

Number 344  
 April 6, 2012

<i>1. Ensuring successful soybean nodulation in fields without established rhizobial populations</i>	<i>1</i>
<i>2. Control of later-emerging kochia in wheat or wheat stubble</i>	<i>3</i>
<i>3. United Soybean Board offers 500 free subscriptions to Plant Management Network</i>	<i>4</i>
<i>4. March weather in Kansas</i>	<i>5</i>
<i>5. Wheat disease report: Evaluating the need for fungicides</i>	<i>6</i>
<i>6. Canola tours scheduled this spring</i>	<i>7</i>
<i>7. Kansas Flint Hills Smoke Management Plan: How smoke impacts air quality</i>	<i>9</i>
<i>8. Comparative Vegetation Condition Report: March 20 – April 2</i>	<i>11</i>

1. Ensuring successful soybean nodulation in fields without established rhizobial populations

Soybean planting season is rapidly approaching and many Kansas producers may be planting into ground that is new to soybean production or that has been out of soybean production for a number of years. The recent increase in soybean acres in Kansas has brought along, in some cases, issues and concerns in achieving effective nodulation on ground that has never previously grown soybeans. Fields that do not attain good nodulation likely will not receive adequate nitrogen for growth and therefore will display a lack of vigor, yellowing, and low yields. Figures 1 and 2 contrast soybeans with good and poor nodulation.



**Figure 1.** The left part of the field had a previous soybean crop, while the right side of the field had not. Photo courtesy of Stu Duncan, K-State Research and Extension.



**Figure 2.** Individual plants from each part of the field showing the visual contrast between well nodulated vs. poorly nodulated soybeans. Photo courtesy of Stu Duncan, K-State Research and Extension.

Functioning nodules on well-nodulated soybeans will provide up to 50 to 60% or more of the nitrogen needed by the plant. A large percentage of this nitrogen is fixed during the plant's reproductive stages, which is the period of greatest nitrogen demand.

Usually land that has been in recent soybean production will have adequate *Bradyrhizobium japonicum* communities present in the soil to nodulate the soybean roots without applying inoculant. However, when planting into "new" soybean ground or ground that has been out of soybean production for many years, as is the case for much of the CRP ground being converted back into crop production, proper bacterial inoculation is critical.

Other situations where proper inoculation is critical would include conditions where soil pH is less than 5.5 or greater than 8.5, where there was severe drought or flooding since the last soybean crop, where substantial soil erosion has occurred, or when the soil contains less than 1% soil organic matter.

The company-recommended rates for inoculants often have proven adequate when planting into new soybean ground. However, this is not always consistent, and several cases of inadequate nodulation have been reported in recent years. Often a 2X rate or combination of different inoculant products is used as added insurance for achieving a good bacterial population near the seedling roots for root colonization. Even then, it may take more than one properly inoculated soybean crop before soybean plants nodulate adequately.

Steps can be taken to ensure maximum numbers of viable *B. japonicum* are present in seed applied bacterial inoculants. These include keeping inoculant in cool, dry storage until seed application, ensuring good seed coverage when inoculating, storing inoculated seed in conditions that will minimize bacterial death (e.g. *B. japonicum* is sensitive to high temperatures), and planting inoculated seed within the recommended time period for the given inoculant product. The rhizobia are sensitive to lack of moisture. Therefore, dry field conditions may contribute to poor nodulation. Also, high residual nitrate levels in the soil will inhibit nodule formation. It may be a good idea to use a non-legume crop in those situations.

If soybeans are planted into fields where excessive residual nitrate is suspected, monitor the field and be ready to apply additional N during pod fill if nodulation has been severely inhibited and nitrogen deficiency symptoms appear. Past research has produced conflicting results regarding late-season nitrogen applications, but the greatest success has been in high-yield situations (>60 bu/acre) where nitrogen can be applied via an irrigation system.

When planting into a site that has had no previous soybean history, monitor the field for nodule development on the soybean roots to ensure inoculation was effective. Do this by digging up plants at different locations in the field and visually assessing nodulation. Do not pull up plants because nodules likely will be stripped off the roots. Small nodules should be observed on the tap root three to four weeks after planting. The number and size of nodules on the roots will continue to increase until the R5 growth stage.

For adequate nodulation there should be 8-15 functioning nodules per plant by approximately 40 days after emergence. Healthy, functioning nodules will appear pink on the inside when split open. If there is a field that has failed to nodulate, a "rescue" nitrogen fertilizer application will most likely

be profitable (see Agronomy e-Update No. 302, June 17, 2011, at: <http://www.agronomy.ksu.edu/extension/p.aspx?tabid=58>).

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## 2. Control of later-emerging kochia in wheat or wheat stubble

Getting kochia under control in any cropping system that includes wheat begins with the wheat crop during the spring, and shortly after wheat harvest. This is not always easy, even if an application of dicamba had been made before jointing to control kochia present at that time.

### **Later-emerging kochia in wheat**

While a majority of kochia emerges early in the spring, some emergence can extend over a period of weeks or months. A herbicide applied early in the spring will need to have residual activity to be effective on later-emerging kochia. Several ALS-inhibitor herbicides have good residual activity, but are ineffective on ALS-resistant kochia.

Dicamba, a non-ALS herbicide and one of the more effective products on most populations of kochia, must be applied before the jointing stage of wheat, meaning that later-emerging plants may not be controlled.

Most other non-ALS herbicides that can be applied at a later growth stage of wheat are primarily contact herbicides that require thorough coverage to be effective, and this can be difficult to achieve when the wheat canopy gets larger and covers up some of the kochia present. Two exceptions are Huskie and Starane. Those two products can be applied at later growth stages of wheat, are translocated (Starane more so than Huskie), and are effective on kochia.

### **Control in wheat stubble after harvest**

If kochia has not been completely controlled in the wheat crop, then it may be present at the time wheat is harvested. In most cases, the kochia plants will have grown taller than the wheat canopy and will get “topped” by the combine as the wheat is harvested.

If kochia has been topped, producers should wait until some regrowth has occurred before applying herbicides in the wheat stubble to control it. A combination of glyphosate plus either dicamba or Starane may be the most effective treatments to control kochia in wheat stubble. Even if kochia populations are resistant to glyphosate, the tank-mix combinations with dicamba or Starane will probably provide good control, as long as the kochia aren't too big or stressed. Some 2,4-D can be

added to the mixture to help with control of other broadleaf weeds, although 2,4-D generally will not help much in controlling kochia.

An alternative option would be to treat the kochia with Gramoxone. Gramoxone activity will be increased if applied with atrazine. However, only corn or sorghum may be planted the following spring if atrazine is used. If soybeans will be planted the following spring, metribuzin (Dimetic, Glory, Metri, Metribuzin, Tricor, and others) can be used instead of atrazine to enhance the Gramoxone activity. These chemistries are contact herbicides requiring thorough coverage and more spray volume than does a glyphosate treatment.

To improve the chances of getting good control after wheat harvest, apply the postharvest treatments in the morning hours or after the field has received some moisture, not when the kochia plants are under maximum stress. If kochia has been severely drought stressed before treatment, waiting a couple of days following a good rain may provide optimum control from the herbicide treatment. If glyphosate is the product of choice, use the highest labeled rate, and make sure to add ammonium sulfate and any necessary surfactants.

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### 3. United Soybean Board offers 500 free subscriptions to Plant Management Network

As part of its tech transfer efforts, the United Soybean Board purchased 500 one-year subscriptions to the Plant Management Network (PMN) for soybean growers and the consultants who work for them. These subscriptions are available on a first-come, first-serve basis and are intended for first-time subscribers.

This subscription includes access to PMN's entire collection of "Focus on Soybeans" webcasts. More than 50 soybean webcasts have been produced to date, and they feature actionable crop management information from experts who work in the field.

PMN subscriptions also include access to nearly 8,000 fungicide, nematicide, insecticide, and biological control trials; more than 1,000 applied crop management research articles; nearly 3,000 crop management news articles; about 5,000 images; tens of thousands of extension documents, and other information useful for growers and consultants. All of this is located through in one central website and searchable by keyword.

You can sign up for a free one-year subscription to all the Plant Management Network's content through the signup form at the following short link: <http://bit.ly/GFDCzj>.

Those who fill out the form will be allowed access to the site through a username and password of their choosing.

Once subscribed, users will receive article alerts once a month in the form of PMN's Update newsletter. Subscriber-only content can be accessed through the username and password.

Only 500 subscriptions are available, so readers are encouraged to sign up for their free username and password as soon as possible. View PMN's entire collection of soybean-inclusive resources at <http://www.plantmanagementnetwork.org/subscriptions/details/soybean.asp>.

-- Phil Bogdan, Plant Management Network subscriber relations manager  
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#### 4. March weather in Kansas

March was much warmer than average in Kansas. Preliminary numbers indicate the statewide average temperature of 54.5 degrees F was 11.7 degrees warmer than normal. This marked it as the 2<sup>nd</sup> warmest March on record for the state. The warmest March occurred in 1910, when the statewide average temperature was 54.7 degrees F. The western divisions had the smallest departures from average, with southwest Kansas averaging 53.1 degrees F or 9.6 degrees warmer than normal. The Northeast Division, with an average of 56.3 degrees F was the warmest at 13.1 degrees above normal.

The biggest departures were in the minimum temperatures. While 185 daily record highs were met or broken, 323 record warm minimums were matched or broken. The highest reading was 89 degrees F at Atwood (Rawlins County) on the 18<sup>th</sup> and Liberal (Seward County) on the 26<sup>th</sup>. The coldest reading for the month was 12 degrees F at Tribune 14N (Greeley County) on the 2<sup>nd</sup>.

Preliminary statewide average precipitation was 2.44 inches, which was 115% of normal. This makes it the 32<sup>nd</sup> wettest March since 1895. The Southeast Division was the wettest in overall precipitation at an average of 5.10 inches or 169% of normal. The Northwest Division was the driest, with an average precipitation of 0.87 inches or 61% of normal. Only four days saw no reports of precipitation, and on 11 days the statewide average was zero, with only isolated reports of moisture. Heaviest rains occurred on March 20<sup>th</sup>, with some flooding reported in southeast Kansas. This continued to make substantial inroads on the soil moisture deficits. Drought conditions improved in the southern divisions, while abnormally dry conditions developed in the Northwest Division.

The latest Drought Monitor showed a decrease in the area of all drought categories. The biggest improvement was a reduction in the area covered by "exceptional" to "extreme" drought. The "exceptional" drought no longer is listed in the state. Currently, just under 45% of the state is reported as "abnormally dry" to "exceptional drought." The latest Drought Outlook indicates drought conditions are expected to continue to persist in the southwestern portions of the state. The La Niña continues, but is expected to fade by the end of April. There is a slight increase in the probability of drier-than-average conditions in the western third of the state, and equal chances for above- or below-normal precipitation in the rest of the state. Temperatures are expected to continue above average.

March 2012										
Kansas Climate Division Summary										
Division	Precipitation (inches)						Temperature (°F)			
	March 2012			January - March 2012			Ave	Dep. <sup>1</sup>	Monthly Extremes	
	Total	Dep. <sup>1</sup>	% Normal	Total	Dep. <sup>1</sup>	% Normal			Max	Min
Northwest	0.87	-0.55	61	1.60	-0.65	70	50.6	10.6	89	15
West Central	1.43	0.09	108	2.11	-0.15	93	50.9	9.8	87	12
Southwest	1.98	0.71	157	2.61	0.43	119	53.1	9.6	89	15
North Central	1.43	-0.66	69	3.06	-0.23	92	54.5	13.1	87	17
Central	2.03	-0.18	92	3.97	0.31	108	55.2	11.9	87	17
South Central	2.54	0.36	115	5.65	1.87	147	55.7	10.9	88	20
Northeast	2.47	0.10	103	4.85	0.71	115	56.3	14.1	85	17
East Central	3.54	0.87	131	5.99	1.27	128	57.3	13.5	85	23
Southeast	5.10	2.12	169	7.85	2.32	142	57.3	11.4	86	24
<b>STATE</b>	<b>2.44</b>	<b>0.38</b>	<b>115</b>	<b>4.27</b>	<b>0.73</b>	<b>115</b>	<b>54.5</b>	<b>11.6</b>	<b>89</b>	<b>12</b>

1. Departure from 1981-2010 normal value  
2. State Highest temperature: 89 °F at Atwood (Rawlins County) on the 18th; Liberal (Seward County) on the 26th.  
3. State Lowest temperature: 12 °F at Tribune 14N (Greeley County) on the 2nd.  
4. Greatest 24hr rainfall: 3.97 inches on the 20th at Bronson 0.2 SW , Bourbon County (CoCoRaHS); 3.60 inches on the 20th at Bartlett 1WSW, Labette County (NWS)  
Source: KSU Weather Data Library

-- Mary Knapp, State Climatologist  
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5. Wheat disease report: Evaluating the need for fungicides

*Disease situation:*

I continue to get reports of low levels of stripe and leaf rust in Kansas. Reports to date have come from primarily south central and central regions of the state. Counties where stripe rust has been reported include: Harper, Kingman, Sedgwick, Pratt, Reno, McPherson, and Saline. The stripe rust in Kansas has been primarily observed on Everest and Armour. This is important because these varieties were previously thought to be resistant to stripe rust.

Leaf rust was observed at trace levels in Kingman, Ness, and Riley counties. Tan spot and other leaf spotting diseases are also being reported in many parts of Kansas. Tan spot is severe in some fields with considerable wheat residue left on the soil surface.

Wheat streak mosaic and barley yellow dwarf are also being reported in some fields. The reports of wheat streak to date have come primarily from central Kansas and a few from eastern Kansas. This

viral disease is historically less common in these portions of the state, but can occur when volunteer wheat is left uncontrolled during the previous summer and fall.

*Risk of Fusarium head blight (FHB):*

There is a national effort to predict outbreaks of FHB based on weather conditions prior to flowering when wheat is most vulnerable to this disease. The prediction models available on-line are showing that considerable areas of central Kansas have moderate and high risk of disease. This is cause for concern, but is not critical during the boot stage of development. Farmers should be carefully monitoring the risk of FHB as the wheat moves into the heading stages of growth. I mention this now because management of FHB requires some modification to fungicide timing and influences product choice. You can find more information about the risk of FHB at:

[http://www.wheatcab.psu.edu/riskTool\\_2012.html](http://www.wheatcab.psu.edu/riskTool_2012.html)

*Evaluating the need for fungicides:*

Producers should be checking their wheat fields for symptoms of disease and making plans for fungicide applications if disease is present. The activity of stripe rust and other diseases in Kansas is a cause of concern, suggesting at least a moderate risk of severe disease in 2012. Finding even low levels of disease on the top two leaves prior to flowering indicates a high risk of severe yield loss. Recent weather in central and south central Kansas has been favorable for continued disease development, further reinforcing the decision to apply a fungicide. Many fields have excellent yield potential this year and are worth protecting with fungicides. Seed production fields are also a top priority. For more information about fungicide decisions in wheat see our recent K-State publication, *Evaluating the Need for Wheat Foliar Fungicides*, MF-3057

<http://www.ksre.ksu.edu/library/plant2/mf3057.pdf>

The best time to apply a fungicide for leaf disease management is between flag leaf emergence and flowering. Most of the wheat in south central or central Kansas is already at flag leaf emergence and boot stages of development. This means that farmers have approximately 10-14 days to make fungicide applications. Applications targeting Fusarium head blight should be made after the wheat has fully headed.

There are many fungicides labeled for use on wheat. Nearly all fungicides provide very good or excellent control of foliar diseases. There is a significant difference in product costs, however, with products containing tebuconazole or propiconazole being the lowest cost options (often less than \$4 per acre product costs). The triazole fungicides including Prosaro and Caramba are the best option for suppression of Fusarium head blight. More information about fungicide products can be found in the publication, *Foliar Fungicide Efficacy for Wheat Disease Management, 2012*, EP130.

<http://www.ksre.ksu.edu/library/plant2/ep130.pdf>

-- Erick DeWolf, Extension Plant Pathology

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## 6. Canola tours scheduled this spring

Kansas farmers will have several opportunities to get a first-hand look at canola fields and research plots in Kansas during the Canola Field Tours scheduled for late April and early May.

The winter canola crop looks very good this spring and we want to give producers an opportunity to see the crop growing in the field. These field tours allow canola producers and those interested in growing canola to view the crop at a time when yield potential is being determined.

Dates, times, locations, and topics for the tour include:

April 27, 2012, 7:30 a.m. – Caldwell

- From K-49 Hwy on the north side of Caldwell, take Avenue G west. Turn right onto Sunflower Rd. (road curves north). Sunflower road turns west and merges with 160<sup>th</sup> Street. Take 160<sup>th</sup> Street west to Milan Rd. Turn left (south) and drive  $\frac{3}{4}$  mile to the field. Field is on the right (west) side of the road.
- Discussions will focus on the current stage of the crop, harvest risk management, and marketing.

April 27, 2012, 10:00 a.m. – Anthony

- From K-2 Hwy on the north side of Anthony, take Garfield Street and drive east  $\frac{1}{2}$  mile.
- Discussions will focus on the current stage of the crop, harvest risk management, and marketing.

May 1, 2012 8:00 a.m. – Lincoln

- From Lincoln, drive two miles east on K-18 Hwy, take 220th Road south two miles. Turn east on Jaguar and drive 1.5 miles to 235th Road. Turn north and drive  $\frac{3}{4}$  mile, then east one mile on Jewel Lane.
- Discussions will focus on the current stage of the crop, harvest risk management, and marketing.

May 1, 2012, 11:00 a.m. – Marquette

- One mile west of Marquette on K-4 Hwy, turn south and take 4th Avenue one mile. Turn west on Smoky Valley Road. Drive one mile then turn north on 3rd Avenue. Drive  $\frac{1}{4}$  mile and the plot will be located on the right (east) side of the road.
- Discussions will focus on the current stage of the crop, harvest risk management, and marketing.
- View 24 commercial winter canola varieties.

May 4, 2012, 11:00 a.m. – Sedgwick County Winter Canola Variety Trial

- From Garden Plain, drive  $5\frac{1}{4}$  miles north on 295<sup>th</sup> Street. Plot is on the east side of the road.
- Discussions will focus on the current stage of the crop, harvest risk management, and marketing.
- View 24 commercial winter canola varieties.
- Lunch provided.

May 31, 2012, 4:00 p.m. – K-State Southwest Research-Extension Center, Garden City

- View 45 entries in the National Winter Canola Variety Trial and learn about today's newest and top-performing varieties.

June 6, 2012, 7:30 a.m. – K-State North Central Experiment Field, Belleville

- View 45 entries in the National Winter Canola Variety Trial and learn about today's newest and top-performing varieties.
- Discussions will focus on general canola production practices.
- Learn if winter canola is an option for north central Kansas.

The field days at Caldwell, Anthony, Lincoln, and Marquette are part of the cooperative agreement between K-State and the USDA's Risk Management Agency (RMA) to promote canola production and educate growers on good farming practices and risk management. The program is titled "Promoting and Disseminating Good Farming Practices and Risk Management Education for Winter Canola to Farmers and Ranchers in the Topeka, Kansas RMA Region." These field days are sponsored jointly by K-State Research and Extension and the RMA.

More information and directions to the sites are available by contacting your local county Extension office, or Mike Stamm at 785-532-3871 or [mjstamm@ksu.edu](mailto:mjstamm@ksu.edu).

-- Mike Stamm, Canola Breeder  
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## 7. Kansas Flint Hills Smoke Management Plan: How smoke impacts air quality

The Kansas Flint Hills Smoke Management Plan is entering its second year in 2012. This comprehensive plan is designed to minimize the movement of concentrated smoke plumes into large metropolitan areas through voluntary participation. All Flint Hills landowners and managers who conduct prescribed burns should know what is in this plan.

To help educate all those affected, a series of radio interviews is being broadcast weekly each Monday 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. The broadcast interviews are podcast online at [www.ksre.ksu.edu/news/DesktopDefault.aspx?tabid=66](http://www.ksre.ksu.edu/news/DesktopDefault.aspx?tabid=66).

The following is a slightly edited transcript of the last in the 2012 series of *Agriculture Today* radio broadcasts on the Kansas Flint Hills Smoke Management Plan. This is an interview with Doug Watson, Kansas Department of Health and Environment air quality data supervisor, conducted by Eric Atkinson of the K-State Radio Network.

Q: What exactly does smoke from prescribed burns do to air quality? Your office monitors this very closely, right?

A: Yes. We have a monitoring network spread out across the state. We're able to monitor various pollutants and see how they are affecting air quality in those mainly metropolitan areas.

Q: What are the specific smoke-related pollutants?

A: The pollutants coming off a prescribed burn are precursors for the formation of ozone, organic compounds and nitrous oxide. The other pollutants of concern are particulate matters, both PM2.5 (which is a smaller particle) and PM10 (which is a larger particle).

Q: And there are established restrictions on both of those pollutants?

A: The federal government sets national air quality standards for both ozone and particulate matter. We follow those standards and look at the monitoring data to see how it compares to those standards.

Q: What affects the concentration of these pollutants in relation to smoke emissions?

A: Mainly we've had problems with the precursors of ozone and the production of ozone in the downwind metropolitan areas – mainly Kansas City and Wichita, although we also saw an exceedance in Topeka last year from smoke. So ozone has been the major problem from the burning. We see high values of particulate matter, but those are short-term spikes in the monitoring data. The way the standards are set up, as a 24-hour standard, we haven't seen exceedances of particulate matter in the state.

Q: So it's the ozone that is of greatest interest?

A: Right. We've concentrated on ozone because that's where we've seen the exceedances the past few years, and then going back to 2003.

Q: Do these exceedances typically have a certain duration?

A: The problems we've seen have been in years when we've seen a lot of burning going on in a very short timeframe, and a lot of smoke going into the metropolitan areas.

Q: There were some spikes last year, weren't there.

A: Yes. There were three or four days in April where we saw exceedances of the ozone standard in Topeka, Wichita, and a monitor site south of the Kansas City metropolitan area.

Q: How does the smoke management plan address the concerns about these two pollutants?

A: The plan is voluntary. What we tried to do is provide tools to the folks in the Flint Hills who do the burning to help them look at the effects that burning has on air quality, and ways they can mitigate those effects if they use those tools. And we've developed a web site where we can consolidate all those tools into one site so that folks can find all that information in one place: [ksfire.org](http://ksfire.org).

Q: Did the plan help in reducing the ozone or particulates spikes last year?

A: There were several things that came into play last year. The plan did not get approved by KDHE until late 2010. So we had just a few months to get the information and educational materials out before burn season started. Also, there was a lot of fuel out there in the Flint Hills last spring, which caused a lot of smoke to be produced in April.

Q: Do you think we'll see different results this year?

A: Taking a look at what's out there, with the drought we had last year, especially in the southern part of the Flint Hills, hopefully there will be significantly less smoke this year.

Q: Do you think this plan, with its mechanisms, will be able to meet its intent and get the job done?

A: Over time it will. We just need to have time to get folks to recognize the effects that smoke has on downwind areas, not just in Kansas but in other states. We need to allow folks to have all the information they need about the impact their burning on a particular will have on areas downwind, and hope they make good decisions about which days to burn.

Q: The KDHE web site has lots of good information on a wide variety of things, including air quality.

A: Yes it does. And we've just recently improved the web site, so I invite everyone to take a look at it. It's at: [kdheks.gov](http://kdheks.gov).

-- Steve Watson, Agronomy e-Update Editor  
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#### 8. Comparative Vegetation Condition Report: March 20 – April 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>

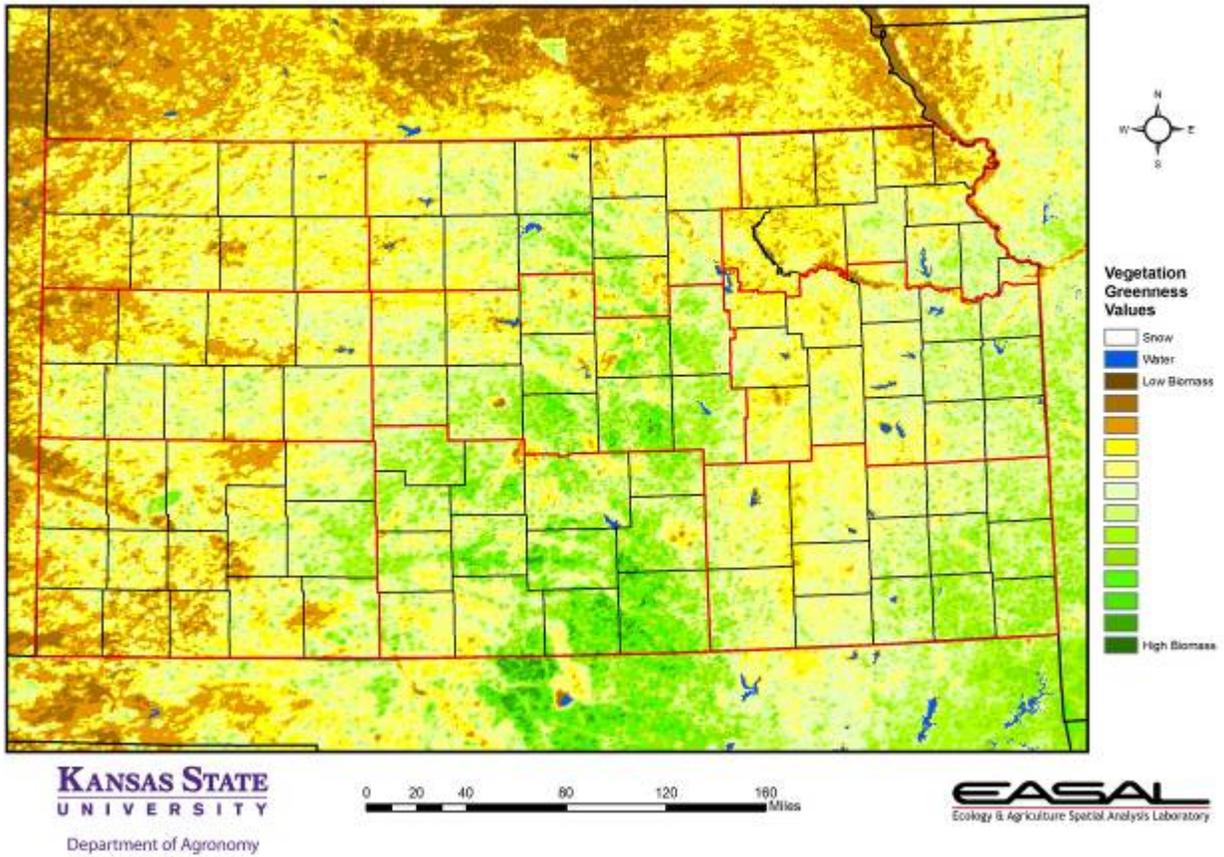
<http://www.youtube.com/watch?v=tUdOK94efxc>

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 21-year average. The report is used by individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

The maps below show the current vegetation conditions in Kansas, the Corn Belt, and the continental U.S, with comments from Mary Knapp, state climatologist:

# Kansas Vegetation Condition

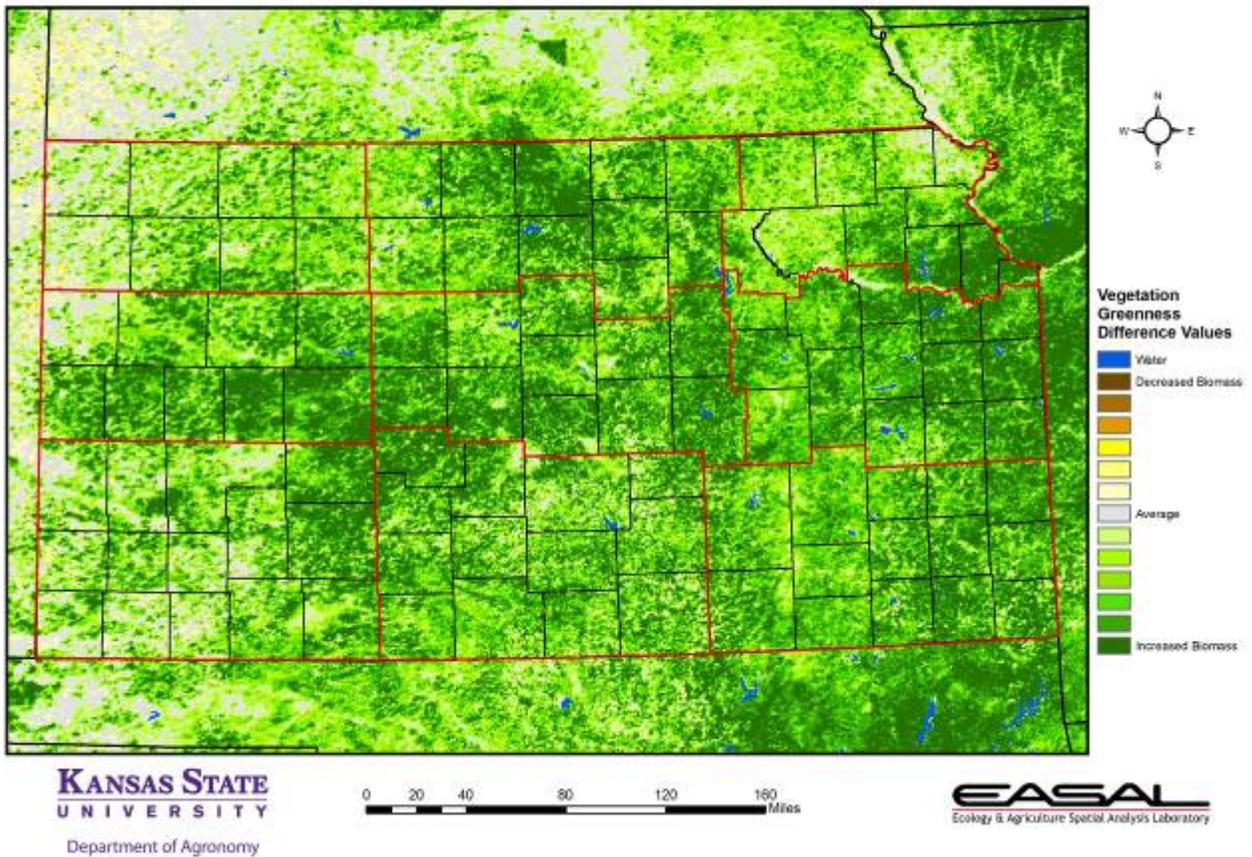
Period 13: 03/20/2012 - 04/02/2012



Map 1. The Vegetation Condition Report for Kansas for March 20 – April 2 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows greatest photosynthetic activity in the central portions of the state. As expected, the dominant warm-season grasses of the Flint Hills continue to show slower activity than the more cultivated areas to their east and west. Western Kansas, where temperatures were not trending as warm, also is showing less photosynthetic activity.

## Kansas Vegetation Condition Comparison

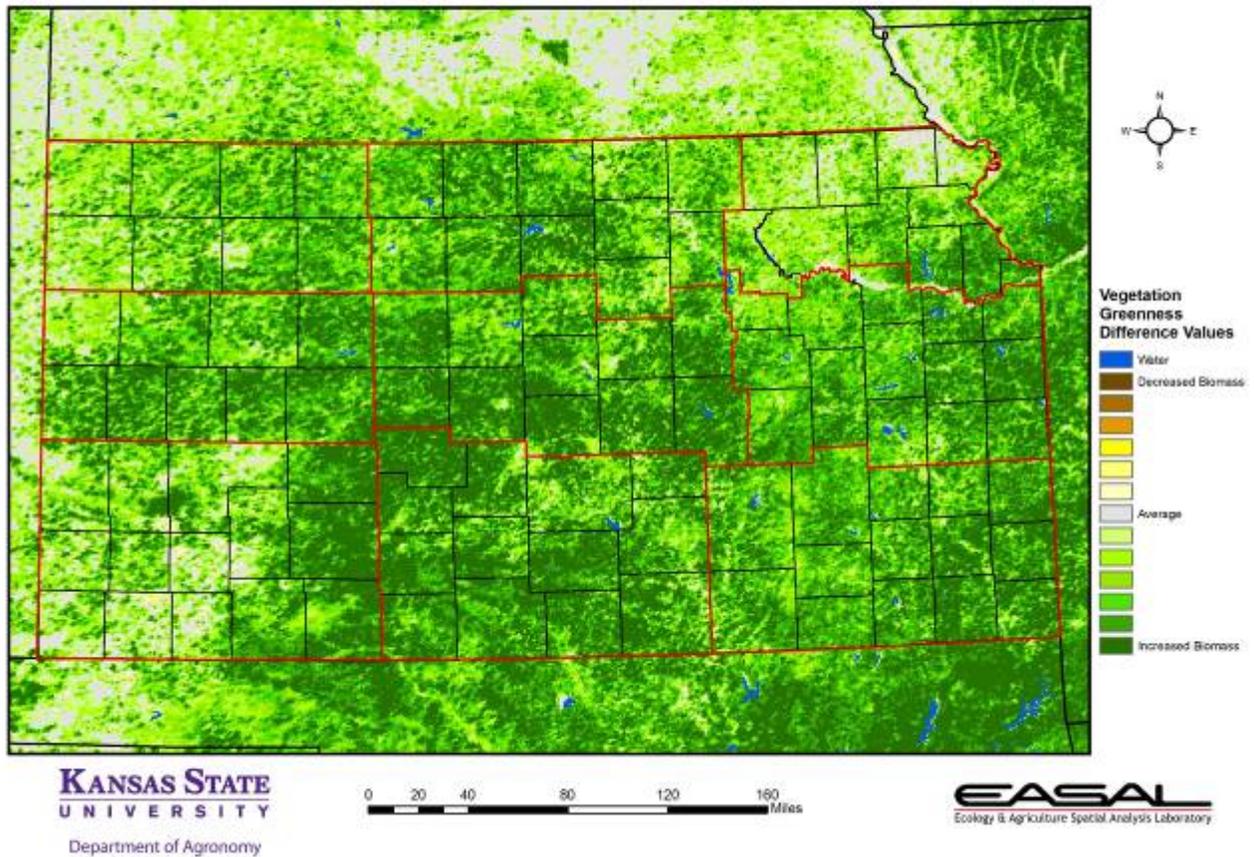
Late-March 2012 compared to the Late-March 2011



**Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for March 20 – April 2 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows much greater levels of photosynthetic activity. Greatest departures can be seen in west central Kansas. Favorable moisture and mild temperatures have plant productivity much ahead of last year.**

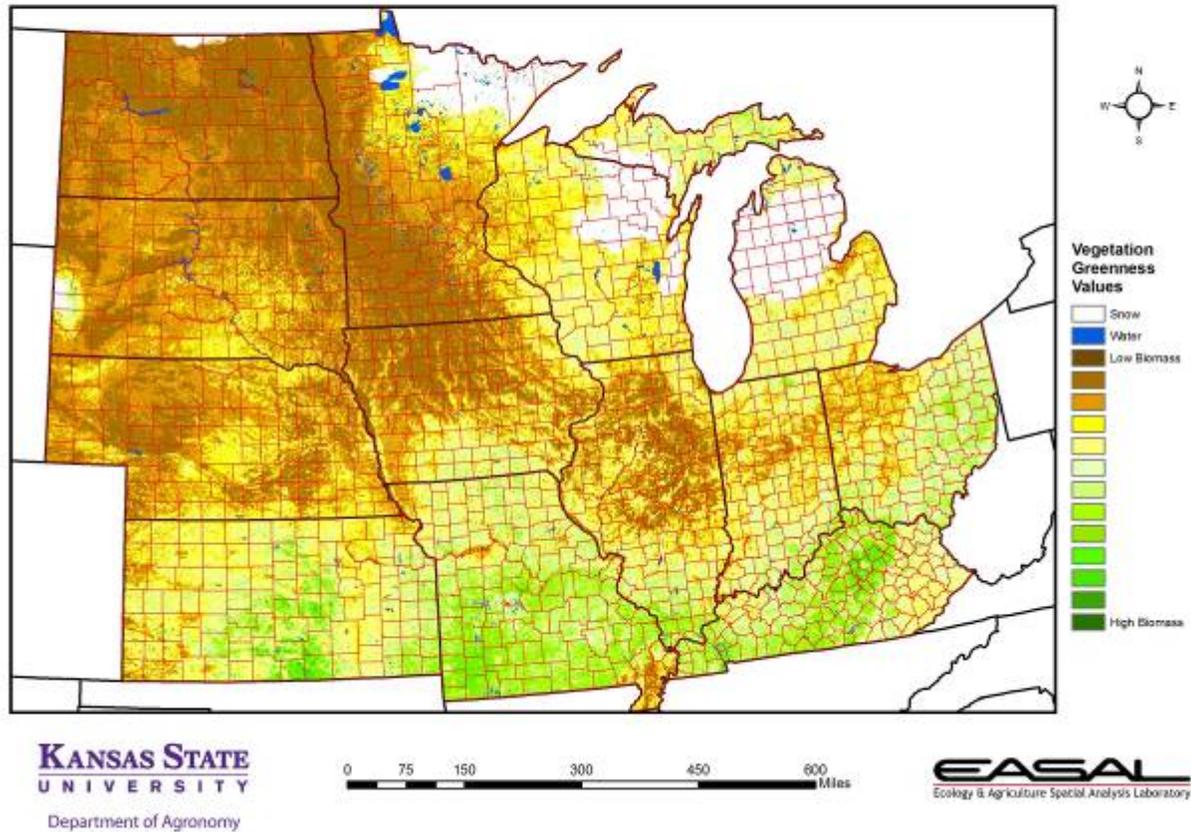
## Kansas Vegetation Condition Comparison

Late-March 2012 compared to the 23-Year Average for Late-March



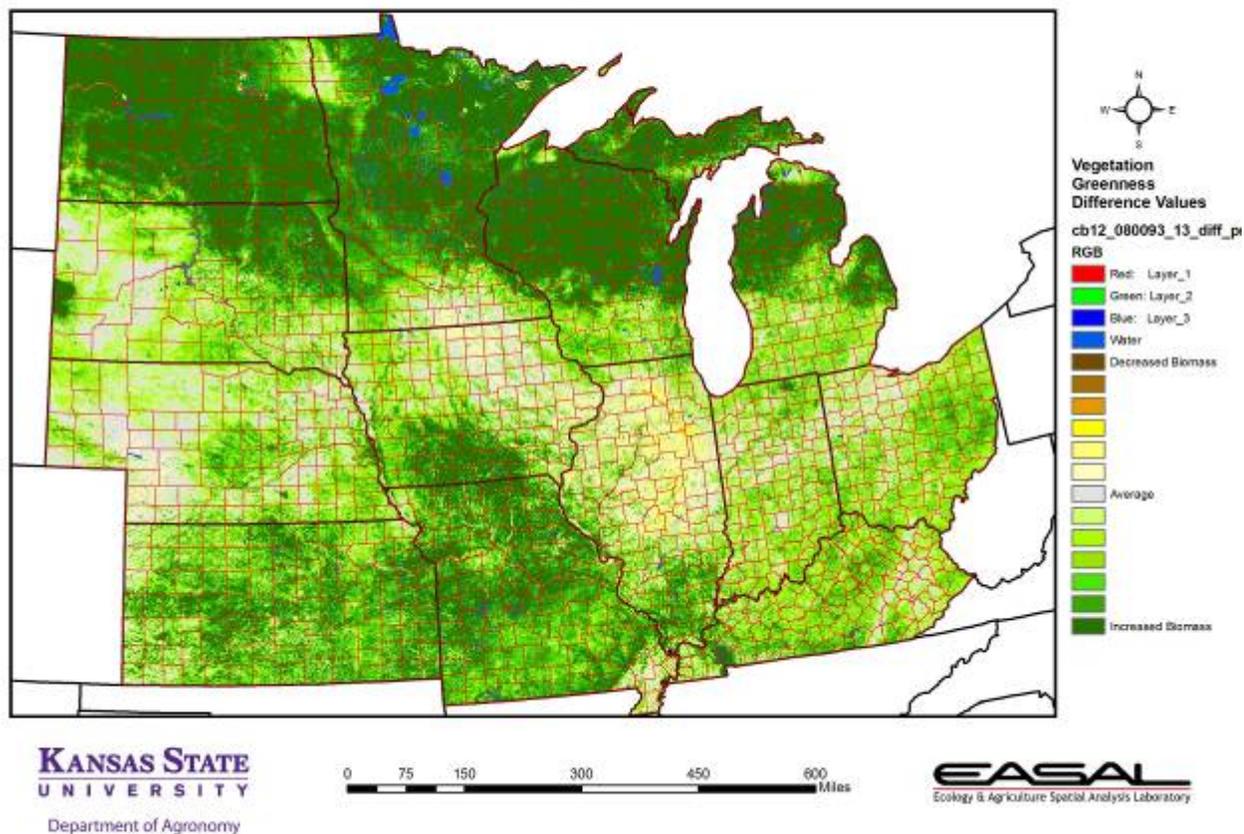
**Map 3. Compared to the 23-year average at this time for Kansas, this year's Vegetation Condition Report for March 20 – April 2 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that photosynthetic activity is much greater than average. Estimates are that plant growth stage is running 3 to 4 weeks ahead of the average stage. There are reports of wheat in south central Kansas in the boot stage.**

U.S. Corn Belt Vegetation Condition  
Period 13: 03/20/2012 - 04/02/2012



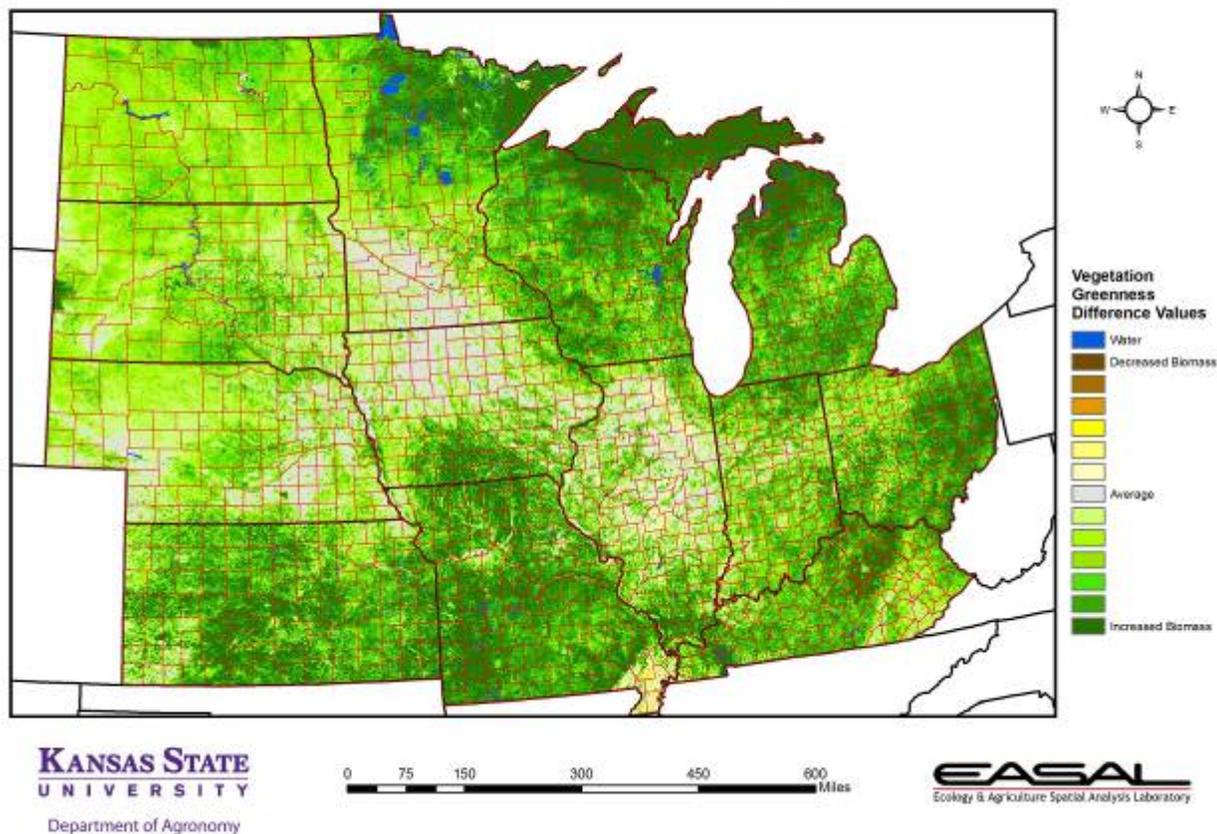
**Map 4.** The Vegetation Condition Report for the Corn Belt for March 20 – April 2 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that photosynthetic activity levels continue to move northward across the region. Snow was only a factor in the early part of this two-week period, and only in the northern most areas.

U.S. Corn Belt Vegetation Condition Comparison  
Late-March 2012 Compared to Late-March 2011



**Map 5. The comparison to last year in the Corn Belt for the period March 20 – April 2 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the seasonal difference in snow pack continues to result in increased NDVI values in the northern portions of the Corn Belt. This, in itself, does not represent high photosynthetic activity in northern regions where most plant growth is still dormant during this period but instead less snow cover. In contrast, the high NDVI values in southern Iowa, Kansas, and Missouri are in fact indicative of much greater photosynthetic activity.**

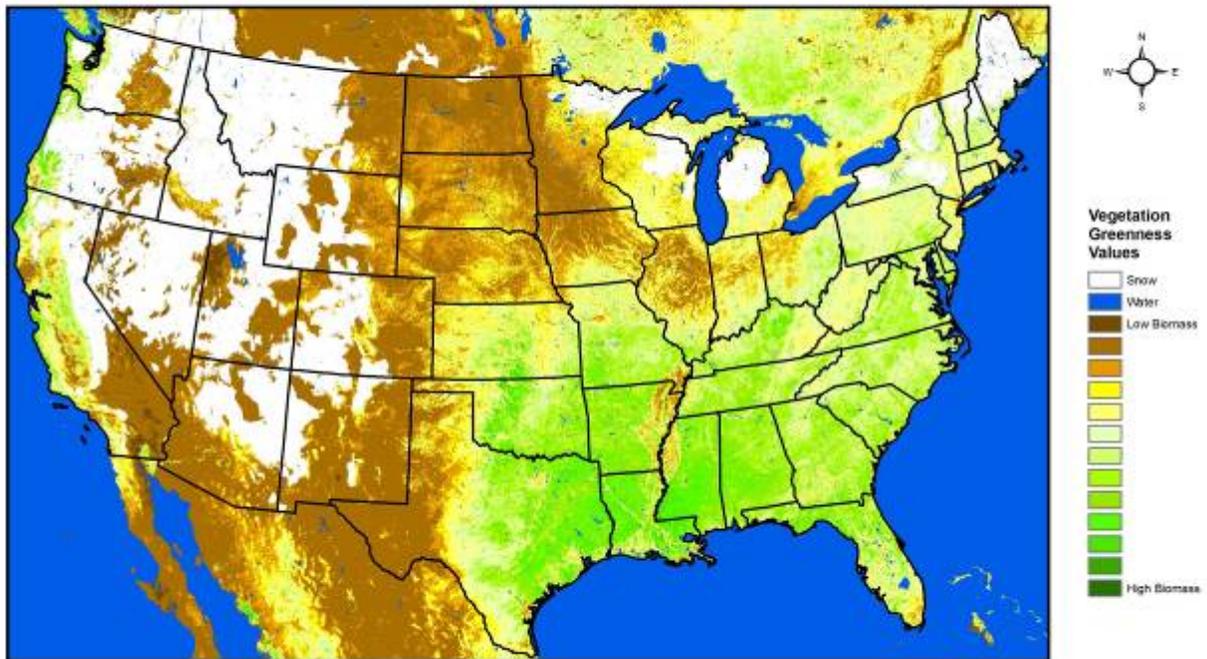
**U.S. Corn Belt Vegetation Condition Comparison**  
 Late-March 2012 Compared to the 23-Year Average for Late-March



**Map 6. Compared to the 23-year average at this time for the Corn Belt, this year’s Vegetation Condition Report for March 20 – April 2 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows much greater photosynthetic activity across the southern Corn Belt. North Dakota, South Dakota, and Nebraska, while not as extreme, are also experiencing earlier emergence from dormancy than typical. In northern Iowa and central Illinois, where row crops dominate and are yet to emerge, average conditions prevail. In Iowa, 58 percent of oats have been planted, compared to 4 percent average at this time. There are also reports of corn planted in the state, although the earliest date for allowed for full coverage on crop insurance is April 11<sup>th</sup>.**

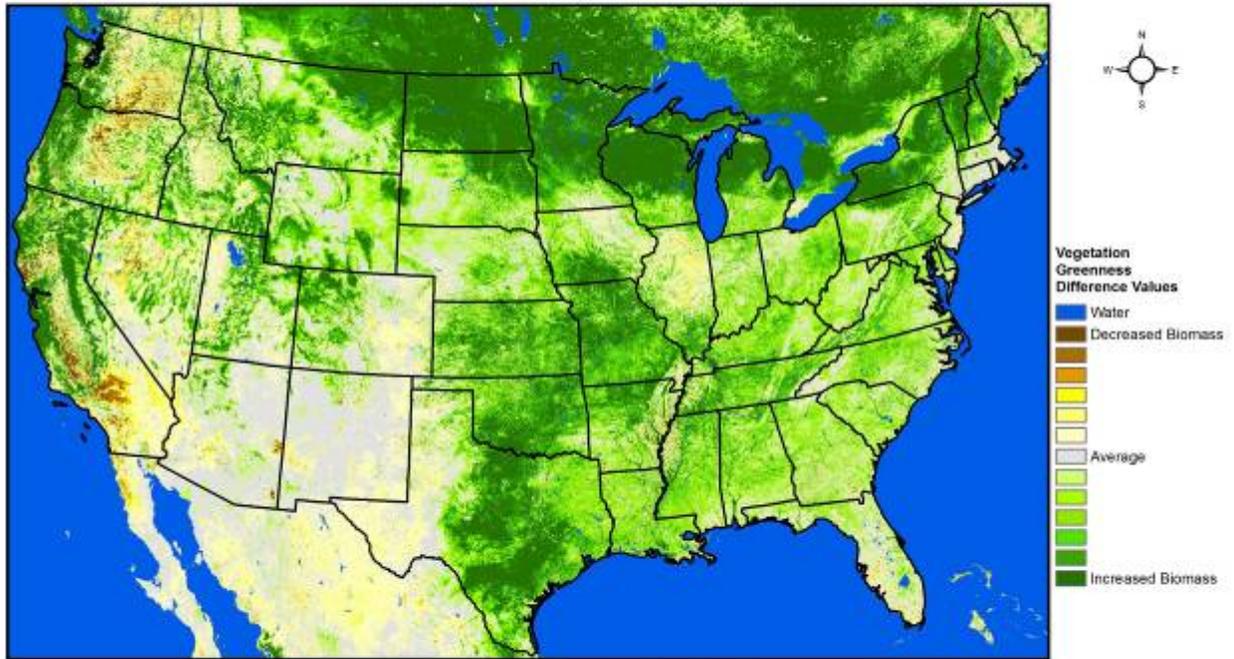
## Continental U.S. Vegetation Condition

Period 13: 03/20/2012 - 04/02/2012



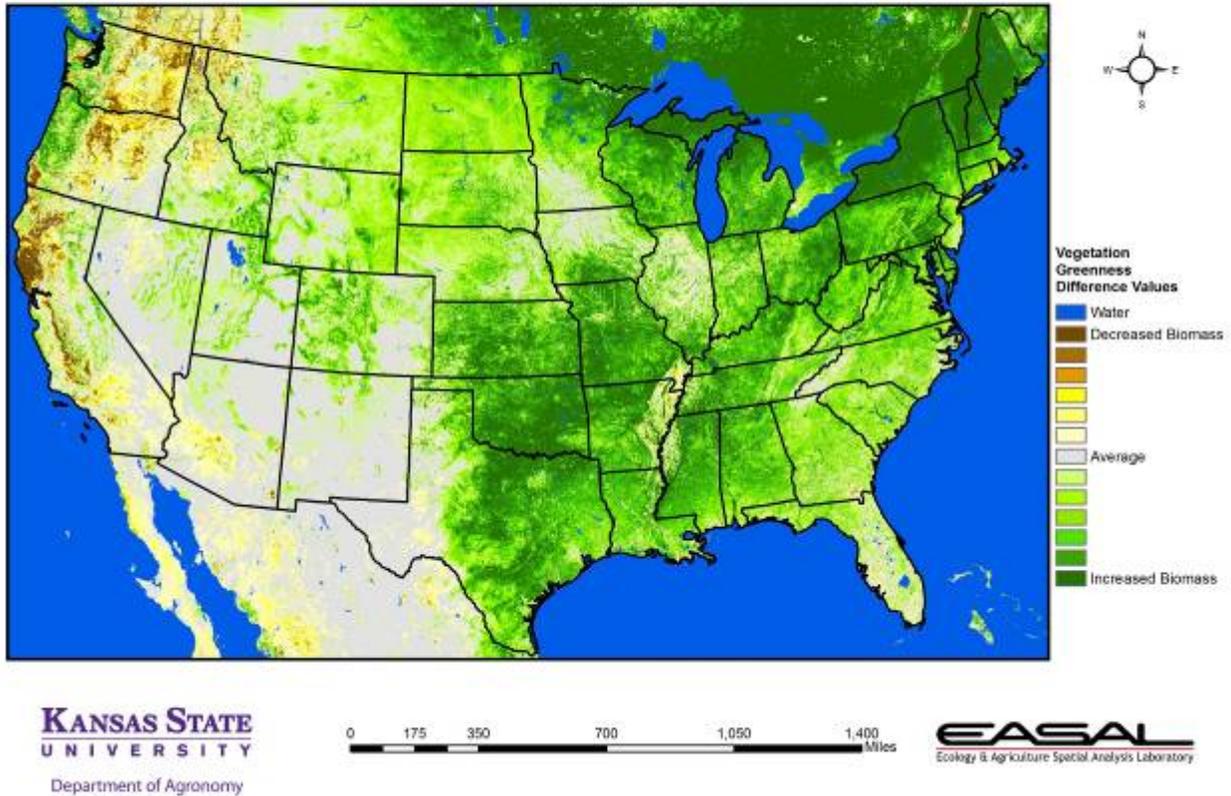
**Map 7. The Vegetation Condition Report for the U.S. for March 20 – April 2 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that significant snow is confined to the Mountain West, and much of the snow shown in Montana is from the early part of this two-week image composite period. Higher NDVI values continue to move further northward in the Eastern U.S. as plants respond to the record warm temperatures in March. The low NDVI values in northern Iowa and parts of Illinois and Indiana are in areas where spring-planted row crops dominate. Planting, for the most part, has yet to begin in these regions.**

Continental U.S. Vegetation Condition Comparison  
Late-March 2012 Compared to Late-March 2011



**Map 8.** The U.S. comparison to last year at this time for the period March 20 – April 2 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the lower snow pack this season continues to drive the difference in NDVI values in the northern U.S. Lack of snow in the Mountain West is also evident in the higher photosynthetic values in these regions. More favorable moisture this winter in the Central Plains has resulted in increased biomass production in these areas. This is particularly notable in central Texas and Oklahoma. Last year, only 8 percent of the South was not in some stage of drought. This year, 48 percent of the South is not in drought.

Continental U.S. Vegetation Condition Comparison  
Late-March 2012 Compared to 23-year Average for Late-March



**Map 9.** The U.S. comparison to the 23-year average for the period March 20 – April 2 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows the impact of the much-warmer-than-average conditions east of the Rockies. Vegetation in these areas is running 3 to 4 weeks ahead of normal. In west Texas, and the desert Southwest, drought conditions and less dramatic temperature departures have resulted in slower plant development.

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

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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.  
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