



Entomological News

COVID-19 UPDATE SPECIAL EDITION

Summary

- Due to the situation concerning COVID-19, KDA-PPWC is currently suspending all planned survey work until further notice.
- Due to present delays, EDRR, emerald ash borer and *Geosmithia morbida* surveys will not take place until 2021.
- KDA-PPWC is optimistic we may be able to resume some surveys, including our spotted wing Drosophila-, small grains-, walnut twig beetle-, spotted knapweed biocontrol agents-, and Canada thistle biocontrol agent surveys.

Original Plan for 2020

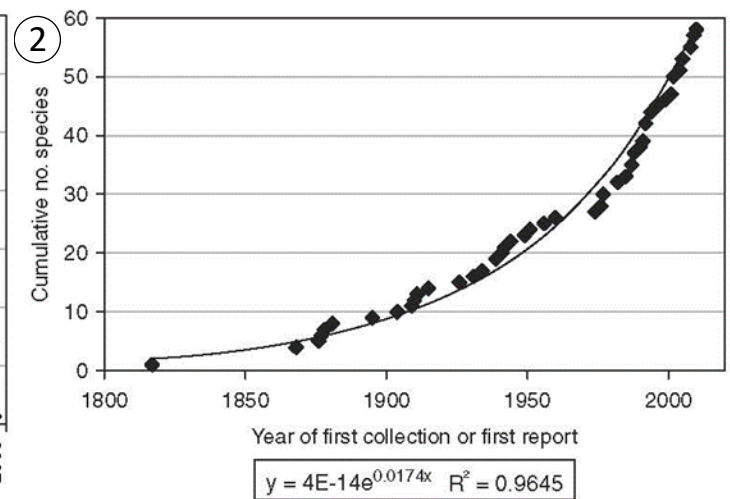
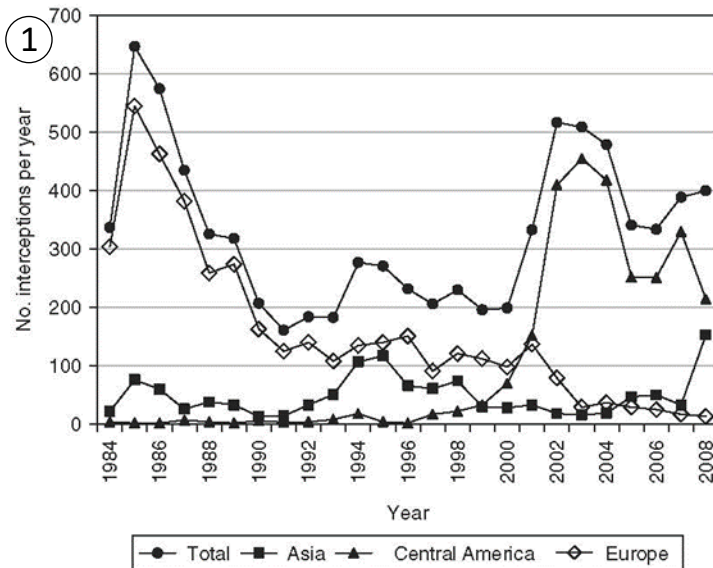
We had a big year of entomological surveys planned here at KDA-PPWC, but due to the situation surrounding COVID-19, we are reluctantly suspending all survey work until further notice. While some surveys may resume, pending changes in state and departmental policy, several surveys have already suffered too much delay and are unfortunately postponed until 2021.

EDRR (Early Detection Rapid Response)

Due to heightened international commerce, the potential for introducing new exotic species has never been more acute. Furthermore, the potential for a newly introduced exotic establishing as a novel pest in North America is of equal concern Figs. (1–2). The National Invasive Species Council highlights that while the exclusion and prevention of introducing nonnative species is the most effective, following these efforts up with early detection and a rapid response is a critical second line of defense, generating

the best chance for eradication.

Bark and ambrosia beetles are a diverse specialized group of weevils (Curculionidae: Scolytinae). As the name implies, bark and ambrosia beetles are wood boring beetles that can potentially impact the health of host trees. While bark beetles primarily bore galleries underneath the bark of trees, ambrosia beetles bore into the xylem (vascular tissue responsible for water transport), or heartwood of trees. The term ambrosia beetle is applied to an array of scolytines that have independently evolved a symbiotic relationship with fungi on which they feed. While bark beetles feed directly on wood, ambrosia beetles inoculate chambers within trees with various fungi which they tend, grow and feed upon. Because ambrosia beetles feed on the fungi they bring with them, they do not generate elaborate galleries as do bark beetles. However, due to the unusual symbiotic relationships that ambrosia beetles have struck with fungi, they often demonstrate odd reproductive strategies that make them more prone to establishing in



Figures 1–2. (1) Total number of annual wool-associated scolytines intercepted at US ports and continents of origin. (2) Cumulative number of new exotic scolytines detected in continental USA. Source: Rabaglia *et al.* 2019.

gies that make them more prone to establishing in novel areas.

~1,700 species of Scolytinae are known from North America, of which >60 species are exotic. Between 1984–2008, >8,000 scolytines have been intercepted at port of entry in the United States. Due to the concern of introducing additional exotic scolytines, in 2001, USDA Forest Service, APHIS, National Plant Board, and National Association of State Foresters began a pilot project for the early detection and rapid response (i.e. EDRR) of scolytines in America. This has since developed into a program and the Forest Service has continued a national annual survey since 2007.

It has been 10 years since EDRR has been conducted in Kansas (Fig. 3), and this year (2020) we were awarded Forest Service funding to conduct an EDRR survey here in Kansas. Unfortunately, traps must be deployed in mid-April and we have missed this crucial window due to the COVID-19 quarantine. Fortunately, this funding will be made available to us so that we may pick up this survey next year in 2021.

References

- Rabaglia, R.J., A.I. Cognato, E.R. Hoebeke, C.W. Johnson, J.R. Labonte, M.E. Carter, J.J. Vlach. 2019. Early Detection Rapid Response: A 10-year sum-

mary of the USDA Forest Service program of surveillance for non-native bark and ambrosia beetles. *American Entomologist*, 65(1): 29–42.

- Haack, R.A. & R.J. Rabaglia. 2013. 3. Exotic bark and ambrosia beetle sin the USA: potential and current invaders. Pp. 48–74. In: *Potential Invasive Pests of Agricultural Crops*, J. Peña (ed.). <https://doi.org/10.1079/9781845938291.0000>.

Table 1. EDRR participation. Source: Rabaglia *et al.* 2019.

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
CA	AK	AR	CA	CA	CA	CA	AK	CA	CA
CO	AL	AZ	FL	CO	CO	FL	CA	FL	DC
FL	CA	DE	GA	FL	CT	GA	FL	GA	FL
GA	FL	HI	IL	GA	FL	NC	GA	IN	GA
KY	ID	IL	LA	MD	GA	NY	GU	MD	MI
LA	IN	KS	MA	MI	KY	PA	IL	MS	MT
MD	MA	ME	NJ	MS	LA	PR	IN	NY	NY
MI	MI	MT	NY	NC	NY	TX	MO	OR	PA
MN	MO	NI	OH	NY	OH	VA	NY	PA	TX
NH	MS	NV	PA	OK	PA	PA	PA	TX	
NY	NC	PA	SC	OR	SE		PR		
OH	NE	RI	TX	PA	TX		TX		
OR	NI	SD	WA	TX	UT				
SC	NM	TN		UT	WA				
TX	NY	VT							
UT	VA	WI							
WA		WV							
WY		WY							
Total number of states and territories in each year									
18	16	18	13	14	14	9	12	10	9

Emerald ash borer (*Agilus planipennis*)

For 2020, similar to previous years, we had planned to continue surveying for emerald ash borer (EAB) along the western front of its invasion here in Kansas. 7 western front counties (Brown, Franklin, Linn, Nemaha, Osage, Pottawatomie, Wabaunsee), Wichita in Sedgwick Co., and several localities at the

southeastern corner of the state were planned (Fig. 4). This year, only girdled trap trees were planned as part of the survey, eliminating the purple prism traps due to poor efficacy. While we were able to set up a trap tree in Pottawatomie Co. prior to the current quarantine, due to the seasonal sensitivity of trap tree deployment, all further EAB survey work will be suspended until 2021.

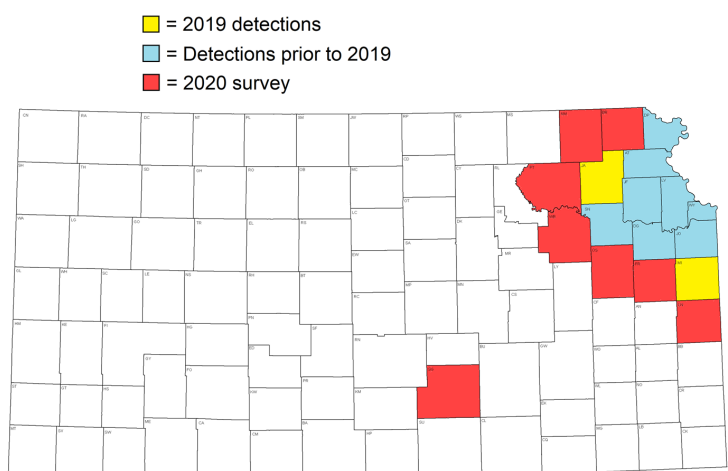


Figure 4. 2020 EAB survey plan.

Geosmithia morbida (thousand canker disease causing fungus)

Geosmithia morbida is the fungal pathogen that causes thousand canker disease (TCD) of walnut. As a high value timber commodity, KDA has been actively monitoring for the disease and the fungus vectoring bark beetle (walnut twig beetle [WTB]: *Pityophthorus juglandis*) for several years. However, research on this disease is increasingly demonstrating that: (1) *G. morbida* is common in the environment; (2) *G. morbida* + WTB causes TCD; but (3) *G. morbida* + non-WTB wood-boring beetles do not cause TCD. KDA's current quarantine (since 2014) on TCD encompasses both the fungus and the beetle as an effort to control the introduction and spread of TCD in Kansas. As an effort to have our quarantine on TCD to accurately reflect the science on the disease, KDA-PPWC is planning to conduct a survey of *G. morbida* in KS to demonstrate that *G. morbida* is present in the environment with sufficient ubiquity but is not causing TCD. Several eastern states including Missouri have conducted surveys of *G. morbida* on non-WTB wood-boring beetles and have found the fungus to be sur-

prisingly abundant in the absence of TCD of walnut. KDA-PPWC is essentially making efforts to conduct our own survey for *G. morbida* as other states have here in KS.

The plan was to implement girdled trap trees, similar to our emerald ash borer survey, in order to rear out non-WTB wood-boring beetles from walnuts in Kansas and screen these beetles for *G. morbida* using a PCR-based molecular assay. Similar to the EDRR and emerald ash borer surveys, we were aiming to set up trap trees in between mid-April and early May. However, due to the COVID-19 quarantine, we have been unable to meet this required window of opportunity. Although this survey will not take place this year, we are planning to pick it back up in 2021.

References

- Moore, M., J. Juzwick, F. Miller, L. Roberts, M.D. Ginzal. 2019. Detection of *Geosmithia morbida* on numerous insect species in four eastern states. *Plant Health Progress*, 20: 133–139.
- Green Horizons, Fall 2018, 22(3). University of Missouri Extension. <http://agebb.missouri.edu/agforest/archives/v22n3/gh2.php>

Spotted wing Drosophila (*Drosophila suzukii*)

Spotted wing Drosophila was (SWD) first introduced into the United States in 2008 and has rapidly spread to many states, including a first detection in Kansas in 2013. A pest of berries and grapes, adults lay eggs into fruit where the larvae feed and develop, rendering affected fruits unmarketable in the process. While berries and grapes are major commodities in KS, relatively speaking, the damage SWD can cause to those involved in their production can be significant. Management of SWD is heavily influenced by timing of management practices. In conjunction with Kansas State University, we are looking to survey for SWD and their seasonal activity with the cooperation of growers in Kansas. Understanding the phenology of SWD in Kansas will help inform growers how to time pesticide applications and manage fruits by utilizing cold storages, for example. Although we have missed

the beginning of SWD activity in Kansas due to the COVID-19 quarantine, we are hopefully that we may minimally begin a pilot survey to better inform us for 2021.

Further Reading

K-State Research and Extension (<https://bookstore.ksre.ksu.edu/pubs/MF3158.pdf>).

Small grains survey

Similar to 2019, KDA-PPWC was awarded CAPS funding to survey for high profile exotic pests of small grains in Kansas that have yet to establish. It is presently unclear whether we will be able to conduct this survey this year due to the COVID-19 quarantine, but we are hopeful that we may resume when the quarantine is lifted.

Walnut twig beetle (*Pityophthorus juglandis*)

Similar to 2019, KDA-PPWC was awarded Plant Protection Act funding to survey for walnut twig beetle the vector for *Geosmithia morbida*, the pathogenic fungus responsible for thousand canker disease of walnut. It is presently unclear whether we will be able to conduct this survey this year due to the COVID-19 quarantine, but we are hopeful that we may re-

Our mission:

- Exclude or control harmful insects, plant diseases and weeds.
- Ensure Kansas plants and plant products entering commerce are free from quarantined pests.
- Provide customers with inspection and certification services.

sume when the quarantine is lifted.

Spotted knapweed biocontrol (*Centaurea stoebe micranthos*)

This year, we had made tentative plans to: (1) continue releasing biocontrol agents targeting the invasive spotted knapweed; (2) survey for the establishment of *Cyphoeconus achates* (which has yet to establish in Kansas; (3) potentially set up another site for the establishment of biocontrol agents. Due to the unforeseen setbacks due to the COVID-19 quarantine, we are uncertain whether we will be able to continue as planned. We are hopeful that we will be able to do releases as planned but are optimistic that surveys will continue as planned as they take place later in the summer.

Canada thistle biocontrol (*Cirsium arvense*)

Previously, KDA-PPWC had conducted releases of biocontrol agents targeting Canada thistle. However, it is presently unclear whether the releases have led to establishment. This year we are planning to revisit release sites to survey for the establishment of Canada thistle biocontrol agents and potentially supplement with additional releases in the future. Despite the COVID-19 quarantine, due to a late-season survey, we are optimistic that we will be able to continue as planned after the quarantine has lifted.

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