k-state extension AGRONOMY e-Updates

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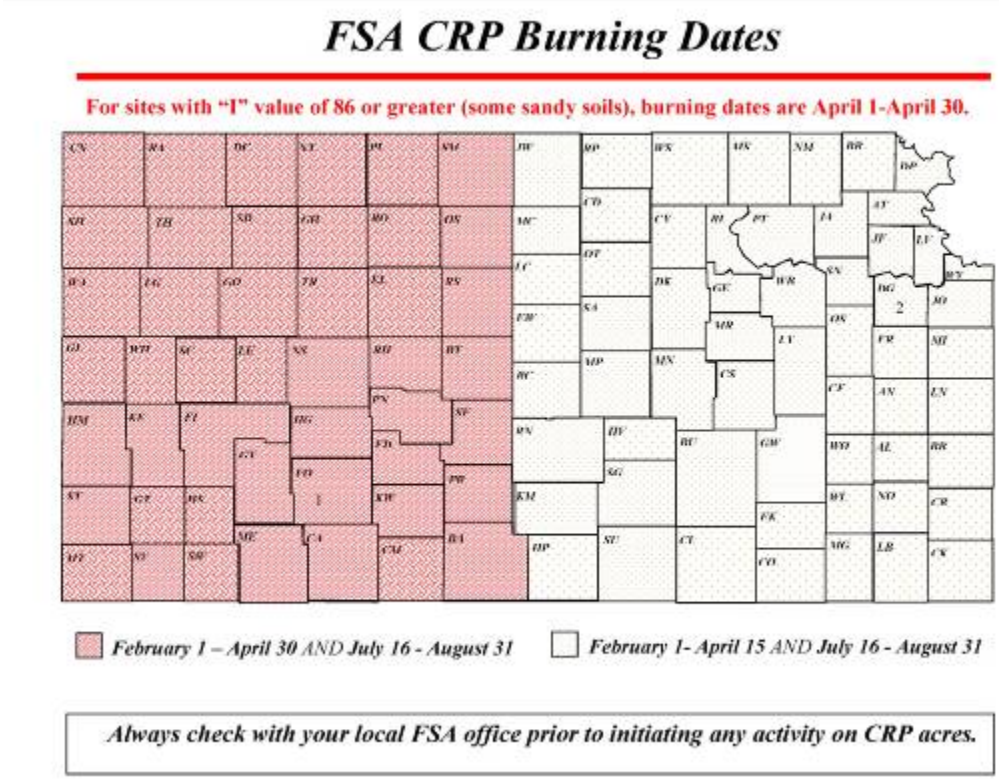
1. Prescribed burning of CRP in 2012

Requirements for prescribed burning of Conservation Reserve Program (CRP) contracts have changed since last year. The Farm Service Agency (FSA) has removed prescribed burning as a required CRP maintenance practice in some contracts. Prescribed burning is still a recommended practice and may be the most economical maintenance practice. CRP participants should work with the Natural Resources Conservation Service (NRCS) and FSA to plan appropriate maintenance practices such as mowing, spraying, or prescribed burning. Participants should check with their local Farm Service Agency office for actual requirements.

Maintenance practices are different than management practices. All CRP participants are required to perform a management practice that can include prescribed burning, interseeding, or light disking. Management practices are eligible for cost-share.

The time to burn CRP ground varies across Kansas depending on region and soil type. The following figure indicates CRP burning dates across Kansas.



In the eastern half of the state, prescribed burning is allowed between February 1 to April 15 and July 16 to August 31. These dates occur outside of the prime bird nesting season in Kansas. In western Kansas, prescribed burning is allowed from February 1 to April 30, and July 16 to August 31. Certain sandy soils are to be burned during the month of April. Lack of cover resulting from early burning on sandy soils may lead to significant soil erosion and/or water loss.

Burning CRP early or during the summer is a good way to spread out the burning season in Kansas and help prevent the concentration of smoke in April, when most pasture burning occurs.

Producers who burn CRP ground should follow the same general safety guidelines and go through the same permit procedures as those who conduct prescribed burns on rangeland. For detailed information on this see:

* Prescribed Burning: Planning and Conducting (L664)
http://www.ksre.ksu.edu/library/crpsl2/L664.pdf

* Prescribed Burning Safety (L565)
www.ksre.ksu.edu/library/crpsl2/l565.pdf

Building a good fireguard is essential when burning CRP. Fireguards can either be mowed, clean tilled, or a combination of mowing and clean till. Clean-tilled firebreaks may be up to 30 feet in width with prior approval by NRCS and the County Committee. Short-mown firebreaks can be up to 300 feet in width.

Producers must make sure they notify the proper authorities in their county before burning, and obtain any necessary permits. They need to be careful not to allow smoke to drift over highways or

airports so as to cause visibility problems. And they must make extra sure the fire is out before leaving.

The two most common methods of conducting prescribed burns on CRP ground are a ring fire and flank fire.

With a ring fire, the entire perimeter of the field, within the fireguard, is lit. Starting on the downwind side, backfires are started. The burned area is gradually widened. Eventually, the entire perimeter is lit and the fire then burns in toward the center from all sides. This results in a single large plume of smoke in the middle of the field. The advantages of a ring fire are that it requires less manpower than other methods, and it is quicker. The disadvantage is that it can trap wildlife in the field with no means of escape except flight.

If producers want to avoid trapping and possibly killing animals in the fire, the flank fire is a good alternative. In this method, a series of parallel strips of fire are lit into the wind, creating a slow-moving series of backfires. Backfires are hotter than headfires at ground level, and provide a more complete burn of mulch. This method also allows plenty of escape routes for any wildlife living in the field. The disadvantages of the flank fire method are that it takes longer to complete, and requires more people to conduct and control the burn. Backfires are also generally less effective at controlling woody plants.

Whatever method is used, one of the most important considerations when conducting a prescribed burn on either CRP or rangeland is to obtain an accurate weather forecast for the proposed day of the burn. There are several good broadcast stations for weather information, or producers can access any of several weather web sites, such as:
www.weather.com or www.nws.noaa.gov

Weather conditions for conducting a safe burn include:

- 5 to 15 mph winds out of a consistent direction that takes smoke away from highways, airports, or population centers
- 30 to 70% relative humidity; incidence of spot fires increases dramatically as RH drop below 40%
- 40 to 70^{o}F air temperatures

The burn should be conducted when conditions for smoke dispersal are optimum. That means there should be few clouds, with little chance of inversions. A minimum mixing height of 1800 feet with 8 to 20 mph transport winds will improve smoke dispersal.

The Flint Hills Smoke Management Plan and other information related to conducting a prescribed burn can be found at: http://www.ksfire.org.

A prescribed burn on CRP ground will help reduce the thatch layer that can build up, promote grass tillering, and reduce the potential for wildfire. Burning can also help control cedars, and woody seedlings such as cottonwood or Russian olive. Once established, older trees will generally resprout after a fire.

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2. Corn seeding rate recommendations

The optimal corn population for any situation will depend on the anticipated environment and how the hybrid responds to that environment. Producers can look back to their corn crop from the previous growing season, or wait until the current growing season is nearly complete, and evaluate whether the population they used was adequate.

Individual hybrids can respond differently, but the following guidelines may help in deciding if current seeding rates need to be adjusted. If more than about 5% of the plants are barren or if most ears have fewer than 350 kernels per ear, the population may be too high. If there are consistently more than 500 kernels per ear or if most plants have a second ear contributing significantly to grain yield, the population may be too low. Of course the growing conditions will influence ear number and ear size as well, so it is important to factor in the growing conditions for that season when interpreting these plant responses.

Don’t be too concerned if a half-inch or so of the ear tip has no kernels. If kernels have formed to the tip of the ear, there may have been room in that field for more plants contributing to grain yield. Again, "tipping back" will vary with individual hybrids and with growing conditions. Potential ear size is set before silking and the actual final number of kernels is not determined until after pollination and early grain fill.

Always keep the long-term weather conditions in mind. The drought that affected much of Kansas in 2011 made almost any population too high for the available moisture in some areas. Don’t make significant changes to seeding rates based only on what happened last year.

Optimal seeding rates may need to be adjusted for irrigated corn if fertilizer or irrigation rates are sharply increased or decreased. For example, research at the Irrigation Experiment Field near Scandia has shown that if fertilizer rates are increased, seeding rates also have to be increased to realize the maximum yield benefit. Consult seed company recommendations to determine if seeding rates for specific hybrids should be at the lower or upper end of the recommended ranges for a given environment.

The recommended planting rates in the following table attempt to factor in these types of questions for the typical corn growing environments found in Kansas. Adjust within the recommended ranges depending on the specific conditions you expect to face and the hybrid you plan to use.

The following recommend planting rates are from the K-State Corn Production Handbook.

Suggested Dryland Corn Final Populations and Seeding Rates			
Area	Environment	Final Plant Population (plants per acre)	Seeding Rate*
Northeast	100-150 bu/a potential	22,000-25,000	26,000-29,500
	150+ potential	24,000-28,000	28,000-33,000
Southeast	Short-season, upland, shallow soils	20,000-22,000	23,500-26,000
	Full-season bottomground	24,000-26,000	28,000-30,500
Northcentral	All dryland environments	20,000-22,500	23,500-26,500
Southcentral	All dryland environments	18,000-22,000	21,000-26,000
Northwest	All dryland environments	16,000-20,000	19,000-23,500
Southwest	All dryland environments	14,000-20,000	16,500-23,500

Suggested Irrigated Corn Final Populations and Seeding Rates			
Environment	Hybrid Maturity	Final Plant Population (plants per acre)	Seeding Rate*
Full irrigation	Full-season	28,000-34,000	33,000-40,000
	Shorter-season	30,000-36,000	35,000-42,500
Limited irrigation	All	24,000-28,000	28,000-33,000

* Assumes high germination and that 85 percent of seeds produce plants. Seeding rates can be reduced if field germination is expected to be more than 85%.

For more information, see the K-State Corn Production Handbook, C-560:
http://www.ksre.ksu.edu/library/crpsl2/c560.pdf

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3. Importance of corn stand and emergence uniformity

With corn planters beginning to roll soon, it is a good time to think about the importance of uniformity of stands and emergence. These are two different things. Stand uniformity has to do with how consistent plant spacing is within the row. Uniformity of emergence deals with timing. Do most plants come up at the same time, or are some delayed by several days?

Stand uniformity: Although uniform stands are desirable, how important is it that the distance between plants be the same from one plant to the next? Past research has indicated the potential for a 1 to 3.4 bushel/acre decrease in yield for every 1-inch deviation in plant spacing. Stu Duncan, Northeast Area Crops and Soils Specialist, has been looking at corn plant populations and stand uniformity the past few years. His results indicate little yield reduction from non-uniform stands as long as the final population is within 15% of the target population.

This agrees with work done by other researchers who have concluded that reduced population and non-uniform emergence have more potential to negatively influence yields than does non-uniform plant spacing. In fact, one study indicated that "doubles" (two plants where one was intended) can

increase yield in favorable environments because the effective plant population was increased. Individual corn plants have enough flexibility in yield components (primarily ear size) to make use of the small changes in available resources resulting from non-uniform plant spacing.

Try to obtain plant spacings that are as consistent as possible, but don't become overly anxious about it as long as the typical spacing between plants is within two to three inches of the desired plant spacing and the final population is not substantially lower than what was desired.

Uniform emergence: Emergence can be delayed by non-uniform moisture in the seed zone, crusting, non-uniform planting depth, or non-uniform crop residue. Uniform emergence can be important for maximizing yield. Research has shown that if one out of six plants is delayed by two leaf stages, yields can be reduced by 4%. If one out of six plants is delayed by four leaf stages, yields can be reduced by up to 8%. Other research has indicated that if plants emerged within a period of two weeks, yield reductions were minimal (<3%). A 3% yield reduction may not be enough to justify replanting but it is enough to justify efforts to minimize variability in emergence when it could affect gross receipts by as much as $36/acre at 200 bushel/acre yields and $6/bushel corn.

Planter speed can affect both stand and emergence uniformity. Research conducted in northeast Kansas supports the conclusion that final plant population, which was reduced with higher planting speeds, had a greater impact on yield than did accompanying reductions in uniformity of plant spacing. Be sure to follow manufacturer guidelines for recommended planter speeds.

Adjust planter units to optimize seed placement and depth. Seed firmers may help place seeds more uniformly. Emergence might be delayed slightly with deeper planting, but it will likely emerge more uniformly than if it were planted too shallowly (e.g. one inch or less). This is especially true with early planting and cool soil temperatures. With warm soil temperatures and adequate, uniform moisture, corn seedlings emerge more quickly and uniformly from any depth. Regardless of soil temperature, stand and emergence uniformity generally is maximized when seed is placed between 1.5 and 2.5 inches in depth. See the January 20, 2012 e-Update for more information on how planting depth can influence emergence and stand uniformity.

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4. How to get your CRP re-enrolled this year

With millions of acres of Conservation Reserve Program (CRP) land expiring this September and several million previously expired acres trying to get back in this year, the current CRP sign-up underway now is going to be extremely competitive. Kansas is no exception to this, with one of the highest CRP enrollments of any state, there is much to be lost or gained in this sign-up. Getting an offer accepted comes down to one thing -- how many points you earn for your offer through the Environmental Benefits Index (EBI). Knowing that the process is going to be very competitive this year, it is vitally important to get as many points for your offer as possible to get your acreage re-enrolled.

The EBI scores are based on six factors. A landowner has the ability to greatly affect his or her individual score in several of these factors, but has no control in several other factors where points are assigned by soil type or physical location.

Details of the EBI can be found at:
http://www.fsa.usda.gov/FSA/newsReleases?area=newsroom&subject=landing&topic=pfs&newstype=prfactsheet&type=detail&item=pf_20110301_consv_en_crpebi.html

The one factor where landowners have the largest impact on their score based on their own decisions is the N1 – Wildlife Factor Point. This factor gives points based on what cover practice is chosen. The points for this factor can range from 0 to 70 points depending solely on the choice of the landowner and an extra 30 points if the acres fall within a state-designated wildlife priority zone.

There are several practices that will earn a producer the maximum 50-point score for the N1a - Wildlife Habitat Cover Benefits subfactor. Table 1 in the link above lists the relevant details, and this is a very important list to the landowner hoping to get his or her offer accepted. This table is titled "Cover Practices (CP) for the N1a Criteria."

The five-species CP2, five-species CP4B or CP4D, CP25, and CP42 Pollinator Practice will all earn 50 points for this individual subfactor. The trick here is knowing what practices will earn you further points down the line in other point factors.

With a little upgrade to your existing stand, choosing CP25 or CP42, or a field of CP25 with a CP42 area in that larger field, will get the maximum amount of points possible based on decisions that can be made by the landowner. On top of the 50 points for the cover type, you will get 20 more points for wildlife enhancement for either a whole field or plot of CP42. You can get another 25 points in the "N4 – Enduring Benefits" factor for either CP25 or CP42; getting 0 points for the rest of the cover practices. Yet another 5 points for the N5d – Air Quality subfactor; getting only 4 points for CP4b or CP4d, and 3 points for CP2.

By choosing to do either a whole field of CP42 Pollinator habitat or a field of CP25 with a CP42 plot in it, you will be getting 100 points just because you chose those practices. If you had gone with CP4b or CP4d you would be getting 54 points. CP2 would earn you only 53 points. This wide disparity in points could end up being very important in the final scoring and offer acceptance of CRP contracts.

Landowners in Kansas will have to make sure they get enough points to be competitive against offers from all over the country. Most areas of the country have much higher erosion and soil values than we do in much of Kansas, and will get more points in those categories than Kansas offers will. So landowners in Kansas need to make sure they get the points where they can, and that is by choosing the higher-scoring cover practices for their CRP fields.

One thing that I am seeing this year, sadly, is that landowners who did not get their CRP back in the program last year -- because they did not want to do any improvements -- are coming back this year wanting to do whatever it takes to get back in the program. Some are finding out that their field is not eligible for general sign-up CRP because the Erodibility Index (EI) score for their field does not meet the minimum of 8.

All fields are automatically eligible for re-enrollment the year they expire. However, if they do not get back in at that time they must meet the same criteria as new fields do for the minimum EI score. These older fields got into CRP before this EI score became a factor several years ago, and did not have to meet these criteria back then.

So these fields that had been in CRP for a long time will no longer be eligible for these whole field programs. Landowners in that situation will have to decide between enrolling part of their field into Continuous CRP, grazing the acres or leaving it in grass without payment, or having to farm some of the acres that were taken out of production years ago because they were poor producing acres.

This is why it is very important to make sure to do what is needed to insure that your CRP field gets back in the year it expires so you are not stuck with this possible scenario in the years to come.

-- Ryan Diener, Northwest Kansas Farm Bill Wildlife Biologist, Pheasants Forever, Inc. and Quail Forever, USDA-NRCS Field Office, Oberlin, Kansas
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5. Kansas Flint Hills Smoke Management Plan: EPA's evaluation of plan's first year

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.

The following is a slightly edited transcript of the first in the 2012 series of *Agriculture Today* radio broadcasts on the Kansas Flint Hills Smoke Management Plan. This is an interview with Karl Brooks, U.S. Environmental Protection Agency (EPA) Region 7 Administrator, conducted by Eric Atkinson of the K-State Radio Network.

Q: When we look at the smoke management plan, how does the EPA view its effectiveness last year in its first season?

A: Our agency was very pleased with the way the plan worked in its first year. We thought that collaboration was the most important part of it. We are optimistic that smoke impacts will continue to drop. One of the best things that we were able to work out with a variety of stakeholders was a multi-pronged approach that really emphasized communication, education, and pollution dispersion. A good web site was developed – ksfire.org. That will help any landowner figure out what days would be good for burning.

Q: You have always been pleased with the cooperative spirit that led to this plan.

A: Very much so. The ranching community in the Flint Hills was really a co-architect on this plan. We also had very good working cooperation with the Kansas Department of Health and Environment (KDHE), as well as with K-State Research and Extension. That was one of the things that made the plan so successful. From our standpoint it was very encouraging that a lot of folks came to the table and contributed what they knew.

Q: What is your sense of the actual impacts of the plan on air quality in the first year of the plan?

A: The impacts this first year gave us the data we needed to assess how continual improvement will work. We laid down a baseline that first year. Everyone was getting familiar with the information. Landowners were becoming more aware of the information they could use to time their burn, and to spread out the burns over time and distance. Some of the readings we got indicate will still have some work to do. But we were fundamentally very pleased with how it worked.

Q: When you say there is some work left to do, what needs to happen to move this one step further?

A: I think probably the most important thing will be for landowners to use the tools and to advise EPA and KDHE, through Extension, how to improve these tools. This program will work when landowners use the best tools we can design. We think we will see the downwind smoke impacts diminish from Flint Hills burning if we get the necessary information to the landowners because they have a very strong spirit of wanting to cooperate and be good neighbors with their city cousins downwind.

Q: Could you explain how EPA views any temporary spikes of smoke from concentrated grassland burning that might exceed the particulate limits in a metropolitan area?

A: One of the things that we are lucky about in EPA is that we have really good air modelers and scientists – the same with KDHE. Those kinds of specialists are looking at that data right now trying to determine what kinds of trends, if any, have been established. We're still early in that process. We know that KDHE has the authority right now to alert people downwind if they detect any really dangerous levels of pollutants in the air, and we assume KDHE would do that if such levels were to exist. We're still in the process of analysis and modeling right now, looking to make the plan better in 2012 and beyond.

Q: Could you explain the term "exceptional air quality event"?

A: The Clean Air Act sets the legal framework for our work at EPA. KDHE also has responsibilities under the Clean Air Act to protect air quality. There is a part of that Act that allows EPA and a state agency to recognize temporary spikes in air pollution as something that are so exceptional that those spikes do not need to be added into overall air quality during a period of years. One of the goals of this smoke management program is to set up the kind of analysis and education program that our two agencies, EPA and KDHE, need to make a finding of an exceptional event in the future. We're not there yet, but we had to get this first crucial foundation laid down.

Q: The plan then, in part, is a discovery process as much as anything.

A: Yes. As with every good process for making decisions about natural resources, we had to step back and figure out what we knew and what we needed to learn. Speaking for EPA Region 7, we needed to know much more about the role of fire in the Flint Hills. We needed to know more about

what landowners were able to do, and were interested in doing. We needed to get a better feel for how we could work with K-State Research and Extension to get the information out that ranchers need and to get the data back that our agency needs.

Q: What is EPA's long-range view on prescribed burning as a grassland management tool as it relates to air quality?

A: Congress has directed EPA for more than 40 years to make sure the air we all breathe in Kansas and downwind of us is safe and healthy. That is our job. We recognize that burning in the Flint Hills has demonstrated long-range ecological benefits for the distinctive tall grass landscape. What we're attempting to do, and what we're optimistic we can do, is maintain that crucial role of fire for the ecosystem, and make sure that the landowner has that tool available for his cattle operation. But we also need to make sure the landowner uses that tool (fire) in a way that preserves air quality for the public health of millions of people downwind.

-- Steve Watson, Agronomy e-Update Editor
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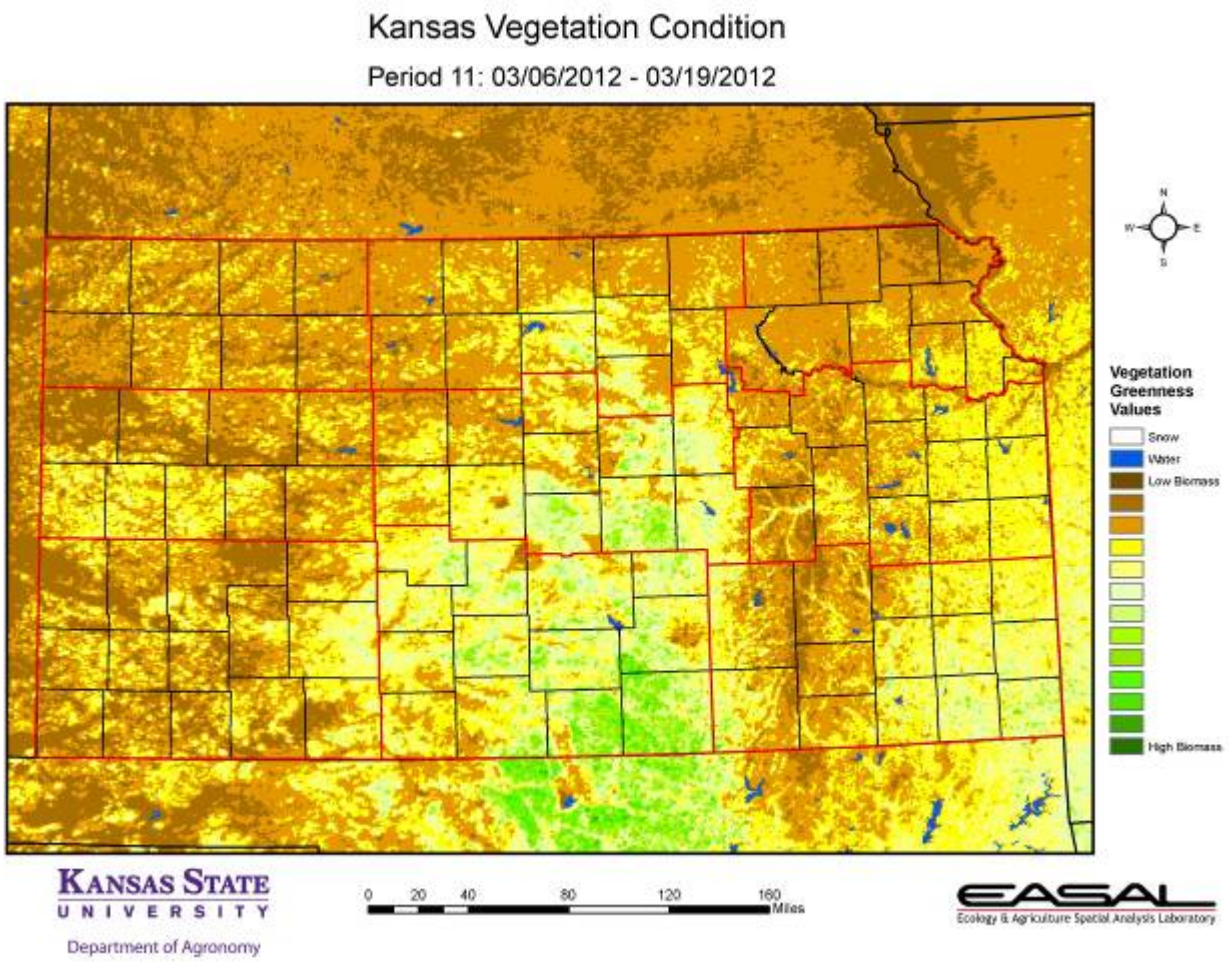
6. Comparative Vegetation Condition Report: March 6 – 19

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.

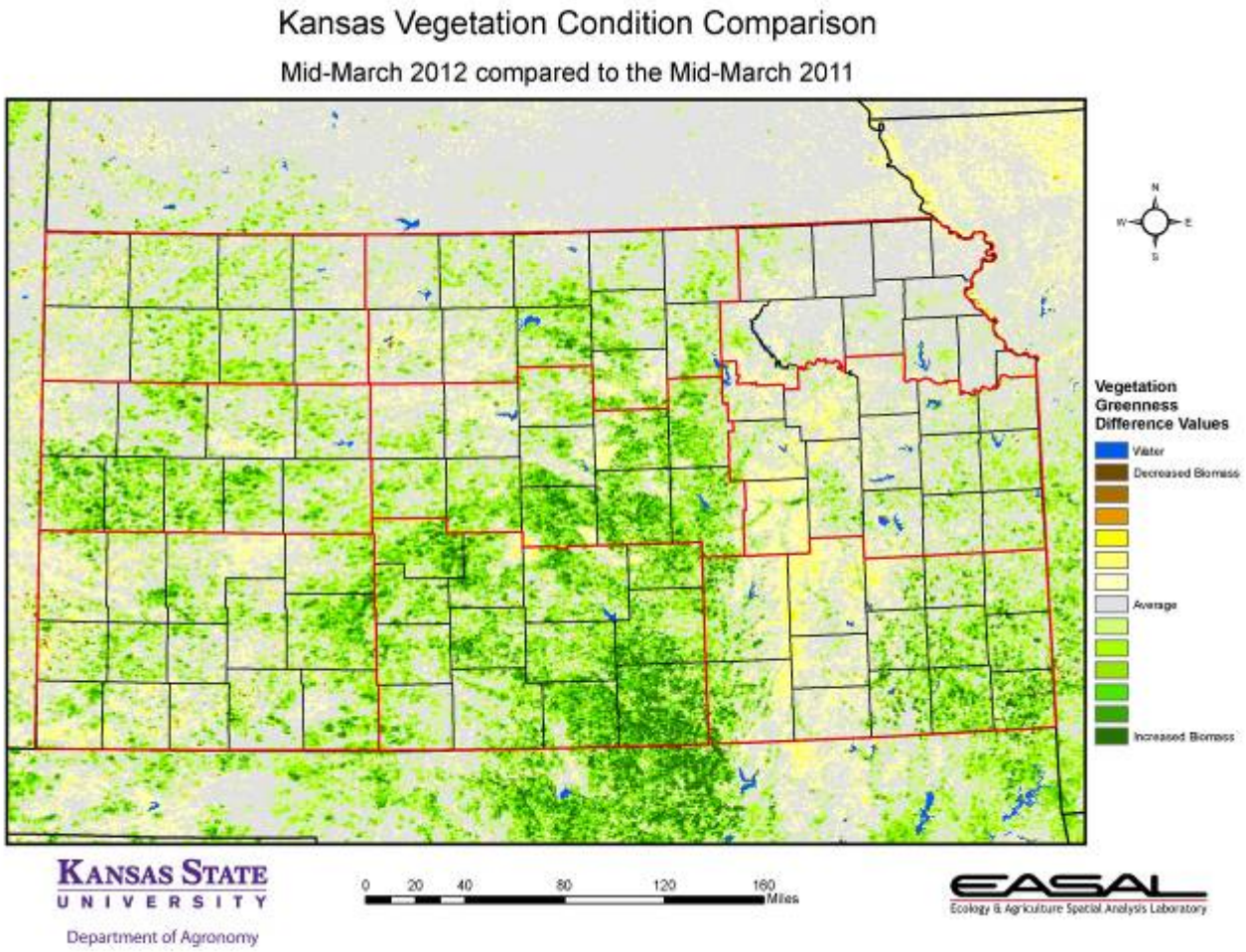
Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:
http://www.youtube.com/watch?v=CRP3Y5NIggw
http://www.youtube.com/watch?v=tUdOK94efxc

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.

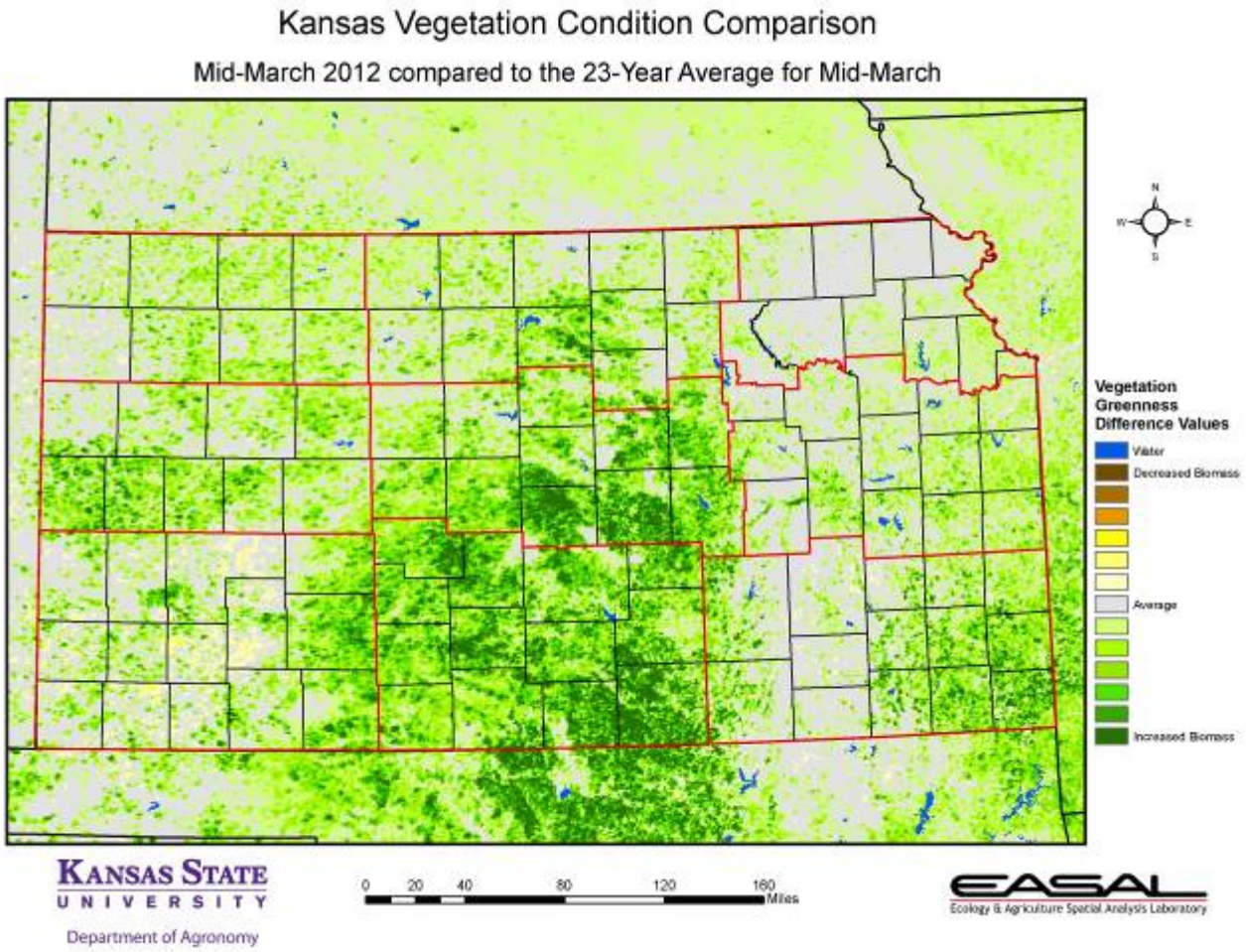
The maps below show the current vegetation conditions in Kansas, the Corn Belt, and the continental U.S, with comments from Mary Knapp, state climatologist:



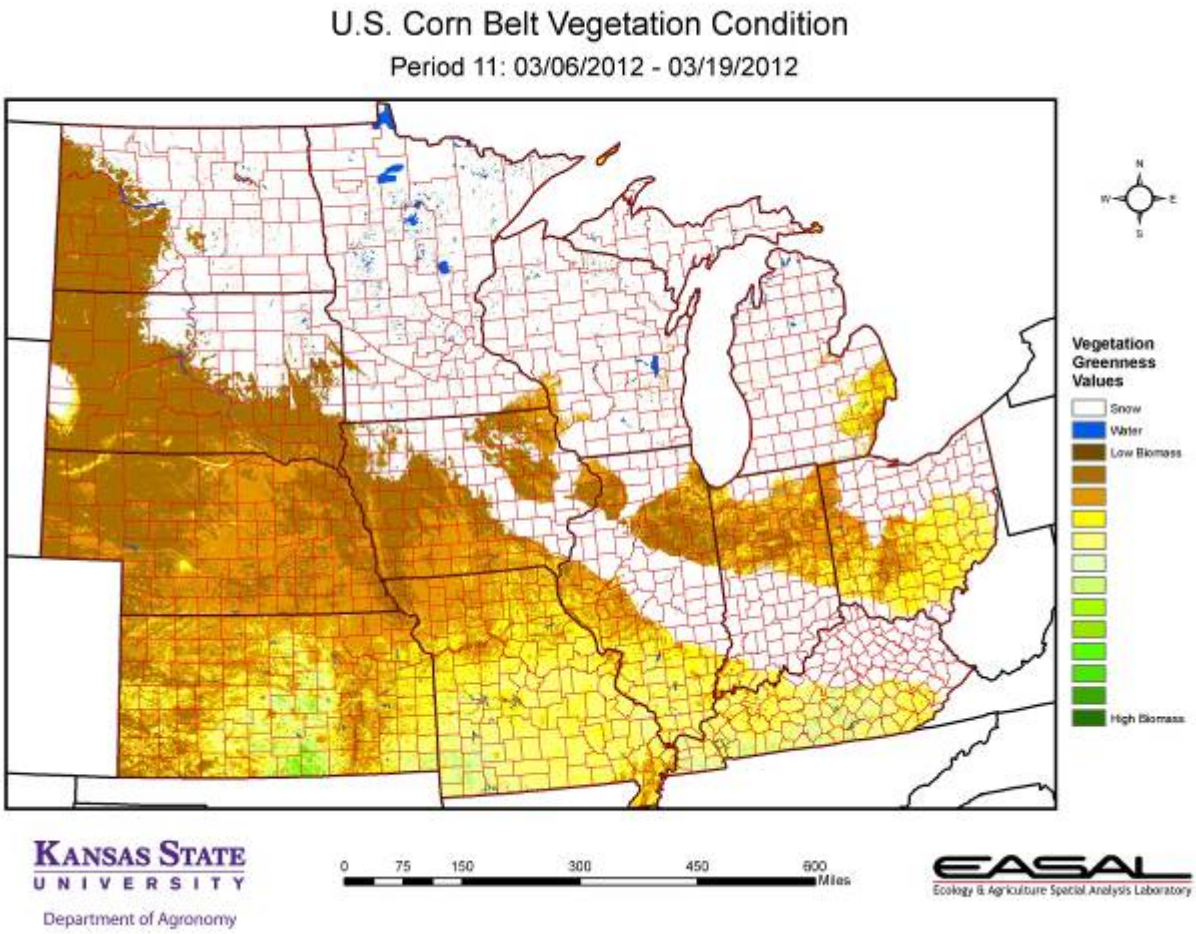
Map 1. The Vegetation Condition Report for Kansas for March 6 – 19 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows the increased photosynthetic activity in central and south central Kansas. The effects of the warmer temperatures at the end of the period will be noticeable in next week's report.



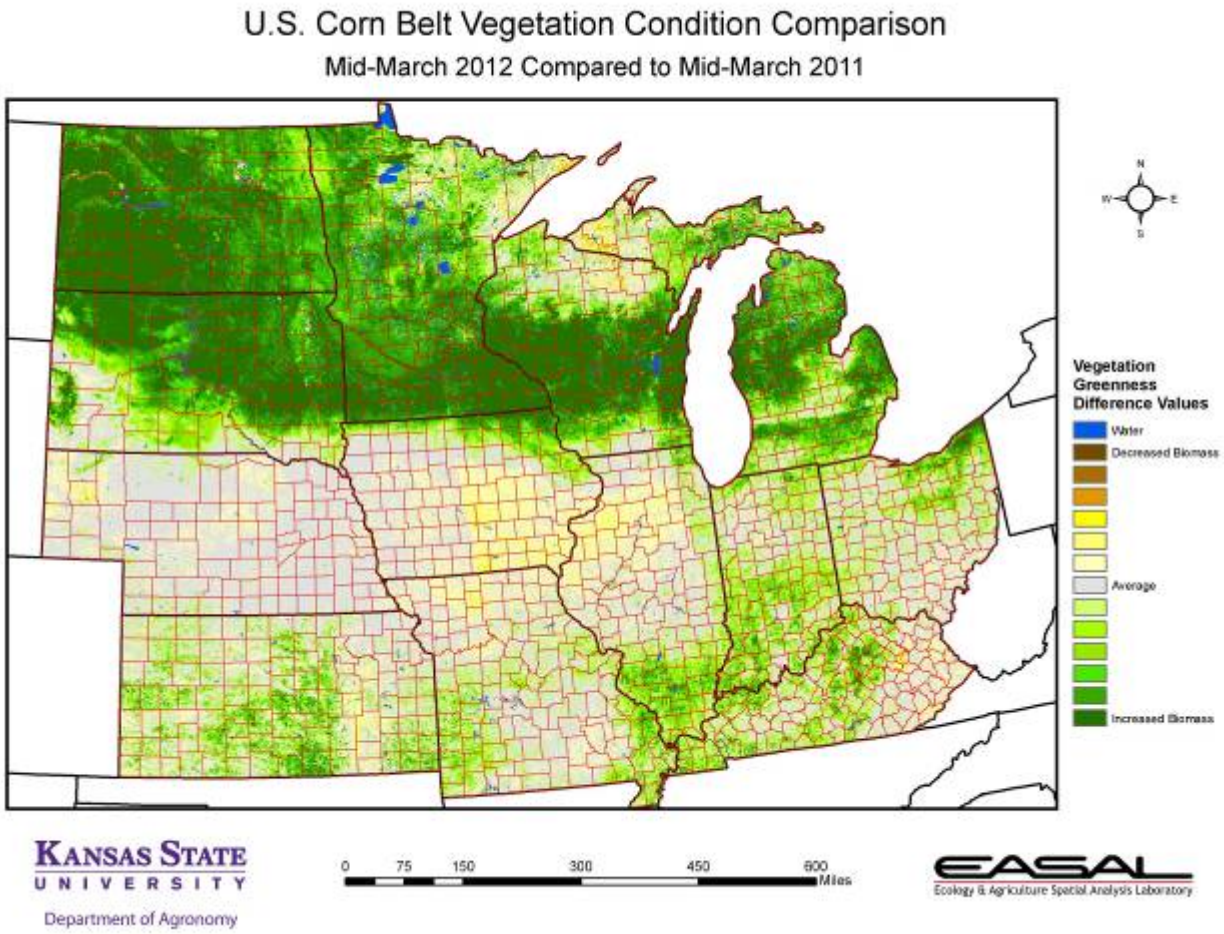
Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for March 6 – 19 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows higher NDVI values were widespread. The marked increase in south central Kansas compared to last year is indicative of the rapidly developing winter wheat crop. On the other hand, NDVI values in the Flint Hills area of eastern Kansas have not been much different than last year.



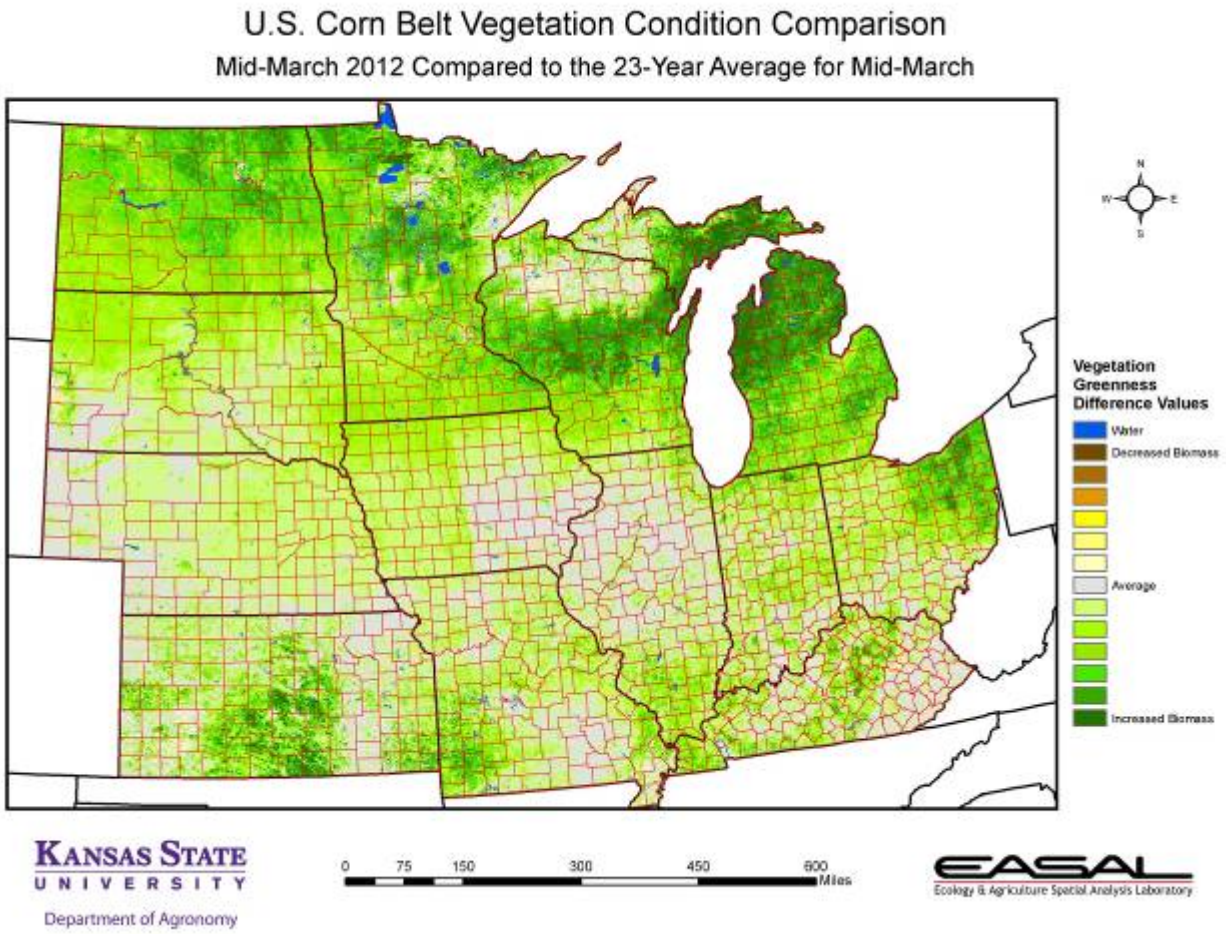
Map 3. Compared to the 23-year average at this time for Kansas, this year's Vegetation Condition Report for March 6 – 19 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that photosynthetic activity is much above normal in the central third of the state. The Flint Hills region of eastern Kansas is notable in the fact that it has not shown a marked increase in biomass production compared to the 23-year average.



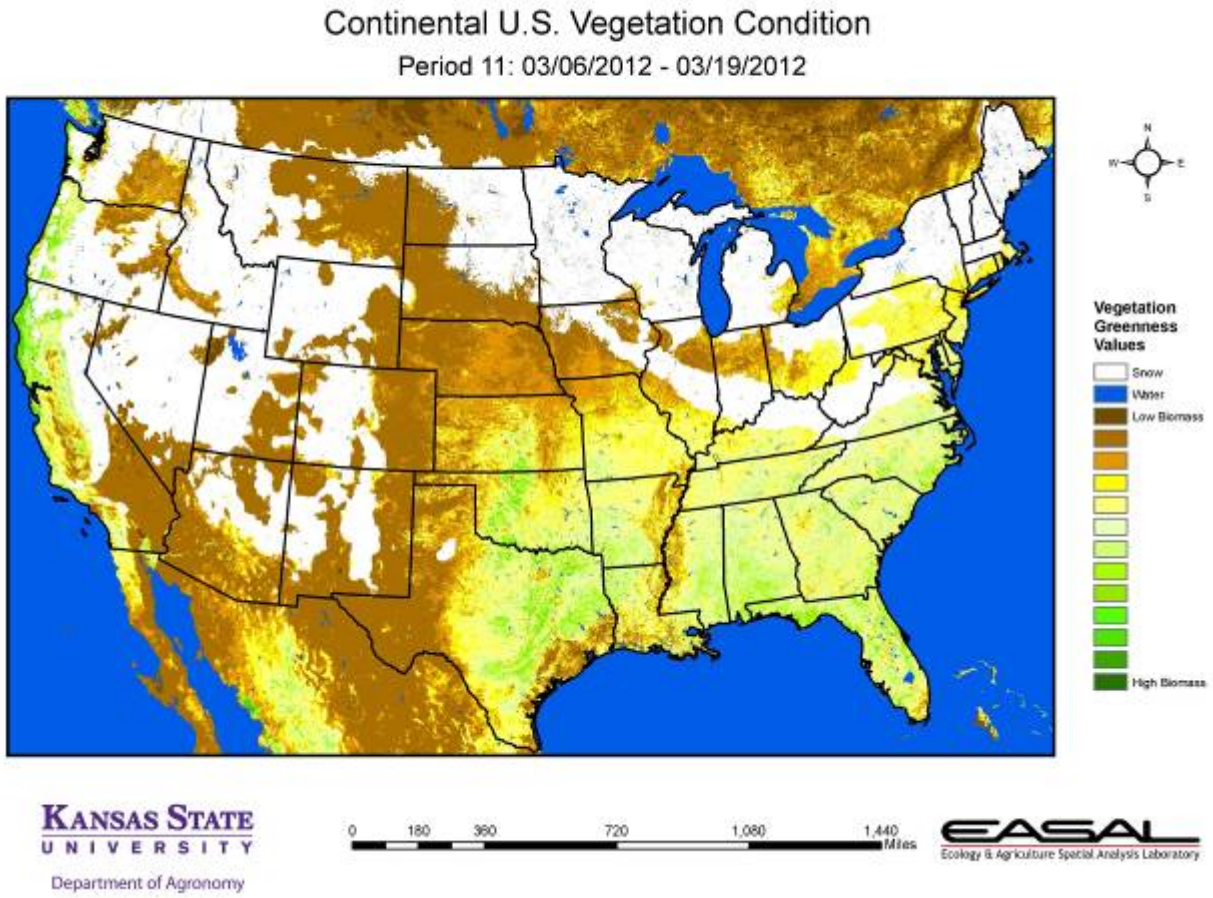
Map 4. The Vegetation Condition Report for the Corn Belt for March 6 – 19 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the area affected by snow cover continues to shrink. Snow depths in the northern Corn Belt continue to be well below average for the season. Reports from the area indicate that the soils are not frozen, and thus the concern for spring flooding is reduced.



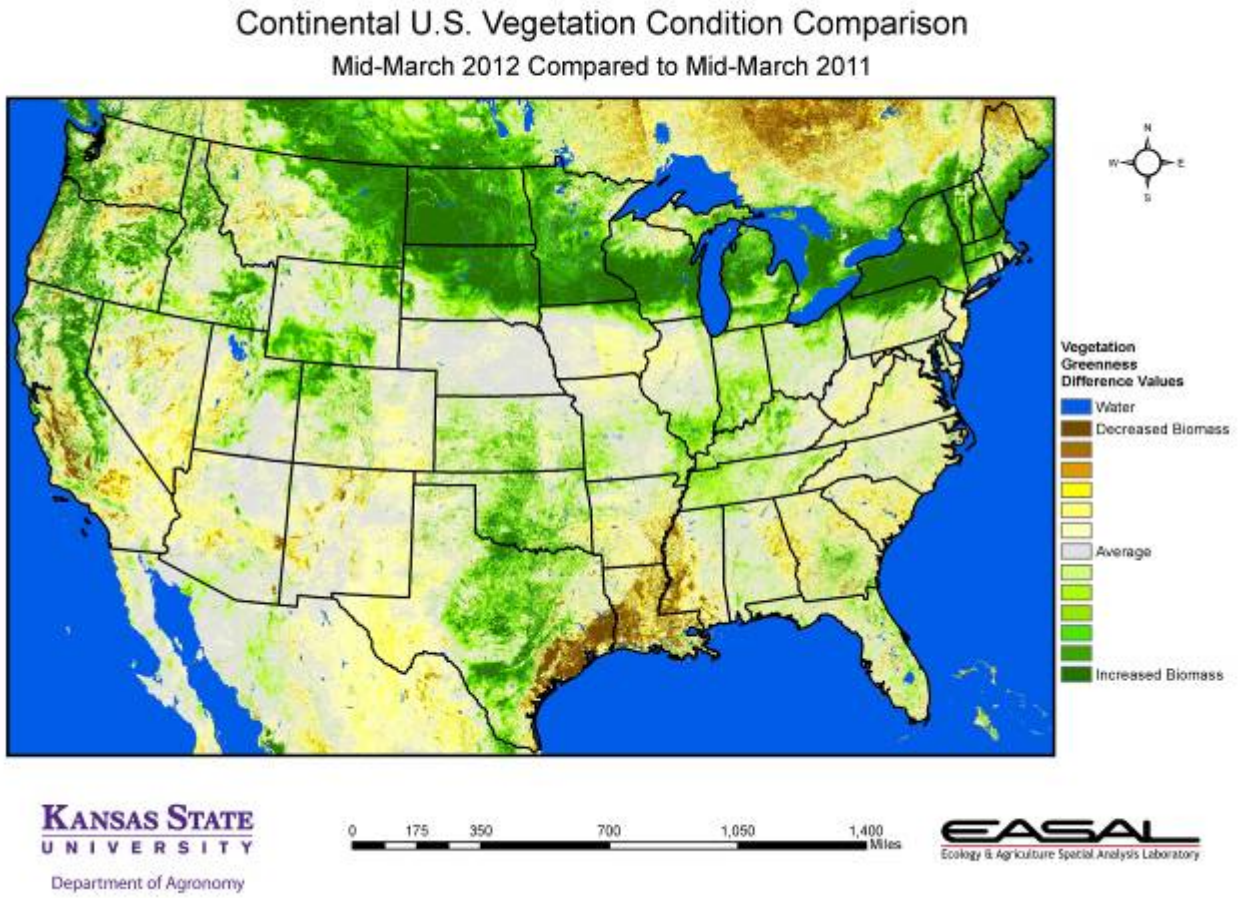
Map 5. The comparison to last year in the Corn Belt for the period March 6 – 19 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows much higher NDVI values. As noted in previous reports, in the northern reaches of the Corn Belt this does not indicate a great deal of photosynthetic activity, but primarily a decrease in the amount of snow cover when compared to last year. The greater-than-average NDVI values in the southern reaches of the Corn Belt, however, are a result of early plant development in the region.



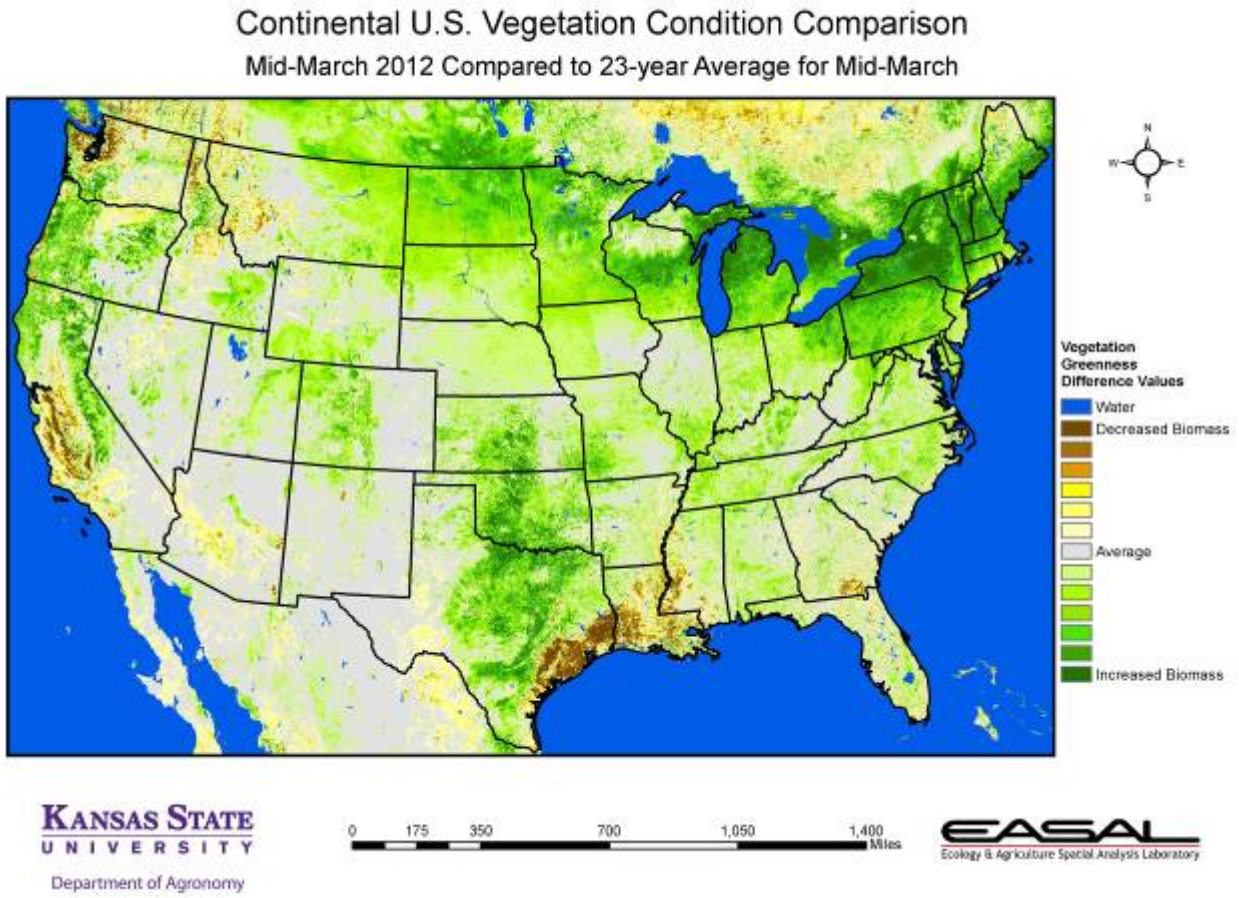
Map 6. Compared to the 23-year average at this time for the Corn Belt, this year's Vegetation Condition Report for March 6 – 19 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows much higher NDVI values across the northern region. This is due to a combination of low snow cover and early plant development, as vegetation responds to the unusually mild winter.



Map 7. The Vegetation Condition Report for the U.S. for March 6 – 19 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that snow cover has retreated. Lack of snow in Montana and Colorado has raised concerns for moisture in the growing season.



Map 8. The U.S. comparison to last year at this time for the period March 6 – 19 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that NDVI values have the greatest departure along the Canadian border. This is due to the lower snow cover when compared to last year. Lower NDVI values are seen along the Texas Gulf Coast and into the Mississippi River basin of Louisiana, Arkansas and Mississippi. Linger effects of last year's drought coupled with excess rains this year have resulted in lower productivity.



Map 9. The U.S. comparison to the 23-year average for the period March 6 – 19 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that Kansas, Oklahoma, and most of Texas have much greater photosynthetic activity than average. Mild temperatures and ample moisture have favored rapid plant development in these areas. The departures in the Southeast haven't been as great, as moisture was more limited.

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 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.
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, or
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