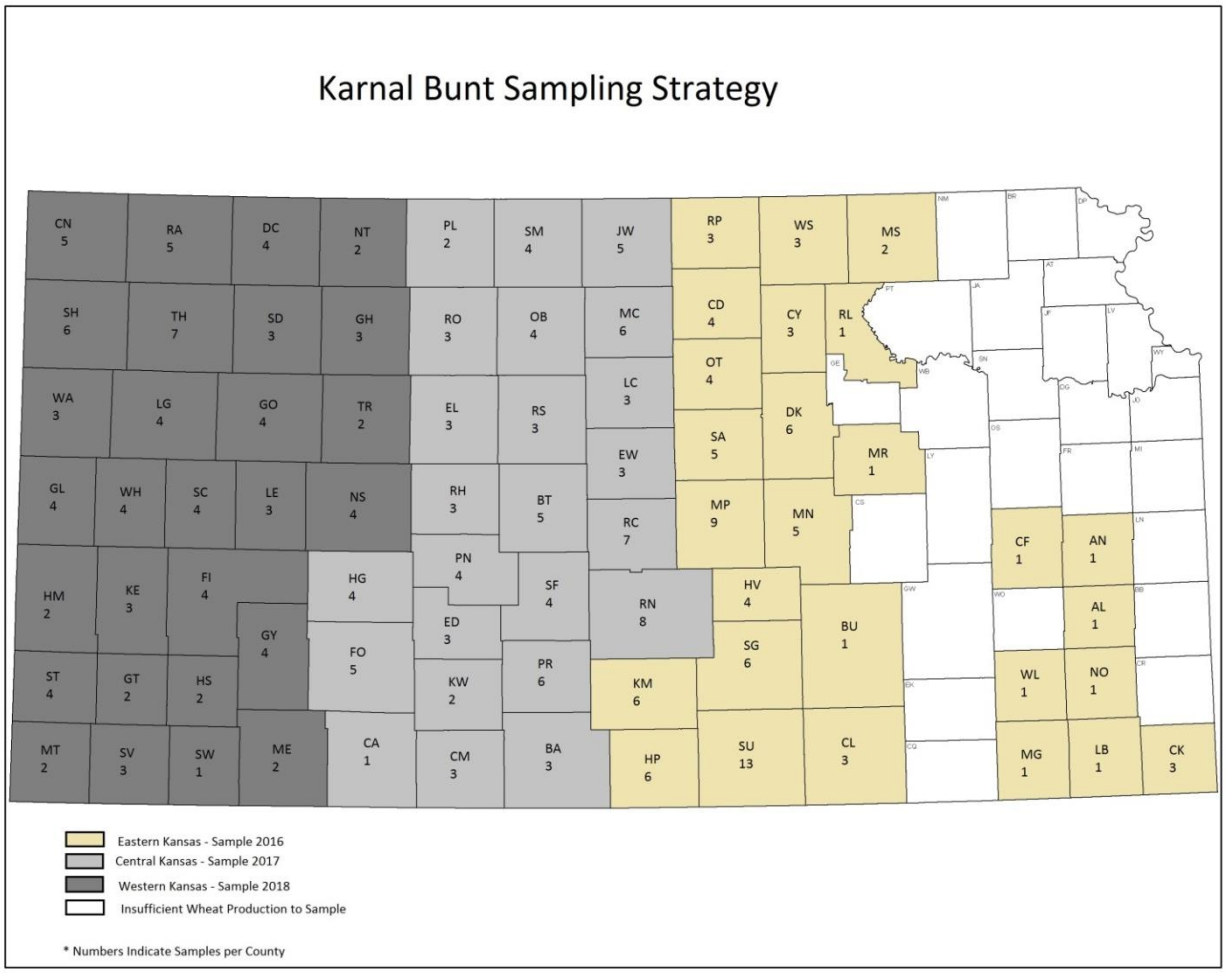
May 30, 2019 CAPS Committee Meeting Notes

In attendance: Ernesto Flores (KDWPT), Walter Fick (KSU Agronomy), Christian Webb (KSU Plant Pathology), Jim Stack (KSU GPDN), Taro Eldredge (KDA Entomologist), George Blush (KDA), Jeff Vogel (KDA, Shayne Galford (USDA-APHIS-PPQ SPHD), Cindy Stoefer Powell (USDA-APHIS-PPQ SITC), Ryan Armbrust (KFS), Doug Jardine (KSU Plant Pathology), Gaelle Hollandbeck (KDA Plant Pathologist), Scott Marsh (KDA Weed Specialist), Judy O'Mara (KSU GPDN).

CAPS Update:

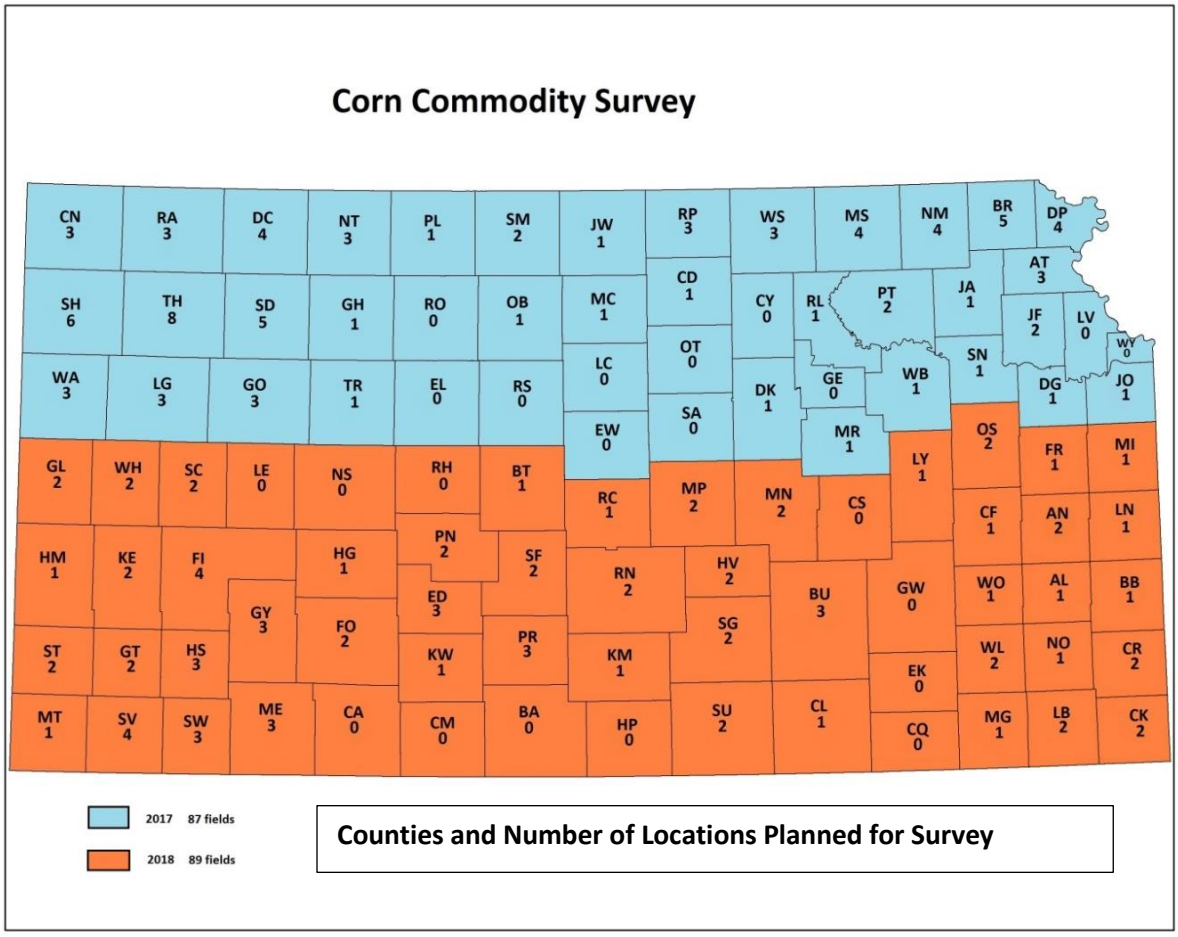
<u>2018 CAPS, Farmbill and Line Items:</u>

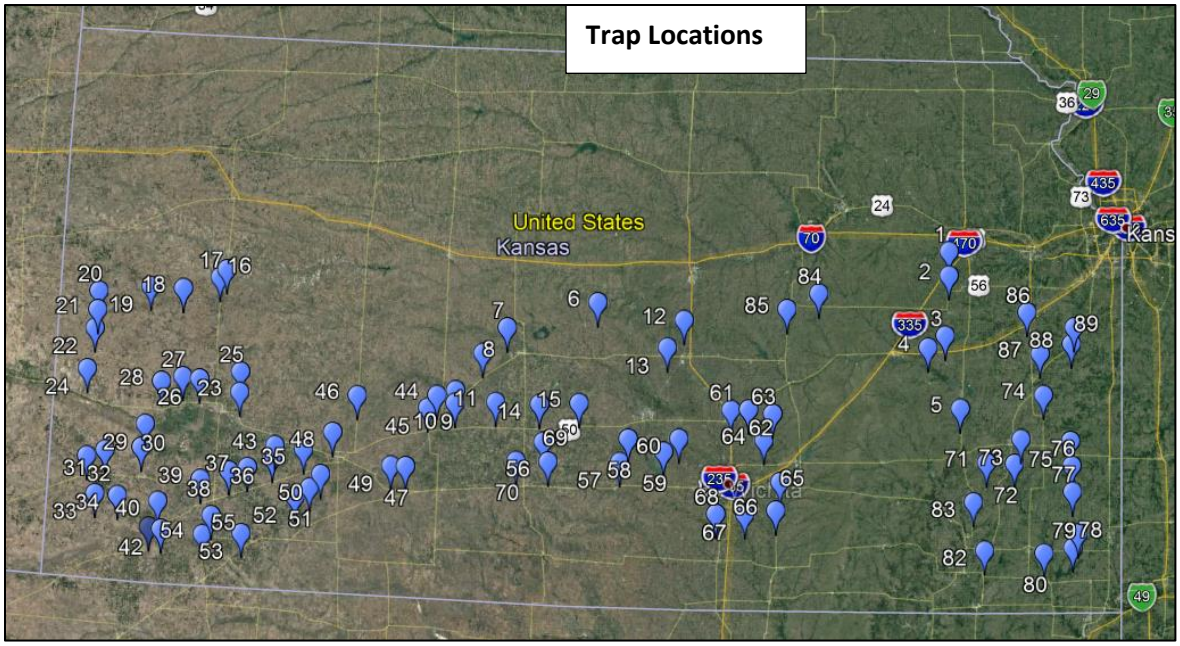
- <u>Karnal bunt</u>
  - 91 samples in 27 counties in the western part of the state – survey done by KDA staff – All negative



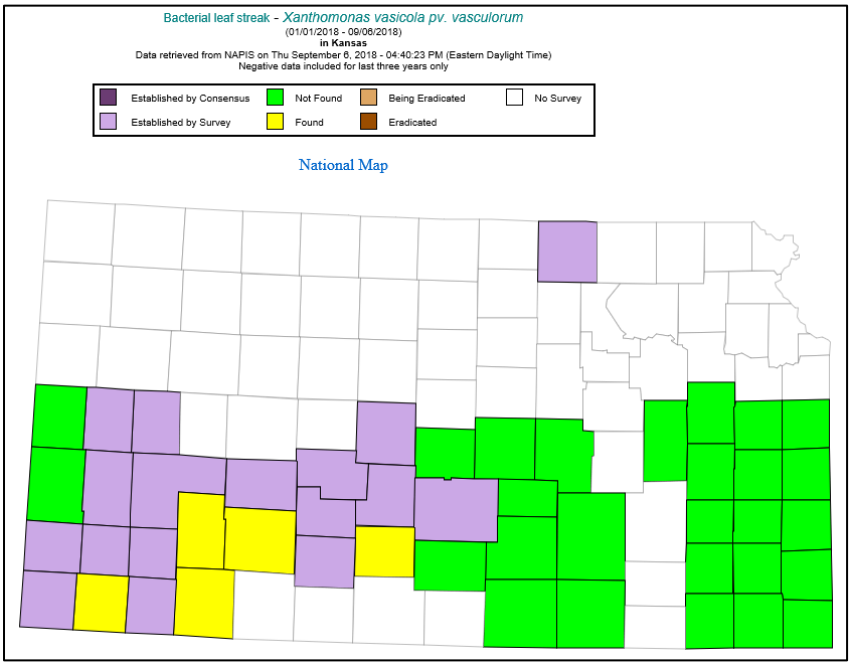
- Corn Commodity Survey

  - Second year of two-year survey. In 2018, 89 fields in 48 southern counties – survey done by seasonal staff, Brian Brunkow. One site for every 25,000 acres of corn. Soil sampling occurred once at each field and disease and trap activities occurred monthly at each site during May to October. Survey began May 14 and completed on October 12. All targets were negative except bacterial leaf streak (*Xanthamonas vasicola* pv. *Vasculorum*). Map of counties below.
  - Trapping – Egyptian Cottonworm (*Spodoptera littoralis*) and cotton cutworm (*Spodoptera litura*) – 1 trap for each at each location
  - Diseases - late wilt (*Harpophora maydis*), Java downy mildew (*Peronosclerospora maydis*), Philippine downy mildew (*Peronosclerospora philippinensis*), Brown stripe downy mildew (*Sclerophthora rayssiae* var. *zeae*), bacterial leaf streak (*Xanthamonas vasicola* pv. *Vasculorum*), tar spot (*Phyllachora maydis* and *Monographella maydis*) and Goss' bacterial wilt.
  - Nematode - Mexican corn cyst nematode (*Punctodera chalcoensis*) – One sample consisting of 15-20 cores of soil from each field. Samples will be sent to Tim Todd at the KSU Nematology Lab.





Bacterial leaf streak/*Xanthomonas vasicola pv. Vasiculorum*



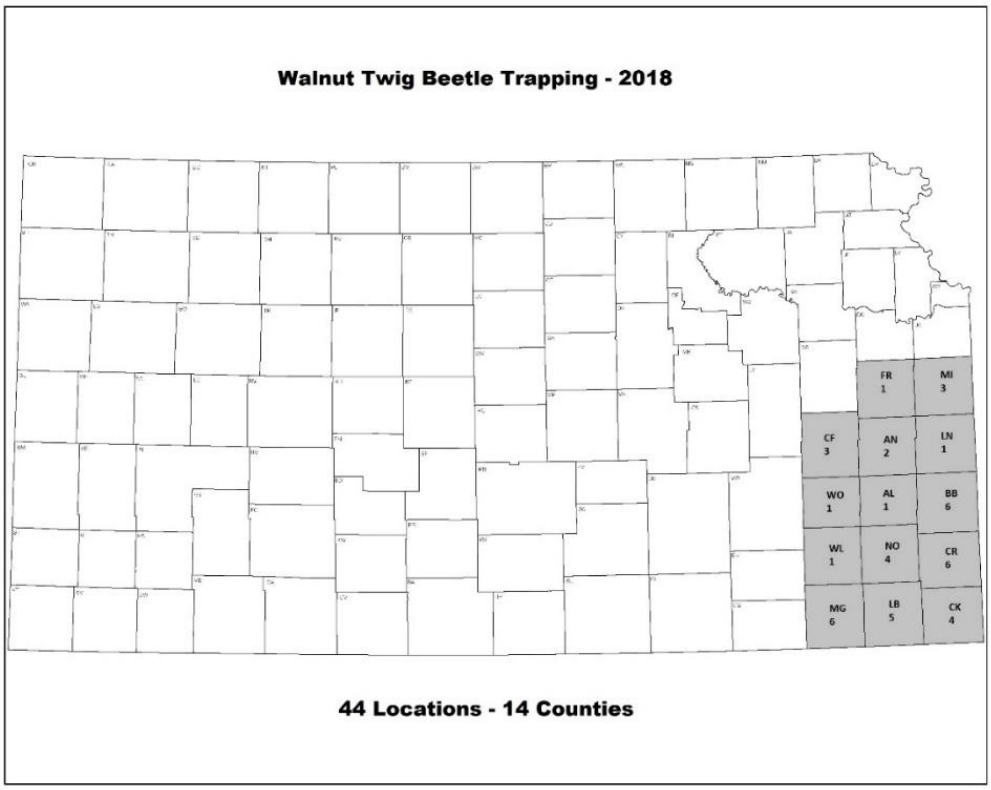
Includes surveys by Doug Jardine (KSU)

- First county finds: Finney, Kearney, Kiowa, Pawnee

2018 Farmbill:

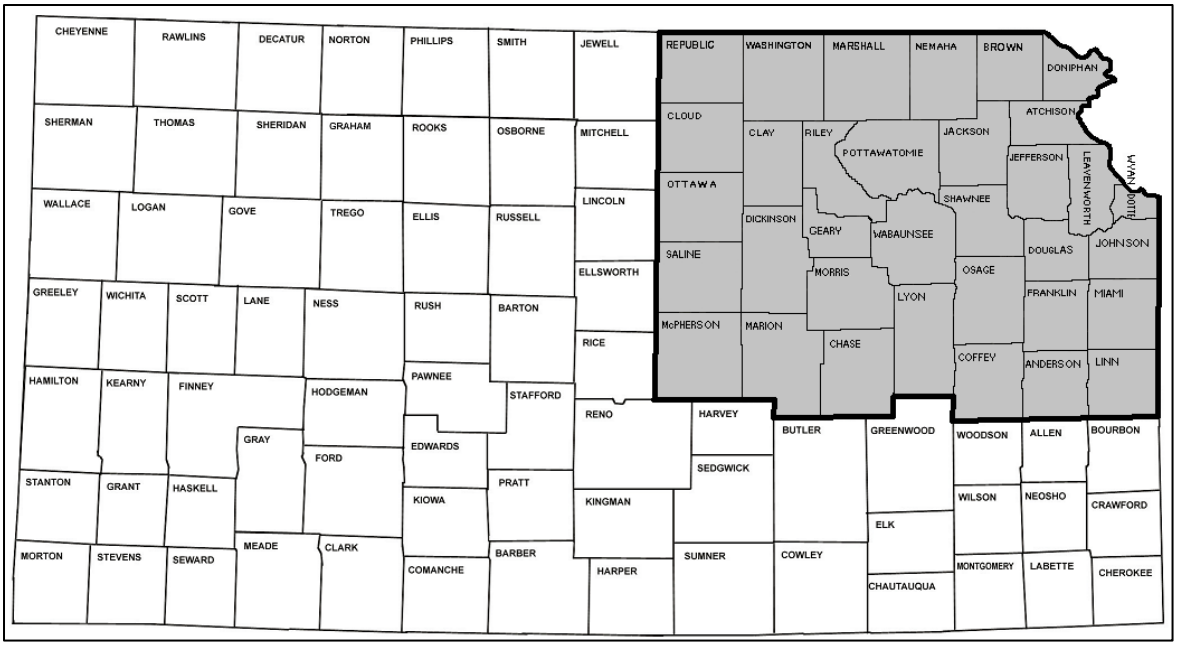
- Walnut Twig Beetle/Thousand Cankers Disease Survey

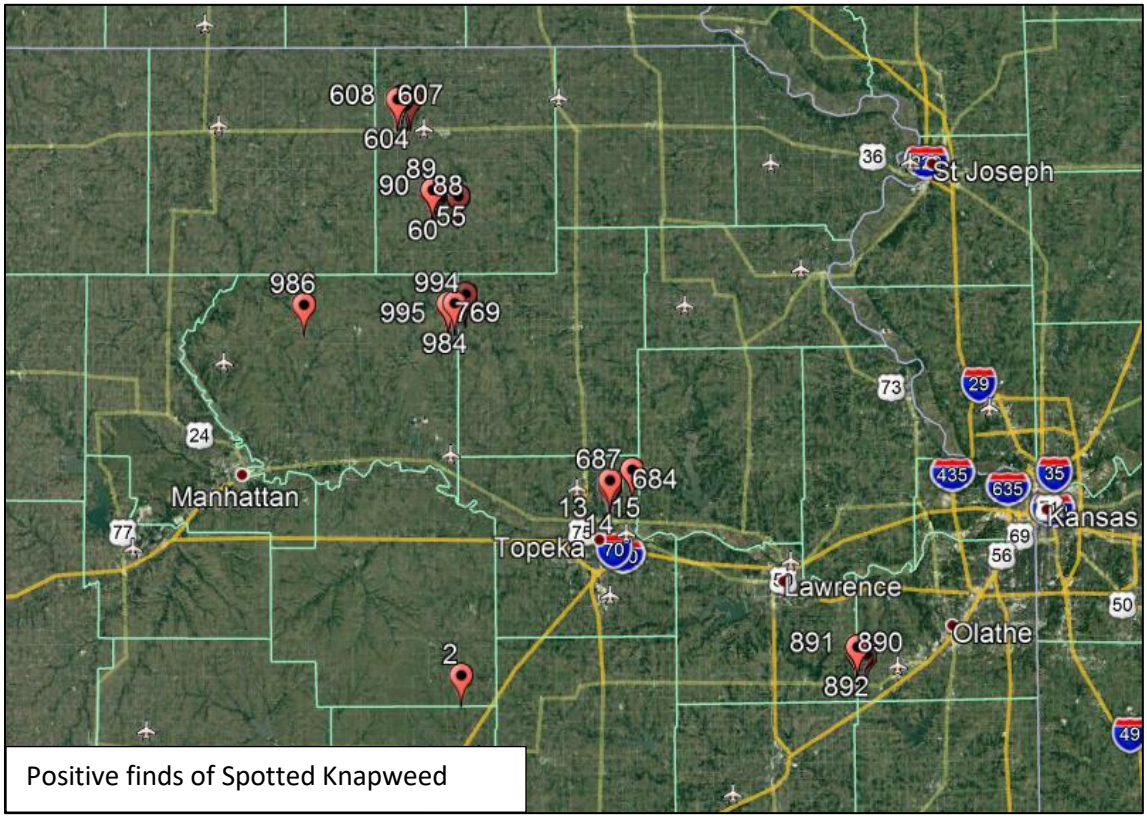
  - 44 sites with 1 trap at each site in 14 southeastern counties by Kristina Hamilton (seasonal employee).
  - Trapping occurred from May 30-August 3, 2018.
  - All negative.



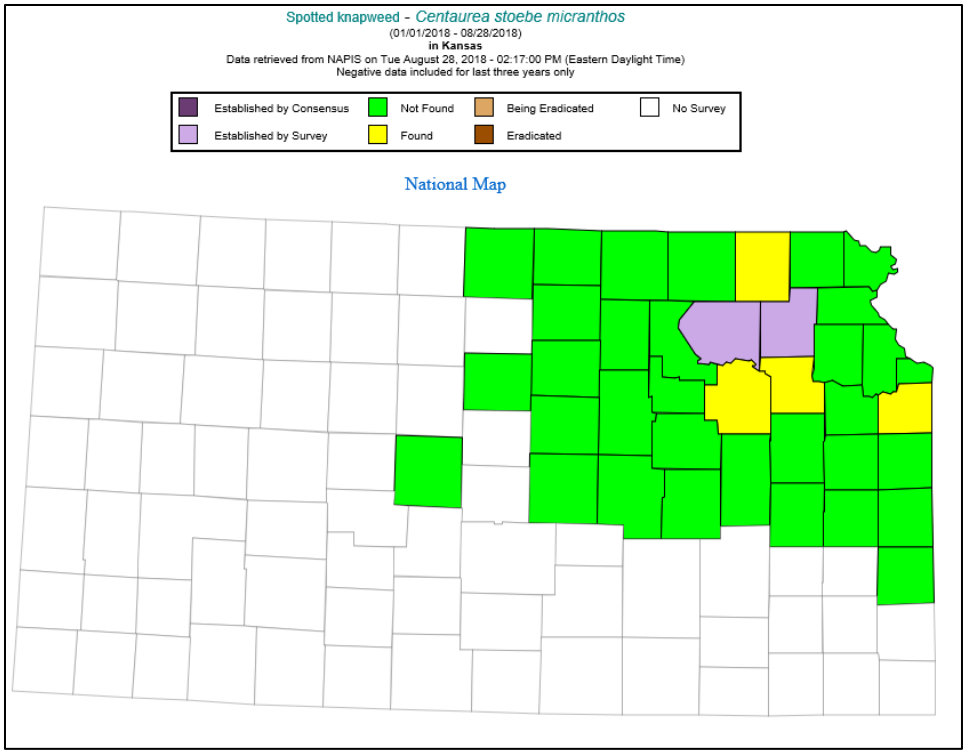
- Spotted Knapweed (*Centaurea stoebe* L.) Survey for Biological Control

  - 39 counties surveyed in the northeast part of Kansas
  - Surveyed by Jason Lambrecht (seasonal employee)
  - June 12 – August 17, 2018
  - 1,060 visual points taken -126 positive, 934 negative for spotted knapweed





Positive finds of Spotted Knapweed



- **<u>Forest Pest Outreach</u>**

- May 22 – August 5, 2018
- 832 surveys filled out in 51 location in 27 counties

Information Gained from Survey:

a. Camping statistics:

1. Average number of people in a group is 2 and they bring a trailer/camper most of the time
2. It was 5% of the campers first time in Kansas
3. 15.3% of campers live out-of-state
4. Out-of-state campers came from 18 out of 28 states that are quarantined for emerald ash borer
5. People from 7 Kansas emerald ash borer quarantine counties brought firewood to 11 non-quarantine county campgrounds. Osage county had the most firewood brought to it.
6. Campers visit campgrounds 6-10 times and spend 11 or more nights a year in Kansas camping
7. 84% of campers have brought firewood camping. 14% rarely do, 20% sometimes do, 20% often do, 30% always bring firewood camping.
8. 60% of campers did not bring firewood and 39% did bring firewood during the survey
9. Most campers know of zebra mussels, but the knowledge of other invasive pests is lacking.
10. Knowledge about quarantines is lacking
11. Firewood habits have not changed most people bring from home
12. Most utilized social media site is Facebook and most people get the news from the internet or TV.

13. Personal visits to the campsites was useful and more campers will change their firewood habits because of it.

b. Increased potential for transporting invasive species

1. Trailers/Campers are most utilized for camping (gypsy moth egg masses, invasive weeds)
2. Lawn furniture and grills (gypsy moth egg masses, invasive weeds)
3. Horses are brought to horse camping trails (invasive weeds)
4. Out-of-state visitors not checking items that can harbor invasive pests before travelling and during travel (gypsy moth eggs masses, invasive water pests)
5. Quarantine Kansas county residents transporting firewood to non-quarantine counties (invasive tree pests)
6. Forty-five percent of campers typically get firewood from home and 31% getting it from friends (invasive tree pests)
7. Boats and jet skis (invasive water pests)

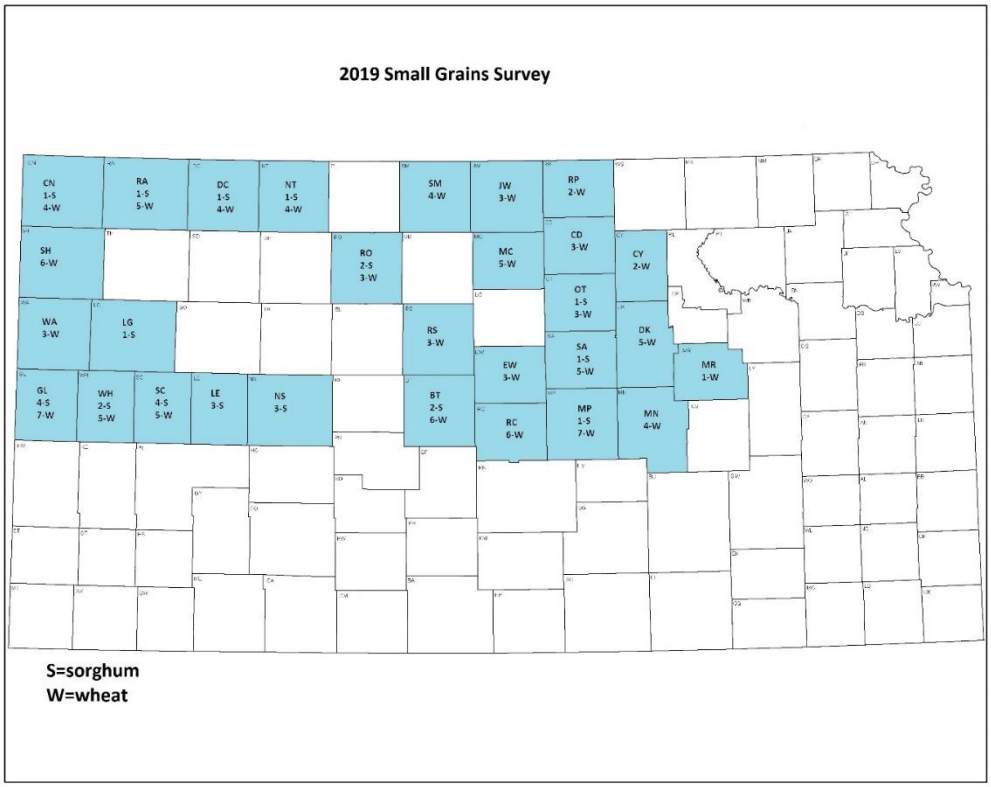
c. Action items from the results of survey

1. Multi-agency meeting – Kansas Department of Agriculture, Kansas Wildlife, Parks and Tourism, Kansas Forest Service, Corp. of Engineers – sent out power point instead
2. Develop targeted outreach, especially on social media
3. Develop firewood movement initiatives

2019 Planned Surveys:

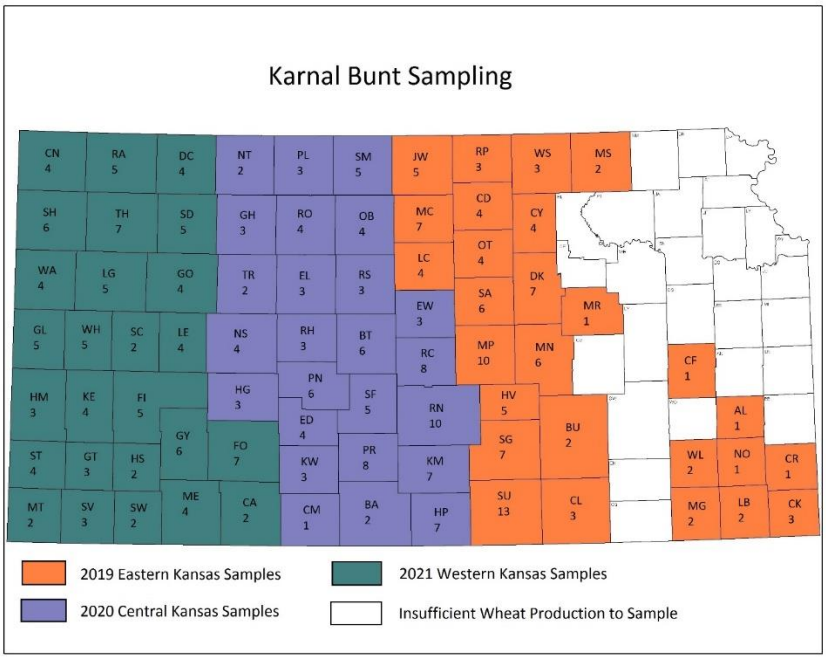
- **Small Grains Survey**

  - 110 fields of wheat and 28 fields of sorghum in 30 northern counties – survey done by seasonal staff, Brian Brunkow, started March 25 and all traps for wheat are up. Sweep net survey is on-going.
  - One site for every 25,000 acres of wheat and sorghum.
  - April to June for wheat
  - June to September for sorghum
  - Trapping – Egyptian Cottonworm (*Spodoptera littoralis*), Old World Bollworm (*Helicoverpa armigera*) – bucket trap with lure - 1 trap for each at each location
  - Small brown planthopper (*Laodelphax striatellus*) – yellow sticky card, no lure - 1 trap for each at each location
  - Visual - Sunn pest – sweep net



- **<u>Karnal bunt</u>**

  - 108 samples in 27 counties in the eastern part of the state – survey done by KDA staff – Amy Jordan, Jeremy Maples, Erin Smothers and Gaelle Hollandbeck



<u>Plant Protection Act 7721(PPA 7721) (used to be Farmbill):</u>

- **<u>Walnut Twig Beetle/Thousand Cankers Disease Survey</u>**

  - 44 sites with 1 trap at each site in 15 south-central counties by a seasonal employee – Morgan Trible.
  - Trapping started June 5
  - Trapping will occur from June to August 2019.

USDA Update:

Shayne:

- Pest Survey Specialist (PSS) - vacant-position bundled with other states so it can be a priority hiring.
- Barry Cole back June 3. He had a broken leg. He will be retiring in February 2020.
- Cindy Stoeffer Powell is covering Kansas for SITC (Smuggling, Interdiction and Trade Compliance)
- Surveys:
  - GM - ~400 traps for the state every 2 years
  - 2019 - Wichita ~130 traps, Topeka ~70 traps
- Exotic Wood Borers – 10-12 locations, 3 different traps at each location in the northeast part of the state and Wichita
- Soybean grain – looking for wild wheat seed. This is the 2nd year. Still waiting on last years' results. Survey being done for exports
- EAB parasitoid releases – June 11, 1st release with seasonal employee. Looking to do destructive sampling looking for parasitoids that had been released the last couple of years.
- Grass hopper survey – survey in western Kansas with seasonal employee

Cindy:

- SITC – looking to do outreach and surveys at Universities with International Student groups – looking for suggestions

KDA Update:

Jeff:

- Hemp – 151 licenses
  - KBI background checks required
  - Hiring a tech position to help in the office and field work
  - In the process from changing from a research to a commercial program
- Office manager and export certificates – record levels for export certificates, hiring this position
- KDA Lab – in process of being built at location where headquarters office is located
- EAB Regulatory – USDA backing away from, focusing on bio-control

Scott:

- Spotted Knapweed

    - New sites from 2011 survey, biggest site is 3-4 acres
    - Wanting to list it as noxious weed
    - Releasing bio-control in Nemaha county this summer
- Noxious Weed Law
    - Developed an advisory board
    - Moved list to Regulations instead of Statutes
    - 2020 New weed list will be in place
- Cimarron Grassland Survey
    - Public Hearing June 26 to regulate yellow and old world bluestem movement of plant and seed material into state

Gaelle:

- Wheat
    - Struggle to get out in field due to rain
    - Muddy conditions
    - Stripe and leaf rust most common, some tan spot
    - Not as much disease given the wet weather

- Purslane/Portulaca
    - Alternanthera mosaic
    - A number of greenhouses across NE, SE area
    - All came from same source

- Mystery virus in cherry
    - Weeping Yoshino Cherry
    - Tested for Tobacco Ringspot, Tobacco Rattle, Apple Mosaic, Prunus Necrotic Ringspot (both cause rose mosaic), American Plum Line Pattern
    - Shipped to MN, saw virus particles with electron scope
    - Shipped to USDA for sequencing, hoping for a diagnosis

- SOD
    - SOD showed up in Indiana in 5 cities on 5 varieties of rhododendron, Kansas had one sample of azalea but it's negative for Phytophthora. Possibly Phyllosticta or Septoria
    - Walmart - Rural King in other states there are 35 Walmarts in KS
    - Actively looking for it and working on containing it if it's gotten here
    - Came from Washington and Canada via Oklahoma

Taro:

- Monitoring expansion of EAB
- Purple prism traps -24
    - 3-Russell county
    - 3-Ellis county
    -
- Girdled trap trees – 16
    - 3-Cherokee county
    - 2-Labette county
    - 1-Crawford county

- EAB Bio-control releases – Shawnee Mission Park, Clinton Lake, Perry Lake, Wyandotte Lake
- Small Grains – screening for noctuids
- Walnut Twig Beetle – Using walnut bolts in 22 of the 44 sites along with Lindgren funnel traps
- Japanese Beetle – Wanting suggestions to rethink approach
- Spotted Lanternfly – Next concern after EAB

KSU Update:

Judy:

- Disease pressure delayed this year
- Greenhouse – lower production because of lower light levels
- Landscape – pine diseases are high

Doug:

- no samples currently because the crops have been flooded or late start
- Everything is delayed this year
- Possible problems in southeast part of state – Goss' blight, streaks and rust
- Retiring February 29

Ryan:

- In partnership with Clemson – wanting Callery pear leaf samples to check to see if there are certain varieties that are more invasive. Need from Johnson, Franklin, Shawnee, Geary and Sedgwick counties.
- Mapping Callery pear – 5-year funding. Looking at 25 counties with significant infestation. KDA and KFS surveying for it
- Herbicide injury – 9 state study, sending woody plant tissue to South Dakota lab
- Walnuts – Funding sentinel tree study in Western Kansas – condition and classing
- Invasive plants and forest health – remote sensing mapping of plants
- Tamarix survey – aerial survey for Diarahba damage
- Great Plains Tree Pest Council (GPTPC) meeting – Denver, October 2-4
- Wanting to increase tree bug collection displays

Jim:

- Field Diagnostics – developing tools to get high quality id's. 8-minute positive results. Variety of technologies – amplifying nucleic acid, colormatic test, test strip and device. Workshop possibilities
- $1 per test or $2500 to $12000 for device.
- Eric DeWolf is changing positions. Replacement search for 2020.

Walt:

- Causian and Old World Bluestem – in most counties
- Yellow Bluestem will form a sod
- 15% expansion per year – seed carried by wind
- Looking at herbicide
- Fire timing – August burn knocks Old world bluestem the best

- Sericea – goats work good for control
- Black Swallow Wort – Morris County in Tallgrass Prairie

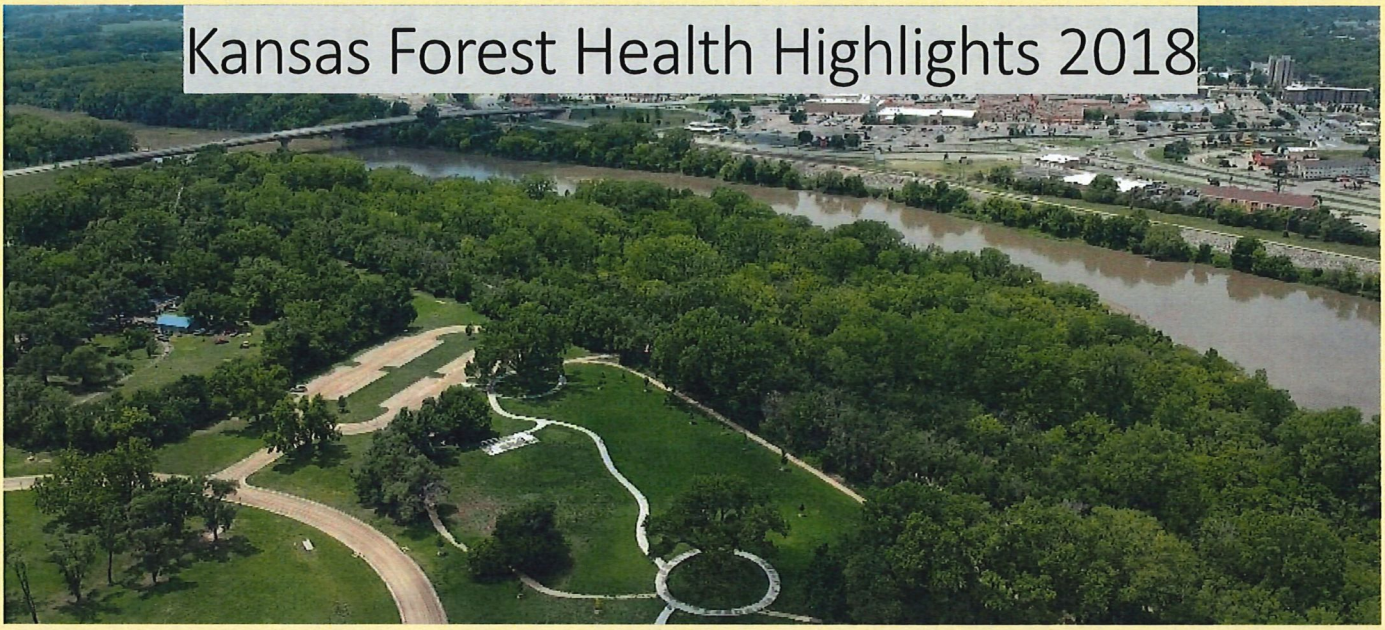
Ernesto:

- Phragmities – wants suggestions on controlling
- New campaign at bait shops – Don't let it Loose

2020 Planned Surveys:

- Karnal Bunt
- Small Grains – southern half of state
- Walnut Twig Beetle – north central part of the state (PPA funding)

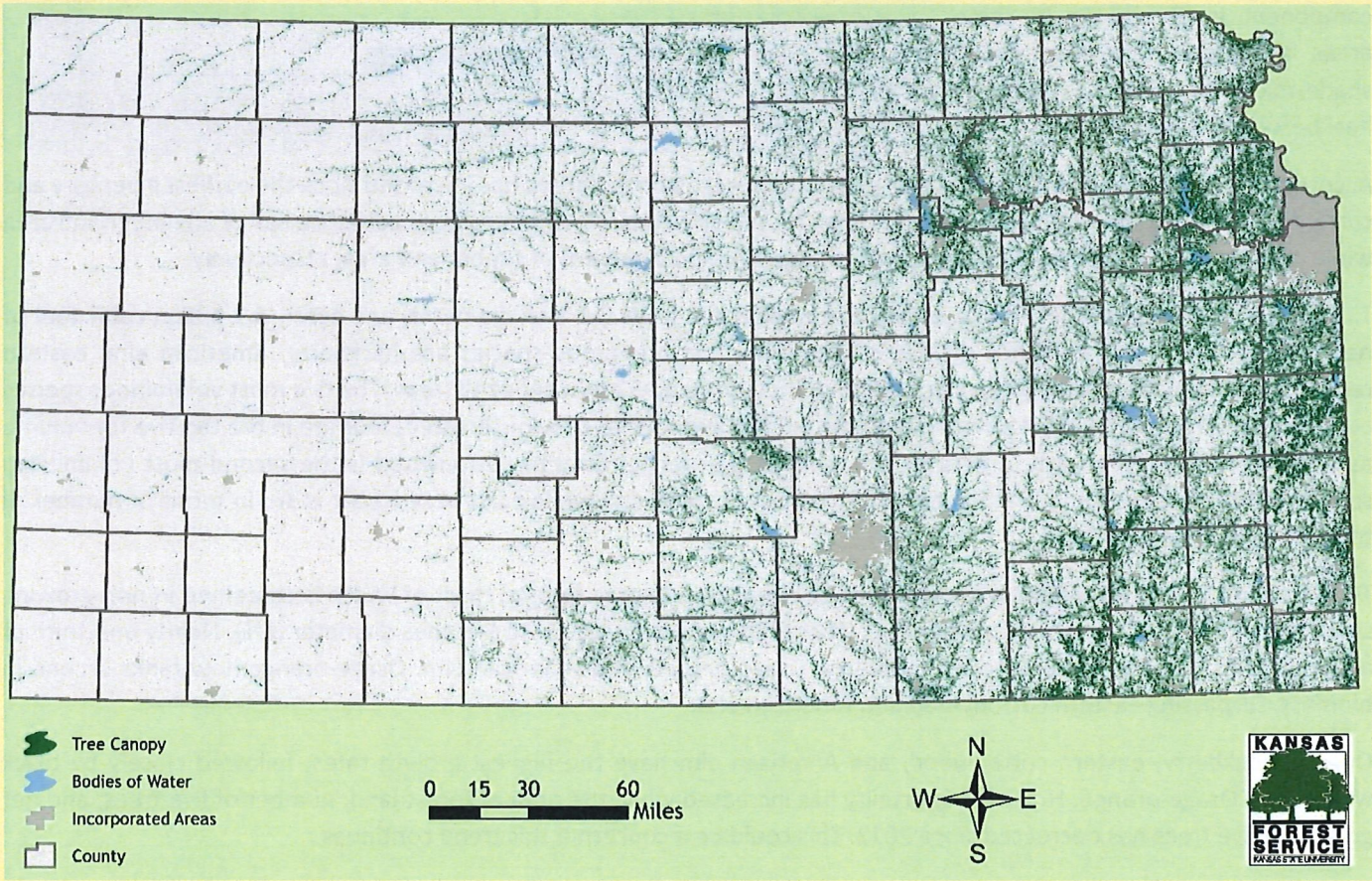
Kansas Forest Health Highlights 2018



Forestland along the Kansas River at Fairmont Park, Manhattan, Kansas.

Forest Resources of Kansas

In Kansas, the central hardwood forests transition into the Great Plains, with more than **4.6 million acres of trees**; 2.5 million acres of forest land and an additional 2.1 million acres of trees outside forest land. These forests, which are 93% privately owned, are productive; local forest products contribute approximately **$2.1 billion annually** to the Kansas economy. Much of the landscape is devoted to agriculture, but forests and trees are prominent components. The majority of these woodlands are linear in nature and follow water features along the terrain, although contiguous forestland can be found in far eastern Kansas.

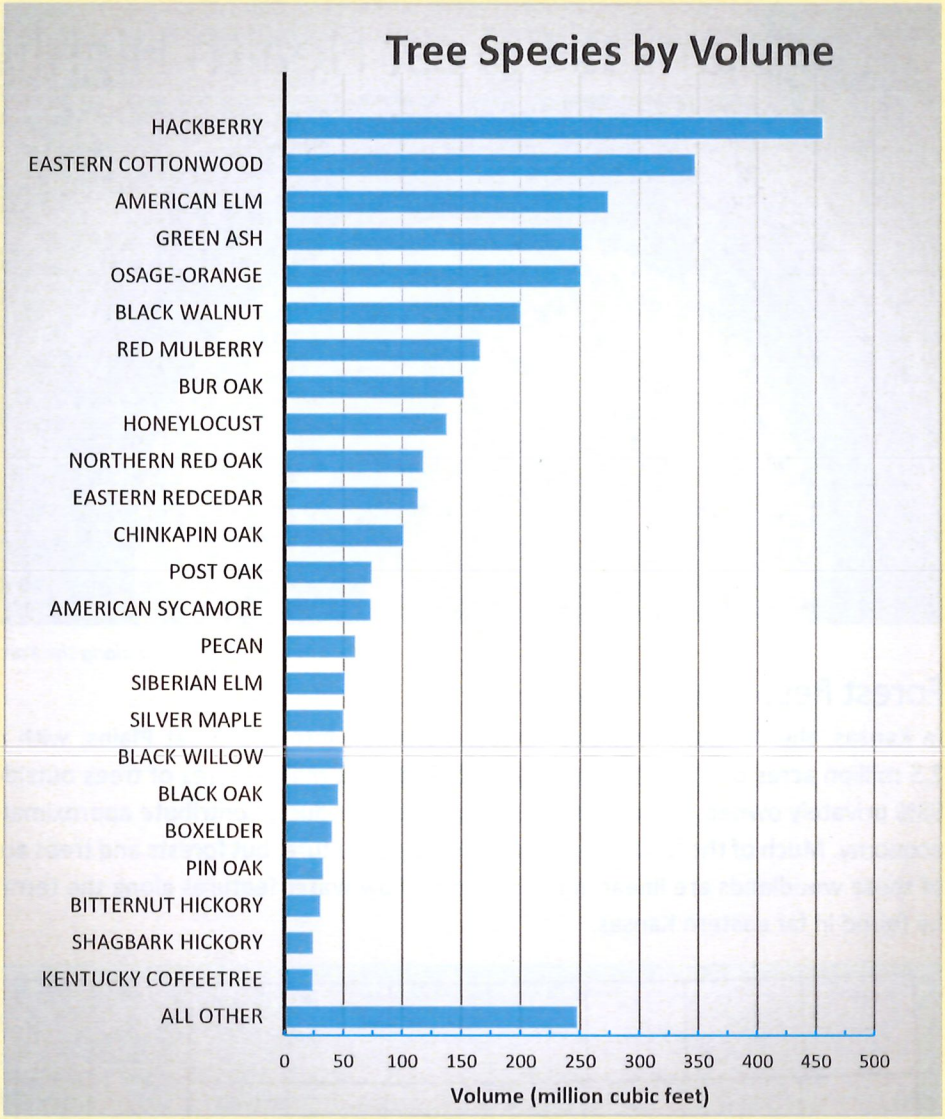


The top tree species, by statewide volume, are hackberry, eastern cottonwood, American elm, green ash, osage-orange, black walnut, red mulberry, bur oak, honeylocust, and northern red oak.

The two dominant forest types in Kansas are Elm/ash/cottonwood and Oak/Hickory.

Over the past 60 years or so, cottonwood regeneration levels have been low. Re-engineering of riparian environments due to the expansion of agriculture, construction of dams, and stream channelization have altered the landscape where cottonwood previously flourished. Unlike cottonwoods, eastern red-cedar trees have been very successful as early invaders on grasslands and abandoned range and farmlands.

Even though Kansas's forests are increasing in acreage, the oak component is decreasing in some areas as forest succession favors shade-tolerant species, such as hackberry and American elm.



According to Forest Inventory and Analysis (FIA) data, forest land in Kansas has increased since the earliest inventory and currently is showing signs of plateauing. In terms of stand-size class, sawtimber stands comprise half of all timberland area while poletimber and sapling/seedling stands occupy 29 and 19 percent of timberland area, respectively.

The forests of Kansas contain approximately **833 million live trees** (≥1-inch diameter) and nearly **3.3 billion cubic feet of net volume** (live trees ≥5-inches diameter). The five most numerous species are hackberry, American elm, eastern redcedar, Osage-orange, and green ash; together, they make up 52 percent of all trees. The five most voluminous species contain nearly half (48%) of total net volume, and of the five species previously listed, four are in the top five for volume as well: hackberry, green ash, American elm, and Osage-orange. Eastern cottonwood is the second-most voluminous species in the state but ranks 25th in terms of number of trees, and while eastern redcedar is 3rd in terms of number of trees, it ranks 11th in volume.

There are more than **89 million oven-dry tons of biomass** in Kansas forests; most of which is contained in non-growing stock trees (59%), followed by growing-stock trees (35%) and live trees 1- to 5-inches diameter (6%). Nearly one-third of all biomass is found in three species: hackberry, Osage-orange, and American elm. Osage-orange now ranks second in biomass, surpassing eastern cottonwood and American elm.

Overall, hackberry, eastern cottonwood, and American elm have the highest growth rates, followed closely by black walnut and Osage-orange. However, mortality has increased while the area of forest land, number of live trees, and net growth of live trees has decreased since 2012. This could be a concern if this trend continues.

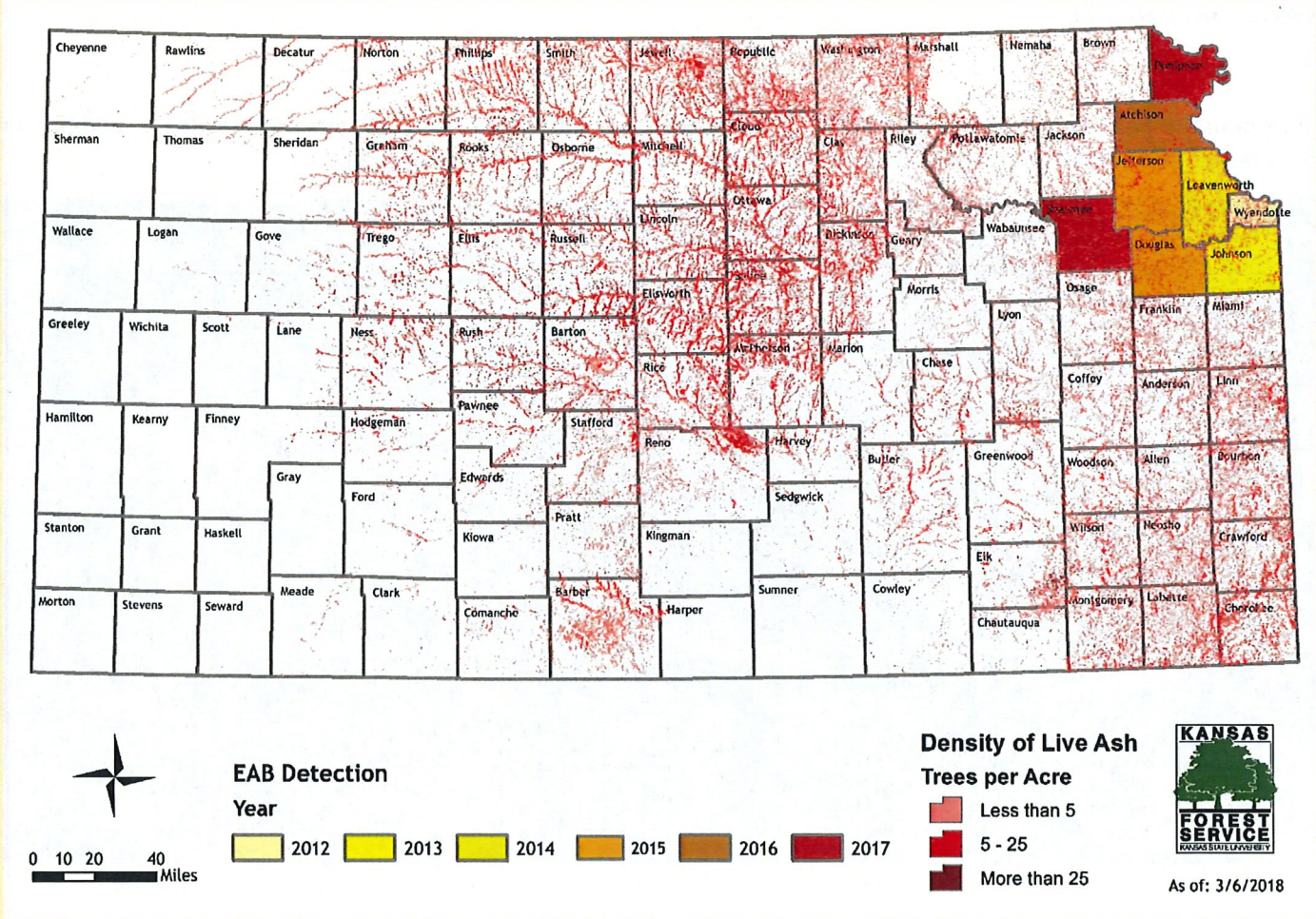
Emerald Ash Borer

Emerald ash borer (EAB), an exotic wood-boring beetle, was first detected in 2012 in Wyandotte County, Kansas. Since that time, EAB has also been found in Johnson, Leavenworth, Douglas, Jefferson, Atchison, Doniphan, and Shawnee counties.

EAB is a pest of all North American ash (*Fraxinus* spp.). Kansas' forest land contains **51.1 million ash trees**, or an average of about 20 trees per acre of forest land. Ash trees account for nearly **275 million ft^3** of volume, or **8 percent** of total net volume of live trees on forest land. Most of the ash resource (93%) is located on privately owned forest lands and is distributed primarily in the central and eastern parts of the state; the heaviest concentrations of ash are in the northeastern corner and along the eastern boundary.

Green and white ash in a parking lot in Manhattan, Kansas.

In 2018, **no new counties** were added to the existing Emerald Ash Borer Quarantine in Kansas, leaving the total number of counties with confirmed EAB presence to eight; all contiguous in the Kansas City area. In previously quarantined counties, ash tree mortality was observed to increase over previous years.



All trap trees placed in non-quarantined northeast Kansas counties (Brown, Riley, Osage, Miami) and southeast Kansas counties (Labette, Crawford, Cherokee) were negative for EAB presence. Emphasis on trapping in southeast Kansas was justified by the detection of EAB in northeast Oklahoma (Delaware County) in late 2016, less than 25 miles from the Kansas-Oklahoma border.

KFS and KDA staff peel EAB trap trees in Osage (left) and Miami (right) counties in October 2018. No EAB larvae were found at either site.

Releases of three biocontrol species (*Tetrastichus, Spathius, Oobius*) were done by the Kansas Department of Agriculture throughout the season at sites around Wyandotte County Lake. This is the third year for biocontrol releases in Kansas. Additional releases of biocontrol agents are planned for 2019, along with follow-up survey to assess if the biocontrol species are established.

In response to EAB, a message of forest health resilience through diversity has been promoted statewide, in addition to the presentation of EAB and invasive pest information at forestry field days and workshops.

Outreach materials and "bug box" samples of EAB and other invasive pests were displayed on site at forestry field days and workshops.

Pine Wilt

Pine wilt is caused by a plant parasitic nematode called the pine wood nematode, *Bursaphelenchus xylophilus*. The nematode is vectored by the pine-sawyer beetle, a long-horned borer in the genus *Monochamus*. They kill pine trees by feeding and reproducing in the resin canals of the branch and trunk.

This disease is continuing to spread westward, frequently damaging and causing high mortality in windbreaks and conservation plantings containing Austrian pine (*Pinus nigra*) and Scotch pine (*P. sylvestris*).

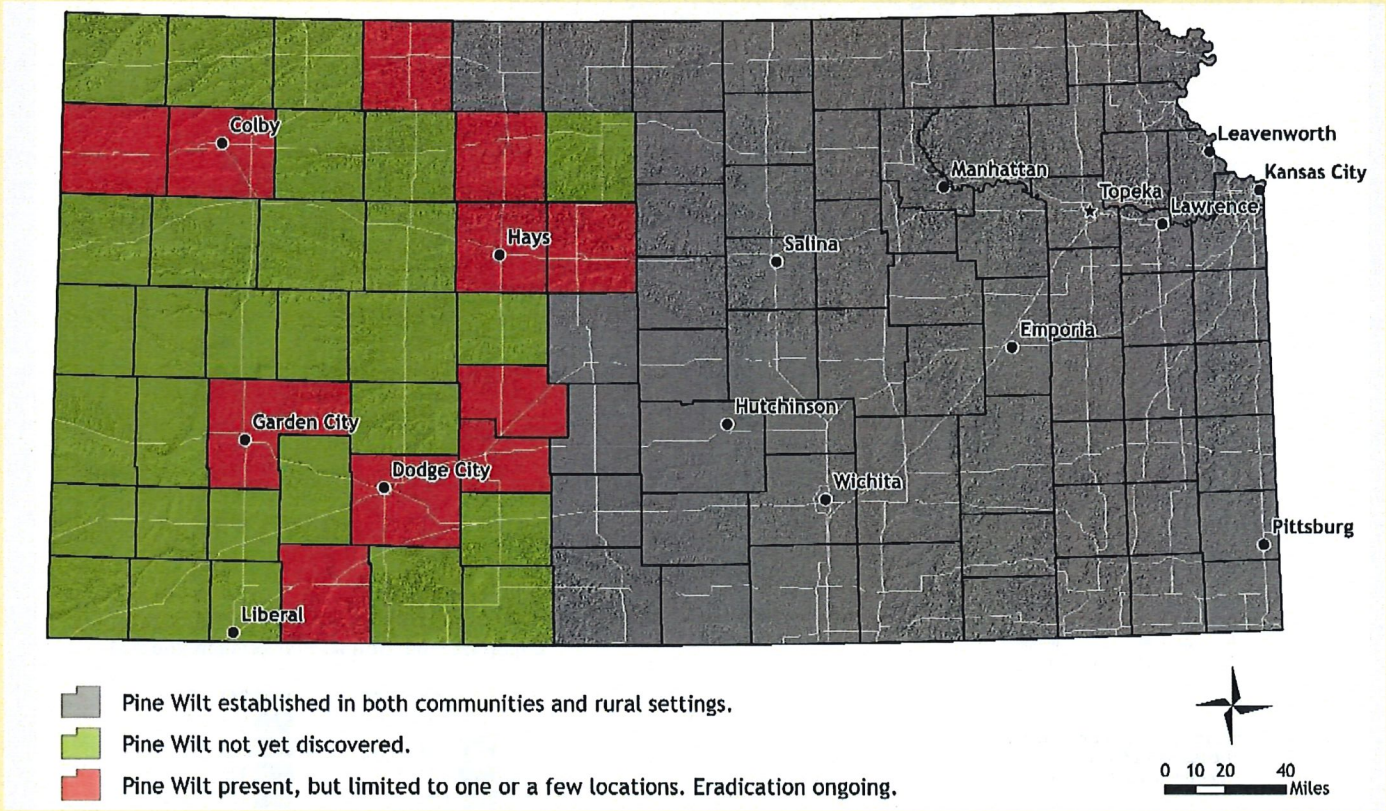
In 2015, several pine wilt positive trees were found in a Scotch pine windbreak, several miles north of Goodland (**Sherman County**). These trees were removed and destroyed. In October 2016, four pine wilt positive Scotch pine trees were found in Goodland. In March 2018, eight Scotch pine trees were removed after two positives. This site will continue to be monitored for additional dead trees.

Five pine wilt positive Scotch pine trees were found and destroyed in the town of Almena (**Norton County**) in March and April 2017. A delimiting survey was performed and no additional suspicious trees were found.

A Kansas Department of Agriculture (KDA) survey of the previously non-infested Finney, Greeley, Hamilton, Wichita, Rush, Scott, and Lane counties was negative for pine wilt.

An Austrian pine showing signs of decline due to pine wilt in late summer, in Manhattan, KS. Healthy ponderosa pine is nearby.

The city of Hays (**Ellis County**) has thousands of susceptible pines, and is surveyed annually as part of the pine wilt initiative project by KDA, Kansas Forest Service, and Ellis county extension. The disease has been eliminated at several sites throughout the community and outlying developments. Trees found positive for pine wilt disease have been removed and destroyed, and the site continues to be monitored and controlled with City of Hays and county extension help. The City of Hays offers rebates for removal of infested pines, incentivizing removal for private landowners.

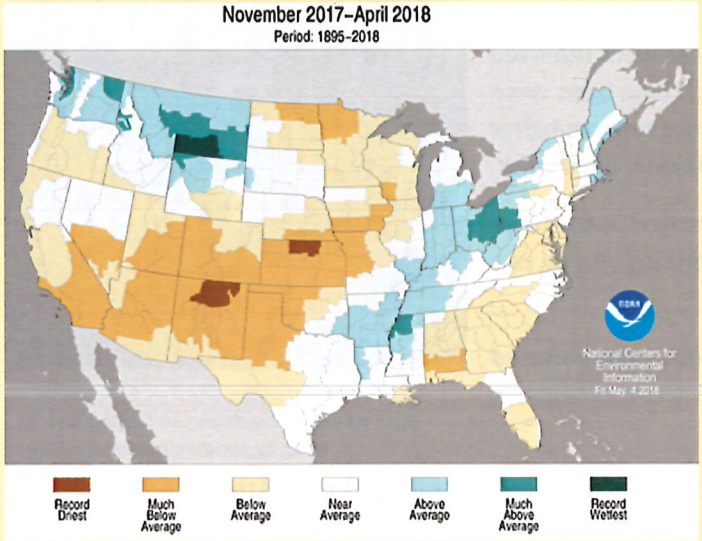


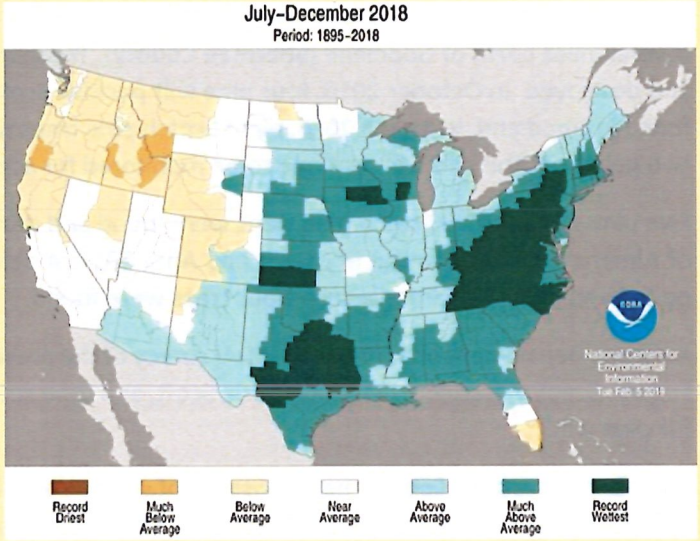
Abiotic Stress

After one of the wettest springs on record in 2017, the winter of 2017-2018 was one of the driest on record for Kansas, leaving little soil moisture for trees to draw on as the growing season approached. Statewide, it was the second-driest November-to-April period since records began in 1895, and the driest on record for the north-central region of the state.

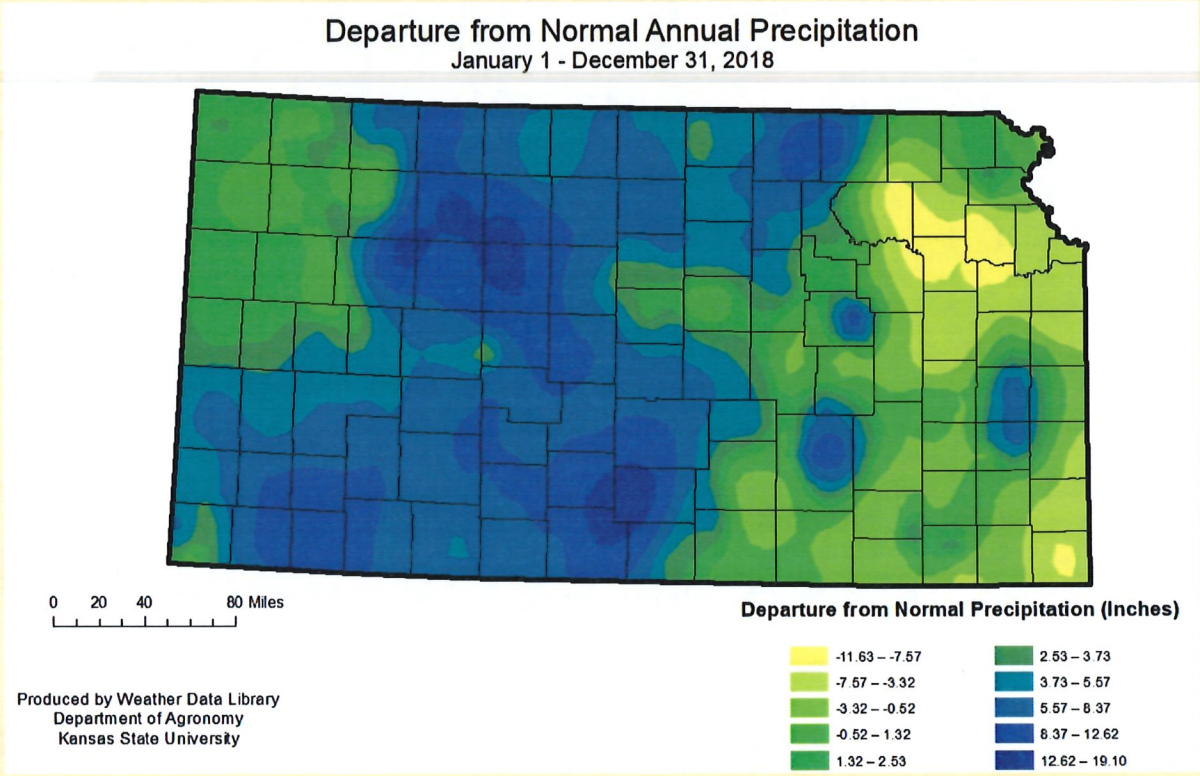
Especially in April, May and June, northwest Kansas continued to receive heavy rains while northeast Kansas was significantly below average for rainfall well into the growing season and heat of summer.

This trend reversed for the second half of the year, as July-to-December was the second-wettest on record statewide, including the wettest second half recorded for south-central and southwest Kansas.





While the acute stress from the short-term drought in eastern Kansas will certainly be reflected in the loss of vigor for those forest lands, the significant rainfall in the fall and winter of 2018 meant that Kansas ended 2018 with no level of drought anywhere in the state, according the United States Drought Monitor.



Invasive Bush Honeysuckle

Bush honeysuckle creating a dense monoculture in the understory of native forestland along a walking trail at Anneberg Park in Manhattan.

The non-native bush honeysuckles (*Lonicera maackii*, *L. tatarica*, and *L.* x *bella*) and their vine counterpart, Japanese honeysuckle (*L. japonica*) have invaded many woodlands, forests, and nature preserves causing declines in species diversity and richness of native ground cover and mid-story vegetation.

Honeysuckle infestation can be ascribed, in part, to their adaptability to a wide variety of habitats and spread as a result of being a prolific producer of seeds (bush honeysuckles primarily) that are easily dispersed by birds.

Asian bush honeysuckle possesses rapid aboveground and belowground growth, is adapted to low-light environments, begins growth earlier and can continue growing later in the growing season than most other woodland species.

Urban woodlands around **Wichita**, **Topeka**, and the **Kansas City** metro area continue to implement management efforts to combat these invasive shrubs and vine. Some land managers have been utilizing backpack mistblowers for control, which show promise in economical, effective control of this forestland invader.

The Kansas Forest Service provides backpack mistblowers on loan to landowners for no charge, in order to facilitate treatment of infestations in late fall, when off-target impact is minimized and control of bush honeysuckle has been shown to be highly effective.

Leaves and fruit of bush honeysuckle in late fall, still green well after leaf drop of native woodland trees and shrubs.

Herbicide Injury

While woody plants in Kansas have experienced varying levels of impact from herbicides for decades, a noticeable increase has taken place in recent years.

The application of herbicides that readily volatilize, such as ester formulation of 2,4-D, has long been known to cause leaf deformation in sensitive species such as oak, redbud, sycamore, and others.

Symptoms consistent with 2,4-D exposure have been documented on woody species across the state. While a one-time exposure to low levels of herbicide may cause deformation of new growth without having a significant impact on long-term tree health and vigor, repeated exposure and injury will contribute to decline, especially when complexed with the existing abiotic and biotic stressors that already impact trees in Kansas.

In 2017, the controversial topic of dicamba injury came to a national forefront, focusing mainly on injury to non-tolerant crops adjacent to dicamba-tolerant fields.

However, Kansas (like many other states in the region) also witnessed injury to many trees within forested land both adjacent to, and some distance from, agricultural land where dicamba may have been applied.

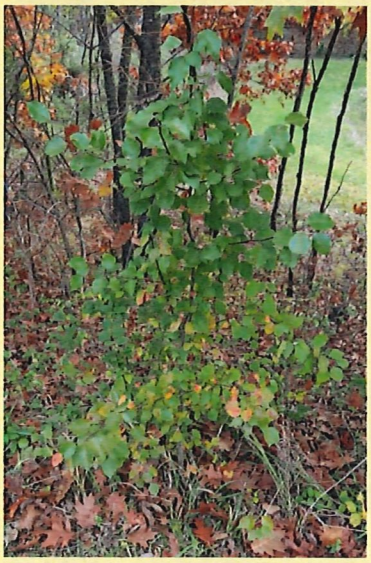
These symptoms manifested especially strongly on black walnut adjacent to agricultural fields where dicamba was applied as an early spring "burn down" herbicide to control glyphosate-resistant weeds before planting soybeans or corn. Even if the applicator has taken steps to limit risk for wind-aided drift, dicamba could move off-target due to volatilization or movement through the soil water.

A clear causal relationship between herbicide application and tree injury has not yet been established, but based on the widespread symptoms observed in 2017 and 2018, further study will be undertaken in 2019 to document and investigate the source of these symptoms. A focus will be on testing of symptomatic trees to determine herbicide residues, if any.

Deformation and cupping of new growth and chlorosis, symptoms consistent with herbicide injury on redbud (top photo), sycamore (middle photo), and northern red oak

Invasive Callery Pear

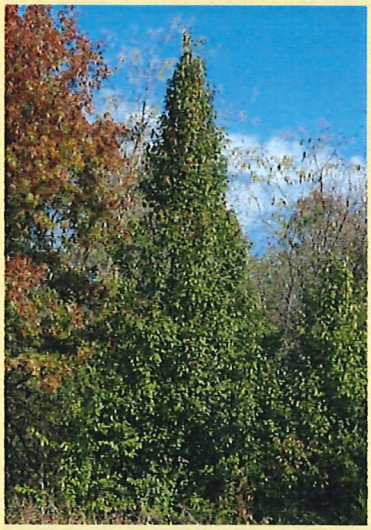
Invasive callery pear seedlings proliferate in grasslands in rural Geary County. Untreated seedlings on the left, treated seedlings on the right.



A seedling of callery pear in forestland in rural Montgomery County.

Callery pear (*Pyrus calleryana*) was introduced to the United States from China in 1917 as an ornamental tree. Starting in the 1950s with the introduction of the popular cultivar 'Bradford', these small trees have been widely planted in landscapes across the country. Efforts to address poor branching structure and subsequent storm damage led to the introduction of improved cultivars, but these new trees with better branch angles were also genetically distinct from the clonally propagated and identical 'Bradford' that existed in the landscape. With these new cultivars came cross-pollination of previously sterile 'Bradford' flowers, and birds widely distributed the now-viable seeds where they became established in undermanaged margins and interfaces between forestland, urban areas, grasslands and "waste" areas.

Callery pear's prolific ability to resprout, tolerance of a wide range of environmental conditions, and dense shade cast by its canopy, has led to a rapid infestation and conversion of previously diverse ecosystems into a virtually impenetrable monoculture of callery pear seedlings and trees in a short time. In many cases, this invasion and conversion happens without land managers being aware of the process, and it is only noticed when it's too late and management has become a challenge.



A large callery pear exhibits strong pyramidal form, in a waste area in rural Crawford County.

Evidence shows that callery pear seedlings are becoming established in important ecosystems such as the tallgrass prairies and gallery forests of the Flint Hills and the remnant post oak savannah forestland of the Cross Timbers. Unlike states to the east of Kansas, from Missouri to Indiana, where infestations are widespread and well-established, Kansas is early in the callery pear infestation stage. There are a few well-established populations of callery pear near urban areas of Wichita and Kansas City, but many smaller infestations are still becoming established in other areas such as Hutchinson, Manhattan, Topeka, and towns in southeast Kansas.

A callery pear seedling produces a proliferation of fruit, with seeds that are likely viable, at an infestation in Riley County.

Forest Health Threats

Thousand Cankers Disease

A 20-year-old black walnut plantation in northeast Kansas, which is threatened by the potential for TCD to enter Kansas.

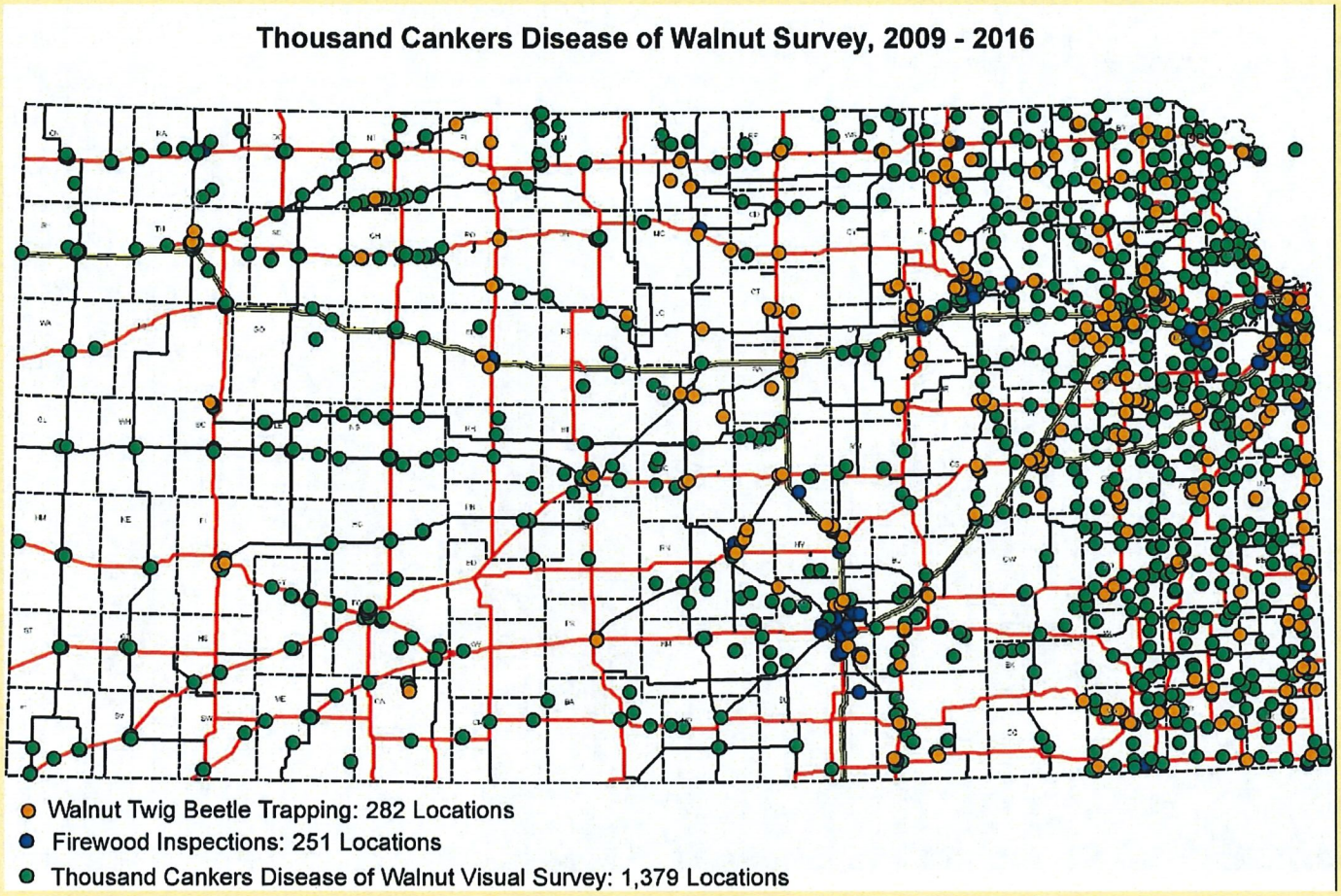
This disease complex has **not yet been detected** in Kansas. However, Kansas shares a 200-mile border with Colorado, an infested state, increasing the risk of TCD introduction. With TCD existing as close as Colorado, Kansas is a potential "doorway" to the entry of thousand cankers disease into the native range of black walnut, which would have disastrous consequences both economically and environmentally.

Doniphan, Bourbon, Franklin, Osage, Linn, Leavenworth and Pottawatomie counties contain the largest number of black walnut trees in Kansas.

A recent estimate of economic loss associated with the introduction of thousand cankers disease to Kansas suggests at least **$160 million** over the next 20 years.

TCD trainings occurred throughout the year to arborists, municipalities, and landowners, greatly increasing the detection network and providing further outreach efforts. Walnut Twig Beetle pocket ID cards were distributed to interested parties, including arborists and extension agents.

Small exit holes and galleries from the walnut twig beetle are visible on this TCD-infested tree in Colorado. Pocket knife is for scale.



Street-side and on-the-ground visual surveys of black walnut have been conducted across the state. High risk areas of central and eastern Kansas were visually surveyed, where walnut is common and pathways are of concern. Lindgren traps, with lure, were set and monitored by Kansas Department of Agriculture (KDA) personnel at key locations statewide. **No walnut twig beetle (WTB) specimens have been found to date.**

The 2018 WTB survey began on May 30 and concluded on August 3. Forty-four Lindgren funnel traps were deployed in 14 southeast Kansas counties, with one trap at each site, in Franklin, Miami, Coffey, Anderson, Linn, Woodson, Allan, Bourbon, Wilson, Neosho, Crawford, Cherokee, Labette, and Montgomery counties.

This was the first year we tried dry cup trapping. Overall it was positive with easier collection and sorting, but some predation was observed. All samples were completed and no suspect specimens were detected.

A dedicated sentinel site trap program was maintained in western Kansas of known walnut locations. This was prompted by the discovery of walnut twig beetle in Eads, Colorado, about 40 miles directly west of the Colorado-Kansas border. The Eads infestation remains the nearest known TCD positive, although a new infestation in along Interstate 76 in Brush, Colorado was found in 2017, 85 miles from northwestern Kansas.

The Interstate 70 corridor from Denver to Kansas City remains the most likely pathway for TCD, linking the TCD-positive Denver metro area with the major black walnut production area of eastern Kansas and Missouri.

A Lindgren funnel trap, used to monitor for WTB.

The onset of autumn on native forestland at Pomona Lake in Osage County, Kansas.

For Forest Health assistance and further information on Forest Health in Kansas, please refer to the following.

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