extension AGRONOMY e-Updates

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1. Kochia control in corn and grain sorghum

Producers should start this winter in planning their program for controlling kochia in corn and grain sorghum. The spread of glyphosate-resistant kochia populations throughout western Kansas, and the difficultly growers have had controlling these populations, suggest that perhaps control measure should begin prior to emergence of kochia.

Huge flushes of kochia emerge in late March and into April. Applying 16 oz/acre of Clarity/Banvel/generic dicamba with a pound of atrazine around mid-March, before the kochia has emerged, could provide significant control of early flushes of kochia. The addition of 2,4-D will help control winter annual mustards that have emerged. This will make subsequent kochia control measures discussed in this article more effective. When treating kochia with burndown or in-crop herbicides, spray early when the plants are about 1 to 3 inches tall.

Control in corn

Kochia control in corn should always include a burndown application in April, shortly after the first 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 they may not get complete kochia control. If that occurs, the surviving plants will go on to cause problems throughout the growing season. Tillage prior to planting in a conventional till system can also be very effective.

The label for Clarity states that no more than 32 oz/acre can be applied per season. If 8-16 oz/acre is applied in March as an early preplant and 8 oz/acre is applied as a burndown ahead of corn or sorghum planting that still allows for an 8 oz application in-crop, which is often more than what is used in-crop.

After the early April burndown treatment, the next step would be to use a preemergence herbicide. 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, FulTime, and others. New options in this class of herbicides that could be used include Zidua and Anthem plus atrazine or Anthem ATZ, which has atrazine included. The active ingredient, pyroxasulfone, in these herbicides has the best activity on kochia of the choroacetamides. If triazine-resistant kochia is present, then one of the other options below would be the better choice.
* An HPPD herbicide. Examples of HPPD herbicides include Lexar EZ or Lumax EZ (premixes of Callisto, Dual II Magnum, and atrazine), Corvus (a premix of Balance Flexx and thiencarbazone methyl), and Balance Flexx. Corvus and Balance Flexx should be mixed with atrazine.
* Verdict, which is a Kixor-powered combination of Sharpen and Outlook herbicides, has activity; however, the residual may be a little too short. Verdict should be mixed with atrazine.

Balance Flexx, and Corvus 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/Armezon, 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 HPPD-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 can also be used alone, without the glyphosate tankmix partner. Halex GT cannot be used on conventional corn since it contains glyphosate.

Liberty can also be used as a postemergence treatment if the corn is Liberty Link. Liberty alone will not control kochia, however. For kochia control, Liberty should be tankmixed with Status or other more effective postemergence products.

It should be noted that Balance Flexx and Corvus can be applied either preemergence or postemergence up through the 2-leaf stage of corn. If applied postemergence to corn, Balance Flexx and Corvus must 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 EZ and Lexar EZ, 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

There are fewer herbicide options for controlling kochia in grain sorghum than in corn, although there is a wider window available for sorghum than corn to make burndown applications prior to planting. Grain sorghum is planted later than corn, allowing more flushes of early-emerged kochia to be controlled with burndown treatments. 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 tall or less 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 EZ, or Lumax EZ. 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 in sorghum. Verdict would provide some residual grass control. However, at the 10-oz rate, it should be 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, good options include Huskie+atrazine+AMS, dicamba+atrazine or Starane-containing products. If Starane is used, it would be best to add a half-pound of atrazine.

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

-- Phil Stahlman, Weed Scientist, K-State Agricultural Research Center-Hays
stahlman@ksu.edu

-- Dallas Peterson, Weed Management Specialist
dpeterso@ksu.edu

2. Diseases on corn, grain sorghum, and soybeans in Kansas in 2012

Corn Diseases

The 2012 growing season was unusually hot and dry for Kansas corn growers, so much so that even irrigated corn was affected. Gray leaf spot, the most common foliar disease in most years, was almost nonexistent in 2012. Only a few irrigated fields and possibly some dryland fields that caught some timely rains were even considered for fungicide applications.

Goss's bacterial wilt, while less common than in 2011, was still severe in some fields that received hail damage early in the season. Goss's wilt is typically more severe in fields that are in continuous, no-till corn and that have received injury due to hail or sandblasting. The disease has spread rapidly across the Corn Belt in recent years and scientists are trying to determine the reasons for the rapid increase.

Goss's wilt on corn. Photo by Bob Harveson, University of Nebraska-Lincoln.

Aspergillus ear rot, the producer of aflatoxin, was as severe as or possibly even a little worse than in 2011. Fields with significant levels of Aspergillus were found as far northwest as Rooks County, an area that rarely has to deal with aflatoxin problems. Fortunately, aflatoxin amounts were generally at levels where the elevators would accept the grain without penalty, but some loads were docked for excessive levels, and a few loads were simply rejected. Because of the dry conditions, charcoal rot was also prevalent in many non-irrigated fields.

On a positive note, because of the drought in Texas and Oklahoma, southern rust was again at very low levels. That, combined with the early maturity of the crop, greatly reduced the threat of yield loss from the disease. The only other disease of concern was common smut. Poor pollination leaves ears more susceptible to this disease and the high heat at pollination resulted in many fields with poorly filled ears and increased levels of common smut.

Grain Sorghum Diseases

Overall disease incidence and severity in grain sorghum was again much less than normal, as it was in 2011. The most significant disease issue in grain sorghum in 2012 was Fusarium stalk rot. It was particularly common in north central and central Kansas.

No other diseases were a significant issue in 2012. Other diseases identified included Fusarium neck rot, charcoal rot, and bacterial leaf streak.

Soybean Diseases

The hot dry conditions also reduced the incidence of soybean diseases in 2012. Common foliar diseases such as brown spot and frogeye leaf spot were absent from most fields. The hot, dry weather proved to be highly favorable for the development of charcoal rot, bringing statewide losses to even higher levels than 2011.

One interesting development in 2012 was that in an effort to keep up with water demand, some fields were actually overwatered and sudden death syndrome (SDS) developed at levels higher than expected. Overall however, levels of SDS were well below average.

A statewide survey for soybean cyst nematode (SCN) was completed in 2012. Approximately 20% of Kansas soybean fields were found to be infected. The majority of these fields have SCN levels in the range where only low to moderate losses are likely occurring. In some counties, such as Cherokee County in southeast Kansas, however, the percentage of fields infested was approaching 100% -- with a few having nematode levels that are likely causing significant yield loss.

Other diseases identified in 2012 include bean pod mottle virus, stem canker, bacterial blight, and iron deficiency chlorosis.

-- Doug Jardine, Extension Plant Pathologist
jardine@ksu.edu

3. Comparative Vegetation Condition Report: December 25 – January 7

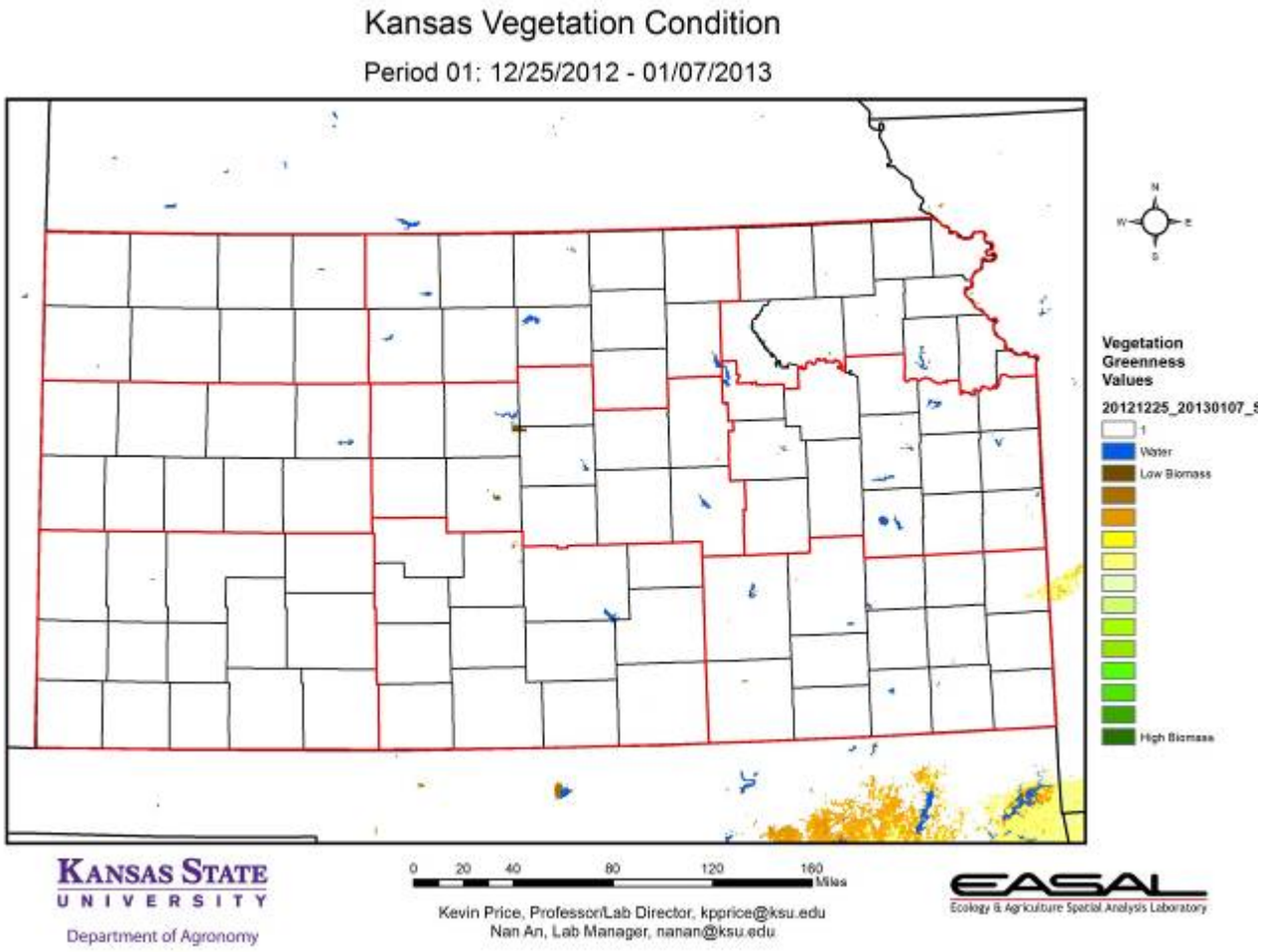
K-State's Ecology and Agriculture Spatial Analysis Laboratory (EASAL) produces weekly Vegetation Condition Report maps. These maps can be a valuable tool for making crop selection and marketing decisions.

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

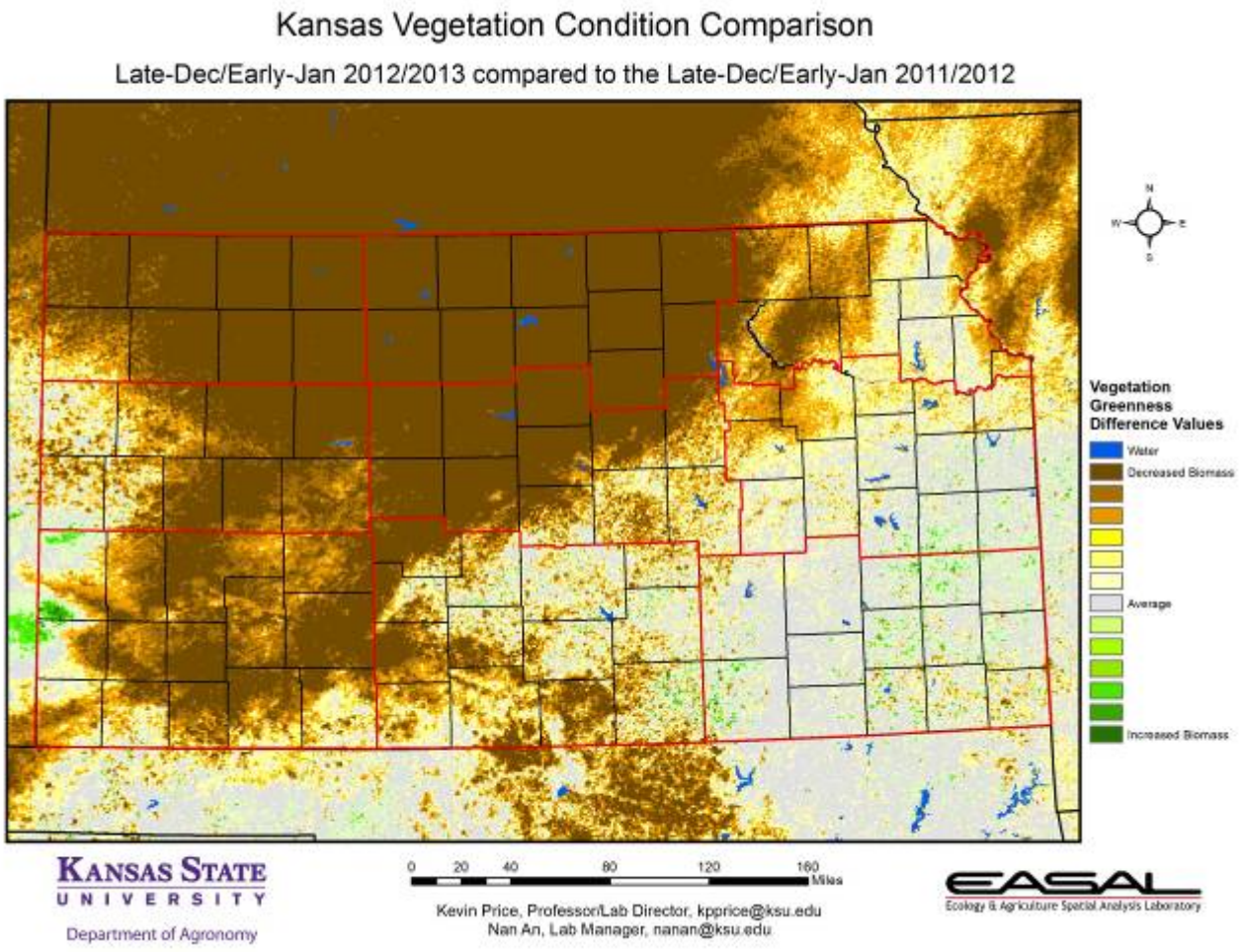
The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 24-year average. The report is used by individual farmers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

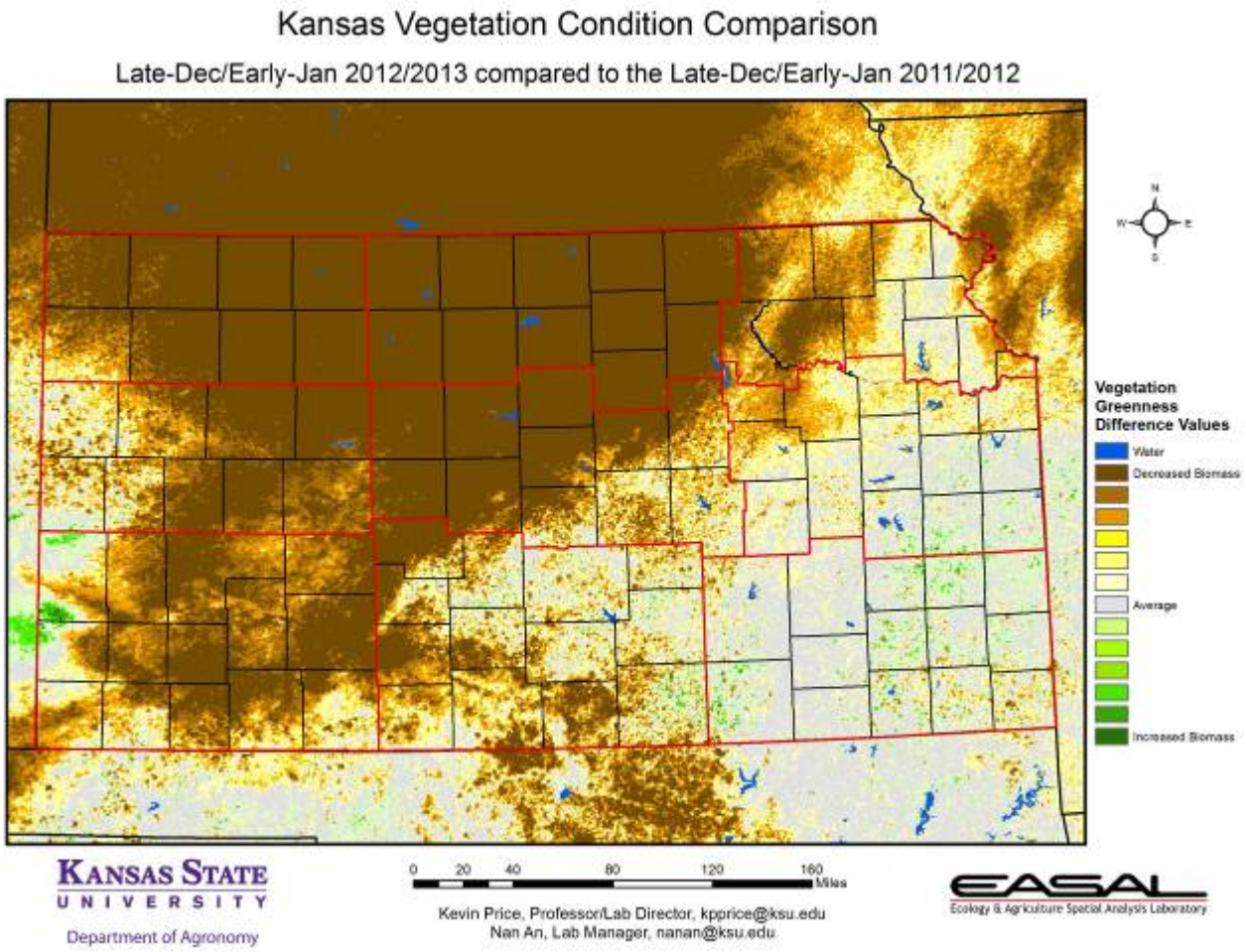
The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, the Corn Belt, and the continental U.S, with comments from Mary Knapp, state climatologist:



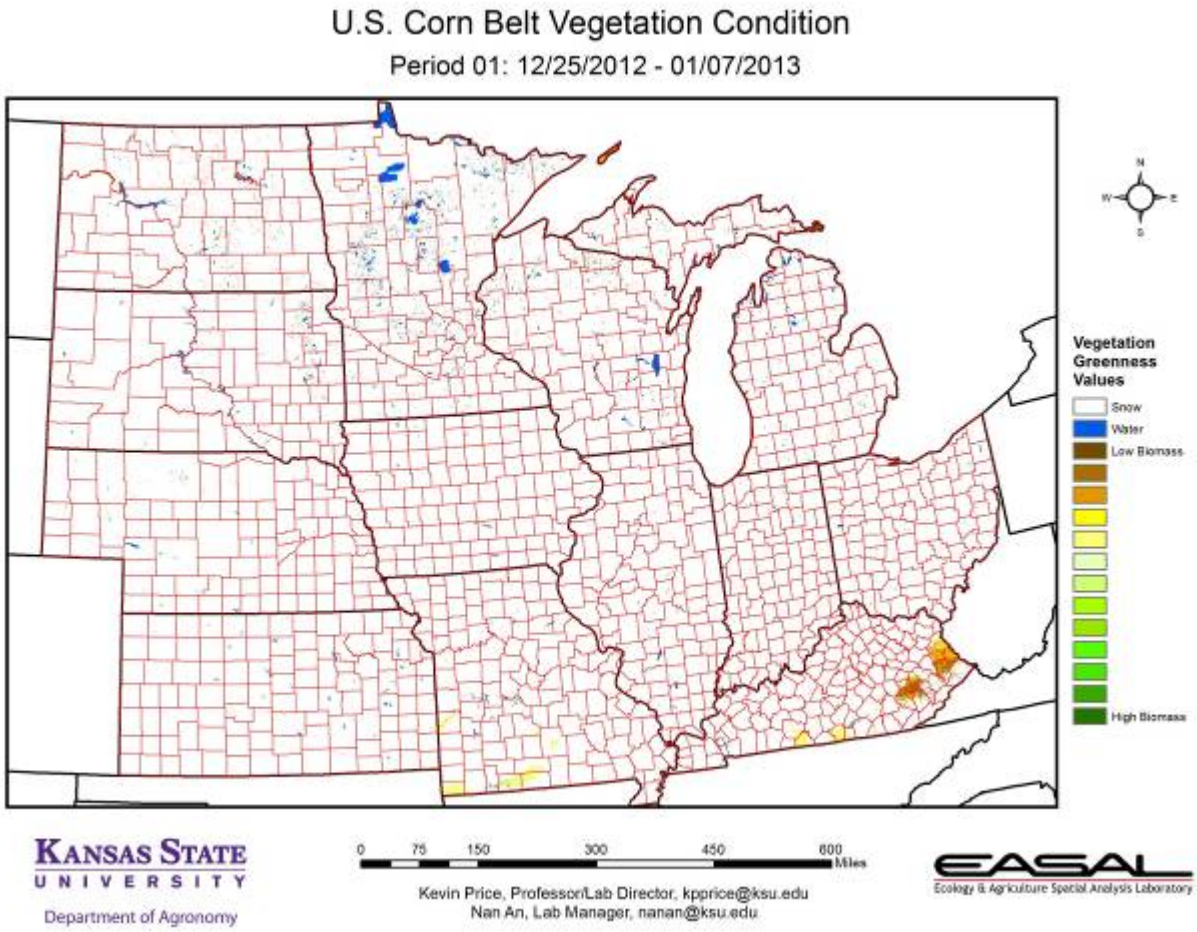
Map 1. The Vegetation Condition Report for Kansas for December 25 – January 7 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that most of the state saw snow during the period. Heaviest amounts were seen in northwest and north central Kansas, where totals were in the 6- to 10-inch range. Lighter amounts were seen in the southern and eastern regions.



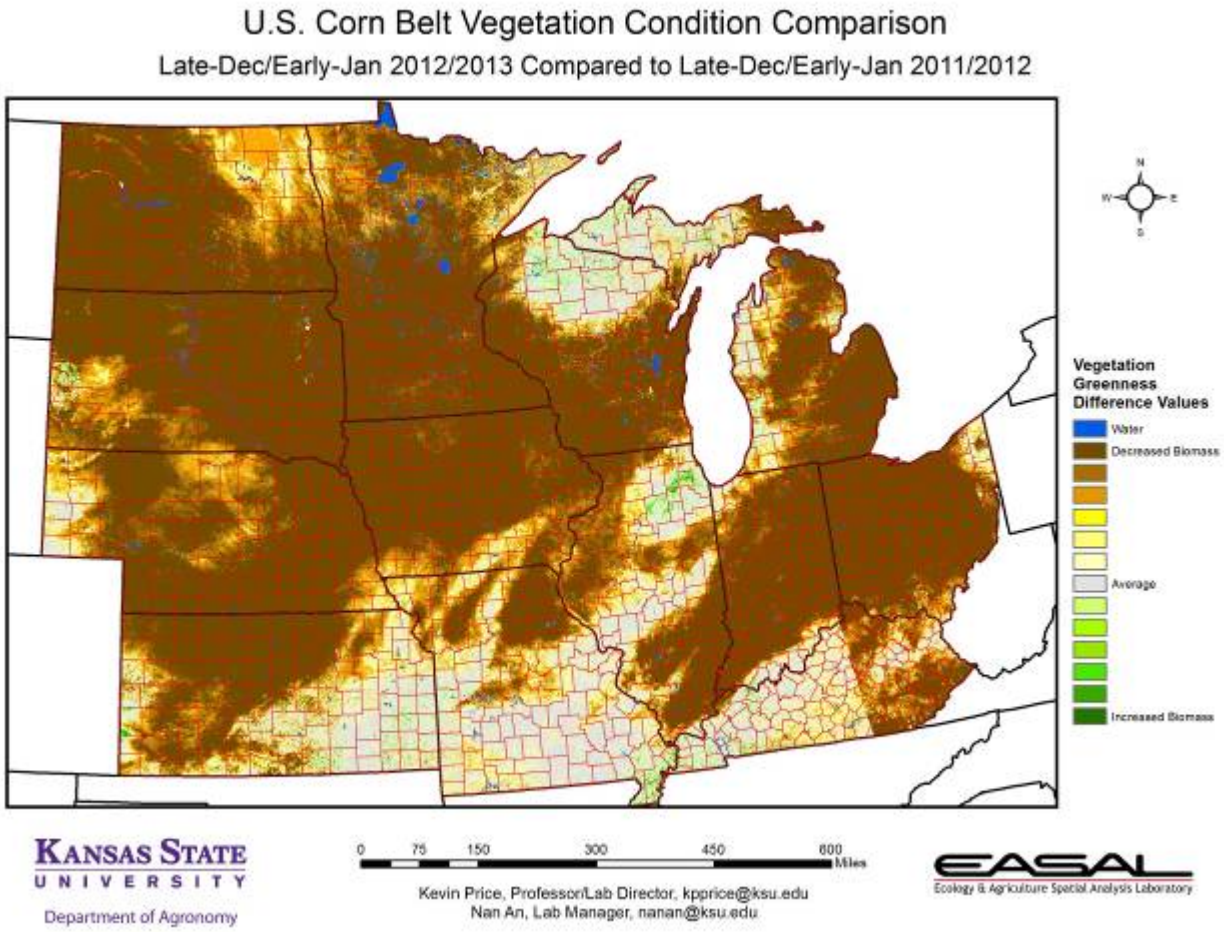
Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for September December 25 – January 7 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that biomass production is generally at or below last year's levels. The lower biomass values from the north central south to the southwest are the result of a combination of colder temperatures and lower precipitation this year.



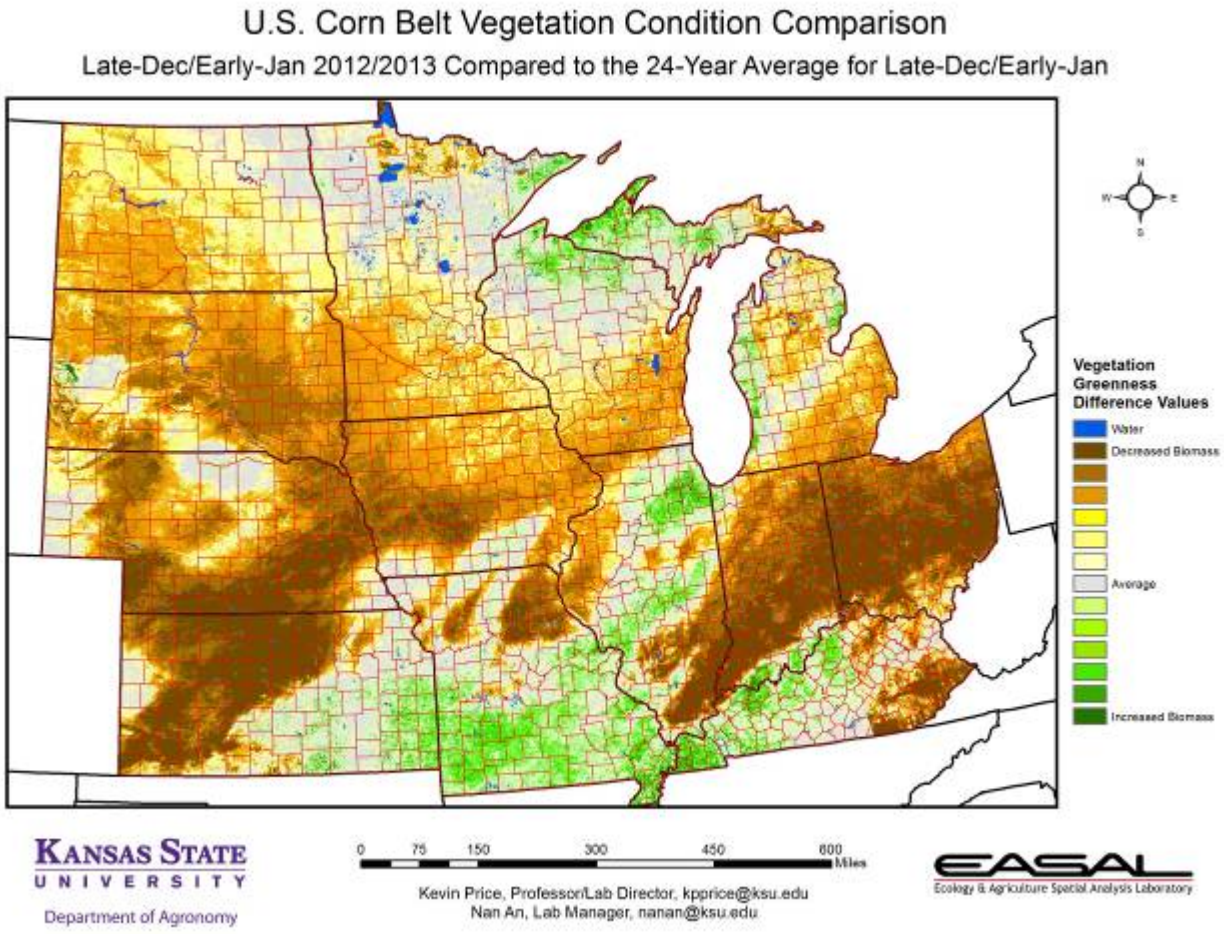
Map 3. Compared to the 24-year average at this time for Kansas, this year's Vegetation Condition Report for December 25 – January 7 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows a distinct line from northeast to southwest Kansas. Areas to the south and east of the line have seen milder temperatures, resulting in greater photosynthetic activity. This is not necessarily a positive, as that also means high evaporative rates increasing the drought stress in the region.



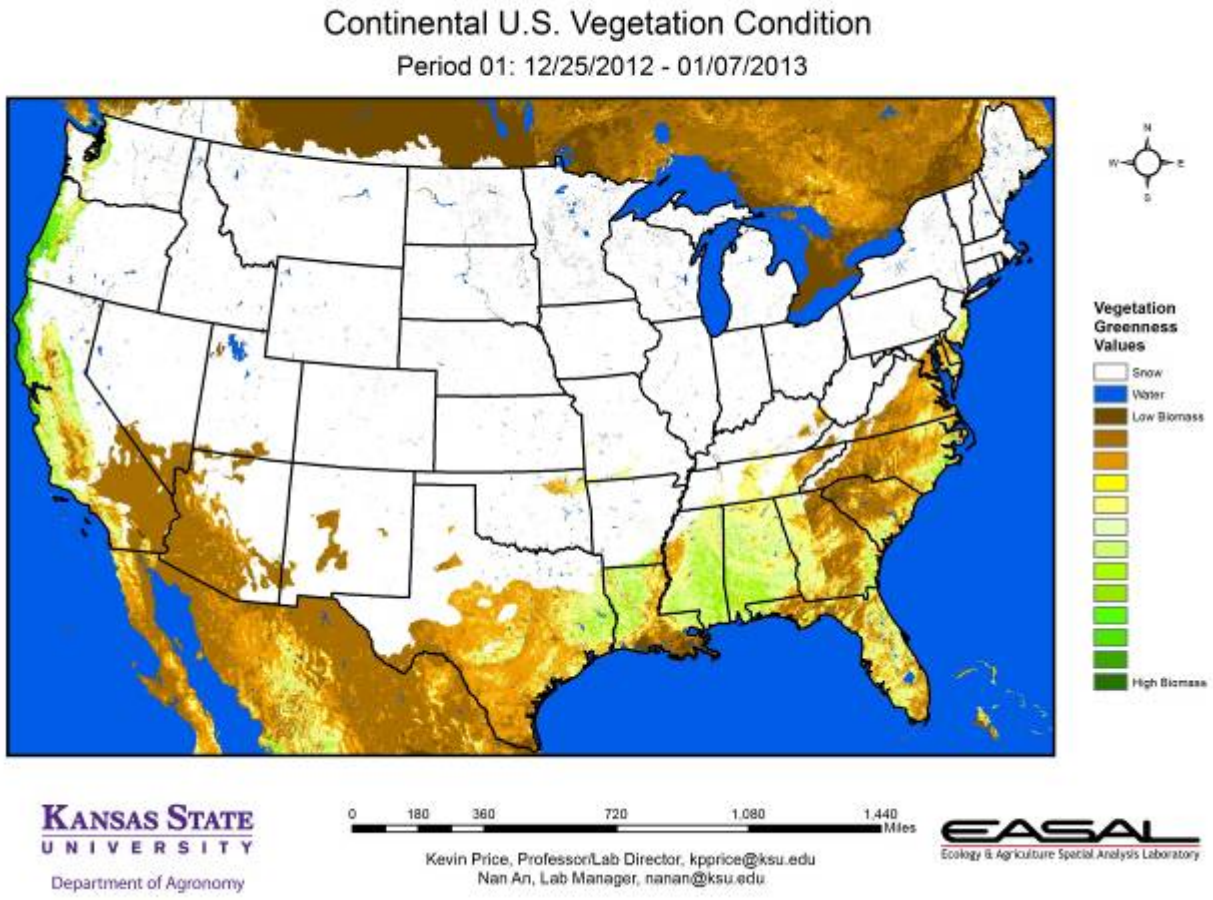
Map 4. The Vegetation Condition Report for the Corn Belt for December 25 – January 7 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that, as with Kansas, most of the Corn Belt saw significant snowfall during the period.



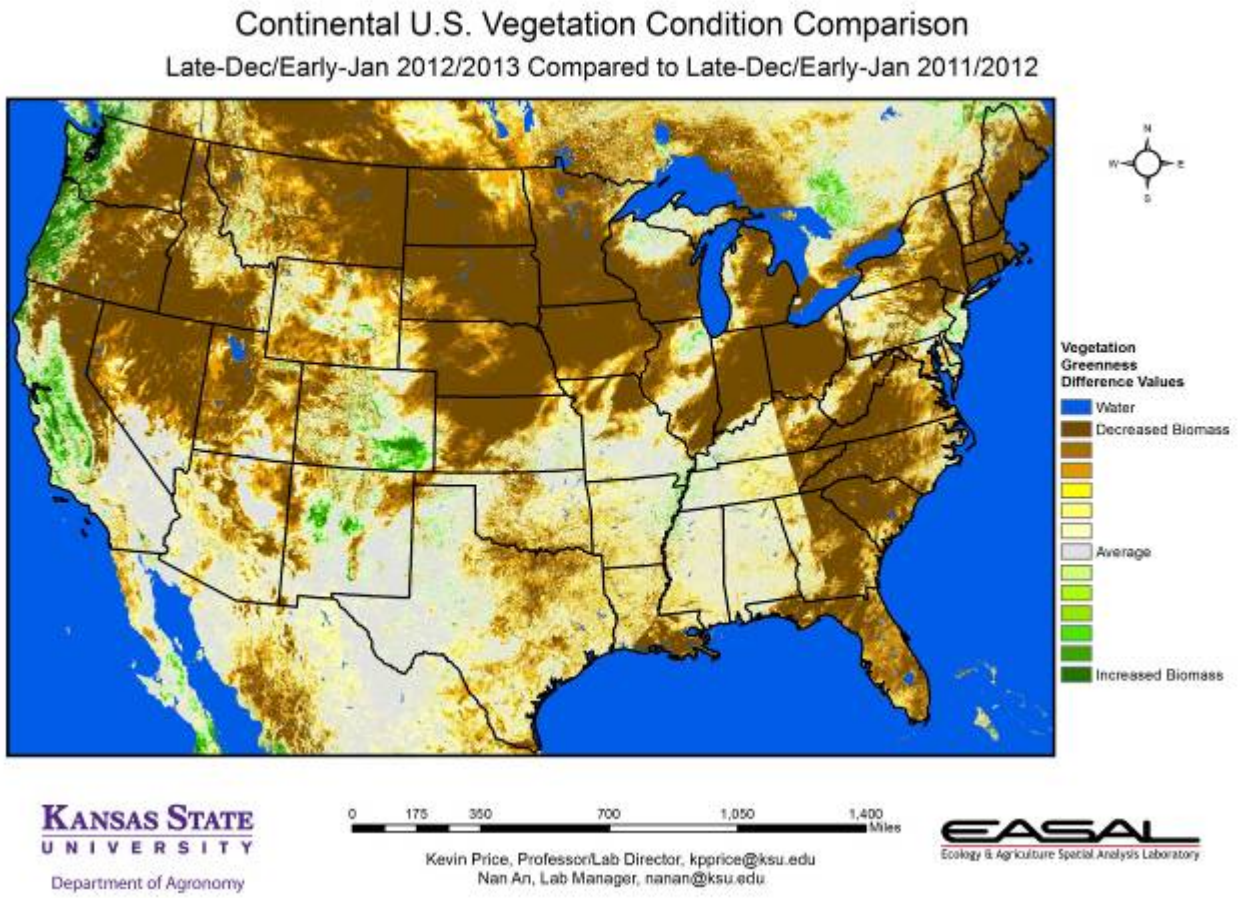
Map 5. The comparison to last year in the Corn Belt for the period December 25 – January 7 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows generally lower photosynthetic activity. Much of this can be attributed to cooler temperatures this season. Note in Kentucky there is a splice line due to cloud cover issues. This is distinct from the more diffuse line in Kansas, where the temperature gradient has influenced photosynthetic activity.



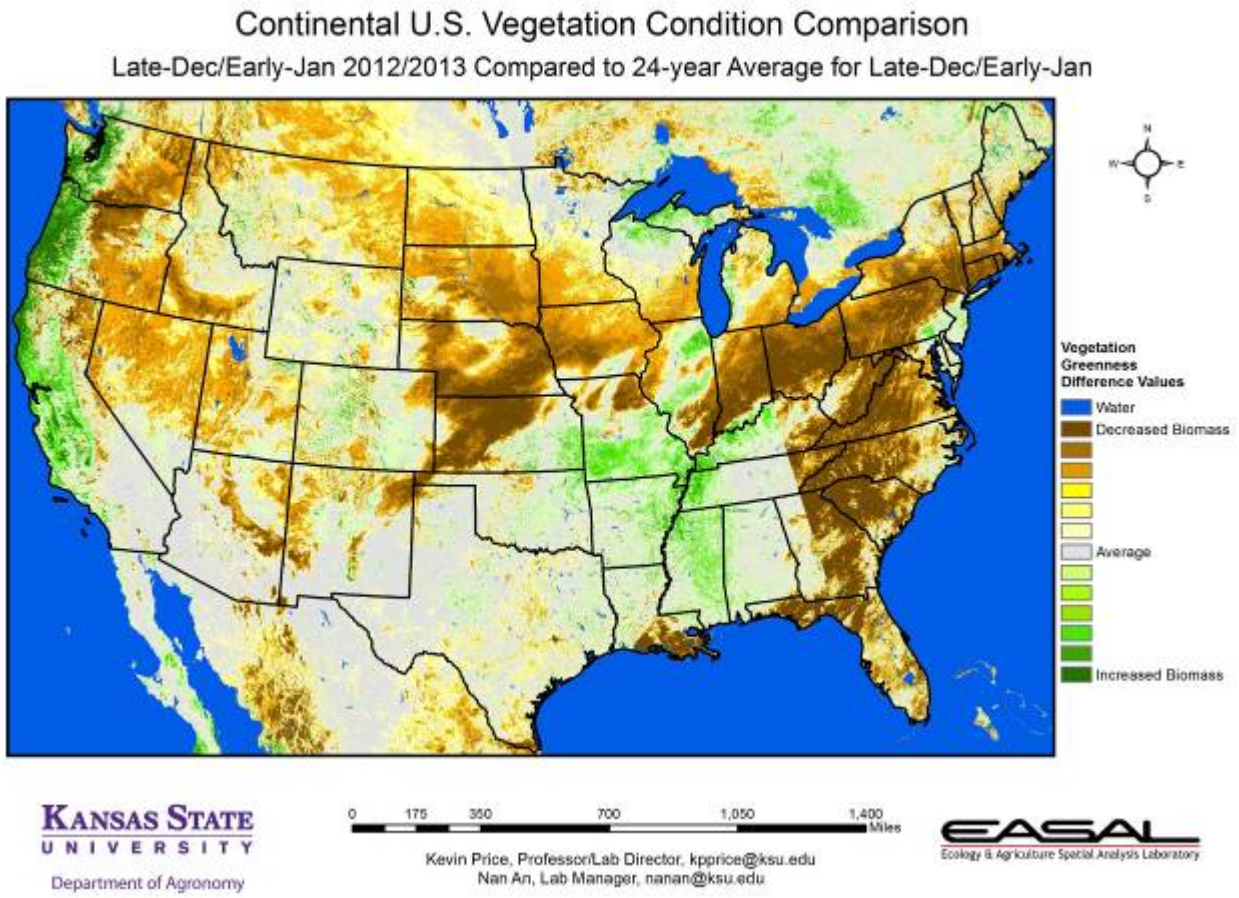
Map 6. Compared to the 24-year average at this time for the Corn Belt, this year's Vegetation Condition Report for December 25 – January 7 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that areas from southeast Kansas through central Illinois have higher NDVI values. Milder temperatures and some favorable precipitation have enhanced photosynthetic activity in these areas.



Map 7. The Vegetation Condition Report for the U.S. for December 25 – January 7 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that snow cover penetrated well to the south, including parts of northern and West Texas. In the snow belt regions, many areas are still below their normal accumulation, but well ahead of last year.



Map 8. The U.S. comparison to last year at this time for the period December 25 – January 7 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that there is a distinct splice line in the eastern part of the country running from Kentucky to Georgia. This is due to cloud cover, and different from the more diffuse line visible from the Oklahoma Panhandle northeast to northern Iowa. In the latter case, temperature and snowfall gradients have influenced photosynthetic activity.



Map 9. The U.S. comparison to the 24-year average for the period December 25 – January 7 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the Pacific Northwest has the greatest increase in photosynthetic activity. Favorable moisture and mild temperatures have resulted in much greater biomass production than usual.

-- Mary Knapp, State Climatologist
mknapp@ksu.edu

-- Kevin Price, Agronomy and Geography, Remote Sensing, Natural Resources, GIS
kpprice@ksu.edu

-- Nan An, Graduate Research Assistant, Ecology & Agriculture Spatial Analysis Laboratory (EASAL)
nanan@ksu.edu

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.