exist that provide residual kochia control. Atrazine cannot be used in this situation, as this treatment is off-label. The following herbicides could provide effective residual control of kochia for fields to be planted to wheat this fall: dicamba, metribuzin or Dimetric (Dimetric label indicates ½ to 2/3 of a pound), Corvus, Balance Flexx, Scoparia (equal to Balance Pro), and Lumax EZ. These products allow wheat to be planted 4 months following application. Effectiveness of some of these herbicide treatments is shown in Figures 2, 3, 9, 10, 12, and 13.

These treatments can be effective when made prior to kochia emergence. A November application of 1 lb of atrazine was effective through June 12. However, this treatment is labeled only if corn or sorghum will be planted the following year. The November application of Corvus was not adequate. The addition of metribuzin to Corvus would have improved kochia control. HPPD inhibitors should always be applied with a triazine. Only metribuzin, which is a triazine, can be applied in the late fall or early spring when wheat will be planted in the fall. February and March applications of Corvus and metribuzin were very similar and effective. This suggests that if weather cooperates and a window for application is available in February, getting these early treatments applied at that time could be beneficial.





Fields of standing wheat

If kochia is emerging in a field of growing wheat, the options for control depend on whether the population of kochia is susceptible or resistant to ALS-inhibitor herbicides and whether wheat has reached the jointing stage. There are three big challenges to kochia control in wheat:

- There are many populations of kochia with resistance to either ALS-inhibitor herbicides, or glyphosate. There may even be some populations resistant to dicamba.
- A majority of kochia emerges early in the spring, but some emergence can extend over a period of weeks or months. An herbicide applied early in the spring will need to have residual activity to be effective on later-emerging kochia. Several ALS-inhibitor herbicides have good residual activity, but are ineffective on ALS-resistant kochia.
- Dicamba, a non-ALS herbicide is one of the more effective products on most populations of kochia, but must be applied before the jointing stage of wheat.

Even though most kochia present in wheat in western Kansas is resistant to ALS-inhibitor herbicides, an ALS inhibitor herbicide tank mixtures with dicamba or herbicides containing Starane can be very effective to control kochia. In general, 2,4-D, MCPA, Aim, and Cadet, are not very effective in controlling kochia.

Additional products containing dicamba include Rave (Amber + dicamba) or Pulsar (Starane + dicamba). These products have to be applied before the jointing stage of wheat. Dicamba has some residual soil activity, but not as much as most sulfonylurea herbicides. Rave will have residual activity from the Amber, but since Amber is a sulfonylurea herbicide, it would not provide any residual control of kochia populations that are resistant to ALS-inhibitor herbicides. Both ingredients in Pulsar have limited residual activity.

As mentioned above, another option producers have for kochia control is Starane or other fluroxypyr products. Like dicamba, Starane is a growth regulator herbicide, but it can be applied up to the early boot stage of wheat. Starane also has limited residual activity, so good coverage is still important for control. Starane is weak on mustard control. A new product for kochia control in wheat is Kochiavore. The premix of Starane+Buctril+2,4-D LV can be applied to wheat from the 4-lf up to flagleaf emergence.

Huskie is also effective on kochia. It is a broad-spectrum herbicide effective on most broadleaf weeds in wheat, and can be applied up to the boot stage of wheat. Huskie also has limited residual activity, so producers will need to make sure kochia plants are thoroughly covered with Huskie to get the best control. Ideally, the Huskie should be timed for application after the majority of kochia has emerged, but before the wheat canopy affects good spray coverage.

Buctril can control kochia and can be applied at later stages of wheat development, but is a contact herbicide with no soil residual activity. Consequently, Buctril has the same kind of challenges as Starane and Huskie in terms of getting good coverage. Getting thorough coverage is even more critical with Buctril since it is a true contact herbicide and not translocated in plants. Buctril is effective on very small kochia only.

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2. Topdressing wheat with nitrogen: Timing, application methods, source, and rates

Now is a good time to start planning for topdressing nitrogen (N) of the winter wheat crop. With adequate soil moisture in most areas of the state, and some fairly small wheat in many fields due to late planting in south-central Kansas and dry weather in southwest Kansas during the fall, there are some key elements that need to be considered when deciding on the exact program you plan to use. These include: timing, N source, application method and N rate.

Ideally, the N in topdress applications will be moved into the root zone with precipitation well before jointing begins in order to be most efficiently utilized by wheat. With some of the small wheat out there this spring, having adequate N available to support spring tillering when it breaks dormancy will be important. Some combination of fall preplant or at-seeding N, and/or early topdressed N, is also normally needed to supply adequate N to support head differentiation. This is the stage when head size is being determined, and can begin about two weeks before jointing. The following will discuss some of the issues to considering when making topdressing decisions.

Timing

The most important factor in getting a good return on topdress N is usually timing. It is critical to get the N on early enough to have the maximum potential impact on yield. While some producers often wait until spring just prior to jointing, this can be too late in some years, especially when little or no N was applied in the fall. For the well-drained medium- to fine-textured soils that dominate our wheat acres, the odds of losing much of the N that is topdress-applied in the winter is low since we typically don't get enough precipitation over the winter to cause significant denitrification or leaching. For these soils, topdressing can begin anytime now, and usually the earlier the better.

For wheat grown on sandier soils, earlier is not necessarily better for N applications. On these soils, there is a greater chance that N applied in the fall or early winter could leach completely out of the root zone if precipitation is unusually heavy during the winter. Waiting until closer to spring green-up to make topdress N applications on sandier soils will help manage this risk.

On poorly drained and/or shallow claypan soils, especially in south central or southeast Kansas, N applied in the fall or early winter would have a significant risk of denitrification N loss. Waiting until closer to spring green-up to make topdress N applications on these soils will help minimize the potential for this N loss.

Also keep in mind that N should not be applied to the soil surface when the ground is deeply frozen and especially when snow covered. This will help prevent runoff losses with snow melt or heavy precipitation.

On both sandy soils subject to leaching and poorly drained soils prone to denitrification, split applications may be a strategy to consider. This would involve applying enough N in the fall at or prior to planting to give good support for fall growth and tillering -- generally 20-30 pounds of N. Then follow this up with an additional shot of about 20-30 pounds of N in late winter or early spring to support spring tillering, possibly applied with herbicides. This late-winter/early-spring application becomes especially important when stands are thin due to poor emergence, as many fields in southwest Kansas this year. Finally, come back around jointing or a few days later with a final application to support heading and grain fill.

Application method

Most topdressing is broadcast applied. In high-residue situations, this can result in some immobilization of N, especially where liquid UAN is used. If no herbicides are applied with the N, producers can get some benefit from applying the N in a dribble band on 15- to 18-inch centers. This can minimize immobilization and may provide for a little more consistent crop response.

Figure 1. Streamer bars used for topdressing wheat in a surface band. Photo by Ray Asebedo, K-State Research and Extension.

Source

The typical sources of N used for topdressing wheat are UAN solution and dry urea. Numerous trials by K-State over the years have shown that both are equally effective. In no-till situations, there may be some slight advantage to applying dry urea since some of it will fall to the soil surface and be less affected by immobilization than broadcast liquid UAN, which tends to get hung up on surface residues.

Figure 2. Urea broadcast to tillering wheat in a topdress application. Photo by Romulo Lollato, K-State Research and Extension.

Dribble (surface band) UAN applications would also avoid some of this tie-up on surface crop residues as well. But if producers plan to tank-mix with an herbicide, they'll have to use liquid UAN and broadcast it.

Some of the new controlled-release products such as polyurethane coated urea (ESN) might be considered on very sandy soils prone to leaching, or poorly drained soils prone to denitrification. Generally a 50:50 blend of standard urea and the coated urea -- which will provide some N immediately to support tillering and head development and also continue to release some N in later stages of development. This probably works best in settings with high loss potential.

Rate

Producers should have started the season with a certain N recommendation in hand, ideally based on a profile N soil test done before the crop is planted and before any N has been applied. It is not too late to use the profile N soil test if taken in late winter/very early spring before the wheat greens up. While it won't be as accurate as when sampled in the fall, it can still point out fields or areas in fields with high levels of available nitrate N. Unfortunately it is not reliable in measuring recently applied N. So if a high rate of N has already been applied, a late winter profile sample probably

shouldn't be taken. Remember that topdressing should complement or supplement the N applied in the fall and the residual soil N present in the soil. The total N application, planting and topdressing, should equal the target recommended rate.

If the wheat was grazed this fall and winter, producers should add an additional 30-40 lbs N/acre for every 100 lbs of beef weight gain removed from the field. If conditions are favorable for heavy fall and/or spring grazing, additional N maybe necessary, especially for a grain crop.

Low grain prices may also play a role for N rate decisions this spring. However, is important to keep in mind that N is the most limiting nutrient for wheat, and the optimum agronomic N application rate will likely result in economic returns. After good yielding crops last year, it is likely that residual soil N will be relatively low. This can also contribute to the frequency and magnitude of yield response to N fertilizer applications.

Some fields may also benefit from an application of sulfur and chloride. Like N, these nutrients are mobile in the soil, and a topdress application before joining is considered an effective application time. Sulfur and chloride topdress applications should be made based on soil test and history of response.

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3. New corn herbicides for 2017

Several new herbicides have received a label for corn within the past two years, and most of them will be on the market in 2017.

Acuron (Syngenta)

Use: Preemergence: All corn types. Postemergence: Field, silage, or seed corn.

Active ingredients (lbs/gallon): Atrazine 1.0 lb + bicyclopyrone 0.06 lb + mesotrione 0.24 lb + S-metolachlor 2.14 lbs

Use rate: 2.5 qt/acre on soils with less than 3 percent organic matter; 3 qt/acre on soils with 3 percent or higher organic matter. Maximum of 3 qt/year.

Target weeds: Key broadleaf weeds include Palmer amaranth, waterhemp, kochia, marestail, velvetleaf, common cocklebur, and others. Most annual grasses in Kansas except shattercane likely won't be controlled. Will provide improved control of large-seeded broadleaf weeds when compared to Lumax EZ or Lexar EZ.

Timing: Apply from 28 days prior to planting up to emerged corn that is less than 12 inches tall.

Adjuvants: If applied postemergence to corn and weeds, use NIS at 0.25% v/v. COC can be used up to 1% v/v, but this may increase the risk of crop injury. Do not use MSO, AMS, or UAN.

Comments: This has been described as "Lumax on steroids." The active ingredients are the same as

Lumax, with the addition of bicyclopyrone, a new HPPD-inhibitor chemical. Acuron cannot and should not be used on grain sorghum; it will cause significant injury to grain sorghum. Do not apply postemergence to popcorn or sweet corn.

Acuron Flexi (Syngenta)

Use: Preemergence: All corn types. Postemergence: Field, silage, or seed corn.

Active ingredients (lbs/gallon): Bicyclopyrone 0.08 lb + mesotrione 0.32 lb + S-metolachlor 2.86 lbs

Use rate: 2.0 qt/acre on soils with less than 3 percent organic matter; 2.25 qt/acre on soils with 3 percent or higher organic matter. Maximum of 2.25 qt/year.

Target weeds: Same as Acuron, however, will be less effective without atrazine.

Timing: Apply from 28 days prior to planting up to planting postemergence from emerged to 30 inches tall or up to the 8-leaf stage on field, silage, and seed corn only.

Adjuvants: If applied postemergence to corn and weeds, use NIS at 0.25% v/v. COC can be used up to 1% v/v, but this may increase the risk of crop injury. Do not use MSO, AMS, or UAN. Comments: This product can be used in areas having atrazine use restrictions. Do not apply postemergence to sweet corn or popcorn.

Armezon PRO (BASF)

Use: All corn

Active ingredients (lbs/gallon): Dimethenamid-P (Outlook) 5.25 lbs + topramezone (Armezon-14) 0.1 lb

Use rate: 14 to 24 fl oz/acre, depending on soil texture and organic matter level.

Target weeds: The spectrum of weeds controlled postemergence is identical to Armezon. However, the addition of dimethenamide-P will provide residual that controls germinating pigweeds and annual grasses.

Timing: Apply preemergence or postemergence to corn up to V8 or 30 inches tall. Use directed application without atrazine when corn is 12 to 30 inches tall.

Adjuvants: When applying postemergence, use MSO, COC, or HSOC at 0.5 to 1% v/v or NIS at 0.25 to 0.5% v/v. Add a nitrogen fertilizer, either UAN at 1.25 to 2.5 v/v or AMS at 8.5 to 17 lb/100 gal.

Comments: Armezon PRO can be tankmixed with other corn herbicides. It is synergized when applied with atrazine. In K-State tests, there has been some crop injury with MSO type adjuvants and atrazine, however, corn recovered.

DiFlexx Duo (Bayer CropScience)

Use: All corn and fallow

Active ingredients (lbs/gallon): Diglycolamine salt of dicamba 1.86 lbs ae + Laudis 0.27 lbs + Bayer CropScience cyprosulfaminde (CSA) safener for corn only. Same form of dicamba salt as in Clarity.

Target weeds: The combination of dicamba and Laudis will provide excellent control of most annual broadleaf weeds, including kochia, pigweeds, velvetleaf, morningglory, sunflower, and others.

Use rate and timing: 24 to 40 fl oz per acre may be applied preplant or preemergence to field, silage, seed and popcorn up through V7 stage. With drop nozzles, can be applied up to corn at the V10 stage or 36 inches tall.

Adjuvants: Adjuvants may be used – COC or MSO at 1% v/v. UAN at 2 to 4 qt/acre or AMS at 8.5 to 17 lb/100 gallons are recommended on the label. The addition of AMS or UAN will increase the risk of dicamba volatility, however.

Comments: Will help manage glyphosate-resistant broadleaf weeds. DiFlexx has a different safener than Status, and does not contain diflufenzopyr, which is in Distinct and Status. The safener in DiFlexx has soil and foliar activity.

Enlist Duo (Dow AgroSciences)

Use: Enlist corn

Active ingredients (lbs /gallon): Colex-D technology: 1.7 lbs dimethylamine salt of glyphosate acid and 1.6 lbs 2,4-D acid as a choline salt.

Target weeds: Glyphosate component will control many weed species that are susceptible to glyphosate, and the 2,4-D component will help manage several glyphosate-resistant broadleaf weeds, including pigweeds, marestail, morningglory, velvetleaf, and others. This product will be very weak on glyphosate-resistant kochia, but will contribute to Palmer amaranth management.

Use rate and timing: Use 3.5 to 4.75 pts/acre to corn no larger than V8 or 30 inches tall. Make 1 to 2 postemergence applications with a minimum of 12 days between applications. Enlist Duo may be used preemergence or postemergence. However, the total application cannot exceed 14.25 pts of Enlist Duo/acre per season.

Adjuvants: No adjuvants listed in the label.

Comments: Enlist Duo received a full federal label in November 2014. Review the label as many application restrictions are listed. We are still waiting now for foreign export approvals (most importantly from China) of corn produced from Enlist hybrids. Enlist Duo cannot be aerially applied. This product will reduce potential off-target movement of 2,4-Dwhen used according to the label.

The gene in Enlist corn confers resistance to the "Fop" grass herbicides – fluazifop (Fusilade) or quizalofop (Assure II). Grass herbicides that will control volunteer Enlist corn include clethodim (Select Max and generics) and sethoxydim (Poast and generics).

Instigate (DuPont)

Use: All corn

Active ingredients: Rimsulfuron (Resolve) 4.17% + mesotrione (Callisto) 41.67%.

Target weeds: Will have residual and foliar activity on annual grasses and several broadleaf weeds.

Use rate: Rates re 5.25 to 7 oz product preemergence to field corn 14 days before planting up through 2-collar corn. If applying postemergence, use 5.25 to 5.4 oz/acre. Use the higher rates preemergence on fine-textured soils or soils having greater than 3% organic matter. Do not apply to coarse-textured soils with organic matter less than 1%.

Timing: Used PRE from 14 days before planting till emergence and POST from emergence through 2-collar corn.

Adjuvants: Add COC, MSO, or NIS to enhance postemergence activity on emerged weeds. In addition, a nitrogen-based adjuvant, AMS or UAN, should be used unless prohibited by a tankmix partner.

Comments: Almost always follow up with a postemergence herbicide program.

Kochiavore (Winfield Solutions)

Use: Field corn

Active ingredients (lbs/gallon): 1.67 lbs ae 2,4-D LV, 1.67 lb ai bromoxynil, and 0.67 lb ae fluroxypry.

Target weeds: Broadleaf weed control, including kochia.

Use rate and timing: Use 1 to 1.5 pints in corn preplant, a minimum of 7 days ahead of conventional-till planted corn, post-plant preemergence to no-till planted corn, or postemergence, to field corn at V3 to V5. Kochiavore will cause injury to corn as it contains an LV ester formulation of 2,4-D. Kochiavore can be applied up to 2.5 pints on fallow. Maximum use rate is 3 pints/acre for a growing season.

Adjuvants: The use of a high-quality adjuvant may be used to improve weed control (Statement in label). Research at K-State suggests that the use of adjuvants may also increase crop injury from Kochiavore, however, should be considered when Kochiavore is applied for weed control in fallow or noncropland areas.

Comments: Do not feed or graze corn for 47 days following application or harvest grain for 90 days of

application. Do not harvest grain within 70 days of application or allow meat or dairy animals to consume fodder, forage, or graze for 45 days following application to sorghum. Do not allow livestock to grazed fallow that has been treated with Kochiavore.

Resicore (Dow AgroSciences)

Use: All field corn and yellow popcorn

Active ingredients (lbs/gallon): 2.8 lbs ai acetochlor, 0.3 lb ai mesotrione, and 0.19 lb ae clopyralid.

Target weeds: Resicore has excellent PRE activity on pigweeds and most broadleaf weeds, and good control of annual grasses except shattercane. When applied with atrazine most common broadleaf weeds will be controlled. Resicore applied postemergence may not provide adequate control of emerged annual grasses thus should be tank mixed with a product having good foliar activity on the grasses.

Use rate: As a preemergence to field, grain, silage, seed and yellow popcorn, use 2.25 to 3.0 qts/acre from 28 days before planting up to emergence. Rate structure is based on soil texture and organic matter. Apply Resicore from 1.5 to 3 qts/acre early postemergence to all types of field, corn, up to corn 11 inches tall. Do not apply POST to popcorn.

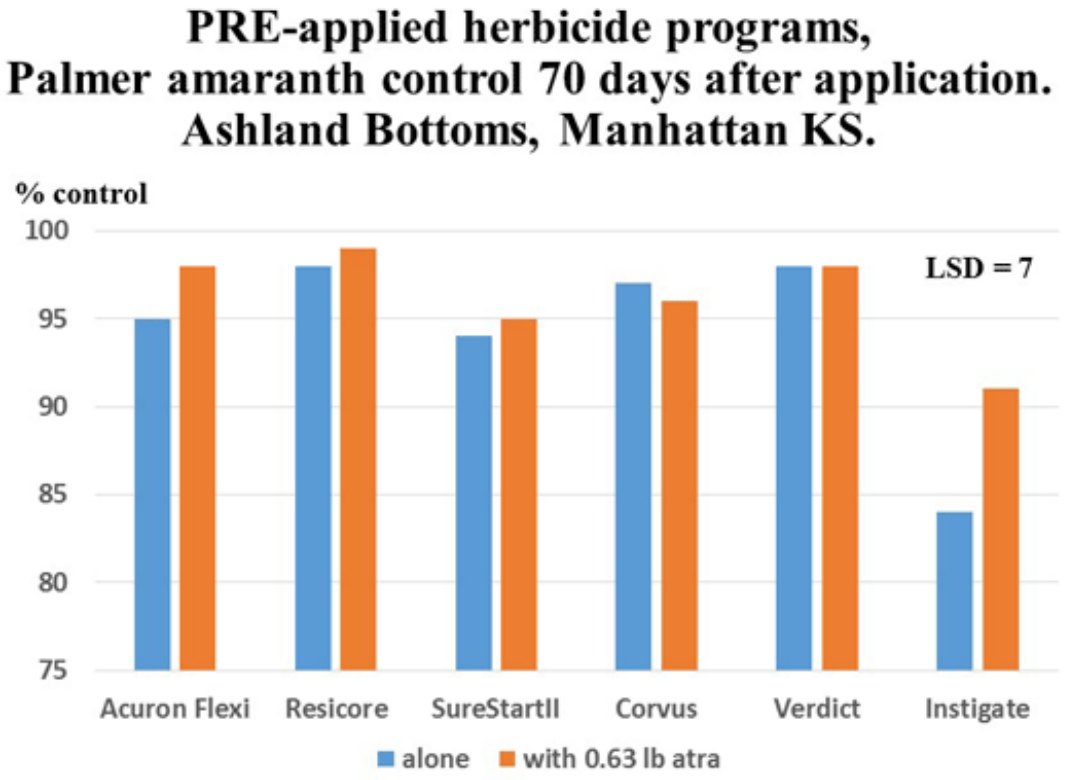
Adjuvants: Add NIS at 0.25% v/v or COC up to 1% v/v to enhance postemergence activity. Do not use MSO or adjuvants containing nitrogen if corn has emerged. The exception is 1.5 qts of Resicore may be applied postemergence with glyphosate (on glyphosate resistant corn) or glufosinate (on Liberty Link corn) and AMS at 8.5 lb/100 gallons + NIS at 0.25% v/v.

Comments: DO NOT APPLY POST to sweetcorn or popcorn. Applying with atrazine will enhance broadleaf weed control.

Weed management in corn with PRE herbicides
Ashland Bottoms, Manhattan KS, 2016

Treatment	Timing	Rate	Herb. Cost	Yield	Palmer amaranth	Velvet-leaf	Morning-glory
		Product / acre	$/a	Bu/a	% control, July 14, 70 days after application		
Acuron*	Pre	2.5 qt	46.50	157	98	100	96
Acuron Flexi	Pre	2 qt	46.40	159	95	98	80
Zemax	Pre	2 qt		151	93	97	71
Resicore	Pre	2.5 qt	44.30	151	98	98	92
Resicore + atrazine	Pre	2.5 + 0.63 qt	46.50	168	94	100	96
SureStart II	Pre	1.25 qt	34.25	146	95	38	69
SureStart II + atrazine	Pre	1.25 +0.63 qt	36.45	148	98	35	76
Degree Xtra*	Pre	3 qts	37.00	138	97	47	82
Corvus	Pre	5.6 fl oz	42.40	140	97	100	56
Corvus + atrazine	Pre	5.6 fl oz + 0.63 qt	44.60	148	96	100	64
Verdict	Pre	15 fl oz	28.40	158	96	81	88
Verdict + atrazine	Pre	15 fl oz + 0.63 qt	30.60	154	97	83	84
Untreated				22	-	-	-
		LSD (0.05)		24	7	16	8

*** Contains atrazine** **PRE application timing = May 5**



Curtis Thompson, Weed Management Specialist and Extension Agronomy State Leader
cthompso@ksu.edu

4. K-State Sorghum Schools scheduled for late January and early February 2017

A series of four K-State Sorghum Production Schools will be offered in late January and early February 2017 to provide in-depth training targeted for sorghum producers and key stakeholders. The schools will be held at four locations around the state. The one-day schools will cover a number of issues facing sorghum growers: weed control strategies; production practices; nutrient fertility; and insect and disease management.

The dates and locations of the K-State Sorghum Production Schools are:

Jan. 31st – Colby: City Limits Convention Center, 2227 S Range Ave
Kurt Sexton, Thomas Co. Extension, kurtsexton@ksu.edu, 785-460-4582

Feb. 1st – Wichita: Sedgwick Co. Extension Center, 7001 W 21st St N
Zach Simon, Sedgwick Co. Extension, zsimon@ksu.edu, 316-660-0100

Feb. 2nd – Concordia: Cloud County Community College, 2221 Campus Drive
Kim Kohls, River Valley Extension District, kclarson@ksu.edu, 785-243-8185

Feb. 3rd – Iola Riverside Park New Community Building, 600 S. State St
Carla Nemecek, Southwind Extension District, cnemecek@ksu.edu, 620-365-2242

More information on the final program for each Sorghum School will be provided in future issues of the Agronomy eUpdate.

Lunch will be provided courtesy of Kansas Grain Sorghum Commission. There is no cost to attend, but participants are asked to pre-register by Jan. 27. Online registration is available at: K-State Sorghum Schools

You can also preregister by emailing or calling the nearest local Research and Extension office for the location you plan to attend.

Ignacio Ciampitti, Cropping Systems Specialist
ciampitti@ksu.edu

Pat Damman, Kansas Grain Sorghum Commission
pat@ksgrainsorghum.org

5. Prescribed Burning Workshops scheduled for 2017

Five Prescribed Burning Workshops are scheduled for the remainder of the winter in Kansas, with the possibility of more upon request.

The agencies involved include K-State Research and Extension, USDA-NRCS, USDA-FSA, Kansas Department of Wildlife, Parks & Tourism, and the National Weather Service. Each workshop lasts about 4 hours. Topics include, reasons for burning, regulations, weather considerations, liability, burn contractors, equipment and crew, hazards, fuels, firebreaks, fire types and behavior, ignition techniques, and burn plans. Attendees have the opportunity to talk through specific burn scenarios with the presenters.

Contact Walt Fick at 785-532-7223 or whfick@ksu.edu if you would like to host a prescribed burning workshop.

Workshop	Date (2017)	Location	Host	Agency	Phone	email
Kingman	Feb. 3	Kingman	Jake Renner	K-State	620-532-5131	jwrenner@ksu.edu
Jeffrey Energy Center	Feb. 16	Jeffrey Energy Center	J.R. Glenn	Westar	785-575-6518	jr.glenn@westarenergy.com
Edwards	Feb. 21	Kinsley	Jess Crockford	KPFC	620-664-4882	jbcrock@sbcglobal.net
Frontier District	Feb. 22	Ottawa	Rod Schaub	K-State	785-828-4438	rschaub@ksu.edu
Southwind District	March 1	Uniontown	Chris Petty	K-State	620-223-3720	cgp@ksu.edu

Walt Fick, Range Management Specialist
whfick@ksu.edu

6. K-State Agriculture Technology Days, Feb. 9-10, Great Bend and Beloit

Keep your farming operation up-to-date and efficient by attending K-State Research and Extension's "Agriculture Technology Days," hosted by Barton County Extension and the Post Rock Extension District.

The first meeting will be Thursday, Feb. 9 in Great Bend at the Recreation Center. The second date will be Friday, Feb. 10 in Beloit at the NCK Technical College. The meetings will begin at 9:20 a.m. and will conclude at 2:00 p.m. The program is the same both days.

9:20 a.m. Welcome and Sign-in

9:30 a.m. Big Data Implications for Farmers – Terry Griffin, Agricultural Economics

10:10 a.m. N Management Using Green Seeker – Romulo Lollato, Wheat and Forages Specialist

10:50 a.m. Planting Technologies: High Speed Planter in Corn – Ajay Sharda, Biological and Agricultural Engineering

11:30 a.m. Lunch

12:00 p.m. Brian McCornack Data Integration Using myFields.info – Brian McCornack, Entomology

12:40 p.m. Use of Satellite Imagery for Forecasting Corn Yield Monitor Data – Ignacio Ciampitti, Crop Production and Cropping Systems Specialist

1:20 p.m. Collecting and Using Yield Monitor Data – Lucas Haag, Northwest Area Crops and Soils Specialist

2:00 p.m. Adjourn

A free lunch meal will be served at each of the sites, courtesy of sponsors CropQuest, Kansas Corn, First Kansas Bank, Plains State Bank, Simpson Farm Enterprises, Inc., and The Guaranty State Bank & Trust.

There is no cost for either meeting. However, RSVP is requested by Monday, February 6, for both meetings. Please RSVP to:
Barton County Extension -- Alicia Boor aboor@ksu.edu 620-793-1910
Post Rock Extension District Offices in Beloit, Lincoln, Mankato, Osborne or Smith Center, or Sandra L. Wick swick@ksu.edu 785-282-6823

Online registration is also available at Barton County Extension (www.barton.ksu.edu) and Post Rock Extension District (www.postrock.ksu.edu) websites. Twenty registered participants will be needed at each site to host the meetings.

7. Western Kansas Forage Conference planned Feb. 20 in Larned

Jeff Rasawehr, of Celina, Ohio, and co-founder of Cover Crop Ranch, will present "Making a Cover Crop Your Most Valued Crop" at the Western Kansas Forage Conference on Feb. 20.

Sponsored by K-State Research and Extension and the Kansas Forage and Grassland Council, the conference will be at the J.A. Haas Building, 400 E. 18th St. in Larned, Kansas. Registration begins at 8:30 a.m., with the program from 9 a.m. - 3 p.m.

Cover Crop Ranch is a network of farms in Michigan and Ohio using sustainable farming practices of no-till, cover crops and a system called mob grazing to produce meat. Mob grazing involves moving cattle at least daily between small enclosures and split by electric fences. The plants in the enclosure are eaten, walked on and trampled, then allowed to rest for 60-120 days or more.

Rasawehr will share his knowledge and experience in using cover crops and making them valuable in a crop production system.

Other conference speakers and topics include:

- Soil Management with Cover Crops – DeAnn Presley, K-State soil management specialist
- What Are We Learning from Integrating a Cover Crop into our Production Practice? – Dale Younker, U.S. Department of Agriculture soil health specialist
- Pasture Weed Management – Walt Fick, K-State range scientist
- Kansas Forage and Grassland Council Update – Mark Jensen, KSFGC board member
- Animal Health Concerns When Grazing Cover Crops – Jaymelynn Farney, K-State animal scientist
- Pasture Risk Insurance – Monte Vandeveer, K-State agricultural economist
- Producer Panel

Registration is requested by Feb. 10. Lunch is included in the registration fee, which is $25 for KSFGC members and $55 for non-members. Online registration and more information are available at www.southwest.ksu.edu. More information is available by contacting Foster at 620-276-8286 or anserdj@ksu.edu.

A.J Foster, Southwest Area Crops and Soils Specialist
anserdj@ksu.edu

8. Preplant Corn School, Feb. 23, Wilson

K-State Research and Extension will hold a Corn Preplant School in Wilson, at the St. Wenceslaus Parish Hall, on Feb. 23, from 9 a.m. to 3 p.m.

Topics include:

- Insects in Corn
- Corn Production Practices
- Diseases in Corn
- Looking at Planting Practices and Early Season Corn
- Economics
- Weed Control

A lunch will be provided at no charge. Please RSVP by Feb. 21 to Michelle Buchanan, Midway Extension District, 785-472-4442 or 785-483-3157, or email mbuchanan@ksu.edu

9. Comparative Vegetation Condition Report: January 17 - 23

The weekly Vegetation Condition Report maps below can be a valuable tool for making crop selection and marketing decisions.

The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 27-year average. The report is used by individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

The Vegetation Condition Report (VCR) maps were originally developed by Dr. Kevin Price, K-State professor emeritus of agronomy and geography, and his pioneering work in this area is gratefully acknowledged.

The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new VCR development. Multiple improvements have been made, such as new image processing algorithms with new remotely sensed data from EROS Data Center.

These improvements increase sensitivity for capturing more variability in plant biomass and photosynthetic capacity. However, the same format as the previous versions of the VCR maps was retained, thus allowing the transition to be as seamless as possible for the end user. For this spring, it was decided not to incorporate the snow cover data, which had been used in past years. However, this feature will be added back at a later date. In addition, production of the Corn Belt maps has been stopped, as the continental U.S. maps will provide the same data for these areas. Dr. Asebedo and Dr. An will continue development and improvement of the VCRs and other advanced maps.

The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, and the continental U.S., with comments from Mary Knapp, assistant state climatologist:

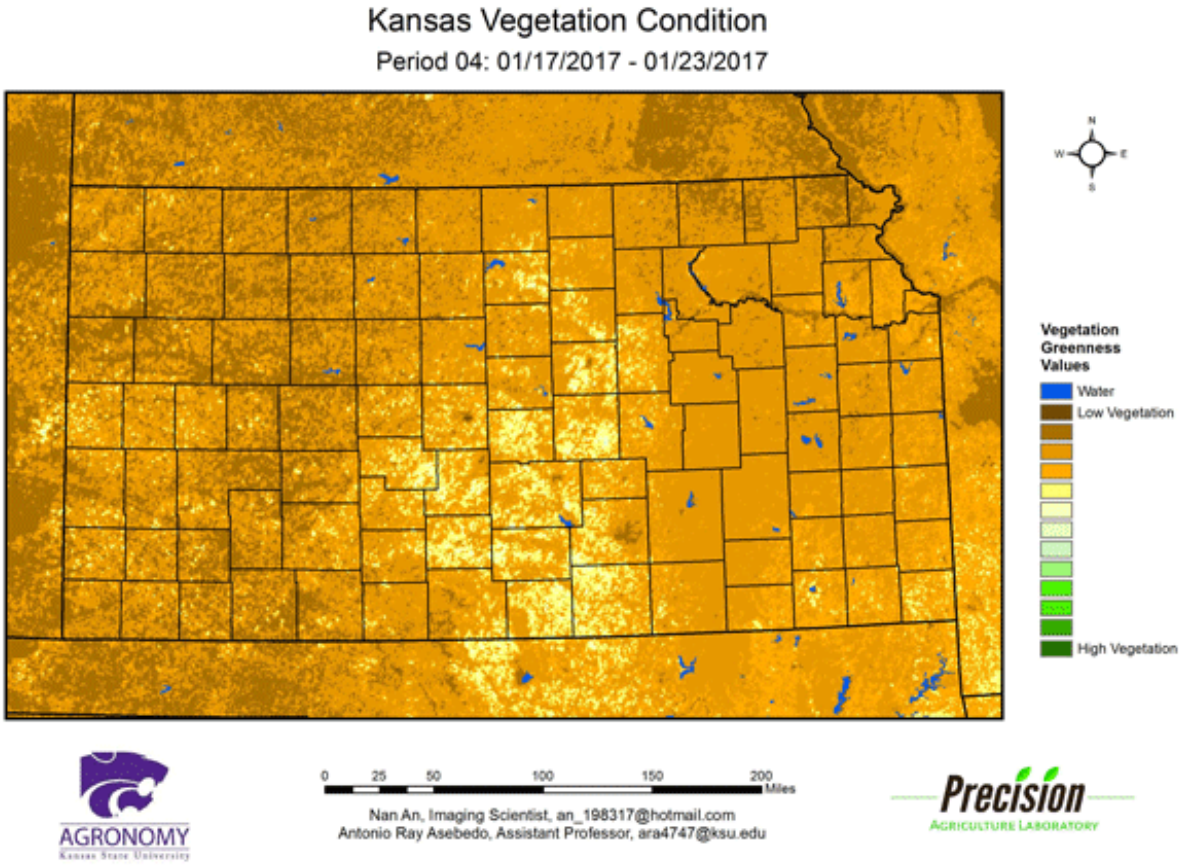


Figure 1. The Vegetation Condition Report for Kansas for January 17 – January 23, 2017 from K-State's Precision Agriculture Laboratory shows almost no photosynthetic activity. The little production there is shows up mainly in central Kansas, although some activity has also begun to show in extreme southeast Kansas. This is not unexpected given the season, lack of snow cover, and slightly warmer-than-normal temperatures.

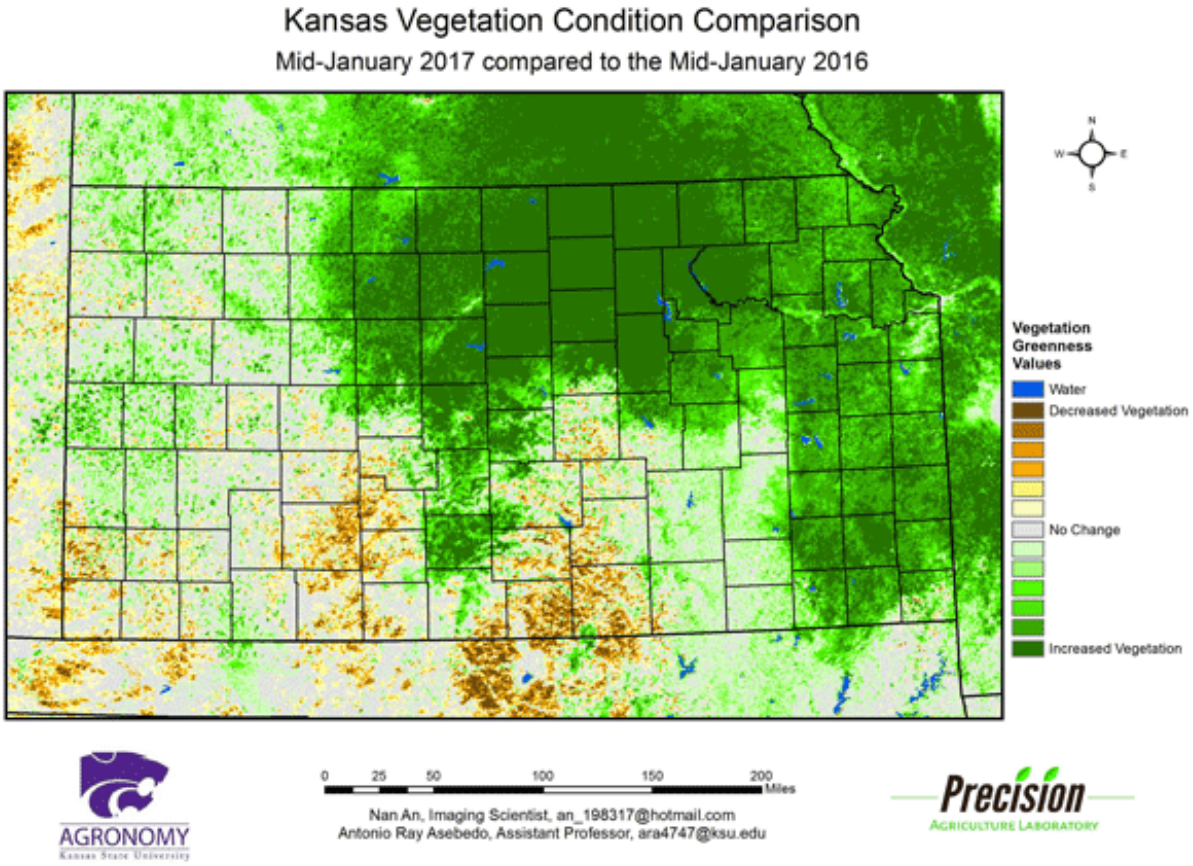


Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for January 170 – January 23, 2017 from K-State's Precision Agriculture Laboratory shows much higher NDVI values from the north central to the southeastern portions of the state. Last year at this time, much of the area was snow covered. Manhattan reported 3 inches on the ground on January 23, 2016, while Parsons had an inch.

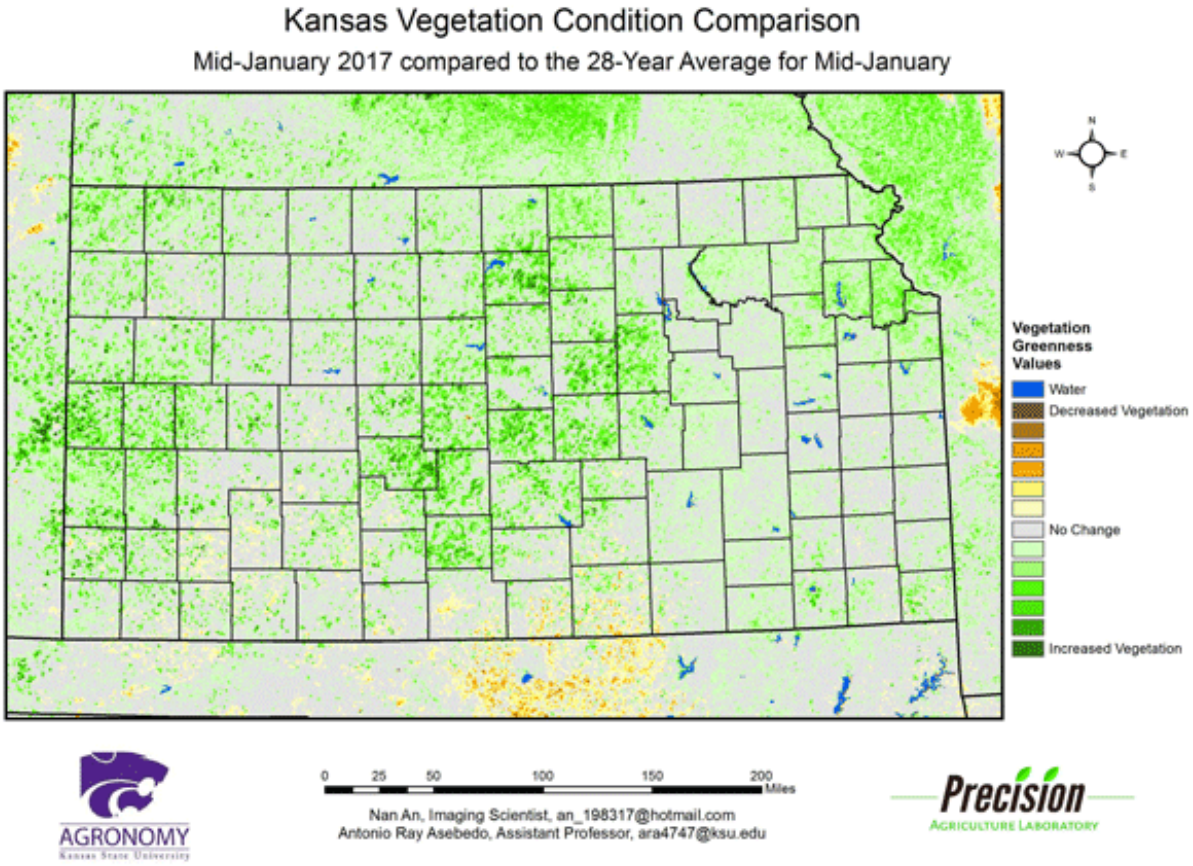


Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for January 17 – January 23, 2017 from K-State's Precision Agriculture Laboratory much of the state has near-normal vegetative activity. The highest NDVI values are in the central part of the state. The impact from recent precipitation and mild temperatures will be more visible on next week's maps.

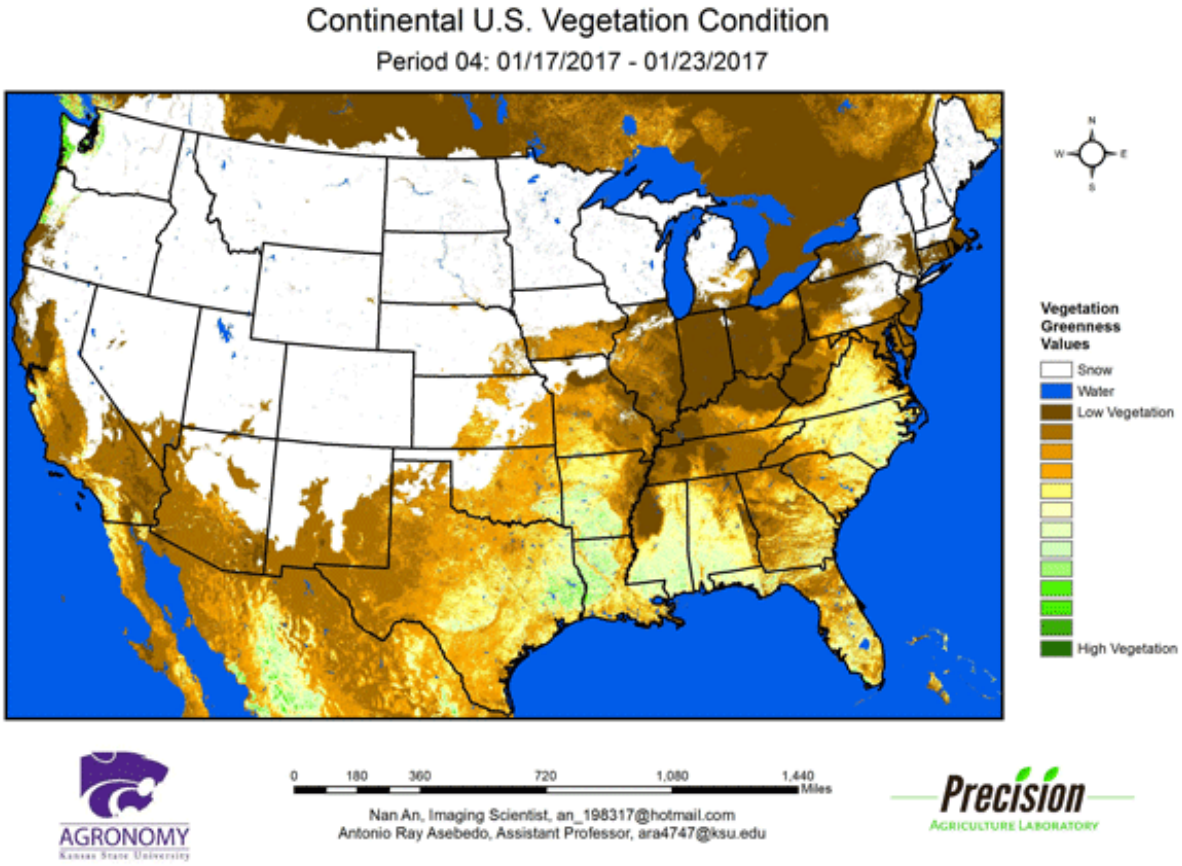


Figure 4. The Vegetation Condition Report for the U.S for January 17 – January 23, 2017 from K-State's Precision Agriculture Laboratory shows the highest NDVI values are confined to the South, particularly in east Texas and Louisiana. Snowfall continued to include areas of the Texas Panhandle and Oklahoma. The Sierra Nevada of California has some of the highest snowfall totals for mid-January on record.

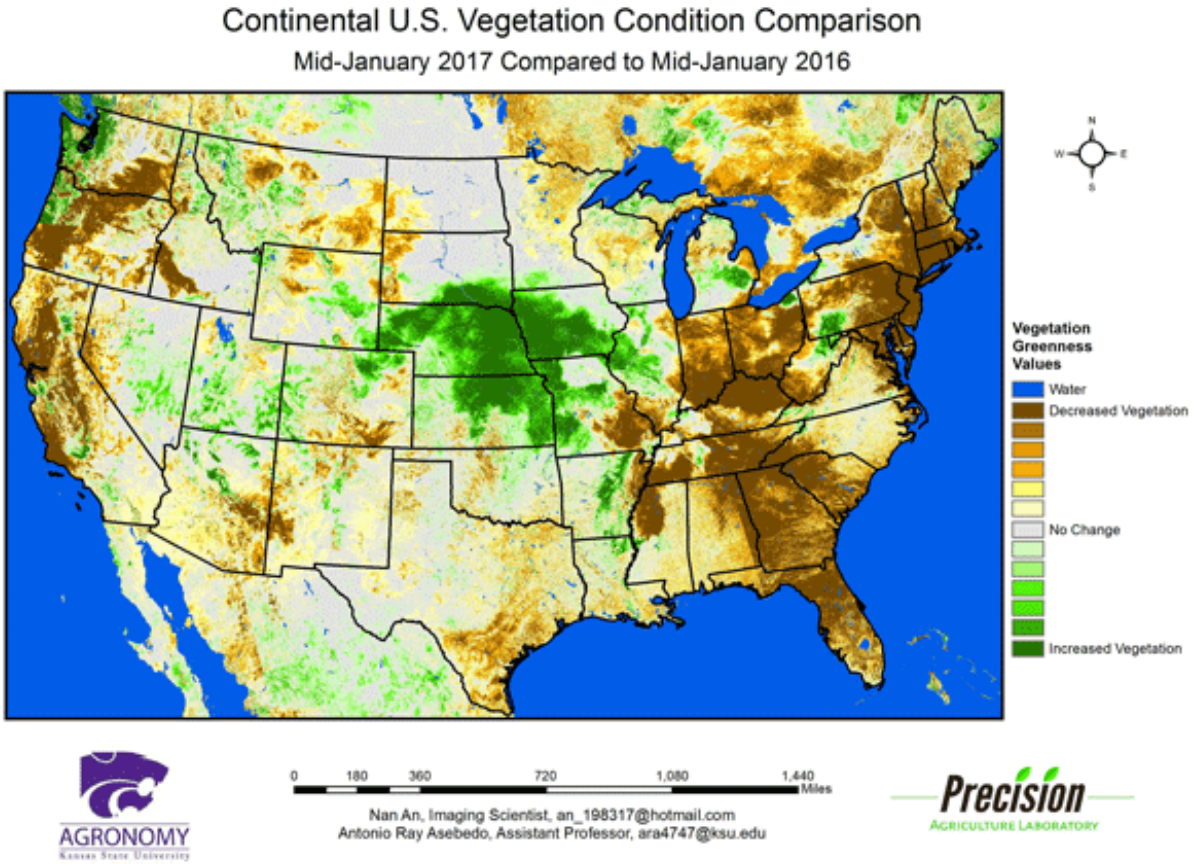


Figure 5. The U.S. comparison to last year at this time for January 17 – January 23, 2017 from K-State's Precision Agriculture Laboratory shows that higher NDVI values are greater in the Plains, where snowfall coverage is much less than last year. In the West, the lower NDVI values are due to greater snow totals. In the east, cloud cover is more prevalent this year.

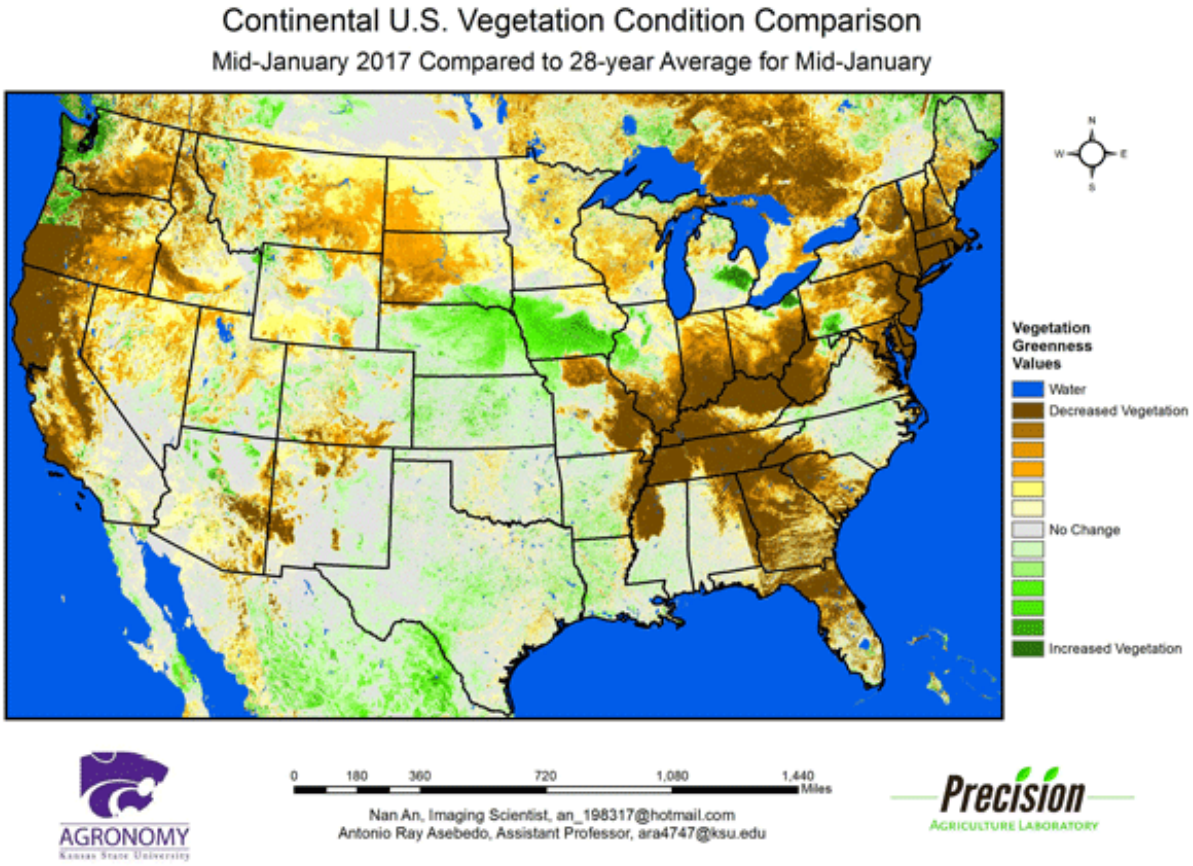


Figure 6. The U.S. comparison to the 27-year average for the period of January 17 – January 23, 2017 from K-State's Precision Agriculture Laboratory shows an area of below-average photosynthetic activity in the South, where recent cloud cover has masked vegetative activity. NDVI values have dropped in the Pacific Northwest and Intermountain West as snow cover continues to increase.

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Nan An, Imaging Scientist

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