

Extension Agronomy

eUpdate

03/06/2015

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, Jim Shroyer, Crop Production Specialist 785-532-0397 jshroyer@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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1. Soil-applied residual herbicide options for soybeans

There are many good reasons to use a soil-applied residual herbicide for soybeans. Producers may want to:

- Get early-season control of weeds and grasses to minimize early-season weed competition and provide more flexibility with postemergence treatment timing.

- Provide some residual weed control before and following the postemergence glyphosate.

- Provide some assistance to glyphosate in controlling certain hard-to-control or glyphosate-resistant weeds.

- Use a second herbicide mode of action to prevent or delay the development of glyphosate-resistant weeds.

In developing an alternative to the exclusive use of postemergence glyphosate treatments on Roundup Ready soybeans, it is useful to know what weeds or grasses are being targeted. Some good options for the most common weed and grass problems include:

Pigweeds (including waterhemp and Palmer amaranth). Glyphosate-resistant waterhemp is now fairly common across the eastern part of Kansas. Glyphosate-resistant Palmer amaranth was first confirmed in Kansas in 2011 and seemed to explode across much of the central and western parts of the state this past summer. Pigweed emergence will generally start in April but the greatest amount of emergence will occur in May and June. Preemergence or burndown plus residual herbicide applications will need to be targeted in these months before pigweed has emerged or while it is still at small growth stages.

For early-season pigweed control, the Valor-based herbicides (Valor SX, Valor XLT, Rowel, Encompass, Outflank, Panther, Fierce, Fierce XLT, Gangster, Surveil, Trivence, Afforia, Envive, and Enlite) and Authority-based herbicides (Authority First, Sonic, Authority Assist, Authority MTZ, Authority Maxx, Authority Elite, Broadaxe XC, Spartan, and Spartan Elite) can all provide very good to excellent control to supplement a postemergence program. If glyphosate-resistant pigweed is suspected, higher use rates may be required to give adequate residual control. Prefix is another excellent "foundation" herbicide for residual pigweed control in soybeans. Metribuzin, Zidua, Anthem, Warrant, Dual, Boundary, Outlook, and Prowl products can also provide some early-season pigweed control, but may not provide as much residual control as those previously mentioned products.

Kochia. Kochia is a major weed problem in western areas and historically has been difficult to control with glyphosate, especially as it gets bigger. In addition, much of the kochia in western Kansas is now glyphosate-resistant. A majority of kochia will probably have emerged prior to soybean planting, so controlling that kochia before planting is critical. Research by K-State the last couple of years indicates that Authority-based products have provided the best residual kochia control in soybeans. Metribuzin can also provide good kochia control, but soil pH and texture label guidelines need to be followed. The Kixor-containing products, such as Sharpen and OpTill, may help with kochia burndown and early-season kochia control, but may not provide very much residual control. ALS-inhibiting herbicides may or may not provide kochia control because of the occurrence of ALS-resistant kochia.

Velvetleaf. Glyphosate is not always entirely effective on velvetleaf. To assist in velvetleaf control, the Valor-based and FirstRate-based herbicides (Valor SX, Valor XLT, Rowel, Encompass, Outflank, Panther, Fierce, Fierce XLT, Gangster, Surveil, Authority First, and Sonic, Trivence, Afforia, Envive, and Enlite) are some of the most effective preplant and preemergence herbicides you can use.

Cocklebur. The most effective preplant and preemergence herbicides to aid in cocklebur control are those that contain First Rate, Classic, or Scepter. Such products would include Authority First, Sonic, Authority XL, Authority Maxx, Gangster, Surveil, Envive, Fierce XLT, and Valor XLT. Extreme, which is a premix of glyphosate and Pursuit, can also be used as a preplant or postemergence treatment in Roundup Ready soybeans to provide residual cocklebur control.

Marestail. Marestail is probably the most widespread glyphosate-resistant weed in Kansas. Marestail control in Roundup Ready soybeans should begin in early spring by controlling fall-germinated seedlings and rosettes before they start to bolt. 2,4-D and Clarity can be used in early spring, but the proper preplant intervals need to be followed. The preplant intervals for 2,4-D LV4 are 1 week for up to 1 pt/acre and 30 days for 1 to 2 pt/acre. The preplant interval for Clarity is 14 days following an application rate up to 8 oz/acre and accumulation of 1 inch of rainfall. Clarity has generally provided better marestail control than 2,4-D.

The Kixor-containing products Sharpen and OpTill can be used any time before soybean emergence (cracking), but are most effective if applied before plants get too big. To optimize marestail control with Sharpen and OpTill, use an adequate spray volume to insure good spray coverage and apply in combination with a methylated seed oil. Liberty herbicide may be the best option as a rescue treatment to burn down bolted marestail prior to planting. There is no waiting interval required between a Liberty application and planting soybeans, but it will not provide any residual marestail control. Other preplant herbicides that can help with burndown and provide residual marestail control include FirstRate-based herbicides, such as Authority First, Sonic, Gangster, or Surveil.

Morningglory. Glyphosate sometimes has trouble controlling morningglory. To help get better control, you can use either Authority-based or Valor-based herbicides preplant or preemergence. OpTill and OpTill Plus can also provide good early season morningglory control.

Crabgrass and other small-seeded grasses. Glyphosate usually gives good control of most grasses, but producers may want to apply a foundation herbicide to control grasses early, then make just one postemergence glyphosate application later. Fierce, Fierce XLT, Prefix, Zidua, Anthem, Dual II Magnum, Outlook, Warrant, and Prowl H2O can all provide early season grass and pigweed control ahead of Roundup Ready soybeans. Of these, Fierce, Fierce XLT, and Prefix generally provide the best pigweed control, and Prowl H2O the least.

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2. Corrective actions for dry ponds

Rural landowners often get a good look at the bottom of their ponds during winter and particularly after a drought. After doing so, they might be considering corrective actions such as cleaning sediment out of the pond or adding sealants. First there are some questions one needs to consider before deciding to clean or amend a pond:

• Should I clean a pond or make a new pond somewhere else? What is the purpose(s) of the pond? What is the pond's value (how much are you willing to spend) for the intended purpose? Is cleaning a pond the best option for a water supply?

Ponds are expensive to build; some leak in spite of corrective measures; they occupy valuable land; unless fenced, ponds are a risk to livestock loss in winter; and they require considerable maintenance. In the absence of a reliable cost from a local business person, a good estimate is \$10 per cubic yard to clean.

If a suitable site is available, it is usually less expensive to construct a new pond than to clean sediment from an existing one. Thus, a new pond should be fully considered before deciding to clean one. Be sure to include fencing the pond and providing a remote watering site in the cost.

Many ponds were originally built for livestock water supply. They may have been the best option at the time. But, is a pond the best option for the purpose now? For information on alternatives, see K-State Research and Extension publication S-147 *Waterers and Watering Systems: A Handbook for Livestock Producers and Landowners* at: <u>http://www.ksre.ksu.edu/bookstore/pubs/S147.pdf</u> For example, a solar pump in a well might be less than half the cost of a new or cleaned pond and would have better quality water.

- What to do with sediment?
- Placing this on the back side of the dam is the best and recommended place. You could also use some of the sediment to fill low spots, small gullies, or ruts on the property.
- Where should you avoid placing the sediment?

Putting it right next to or upslope from the pond is not a good spot because it could wash right back in.

• Using it as a building or topsoil material

Pond fill will not have any soil structure, so it will have very little strength. It is probably not a good idea to use pond fill under a supporting wall of a building, but it

Why is my pond dry?

There are a possible few reasons. After a drought it can take a few years for the water table to be replenished, so even ponds that once held water will take a while to recharge. If this is a new or newly-renovated pond, it's possible that there is either a structural problem or that there is not enough clay in the soil. How can you tell if a soil has enough clay?



Moisture-by-feel test: Roll out a small clump of soil into a wire. The ideal soil/moisture condition would be for it to roll out to 1/8-inch diameter without breaking or crumbling. If it breaks, rewet it. If it still does not roll out to 1/8-inch diameter, it may not contain enough clay, and therefore, might need a soil additive.

Sealing Lagoons or Ponds: Dispersants

Dispersants work by causing clay particles to swell and repel each other, thus destroying soil structure. All dispersants are to be incorporated and compacted in six-inch layers during the construction. (Adding the dispersants to an existing pond may not work).

Sodium Bentonite

Application rate: 1-1.5 lbs/sq. ft. (silty soil)

2-3 lbs/sq. ft. (sandier soil)

Notes: Most expensive option

Soda Ash

Application rate: 10-25 lbs/100 sq. ft.

Notes: Makes a good seal. Soil must contain >15% clay, and >50% clay + silt

Rock Salt

Application rate: 20 to 33 lbs/100 sq. ft.

Notes: Least expensive option. (One reference suggested rates as high as 4 lbs per sq. ft. during new construction would not harm fish or inhibit vegetation).

Assessing soil compaction: Soil penetrometer

Cone penetrometers are often used to locate compaction. The penetrometer rod should be driven in the soil at a rate of approximately 1 inch per second.

Level at which root growth is impossible: 300 p.s.i.

Lagoons and ponds should be compacted to between 625 and 725 p.s.i.

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3. Kansas Smoke Model web site now active for 2015

One of the key elements of the Kansas Flint Hills Smoke Management Plan is the smoke modeling

decision-aid tools. The tools can be found at: <u>http://ksfire.sonomatechdata.com/view/summary/</u>

Producers in the Flint Hills region are encouraged to use these tools as part of their prescribed burn planning. The purpose is to help avoid air quality problems that have been associated with the burning of an average of 2,500,000 acres in the region each spring. The Cumulative Fire Impacts page has a map showing the potential for each area to negatively impact air quality at a monitoring site in Kansas or southeastern Nebraska. Smoke from fires in areas that are colored red have a high possibility of decreasing air quality in a monitor location. Fires in yellow areas also have an elevated chance of negatively impacting air quality.

The graphics below are March 5 screen shots from the web site to illustrate this feature.



Color	Potential Contribution
Green	Fires in the county are expected to have a small contribution
Yellow	Fires in the county are expected to have a medium contribution
Red	Fires in the county are expected to have a large contribution
White	The county is not included in the model

The map shows two days at a time. Before noon, the maps are for the current day and the next day. After noon, the maps are for the next day and the day after. Areas coded red for the current day may be coded green on the following day. Producers can opt to hold off burning for a day if weather conditions are changing and the prediction is for reduced smoke impacts the following day. For example, in the graphic above, Pottawatomie County goes from red on March 5 to green for March 6, indicating a reduced chance of a burn in that county impacting air quality by waiting a day to burn.

Near the bottom of the page is a very brief forecast discussion, including an extended forecast for the Flint Hills region. This can also assist a producer in deciding whether to postpone a burn and wait for improved dispersion conditions.

It is important to note that the map is for smoke dispersion only. It does not provide any information on other important prescribed burning weather conditions, such as wind speed, temperature, and humidity (e.g. 5-15 mph, 40-80 F, and 40-70%). Dispersion is generally excellent on days that are otherwise too windy to burn safely.

Producers are strongly requested to refrain from starting a prescribed burn on the days when a fire in their area would cause air quality problems at a monitoring site (when their area of the map is colored red or yellow). Kansas monitoring sites can be found on the map below.



2015 Kansas Air Monitoring Sites

For most producers, knowing the "cumulative fire impacts" prediction for their area is adequate. But there's a second tool that producers can use to see specifically where a plume of smoke is forecasted to go from their fire. This modeling tool can be found on the tab "Your Fire Impacts."



To use this tool, producers enter their location, estimated fuel load, and number of acres to be burned. The model will generate an image of the smoke plume movement from their burn. Often you can see by the plume movement why a region would be coded red, as the plume moves directly over a monitoring location.

The modeling tools are also available in a format for mobile devices. <u>http://ksfire.sonomatechdata.com/view/mobile/</u>

Besides the tools discussed above, the website ksfire.org has a plethora of other information related to prescribed burning and links to the Kansas Flint Hills Smoke Management Plan, weather, county burn regulations (partial list), and much more.

Kansas State University Department of Agronomy 2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506 www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron The Kansas Smoke Management Facebook page, found at <u>https://www.facebook.com/ksfire</u>, provides information updates about smoke management and fire in the Flint Hills, especially before and during the spring burn season.

Spreading out the burn season is another way to reduce air quality problems. Evaluate your burn objectives. Increased yearling steer weight gains are one of the primary reasons burning is conducted in April. If you are burning for a different objective, burning at times other than April reduces smoke concentration and can lead to fewer air quality problems. K-State agronomist Clenton Owensby's research in the Flint Hills on steer weight gains is summarized below.

Time of Burn	Weight Gain (lbs)					
Unburned	233					
Early Spring	238					
Mid-Spring	252					
Late Spring 265						
*April is considered late spring in this context.						

Effect of Time of Burning on Steer Gains

Three Extension publications are available on air quality related to prescribed burning,

Fire Management Practices to Improve Air Quality <u>http://www.ksre.ksu.edu/bookstore/pubs/MF3072.pdf</u>

Air Quality Concerns of Prescribed Range Burning in Kansas http://www.ksre.ksu.edu/bookstore/Item.aspx?catId=364&pubId=16940

Fire Management Practices Used to Reduce the Impacts of Smoke Before, During, and After a Burn http://ksfire.org/p.aspx?tabid=2

Weather Tool

The National Weather Service has numerous tools to assist prescribed burners in planning a burn. Two that are often used are the Hourly Weather Forecast and the Weather Activity Planner.

A general forecast can be obtained for a location by entering a zip code or city and county in the bar in the upper left hand corner of the National Weather Service home page <u>http://www.weather.gov/</u>.

This forecast is for about a 3 square mile area. To obtain a forecast closer to the burn unit, slide the map on the right hand side of the page so that the location of the burn unit is in the center of the map. This will generate a forecast for the new location.

The Hourly Weather Forecast is a graphical version of the forecast for the next 48 hours. It includes when changes in wind speed, wind direction, and humidity can be expected during the day. By clicking extra boxes at the top of the form, transport winds, mixing height, and Haines Index can be

added to the graph. The Hourly Weather Forecast can be accessed from an icon located in the lower right hand side of the forecast page.



Kansas State University Department of Agronomy 2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506 www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron The Weather Activity Planner allows you to set the parameters you need for a burn and will return the times during the next 7 days when those weather conditions will be met. It can be accessed from the National Weather Service page for each forecast area. The Flint Hills forecast areas are Topeka http://www.crh.noaa.gov/top/ and Wichita http://www.crh.noaa.gov/ict/. In the blue bar on the left side of the home page under Forecasts, select Activity Planner.

In summary, use the smoke model (<u>http://ksfire.sonomatechdata.com/view/summary/</u>) to predict where the smoke plume will go and check specific conditions with the National Weather Service to see if it is safe to burn.

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4. Assessing winter damage to alfalfa stands

This could be a tough winter for alfalfa in Kansas, especially on newly seeded stands. The two main concerns for alfalfa are winterkill and heaving.

Winterkill

There is a wide range of winterhardiness among alfalfa varieties. Some varieties may have suffered winterkill injury this winter, especially where the crop had no snow cover. As in wheat, winterkill in alfalfa occurs when the crown is frozen. When this occurs, the taproot will turn soft and mushy. In the early spring, check for bud and new shoot vigor. Healthy crowns are large, symmetrical and have many shoots. Examine them for delayed green-up, lopsided crowns and uneven shoot growth. If any of these characteristics are present, check the taproots for firmness. Some plants may even begin to greenup and then die. Plants that put out second leaves are likely unaffected.

Interseeding alfalfa to thicken an alfalfa stand will generally not work. If the stand is one year or less old, plants will generally come up and then be outcompeted by the survivors from last year. Large dead spots should be disked first and then seeded. If the stand is two or more years old, interseeding alfalfa will not work because of autotoxicity. In this situation, you should wait one year before reseeding.

Heaving

This winter could also result in a more common form of injury to alfalfa. As the soil freezes and thaws, alfalfa stands can be damaged by the heaving effect. This will be more likely to occur where soils are not under continuous snow or ice cover, and where temperatures have been in the single digits at night. This winter has been cold enough to freeze the soil where it is not under snow cover. Soils with high levels of clay are especially prone to winter heaving.

If heaving has occurred, dig up some plants to determine if the taproot is broken. Plants with broken taproots may green-up, but they perform poorly and eventually die. Slightly heaved plants can survive, but their longevity and productivity will be reduced. Crowns that heaved one inch or less are not as likely to have a broken taproot. With time, these plants can reposition themselves. Raised crowns are susceptible to weather and mechanical damage. Raise cutter bars to avoid damaging exposed crowns.

Evaluating Plants and Stands

Producers can start to evaluate the health of their alfalfa stands in March or April, as soon as the soils thaws. They should look at the crowns and roots. Buds should be firm, and white or pink in color if they have survived with good vigor. The bark of roots should not peel away easily when scratched with a thumbnail. When cut, the interior of healthy roots will be white or cream in color.

When alfalfa growth reaches 4 to 6 inches, producers can use stems per square foot to assess density measure. A density of 55 stems per square foot has good yield potential. There will probably be some yield loss with stem counts between 40 and 50 per square foot. Consider replacing the stand if there are less than 40 stems per square foot and the crown and root health is poor.

If an established stand was injured by winterkill or heaving, and large patches are dead, producers

may want to buy some time before replacing the stand by temporarily thickening the bare areas with red clover. Red clover is not susceptible as alfalfa to the plant toxins released by alfalfa (allelopathy), and help provide good quality forage.

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5. Early spring insect control and fertility management practices for alfalfa

As alfalfa breaks dormancy, producers should plan to keep a close watch for insect activity. This is also a time of year when producers can apply lime or fertilizer, if needed.

Insect activity

Alfalfa weevils are probably the first and foremost insect pest to start scouting for at this time of year. Scouting for alfalfa weevil should begin as soon as the plants break dormancy, or see K-State Research and Extension publication *Alfalfa Weevils*, MF2999, available online at: <u>http://www.ksre.ksu.edu/bookstore/pubs/MF2999.pdf</u> to calculate growing degree days required for egg hatch. Some eggs were deposited last fall. With the warm weather we have had sporadically and which can be expected over the coming weeks, we have now accrued several degree days or thermal units towards hatching these eggs. Heat units accumulate for alfalfa weevils at temperatures above 48 degrees F. However, do not be too quick to treat for alfalfa weevil. Wait until the field reaches the treatment threshold.

The next insect to start watching for would probably be pea aphids. They can also start relatively early in the spring, and can be a problem on first-year stands. If weevil treatments are applied, they will wipe out any beneficial insects -- which normally do a good job of keeping aphid populations under control.

Also, producers will need to keep an eye out for army cutworms as there were some reports of army cutworm activity last fall. Army cutworms will start feeding again anytime temperatures are above 50 degrees F. Armyworms are another potential problem.

Those are the early season pests which have the most potential for damaging alfalfa prior to the first cutting. For more information on control, see K-State publication MF-809, *Alfalfa Insect Management 2015*, at: <u>http://www.ksre.ksu.edu/bookstore/pubs/mf809.pdf</u>

Fertility decisions

Alfalfa is a crop with high nutrient removal rates, with average values of 10-12 lbs of P_2O_5 and 60 lbs of K_2O per ton of alfalfa. Annual fertilizer application of P and K is often needed to maintain soil nutrient levels, which also helps to maintain good stand vigor and therefore the longevity of an alfalfa field.

Alfalfa and Clover P and K Recommendations

Broy P1		Yield	d Goal (Ta	on/A)		Exch. K		Yield Goal (Ton/A)			
Soil Test	2	4	6	8	10	Soil Test	2	4	6	8	10
(ppm)			bΡ ₂ O ₂ /A			(ppm)			bΡ ₂ O ₂ /A		
0-5	75	80	90	100	105	0-40	80	90	100	110	120
5-10	60	65	70	75	85	40-80	55	65	70	75	80
10-15	40	45	50	55	60	80-120	30	35	40	40	45
15-20	25	30	30	35	35	120-150	15	15	15	15	15
20-25	15	15	15	15	15	150+	0	0	0	0	0
25+	0	0	0	0	0						
Crop Removal ²	24	48	72	96	120	Crop Removal ²	120	240	360	480	600

Phosphorus Sufficiency Recommendations for Alfalfa^{1, 5}

Potassium Sufficiency Recommendations for Alfalfa¹

Source: Soil Test Interpretations and Fertilizer Recommendations, K-State Research and **Extension publication MF-2586**

Alfalfa also shows responses to some secondary and micronutrients, and in Kansas sulfur and boron can often limit yield potential and should be monitored periodically.

If phosphorus, potassium, sulfur, or boron are needed, how and when should they be applied?

On established stands, broadcasting phosphorus has proven effective on soils low in phosphorus because alfalfa has roots near the soil surface. For nonirrigated stands, topdressing is normally done in the fall, early spring, or even after the first cutting. Irrigated stands can be fertilized in the fall, early spring, or after any cutting because moisture can be supplied to make the top-dressed fertilizer available to plants.

Potassium application times and methods are similar to those for phosphorus, and in most cases, these nutrients will be applied together.

When high nutrient application rates are needed to boost soil fertility, splitting the total required amount into two or more applications is recommended in order to avoid salt injury and luxury consumption beyond the alfalfa nutritional requirement.

For more information, see K-State publication C-683, Alfalfa Production Handbook, at: http://www.ksre.ksu.edu/bookstore/pubs/c683.pdf

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6. On-farm research collaborations: North Central Kansas case study

K-State Research and Extension state specialists, area agronomists, and county/district agents are seeking to collaborate with producers in establishing on-farm and large-scale research plots again in 2015. The goal is to establish a network of on-farm research collaborators with the main purpose of providing research results on production practices at the local scale.

During the 2014 growing season, we collaborated with several farmers in performing on-farm seeding rate research trials in corn, soybean, and grain sorghum. Here is one example a study done in 2014, and how this information can assist farmers.

CORN Seeding Rate Study							Belle	eville				
e					240	feet						>
18,000 Seeds/Acre	22,000 Seeds/Acre	26,000 Seedt/Acre	30,000 Seeds/Acre	30,000 Seeds/Acre	18,000 Seeds/Acre	26,000 Seed%/Acre	22,000 Seeds/Acre	22,000 Seedu/Acre	26,000 SeedU/Acre	30,000 Seeds/Acre	18,000 Seeds/Acre	165 feet
REPLICATION #1					REPLICA	TION #2		REPLICATION #3				
N Nada Post I Post I					i ngth= 165 feet s idth= 20 feet s Niacre d 05/02	trips		Each strip N applica	is 20-ft tion = 150	lbs/A		

Experimental layout:

Field variability:



Strip trial, plant population:

On-Farm Research: Corn Study



Kansas State University Department of Agronomy 2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506 www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron Position of experimental layout in the field:



Optimum Plant Population:

Agronomically, the optimum plant population for maximizing corn yields in this study was close to 30,500 plants/acre. The agronomically optimum plant population did not coincide with the economically optimum plant population, however. The population that maximized net profits was 28,300 plants/acre (2,200 plants/acre less than the agronomic optimum population).



Assuming a price of \$3.50 per bushel for corn and a cost of \$280 (80,000 kernels) per bag of corn seed, cutting back the population by 2,200 plants/acre or 2,500-3,000 seeds/acre (assuming 80-90% seed emergence) could represent a seed savings of close to \$10 per acre.

The on-farm project has as a goal of establishing a network of on-farm research trials with the purpose of fine-tuning crop production recommendations to local environments.

Farmers interested in participating in this project can get more information by directly contacting Ignacio Ciampitti (Coordinator, K-State On-Farm Project) at 785-410-9354 or <u>ciampitti@ksu.edu</u> or by contacting their county Extension Agricultural Agents or Area Extension Agronomists -- Stu Duncan, Northeast Area; Lucas Haag, Northwest Area; and Doug Shoup, Southeast Area.

K-State Research and Extension agents involved in this project in 2014:

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7. Kansas weather summary for February: Extended cold

Despite some record warm readings at a few locations, February was characterized by colder than normal conditions. This was particularly true during the last week of the month when temperatures averaged 17 degrees cooler than normal. For the entire month of February, statewide temperatures averaged 30.1 degrees F which was 3.1 degrees cooler than normal. This places it in the cold third of

the average February temperatures, as the 31st coldest since 1895. The Northwest Division came closest to average at 31.0 degrees F or exactly normal. The Northeastern Division saw the greatest departure. The average temperature for February in that region was 24.7 degrees F, or 7.6 degrees cooler than normal. The colder-than-average temperatures didn't mean that the month was without warm weather. All divisions reached highs in the mid to upper seventies. The warmest reading for the month was 85 degrees F at Hays. The coldest reading occurred at the middle of the month, as an Arctic front again moved into the state. The coldest reading was a -8 degrees F at Howard, in Elk County, on the 19th. Sub-zero readings were recorded in all but the three southern divisions and the Central Division. There were 79 record maximum daily temperatures. None of these set new records for the month. There were 8 record daily warm minimum temperatures were recorded and 15 records were tied. There were 4 record daily low minimum temperatures set, and 14 records tied.



Statewide average precipitation was 0.88 inches, which was 94 percent of normal. The Northwest, West Central, Central, South Central and Southeast divisions averaged below normal for the month. The Southeast Division had the lowest percentage of normal at 61 percent, which translates to a deficit of 0.68 inches for the month. The areas with greatest departure from normal on the positive side only had slight increases. The Southwest Division had 0.27 inches more than normal, which was 161 percent of normal. The Northeast division, which had the second largest percent of normal at 117 percent, was just 0.21 inches above normal.





As typical, February was quiet on the severe weather side. There were snow events, but amounts were generally not troublesome. The highest daily total reported was 7 inches at Axtell, in Marshall County (NWS), on the 1st (NWS) and 12.4 inches at Barnes, Washington County (CoCoRaHS) also on the first. Unfortunately, the moisture from the snow was limited.



Drought conditions persist across the state, particularly in the west. There was some degradation in the eastern portions of the state. The drought-free portion of the state expanded slightly. The wet start to February brought a brief halt to further deterioration. However, a continued dry pattern is likely to result in a rapid expansion of more severe drought conditions. March is well into our wetter part of the year, and deficits can accumulate rapidly, particularly in the eastern third of the state. The El Niño conditions are now present in the Pacific, but are weak and an El Niño event has yet to be declared. As we move later into spring, the impacts are less consistent. Other global circulation patterns, including the North Atlantic Oscillation (NAO), can have significant impacts on the spring season. The March temperature outlook calls for cooler-than-normal conditions statewide. The precipitation outlook is neutral, with precipitation equally likely to be above normal, normal or below normal.

U.S. Drought Monitor Kansas

March 3, 2015 (Released Thursday, Mar. 5, 2015) Valid 7 a.m. EST

Drought Conditions (Percent Area)



David Simeral

USDA

Western Regional Climate Center

http://droughtmonitor.unl.edu/

6669

D0 D1 None DO Carrent 11.06 47.2421.03 16.80 1.88 0.00 Lad Week 11.05 47.24 23.02 0.00 16.00 1.08 1045015 3 Months Ago 19.58 18.25 17.08 2.250.00 42.88 638,804 V Start of Calendar Ye Catagory 19.40 43.02 12.10 16.05 2.25 0.00 Start of Water Year 19.51 25.26 25.62 17.12 2.27 0.00 One Year Age 4.16 30.70 22.03 35.26 7.78 0.00 049914



The Drought Monitor forwards on broad-scale conditions, Local conditions may vary. See accompanying text assurancy for forecast statements.



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Table 1

Feb 2015

Kansas Climate Division Summary

	Precipit	ation (in	ches)	Temperature (°F)						
Feb 2015				2015, Ja	n throug	ıh Feb			Monthly	
Division	Total	Dep. ¹	% Normal	Total	Dep. ¹	% Normal	Ave	Dep. ¹	Max	es Min
Northw est	0.33	-0.21	64	0.44	-0.55	46	31.6	0.0	81	-3
West Central	0.38	-0.21	66	0.66	-0.44	59	32.9	-0.1	83	-1
Southw est	0.82	0.27	161	1.32	0.30	134	35.1	-0.5	84	1
North Central	0.87	0.05	98	1.18	-0.27	78	26.8	-5.3	81	-7
Central	0.89	-0.12	86	1.29	-0.41	76	30.1	-4.0	85	0
South Central	0.93	-0.23	81	1.30	-0.69	66	32.1	-4.4	78	3
Northea st	1.33	0.21	117	1.52	-0.40	79	24.7	-7.6	73	-8
East Central	1.34	0.01	102	1.58	-0.70	70	27.0	-6.8	73	-1
Southea st	1.04	-0.68	61	1.35	-1.62	46	30.3	-6.3	76	3
STATE	0.88	-0.11	94	1.20	-0.53	74	30.1	-3.9	85	-8

1. Departure from 1981-2010 normal value Source: KSU Weather Data Library

Mary Knapp, Weather Data Library <u>mknapp@ksu.edu</u>

8. Comparative Vegetation Condition Report: February 17 - March 2

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 26-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.

NOTE TO READERS: The maps below represent a subset of the maps available from the EASAL group. If you'd like digital copies of the entire map series please contact Nan An at nanan@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.

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

Kansas Vegetation Condition

Period 09: 02/17/2015 - 03/02/2015



Figure 1. The Vegetation Condition Report for Kansas for February 17 – March 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that all parts of the state had snow with the last system. Amounts varied from as much as 7 inches in southwest Kansas, to an inch or less in parts of north central and eastern Kansas.

Kansas Vegetation Condition Comparison



Late-February 2015 compared to the Late-February 2014

Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for February 17 – March 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows the greatest increase in NDVI readings was in the Southwestern Division and in parts of central and southeast Kansas. Sedgwick and Sumner counties, in particular, have higher photosynthetic activity than last year at this time.

Kansas Vegetation Condition Comparison



Late-February 2015 compared to the 26-Year Average for Late-February

Figure 3. Compared to the 26-year average at this time for Kansas, this year's Vegetation Condition Report for February 17 – March 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that southwest and south central Kansas have above-average NDVI readings. Temperatures in these areas have been close to normal. Moisture has also been favorable, particularly in southwest Kansas.



Figure 4. The Vegetation Condition Report for the Corn Belt for February 17 – March 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that snow was present in most of the region during the period. The Northern Plains continues to have much lower-than-normal snow cover, while the eastern areas of the region are dealing with much higher-than-average snow packs.



U.S. Corn Belt Vegetation Condition Comparison Late-February 2015 Compared to Late-February 2014

Figure 5. The comparison to last year in the Corn Belt for the period February 17 – March 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that higher NDVI values are concentrated in southern Minnesota, northern Iowa, and eastern South Dakota. These areas continue to have low snow cover and increasing drought stress. The lower NDVI values are concentrated on the southern and eastern portions of the region, where continued snow cover is limiting activity.



U.S. Corn Belt Vegetation Condition Comparison Late-February 2015 Compared to the 26-Year Average for Late-February

Figure 6. Compared to the 26-year average at this time for the Corn Belt, this year's Vegetation Condition Report for February 17 – March 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows much lower-than-average NDVI readings are concentrated on the southeastern portions of the region. Greater-than-average NDVI readings are visible from South Dakota through southwestern Minnesota. Southern Missouri through Kentucky and Ohio have below-average NDVI readings due to increased snow. Columbus Ohio reported 15.5 inches of snow in February. Its normal February snowfall is just 6.3 inches.



Continental U.S. Vegetation Condition Period 09: 02/17/2015 - 03/02/2015

Figure 7. The Vegetation Condition Report for the U.S. for February 17 – March 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that snow penetrated into the South, but missed the mountains of the West.



Continental U.S. Vegetation Condition Comparison Late-February 2015 Compared to Late--February 2014

Figure 8. The U.S. comparison to last year at this time for the period February 17 – March 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that lower NDVI readings are prevalent from Missouri to the Atlantic Seaboard, where heavier snows have fallen. The Front Range of the Rockies also has had higher snowfall, with resultant lower NDVI values. The Pacific Northwest continues to see a lack of snow cover.



Continental U.S. Vegetation Condition Comparison Late-February 2015 Compared to 26-year Average for Late-February

Figure 9. The U.S. comparison to the 26-year average for the period February 17 – March 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that there is a big split, with the eastern parts of the country having much lower-than-average photosynthetic activity. This is a result of the much higher-than-average snow. In contrast, the West has much higher-than-average NDVI readings as a result of much lower-than-normal snow cover. The exception to this is the Front Range of the Rockies, where snow cover has been higher-thanaverage.

Mary Knapp, Weather Data Library mknapp@ksu.edu

Kevin Price, Professor Emeritus, Agronomy and Geography, Remote Sensing, GIS <u>kpprice@ksu.edu</u>

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