



## Extension Agronomy

# eUpdate

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*06/02/2017*

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 Curtis Thompson, Extension Agronomy State Leader and Weed Management Specialist 785-532-3444 [cthompso@ksu.edu](mailto:cthompso@ksu.edu).

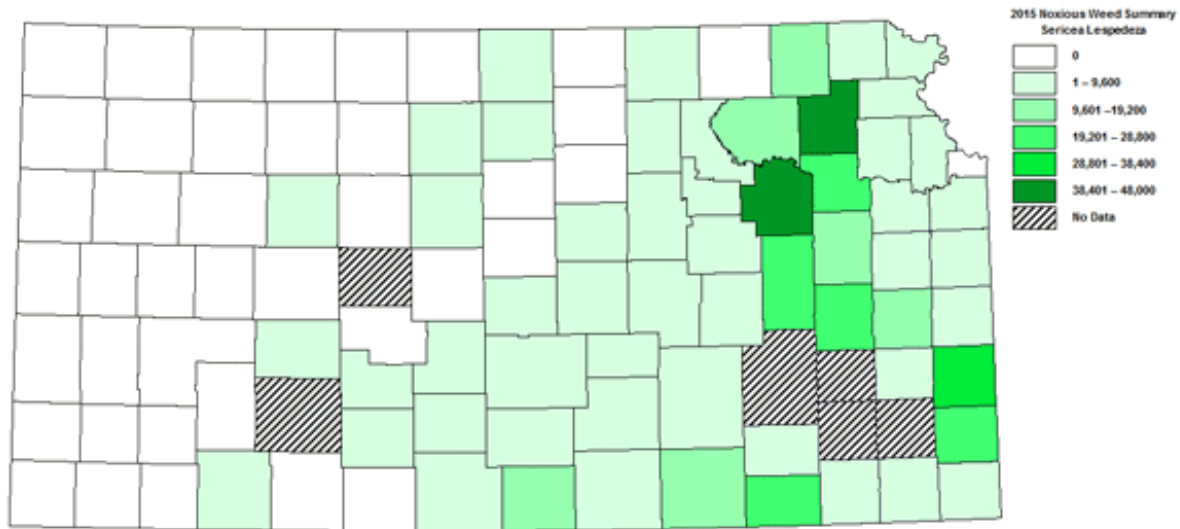
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## 1. *Sericea lespedeza* control in rangeland, pasture, and CRP

*Sericea lespedeza* (*Lespedeza cuneata*) has been a statewide noxious weed in Kansas since July 1, 2000. Despite control efforts, this introduced, invasive species continues to persist on rangeland, pasture, and CRP acres in the state. *Sericea lespedeza* has a tremendous seed bank that helps reestablish stands following control efforts. *Sericea lespedeza* infests nearly 450,000 acres in Kansas (Fig. 1).



**Figure 1. Distribution of *sericea lespedeza* in Kansas based on survey by Kansas Department of Agriculture.**

There are no known biological controls that can be effectively used on *sericea lespedeza*. However, grazing with sheep and goats can suppress *sericea lespedeza* stands and produce a saleable product. Cattle supplemented with corn steep liquor (CSL) have been shown to consume more *sericea lespedeza* than animals not supplemented with CSL. Frequent mowing will reduce *sericea lespedeza*, but is also damaging to plants that might be growing/competing with *sericea*. A single mowing in mid- to late-July will eventually reduce stands of *sericea lespedeza* to some extent, but has not eliminated *sericea*, even after several years of mowing. A late-summer mowing will eliminate most seed production. Application of appropriate herbicides about 4-6 weeks after mowing will help reduce *sericea lespedeza* stands. Prescribed burning in April seems to stimulate seed germination. Burning in August and early September nearly eliminates seed production.

Herbicides applied at the correct time and under favorable environmental conditions can significantly reduce *sericea lespedeza*, but retreatment has proven to be required. Early summer is a good time to consider spraying *sericea lespedeza*. Plants are in a vegetative growth stage (Fig. 2) and previous research has indicated good to excellent control at this time.



**Figure 2. Vegetative growth stage of sericea lespedeza. Photo by Walt Fick, K-State Research and Extension.**

Remedy Ultra (triclopyr) and PastureGard HL (triclopyr + fluroxypyr) can provide effective control when applied during June and into early July when the sericea plants are in a vegetative growth stage. Broadcast applications of Remedy Ultra at 1 to 1.5 pints/acre and PastureGard HL at 0.75 to 1.5 pints/acre should be applied in spray volumes of 10 to 20 gallons/acre.

Products containing metsulfuron, such as Escort XP, Cimarron Plus, and Chaparral, are generally more effective in the late summer when sericea lespedeza is actively blooming. Recommended rates are 0.5 oz/acre of Escort XP, 0.625 oz/acre Cimarron Plus, and 2.5 to 3 oz/acre Chaparral. Use a non-ionic surfactant with all of these products. These products containing metsulfuron may stunt tall fescue.

For spot applications, mix 0.5 fl oz PastureGard HL per gallon of water, use a 1 percent solution of Remedy Ultra in water, or 1 gram Escort XP per gallon of water. Aerial applications of these products should be done with a minimum spray volume of 3 gallons per acre. Higher volumes, e.g. 5 gallons per acre, will generally be more effective.

Herbicide treatments will need to be repeated every 2 to 4 years to keep this invasive species in check. Initial treatments should reduce dense stands to the point where spot treatment can be used in future years. Left untreated, sericea lespedeza will dominate a site, greatly reducing forage production and species diversity.

If you are unfamiliar with sericea lespedeza, learn how to identify the species and get started with a control program. Be persistent with control efforts to keep this invasive species at manageable populations.

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## 2. Pre-harvest weed control in wheat

Recent hail storms and other problems have affected wheat stands in some areas of Kansas. The resulting thin stands in some areas, along with the abundant rains in May, have caused weeds to start showing up in many wheat fields -- especially in fields not treated earlier. When broadleaf weeds are given the opportunity to grow rapidly in wheat fields because of wet weather and open canopies at the end of the growing season, these weeds flourish and often grow above the wheat canopy.

This raises several potential concerns, including harvest difficulties, dockage problems, weed seed production, and soil water depletion. No one wants to spend extra money on a below-average crop, but it may be necessary.



Figure 1. Weeds in wheat near harvest time. Photo by Dallas Peterson, K-State Research and Extension.

Unfortunately, there aren't many good options at this point in time. There are also a lot of questions about which herbicides are approved and the "use guidelines and restrictions" for pre-harvest treatments in wheat. Listed below are the various herbicide options producers can use as pre-harvest aids in wheat. There are differences in how quickly they act to control the weeds, the interval requirement between application and grain harvest, and the level or length of control achieved. All

of them will require good thorough spray coverage to be most effective.

Please note that the 2,4-D rate approved for pre-harvest weed control in wheat has been reduced to a maximum of 0.5 lb/acre, which is equal to 1 pt of a 4-lb formulation or 2/3 pt of a 6-lb material. 2,4-D also has a 14-day pre-harvest requirement.

Another herbicide that is sometimes mentioned as a possible pre-harvest treatment is paraquat.

**Paraquat is not labeled for pre-harvest treatment in wheat.** Application of paraquat to wheat is an illegal treatment and can result in a quarantine and destruction of the harvested grain, along with severe fines.

Product and rate	Advantages	Disadvantages	Comments
Aim EC (1 to 2 oz)	Acts quickly, usually within 3 days.  Short waiting interval before harvest – 3 days.	Controls only broadleaf weeds.  Regrowth of weeds may occur after 2-3 weeks or more, depending on the rate used.	Apply after wheat is mature. Always apply with 1% v/v crop oil concentrate in a minimum spray volume of 5 gal/acre for aerial application and 10 gal/acre for ground applications.  Do not apply more than 2 oz of Aim during the growing season.
Dicamba (0.5 pt)	Controls many broadleaf weeds.	A waiting period of 7 days is required before harvest.  Acts slowly to kill the weeds.  Controls only broadleaf weeds.  High potential for spray drift to susceptible crops.	Apply when the wheat is in the hard dough stage and green color is gone from the nodes of the stem.  Do not use treated wheat for seed unless a germination test results in 95% or greater seed germination.
Glyphosate (1 qt of 3 lb ae/gal product, or 22 fl oz of Roundup PowerMax or WeatherMax)	Provides control of both grasses and susceptible broadleaf weeds.	Acts slowly. May take up to 2 weeks to completely kill weeds and grasses.	Apply when wheat is in the hard dough stage (30% or less grain moisture).

		Cannot harvest grain until 7 days after application. Kochia, pigweeds, and marestail may be resistant.	Consult label for recommended adjuvants.  Not recommended for wheat being harvested for use as seed.
Metsulfuron (0.1 oz)	Provides control of susceptible broadleaf weeds.	Acts slowly.  Cannot harvest grain until 10 days after application.  Controls only susceptible broadleaf weeds. Kochia, pigweeds, and marestail may be resistant.	Apply when wheat is in the dough stage.  Always apply with a nonionic surfactant at 0.25 to 0.5% v/v.  Generally recommended in combination with glyphosate or 2,4-D.  Do not use on soils with a pH greater than 7.9.  Weeds growing under limited moisture may not be controlled.  Do not use treated straw for livestock feed.
2,4-D LVE (1 pt of 4lb/gal product or 2/3 pt 6 lb/gal product)	Provides control of susceptible broadleaf weeds.	Acts slowly. Weak on kochia and wild buckwheat.  Cannot harvest grain until 14 days after application.	Apply when wheat is in the hard dough stage to control large, actively growing broadleaf weeds.  Weeds under drought stress may not be controlled.  Do not use treated straw for livestock feed.

It is very difficult to estimate the value of preharvest weed treatments as it will depend in part on the differences a treatment would have on harvest efficiency and dockage. It may not pay to treat wheat with lower weed densities unless harvest is delayed. If the weeds are about to set seed, a preharvest treatment can go a long way toward reducing weed problems in future years by preventing seed



production.

In the coming weeks, we will address the issues of controlling weeds and volunteer wheat shortly after harvest this year. This will be important in reducing the incidence of wheat streak mosaic, which was a major problem across western Kansas in 2017.

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### 3. Chemical control of roughleaf dogwood

Roughleaf dogwood (*Cornus drummondii*) is a native shrub found throughout the eastern two-thirds of Kansas. It is commonly found along fencerows, the edge of trees, on streambanks, and in open prairies. The plant does provide wildlife cover and nesting sites for birds. Roughleaf dogwood blooms with white flowers in late May and early June and produces white, round fruit in September and October.

Roughleaf dogwood is rarely grazed and invades grassland in the absence of prescribed burning. The species continues to spread on the Konza Prairie, especially on sites with a 4-year burning frequency. Pastures that are frequently burned usually do not have a roughleaf dogwood problem. Once established, roughleaf dogwood is difficult to remove with fire alone as the plant usually leafs out after the burning season. Long-term late spring burning may gradually reduce roughleaf dogwood stands.



**Figure 1. Roughleaf dogwood on Konza Prairie watershed with 10-year burning frequency. Photo by Walt Fick, K-State Research and Extension.**

As of early June this year, roughleaf dogwood is in full bloom. The optimum time to spray roughleaf dogwood is between the flower bud state and early seed production. This time frame corresponds to increasing food reserves in the root/crown of the species.



**Figure 2. Roughleaf dogwood in full bloom in Riley County. Photo by Walt Fick, K-State Research and Extension.**

A number of foliar-applied herbicides including triclopyr (Remedy Ultra), dicamba (Banvel), and picloram (Tordon 22K), used alone or in combination with 2,4-D, will defoliate roughleaf dogwood, but actual mortality is usually less than 25%. Roughleaf dogwood can be difficult to control. High-volume treatments providing greater than 50% mortality include 1% PastureGard (triclopyr + fluroxypyr), 0.5% Surmount (picloram + fluroxypyr), and 1% Grazon P+D + 0.5% Remedy Ultra (picloram + 2,4-D + triclopyr). All these herbicides are applied with water. Adding a 0.25 to 0.5% v/v non-ionic surfactant may enhance control.

Aerial applications should be applied in a minimum 3 gallons per acre total spray solution to insure adequate coverage. Broadcast rates for roughleaf dogwood control would include 3-6 pints/acre Surmount or combinations of picloram + 2,4-D + triclopyr, e.g. 1 pt/acre Tordon 22K + 2 pt/acre 2,4-D + 1 pt/acre Remedy Ultra or 4 pt/acre Grazon P+D + 1 pt/acre Remedy Ultra.

A single application of any herbicide does not completely eliminate roughleaf dogwood, but may open up the stand enough to carry a fire. In subsequent years, a combination of prescribed burning in the late spring followed by a herbicide application 4-6 weeks post burning should provide good control.

Soil-applied materials such as Spike 20P (tebuthiuron) and Pronone Power Pellets (hexazinone) can provide control of roughleaf dogwood. Spike 20P should be applied during the dormant season at 0.75 ounces product per 100 square feet. This is equivalent to 20 pounds of product per acre. Pronone Power Pellets should be applied when the soil is moist and rainfall is expected within 2

weeks of application. For plants 3-6 feet tall apply 2-4 pellets at the base of the plant. Expect to see grass damage following use of Pronone Power Pellets.

These dry soil-applied products may be useful in areas where spray drift may cause considerable non-target damage.

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#### 4. Diagnosing early-season growth problems in corn

Getting a good stand of corn, with vigorous early-season growth, is the first step in getting good yields. When adverse conditions, such as a hard rain or unusually cool weather, occur after planting and emergence, producers should get out in their fields and take a close look at how their corn is doing.

If the plants emerged in good fashion, but the seedlings then have problems maintaining adequate growth and development or leaf color, there may be several possible reasons. A few of the most likely causes include:

- Corn rootworm damage. Cool, wet weather this year has delayed some corn planting and/or corn emergence and growth. Western corn rootworm (CRW) eggs were deposited in continuous corn fields last fall, and many hatched a little later this spring than usual due to the warmer-than-usual winter. The first CRW larvae were detected in north central Kansas on May 17. These larvae are feeding on corn roots from plants in the V-4-6 stage. In many cases these plants are still struggling with saturated soils. Under more normal conditions, these larvae would be feeding on larger plants with better established root systems at this point in the season. This earlier-than-usual feeding can have a much greater impact on the younger plants than when feeding is on larger, better-established plants.



**Figure 1. Western corn rootworm larva. Photo by Jeff Whitworth, K-State Research and**

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## Extension.



**Figure 2. Western corn rootworm larvae and feeding damage on V4 corn roots. Photo by Jeff Whitworth, K-State Research and Extension.**

- Unusually cool temperatures, compacted soil, or waterlogging. This has been a common problem in much of Kansas this year. Wet soils and unusually cool temperatures can inhibit root growth especially, slowing plant development. This can cause yellowed, wilting plants due to poor root growth, drowning, or a seedling blight infection. Seedling blight is often characterized by stem tissue near ground level that is discolored or water-soaked in appearance. Also, planting in wet soil can compact the seed furrow, inhibiting root growth. A shallow compaction layer can slow early root growth, resulting in stunted, nutrient deficient plants – especially potassium deficiency – early in the season.





Figure 3. Sidewall and seed zone compaction in heavy clay soil. Photo by Stu Duncan, K-State Research and Extension.



**Figure 4. Classic potassium deficiency in a field with excellent soil test K levels but with sidewall compaction from planting when seedbed was wet. Photo by Stu Duncan, K-State**





**Figure 5. Yellow corn due to low soil temperature, slow early growth. Photo by Ignacio A. Ciampitti, K-State Research and Extension.**





**Figure 6. Poor seedling emergence produces uneven stands. Photo by Ignacio A. Ciampitti, K-State Research and Extension.**

- Long period of unusual low temperatures can also cause purple coloring on corn seedlings. This condition is only expressed up until V6 or six-leaf growth stage. For more information on this topic, please check:

[https://webapp.agron.ksu.edu/agr\\_social/eu\\_article.throck?article\\_id=1401](https://webapp.agron.ksu.edu/agr_social/eu_article.throck?article_id=1401)



**Figure 7. Purple coloration in corn due to low temperature, slow early growth. Photo by Ignacio A. Ciampitti, K-State Research and Extension.**

- Early-season lodging (“floppy corn syndrome”). This is usually associated with hot, dry weather during V1 to V6, which prevents adequate development and penetration of nodal roots. Plants can survive for a time on just the seminal root system, but they will have little mechanical support. Reasons for poor nodal root development and an elevated crown include sidewall compaction, erosion after emergence but before nodal root development, and sinking of the seedbed due to pounding rains. Often a good soaking rain is enough to allow nodal roots to establish and plants to recover. Inter-row cultivation can be used to push soil against plants with exposed crowns. For more information on this topic, please check: [https://webapp.agron.ksu.edu/agr\\_social/eu\\_article.throck?article\\_id=1402](https://webapp.agron.ksu.edu/agr_social/eu_article.throck?article_id=1402)



**Figure 8. Plants with adequate (left) and poor (right) root development. Photo by Ignacio Ciampitti, K-State Research and Extension.**

- White grubs or wireworms. These soil insects may be eating the roots, which will cause the plants to wilt.
- Black cutworms. These insects, which can be found in the soil or on the surface, cause “window paning” of the leaves on young plants. Cutworms may also cut off seedling plants at the soil surface.
- Flea beetles. These tiny leaf-chewing insects can cause “scratches” on leaves. Eventually, the leaves may shrivel, turn gray, and die. Plants are more susceptible to flea beetle injury when temperatures are cold and seedling growth is slow. Seedling plants are often able to recover from flea beetle injury because the growing point remains below ground level until the fifth leaf emerges.
- Poor growth that occurs as circular to oval patches in the field could be an indicator of nematode problems. Approximately 35 days after emergence is an ideal time to sample for nematodes, particularly the root lesion nematode that inhabits about 80 percent of Kansas



corn fields. Take 20 cores at a depth of 12 inches from directly in or alongside the row from the outer edges of affected areas. Additionally, 2 to 3 root balls of affected plants should be submitted at the same time. Bag the root samples separately from the soil cores. Samples can be submitted through local Extension offices or sent directly to the Plant Disease Diagnostic Lab in Throckmorton Hall.

- Free ammonia from an anhydrous ammonia application. This can injure roots and kill germinating seed if the ammonia was applied too shallowly (especially in coarser soils), too close to the time of planting, or if dry soil conditions slowed the conversion of ammonia to ammonium. One way to minimize damage is to apply the ammonia at a 10 to 15 degree angle from the direction of planting. If injury occurs then it is more randomly distributed, reducing the multi-plant skips, and allowing the unaffected plants to compensate.
- Ammonia injury can also occur when sidedressing anhydrous ammonia under dry soil conditions. Root injury can occur if the plants get too big or the knives run too close to the row. Ammonia injury resulting from poor soil sealing can cause leaves to appear watersoaked or have dead margins. Roots may appear sheared off, or burned off. Plants will normally recover from this injury, but yields can be reduced.
- Putting a urea-based N fertilizer in contact with the seed. Urea will hydrolyze into ammonia and injure the seedling.



Figure 9. Seedlings damaged after starter fertilizer containing urea-N was placed in direct seed contact. Photo by Dorivar Ruiz Diaz, K-State Research and Extension.

- Nitrogen (N) deficiency. This does not usually occur until a later stage of growth in conventional tillage systems. But in no-till corn, especially in high residue situations, N deficiency is common where producers haven't applied nitrogen as a starter, or broadcast a significant amount of N prior to or at planting. In early planting in very cold soils where no N was applied close to the seed as a starter, seedlings may be N deficient in conventional-till also. Nitrogen deficient corn seedlings will be spindly, with pale yellow-green foliage. As the plants grow, the lower leaves will "fire," with yellowing starting from the tip of the leaf and progressing back toward the stalk.

- Phosphorus deficiency. This can result in stunted growth and purple leaves early in the growing season. Phosphorus deficiency is often enhanced by cool, wet growing conditions.
- Iron deficiency. This can cause upper leaves to be pale green between the veins. Iron deficiency is more common on high pH and calcareous soils.
- Sulfur deficiency. This can result in stunted plants having pale green leaves, with no distinct pattern on the leaves.
- Herbicide injury. This is not as common now as in the past, but can still occur. Corn is very susceptible to injury from carryover sulfonylurea herbicides which may have been applied to a previous crop, such as wheat. Carryover depends on soil pH, soil texture, application rates, rainfall, and other factors listed on the herbicide labels. Symptoms include stunting, chlorosis, and an overall sickly appearance. Corn will not grow out of this type of injury.



Figure 10. ALS herbicide carryover injury to corn. Photo by Stu Duncan, K-State Research and Extension.

For more details, see "Diagnosing Corn Production Problems in Kansas," K-State publication S-54, at: <http://www.ksre.ksu.edu/bookstore/pubs/S54.pdf>

In addition, check the new eBook version of this publication at: <http://www.agronomy.k-state.edu/extension/crop-production/corn/>

Also, see "Corn Production Handbook," K-State publication C-560, at: <http://www.ksre.ksu.edu/bookstore/pubs/C560.pdf>

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## 5. Double crop options after wheat

Double cropping after wheat can be a high-risk venture. The available growing season is relatively short. Heat and/or dry conditions in July and August may cause problems with germination, emergence, seed set, or grain fill. Still, the good soil moisture conditions so far this year improve the odds of success.

The most common double crop options are soybean, sorghum, and sunflower. Other possibilities include summer annual forages and specialized crops such as proso millet or other short-season summer crops – even corn. Cover crops are also an option for planting after wheat.

One major consideration before deciding to plant a double crop or cover crop after wheat is the potential for herbicide carryover. Cover crops can be challenging in this regard. There is little or no mention of rotational restrictions for specific cover crops on the labels of most herbicides. If a crop isn't listed on the label, that doesn't mean there are no restrictions. Generally, there are statements on most labels that indicate "no other crops" should be planted for a specified amount of time, or that a bioassay must be conducted prior to planting the crop. Most of the brassica, or mustard type, crops are likely to be very susceptible to residues of the sulfonylurea herbicides.

Management considerations, production costs, and yield expectations for several double crop options are discussed below.

### **Soybean**

Soybeans are probably the most commonly used crop for double cropping, especially in central and eastern Kansas. With glyphosate-resistant varieties, often the only production cost for planting double crop soybeans in recent years has been the seed, an application of glyphosate, and the fuel and equipment costs associated with planting and harvesting. However, with the development of glyphosate-resistant weeds, additional herbicides may be required to achieve acceptable control and minimize the risk of further development of resistant weeds.

The cost for weed control can't really be counted against the soybeans, however, since that cost should occur whether or not a soybean crop is present. In fact, having beans on the field may even reduce herbicide costs compared to leaving the field fallow. Still, it is highly recommended to apply a pre-emergence residual herbicide before soybeans are planted especially if weed resistance to glyphosate has been a problem. Later in the summer, a healthy soybean canopy may suppress weeds enough that a late-summer burndown application may be avoided.

Variety selection for double cropping is important. Soybeans flower in response to a combination of temperature and daylength, so shifting to an earlier-maturing variety when planting late in a double crop situation will result in very short plants with pods that are close to the ground. Planting a variety with the same or perhaps even slightly later maturity rating (compared to soybeans planted at a typical planting date) will allow the plant to develop a larger canopy before flowering. Planting a variety that is too much later in maturity, however, increases the risk that the beans may not mature before frost, especially if long periods of drought slow growth. The goal is to maximize the length of the growing season of the crop, so prompt planting after wheat harvest time is critical. The earlier you can plant, the higher the yield potential of the crop if moisture is not a limiting factor.

Adding some nitrogen (N) to double crop soybeans may be beneficial if the previous wheat yield was high and depleted soil N. A soil test before wheat harvest for N levels is recommended. Use no more than 30 lbs/acre of N. It would be ideal to knife-in the N. If that's not possible, banding it on the soil surface would be acceptable. Do not apply N in the furrow with soybean seed as severe stand loss can occur.

Recommended seeding rates for double crop soybeans are no different than for soybeans planted at a typical planting date in a given area or cropping system. Still, seeding rate can be slightly increased if soybeans are planting too late, in order to increase canopy development. Narrow row spacing (15-inch or less) has often resulted in a yield advantage compared to 30-inch rows in late plantings. Soybeans planted in narrow rows will canopy over more quickly than in wide rows, which is important when the length of the growing season is shortened. Narrow rows also offer the benefits of increasing early-season light capture, suppressing weed control and reducing erosion. On the other hand, the advantage of planting in wide rows is that the bottom pods will usually be slightly higher off the soil surface to aid harvest. The other consideration is planting equipment. Often no-till planters will handle wheat residue better and place seeds more precisely than drills, although the difference has narrowed in recent years.

What are typical yield expectations for double crop soybeans? It varies considerably depending on moisture and temperature, but yields are usually several bushels less than full-season soybeans. A long-term average of 20 bushels per acre is often mentioned when discussing double crop soybeans in central and northeast Kansas. Rainfall amount and distribution can cause a wide variation in yields from year to year. Double crop soybean yields typically are much better as you move farther southeast in Kansas, often ranging from 20 to 40 bushels per acre.

## **Sorghum**

Sorghum is another double crop option. Unlike soybeans, sorghum hybrids for double cropping should be earlier maturing. Sorghum development is primarily driven by accumulation of heat units and the double crop growing season is too short to allow medium-late or late hybrids to mature before frost in most of Kansas.

Late-planted sorghum will likely not tiller as much as early plantings and can benefit from slightly higher seeding rates than would be used for sorghum planted at an earlier date. Narrow row spacing is advised, especially if the outlook for rainfall is good.

A key component for estimation of N application rates is the yield potential. This will largely determine the N needs. It is also important to consider potential residual N from the wheat crop. This can be particularly important when wheat yields are lower than expected. In that situation, additional available N may be present in the soil.

Double crop sorghum planted into average or greater-than-average amounts of wheat residue can result in a challenging amount of residue to deal with when planting next year's crop. Nitrogen fertilizer can be tied up by wheat residue, so use application methods to minimize tie-up, such as knifing into the soil below the residue.

Weed control can be important in double crop sorghum. Warm-season annual grasses such as crabgrass can reduce double crop sorghum yields. Using a chloracetamide-and-atrazine preemergence product may be key to successful double crop sorghum production.

No-till sorghum studies at Hesston documented 4-year average double crop sorghum yields of 75 bushels per acre compared to about 90 bushels per acre for full-season sorghum. A different 10-year study that did not have double crop planting but did compare early and late planting dates averaged 73 bushels per acre for May planting vs. 68 bushels per acre for June planting.

### **Sunflowers**

Sunflowers can be a successful double crop option anywhere in the state, provided there is enough moisture at planting time to get a stand. Sunflowers need more moisture than any other crop to germinate and emerge, so the biggest hurdle to sunflower production is getting a successful stand. Once that hurdle is overcome, sunflowers are more drought-tolerant than most crops so the chances of having a yield in any kind of environment are good.

When double cropping sunflowers, producers should use slightly lower seeding rates to reflect the lower yield expectations compared to full-season sunflowers. It is also necessary to use shorter-season hybrids so they bloom and mature before frost.

Weed control can be an issue with double crop sunflowers since herbicide options are limited, especially postemergence. Thus, controlling weeds prior to sunflower planting is critical and may be complicated by the presence of glyphosate-resistant weeds and preplant restrictions with other herbicides. Consequently, double crop sunflowers may be most successful where glyphosate-resistant weeds are not present. Planting Clearfield or Express Sun sunflowers will provide additional postemergence herbicide options, but ALS-resistant kochia and pigweeds still could not be controlled. Beyond, the product used in Clearfield sunflower, does have activity on annual grasses as well as broadleaves (except for ALS-resistant biotypes).

### **Summer annual forages**

With mid-July plantings, and where herbicide carryover issues are not a concern, summer annual sorghum-type forages are also a good double crop option. A test planted July 21 near Holton in 2008, when summer rainfall was very favorable, provided yields of 2.5 to 3 tons dry matter/acre for hybrid pearl millet and sudangrass at the low end to 4 to 5 tons dry matter/acre for forage sorghum, BMR forage sorghum, photoperiod sensitive forage sorghum, and sorghum x sudangrass hybrids. Earlier plantings may be able to produce even more tonnage, as long as there is adequate August rainfall. One challenge with late-planted summer annual forages is getting them to dry down when harvest is delayed until mid- to late-September. Wrapping bales or bagging to make silage are good ways to deal with the higher moisture forage this late in the year.

### **Corn**

Is double crop corn a viable option? Corn is typically not recommended for June or July plantings because yield is usually substantially less than when planted earlier.

Typically, corn planted in mid-July has a difficult time pollinating and seldom receives sufficient heat units to fill grain before frost. This was illustrated in a study at the South Central Experiment Field in 2007 where 100 to 112 RM corn planted in late June yielded only 40 bushels per acre compared to over 130 bushels per acre for an April planting. In Manhattan in 2007, the same hybrids planted on June 25 yielded over 130 bushels per acre, which is certainly acceptable but substantially less than the 150 bushels per acre for earlier plantings.

In another study at Manhattan a 112-day corn hybrid planted in mid-July produced nearly 100 bushels per acre. No grain production was expected from that planting, but July rains were above normal at this location, allowing for successful pollination in August and grain fill in September. Note however that the corn could not be harvested until January because it took so long to dry down with the cool fall temperatures. Also note that 2007 was somewhat unusual in the amount and distribution of July and September rains at this location.

Very short-season corn hybrids (80 to 95 RM) have the greatest chance of maturing before frost in double crop plantings, but generally have less yield potential than hybrids that are 100 RM or more used for full-season plantings. Short-season hybrids often will set the ear fairly close to the ground, increasing the difficulty of harvest. Glyphosate-resistant hybrids will make weed control easier with double crop corn, but there may still be problems with late-emerging summer weeds such as pigweeds, velvetleaf, and large crabgrass. Keep in mind that corn is very susceptible to carryover of most residual ALS herbicides used in wheat.

### **Volunteer wheat control**

One of the issues with double cropping often overlooked by producers is the potential for volunteer wheat in the crop following wheat. If volunteer wheat emerges and goes uncontrolled, it can cause serious problems for nearby planted wheat fields in the fall.

Volunteer wheat can generally be controlled fairly well with glyphosate in Roundup Ready crops. It can also be controlled in sunflowers and soybeans with the labeled postemergence grass herbicides such as Assure II, Select, or Poast Plus, but control is reduced during times of drought stress. Atrazine can provide control of volunteer wheat in corn and sorghum, but can be erratic depending on rainfall patterns.

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## 6. K-State wheat plot tours for June 5 - 9

The week of June 5 – 9 has 10 wheat plot tours in Kansas. Producers willing to learn about the different varieties can choose to attend one (or several) plot tours in their county or agricultural district.

The plot tours generally include a discussion of wheat conditions across the state, as well as tips on what to look for when selecting wheat varieties for one operation. New and upcoming varieties are discussed, as well as older and more established ones and a discussion of how all these varieties are responding to this growing season's conditions.

For the week of June 5 – 9, the scheduled plot tour locations include:

**? 6/06/2017, 8:00 a.m.**

**Location: Clay Co., Clay Center**

Contact: Stu Duncan, 785-532-2277, [sduncan@ksu.edu](mailto:sduncan@ksu.edu)

Directions: Zoe Auld. 10 miles south of Clay Center on KS-15 S/Navajo Road, 8.6 miles east on KS82-E.

**Tuesday, 6/06/2017, 12:00 p.m.**

**Location: Cloud Co., Clyde**

Contact: Stu Duncan, 785-532-2277, [sduncan@ksu.edu](mailto:sduncan@ksu.edu)

Directions: Clifton-Clyde FFA with LeClair Seed. 2929-2993 Plum Rd, Clyde. 3 miles south of Clyde on N280th road, 1.5 miles west on Plum road.

**Tuesday, 6/06/2017, 6:00 p.m.**

**Location: Washington Co., Palmer**

Contact: Stu Duncan, 785-532-2277, [sduncan@ksu.edu](mailto:sduncan@ksu.edu)

Directions: Ohlde Seed, 1569-1599 4th Rd, Palmer. 3 miles east of Palmer on 4th road.

**U. 6/07/2017, 7:30 a.m.**

**Location: Republic Co., Belleville**

Contact: Stu Duncan, 785-532-2277, [sduncan@ksu.edu](mailto:sduncan@ksu.edu)

Directions: North Central Kansas Experiment field, 2 miles west of Belleville on highway 36, north side of the road.

**Wednesday, 6/07/2017, 10:00 a.m.**

**Location: Republic Co., Munden**

Contact: Stu Duncan, 785-532-2277, [sduncan@ksu.edu](mailto:sduncan@ksu.edu)

Directions: Christian Tipton 4 H plot - Co Rd H, Munden. 1.5 miles south of Munden on 22, then 1.5 miles east on road H.

**Wednesday, 6/07/2017, 12:00 p.m.**

**Location: Republic Co., Cuba**

Contact: Stu Duncan, 785-532-2277, [sduncan@ksu.edu](mailto:sduncan@ksu.edu)

Directions: Republic Co FFA, Linden St., Cuba. 1.6 miles west of Cuba on Linden St.

**Wednesday, 6/07/2017, 6:00 p.m.**

**Location: Republic Co., Belleville**

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Contacts: Stu Duncan, 785-532-2277, [sduncan@ksu.edu](mailto:sduncan@ksu.edu)

Directions: Polansky Seed, 1.5 mile east of the intersection Hwy 36 and 81 on Hwy 36, south side of the road.

**Thursday, 6/08/2017, 8:30 a.m. MDT**

**Location: Greeley Co., Tribune**

Contact: Lucas Haag, 785-462-6281, [lhaag@ksu.edu](mailto:lhaag@ksu.edu)

Directions: K-State Southwest Research-Extension Center, Tribune. 1 mi w of Tribune on Kansas Hwy 96.

**Friday, 6/09/2017, 7:00 a.m.**

**Location: Dickinson Co., Abilene**

Contact: James Coover, 785-263-2001, [jcoover@ksu.edu](mailto:jcoover@ksu.edu)

Directions: 7mi N of Abilene on Hwy 15; just south of Hwy 15 and Hwy 18 intersection.

**Friday, 6/09/2017, 5:00 p.m.**

**Location: Wichita Co., Leoti**

Contact: Horton Seed, 620-214-1460

Directions: 1352 South County Road 21, Leoti.

Romulo Lollato, Extension Wheat Specialist

[lolato@ksu.edu](mailto:lolato@ksu.edu)

Erick DeWolf, Extension Wheat Pathologist

[dewolf1@ksu.edu](mailto:dewolf1@ksu.edu)

## 7. Wheat field day scheduled at North Central Experiment Field, June 7

The North Central Experiment Field Wheat Field Day is scheduled for Wednesday, June 7, starting at 7:30 a.m. The field is located about two miles west of Belleville on Kansas Highway 36. Juice and rolls will be served ahead of the tour, provided by Belleville Chamber & Main St.

K-State speakers will include Romulo Lollato, Wheat and Forages Specialist. Tour topics include:

- Wheat Varieties (40 varieties)
- Wheat Management Research

More information is available by calling the North Central Experiment Field at 785-335-2836 or contacting Andrew Resser, Agronomist-in-Charge, at [aresser@ksu.edu](mailto:aresser@ksu.edu).

## 8. Dryland Ag Day planned in Tribune, June 8

Against the backdrop of a diminishing Ogallala Aquifer, dryland farming is increasingly moving into sharper focus. A K-State field day planned in Tribune will feature research related to growing dryland crops in western Kansas.

The Dryland Ag Day will be held June 8 at K-State's Southwest Research-Extension Center one mile west of Tribune on Kansas Highway 96. Registration and refreshments are available at 8:30 a.m. MDT, followed by field tours, indoor seminars and a lunch sponsored by TBK Bank.

Field tours starting at 9:00 a.m. MDT include:

- Wheat varieties
- Wheat streak mosaic and varietal resistance
- Wheat seeding rates
- Solid stem wheat update
- Tillage in dryland systems
- Dryland crop rotations
- Weed control in fallow and row crop

Indoor seminar topics beginning at 11:15 a.m. MDT include:

- Control of Palmer amaranth
- Seeding depth for wheat.
- Weather forecast development and long-range forecast

Speakers include:

Erick DeWolf, Extension Wheat Plant Pathologist

Lucas Haag, Northwest Area Crops and Soils Specialist

Jeanne Falk Jones, Sunflower District Extension Agronomist

Curtis Thompson, Weed Management Specialist

Alan Schlegel, Agronomist, Southwest Research-Extension Center-Tribune

More information is available by calling 620-376-4761.

## 9. Field pea plot tours, June 15

Three field pea plot tours from K-State Research and Extension have been scheduled for June 15.

1. Gove County, 8:30 a.m. CT. From Grainfield/Hoxie exit on I-70 go 2 ¾ miles south on Road 50, then 2 ½ miles east on Road Z.

- Variety performance test with 17 entries
- Seeding rate study, seed treatment study, and in-furrow fertilizer study

2. Northwest Research-Extension Center, 1 p.m. CT. 105 Experiment Farm Road, Colby. Come in the main drive and follow the signs.

- Variety performance test with 19 entries
- Seeding rate study
- In-furrow fertilizer application study
- Lentil variety evaluation

3. Rawlins County, 4 p.m. CT. From the intersection of Hwy US 36 and K-25 in Atwood go 6 miles north on K-25, then 1/8 mile west on Road X.

- Variety performance test with 17 entries
- Seeding rate study
- Seed treatment study
- Wheat plot tour to follow at 5:30 p.m. CT

K-State faculty, industry representatives, and experienced producers will be on hand to discuss pea growth and development, variety selection, herbicide options, production practices, disease management and producer experiences.

For more information contact:

Lucas Haag, K-State Northwest Area Agronomist (785) 462-6281, [LHaag@ksu.edu](mailto:LHaag@ksu.edu)

Golden Prairie Extension District (785) 673-4805

Rawlins County Extension (785) 626-3192



## **2017 Field Pea Plot Tours June 15<sup>th</sup>**

### **Gove County, 8:30 AM CT**

- Variety Performance Test with 17 entries
- Seeding rate study, seed treatment study, and in-furrow fertilizer study
- From Grainfield/Hoxie exit on I-70 go 2 ¼ miles south on Road 50, then 2 ½ miles east on Road Z.

### **Northwest Research-Extension Center – 1:00 PM CT**

- Variety Performance Test with 19 entries
- Seeding Rate Study
- In-Furrow Fertilizer Application Study
- Lentil variety evaluation
- 105 Experiment Farm Road, Colby, KS. Come in the main drive and follow the signs

### **Rawlins County– 4:00 PM CT**

- Variety Performance Test with 17 entries
- Seeding Rate Study
- Seed Treatment Study
- Wheat plot tour to follow at 5:30 CT
- From the intersection of Hwy US 36 and K-25 in Atwood go 6 miles north on K-25, then 1/8 mile west on Road X

**K-State faculty, industry representatives, and experienced producers will be on hand to discuss pea growth and development, variety selection, herbicide options, production practices, disease management and producer experiences.**

#### ***For questions or more information contact:***

Lucas Haag, K-State Northwest Area Agronomist (785) 462-6281, [LHaag@ksu.edu](mailto:LHaag@ksu.edu)  
Golden Prairie Extension District (785) 673-4805  
Rawlins County Extension (785) 626-3192

## 10. Comparative Vegetation Condition Report: May 23 - 29

The weekly Vegetation Condition Report maps below can be a valuable tool for making crop selection and marketing decisions.

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 27-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 Vegetation Condition Report (VCR) maps were originally developed by Dr. Kevin Price, K-State professor emeritus of agronomy and geography, and his pioneering work in this area is gratefully acknowledged.

The maps have recently been revised, using newer technology and enhanced sources of data. Dr. Nan An, Imaging Scientist, collaborated with Dr. Antonio Ray Asebedo, assistant professor and lab director of the Precision Agriculture Lab in the Department of Agronomy at Kansas State University, on the new VCR development. Multiple improvements have been made, such as new image processing algorithms with new remotely sensed data from EROS Data Center.

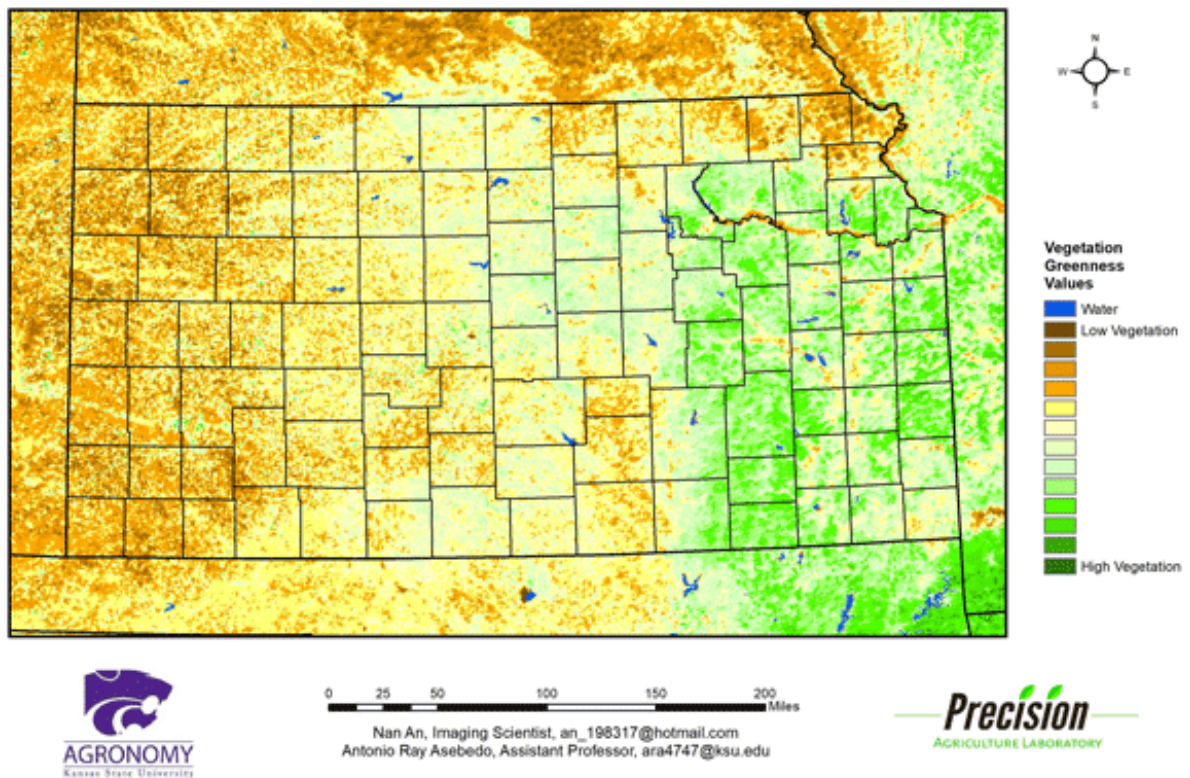
These improvements increase sensitivity for capturing more variability in plant biomass and photosynthetic capacity. However, the same format as the previous versions of the VCR maps was retained, thus allowing the transition to be as seamless as possible for the end user. For this spring, it was decided not to incorporate the snow cover data, which had been used in past years. However, this feature will be added back at a later date. In addition, production of the Corn Belt maps has been stopped, as the continental U.S. maps will provide the same data for these areas. Dr. Asebedo and Dr. An will continue development and improvement of the VCRs and other advanced maps.

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



## Kansas Vegetation Condition

Period 22: 05/23/2017 - 05/29/2017



**Figure 1. The Vegetation Condition Report for Kansas for May 23 – May 29, 2017 from K-State’s Precision Agriculture Laboratory shows increased activity across much of the state. The recent cool weather has continued to slow vegetative activity in the west, however. The largest area of high vegetative activity is in the southeast, where temperatures have been consistently warmer than the rest of the state.**

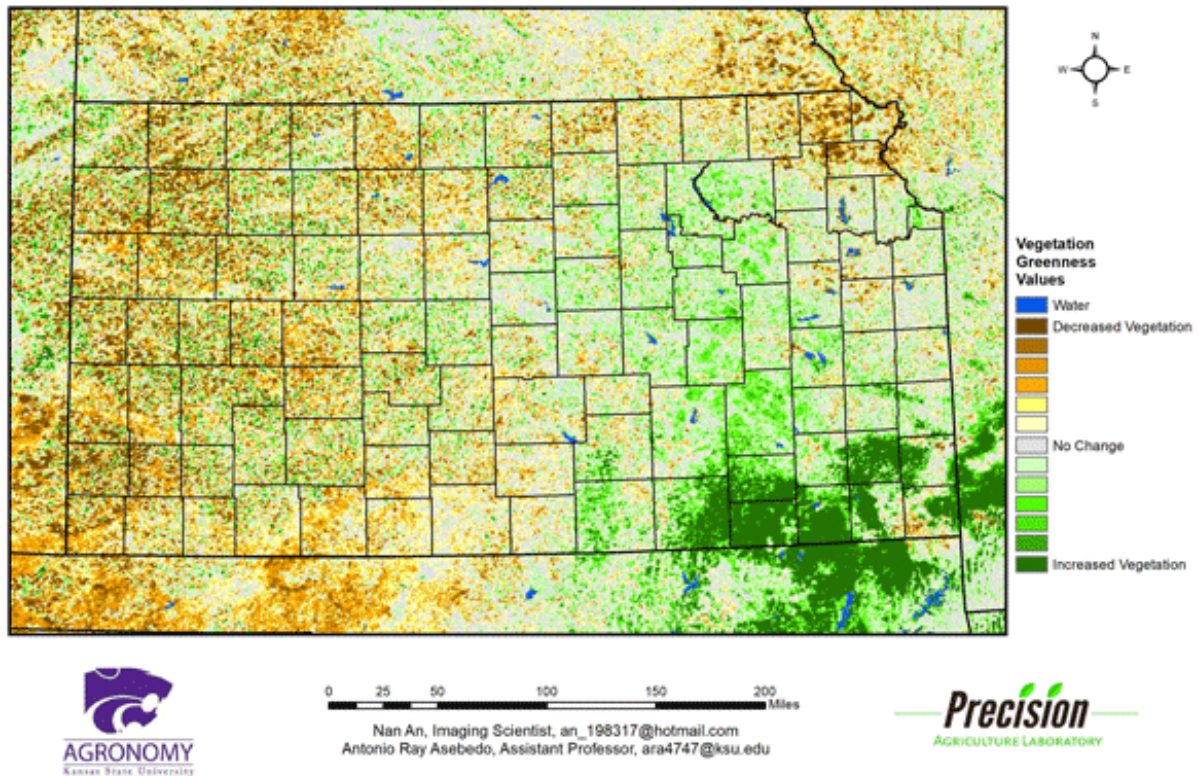
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## Kansas Vegetation Condition Comparison

Late-May 2017 compared to the Late-May 2016

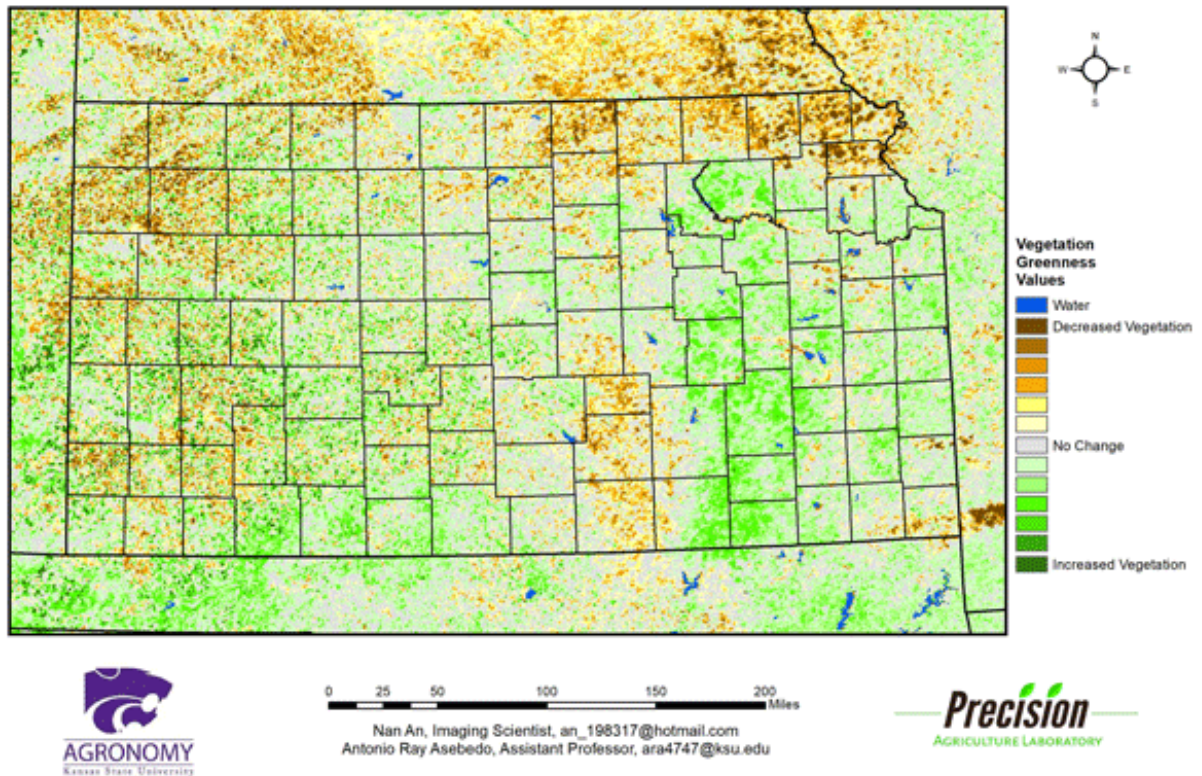


**Figure 2. Compared to the previous year at this time for Kansas, the current Vegetation Condition Report for May 23 – May 29, 2017 from K-State’s Precision Agriculture Laboratory shows a mix of conditions. In parts of western and northeast Kansas much lower NDVI values are visible. The winter wheat is less advanced this year than last, particularly in western Kansas, where dry fall conditions hampered establishment and recent cold weather has slowed development. Other areas reflect the cooler temperatures this year. Higher NDVI values in the southeast reflect the more favorable moisture, coupled with warmer temperatures, that have prevailed this year.**



# Kansas Vegetation Condition Comparison

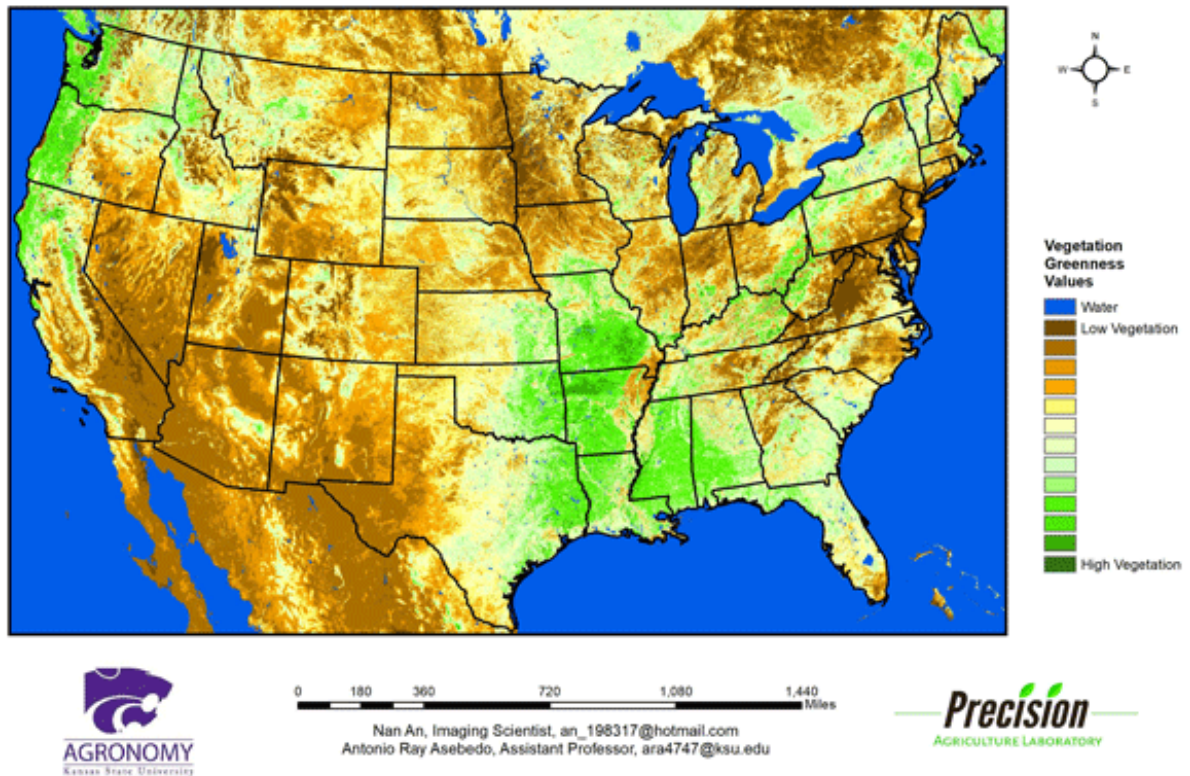
Late-May 2017 compared to the 28-Year Average for Late-May



**Figure 3. Compared to the 27-year average at this time for Kansas, this year's Vegetation Condition Report for May 23 – May 29, 2017 from K-State's Precision Agriculture Laboratory photosynthetic activity is near normal across much of the state. The wetter-than-normal conditions have slowed spring planting in the northern parts of the state, and excessive moisture has dampened vegetative activity in the Southeastern Division.**

## Continental U.S. Vegetation Condition

Period 22: 05/23/2017 - 05/29/2017



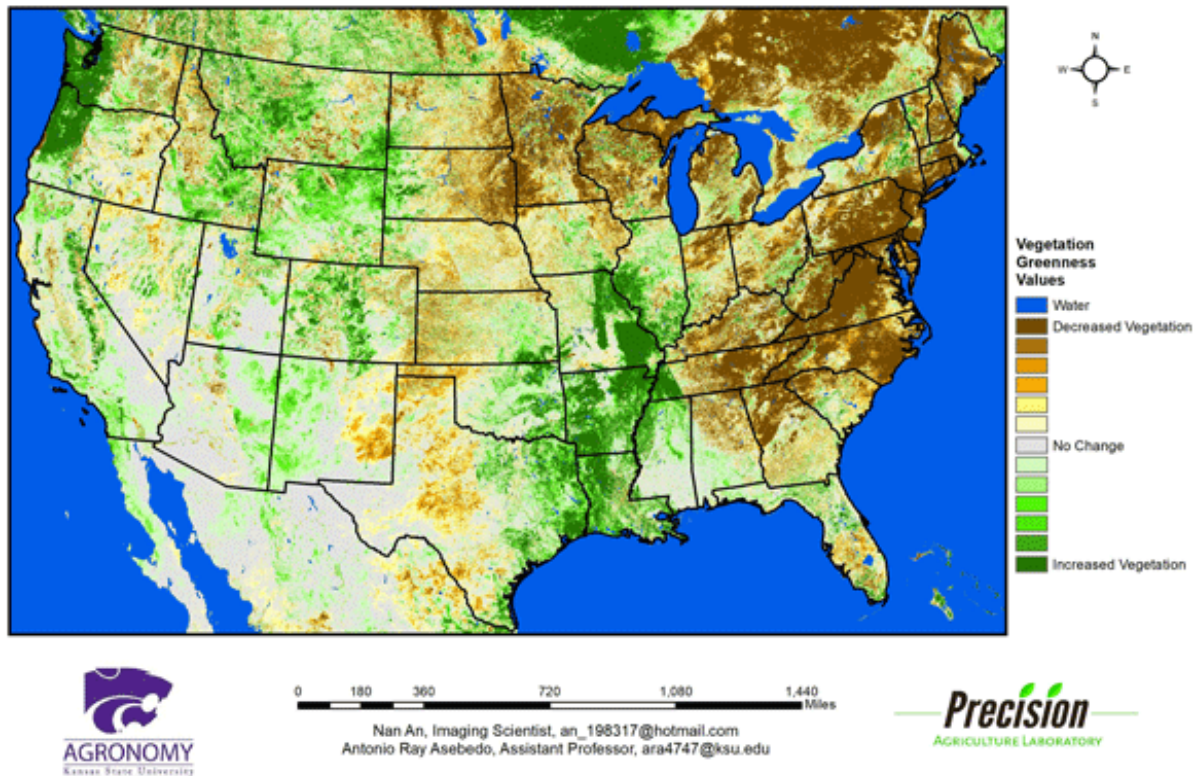
**Figure 4. The Vegetation Condition Report for the U.S for May 23 – May 29, 2017 from K-State’s Precision Agriculture Laboratory shows the area of highest NDVI is confined to the South, particularly in east Texas and Louisiana northward into Arkansas and Missouri. A second area of higher vegetative activity is also visible along the West Coast, where the wet conditions continue. Low NDVI values are visible along the central Mississippi River Valley, where flooding continues to be an issue, and in the Ohio River Valley, where planting has been delayed.**

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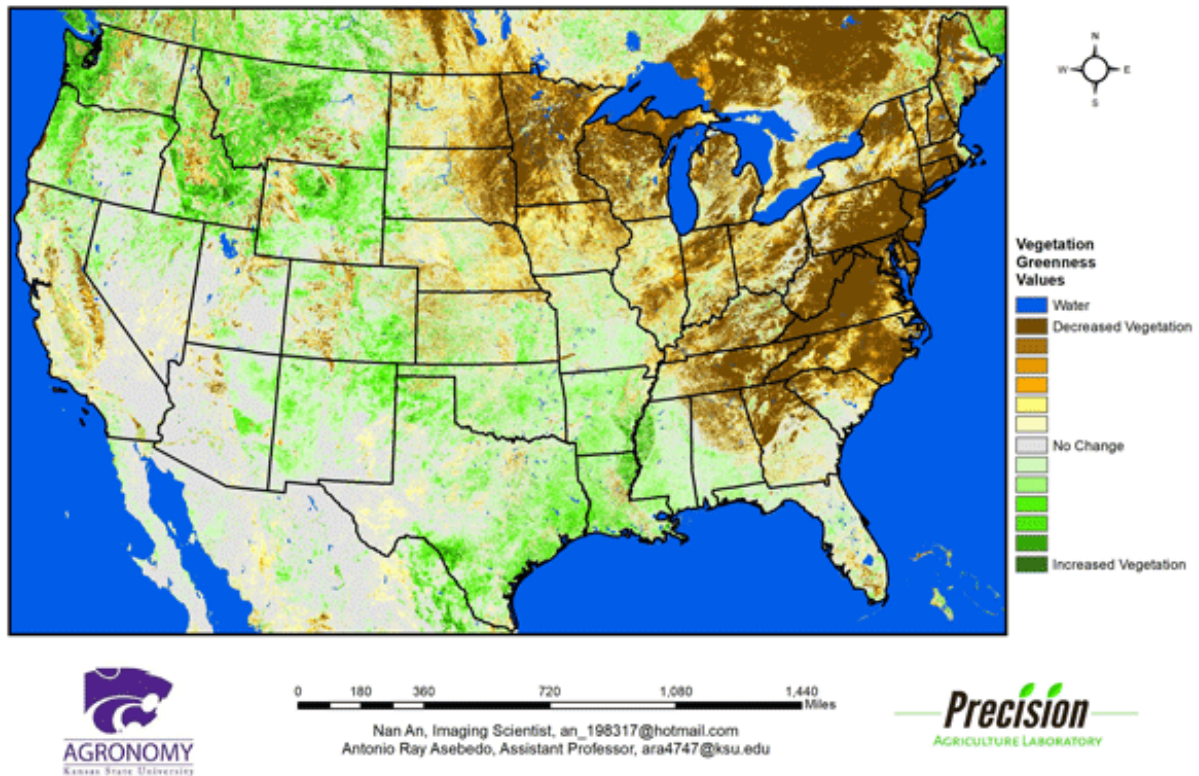
Continental U.S. Vegetation Condition Comparison  
Late-May 2017 Compared to Late-May 2016



**Figure 5. The U.S. comparison to last year at this time for May 23 – May 29, 2017 from K-State’s Precision Agriculture Laboratory shows slower vegetative activity in the upper Midwest and in the eastern U.S. Much lower NDVI values visible in the East are due to persistent cloud cover.**



Continental U.S. Vegetation Condition Comparison  
Late-May 2017 Compared to 28-year Average for Late-May



**Figure 6. The U.S. comparison to the 27-year average for the period of May 23 – May 29, 2017, 2017 from K-State’s Precision Agriculture Laboratory shows below-average photosynthetic activity concentrated in the eastern region. Areas from Alabama and Georgia through the Great Lakes are showing much below-average NDVI values due mainly to persistent cloudy, wet weather.**

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