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#### 1. Effect of cold temperatures on unemerged wheat

In some areas of Kansas, wheat has not yet emerged. Will the cold weather we've had in December and January kill this wheat and prevent any chance of it making a stand later this winter? It's possible, but unlikely.

If the seed had germinated but not yet emerged, and if soil temperatures at seeding depth reach single digits, then that seed may be damaged. In that situation, full emergence later this winter or spring is unlikely. Damage could also occur where the plants have emerged but developed no crown roots, especially if soil temperatures reach single digits.

Where there has been snow cover, it is unlikely that soil temperatures have dipped into the single digits, however. Also, if the seed has not yet germinated or started to swell, it will not be damaged by soil temperatures even if they do reach single digits.

One of the most serious concerns on fields where the wheat has not yet emerged is the potential for blowing later this winter or early spring. Blowing will not only result in erosion losses from the fields in question, but can also cause damage to young emerged wheat plants in other fields.

The bottom line is that wheat that hasn't yet emerged will almost certainly emerge later this winter or early spring, whenever there's enough moisture and temperatures warm up. When wheat emerges in early spring, K-State research has shown that the yield potential will typically be about 40-60 percent of normal. In this situation, yields will benefit most from a long, cool filling period in May.

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## 2. Kansas Flint Hills Smoke Management Plan explained in radio broadcasts

The new Kansas Flint Hills Smoke Management Plan is beginning to take effect. This comprehensive plan is designed to minimize the movement of concentrated smoke plumes into large metropolitan areas. All Flint Hills landowners and managers who conduct prescribed burns will need to know what's in this plan.

To help educate all those affected, a series of radio interviews is being broadcast on Mondays on K-State's *Agriculture Today* talk show. These programs will explain the many aspects of the new plan. *Agriculture Today* is part of the K-State Radio Network. A list of stations carrying the program, and the times, is available at: [www.ksre.ksu.edu/news/DesktopDefault.aspx?tabid=61](http://www.ksre.ksu.edu/news/DesktopDefault.aspx?tabid=61). Online streaming is available during the broadcast at [www.ksre.ksu.edu/news](http://www.ksre.ksu.edu/news).

The broadcast interviews are also podcast online at [www.ksre.ksu.edu/news/DesktopDefault.aspx?tabid=66](http://www.ksre.ksu.edu/news/DesktopDefault.aspx?tabid=66). The most recent podcasts are also featured at [www.ksre.ksu.edu](http://www.ksre.ksu.edu). The first broadcast is now available online.

The schedule (which is subject to change) for the broadcasts is:

January 17. "Reasons for Burning in the Flint Hills" Clenton Owensby, K-State Department of Agronomy

January 24. "The Kansas Flint Hills Smoke Management Plan" Tom Gross, Kansas Department of Health and Environment

January 31. "The Role of Weather in Smoke Management" Kris Craven, National Oceanic and Atmospheric Administration

February 7. "How the Smoke Management Plan Will Affect Ranchers" Jeff Davidson, Greenwood County Extension Agent

February 14. "Decision Support System" Doug Goodin, K-State Department of Geography

February 21. "Legal Aspects of the Kansas Flint Hills Smoke Management Plan" Roger McEowen, Iowa State University

February 28. "Fire Management Practices for Smoke Management" Walt Fick, K-State Department of Agronomy

March 7. "Using a Burn Plan" David Kraft, Natural Resources Conservation Service

March 14. "The Role of Emergency Managers and Fire Chiefs in Implementing the Kansas Flint Hills Smoke Management Plan" Jason Hartman, Kansas Forest Service

March 21. "Non-Essential Burn Ban" Cindy Kemper, Johnson County Environmental Services

-- Carol Blocksom, Range Management  
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## 3. Reasons for burning in the Flint Hills

The following is a transcript of the first of the radio broadcasts (see article No. 2 above) on the Kansas Flint Hills Smoke Management Plan. This is an interview with Clenton Owensby, K-State rangeland scientist, conducted by Eric Atkinson of the K-State Radio Network.

Q: This coming spring the newly drafted smoke management plan for prescribed burning in the Kansas Flint Hills will be implemented on an introductory basis. A task force including producer

groups, K-State researchers and Extension specialists and agents, municipality officials, and state and federal environmental regulators teamed up to create this plan, the aim of which is to allow pasture burning to continue as an important management tool while preventing temporary spikes in air quality problems in our larger cities due to concentrations of smoke. Why is prescribed burning essential to preserving our native grass resources?

A: There are two primary reasons people burn. Number one is that it maintains a high quality prairie. There is concern you hear about prairie chickens, but the whole point of it is that without fire in this system, it will eventually revert to a forest type. It turns out that fairly frequent fire is necessary to maintain a quality tallgrass prairie in the Flint Hills.

Q: Is it an economic consideration for cattle producers as well?

A: The steers that are grazing on grass that has been burned will gain an average of about 30 pounds more per animal. That's if the burn is properly timed. You can't just burn at any time. You must burn at just about the beginning of growth of the warm-season perennial grass dominants that are out there in order to get that benefit from burning. And that occurs primarily in the first half of the season, so that impacts both the intensive early-season stock systems as well as the season-long stocking.

Q: How important is it from the perspective of grass management and woody brush control perspective, as well as the economic perspective, for producers in that concentrated time window (for native grasses) of April and early May?

A: If you want to hurt somebody, you want to hurt them when they're at their lowest point. It's the same thing with these woody species. When they have their lowest amount of food reserves, that material they use to regrow following top kill, if you burn at that low point then you get control. If you burn at an earlier date than that you're going to actually get an increase in the number of stems of those woody species. So it's very critical that you burn in the late spring. And the nice thing is that the late spring timing coincides with the maximum amount of cattle gain and obtaining the highest productivity of the grass. So to get woody plant control, high productivity of the warm-season perennial grasses, and really good gain in the cattle, you burn in late spring.

Q: You have done such extensive research on prescribed burning methods during your years at Kansas State University, and have interacted with a number of producers who have conducted prescribed burns, what is your assessment of how well individual landowners carry out this practice, and how efficiently?

A: They do really well. In fact, when we had meetings recently with producers from the Flint Hills region, one of the things they were most concerned about was the timing that burning occurred. They wanted to make sure they were doing it right. They had been doing it right because they had listened to the research work we had done here at K-State. Burning research at K-State started in 1918 and has continued to this day with respect to the production of livestock.

Q: So part of the message you would stress here is that prescribed burning can be managed appropriately. And with this new smoke management plan in place, can the objectives of that plan be met and still maintain the opportunity to preserve pasture land through burning?

A: Just to clarify, the number of times in the last six or seven years that we've had an incident where there was an exceedance of ozone levels in a metropolitan area has been three. So it's not a common occurrence. The normal practice is for them to begin to burn in the southern Flint Hills region earlier in the season because that's when growth starts there. Then it progresses up through the remainder of the Flint Hills. That then spreads it out over a larger time period. But when weather conditions get to the point that you cannot burn during that window down in the south, then they go later and later with their burn. And that then tends to coincide with the time that burning in the northern Flint Hills occurs, and that's when we have had exceedances in the ozone levels in those metropolitan areas. So there is a set of circumstances with respect to when burning occurs that makes a difference in the level of smoke from the Flint Hills region.

Q: If you were to talk to a producer who wanted to get your take on the smoke management plan and its implementation, and whether it will coincide with the need to manage grass with prescribed burning, what would you say?

A: In the meetings I've had and the testimony I gave before the state legislature, there was unanimous approval of the idea that the Flint Hills would burn. The rancher is not hamstrung by any of the new regulations. It is advisory in nature right now, and as long as ranchers in the Flint Hills region are cognizant of the fact that burning could cause a problem on a certain day, and that they change from one day to the next to burn in order to accommodate that, then I don't think there's going to be a difficult problem.

Q: So it really can be just as simple as a slight adjustment?

A: I think so. The key to the issue is that there are certain times when we burn huge numbers of acres because that's the first day of the year that a fire can occur. So what we basically need to do is that in this instance, make sure that we burn when the opportunity arises and not wait for that time when everyone else is burning. I am hopeful that just a few changes in the way we do things will cause us to have greater success in keeping regulation out of it. That's what we really want to do. We don't want them telling us when or how or if we burn. What we'd like to do is cooperate with them and make sure that burning occurs in the Flint Hills forever.

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#### 4. Availability of phosphorus in manure applications to soil

The total phosphorus content in manure varies depending on the animal species, age, diet, and how the manure has been stored. Concentration of phosphorus (P) in some manures may be up to 80 to 90 lbs  $P_2O_5$  per ton (some poultry manures, for example), whereas other manure may contain as little as 4 lbs  $P_2O_5$  per ton. It will require a laboratory analysis to know for sure.

#### **Phosphorus Availability Considerations**

When manure is applied to the soil, what percentage of this P is available to the crop during the first year?

A large fraction of the P in manure is considered to be plant available during the first year after application. The fraction that is not plant available shortly after application will become potentially available over time.

Estimated values of P availability are from 50 to 100%. This range accounts for variation in sampling and analysis, and for P requirements with different soil test levels. Use the lower end of the range of P availability values (50%) for soils testing “Very Low” and “Low” (below 20 ppm) in soil P tests. In these situations, significant yield loss could occur if insufficient P is applied and soil phosphorus buildup is desirable.

On the other hand use 100% availability when manure is applied to maintain soil test P in the “Optimum” soil test category, and when the probability of a yield response is small.

Several studies have shown that manure P is a valuable resource, comparable to inorganic fertilizer P for crop production. These two P sources are similarly effective when the manure P concentration is known and the manure is applied properly.

### **Preventing Excessive Phosphorus Buildup and Runoff Losses**

Excessive application of manure P (for example, applying manure at rates sufficient to meet the crop’s nitrogen needs) often results in excessive soil P buildup over time, resulting in higher risk of surface water contamination. This problem of excessive P buildup in the long-term can be minimized by:

- \* Applying manure to cover the P needs of the crop and using inorganic sources of fertilizer to complement nitrogen needs,
- \* Constantly monitoring soil test P levels, and
- \* Using the P-index to assess potential impact of P buildup on water quality.

It is also important to use caution when storing and stockpiling manure in the field with risk of runoff to nearby surface water sources, and in the application timing and methods. Manure should not be stored in the field for long periods of time to minimize risk of runoff losses and surface water contamination.

Manure application on snow-covered or frozen soils can also increase the risk of runoff and nutrient losses from the field, particularly on fields with significant slope. Manure incorporated after application is suggested whenever possible, particularly if there is a risk of significant rainfall events immediately after manure application.

### **Summary**

For maximum efficiency of manure use, it is essential to know the nutrient content of the manure. Using a manure lab analysis will help in determining the actual nutrient rates applied to a particular field. Producers should ideally think in terms of actual P application rates and not just gallons or tons per acre of manure being applied.

Uniform application of manure at precise rates can also be difficult. Careful calibration of manure applicators is needed. If these aspects are not considered, the efficiency of manure P compared with inorganic fertilizer P may be reduced. However with careful management, manure not only provides the needed P, but also additional macronutrients and micronutrients that may contribute to the overall plant nutrition.

For more information, see K State Extension publication MF-2562, “Estimating Manure Nutrient Availability,” at: <http://www.ksre.ksu.edu/library/crpsl2/mf2562.pdf>

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#### 5. Potassium fertilization of soybeans open-access webcast

The Plant Management Network has launched a new webcast in its Focus on Soybean webcast resource. This webcast is about potassium fertility in soybean by Robert Mullen, Associate Professor and Extension Specialist at The Ohio State University. The webcast is open access through February 28, 2011.

In this webcast, Mullen discusses:

- A soil science perspective of how potassium behaves in the soil and what dictates potassium availability.
- The soybean plant's interactions with potassium in the soil, including how potassium is translocated to the plant aboveground.
- Potassium's critical levels for multiple states and how they're determined.
- Diagnosis of potassium deficiency and the factors that lead to it.
- Foliar applications of potassium.

View Mullen's presentation at  
<http://www.plantmanagementnetwork.org/edcenter/seminars/PotassiumFertility/>

View other presentations on the Focus on Soybean homepage at  
[www.plantmanagementnetwork.org/fos](http://www.plantmanagementnetwork.org/fos).

The Plant Management Network (PMN) is a nonprofit online publisher whose mission is to enhance the health, management, and production of agricultural and horticultural crops. It achieves this mission through its applied, science-based resources, like Focus on Soybean. PMN is jointly managed by the American Society of Agronomy, American Phytopathological Society, and Crop Science Society of America.

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## 6. Comparative Vegetation Condition Report: January 3 – 17

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.

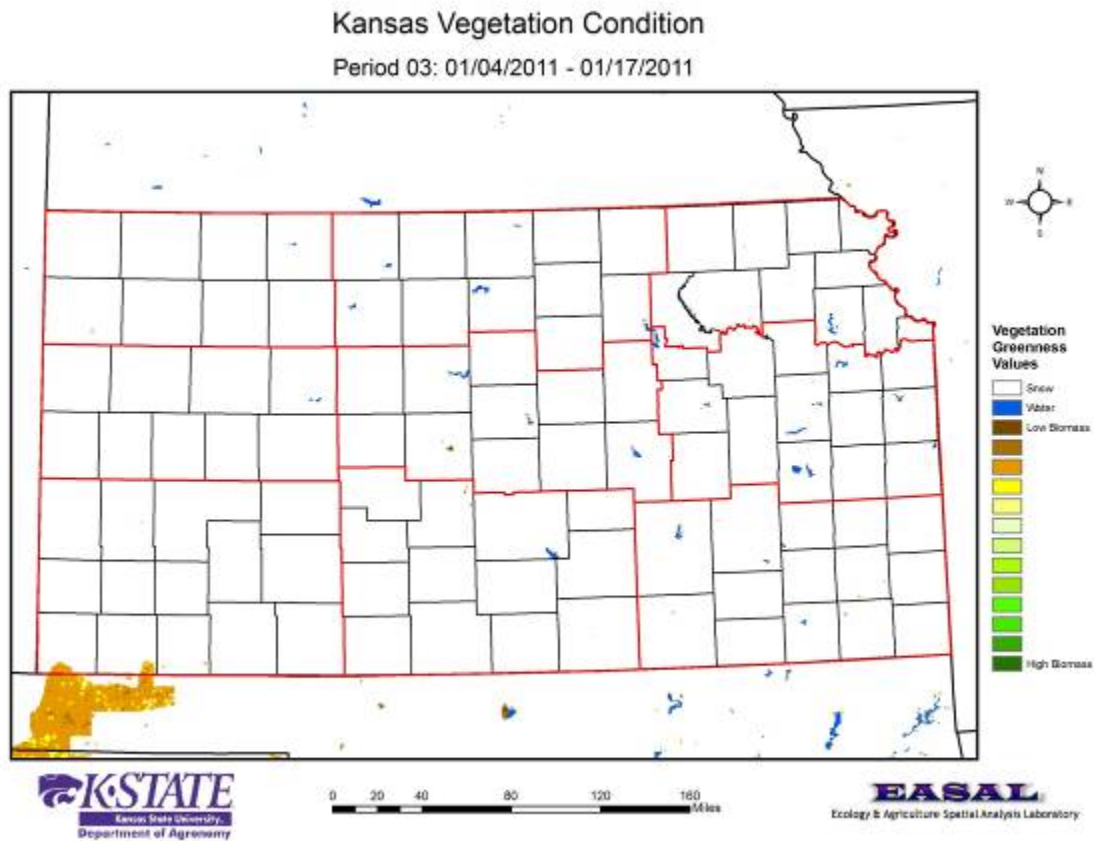
Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:

<http://www.youtube.com/watch?v=CRP3Y5NIggw>

<http://www.youtube.com/watch?v=tUdOK94efxc>

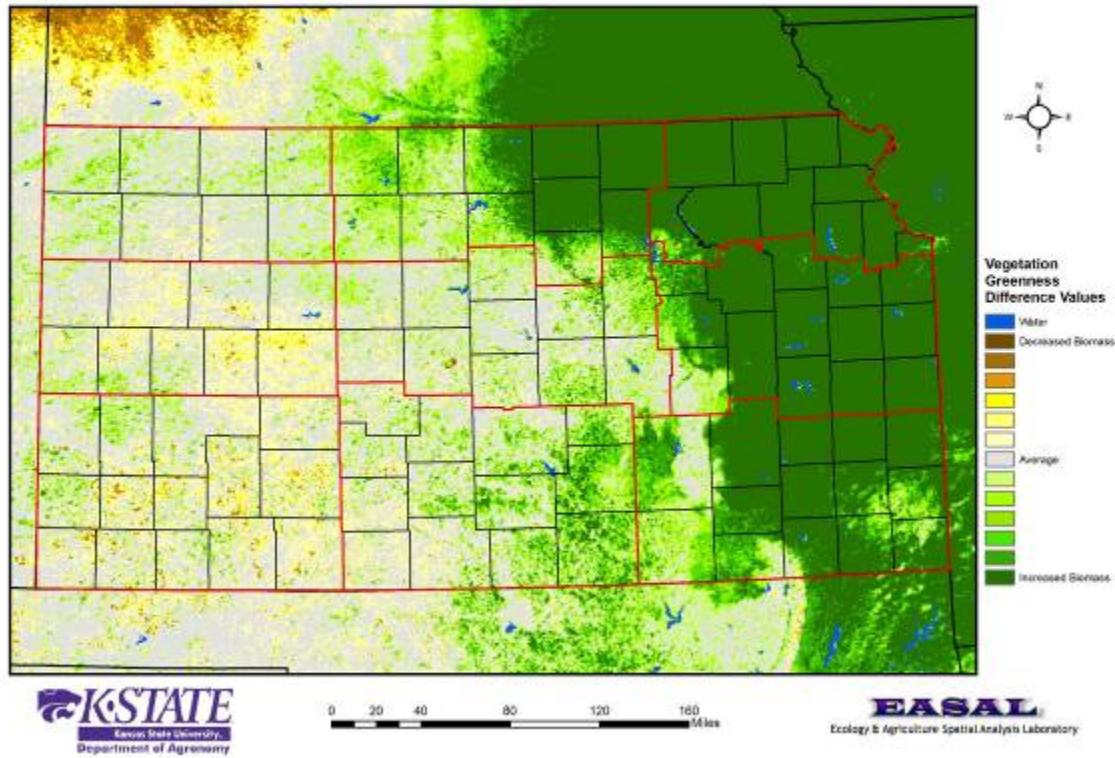
The objective of these reports is to provide users with a means of assessing the relative condition of crops and grassland. The maps can be used to assess current plant growth rates, as well as comparisons to the previous year and relative to the 21-year average. The report is used by individual farmers 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 Knapp's comments:



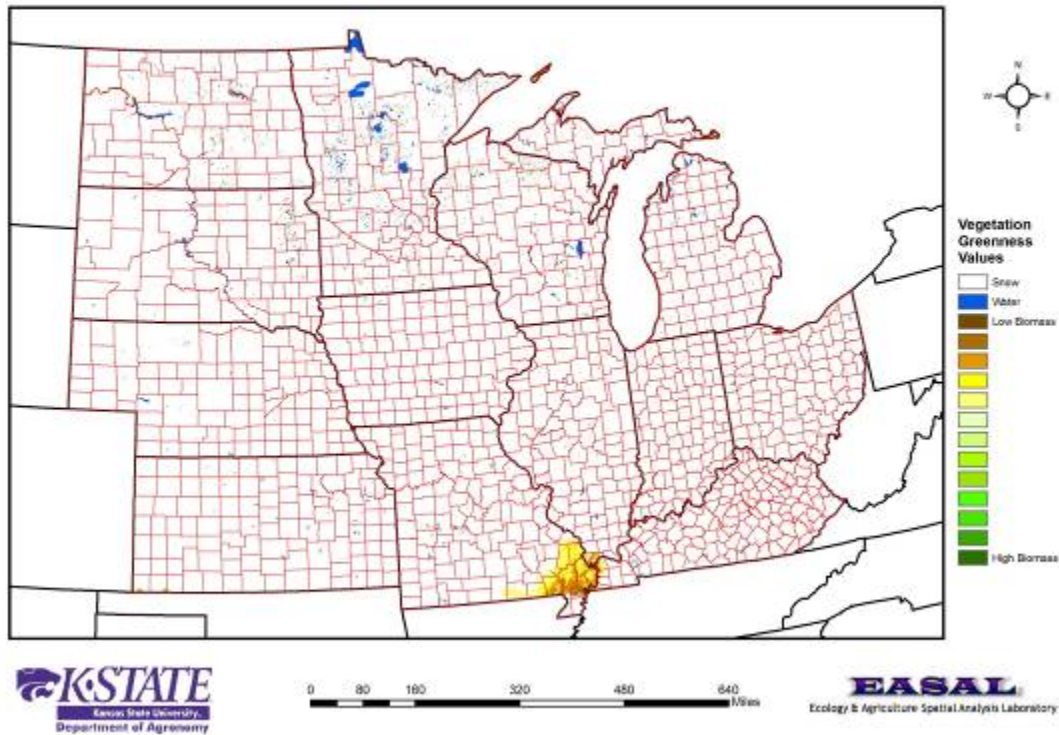
**Map 1. The Vegetation Condition Report for Kansas for January 3 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the wintery start to the year has continued. All of Kansas except a small area in southwest Kansas has had snow. Unfortunately, the liquid equivalent of the snow wasn’t particularly high. The northern divisions averaged greater than normal precipitation for the two-week period, while the southern and east central division had less than average. Amounts averaged from 0.48 inches in the north central and northeast to 0.14 inches in the southwest.**

# Kansas Vegetation Condition Comparison Early-January 2011 compared to the Early-January 2010



Map 2. Compared to last year at this time, this year's Vegetation Condition Report for January 3 – 17 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows region of increased photosynthetically active biomass compared to last year is shrinking. Areas of lower photosynthetic activity, compared to last year, are visible in southeastern Kansas and increasing in west central and southwest Kansas.

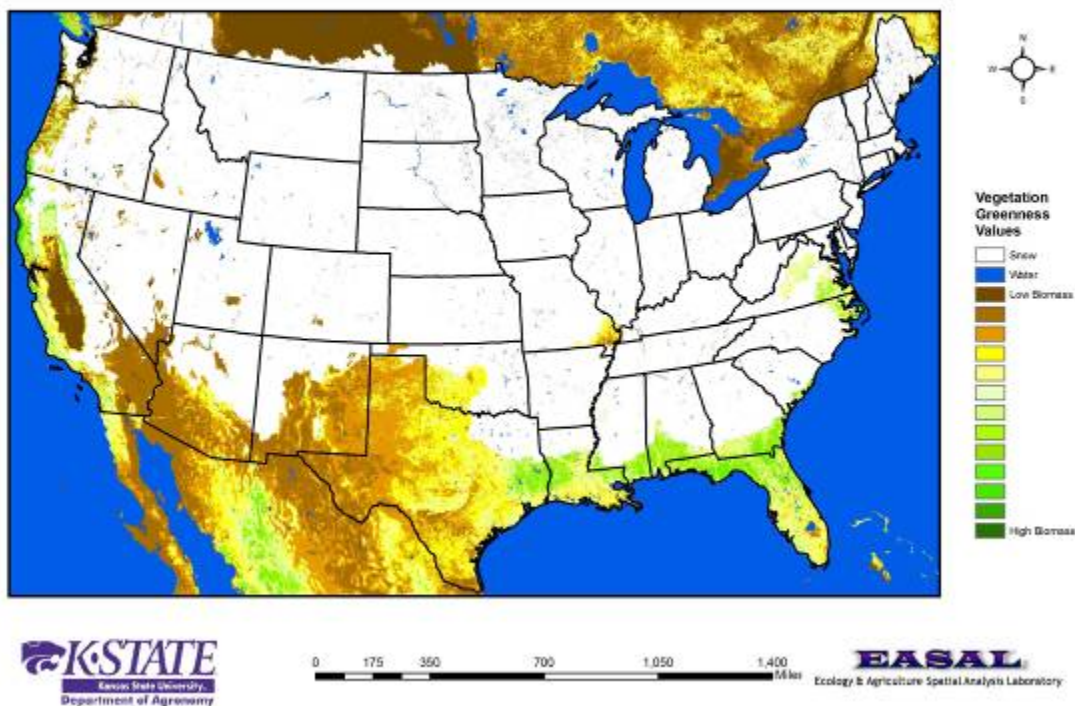
**U.S. Corn Belt Vegetation Condition**  
 Period 03: 01/04/2011 - 01/17/2011



**Map 3. The Vegetation Condition Report for the Corn Belt for January 3 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that only the Missouri Boot Heel region missed out on the series of winter storms that covered the Corn Belt during the period.**

## Conterminous U.S. Vegetation Condition

Period 03: 01/04/2011 - 01/17/2011



**Map 4. The Vegetation Condition Report for the U.S. for January 3 – 17 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the snow cover penetrated well into the South. However, much of Texas and parts of Oklahoma missed out on the moisture. The snowfall in Arkansas and Louisiana did not provide sufficient moisture to improve the drought conditions in these states. Texas had a slight decrease in the areas of drought, while Oklahoma had an increase in the areas with abnormally dry to drought conditions.**

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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](mailto:swatson@ksu.edu), or Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader 785-532-0397 [jshroyer@ksu.edu](mailto:jshroyer@ksu.edu)