Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants and Extension Personnel

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Itty Bitty Holes ---- Shothole Borers

A tree dies. Or branches dieback. In either situation, a person is drawn to take a closer look, and soon discovers the presence of numerous **tiny holes** (Figures 1 and 2).

Figure 1

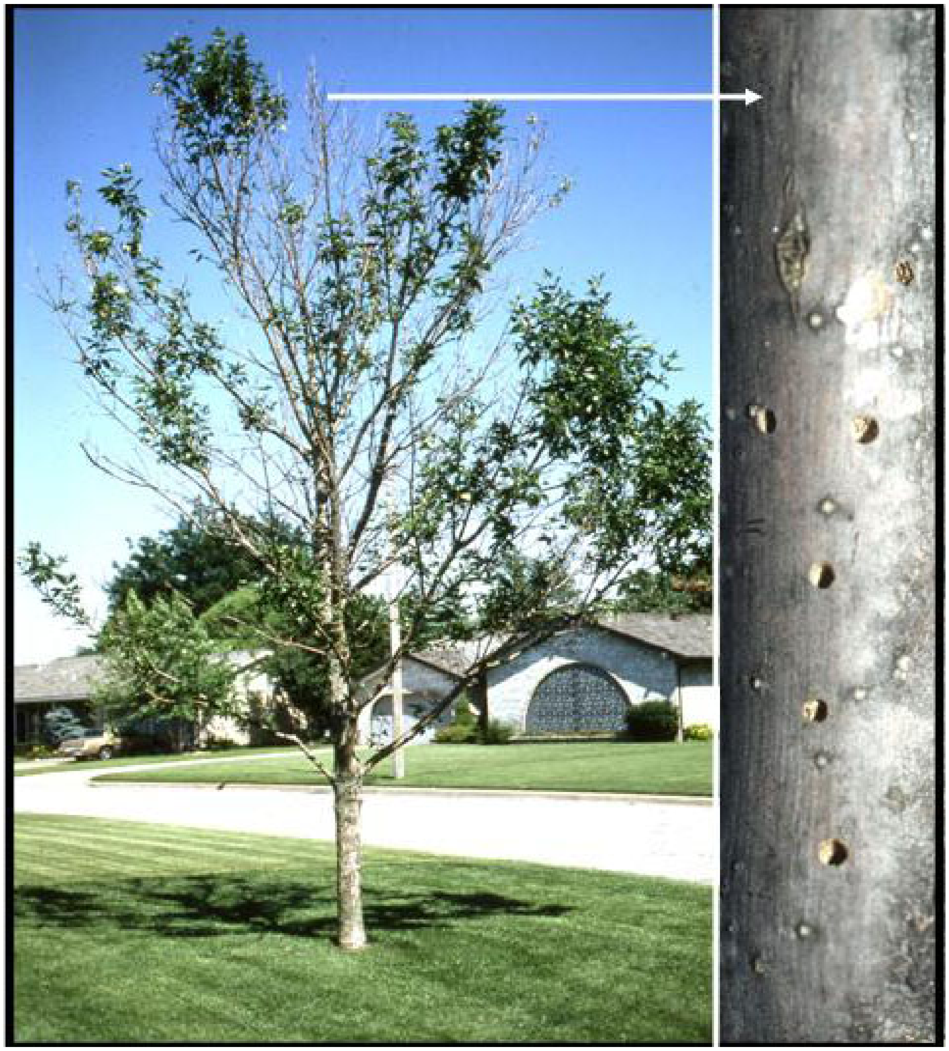

Figure 2

These are the holes through which tiny scolytid beetles emerged. How tiny is tiny? Refer to Figure 3. Although the beetle image on the screen appears large, contrast the actual size against the 1 centimeter scale …. the beetle is but 2 millimeters in length. Still look big in your mind? Look at 2 mm on a metric rule to get an actual visual check for how tiny these beetles are (some species are less than 1 mm in length).

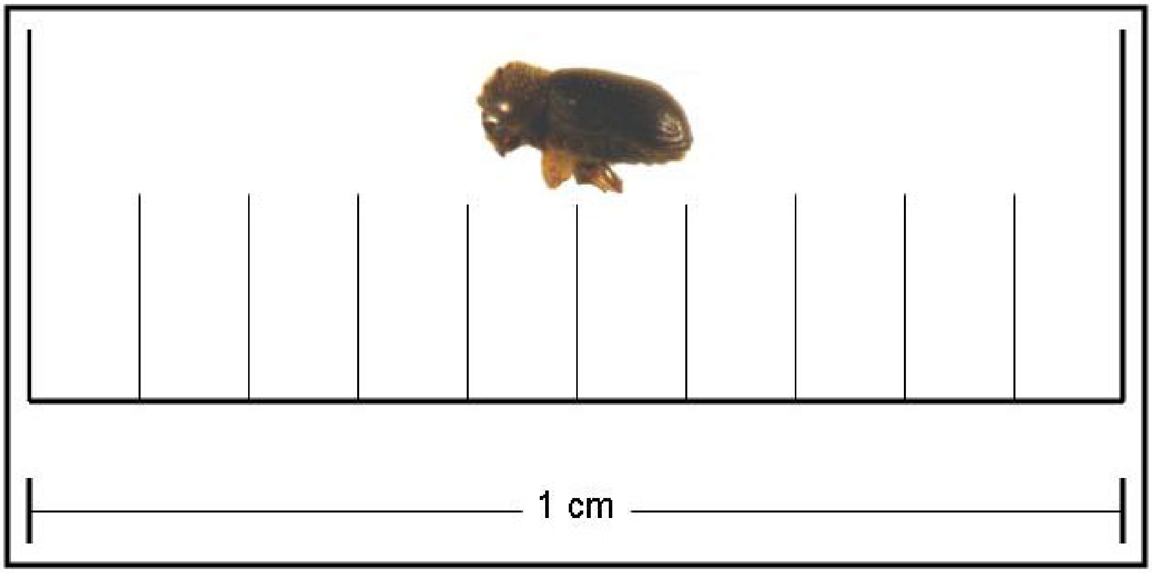

Figure 3

Beetles in the family Scolytidae are commonly referred to as bark beetles. But if you hear the term engraver beetles, shothole borers, timber beetles, *Ips* beetles or turpentine beetles, all refer to scolytid beetles. One reference source estimates that there are more than 6,000 species world wide with about 477 species occurring in the United States. What all more-or-less have "in common" are their small size, narrow host range (in many instances but a single host) and the exploitation of stressed or dead trees.

When people observe the "shotholes" in dead trees/branches/twigs, they assume that the scolytids were responsible for the demise. In fact, as already stated, scolytid beetles seek out already weakened hosts probably destined for the "scrap heap". In the natural scheme of things, some people view scolytids as beneficial insects, hastening the inevitable demise and aiding in the recycling of dead wood.

What cannot be dismissed is that some scolytids are responsible for transmitting pathogenic organisms. Perhaps the most familiar "tree disease" associated with scolytids is Dutch elm disease (Refer back to Figure 1). Two scolytid species, the European elm bark beetle and the native elm bark beetle, are the vectors of the fungus *Ceratocystis ulmi* which (when introduced into susceptible elm species by the feeding activities of the aforementioned beetle species) rapidly proliferates and spreads throughout via the vascular systems of infected trees. With their vascular elements essentially clogged, trees decline and die. During this process and time frame, of course, more and more beetles are attracted to the struggling and weakened trees. This is sort of the "second bullet" in a tree's death: the extensive larval boring/feeding/destruction of the cambium, phloem elements and newly formed xylem tissues essentially girdles larger branches and the tree trunk. In fact, bark easily sloughs off (Figure 4), thus exposing the definitive frass-filled larval galleries (Figure 5) which have essentially converged/co-mingled thus obliterating the distinctive galley pattern associated with these beetle species.

Figure 4

Figure 5

Another point-of-fact regarding scolytid beetles is that different species have preferred points-of-attack. For instance, eastern ash bark beetles prefer smaller branches (refer back to Figure 2).

Due to the smaller diameter of branches, larval feeding and movement do not result in definitive gallery patterns. But the effect is the same: commingling of feeding galleries results in girdling and ultimately branch dieback. Figure 6 “exposes” the damage. “A” is the intact branch. The holes merely indicate where the beetles emerged. But by stripping back the bark “B”, the frass-filled galleries can be seen. Especially after the frass has been removed, the full extent of the damage becomes readily apparent “C”.

Figure 6

After observing shotholes in dead or dying trees (or portions thereof), people ask what they can do to prevent this from occurring in-the-future. Again, it must reiterated that scolytid beetles (and most other borer species) are regarded as secondary invaders --- only able to successfully establish themselves in declining trees whose natural defenses are weakened and therefore unable to thwart the establishment of borer larvae. The natural inclination, though, is for a person to persistently ask, “Can’t I use insecticides to control scolytid beetles”? , to which the response is, “You can attempt to do so but it may prove futile”.

Keys for identifying scolytid beetles down to genus and species are available. Yet for all but the most economically important species which warranted intensive studies, the biology and seasonal life histories for most scolytid species have not been determined.

However, cutting with a broad sword, in Kansas, most scolytids probably produce 2 generations per season. Therein lies the problem when attempting to apply spray treatments against scolytids: when exactly are the species-of-interest flying? And, it may be that there are no precise flight peaks as exemplified in monitoring activities conducted by KSB Survey Entomologists: it appeared that beetle activity is not restricted to 2 flight periods (each representing one of the two seasonal generations) but rather an overlap of adult emergences which results in the continual seasonal presence of adults.

One might counter that systemic insecticide treatments might negate the "precise timing" factor. While systemic insecticides (notably imidacloprid) have provided fairly effective and consistent control of some species of flatheaded borers, imidacloprid products applied as basal injections, grid injections or drench treatments have performed poorly for controlling scolytids (namely *Ips* beetles).

Perhaps the best control against scolytid (actually any borer species) attack is attempting to maintain tree health and vigor. This begins with the proper selection of tree species for the site in which it is to be transplanted, proper transplant and bracing techniques, trunk wraps to prevent sun scald especially on thin-barked species, avoidance of damage to the tree (i.e. mower and/or string trimmer bumping/bruising) and providing adequate moisture especially during the first several years of its establishment. And if practical, soaker hoses can be used to provide moisture during periods of extreme heat and drought.

Bob Bauernfeind

Mailing Specimens to the Insect Diagnostic Lab

The Insect Diagnostic Lab should be providing cardboard mailing tubes and sample vials to all Counties in Kansas. If your County office does not have any mailing tubes or glass vials please let me know (gotbugs@ksu.edu) and I will get some sent to you! I have been receiving many samples in padded envelopes and, in most cases, these insects are damaged or destroyed. Also, all soft-bodied organisms such as caterpillars, spiders, aphids, etc., need to be placed in a sealed vial of vinegar to keep them preserved in transit. To see complete directions on submitting a sample to the Insect Diagnostic Lab, please follow this link. I appreciate you help!

http://www.ksre.ksu.edu/library/entml2/EP162.pdf

Report from the Kansas State University Insect Diagnostic Laboratory:

The following samples were submitted to the Insect Diagnostician Laboratory from September 18th to September 24th.

September 18 2009 Allen County – Lace bugs on Oak leaves
September 18 2009 Riley County – Muscidae maggots
September 18 2009 Jewell County – Muscidae maggots in home
September 18 2009 Nemaha County – Spinewaisted ants (winged) around home

September 18 2009 Decatur County – Whirligig and diving beetles in stock tank
September 18 2009 Nemaha County – Midge larvae, carpet beetle larvae found in homes
September 18 2009 Leavenworth County – Mimosa webworms in locust tree
September 18 2009 Saline County – Small hive beetle in bee hive
September 23 2009 Riley County – Caterpillar pupae on outside of home
September 24 2009 Labette County – Sawtoothed grain beetle in home
September 24 2009 Graham County – Dragonfly naiad exuviae in stock tank
September 24 2009 Brown County – Mildew feeding lady beetle on ash tree

If there are any questions regarding these samples or about the identification of any arthropod please contact the Insect Diagnostician at (785) 532-4739 or GotBugs@ksu.edu.

Holly Davis

Sincerely,

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