extension AGRONOMY e-Updates

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1. Topdressing canola: How to maximize the benefits

To maximize the yield potential of winter canola, producers should topdress with nitrogen, sulfur, and possibly boron in the winter. Producers should be sure to make topdress applications under the right environmental conditions, with the right nutrients, and with the right application method.

Environmental conditions

The best time to topdress winter canola is during the rosette stage when the canola is dormant. Most years, this can easily be accomplished by topdressing in January or February, since temperatures are cold enough to keep canola from actively growing. If nitrogen is applied as a liquid when canola is green and physiologically active, be careful that the rate applied does not cause leaf burn. Both dry and liquid fertilizers are effective products.

Nutrients

A combination of nitrogen and sulfur, perhaps along with some boron, should be used in the topdressing blend.

Nitrogen. About two-thirds of the total nitrogen needed by the canola crop should be applied as a winter topdress. This should be done just as plants begin to show increased growth, and before the plants start to bolt. Topdress applications should be based on an updated assessment of yield potential, less profile residual nitrogen, and the amount of nitrogen applied in the fall. Suggested nitrogen rates for five yield levels and a soil with 2 percent organic matter and varying residual nitrate-nitrogen levels is shown in the table below. For soils with 1 percent organic matter, add 15 pounds nitrogen for each yield and nitrate level above and for soils with 3 percent organic matter subtract 15 pounds nitrogen for each yield and nitrate level.

Total nitrogen fertilizer needs for canola as affected by yield potential and soil test nitrogen levels in the southern Great Plains					
Profile N test (lbs/acre)	Yield potential (lbs/acre)				
	1,500	2,000	2,500	3,000	3,500
0	75	100	125	150	175
20	55	80	105	130	155
40	35	60	85	110	135
60	15	40	65	90	115
80	0	20	45	70	95
100	0	5	25	50	75

Source: Great Plains Canola Production Handbook,
http://www.ksre.ksu.edu/library/crpsl2/mf2734.pdf

Either solid or liquid forms of nitrogen can be used before green-up in the early spring. Once the weather warms and growth begins, solid materials are preferred for broadcast applications to prevent/avoid leaf burn.

Some of the new controlled-release products such as polymer-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 bolting and flowering and also continue to release some N in later stages of development -- works best in settings with high loss potential.

Sulfur. If canola is deficient in sulfur, the consequences can be very serious because it needs sulfur to produce oil and protein in the seed. For this reason, soils having less than 20 lbs/acre sulfate-sulfur (10 ppm SO_4-S) in the upper 24 inches should receive supplemental sulfur. A good rule to follow is to keep sulfur to nitrogen availability at a ratio of about 1 to 7. Another simple guideline is to apply 20 pounds sulfur per acre, which will be sufficient for low and medium yield levels. Sulfur can be applied in the fall and incorporated into the seedbed or surface applied with nitrogen in the winter topdressing. Canola growers may consider using elemental sulfur, ammonium sulfate, or a thio-sulfate form of sulfur. Since elemental sulfur must oxidize to become plant available, it should only be applied in the fall. Ammonium thio-sulfate or ammonium sulfate can be applied in the spring or fall, but thio-sulfate should not be topdressed directly on tissue or placed with seed to avoid phytotoxicity.

Boron. If deficient, boron is one micronutrient that can have negative consequences on canola yield. Typically boron deficiency is not something we have seen in Kansas. However, if there are micronutrients that could influence yield, then boron would be one of them. The most important thing is to know what your soil sample states. Oklahoma State University is looking more into boron fertility. Applying boron may help to reduce flower abortion and enable efficient pod filling. However, there is not much room for error when comparing adequate boron fertility levels and toxic levels that might result from over application. Because of this, application rates of boron are often 1.0 lbs per acre or less. Soil and foliar applications of boron are effective. Foliar applications can be made with herbicides, and soil applied boron can be either broadcasted or banded. Make sure applications are uniform across the field to avoid toxicity.

Application method

It is important to avoid crushing winter canola with applicator tires after it bolts. Crushed plants will lodge and maturity will be delayed, which can slow harvest and increase the risk of shattering losses. For this reason, applicators with narrow tires are preferred. Do not use high flotation tires. As for the question of whether broadcast or banding is best -- if temperatures are cold and the plants are dormant, topdress fertilizer can be broadcast. If temperatures are mild enough that the canola plants have resumed active growth, it may be best to use streamer bars or some other form of banded application to avoid foliar burn.

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2. Planning for improved grazing distribution

This winter is a good time for grassland managers to evaluate their grazinglands and see if grazing distribution patterns can be improved. Grazing distribution has a direct impact on the uniformity of vegetative cover, affecting forage quality, prescribed burning effectiveness, and erosion potential.

Managing livestock behavior for improved grazing distribution requires that the manager understand what influences livestock movement within a pasture. Identifying areas where livestock concentrate is the first step to understanding grazing patterns. Once these areas have been identified, it is possible to understand reasons why patterns occur. Primary factors that influence where animals concentrate are:

* Location of preferred water
* Location of preferred shade
* Prevailing wind direction
* Topography

The location of areas where livestock tend to concentrate is often influenced by two or more of these factors interacting. If livestock concentrate too often in the same area, this can reduce profitability, water quality, air quality, and wildlife habitat.

Benefits of improving grazing distribution

If you can manage to utilize forage evenly throughout a grazingland area, you can better achieve the cover needed to reduce runoff and promote vigorous new growth for the following season. By keeping forage value high and ground cover adequate, uniform livestock distribution helps keep populations of noxious weeds and unpalatable forages to a minimum. This reduces the potential need for chemical treatments, reducing operating costs and environmental concerns.

An emphasis on managing animal behavior will require an extensive inventory and analysis of the management and landscape features of a grazingland, plus the patterns of use and concentration of the livestock. This assessment necessitates an on-the-ground inspection of the entire grazingland. In addition, a complete review of the management style also is needed.

Grazing patterns are established as soon as livestock enter a new grazingland. It is essential to have a management system in place to encourage uniform distribution from the first day of grazing. For example, grazing systems such as intensive early stocking and rotation grazing will increase the total area being grazed and allow rest periods for maintaining or improving plant vigor.

Animals tend to graze in spotty patterns that can be highly localized if management does not encourage more widespread use. If the animals move on to graze other areas before a localized area is seriously overgrazed, regrowth from these localized patches will occur and help maintain forage quality in the grazing animal's diet. In areas that remain ungrazed for long periods of time, forage quality declines as plants mature, but this forage will be used during drought when forage availability is declining.

Main factors affecting grazing distribution

Uneven grazing patterns generally occur due to a combination of the four factors listed previously and described in more detail below:

Livestock Water – Water is essential for animals. As a general rule, livestock will select drinking water based on quality and accessibility. Recent research and field observations suggest that the typical order of preference for water source types is:
1. Trough watered from a well or spring
2. Trough watered from a pond
3. Pond
4. A pool in a stream
5. A flowing stream

In addition to water quality and accessibility, water temperature and fear for safety are possible influences on livestock water preferences. Safety concerns include ice, mud, and collapsing stream banks. Water quality and temperature influence water consumption, which in turn can influence forage consumption.

Research also has shown that water in a trough can improve grazing distribution and may improve animal performance. Even when preferred watering facilities are available, poorly distributed water and/or rough terrain often results in underused areas within a grazingland. Animals will readily travel more than a mile to water on level terrain, but they may not travel even a half mile in steep or heavily rolling terrain.

Topography – Slope, aspect, and terrain comprise the elements of topography. Steep slopes create barriers to animal movement and grazing. South facing slopes green up earlier than the north facing slopes, creating more desirable grazing areas. The location of streams and other drainages add to the complexity of topography. All of these factors combine to create opportunities and barriers to animal movement.

Prevailing Wind Direction – Wind direction, along with other seasonal weather factors, has a major influence on how animals graze and where they concentrate. As a rule, animals grazing during the growing season tend to use the south side of the pasture most frequently. Prevailing north and northwest winds influence distribution patterns of livestock wintering on grazed forage.

Shade – Shade is attractive feature for grazing animals. It provides cooling, protection from the sun, and can provide protection from insects. Trees with broad crowns with reasonable clearance above the ground are preferred. Tall trees, such as cottonwoods, provide little opportunity for quality shade. Natural shade provided by trees, or artificial shade such as sheds, should be located away from water to help encourage grazing in areas where forage is being underutilized.

Other influences

Other features that can influence grazing distribution are:

Pasture Shape – The shape of a pasture can affect uniformity of grazing. For example, in a large "L" shaped pasture with the water in one end, the end farthest from water will usually be underutilized. Even utilization of these areas is often difficult and requires changing the grazing animals' habits and patterns.

Grazing Preference – Grazing animals prefer certain forages over others; preferred forages are said to be more palatable. The relative palatability of a plant species depends on factors such as the stage of growth and water content of each species, soil fertility level, and the palatability of other species present. Grazing animals will concentrate where the plants are most palatable.

In eastern and central Kansas rangeland, highly palatable species include eastern gamagrass, big bluestem, Indiangrass, little bluestem, and sideoats grama. Switchgrass, blue grama, and buffalograss will be grazed least when species that are more palatable are present. In western Kansas, blue grama and buffalograss may be the preferred species present. Western wheatgrass is palatable in the early spring, but it is rarely grazed during late spring and summer. In the fall, new growth again makes it palatable. Tame pastures, such as smooth brome or tall fescue tend to be more uniformly grazed, except when physical barriers are present, incompatible forages have invaded, or fertility problems exist.

Some forages are rarely preferred when other plants are available. These species are readily grazed only when planted and managed as a pure stand or when high stock density forces animals to consume plants they normally would not consume. Examples of such forages would be the Old World bluestems, tall fescue, and switchgrass.

Forbs (broadleaf plants) and browse (woody plants) vary in palatability. Examples of highly palatable forbs are showy partridgepea, purple prairiecover, and compassplant, while leadplant, elm, and Russian olive are examples of browse that are palatable at certain times of the season.

Seasonal nutritional needs – Forbs and shrubs often fill nutritional needs during certain periods of the year and may cause seasonal variations in grazing animal distribution.

Spot grazing – Animals create and maintain grazing patches. Forage outside the patches is not utilized until regrowth on overgrazed patches slows. Effort made to improve grazing distribution can be monitored based on the number, size, and distribution of spot grazing areas.

Summary

If you determine that livestock distribution is poor, resulting in uneven vegetative cover and eroded areas, you should try to evaluate the factors mentioned above and see what can realistically be done in your situation to improve grazing distribution. Tools to help distribute grazing are discussed in the publication listed below.

This article is adapted from the K-State publication MF-515, *Grazing Distribution*, available at: http://www.ksre.ksu.edu/bookstore/pubs/MF515.pdf

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3. Sorghum Schools scheduled at six locations in February

Sorghum production will be the focus of six in-depth Sorghum Schools in various locations around the state. The one-day schools will cover a number of issues facing sorghum growers: sorghum for risk management; importance of sorghum for the ethanol industry; sorghum irrigation management; weed control strategies; and planting, fertility, insect, and management.

The schools, sponsored by the Kansas Grain Sorghum Commission and the United

Sorghum Checkoff Program, and supported by Bayer CropScience and KFRM 550 AM Radio, each begin with registration at 9 a.m. The program starts at 9:30 a.m. Lunch is included at each location. The program will wrap up by mid-afternoon.

Dates and locations include:
Feb. 5 – Salina – Saline County Fairgrounds 4-H Building
Feb. 6 – Greensburg – Kiowa County Fairgrounds, 720 North Bay Street
Feb. 7 – Hillsboro – United Methodist Church, 905 East D Street
Feb. 12 – Oakley – Northwest Kansas Educational Service Center, 703 West 2nd Street
Feb. 13 – Tribune – Greeley County Fairgrounds 4-H Building
Feb. 14 – Ulysses – Grant County Civic Center, Lawson Room, 1000 West Patterson

Certification credits have been applied for:

* CCA credits: 2 Crop Management, 2 IPM, 1 Nutrient Management, 1 Water Management, and 0.5 Professional Development
* Commercial Applicator Recertification Credits: 2

Participants are asked to register for the sorghum school of their choosing by the Monday before the school they plan to attend, either by contacting their local K-State Research and Extension office or online at:
http://2013sorghumschools.eventbrite.com

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4. Comparative Vegetation Condition Report: January 1 – 14

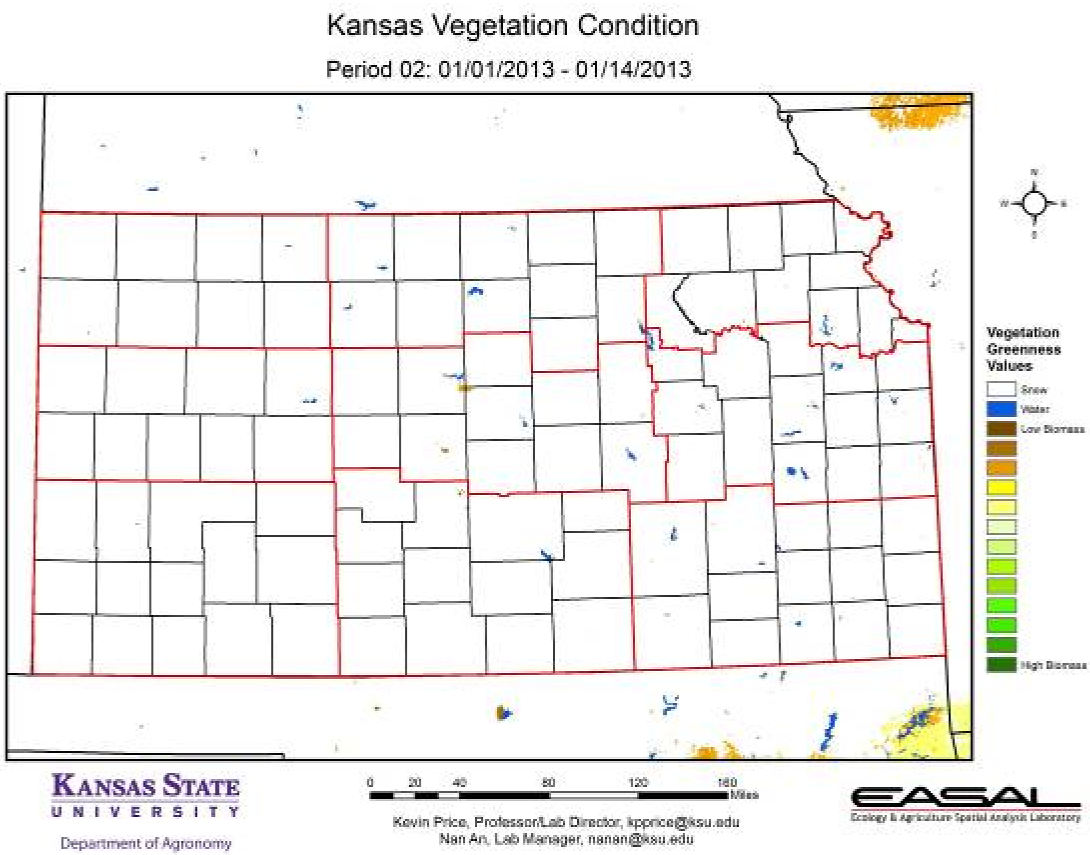
K-State's Ecology and Agriculture Spatial Analysis Laboratory (EASAL) produces weekly Vegetation Condition Report maps. These maps can be a valuable tool for making crop selection and marketing decisions.

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

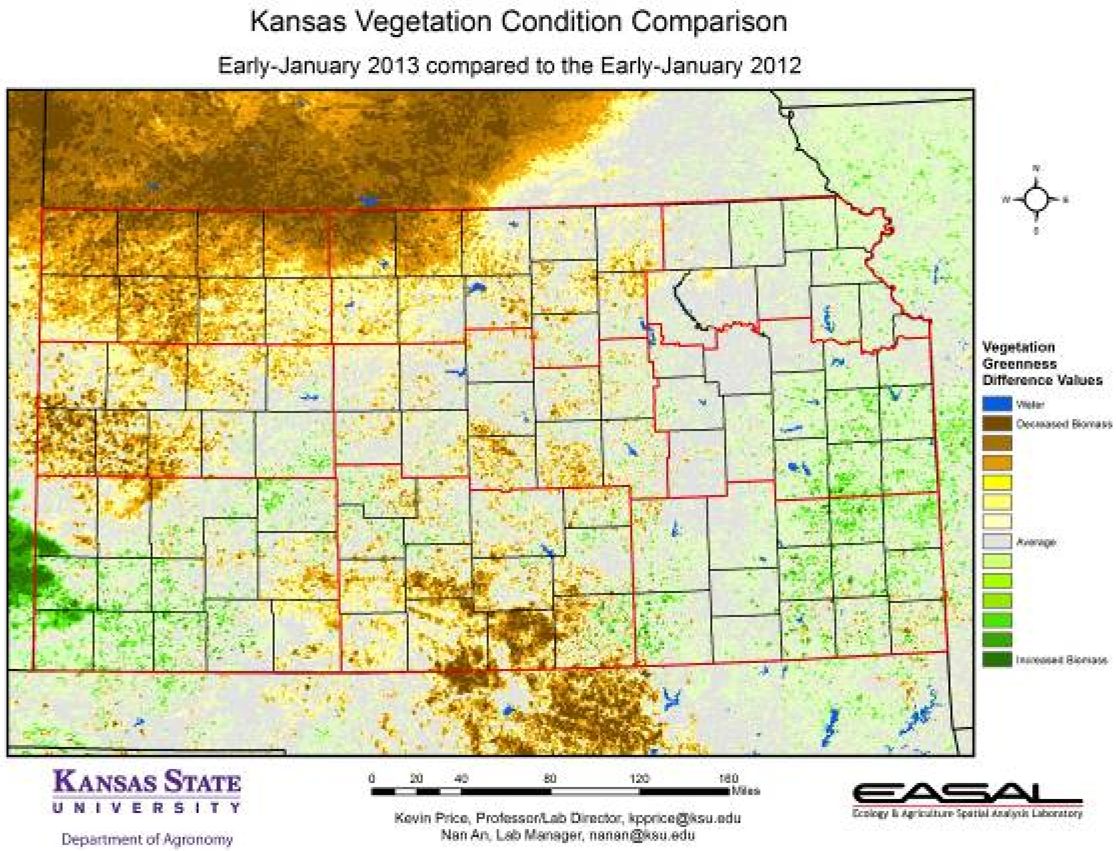
The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 24-year average. The report is used by individual farmers 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 Kevin Price 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.

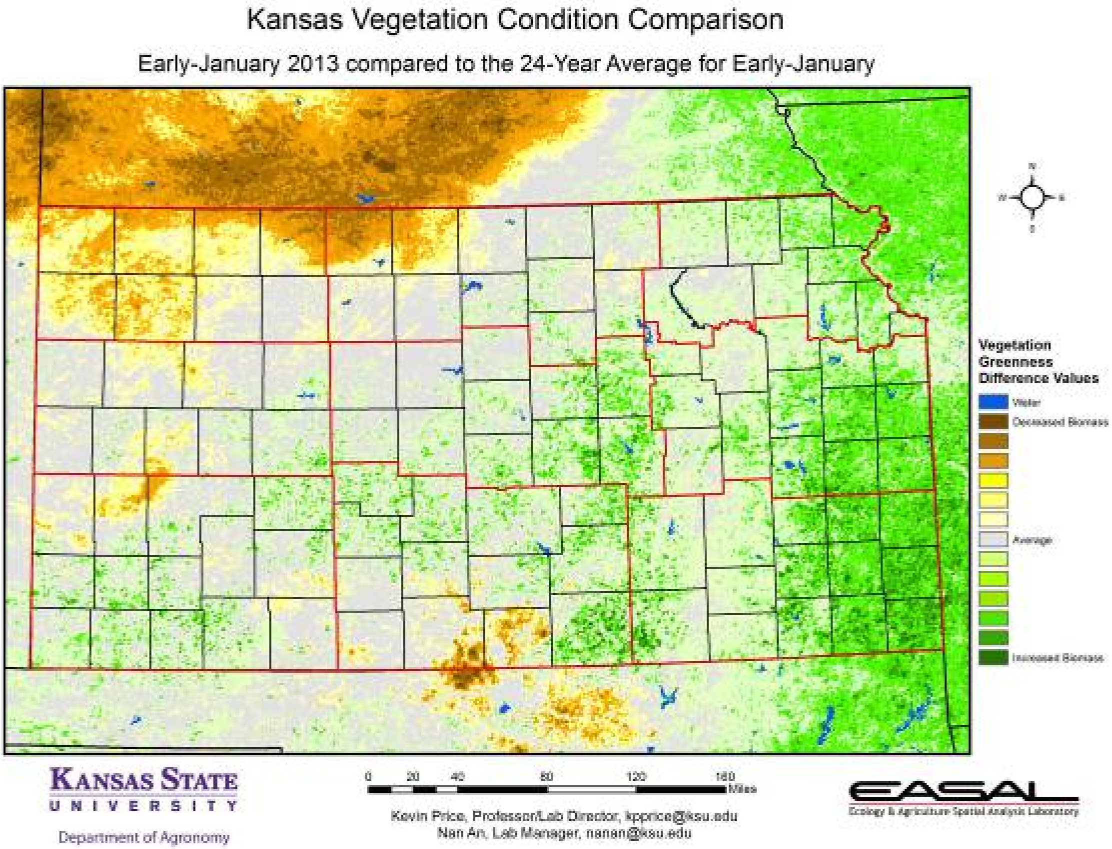
The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, the Corn Belt, and the continental U.S, with comments from Mary Knapp, state climatologist:



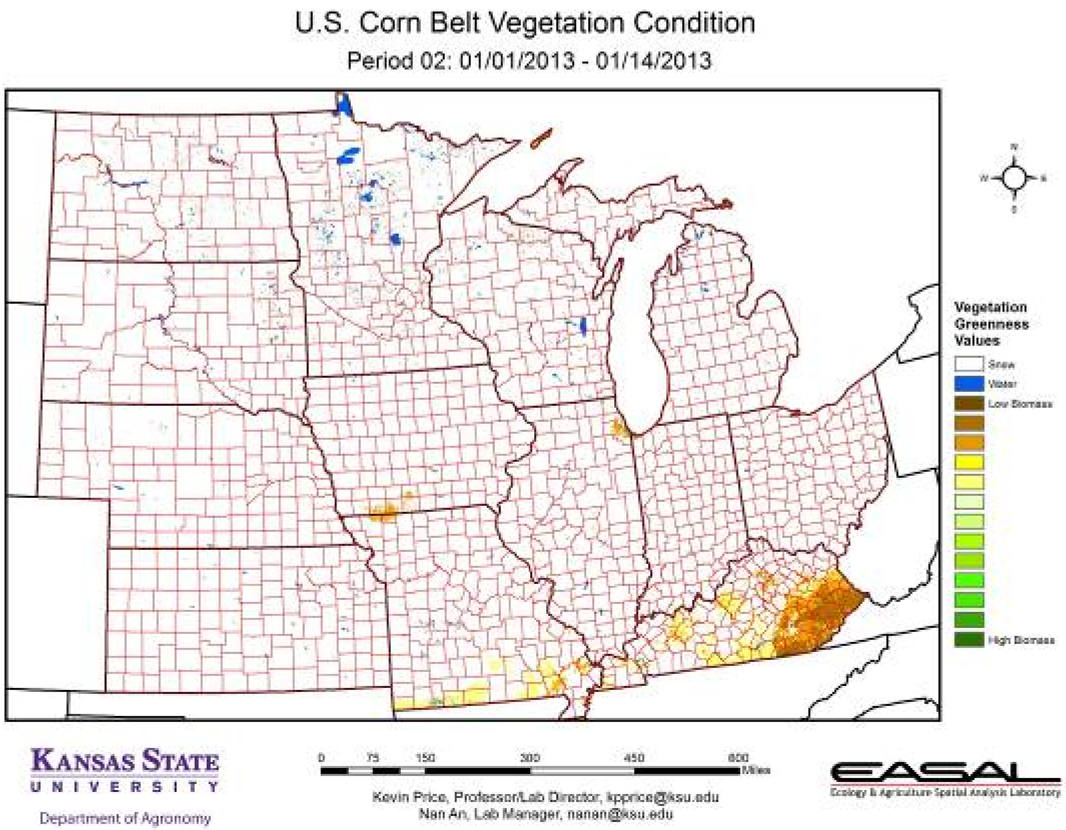
Map 1. The Vegetation Condition Report for Kansas for January 1 – 14 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that all parts of the state saw snow in the first part of January. Highest amounts were 7 to 9 inches in western Kansas.



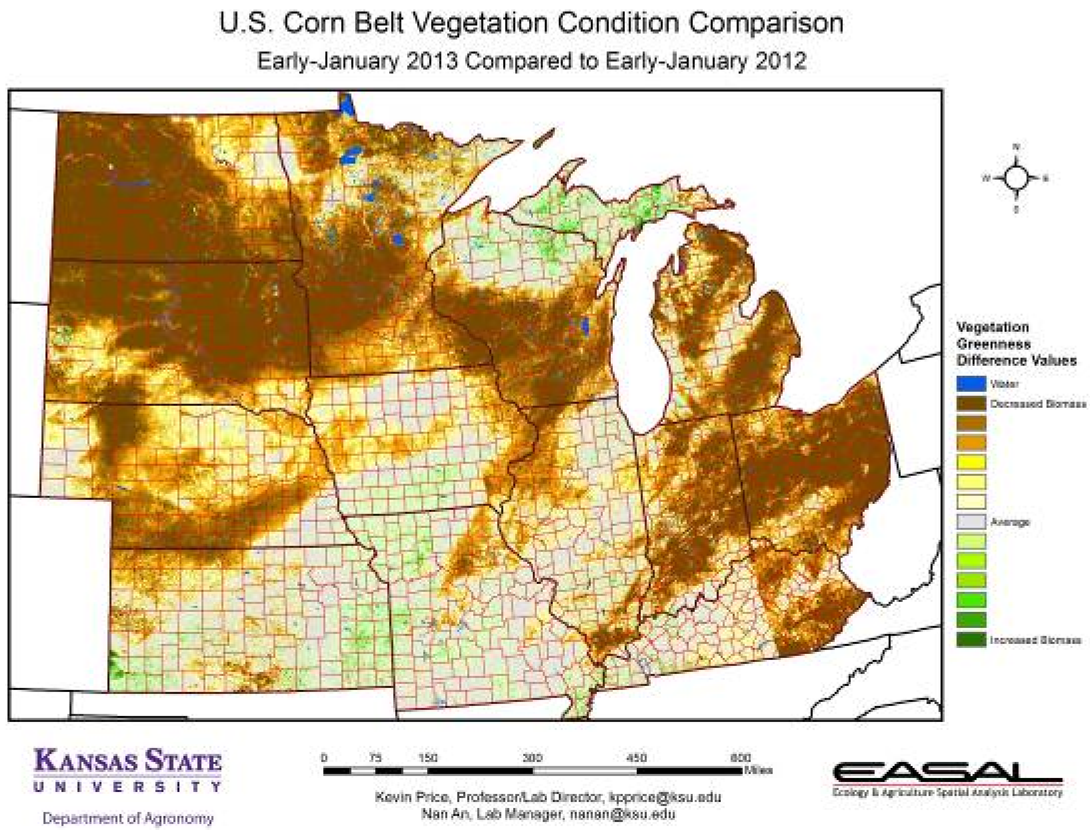
Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for September January 1 – 14 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that there is a very small area in extreme southwestern Kansas with greater photosynthetic activity. Much of northwest and west central Kansas has lower photosynthetic activity, as does parts of south central Kansas. The latest winter wheat condition report, as of Dec. 30, 2012, had almost a third of the crop in poor to very poor condition, and another 45 percent in only fair condition.



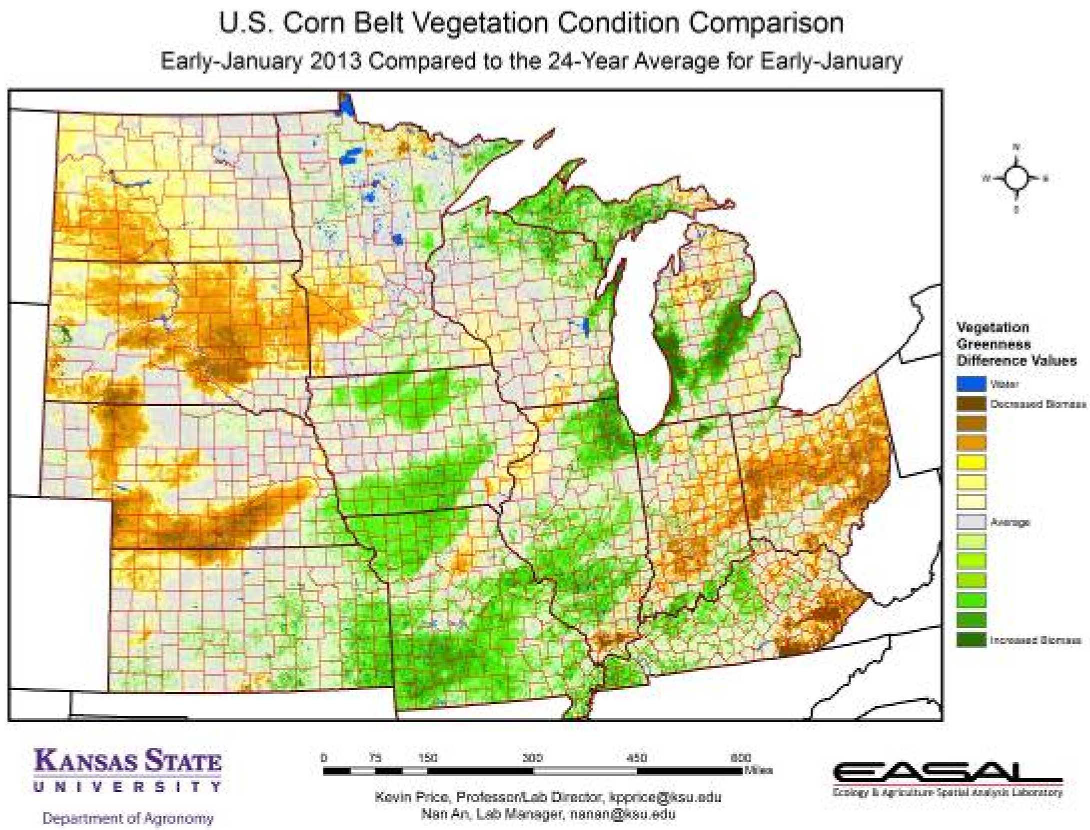
Map 3. Compared to the 24-year average at this time for Kansas, this year's Vegetation Condition Report for January 1 – 14 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows greatest photosynthetic activity in the eastern third of the state. This corresponds with warmer-than-average temperatures in the east and cooler-than-average temperatures in the west. In northwest Kansas, mean temperatures were almost 5 degrees below average. In northeast Kansas, temperatures averaged almost 2 degrees above average.



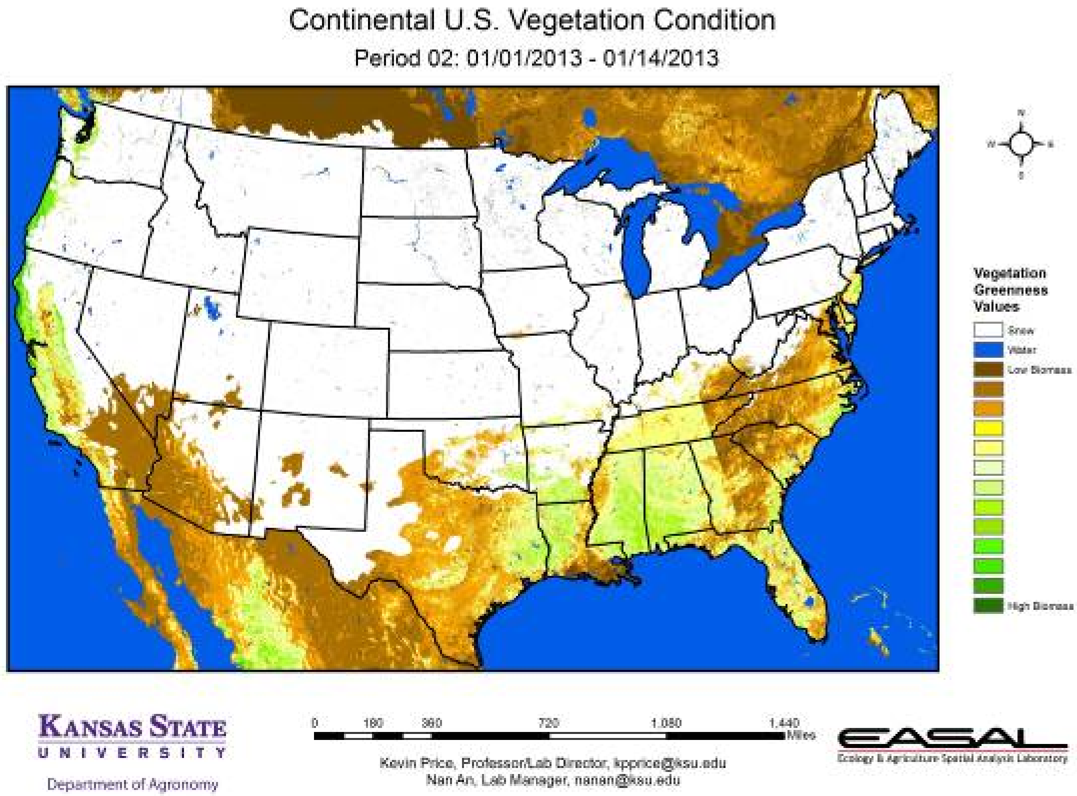
Map 4. The Vegetation Condition Report for the Corn Belt for January 1 – 14 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that only southeastern Kentucky missed all the snow for the period. This is a major contrast to last year, when much of the Corn Belt region was without snow at this time.



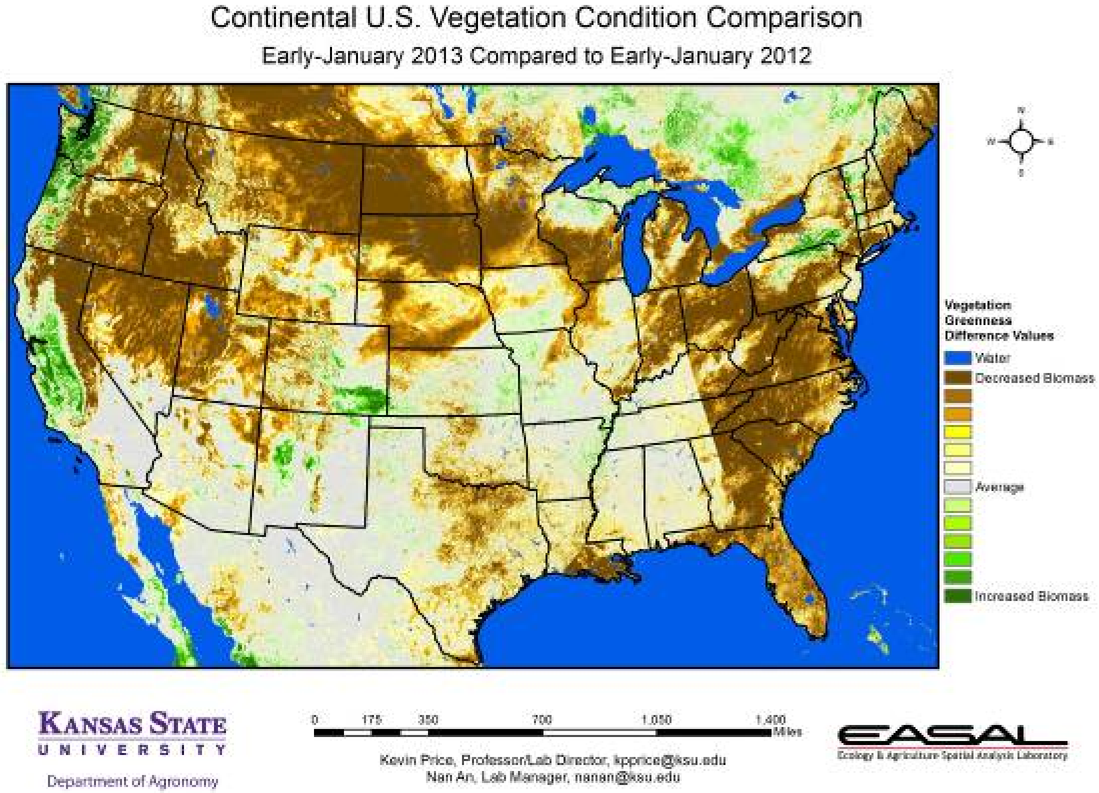
Map 5. The comparison to last year in the Corn Belt for the period January 1 – 14 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows a distinct splice line in Kentucky. Much of the region has less photosynthetic activity than last year for this period. This is not as negative as it might be at other times of the year, as most vegetation would be dormant. The lower activity would indicate less water demand, allowing for greater recharge of soil moisture in areas receiving moisture.



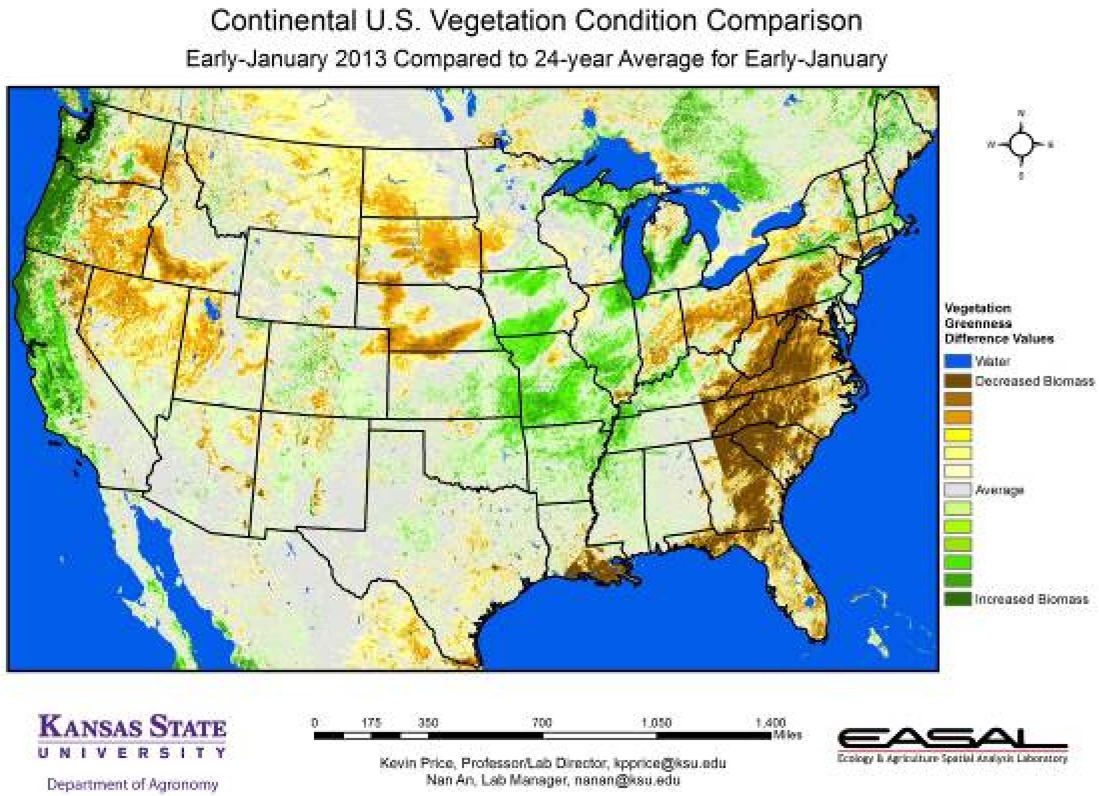
Map 6. Compared to the 24-year average at this time for the Corn Belt, this year's Vegetation Condition Report for January 1 – 14 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that areas in the central part of the region have greater-than-average photosynthetic activity. Warmer-than-average temperatures and some moisture have favored increased photosynthetic activity. This will translate to higher water demands than would typically be expected at this time of the year.



Map 7. The Vegetation Condition Report for the U.S. for January 1 – 14 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the storms during this two-week period brought snow as far south as West Texas.



Map 8. The U.S. comparison to last year at this time for the period January 1 – 14 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that much of the northern and eastern part of the lower 48 has less photosynthetic activity than last year. There is a distinct splice line from eastern Kentucky to the Florida Panhandle, as a result of cloud contamination. Noticeable is an area of greater photosynthetic activity in southeast Colorado. This region saw favorable moisture in late fall, which fueled photosynthetic activity in the area to a greater level than at this time last year.



Map 9. The U.S. comparison to the 24-year average for the period January 1 – 14 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the splice line continues in the Southeast. The greatest increase in biomass production has been along the Pacific Northwest through the central California coast, where repeated storms have allowed ample moisture for plant growth. In the Central U.S., particularly in southern Iowa and Missouri, moisture coupled with warmer-than-average temperatures has led to continued photosynthetic activity.

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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, 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.