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#### 1. The state of the K-State wheat breeding program at Manhattan

The K-State wheat breeding program is moving rapidly into an exciting new phase of operation. We are implementing new technologies (doubled haploid breeding with Heartland Plant Innovations, marker-assisted selection with the USDA Genotyping Lab, and a complex genomic selection process) and engaging in new cooperative agreements with private and public wheat breeding programs. All of this is designed to make our breeding program more efficient, more effective, and faster. As a result, the long-term future is very promising.

The near-term future is also promising. We have a full pipeline of new lines in the works, with multiple strong performers in each generation, including some hard red winter lines well adapted to western Kansas.

Currently, we have one line (KS020319-7-2) for potential release in 2012. This line is in the Kansas Intrastate Nursery and USDA Southern Regional Performance Tests this year, but has not yet been entered in the K-State Wheat Variety Performance Test. Hopefully it will do well enough this year to be entered in the K-State Performance Test in the fall of 2011.

In addition, there are four promising lines right behind, for potential release in 2013. More details will be available on these lines as they get closer to release.

In general, the priorities of our wheat breeding program (in addition to high grain yields) include:

\* Durable rust resistance. This involves combining two or more minor genes for both leaf rust and stripe rust resistance. In terms of football defensive units, this approach aims to result in varieties that will “bend but not break” when attacked by these diseases. This will give us long-lasting, durable resistance. We are hoping to break the cycle of coming up with varieties with strong resistance to rust, only to have new races of rust develop within a couple years that can

break the resistance. We have made good progress in this approach, with 21 of 36 lines in our advanced nurseries in 2011 having durable rust resistance.

\* Hessian fly resistance. We are making good progress here, as well. Our newest release, Everest, has Hessian fly resistance. Many of our experimental lines also now carry one or more genes for Hessian fly resistance. The challenge is that there is more than one biotype of Hessian fly active in Kansas, and few genes are effective against all biotypes.

\* Shattering tolerance. This trait is especially important for western Kansas. One of our goals is to develop more hard red winter varieties for this region, to complement the hard white winter varieties that have been released by the wheat breeding program at Hays. We have expanded our testing program of hard red winter wheat experimental lines in western Kansas in recent years.

\* Heat and drought tolerance. This is a high priority for us, but making progress is hard work and there is much left to do before significant progress can be reported.

\* Fusarium Head Blight resistance. This is also a high priority. Fusarium Head Blight resistance would make it much more feasible to doublecrop wheat after corn, or plant wheat in the vicinity of corn, which could benefit an increasingly wide area of Kansas. We have made some progress, including some tolerance in the new variety Everest, but there is more to do.

These traits give us a full plate, but we are also focusing now on flood tolerance, nematode resistance, Ug99 stem rust resistance, barley yellow dwarf resistance, and special quality traits.

-- Allan Fritz, Wheat Breeder  
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## 2. Kansas Flint Hills Smoke Management Plan: What prompted its development?

The following is a transcript of the second in a series of K-State's Agriculture Today radio broadcasts on the Kansas Flint Hills Smoke Management Plan. This is an interview with Tom Gross, Bureau of Air, Kansas Department of Health and Environment, conducted by Eric Atkinson of the K-State Radio Network. Podcasts of all Agriculture Today interviews can be found at:

<http://www.ksre.ksu.edu/news/DesktopDefault.aspx?tabid=66>

Q: The process of developing the new Kansas Flint Hills Smoke Management Plan started with the Kansas Department of Health and Environment, which convened a smoke management advisory group. This group consisted of agricultural producers, government agency representatives, municipality officials, and K-State Research and Extension personnel, among others. That group came up with a plan that will be introduced this spring in the Flint Hills. What prompted the agency to pursue this smoke management plan.

A: The issue of Flint Hills burning impacting air quality is one that we've been working on with the agricultural community for a number of years. We first saw concerns about this in 2003. That was a year when we had a constricted burn season as a result of dry weather and some burn bans that were put into place. So there was quite a bit of burning done in just a small number of days. On those days, we saw impacts in Kansas City and in downwind cities several states away. That

got us started, and we've met with agricultural representatives on this from 2003 to the present. We also had some occurrences in 2009 and 2010 when we saw exceedances of the ozone standards in both Kansas City and Wichita. So that's what prompted our development of the smoke management plan. The plan is important for the agency to get data flagged, or not counted, in evaluating whether a city or any community meets the ozone standards.

Q: As we go through this series, we will remind listeners and readers from time to time about the general components of the plan and its initial implementation on a pilot basis in 2011. Will you go over that?

Note: The 53-page Kansas Flint Hills Smoke Management Plan can be found at:  
[http://www.kdheks.gov/bar/air-monitor/flinthillsinfo/SMP\\_v10FINAL.pdf](http://www.kdheks.gov/bar/air-monitor/flinthillsinfo/SMP_v10FINAL.pdf)

A: The plan starts off with an introduction and talks about the same history mentioned above. Then it also has a component on the Flint Hills ecosystem – what's unique about the ecosystem and why it's important to preserve the tall grass prairie. It talks about the role that fire has played in the Flint Hills ecosystem, which is an important part of the plan. Then we get into air quality standards and a little bit of the history of what we've seen in regard to those standards, including the situations where we've had problems over the years and the reasons why we have a plan. Then Chapter 3 talks about some of the tools that are being made available to producers in order to make more informed decisions about whether the burning they're wanting to do on a certain day is going to have impacts downwind in cities such as Wichita or Kansas City. That chapter is the heart of the plan. The rest of it is supplemental information leading up to that chapter. If people are going to read one chapter, Chapter 3 is the one to read.

We also have some discussions in Chapter 4 on restrictions on April burning. We want to make sure that non-agricultural burning that could occur sometime other than in April doesn't take place when the Flint Hills burning takes place. So we have some provisions that we're going to be putting into a new regulation regarding April restrictions. This will not affect prairie burning in the Flint Hills. It is non-agricultural burning that we're addressing with this regulation.

Q: That will apply to the 13 identified counties in the Flint Hills, plus some municipalities?

A: Yes. It applies to the core of the Flint Hills, and to Sedgwick, Johnson, and Wyandotte counties. This restriction is not done yet; we're working on that right now. We'll get a draft developed, then we'll share it with the folks who have a stake in that and get some feedback from them on the draft rule.

Q: One of the keystones to this program is the informational site that K-State is developing and will house. And of course all the stakeholders involved in creating the plan will be involved in contributing to that information as well. Could you talk about that?

A: Yes. The next chapter is on outreach and educations, and public notification. That is another critical chapter, probably as important as the other. It's important to know how to get this information out. We're working with K-State, which has taken a lead on this in developing a web site that includes the tools available to producers. We're also going to try to get the word out in a number of different ways, with some of the farm organizations and their own web sites, newsletters, on the KDHE web site, on-the-ground training that takes place with K-State Extension, and by NRCS. Those folks are all involved in this and will be getting the message out

on what's in the plan and particularly Chapter 3 where we talk about some of the ways producers can make a more informed decision.

Q: The intent is to introduce this whole apparatus in two Flint Hills counties, Chase and Greenwood, in 2011 and see where it goes. But it is voluntary, right?

A: The plan itself, and the materials, we hope to introduce to everybody. We are having a more focused effort in the two counties you mentioned. We're going to try to work with producers in those counties and try to get them to use a fire checklist they can go through to make sure they've touched all the bases in gathering all the needed information. But the same materials are going to be available to everybody and we're going to reach out to everybody. We're just going to have a more focused effort in Chase and Greenwood counties in 2011.

Q: You are really encouraging feedback from producers, land owners, grassland managers, and anybody conducting a prescribed burn upon implementation of this plan in 2011, correct?

A: Yes, we want to know if this is working. There are a couple of ways we can judge that. One is through air quality monitoring through the month of April. Are we seeing improvement there. But just as important is to know whether the materials that are being developed now are useful in their current format. Are they understandable and helpful in making those burn decisions? If they're not and they need to be improved, then we ask for feedback from the producers so that going into the 2012 burn season we can make improvements.

-- Steve Watson, Agronomy e-Update Editor  
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### 3. Planning for spring-seeded alfalfa

Now is a good time to start planning for spring seeding of alfalfa. If new fields of alfalfa were not seeded last fall, spring seeding will be necessary.

Spring seeding of alfalfa often succeeds well in Kansas, since rainfall in April and May is usually more predictable than rainfall in late summer or early fall. Productivity the first summer after planting will be limited, however.

Alfalfa planting can begin in late March in southeast Kansas, and in April in other areas of the state. On irrigated fields, alfalfa can be planted into early May.

Some tips for planting alfalfa:

\* Producers should have their soil tested as soon as it thaws this winter to determine if phosphorus, potash, or lime needs to be added.

\* In selecting a variety, producers should look at state performance test results. The most recent results from K-State are from 2009: <http://www.ksre.ksu.edu/library/crpsl2/srp1025.pdf>. Also, look at disease resistance and fall dormancy ratings. Choose varieties that can resist phytophthora root rot, bacterial wilt, fusarium wilt, verticillium wilt, anthracnose, pea aphid, spotted alfalfa aphid, and other diseases and insects. Fall dormancy ratings of 3 to 4 are best for

the northern part of the state, and 4 to 5 are best for southern areas. The lower the number, the earlier the variety goes into dormancy and the less productive it is in the early fall.

\* Plant in firm, moist soil. This can be accomplished with no-till. Minimizing tillage when planting alfalfa this spring can also decrease planting costs and help maintain soil moisture levels. No-till has worked well for alfalfa, especially when planted onto failed wheat ground, or into last year's wheat or row crop stubble. Before planting alfalfa, producers should take into account any herbicides used on the previous crop and whether residual carryover would be a concern to alfalfa establishment.

\* Make sure weeds are controlled before planting and after emergence. This is especially important in spring-planted alfalfa. For the latest recommendations, see K-State Report of Progress 994 "2011 Chemical Weed Control for Field Crops, Pastures, Rangeland, and Noncropland": <http://www.ksre.ksu.edu/library/crpsl2/srp1045.pdf>

Read and follow all label directions when using any pesticide.

\* Producers should make sure there is no potentially harmful herbicide carryover remaining in the field that will be planted to alfalfa. Consult product labels for specific rotation restrictions of any herbicide.

\* Inoculate the seed to help ensure the nitrogen fixation necessary for optimum production.

\* In general, plant seed 1/4 to 1/2 inch deep. But never plant less than 3/4 inch deep in sandy soils unless the field is irrigated.

\* Plant 8 to 12 pounds of seed per dryland acre in the west, 12 to 16 pounds per dryland acre in central and eastern Kansas, and 15 to 20 pounds per irrigated acre in all soils.

\* Plant certified, treated seed.

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#### 4. Comparative Vegetation Condition Report: January 11 – 24

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.

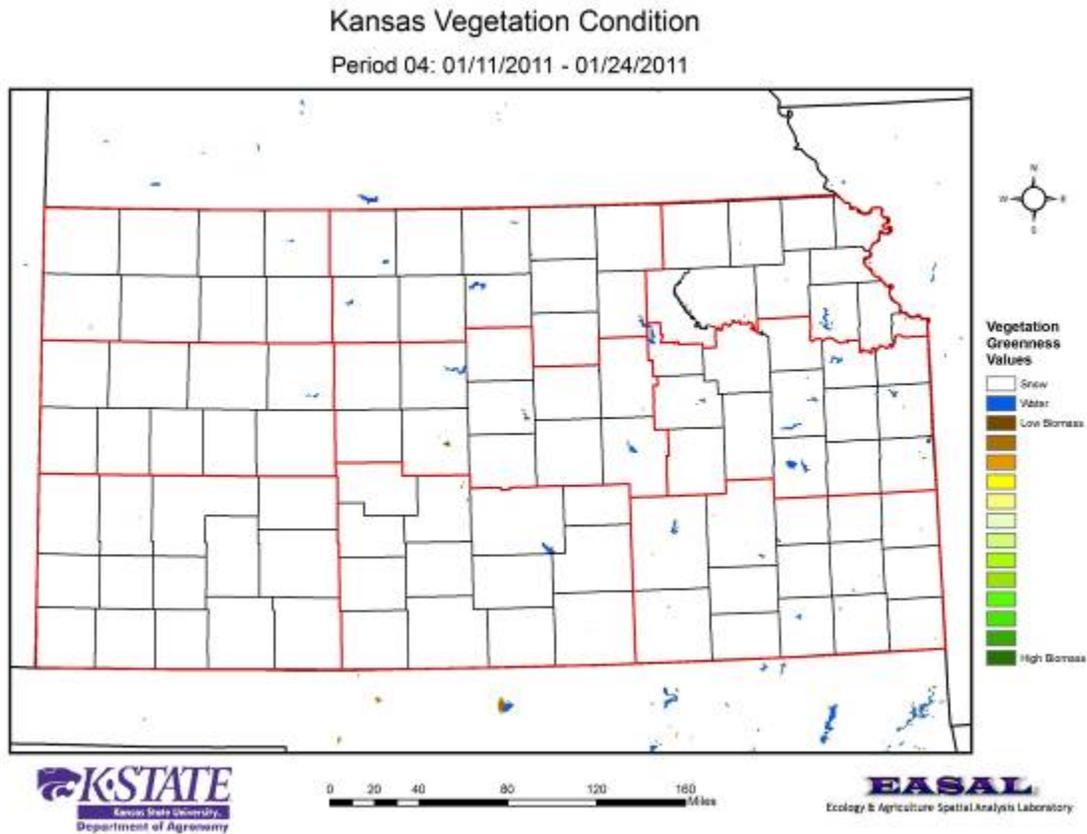
Two short videos of Dr. Kevin Price explaining the development of these maps can be viewed on YouTube at:

<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

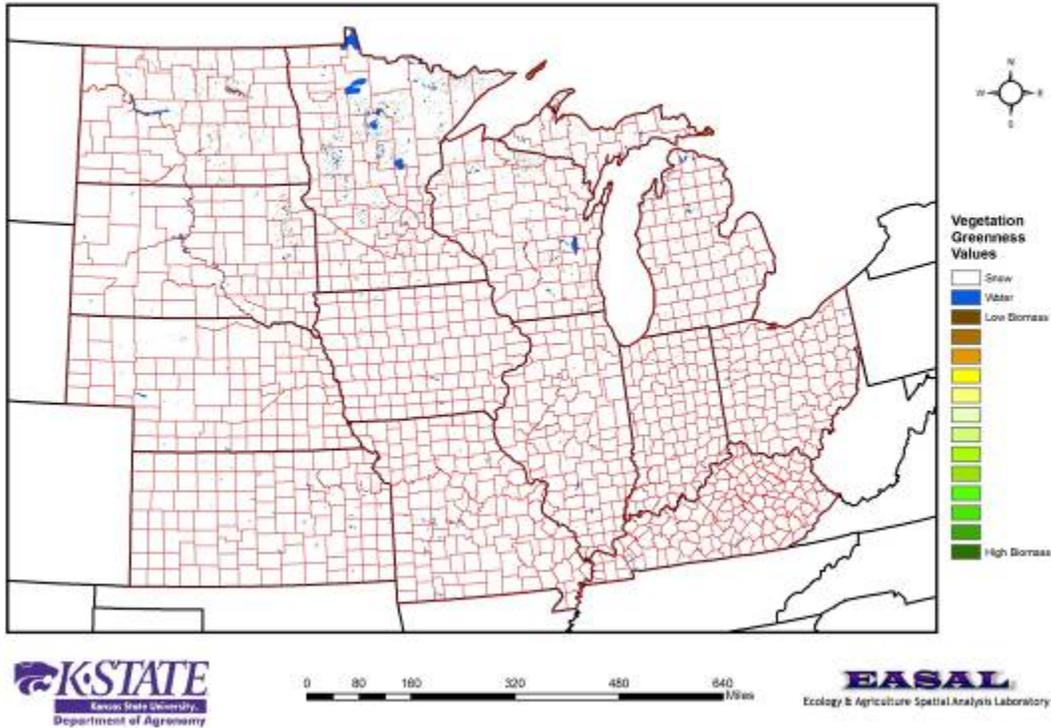
individual farmers and ranchers, the commodities market, and political leaders for assessing factors such as production potential and drought impact across their state.

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:



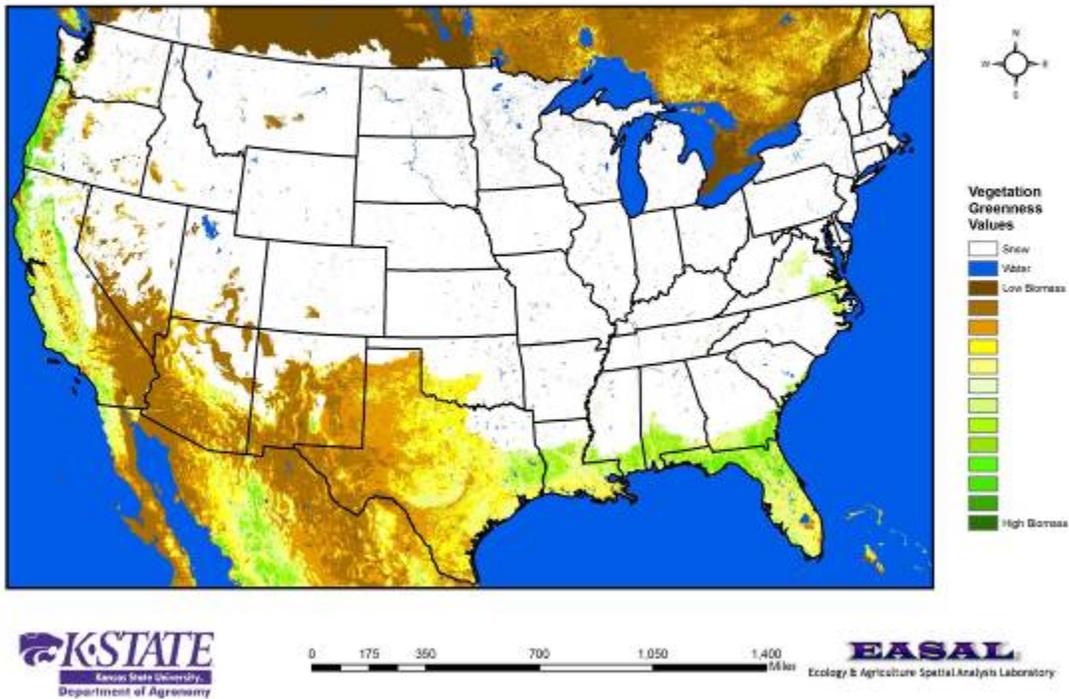
**Map 1. The Vegetation Condition Report for Kansas for January 11 – 24 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that all of the state saw some snow or ice. Unfortunately, the moisture equivalent values for much of the state were lacking. Only the northeast and north central divisions saw above-average moisture at 144 and 124 percent of normal respectively. The south central division saw the least moisture, with an average of only 0.02 inches, or eight percent of normal.**

U.S. Corn Belt Vegetation Condition  
Period 04: 01/11/2011 - 01/24/2011

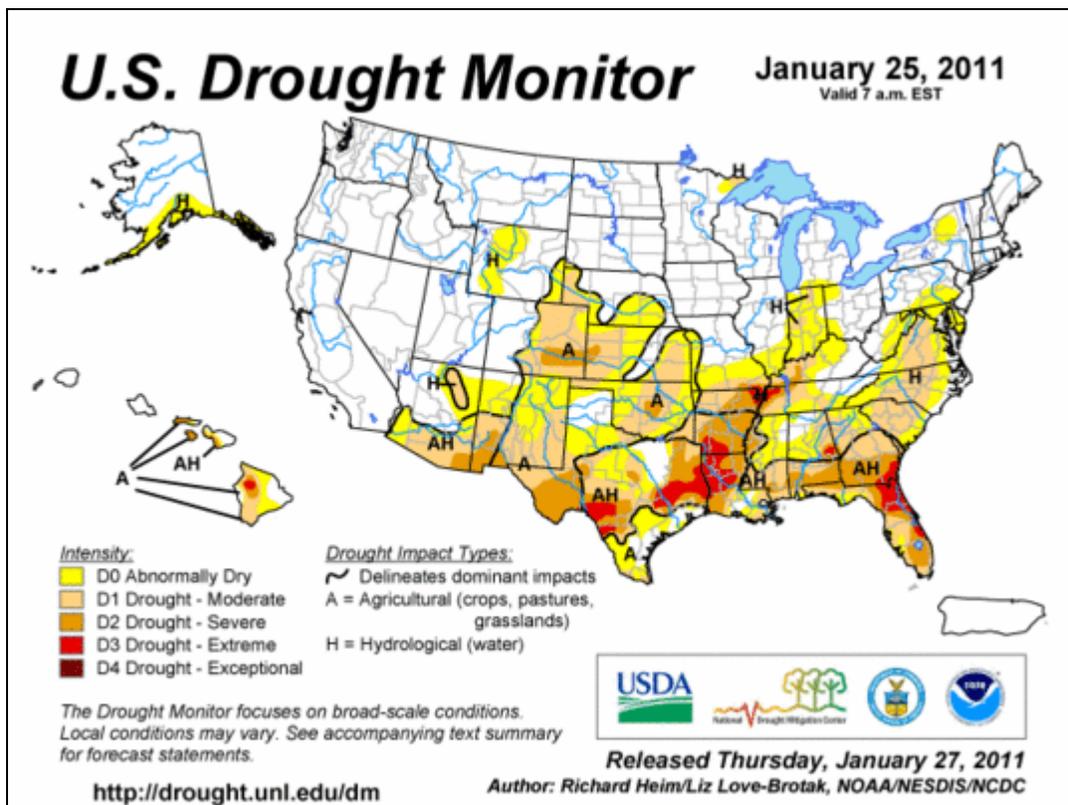


Map 2. The Vegetation Condition Report for the Corn Belt for January 11 – 24 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows, again, that the entire region had snow/ice over the period. As with Kansas, the amount of moisture compared to the normal varied. Parts of central Nebraska into South Dakota were above normal for the period, while areas of eastern Iowa to Ohio saw below-normal moisture from the events.

Conterminous U.S. Vegetation Condition  
Period 04: 01/11/2011 - 01/24/2011



Map 3. The Vegetation Condition Report for the U.S. for January 11 – 24 from K-State’s Ecology and Agriculture Spatial Analysis Laboratory shows that the snowy winter pattern has continued. Particularly notable was the snow reaching the coastal regions of South Carolina. Despite the snow, moisture totals are running below normal for most of the lower 48 states. Exceptions can be found in east Texas and across parts of northern Florida.



**Map 4.** The latest Drought Monitor, which covers a slightly longer period than the above VCR map, shows that underneath the snow cover, areas of extreme drought continue in east Texas, Louisiana, and parts of Alabama, Georgia, and Florida. The Drought Outlook calls for some improvement in Arkansas up through the Ohio River Valley. However, drought is expected to develop in the Texas Panhandle, Oklahoma, and central Kansas.

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These e-Updates are a regular weekly item from K-State Extension Agronomy and Steve Watson, Agronomy e-Update Editor. All of the Research and Extension faculty in Agronomy will be involved as sources from time to time. If you have any questions or suggestions for topics you'd like to have us address in this weekly update, contact Steve Watson, 785-532-7105 [swatson@ksu.edu](mailto:swatson@ksu.edu), or Jim Shroyer, Research and Extension Crop Production Specialist and State Extension Agronomy Leader 785-532-0397 [jshroyer@ksu.edu](mailto:jshroyer@ksu.edu)