

# **Extension Agronomy**

# eUpdate

## 03/13/2015

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, Jim Shroyer, Crop Production Specialist 785-532-0397 jshroyer@ksu.edu, or Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 cthompso@ksu.edu.

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#### 1. Is there still time to effectively control kochia?

Kochia was in the process of emerging on March 10 in a field near Tribune. With windblown kochia plants rolling across the countryside, seeds have been widely distributed. Hopefully many producers have residual herbicides in place to prevent emergence of kochia.



Figure 1. Newly emerged kochia in the cotyledon stage. This is in an irrigated corn field near Tribune on March 10, 2015. Corn residue was not covering the ground in this area of the field. With no soil-applied residual herbicides present, the kochia emerged. Photos by Curtis Thompson, K-State Research and Extension.



Figure 2. In a different area of the same corn field, residue was moved aside and elongated lightstarved kochia have emerged beneath the residue.

Can this emerged kochia be managed adequately at this point? Kochia plants in the cotyledon stage can be controlled with a direct application of a herbicide (provided the kochia population is not resistant to the herbicide being applied). When making an application at this time, the triazines -atrazine or metribuzin -- an oil adjuvant should be added to enhance postemergence activity. Products containing dicamba will control these small kochia. Products which contain isoxaflutole -such as Balance Flexx, Corvus, or Scoparia -- with an oil additive and AMS will control small, emerged kochia. Other products such as Sharpen or Verdict with MSO will also control these small, emerged kochia. Even glyphosate will control many of these little kochia at this stage of growth.

But the problem remains with the kochia beneath the residue. These plants will not be covered adequately by an application of herbicide at this time. If dicamba or isoxaflutole products are applied, and if moisture follows the application to incorporate the herbicide, these herbicides can be taken up through the root systems of this little kochia and translocated into the plant and the kochia will be controlled. The PPO herbicides, such as Sharpen products, or Authority/Spartan products, are much less likely to provide control after kochia have emerged.



Figure 3. Dense stand of kochia on March 10, 2015. This can cause severe problems if left uncontrolled.



Figure 4. Kochia in the "fuzzball" stage.

Even a dense stand of small kochia, as in Figure 3 above, likely can be controlled if herbicides are applied soon. Within two or three weeks, the kochia that emerged recently will be in the fuzzball stage (Figure 4) and from that point on the plants will be much more difficult to control. This is especially true in a more stressful environment where the plants are short of moisture and nutrients – which is more likely to occur in a dense stand. Foliar applications of herbicides in mid- or late-April on stressed kochia in a dense stand are often unsuccessful regardless of the herbicide combination used.

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#### 2. Winterkill in wheat and potential yield loss

With the recent warm weather and wheat greenup, it should be a little more apparent now where stands have suffered winter damage. If damage has occurred, how much affect might this have on yield potential?

Wheat is a resilient crop, so there is no way to be precise about yield loss based on a certain level of damage from winter injury or a freeze. But a K-State study at four locations (Belleville, Hays, Hutchinson, and Manhattan) over five years (2002, 2003, 2006, 2011, and 2012) gathered data on this topic. The results allow us to make some general conclusions.

To simulate winter damage and late-season freeze injury, we blended a Clearfield and non-Clearfield variety then sprayed the blend at different times of the year with Beyond. This killed the non-Clearfield variety. One limitation of the study is the stand was reduced uniformly within the row as opposed to large areas being damaged.

The blends consisted of different ratios of the two varieties. As a results, we simulated winter damage levels of 0, 33, 50, 67, and 100 percent. We also tested different timings of the damage: fall, spring greenup, and flag leaf.

Compiling the 20 site-years of data, we found the following:

- Fall damage had a small negative impact on yield (8-27 percent), but only when stand reductions were greater than 50 percent. This suggests there is usually time for wheat to compensate and recover from stand loss in the fall.
- Damage at spring greenup had a larger negative impact on yield (10-41 percent). The maximum reduction occurred when stand loss was greater than 50 percent.
- Late spring damage at the flag leaf stage resulted in the largest yield decrease (14-60 percent) at all stand reduction levels. This shows that any late-season damage can decrease grain yield.

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### 3. Writing a burn plan

Smoke impacts are just one of numerous factors that go into writing a good burn plan. A burn plan provides a framework for considering all relevant components of a burn. Key components of a burn plan are:

1. Map. A map of the area to be burned (burn unit) facilitates both planning and communicating the plan to others. The map should show hazards, firing lines, safety zones and escape routes, roads, and location of nearby houses. Below is an example of a burn plan map (created by Toni Flax, NRCS range conservationist).



Notice that the map extends beyond the borders of the area to be burned. It's important to consider what's around the fire as well as the burn unit itself. In this instance, the road on the west side of the burn unit needs to be taken into consideration to avoid causing traffic accidents. The quarry on the south side of the burn unit makes a good safety zone if needed, due to the lack of flammable vegetation.

Deployment of crew and vehicles is also marked on the map. The green squares show where water vehicles are stationed prior to ignition. These fire suppression vehicles will move as necessary.

The red arrows indicate the pattern of planned ignition (fireline). Ignition deployment takes into account the direction in which you want the fire to burn, the wind direction, topography, and avoidance of hazards. In order to avoid placing smoke into the city directly north of this burn unit, a north wind is prescribed.

In this example, the ignition begins on the south side. Igniters proceed both east and west from the ignition point, starting backfires that will create a firebreak for the headfire. Gradually the unit is encircled and burns back into areas previously lit. This is a very common type of fire called a ring fire.

- 1. Burn Objectives. It is important to state why you are burning so you know how to conduct the burn and afterwards to determine if you've achieved your objectives.
- 2. Weather conditions needed. Weather conditions considered safe for prescribed burns are given in the table below. Most prescribed burns should be conducted within these parameters. Smoke management is part of the weather considerations.

Weather Factor	
Wind Speed	5-15 mpg, steady
Relative Humidity	30-60%
Air Temperature	40-80°F
Cloud Cover	Clear to 70%
Haines Index	4-5
Mixing Height	1800 ft or higher
Transport Wind Speed	8-20 mph

- 1. Firebreaks. Location and preparation method of firebreaks should be described.
- 2. Hazards. Hazards such as fences, roads, and utility lines should be noted and included in the plan. There are many types of hazards and they are best found by looking at an aerial map and by actually driving/walking across the burn unit.
- 3. Equipment. A variety of equipment will be needed. Careful consideration should be made to ensure sufficient equipment of the right type in the right location when it is needed.
- 4. Crew. The number and role of people on the fire should be determined.
- 5. Contingency Plan. If a fire should escape, having a plan of action thought out in advance can save critical time in responding to the situation.
- 6. Notification List. Landowners and residents near a burn unit should be notified as part of the planning process.

The overall goal of a burn plan is to ensure that the burn is well-coordinated, that burn objectives are met, and that property and crew are unharmed.

For more information on prescribed burning, attend one of the numerous Joint-Agency Prescribed Burning Workshops held each year around Kansas during the winter months. The notebook for the class can be found at <u>http://ksfire.org/p.aspx?tabid=18</u> or a paper copy can be purchased for \$10. The ksfire website is currently in a state of transition, with the new site due to come on line next week. It will have the most current version of the burn notebook, which is located on the Education page of the website.

#### Liability

A burn plan can reduce liability for two reasons. First, it forces you to think through how you intend to burn, taking into consideration numerous factors that will influence the burn and the safety of the crew. This greatly reduces chances of an escape. Secondly, in case of escape, it provides evidence that you followed due diligence in conducting your burn. This can be important if the case goes to court.

Prescribed burning insurance is provided to many agricultural producers and landowners through their farm policies, but it's always best to check with an insurance agent about your specific policy. The Bramlett Agency has developed a new policy this winter at the request of The Samuel Roberts Nobel Foundation specifically to cover prescribed burning activities not covered by a typical policy. See: <u>http://www.bramlettagency.com/category.aspx?id=MISC6</u>

This policy provides coverage for burn association members and others who assist with burns not on their own property.

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#### 4. Outlook for rust diseases on wheat in 2015

There have been continued reports of wheat rust diseases in Texas and Oklahoma in early March. These reports indicate that both leaf rust and stripe rust are active in the region. Moreover, trace levels of leaf rust were detected in research plots near Manhattan this week. These early reports are significant because they indicate potential overwintering of the diseases within Kansas and throughout the region. Spores produced by disease outbreaks in the Southern Great Plains are often moved northward into Kansas by storm systems, where they initiate additional disease.



Figure 1. Overwintering leaf rust on wheat in Kansas, March 2015. Photo by Erick DeWolf, K-State Research and Extension.

Interestingly, there is also some information that suggests the risk of stripe rust is low in the Great Plains despite early reports of disease in the South. Analysis of the weather conditions associated with past outbreaks of stripe rust in Kansas suggest that dry conditions throughout the region in October-December and again in February will often reduce the risk of severe disease in Kansas. A look at these time periods for the current growing season suggests that conditions have not been favorable for severe stripe rust in 2015. It is not clear what effect these same conditions might have on leaf rust. The bottom line is that it will be important to stay current on the disease situation in the southern states and scout the local fields for any early signs of rust. If the disease becomes established early, it may be beneficial to protect susceptible varieties with fungicide applications if the yield potential looks promising. There is no need for fungicides now because the most effective fungicide applications are those applied just prior to heading of the wheat crop. We still have time to gather more information and make a good decision.

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#### 5. Spring herbicide application decisions on winter wheat: The importance of wheat growth stage

The warm temperatures recently have caused wheat to green up and begin spring growth in most areas of the state. Producers should pay close attention to the growth stage of their wheat before making their herbicide applications.

Dicamba can be applied to wheat between the 2-leaf and jointing stages of wheat. Application of dicamba after wheat reaches the jointing stage of growth causes severe prostrate growth of wheat and significant risk of yield loss. Dicamba is effective for control of kochia, Russian thistle, and wild buckwheat, but is not good for control of mustard species. Kochia, Russian thistle, and wild buckwheat are summer annual weeds that may emerge before or after wheat starts to joint, so timing of dicamba for control of these weeds can sometimes be difficult. Fortunately, dicamba provides some residual control of these weeds following application.

Other herbicides that must be applied prior to jointing include Agility SG, Beyond (on Clearfield varieties only), Olympus, Olympus Flex, Orion, PowerFlex, Pulsar, Rage D-Tech, and Rave.

MCPA and 2,4-D have different application guidelines. In general, MCPA is safer on wheat than 2,4-D, especially when applied prior to tillering. We recommend that 2,4-D not be applied to wheat until it is well-tillered in the spring. Application of 2,4-D prior to tillering hinders the tillering process, causes general stunting and can result in significant yield loss.



Figure 1. Stunting from an application of 2,4-D to wheat prior to tillering. Photo by Dallas Peterson, K-State Research and Extension.

2,4-D is labeled for application to wheat from the full-tiller stage until prior to the boot stage of growth, but is probably safest between full-tiller and jointing stages of growth. Wheat will sometimes exhibit prostrate growth from 2,4-D applications applied in the jointing stage of growth, but yields generally are not significantly affected if applied before the boot stage of growth.

MCPA is relatively safe on young wheat and can be applied after the wheat is in the three-leaf stage (may vary by product label) until it reaches the boot stage of growth. Consequently, MCPA would be preferred over 2,4-D if spraying before wheat is well-tillered. Neither herbicide should be applied once the wheat is near or reaches the boot stage of growth, as application at that time can result in malformed heads, sterility, and significant yield loss (Figure 2).



Figure 2. Malformed heads from an application of 2,4-D at boot stage. Photo by Dallas Peterson, K-State Research and Extension.

Both 2,4-D and MCPA are available in ester or amine formulations. Ester formulations generally provide a little better weed control than amine formulations at the same application rates, but also are more susceptible to vapor drift. Ester formulations generally are compatible for use with fertilizer carriers, while amine formulations often have physical compatibility problems when mixed with liquid fertilizer.

Other herbicides used in the spring on wheat can be applied up to the time the flag leaf is visible, or

Kansas State University Department of Agronomy 2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506 www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron later. Affinity BroadSpec, Affinity TankMix, Ally Extra SG, Express, Harmony + 2,4-D or MCPA, Harmony Extra, and Supremacy must be applied before the flag leaf is visible. Huskie, Weld, and WideMatch can be applied through the flag leaf stage. Herbicides that can be applied later in the spring – prior to the boot stage -- include Ally + 2,4-D, Amber, Finesse, Starane Ultra, and Starane Plus Salvo.

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#### 6. Management following a wildfire

The dry conditions throughout much of Kansas have led to an increased danger of wildfires. If a wildfire occurs, the ability of rangeland or tamegrass pastures to regenerate forage depends on precipitation amounts, the time of year that the fire occurs, the water infiltration ability of the soil, and management factors following the fire.

Wildfires can damage grasses, reduce stored food reserves, reduce moisture infiltration, increase evaporation and runoff, lead to erosion, create grazing distribution problems, and lead to an infestation of noxious weeds. Wildfires differ from prescribed burns as the land manager doesn't select the time of burning or the weather conditions under which to conduct the burn.

The crowns of grass plants often survive a wildfire and will regrow, but some can be damaged if the fire occurs when soil and air conditions are extremely dry. If plant litter remains after the fire, less damage will have occurred to the plant crowns, and soil conditions will be better. Evaporation and runoff may be increased if the fire occurs when the grasses are not actively growing. Bare soil may lose at least one-half inch of moisture per week through evaporation. The higher the clay content of the soil, the greater the potential for puddling and runoff.

#### A. Native warm-season grass rangeland

When wildfires occur between late June and frost, the major consideration is to protect the plants from overuse. Immediate removal of the grazing animals is usually necessary. This will permit regrowth and allow plants to accumulate food reserves before winter. Wildfires occurring between fall and mid-March leave the soil bare until spring growth. Forage yields may be reduced, and a reduction is stocking rate is advised.

Between mid-March and June, wildfires generally do not reduce forage production. However, if conditions are dry, regrowth will not occur and stocking rate must be reduced. Wildfires at this time may change plant composition of the grazing land.

On sandy soils, blowouts should be controlled as soon as possible. Mulching with manure, straw, or hay free of noxious weeds, along with reseeding can stabilize the blowout area. Fencing of blowouts will restrict livestock traffic and speed recovery.

Several grazing management options exist after a wildfire. If a wildfire occurs where prescribed burning is practiced, burn the areas that were untouched by the wildfire in late spring, when the desirable grass species have 1 to 1.5 inches of new growth. This will encourage grazing of the entire pasture. Observe where the animals are grazing, and use grazing distribution tools such as salt, mineral, and oilers to attract cattle to underutilized areas.

For forage plants to recover, it usually will be necessary to reduce stocking rates on the burned area.

Area	Year after wildfire	Stock at:
Flint Hills and East	1	75-85%
	2	Normal

Central Kansas	1	65-75%
	2	90-100%
	3	Normal
Western Kansas	1	50%
	2	75%
	3	Normal

Note: During lengthy droughts, use lower stocking rates than those listed in the chart. The main concern is the inability of the plants to regrow. The plants must be given the opportunity for regrowth during drought.

If a wildfire occurs where prescribed burning is not practiced, management decisions should be based on when the grassland was burned, how much of it was burned, and where livestock water is located.

Example 1: If there is a livestock-watering source in both the burned and unburned portions of the grassland, divide the burned and unburned areas (using an electric fence, for example) and reduce the stocking rate in the burned area.

Example 2: If there is only one livestock-watering source in the grassland area, the decision is whether to manage the burned or the unburned area. If the unburned area is larger, separate the two areas with an electric fence and stock the unburned area at the normal rate. If the burned area is larger, either manage only the burned part by reducing the stocking rate or establish an alternate water source, fence the area, and reduce the stocking rate on the burned portion. If the sole watering source is in the burned portion, the unburned portion would not be utilized unless the area was fenced and another water source established or a lane is fenced off to allow watering from the unburned area.

Example 3: If only a small portion of the grassland is burned, fence it off and reduce the stocking rate on the unburned portion accordingly.

Mowing unburned areas in the early spring can encourage livestock to move from the burned area. However, don't mow in August or September. Early intensive grazing is another option for burned areas. Removing all livestock from the grassland by mid-July provides late-season rest and time for the desirable grasses to replenish root reserves.

#### Patch-Burn Grazing:

Another option to consider is patch-burn grazing. Research in eastern Kansas has shown that burning a third of a pasture will not reduce stocker gains compared to burning the entire pasture. Animals will graze the burned area more frequently and cause some temporary shifts in plant composition. The key is to burn a different third the next year and so on. Different ages of burn in a pasture will increase plant diversity and may be a good wildlife management tool.

#### B. Tamegrass hay meadows

Hay meadows burned by wildfires will probably produce less hay. To return hay meadows to their

Kansas State University Department of Agronomy 2004 Throckmorton Plant Sciences Center | Manhattan, KS 66506 www.agronomy.ksu.edu | www.facebook.com/KState.Agron | www.twitter.com/KStateAgron former production, cut the meadow in early to mid-July to allow regrowth and replenishment of root reserves.

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#### 7. Corn seeding rate recommendations

The optimal corn seeding rate for any situation will depend on the anticipated environment and how the hybrid responds to that environment. Thus, optimum seeding rate depends on the hybrid (genotype, G) and the interaction with the environment (E).Researchers refer to this as the G x E interaction. 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. Another factor, sometimes overlooked, is the effect of management practices (M). Planting date, row spacing, and crop rotations can exert some influence on the yield response to the plant population factor.

Individual hybrids can respond differently to all these factors, 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 250 kernels per ear, the population may be too high.
- If there are consistently more than 600 kernels per ear or if most plants have a second ear contributing significantly to grain yield, the population may be too low.

Of course, 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. In addition to the growing conditions, nutrient status can also exert some influence on the final number of kernels per ear. For example, severe nitrogen (N) deficiency will have an impact on the final number of kernels, ear size, and ear number.

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 the G x E x M interaction. Potential ear size and potential kernel numbers (1,000-1,200 per ear) are set before silking, but the actual final number of kernels is not determined until after pollination and early grain fill. Lack of fertilization and early abortion of grain number, among other factors, can influence the actual final number of kernels.

Always keep the long-term weather conditions in mind. The drought that affected much of Kansas in 2011 and 2012 made almost any population too high for the available moisture in some areas. Although it's not a good idea to make significant changes to seeding rates based only on what happened recently, it is worthwhile taking into consideration how much moisture there is in the soil profile and the long-term forecasts for the upcoming growing season.

Making a decision on whether to keep seeding rates at your usual level or cutting back somewhat this year if the soil profile is drier than normal is a little like the famous line in the movie Dirty Harry: "How lucky do you feel?" If you think weather conditions will be more favorable for corn this year than the past two years, stay about in the middle to upper part of the range of seeding rates in the table below. If you do not think growing conditions will improve enough to make up for dry subsoils, you might want to consider going toward the lower end of the range of recommended seeding rates, with the caveat that if growing conditions improve you will have limited your top-end yield potential. The latest Kansas Crop Progress and Condition report (released by Kansas Agricultural Statistics on March 9) lists near normal temperatures across much of the State. Overall, topsoil and subsoil moisture supplies were rated close to 50% as very short or short. The three western crop reporting districts (NW, WC, and SW) and the North Central district have >50% of topsoil and/or subsoil moisture conditions as very short or short in the report. The three eastern crop reporting districts (NE, C, and SE) are reporting >60% as adequate topsoil and subsoil moisture conditions.

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	Seeding Rate*
		(plants per acre)	
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,	20,000-22,000	23,500-26,000
	shallow soils		
	Full-season	24,000-26,000	28,000-30,500
	bottomground		
Northcentral	All dryland	20,000-22,500	23,500-26,500
	environments		
Southcentral	All dryland	18,000-22,000	21,000-26,000
	environments		
Northwest	All dryland	16,000-20,000	19,000-23,500
	environments		
Southwest	All dryland	14,000-20,000	16,500-23,500
	environments		

Suggested Irrigated Corn Final Populations and Seeding Rates			
Environment	Hybrid Maturity	Final Plant Population	Seeding Rate*
		(plants per acre)	
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: <u>http://www.ksre.ksu.edu/bookstore/pubs/c560.pdf</u>

Drought-tolerant (DT) hybrids have arrived on the market in recent years. Questions about whether changes in seeding rates are needed when using these new hybrids are becoming more frequent. A summary of information is in preparation regarding the evaluation of DT vs. non-DT corn hybrids at different site-years around the state. From the evaluation performed the last 3 years in Kansas evaluating diverse seeding rates, hybrids, and water usage, differences in yield were observed when DT corn hybrids were compared with non-DT hybrids. Still, the most important point, as presented in the below figure, is that the yield response at the plant-scale to plant population is similar for DT vs. non-DT corn hybrids. Thus, a change in plant population doesn't seem to be needed when this new corn hybrid technology is used.



Figure 1. Plant-scale association between plant density or plant population (plants per square foot) and the yield (in bushels per 1,000 plants) [Adee, Roozeboom, Schlegel, and Ciampitti].

On-Farm Corn Seeding Rate Studies: 2014 season – Central Kansas

During the last growing season, three on-farm research studies were established in collaboration with Tom Maxwell, Central Kansas District Extension Agent, and corn farmers in that district (Justin Knopf, Mark Pettijohn, and Karbers' Farm). The experimental layout for those studies is presented below.

18,000 seeds per acre   26,000 seeds per acre   14,000 seeds per acre   22,000 seeds per acre	14,000 seeds per acre18,000 seeds per acre22,000 seeds per acre22,000 seeds per acre26,000 seeds per acre	26,000 seeds per acre   26,000 seeds per acre   14,000 seeds per acre   22,000 seeds per acre   18,000 seeds per acre
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<u>Field Variability</u>: an example of the field variability was clearly reflected by the yield monitor information collected at harvest time for one location.

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A summary of corn plant population response to all three on-farm locations allowed us to visualize the complex yield response to plant population and how essential it is to continue the on-farm research efforts to properly identify optimal corn plant population. Ultimately, this will result in better guidance to producers and key-stakeholders in the seeding rate decision-making process.



The three different colored dots in the graph above represent yields from the three different farms. Agronomically, the optimum population for all these on-farm corn population studies was different. Even when environmental conditions and planting times were very similar, optimal population ranged from 18,000 to 24,000 seeds per acre. The agronomically optimum population did not coincide with the economically optimum population, which was lower in most cases.

More information on the on-farm studies will be summarized in coming issues of the K-State Agronomy eUpdate. Stay tuned.

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#### 8. Comparative Vegetation Condition Report: February 24 - March 9

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 26-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.

NOTE TO READERS: The maps below represent a subset of the maps available from the EASAL group. If you'd like digital copies of the entire map series please contact Nan An at nanan@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.

The maps in this issue of the newsletter show the current state of photosynthetic activity in Kansas, the Corn Belt, and the continental U.S., with comments from Mary Knapp, assistant state climatologist:

Kansas Vegetation Condition

Period 10: 02/24/2015 - 03/09/2015



Figure 1. The Vegetation Condition Report for Kansas for February 24 – March 9 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that snow was a factor statewide. The last of this snow occurred with the March 4-5 system. Amounts were light and moisture was limited except in extreme southeastern Kansas.

#### Kansas Vegetation Condition Comparison



Late-Feb/Early-Mar 2015 compared to the Late-Feb/Early-Mar 2014

Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for February 24 – March 9 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows vegetative activity is much lower. Cold temperatures and snow cover have limited development.

#### Kansas Vegetation Condition Comparison



Late-Feb/Early-Mar 2015 compared to the 26-Year Average for Late-Feb/Early-Mar

Figure 3. Compared to the 26-year average at this time for Kansas, this year's Vegetation Condition Report for February 24 – March 9 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that southwest and south central Kansas have the greatest increase. These areas are showing slightly above-average photosynthetic activity for the period.



Figure 4. The Vegetation Condition Report for the Corn Belt for February 24 – March 9 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that while snow was widespread across the region, central Nebraska missed out on the system. Snowfall in the Northern Plains continues to be much below average.



U.S. Corn Belt Vegetation Condition Comparison Late-Feb/Early-Mar 2015 Compared to Late-Feb/Early-Mar 2014

Figure 5. The comparison to last year in the Corn Belt for the period February 24 – March 9 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that eastern portion of the region has much lower NDVI values. Cold temperatures continue to limit biomass development in the region.



U.S. Corn Belt Vegetation Condition Comparison Late-Feb/Early-Mar 2015 Compared to the 26-Year Average for Late-Feb/Early-Mar

Figure 6. Compared to the 26-year average at this time for the Corn Belt, this year's Vegetation Condition Report for February 24 – March 9 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows the split of above-average photosynthetic activity to the north and below-average activity to the south. Photosynthetic activity in the southeastern portions of the region has been limited by cooler-than-normal temperatures. Temperatures in southern Indiana are averaging 8 to 12 degrees cooler than normal for the week ending March 10<sup>th</sup>.



Continental U.S. Vegetation Condition Period 10: 02/24/2015 - 03/09/2015

Figure 7. The Vegetation Condition Report for the U.S. for February 24 – March 9 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the snow again penetrated into the Deep South, but missed the mountains of the West Coast. The latest snowfall in the southern areas during this two-week composite period was with the March 4-5<sup>th</sup> storm.



Continental U.S. Vegetation Condition Comparison Late-Feb/Early-Mar 2015 Compared to Late-Feb/Early-Mar 2014

Figure 8. The U.S. comparison to last year at this time for the period February 24 – March 9 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that lower NDVI values dominate the eastern half of the country. Much cooler-than-average temperatures in late February and early March have delayed plant development in these areas. In the Pacific Northwest and California, higher photosynthetic activity is a signal of the continuing low snowpack in these areas.



Figure 9. The U.S. comparison to the 26-year average for the period February 24 – March 9 from K-State's Ecology and Agriculture Spatial Analysis Laboratory shows that the West has much above-average photosynthetic activity while the East has much below-average values. The East continues to have much cooler-than-average temperatures, which have limited plant development. The West has had more winter moisture in the form of rain rather than snow. This has increased photosynthetic activity at the expense of water storage for the summer. A notable exception to this trend is the Front Range of the Rockies. Snow water equivalents there are at or above normal.

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