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1. Preemergence herbicide programs for corn

There are several preplant and preemergence residual herbicides available for corn. It's important to know the strengths and weaknesses of each product in terms of the spectrum of weeds controlled.

For burndown applications in a no-till system on emerged grass and broadleaf weeds, an application of glyphosate and a product containing dicamba or 2,4-D may be critical. The choice between 2,4-D and dicamba will depend on weed species present. Dicamba products will be more effective on kochia and marestail. 2,4-D is more effective on winter annual mustards. The use of preemergence herbicides often provide control of weeds for several weeks. This can greatly improve the effectiveness of a postemergence herbicide application, and give the producer more leeway on post application timing.

Soil-applied residual herbicides for corn can be grouped into several basic categories.

* Acetamides and acetamide/atrazine premixes. The main acetamide products used in corn include acetochlor, flufenacet, S-metolachlor, and dimethamid-P, and many premix products containing one of these four active ingredients. In general, these products are very effective in controlling grasses (except Johnsongrass and shattercane) and small-seeded broadleaf weeds such as pigweeds. They are much less effective in controlling kochia which is small-seeded or large-seeded broadleaf weeds such as cocklebur, devilsclaw, morningglory, sunflower, and velvetleaf. There have been no cases of weed populations in Kansas developing resistance to acetamides to date.

These products are most effective when applied with atrazine. Several atrazine/acetamide premixes are available and should be used instead of acetamides alone unless atrazine is not allowed. In past years, often because of cost, reduced rates of these products were applied to help manage heavy summer annual grass pressure, then followed up with a good postemergence herbicide program.

With the increased occurrence of glyphosate- and other herbicide-resistant weeds, the use of reduced/setup rates greatly increases the risk of unacceptable control.

In fields with normal weed and grass infestations (no herbicide resistance problems), a reduced-rate of an acetamide/atrazine premix product applied preemerge, followed by a postemerge application can still do a good job. The purpose of the low-rate preemerge treatment is to kill the easy weeds (common annual grasses and pigweeds), get corn off to a head start, keep the weed infestation manageable, and buy time for the post application.

* HPPD-inhibitors. Examples of HPPD-inhibitors are isoxaflutole (e.g. Balance Flexx, Corvus, and Prequel) and mesotrione (e.g. Callisto, Lexar, Lumax). These products either contain atrazine or should be applied with atrazine, and are excellent on kochia, pigweeds, velvetleaf, and many other broadleaf weeds. Lexar, Lumax, and Corvus+atrazine will provide the best control of grass weeds. Corvus will also control shattercane. Balance Flexx has activity on shattercane but is less consistent than Corvus. Prequel has a low rate of Balance mixed with Resolve and will not provide the same level of residual control as Lexar, Lumax, Balance Flexx or Corvus used at full rates. Keep in mind, products containing Balance should not be applied to coarse-textured soils when the water table is less than 25 feet below the soil surface. Balance Flexx is variable on sunflower. Corvus will be much better than Balance Flexx, provided the sunflower is not ALS resistant.

Also, herbicides containing clopyralid such as Hornet, TripleFlex, or Surestart will provide very good control of sunflower. Callisto, a component in Lexar or Lumax, has the same mode of action as Balance or Corvus but has less activity on grass weeds, thus if applied preemergence it should be applied with an acetamide and atrazine.

* Triazine. Atrazine is a common component of many preplant and preemergence herbicide premixes for corn. Where weed pressure is light, a March application of atrazine with crop-oil concentrate and 2,4-D or dicamba can control winter annual weeds such as mustards and marestail and provide control of most germinating weeds up to planting. It is essential to add glyphosate to the mix if winter annual grasses are present. In a premix with other herbicides, atrazine adds burndown control of newly emerged grasses and broadleaf weeds present near planting time, as well as some residual control of small-seeded broadleaf weeds such as pigweeds and kochia (except for triazine-resistant populations).

* PPO-inhibitors. Examples of PPO-inhibitors include flumioxazin (e.g. Valor, Fierce), and saflufenacil (Sharpen, Verdict). Valor or Fierce must be applied 7 days before corn planting in a no-till system. These herbicides provide excellent control of pigweeds; however, they are marginal on kochia. Fierce will provide improved control of velvetleaf compared to that from Valor. The addition of atrazine will enhance kochia, pigweed, velvetleaf, and morningglory control, provided the populations are not triazine-resistant. Sharpen and Verdict have excellent activity on pigweeds, kochia, and large seeded broadleaf weeds, however, length of residual is relatively short compared to other preemergence products when all are compared at full rates.

* ALS-inhibitors. Examples of ALS-inhibitors for use as a soil-applied herbicide for corn include flumetsulam (Python) and Hornet, which is a premix of flumetsulam and clopyralid. Both herbicides have broadleaf activity only. These products are strong on large-seeded broadleaf weeds such as cocklebur, sunflower, and velvetleaf, or the small-seeded common lambsquarters. Adding Hornet to a full rate of an acetamide/atrazine mix as a preemerge treatment will control the annual grasses and add considerably to large-seeded broadleaf weed control. Sunflower appears to be most sensitive to

Hornet, followed closely by cocklebur and velvetleaf. Morningglory is less sensitive. Depending on weed species present, control may be improved enough that a postemergence treatment is not needed.

An additional ALS-inhibiting herbicide from DuPont is called Resolve. Also a component in Prequel, which was previously mentioned, Resolve will provide short residual of grass and broadleaf weeds and should be used as a setup herbicide with a good postemergence weed control program. Keep in mind, if ALS-resistant broadleaf weeds are present, these ALS-containing herbicides often will be less effective.

New products for 2012

There are three new herbicides labeled for corn in 2012.

*Zidua, from BASF, contains a new active ingredient, pyroxasulfone, which is in the acetamide family. The pyroxasulfone provides excellent residual control of annual grasses, has some activity on shattercane, excellent activity on pigweeds, and very good activity on velvetleaf. When combined with atrazine, this product will be very competitive with other acetamide/atrazine premixes. Although registered, this product may not be available for corn planting in 2012.

*Fierce is a premix of the new active ingredient pyroxasulfone and Valor. This Valent product, because of the Valor component, must be applied to corn 7 days before planting at a 3 oz rate. The Valor component in Fierce will provide improved broadleaf activity over Zidua alone.

* Anthem, from FMC, is a premix of pyroxasulfone and Cadet. This product will give similar residual weed control as Zidua. However, Anthem will provide some postemergence activity on limited broadleaf weed species when applied postemergence. This product currently is not registered but registration is expected sometime during 2012.

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2. Plan now for good marestalk control in soybeans

Controlling marestalk in soybeans has been a big challenge for Kansas no-till producers. Because soybeans are generally planted later in the season, and marestalk generally germinates in the fall or early spring, application timing and weed size are critical factors to successful control.

In the early spring, using a growth regulator herbicide like 2,4-D or dicamba is an inexpensive and effective option to control rosette marestalk. In addition, using a herbicide with residual control of marestalk helps with weeds that germinate between the fall and early spring burndown and soybean planting. Products that include Canopy EX, Classic, FirstRate, Sharpen, or Valor can help provide residual control against several broadleaf species including marestalk. Consult the herbicide labels for the required preplant intervals prior to planting soybeans.

As soybean planting nears, marestail control can become difficult because plants will have bolted and be considerably larger. Herbicides to apply as a burndown prior to planting include tank mixes of glyphosate with FirstRate, Classic, Sharpen, Optill, or 2,4-D. Be very careful to follow label directions when using 2,4-D prior to soybean planting because the plant-back restriction with these herbicides ahead of soybean can be from 7-30 days. Sharpen is a relatively new herbicide that has provided good marestail control and can be applied any time before soybean emergence. Maximize marestail control by applying Sharpen in combination with methylated seed oil and at spray volumes of 15 gallons per acre or more.

One additional herbicide to consider as a rescue burndown application to control bolting marestail prior to soybean planting is Liberty. Although, it would be better to control maresatil at an earlier stage of growth, Liberty has been one of the most effective herbicides to control bolting marestail. Liberty also has broad spectrum non-selective activity on other broadleaf and grass species if treated at a young growth stage. Liberty, is primarily a contact herbicide, so a spray volume of 15 gpa or greater generally provides the most consistent weed control. Liberty tends to work best under higher humidity and warm sunny conditions at application.

Controlling marestail in the growing soybean crop can be the biggest challenge for producers. Glyphosate alone is often not effective on larger or glyphosate-resistant marestail. The most successful treatments for large marestail in Roundup Ready soybeans have been with combinations of glyphosate + FirstRate, glyphosate + Classic, or glyphosate + Synchrony. Another option to control marestail in soybean is to plant Liberty Link soybeans and use Liberty herbicide. It is important to remember that Liberty can only be applied postemergence on Liberty Link soybeans.

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3. Wheat disease update

Most parts of Kansas experienced warm temperatures this week and the wheat is growing rapidly. I continue to receive reports of leaf rust and stripe rust from Texas with wheat breeders reporting the leaf rust is severe on susceptible varieties in research plots near College Station and San Antonio. Stripe rust is also active at these locations but it does not appear to be as severe as in 2010. Oklahoma is reporting low levels of stripe rust near Stillwater.

To date, I have not been able to find leaf rust or stripe rust in Kansas. However, the weather this past week likely favored movement and establishment of these diseases in our region. I have seen some fields and research plots with of low levels of Septoria tritici blotch and powdery mildew, but currently these diseases are restricted to the lower leaves. The risk of severe disease yield losses is currently low in Kansas, but disease activity may increase if the weather remains favorable for disease development. Farmers should be checking fields carefully in the next 10 to 14 days make sure disease remains at low levels.

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4. Kansas Flint Hills Smoke Management Plan: Impact of dry conditions on prescribed burning

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 Bill Waln of the U.S. Fish and Wildlife Service office at the Quivira National Wildlife Refuge in Stafford County, conducted by Eric Atkinson of the K-State Radio Network.

Q: You're also involved in the Mid-Plains Interagency Fire Management District. What is your role in the district?

A: I'm the fire management officer for the Mid-Plains District. That comprises four wildlife refuge areas in Kansas, as well as all the National Park Service lands. My job is to assist all those refuges and park lands with their wild land fire management responsibilities – which includes wild land fire suppression as well as all the prescribed burns done on those lands in Kansas.

Q: Is that a substantial amount of prescribed burning?

A: In any given year, we'll do about 70 to 75 prescribed burns involving about 20,000 acres.

Q: There are still areas this spring on your lands and elsewhere in which conditions are dry, correct?

A: That's right. Actually, we're still seeing a substantial moisture lag throughout the entire state, even though many areas have received good precipitation the last couple months. That impacts how we will burn from now through the rest of the spring.

Q: With respect to prescribed burning, what lessons did we learn from last year under the extreme drought conditions?

A: First of all, it's important for people to realize we are still under drought conditions and that burning conditions will not be normal. For example, when we go out and put in a control line, they will have to be wider than normal. We're currently looking at 20 times the fuel height. So if you have a grass stand that's 5 feet tall, the control line is 20 times that. This is a contingency because the fires are going to burn hotter. It's going to take more resources to hold that fire. I'd rather do a little overkill in that regard than find ourselves in a situation where we're just barely able to keep the fire under control and have to fight pretty hard to do so. If you have a control line of the minimum width, if you get a wind shift or the relative humidity drops more than you expected, the line may not be able to hold the fire and you'd be in a bad situation. Our main objective is always the safety of our fire team on the ground, and the public safety as well. When we're in this drought condition, we

have to be aware of it and we have to plan for the contingencies. We want extra wide fire control lines, more people out there working the fire, more equipment, more water, just more of everything in order to get the job done and meet our number one objective, which is safety.

Q: And you also say the grazing management post-burn can also be impacted by the dry conditions.

A: I don't have a lot of specifics on this. But we are a little bit concerned here that we did some grazing on the land that was burned last spring with the hope that we'd get some rain over the summer. It didn't happen. Now we're concerned that if we come back and burn again, we could be setting those grasses back a bit. When the rains come, we're wondering if the grasses will be slower to come back where we've done burning/graze/burning.

Q: Are you thinking there may be occasions where you might want to skip burning?

A: That always has to be an option. Even in good years, you always have to keep in mind your main objective – which in our case is safety. There are so many inherent risks to burning that we always have to be willing to say no. That's one of the lessons learned from last season. We more readily accept that “no” is a viable option for the land manager. We've looked at skipping a year. We've decided not to burn some of the areas that we had hoped to burn this year simply because we're concerned about the ability of those lands to recover in a timely fashion. If you're willing to set back your time horizon, if you're willing to wait 2 or 3 years for that land to recover, then you can go ahead and burn this year and see what happens. But if you're looking to make sure you'll get a quicker turnaround once the moisture returns, then it might be best not to burn it again so soon.

Q: Do you have any recommendations on practices to control smoke production and movement under these dry conditions?

A: Generally speaking, under dry conditions we have to realize that we'll be putting more smoke into the atmosphere than we do under normal moisture conditions. For example, a lot of times in the springtime you might put some fire into a shelterbelt. Shelterbelts are usually holding a lot of moisture in the leaf litter, and you won't get a complete burn. In a dry year, however, all that litter that has accumulated and all the dead downed fuel in that shelterbelt is now dry and available to burn. The heavier fuel, the downed logs and downed trees will burn longer when it's dry. So you'll have more residual smoke. Another issue when it's drier is that more of the surface fuels are available to burn. If you have a really heavy stand of grass, the burn normally doesn't go all the way down to the soil line because of all the previous several years of growth matted down near the ground. That mat of old vegetation is usually holding some moisture, so it won't burn all the way to the ground. In a dry year, what we saw last year is that we were burning all the way down to the soil on some of our lands. The more thoroughly the vegetation layer is burned, the more smoke it's going to produce. So in a dry year, you'll usually be putting more smoke into the air. That's something to consider.

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5. Diagnosing a case of unusual green strips in a wheat field

Wheat was planted after corn in this field in Ottawa County. In visiting the field this week, there was an unusual pattern to the field. The wheat was planted in one direction (at an angle from lower left to upper right in the photo below), while there were obvious green stripes across the field at about a 45 degree angle.

The wheat received about 90 pounds of nitrogen before planting in mid-October. Emergence was fine. Corn yields were well below normal in 2011, about 50 bushels per acre.



Wheat field in Ottawa County, March 14, 2012. There are green strips through the field at an angle to the direction the wheat crop was planted. Photo by Jim Shroyer, K-State Research and Extension.

It turns out that the green strips going across the field at an angle are exactly where phosphorus starter fertilizer was applied to the previous corn crop. The wheat crop is deficient in phosphorus in this field – except where it is growing in the areas where phosphorus fertilizer was applied to the corn crop.

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6. Comparative Vegetation Condition Report: February 28 – March 12

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>

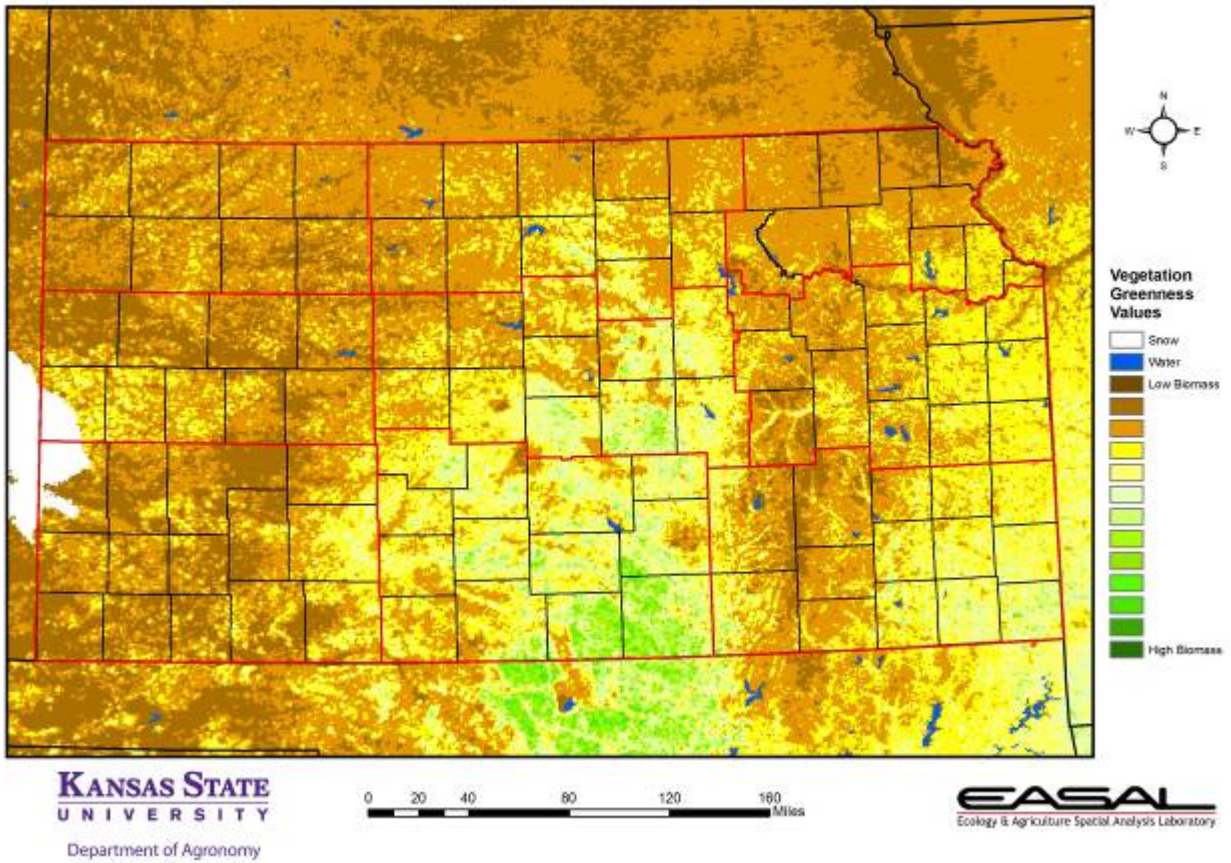
<http://www.youtube.com/watch?v=tUdOK94efxc>

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

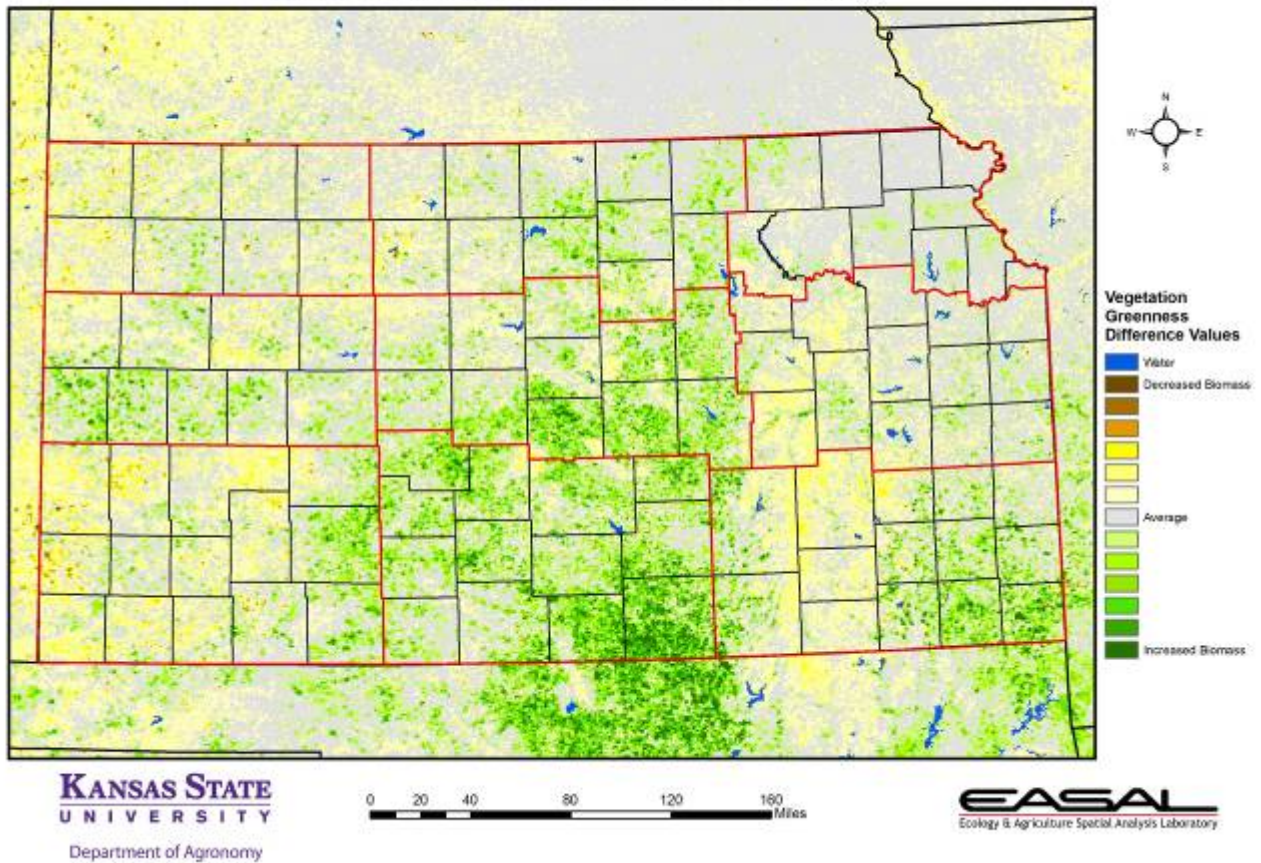
Period 10: 02/28/2012 - 03/12/2012



Map 1. The Vegetation Condition Report for Kansas for February 28 – March 12 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows only extreme western Kansas had any snow, and that contributed little to the moisture. Central and south central Kansas are beginning to show increased photosynthetic activity as the winter wheat has broken dormancy. Precipitation in the South Central division is at 144 percent of normal for the year-to-date, and temperatures over the last two weeks have averaged 6 degrees warmer than usual.

Kansas Vegetation Condition Comparison

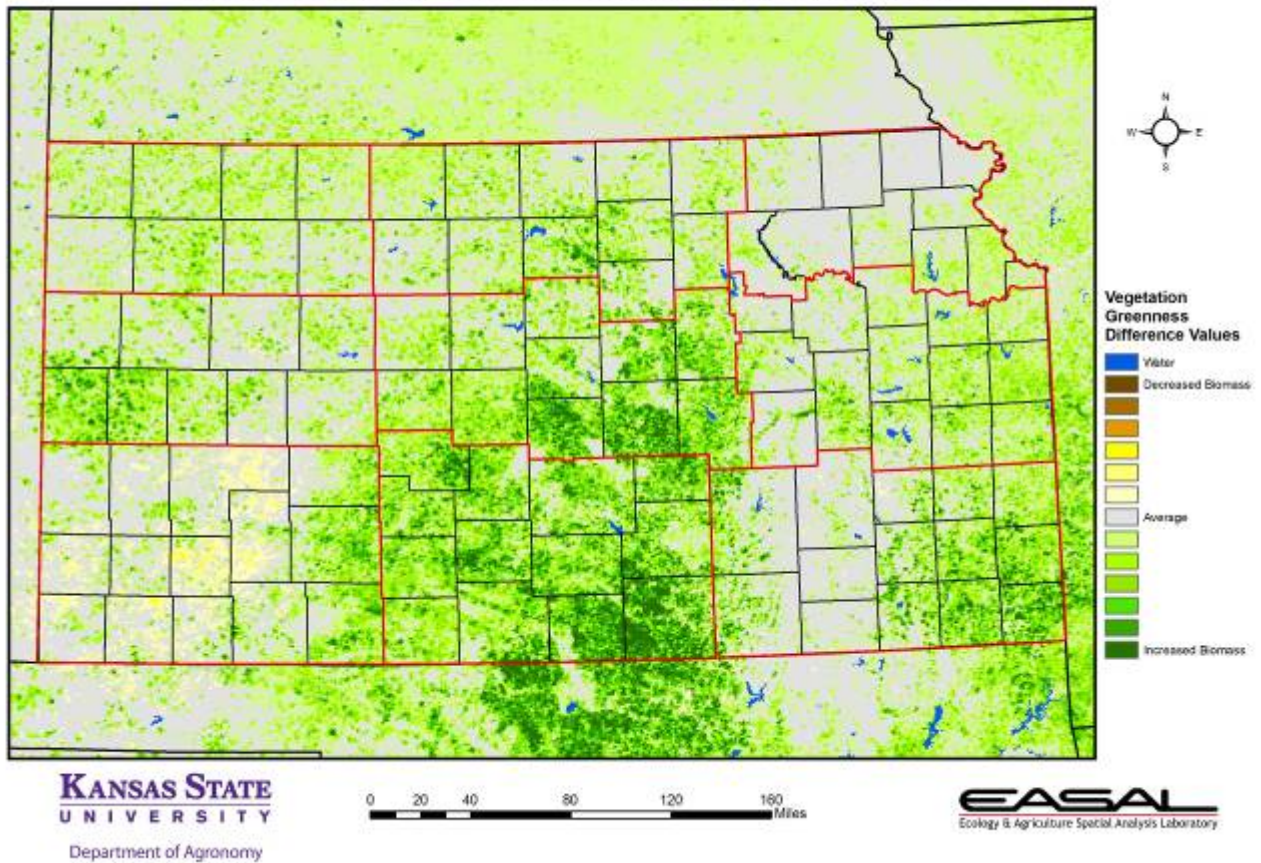
Early-March 2012 compared to the Early-March 2011



Map 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for February 28 – March 12 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows above-average NDVI values across much of the state. The most notable departure is in the South Central Division. Warm weather and adequate moisture has resulted in greater photosynthetic activity in the area. Last year, temperatures in the Central and South Central Divisions were running at or below normal, and precipitation was less than 70 percent of normal for the year-to-date. This year, temperatures are averaging 6 degrees above normal, and precipitation in the South Central Division is 144 percent of normal.

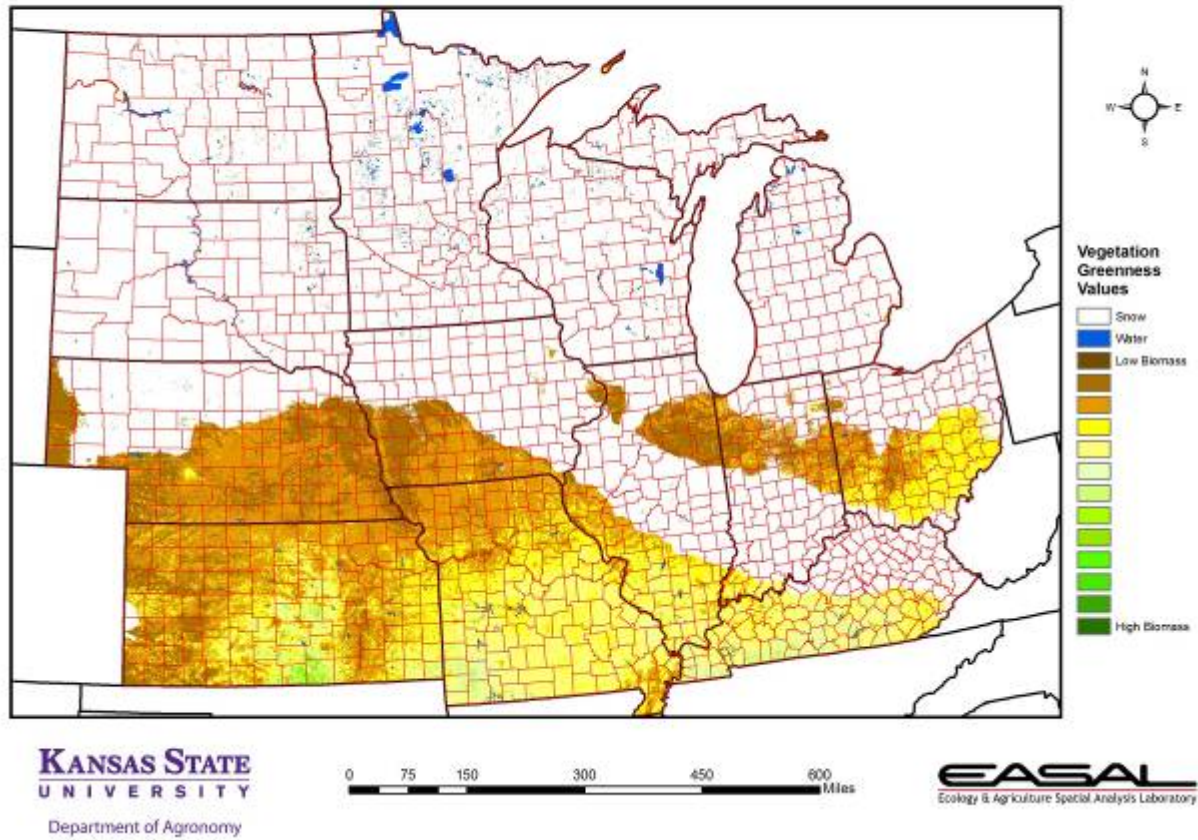
Kansas Vegetation Condition Comparison

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



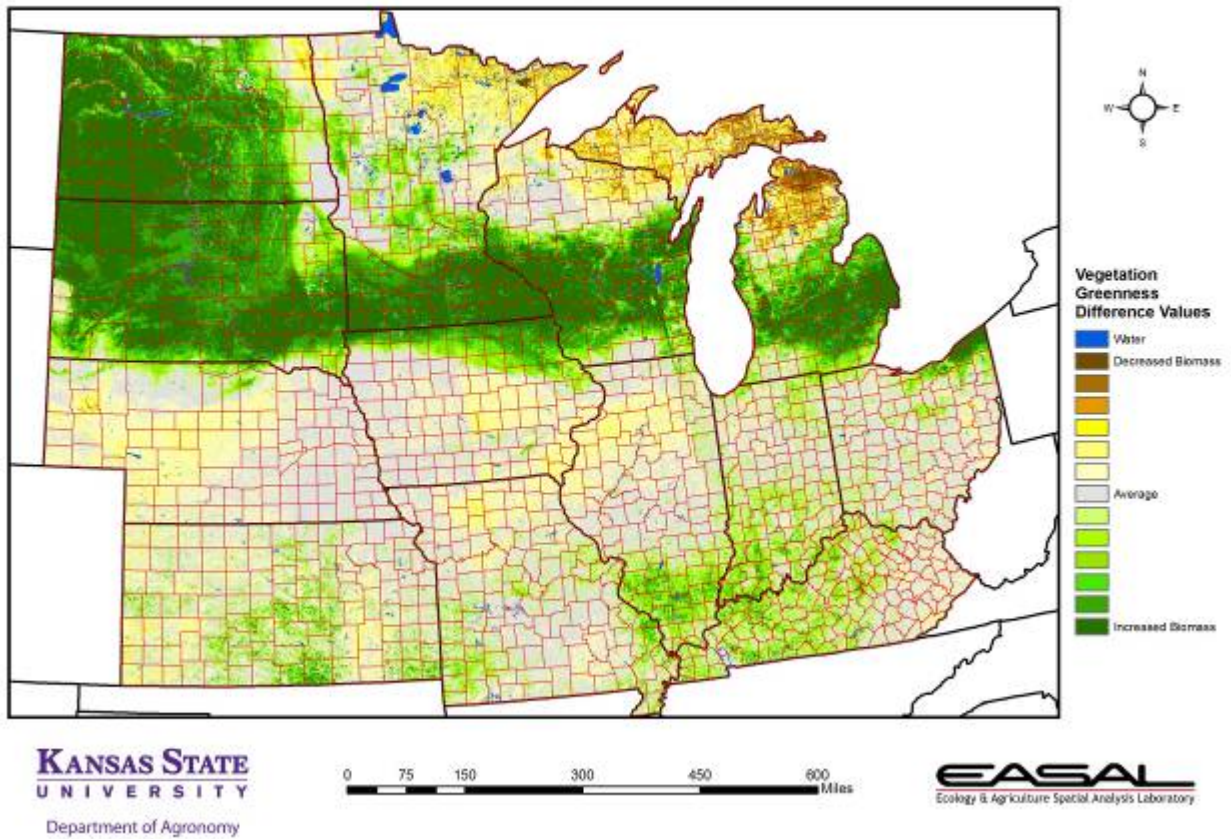
Map 3. Compared to the 23-year average at this time for Kansas, this year's Vegetation Condition Report for February 28 – March 12 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the Central and South Central Divisions have much higher NDVI values. The main driver is warmer-than-average temperatures for the period. More vegetation has broken winter dormancy than normal for this time period, and winter wheat has progressed rapidly. Native grasses in the Flint Hills region have been slower in development.

U.S. Corn Belt Vegetation Condition
Period 10: 02/28/2012 - 03/12/2012



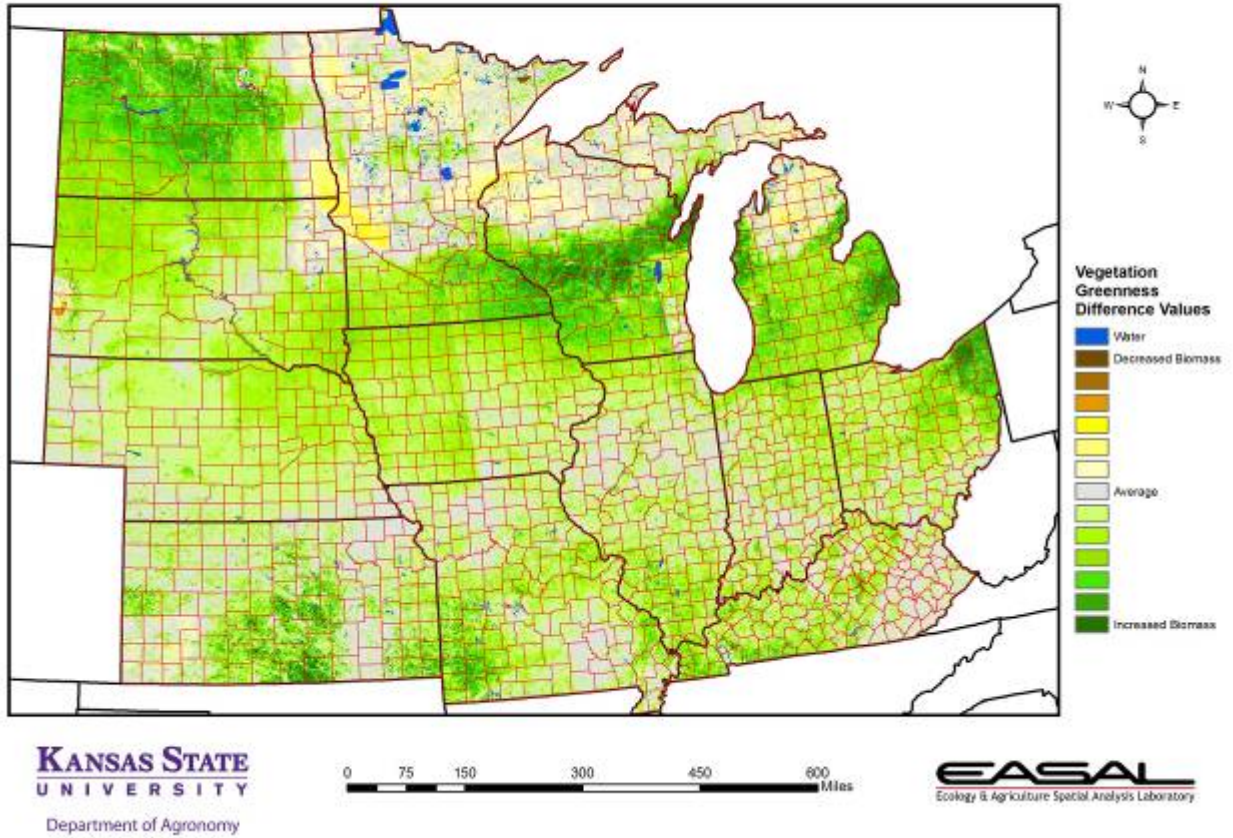
Map 4. The Vegetation Condition Report for the Corn Belt for February 28 – March 12 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that snow cover was a larger influence in the northern areas of the Corn Belt. This has moderated the influence of the warmer-than-average temperatures across the region.

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



Map 5. The comparison to last year in the Corn Belt for the period February 28 – March 12 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows higher NDVI values in areas of North and South Dakota. This is due to the lower snow depths in these areas when compared to last year. The higher NDVI values in the southeastern stretches of the Corn Belt are due to a quicker onset of biomass production as warm temperatures continue.

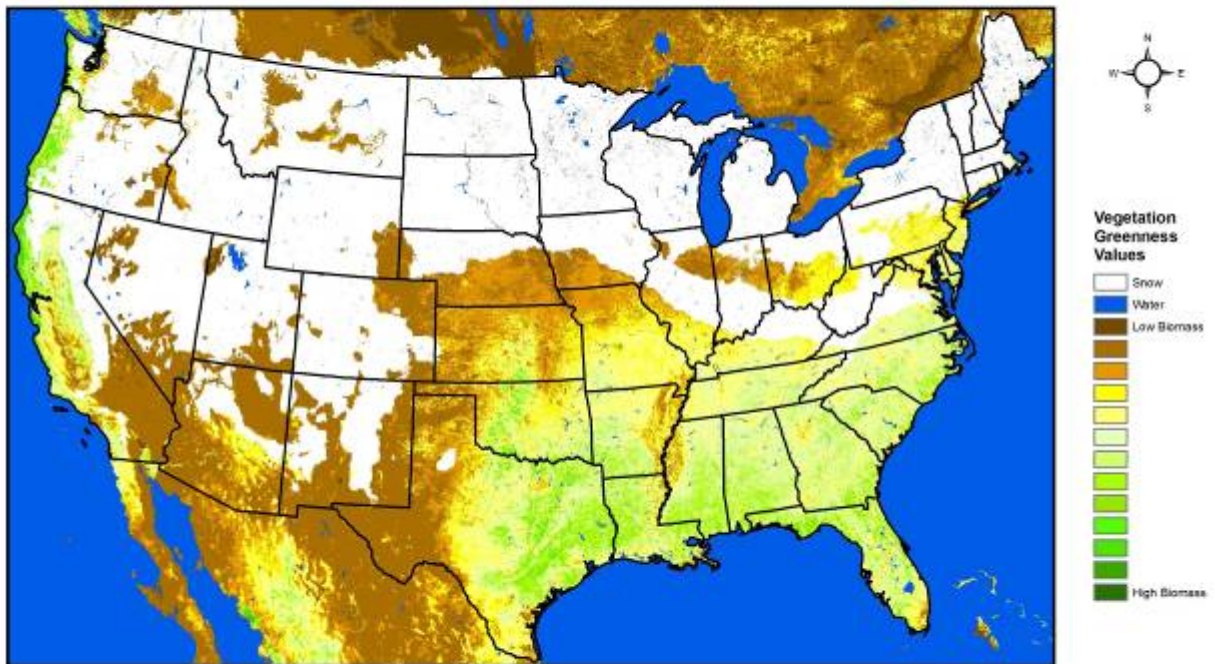
U.S. Corn Belt Vegetation Condition Comparison
 Early-March 2012 Compared to the 23-Year Average for Early-March



Map 6. Compared to the 23-year average at this time for the Corn Belt, this year’s Vegetation Condition Report for February 28 – March 12 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows much of the Corn Belt has higher NDVI values. The areas in North Dakota through southern Wisconsin and Michigan are due to lower-than-average snow depths. In the southern areas of the Corn Belt, these higher NDVI values signal increased photosynthetic activity as vegetation responds to the milder-than-average winter with early emergence from dormancy.

Continental U.S. Vegetation Condition

Period 10: 02/28/2012 - 03/12/2012



KANSAS STATE
UNIVERSITY

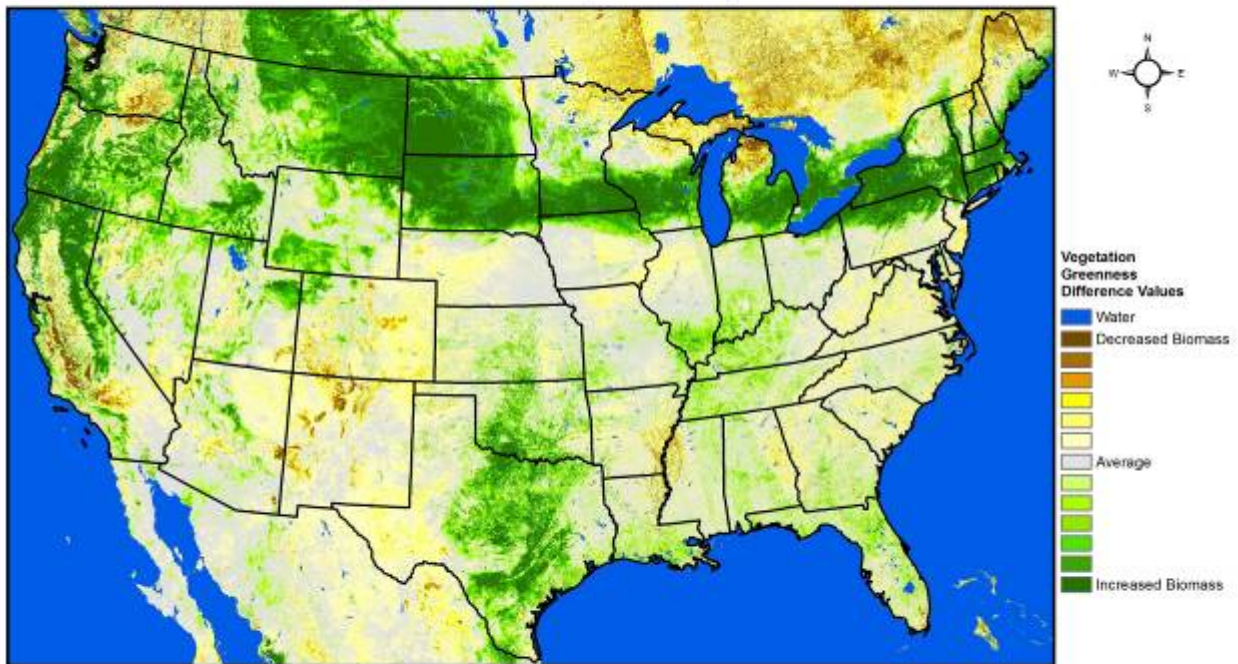
Department of Agronomy

0 180 360 720 1,080 1,440 Miles

EASAL
Ecology & Agriculture Special Analysis Laboratory

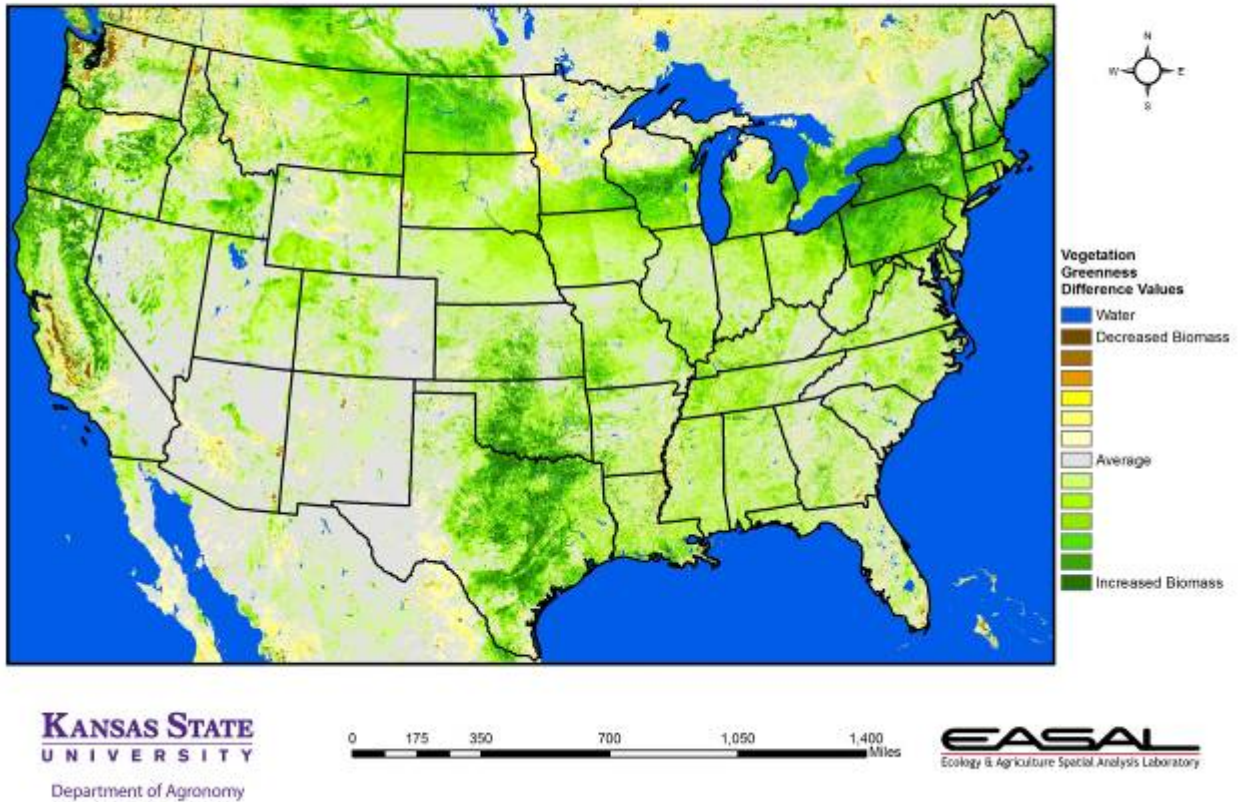
Map 7. The Vegetation Condition Report for the U.S. for February 28 – March 12 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that snow still has been a feature across the northern U.S. In contrast, much of the southern U.S. has slightly elevated NDVI values.

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



Map 8. The U.S. comparison to last year at this time for the period February 28 – March 12 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that central Texas has much greater photosynthetic activity. Favorable moisture and mild temperatures in the area have resulted in increased biomass production. West Texas has not seen as much improvement, but temperatures have been cooler and moisture more limited in that part of the state. The higher NDVI values in the northern U.S. are due to lower snow cover in the area than during this same period last year.

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



Map 9. The U.S. comparison to the 23-year average for the period February 28 – March 12 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that much of the U.S. has higher-than-average levels of photosynthetic activity. This is particularly noticeable in the Central and Southern Plains. Also, favorable moisture in the drought areas of southern Georgia and northern Florida have resulted in NDVI values closer to average.

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.
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