1. Kochia control in corn and grain sorghum

Even with the various types of herbicide-resistant populations present, kochia control in corn and grain sorghum should not be especially difficult in most cases -- as long as the kochia is targeted early when the plants are about 1 to 3 inches tall.

**Control in corn**

Kochia control in corn should always begin with either tillage or a burndown application in early April, shortly after the first flush of kochia has emerged. A combination of glyphosate and dicamba will control small kochia, and almost all other existing weeds and grasses, at that time. If producers wait until later so they can apply the burndown and preemergence herbicide in the same application, the kochia will be larger and producers may not get complete kochia control. If that occurs, the surviving plants will go on to cause problems throughout the growing season. Waiting to apply a burndown and preemergence herbicide together is risky where kochia is a problem.

After the early April burndown treatment, the next step would be a preemergence herbicide application. Atrazine, or a product containing atrazine, should be included with this application. Even if there are triazine-resistant populations of kochia present, atrazine will still help control a number of other weed species.

Good options to include in a preemergence application for control of kochia (and other weeds) include:
* A chloroacetamide/ atrazine premix. Examples of chloroacetamide- atrazine premixes include Bicep II Magnum, Cinch ATZ, Guardsman Max, Propel ATZ, Bullet, Harness Xtra, Keystone, Volley ATZ, FullTime, and others. If triazine-resistant kochia is present, then one of the other options would be a better choice.

* An HPPD herbicide. Examples of HPPD herbicides include Lexar or Lumax (premixes of Callisto, Dual II Magnum, and atrazine), Corvus (a premix of Balance Flexx and thiencarbazone methyl), and Balance Flexx.

* Verdict, formerly known as Integrity, which is a Kixor-powered combination of Sharpen and Outlook herbicides.

* Prequel, which is a premix of Resolve and Balance.

Balance Flexx, Corvus, and Prequel cannot be applied on coarse-textured soils with shallow (25 feet or less) groundwater. Always consult the labels for details.

If kochia becomes a problem after the corn has emerged, there are several postemergence herbicide options. In Roundup Ready corn, glyphosate should be used even though resistant populations of kochia may be present. It is also a good idea to add one or more herbicides with a different mode of action to the glyphosate. This will not only help control any glyphosate-resistant populations present, but will also help prevent the development of glyphosate-resistant populations of kochia where such populations do not yet exist.

Possible glyphosate tankmix partners would include Status, Impact, Callisto, Laudis, Starane, Starane NXT, or Starane Ultra. If an HPPD containing herbicide was used in the preemergence application (Lexar, Lumax, Corvus, or Balance Flexx), it would be a good idea not to use this mode of action in the postemergence treatment to help reduce the chances of resistant weeds developing. Another option in Roundup Ready corn is Halex GT plus atrazine. Halex GT is a premix consisting of a high rate of glyphosate, Dual II Magnum, and Callisto. Atrazine should be added to this product to get the best season-long control of kochia. With Impact, Callisto, Capreno, and Laudis, producers should include a half-pound of atrazine.

In conventional corn, any of those postemergence herbicides mentioned above as tankmix partners with glyphosate also be used alone, without the glyphosate tankmix partner. Halex GT, cannot be used on conventional corn since it contains glyphosate.

Ignite can also be used as a postemergence treatment for kochia and other weeds if the corn is Liberty Link.

It should be noted that Balance Flexx and Corvus can be applied either preemergence or up through the 2-leaf stage of corn. If applied postemergence to corn, Balance Flexx and Corvus can be applied with atrazine only. No glyphosate or other adjuvants can be used. These products can do an excellent job of controlling kochia throughout the season if they are tankmixed with at least 1 lb/acre of atrazine. These products require moisture for soil activation, however they do have foliar activity.

Lumax and Lexar, which are best used as preemergence treatments, can also be applied early postemergence up to 12-inch corn when weeds are very small. Although waiting until this stage before application may work for controlling kochia, it is risky. Also, to get adequate grass control, these products must be applied preemergence to the grass.
Control in grain sorghum

Fewer options exist for controlling kochia in grain sorghum than corn. Although grain sorghum is planted later than corn allowing early-emerged kochia to be controlled, effectiveness of control during this time period is essential as in-crop options become limited.

This later planting of sorghum relative to corn requires producers to make two burndown applications of glyphosate-plus-dicamba before planting. This will control the largest two flushes of kochia emergence of the season. Producers who take advantage of this opportunity often have very good kochia control, although glyphosate-resistant kochia could complicate the issue. Producers who try to cut corners and do not control the early flushes of kochia when they have a chance often have problems with kochia in their sorghum later in the season.

To get the best control of kochia with the burndown treatments of glyphosate and dicamba, the kochia should be sprayed when plants are 2- to 4-inches tall and actively growing. Kochia plants one-inch or less tall that have not started to elongate and plants taller than six inches often are more difficult to control, especially under conditions of environmental stress.

If a flush of kochia emerges close to the time of grain sorghum planting, producers could combine a burndown treatment with a preemergence herbicide such as a chloroacetamide/atrazine premix, Lexar, or Lumax. Another option for burndown and early season residual control of kochia prior to emergence of sorghum would be Sharpen or Verdict. Sharpen provides no grass control. Methylated seed oil should be added to Sharpen for optimal burndown activity. Sharpen can be used at the 2 oz rate. Verdict would provide some residual grass control. Verdict is generally used at the 10 oz rate, and is combined with G-Max Lite or Guardsman Max for improved residual weed control.

If a flush of kochia reaches 4 to 6 inches in height and grain sorghum planting is still a week or more away, producers should strongly consider making a burndown treatment before sorghum planting, while the kochia is controllable, and then making the preemergence application as a separate treatment.

If a postemergence application becomes necessary in grain sorghum, one good option is a herbicide premix of dicamba and atrazine. Another good choice would be Starane-containing products. If Starane is used, it would be best to add a half-pound of atrazine.

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2. Wheat disease update

The wheat in most areas of the state is progressing through the final stages of tillering and starting stem elongation, except where it just emerged a few weeks ago. A relatively dry spring in most areas of the state appears to be keeping the activity of leaf diseases at low levels.

**Leaf rust**: I have been able to find trace levels of leaf rust in research plots near Manhattan, suggesting that the disease likely overwintered in some areas of the state. This overwintering of leaf rust is common for Kansas. The disease is still on the lowest leaves of the wheat canopy, which will naturally dieback as the plants put out new growth. The contribution of the overwintering leaf rust will be minor if the infected leaves die before the fungus can spread to the new growth. Leaf rust has been reported in Texas and Oklahoma this year. Some fields in south Texas apparently have severe leaf rust and growers were being advised to apply fungicides. Leaf rust appears to be at low levels in Oklahoma, where the disease has been reported near Stillwater. It is still too early to tell if these low levels of leaf rust will pose much threat to the wheat crop in Kansas, but we need to watch this situation carefully over the next few weeks.

**Stripe rust**: Reports from south Texas indicate that stripe rust is still at low levels in this region of the country. Interestingly, most reports of stripe rust have come from Louisiana and Arkansas, where fields containing hot spots of disease were reported. This week, Kentucky and Mississippi plant pathologists also reported stripe rust in several fields. Based on this information, it appears the risk of severe stripe rust in Kansas is low. Stripe rust in Louisiana and Arkansas tends to move north and east following the Mississippi and Ohio River valleys.

**Other diseases**: Wheat spindle streak mosaic and wheat soilborne mosaic have been observed in central Kansas. These diseases can cause significant yellow discoloration of the fields and are normally most severe in wetter areas of the field. The symptoms of these diseases are most intense during periods of cool weather when the virus is most active, but will begin to fade as the weather becomes warmer. These diseases are generally managed with genetic resistance and most varieties grown in central Kansas have resistance to these diseases. The variety Endurance from OSU, which has increased in popularity in recent years, is susceptible to wheat spindle streak mosaic.

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The following is a slightly edited transcript of the seventh in a series of K-State’s Agriculture Today radio broadcasts on the Kansas Flint Hills Smoke Management Plan. This is an interview with Tom Gross, Bureau of Air, Kansas Department of Health and Environment, conducted by Eric Atkinson of the K-State Radio Network. Podcasts of all Agriculture Today interviews can be found at:

http://www.ksre.k-state.edu/DesktopDefault.aspx?tabid=197

For complete information on the Kansas Flint Hills Smoke Management Plan, see the new website: www.ksfire.org/
Q: The cornerstone of the Smoke Management Plan is the online smoke modeling tool that producers can reference to help with burning decisions. This modeling tool is up and running now. Can you briefly describe this tool for us?

A: The purpose of the tool is to provide a landowner with a look at where the smoke from his or her prescribed burn might travel and the relative concentration of the smoke. It also has information about the cumulative impact of smoke if a large amount of grassland acreage in the county was burned on that same. The model uses information from the days last year when Kansas City and Wichita got impacted by smoke, then predicts what the impact would be this year if the same number of acres were burned with the predicted meteorological conditions.

People can access the website at: www.ksfire.org

On the website, once people click on the Modeling tab, they’ll be taken to a page that has three tabs. The first of those is “About,” which is a section that explains what the modeling tools are, how they work, and how to use the outputs. The second tab leads to a page called “Cumulative Fire Impacts.” This one looks at what would happen if all the people in a county were burning that day or the following day. It shows a map of the Flint Hills area. Each county is highlighted either in red, yellow, or green. If a county is in red, it means that burning in that county that day would contribute to greater impacts from smoke in the cities that have the ozone and particulate matter monitors. If a county is in yellow, it’s a moderate impact. If a county is in green, then it’s a better day to burn from an air quality standpoint. There are two maps. On the left side is a map of impacts from burning the next day (or if you check the website early in the morning, it will be for the same day), and the map on the right is for the following day. The date for each map is labeled at the top.

The third tab is “Your Fire Impacts.” On that page, you fill in information regarding your planned burn and the model will project the impacts of smoke from your particular burn. It’ll ask you which county you’re in and the approximate size of the area that you plan to burn -- a small, medium, or large fire. And it’ll ask you for the size of your fuel load – light, average, or heavy – which will depend upon whether you’ve got a good cover of grass, how much it’s been grazed, whether it was burned last year or not.

Once you put in this information and click the “View Your Fire’s Impacts” tab, then you’ll see the smoke plume from your fire moving across the map. You can see whether it is impacting one of those metropolitan areas.

Q: It’s a real-time site, constantly updated with weather information. Then the grassland managers plug in their own field information. It’s easy to use, but you would urge those planning to use this tool to read the instructions first, correct?

A: Yes. The very first page you get to talks a little bit about how to use the tool. We hope it’s fairly intuitive. We’ve had a lot of training sessions with those in the Flint Hills counties to explain how to use the tool. But if anyone has any questions or glitches, they can contact us or their county Extension agent. We want feedback from the users.

Q: This smoke modeling tool is not intended to be a “thumbs up” or “thumbs down” for an individual planning to make a burn on any given day, correct?
A: That’s a very good point. There might be days when it’s unsafe to burn because of high winds or another factor that would cause the local fire officials to say that it is not a safe day to burn. Conditions for a prescribed burn on a given day might be an okay from an air quality emissions standpoint, because it might be the kind of day where the emissions from that fire might disperse, but conditions might not be suitable for actually conducting the burn safely.

People can’t use this model as their only source to judge whether conditions are right for conducting a prescribed burn. It is a secondary decision-making tool so that if conditions for burning are good from a safety standpoint, then people can check this modeling tool to see if conditions are also okay from an air quality standpoint. There is information other than the smoke modeling tool on the web site with links to factors such as mixing heights, wind speeds, wind directions, these kinds of things – the kind of information that people utilize in making that safety decision. The model itself is geared toward air quality impacts, not safety.

Q: In other words, people planning to do a prescribed burn still need to utilize good sound judgment.

A: Yes. And grassland managers in the Flint Hills are experienced in doing that. They’ve done that for a number of years. This website can provide them with information to continue to do that. But the smoke modeling tool is an entirely new set of decision criteria.

Q: A lot of work has gone into this.

A: Yes, we’ve done a lot in a short period of time. We’ve had a lot of cooperation from K-State and the agricultural community, and I want to thank all of them for their participation in this.

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4. April burning restrictions – Frequently Asked Questions

The restrictions on April burning are new this year. Two Kansas Department of Health and Environment (KDHE) officials answer some of the most common questions regarding these restrictions below:

1. Is crop residue burning restricted in April?
Yes, crop residue burning is restricted for the 16 counties specified in the April Burning Restrictions of K.A.R. 28-19-645a (13 in Flint Hills + Johnson, Sedgwick & Wyandotte). Burning of the tall grass prairie is not considered crop residue burning.

2. Is burning yard waste allowed at an individual residence during April?
Yes, unless restricted by a local ordinance.

3. Are residential trash burn barrels permitted?
Yes, unless restricted by a local ordinance.

4. Can a local fire chief override the April Burning Restrictions of K.A.R. 28-19-645a if requested by a local resident or business?
Yes, if local ordinance is more stringent. No when the purpose of the override is to allow something prohibited under state regulation.

5. Are fire fighter training burns permitted?
Yes, with approval from KDHE. However, it is appropriate to request fire training be scheduled outside of the month of April in the affected counties.
6. Is open burning for land clearing and construction projects allowed in April?
Not in the 13 Flint Hills Counties. In Johnson, Wyandotte and Sedgwick counties, the local authority can approve burning of trees and brush from nonagricultural land clearing and clean wood waste at the construction site; all other open burning in these counties must be approved by KDHE. In the rest of the state, KDHE must approve this burning unless local ordinance is more stringent. It is our intent to discourage nonagricultural burning during the month of April.

7. Are air curtain destructors / incinerators allowed to operate in April?
Yes. ACDs are permitted by KDHE as a special type of incinerator.

8. What is an example of open burning that might be “deemed to be necessary and in the public interest”?
Fires set to remove dangerous or hazardous liquid materials, debris from an ice storm or a tornado (where landfilling is not feasible) or storage capacity after ice storms or tornados is not sufficient to wait until May or later.

9. What agencies and offices are involved in regulating open burning?
a. Local fire, emergency response and law enforcement, depending on local ordinance.
b. The six KDHE District Offices
c. The Compliance Section of the Bureau of Air at KDHE in Topeka.

10. Where is the first place a person should call with questions concerning open burning?
The local fire department or law enforcement authority. Next, our KDHE District Office.

11. Which agency has the final authority on regulating open burning?
In most cases, the local fire department if they are more stringent. If local requirements are less stringent than KDHE, the state agency has authority.

12. Are camp fires and bonfires allowed in April?
Yes, open burning for cooking or ceremonial purposes, on public or private lands regularly used for recreational purposes.

13. How will the April Burn Restrictions be enforced?
KDHE intends to utilize compliance assistance and public education to get the word out. If there are extenuating circumstances in a particular situation, KDHE may utilize their enforcement authority to address an egregious problem.

14. Is the local permitted open burn site allowed to burn in April?
No, unless KDHE issues a special circumstances or emergency approval specifically for April. Otherwise, all local permitted open burn sites are discouraged from open burning during the month of April, even if a permit had been previously issued. The success of the Flint Hills Smoke Management Plan is contingent on all parties cooperating to reduce smoke impacts.

15. If there are severe storms, can the collected debris be burned?
Yes, with approval from the local authority in Johnson, Sedgwick or Wyandotte counties, or with KDHE approval elsewhere.

If you have additional questions, please contact Russ Brichacek (785-296-1544) or Miles Stotts (785-296-1615) at KDHE.

5. Plant Management Network

Plant Management Network (PMN) is a not-for-profit, online publishing effort whose mission is to enhance the health, management, and production of agricultural and horticultural crops. PMN achieves this mission by developing science-based resources that help researchers, crop management professionals, consultants, growers, educators, and students make better plant management decisions and recommendations.

PMN is jointly managed by the American Phytopathological Society, American Society of
Agronomy, and Crop Science Society of America, in conjunction with many other partners, including scientific societies, agricultural universities, and agribusiness.

You can get a description of the available resources at: http://www.plantmanagementnetwork.org/subscriptions/details/ResourceDescription.asp

K-State’s Hale Library pays the annual group subscription fee that allows all K-State employees to have access to the site. Upon your first visit, you will need to activate your account in order to view the subscription only parts of the site. You can do this by going to the following link and filling in the appropriate information.

http://www.plantmanagementnetwork.org/subscriptions/details/ResourceDescription.asp

This is an excellent site for all sorts of plant-health-related information and I encourage you all to sign up for the monthly newsletter and visit the site frequently.

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6. Comparative Vegetation Condition Report: March 15 – March 28

K-State’s Ecology and Agriculture Spatial Analysis Laboratory (EASAL) produces weekly Vegetation Condition Report maps. These maps can be a valuable tool for making crop selection and marketing decisions.

Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:
http://www.youtube.com/watch?v=CRP3Y5NIggw
http://www.youtube.com/watch?v=tUdOK94efxc

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 21-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 maps below show the current vegetation conditions in Kansas, the Corn Belt, and the continental U.S, with comments from Mary Knapp, state climatologist:
Map 1. The Vegetation Condition Report for Kansas for March 15 – 28 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that snow was a lesser feature in this period than in previous periods. Totals ranged from just over 3 inches near Topeka to trace amounts. Most of the snow melted within 24 hrs of falling.
Map 2. Compared to the previous period at this time for Kansas, this year’s Vegetation Condition Report for March 15 – 28 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that there was a big increase in greenness across much of the state. In much of western Kansas this was the result of germination and emergence of fall-planted winter wheat. South central and southeast Kansas saw milder temperatures than average, and there was rapid development with trees beginning to leaf.
Map 3. Compared to the 22-year average at this time for Kansas, this year’s Vegetation Condition Report for March 15 – 28 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that in northeast Kansas conditions lag behind the normal for the period. This is the area that saw the greatest snowfall, and photosynthetic activity is lagging behind the 22 year average. Scott, Lane, Ness, and Stevens continue to show the impact of the drought conditions in the region. These counties averaged only 0.03 inches of precipitation. The western three divisions averaged only 0.08 inches, or less than 15 percent of normal.
Map 4. The Vegetation Condition Report for the Corn Belt for March 15 – 28 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows the band of snow that cut across the southern portion of the Corn Belt during the middle of the period. Generally these snows melted as they fell, with little persistence.
Map 5. Compared to the 22-year average at this time for the Corn Belt, this year’s Vegetation Condition Report for March 15 – 28 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows coldest ground is in the northern regions, with North Dakota, Minnesota, Wisconsin, and upper Michigan still behind the normal March progress. In western Kansas, much of the increased photosynthetic activity above normal is the result of late emergence of fall-planted wheat.
Map 6. The Vegetation Condition Report for the U.S. for March 15 – 28 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that snow continues to be a factor in the northern part of the U.S. The Southeastern U.S. shows photosynthetically active biomass from east Texas through Virginia. Low photosynthetic activity can be seen along the lower Mississippi, where flooding continues to be a problem.
Map 7. The U.S. comparison to the 22-year average for the period March 15 – 28 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows a marked increase in photosynthetically active biomass along the Front Range of the Rockies. A noticeable increase can also be seen along the Red River in southeast Oklahoma, northeast Texas, and the border between Louisiana and Arkansas and the eastern Corn Belt. Milder-than-normal temperatures over the period have resulted in a rapid flush of development.

Note to readers: The maps above represent a subset of the maps available from the EASAL group. If you’d like digital copies of the entire map series please contact us at kpprice@ksu.edu and we can place you on our email list to receive the entire dataset each week as they are produced. The maps are normally first available on Wednesday of each week, unless there is a delay in the posting of the data by EROS Data Center where we obtain the raw data used to make the maps. These maps are provided for free as a service of the Department of Agronomy and K-State Research and Extension.

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7. Photos from March 30 of wheat and alfalfa in southwest Kansas

The photos below were taken in various counties of southwest Kansas on March 30. This illustrates the effect of the fall and winter weather on these fields. There is some variation in crop condition in this region, of course, but many fields are in similar condition.
Dryland wheat in Meade County, March 30, 2011.
Alfalfa in Stanton County, March 30, 2011.

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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 Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader 785-532-0397 jshroyer@ksu.edu