

Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants and Extension Personnel



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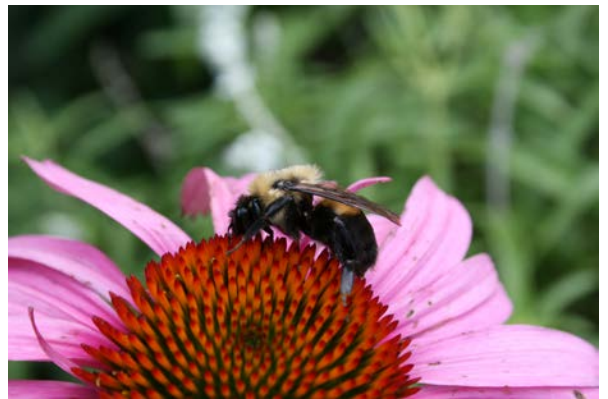
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Insect Diagnostic Laboratory Report

Honey Bees and Bumble Bees: What Is The Difference?

Honey bees and bumble bees are important pollinators of many horticultural crops including vegetables, and ornamental plants in gardens and landscapes. As the weather warms, both pollinators will become more active visiting the flowers of plants in bloom. However, how different are honey bees and bumble bees? There are a number of behavioral differences associated with honey bees and bumble bees that are presented below:



1. Bumble bees are more active at lower temperatures (40°F) whereas honey bees are primarily active when temperatures are around 60°F or higher.
2. Bumble bees are active on cloudy and rainy days. Honey bees are less active at low light intensities.
3. Bumble bees “buzz pollinate” flowers so only a single bumble bee is required for pollination whereas up to 7 honey bees may be needed to pollinate a flower.
4. Bumble bees forage for pollen instead of nectar. They are also more efficient pollinators than honey bees because they visit more flowers in a designated time period (e.g., minute).

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5. Bumble bees are present longer during the day (early morning and late evening) than honey bees, which means they may be more susceptible to exposure from pesticide applications.

It is important to protect honey bees and bumble bees from exposure to pesticides including insecticides and fungicides. So, when using pesticides be sure to adhere to the following:

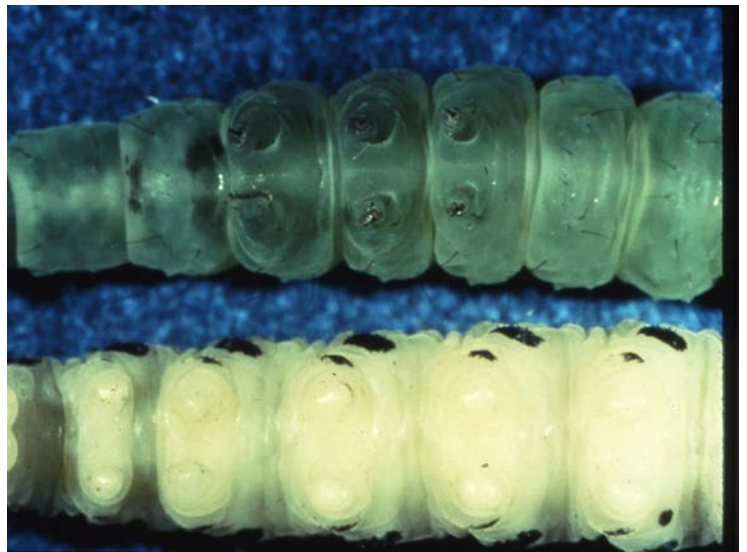
1. Use pesticides according to the label (ALWAYS READ THE LABEL DIRECTIONS CAREFULLY).
2. Apply pesticides when both honey bees and bumble bees are less active (early morning and later evening).
3. Apply more selective pesticides such as *Bacillus thuringiensis* subsp. *kurstaki* (sold as **Dipel**), which is only active on caterpillars.
4. “Bee-Careful” when applying any pesticides. For example, avoid directly applying pesticides to open flowers that may be visited by honey bees or bumble bees.



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Caterpillars and Sawflies

Caterpillars are the larval stage of butterflies and moths; whereas the larval stage of sawflies is greasy looking and slug-like with the adults resembling wasps. Remember, caterpillars are in the insect order Lepidoptera (butterflies and moths) whereas sawflies are in the order Hymenoptera (ants, bees, and wasps). There are a number of caterpillars and sawflies that feed on horticultural crops. Common caterpillar pests include bagworms, eastern tent caterpillar, fall webworm, mimosa webworm, yellownecked caterpillar, walnut caterpillar, cutworms, European corn borer, and tomato/tobacco hornworms. Sawflies that feed on plants include the European pine sawfly, brownheaded ash sawfly, rose sawfly, and scarlet oak sawfly. Sawfly larvae resemble caterpillars; however, there is a difference.



There are two ways to distinguish between caterpillars and sawflies. First, sawfly larvae have prolegs (stubby-looking legs) on every segment of the abdomen whereas caterpillars are typically missing prolegs. In Figure 1, a caterpillar is on the top and sawfly on the bottom. Second, caterpillar larvae have hairs or crochets on their feet while sawfly larva do not have hairs or crochets on their feet, which is shown in Figure 2, with the caterpillar

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prolegs on the top and sawfly prolegs on the bottom. Why is it important to know the difference between caterpillars and sawflies? Well, one of the common insecticides recommended for use against young caterpillars is *Bacillus thuringiensis* subsp. *kurstaki* that is sold under many trade names including **Dipel** and **Thuricide**. This is a bacterium that must be ingested or consumed by the target insect pest, in this case, caterpillars, in order for death to occur. However, the insecticide has no direct effect on sawfly larvae. Therefore, it is important to correctly identify the “caterpillar-like” insect before selecting an insecticide. Specimens may be sent to Kansas State University, Department of Entomology (Manhattan, KS) or the Kansas State University Diagnostic Clinic in the Department of Plant Pathology (Manhattan, KS).



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Raymond Cloyd

The Kentucky Derby = Finish Line Winner: ??? Kansas Insect Newsletter???

Yes ---- there is a connection (although admittedly I may streeetch the rubber band thin). The Kentucky Derby is held the first Saturday of May (tomorrow – May 2) and the winning horse will cross the finish line making some bettors and owners HAPPY!!! Coinciding with this Annual Run-for-the-Roses are Eastern tent caterpillars and European pine sawflies which also are fast approaching the finish line for their yearly foraging activities.

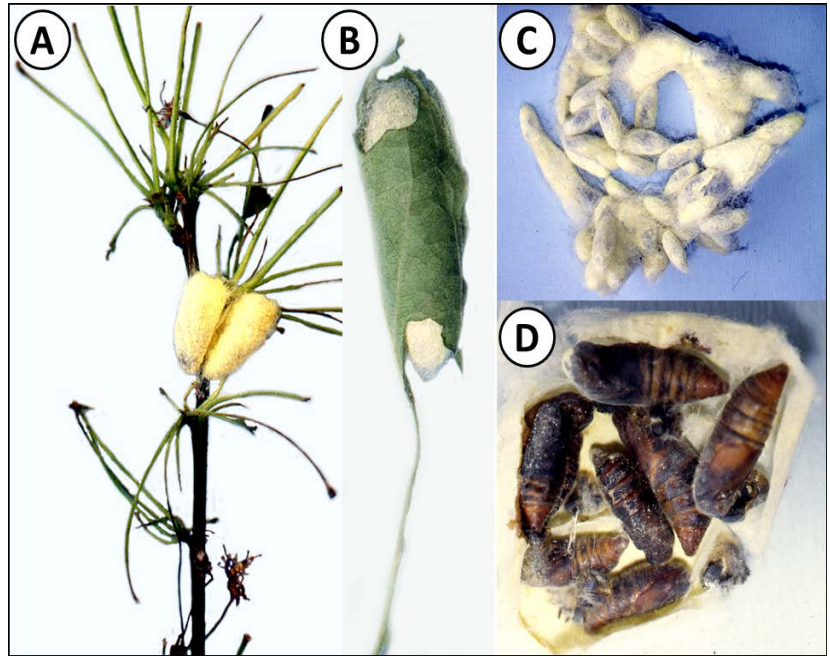
ETCs are nearly mature. I expect that by next week, they will have begun transitioning into their pupal stage. This begins with caterpillars creating their silken cocoons which are coated with a whitish/yellowish powdery substance (which can be irritating to a person’s skin and eyes).



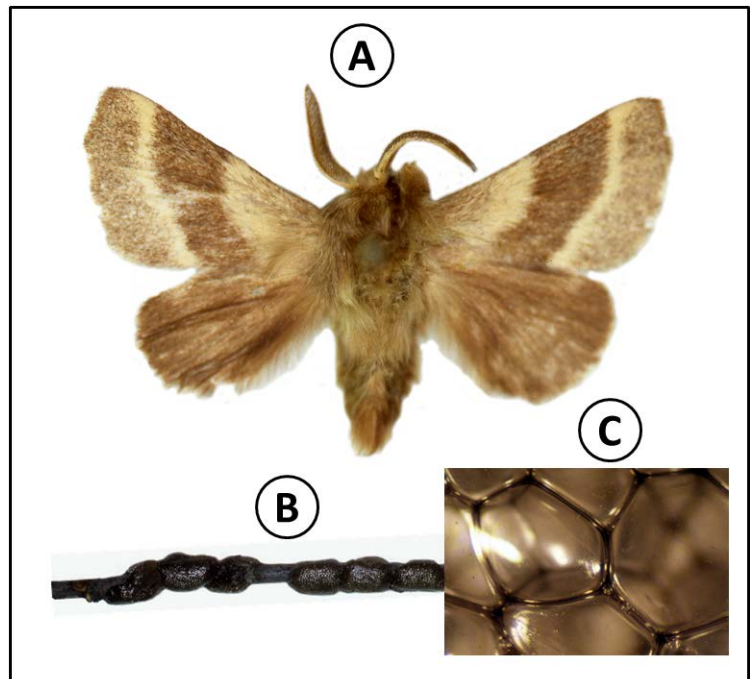
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Caterpillars may remain on the host plant, their cocoons being exposed (A) or somewhat concealed/wrapped in a leaf (B). Sometimes caterpillars may go “walkabout”, leaving their tree host to make an individual cocoon, or sometimes gathering and making cocoon clusters (C). After formation of cocoons has been completed, caterpillars transition into their pupal stage (D).



By late May/early June, moths (A) will emerge and mate. Egg masses will then be deposited on twigs (B). A hard shellac-like coating (C) protects the eggs through the summer heat and rigors of winter. Their cycle will be renewed with egg hatch and caterpillar emergence in March of 2016.



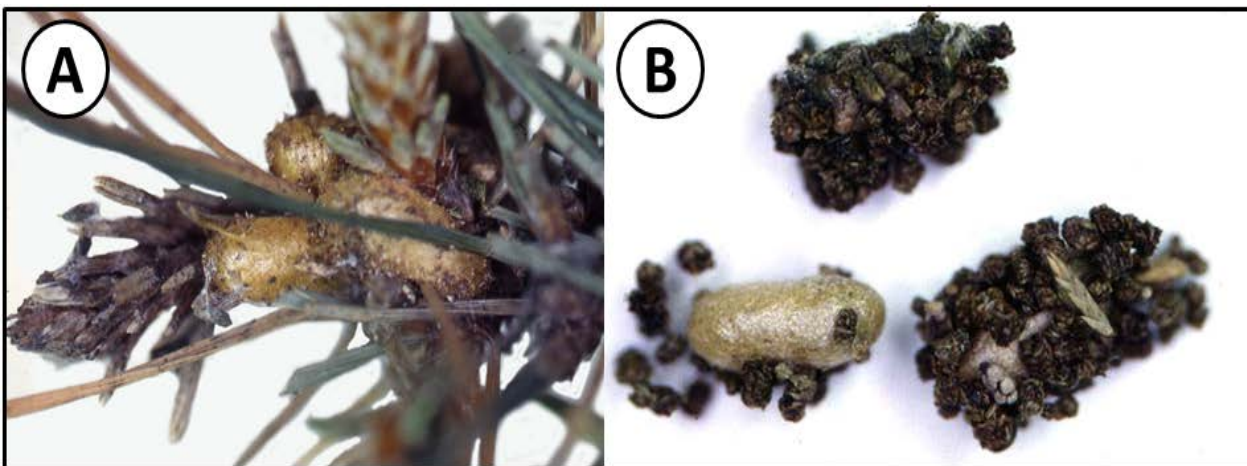
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Regarding EPS, one has but to approach a heavily infested pine to know that the larvae are nearing the end of their feeding stage. The sparse/bare branches (a result of increasingly large larvae satisfying their ravenous appetites) signal an approaching end to their feeding cycle.



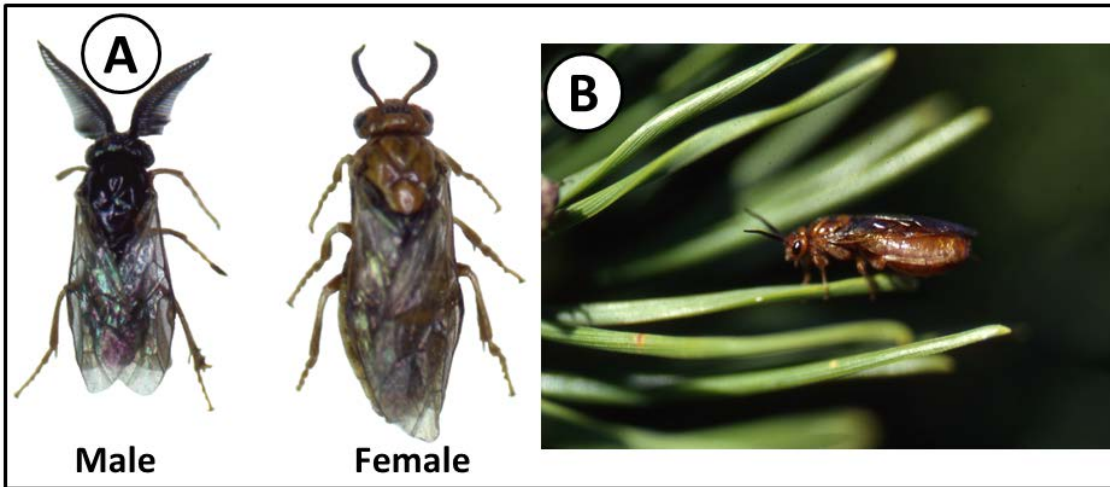
Within a week, larvae will begin forming their thin-walled papery and somewhat leathery cocoons. Like eastern tent caterpillars, some larvae will form cocoons while remaining on their host (A). However, most will leave their host to form cocoons elsewhere. Cocoons may not be obvious because they will be camouflaged with particles of dirt and debris. When cocoons are formed under their host tree, the dirt/debris consists mostly of fecal pellets (B) which dropped to the ground by larvae as they fed.



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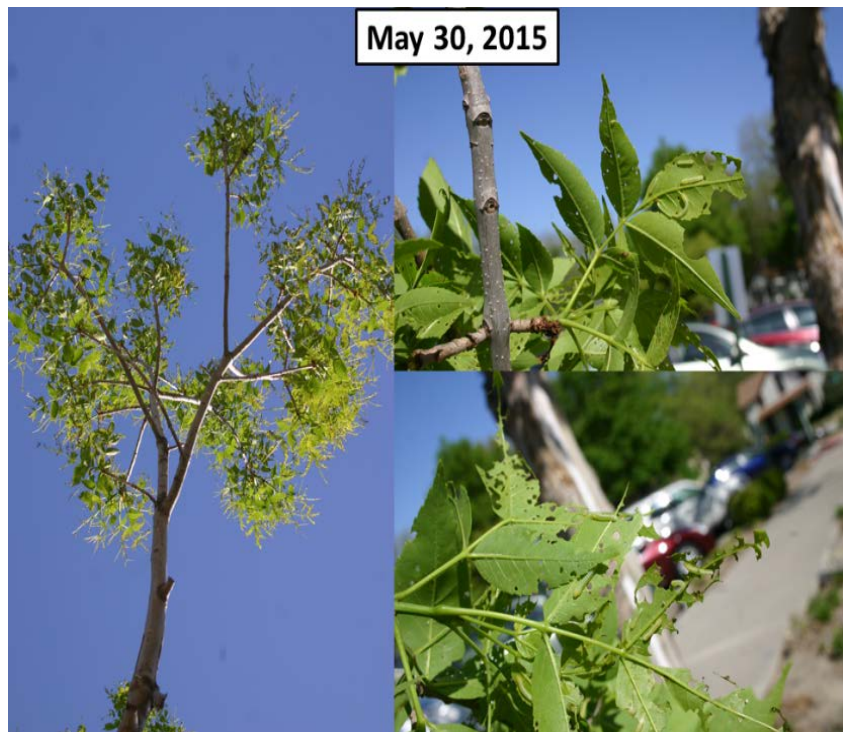
Unlike the rather immediate appearance of adults/mating/egg production of eastern tent caterpillars, European pine sawfly larvae aestivate (period of “rest”/decreased metabolic activity in response to higher temperatures) during the summer months. Actual pupation occurs in the fall followed by the emergence of adult sawflies (A) at which time mating occurs and overwintering eggs are inserted into needles (B). Their cycle will be renewed with egg hatch and larval emergence in late March/early April of 2016.



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Brownheaded Ash Sawfly (BHAS) Update

While I had not intended to follow the progress of BHAS as I have done in previous years, I can't seem to drive past the “busy beavers” without stopping to have a look. And so, within the past week, pinhole feeding has progressed to the tattered-appearance phase. Like ETC and EPS, BHAS activities are about a week ahead of where they were in 2014.



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Ash/Lilac Borer Activity

Not to beat a dead horse given that Dr. Cloyd's KIN #2 article addressed the facets of ALB development/damage/control, and last week's update in KIN#3 substantiating the actual initiation of the 2015 flight activity, but I noted that the table was incorrect in the "Date" column. So to correct that, I have entered the proper dates, and also added in this week's flight numbers. Again, as can be seen, these moths just don't fly at temperatures below 70. So this week when temperatures were into the 70's, moths were active. And, no more wrens.



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Easy Math: 2015 minus 1998 = 17

Algebra? Trigonometry? Calculus? Not my strongest subject matter. Never was --- never will be! But simple math, I can handle. The answer of "17" can only mean one thing to an entomologist: 17-year periodical cicadas. By the end of May and into June, the "buzz" created by massive numbers of newly emerged periodicals will create quite a "buzz" mainly amongst citizens of eastern Kansas.

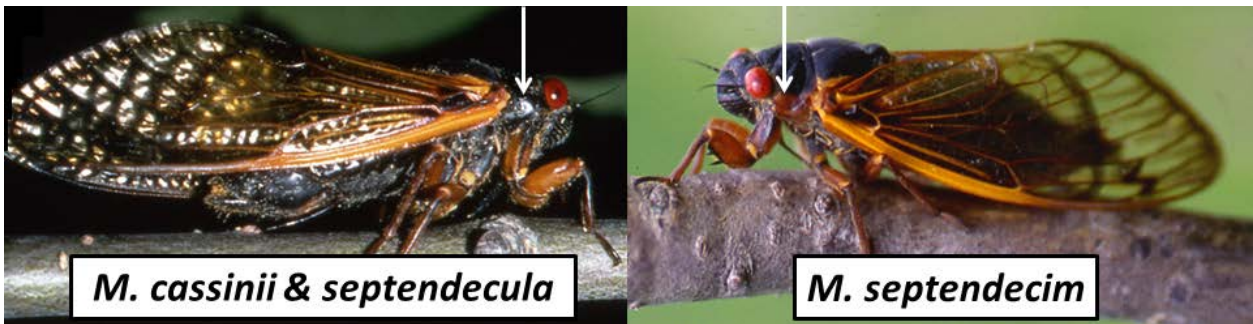
With their distinctive appearance (black body, blood-red beady eyes and orange-veined clear/transparent wings), there can be no mistaking periodical cicadas for any other insect. In actuality, the simple above-mentioned descriptors are (for lay people) not utilized in taxonomic keys used by systematists to identify/classify cicadas.

Whereas there is a tendency to lump/consider periodical cicadas as "one", there actually are 3 separate species of 17- year periodical cicadas. Only *Magicicada cassinii* and *M. septendecim* have been officially documented

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as occurring in Kansas. If one wished to differentiate which is which, the body of the smaller *cassinii* measures .8-inch long with an abdominal width of ¼-inch, whereas the more robust *septendecim* measures 1.1-inches in length with an abdominal width of ⅓ – inch (quite evident if comparing specimens side-by-side). If not wanting to take measurements, simply flip the specimens over and examine the bottom of their abdomens: *cassinii* is entirely black whereas *septendecim* is orangish. Although discernable but a little more difficult to observe is the area between the eye and base of the forewing: black for *cassinii* and orangish for *septendecim*. All this being said, by far, *cassinii* are more common and likely to be encountered than *septendecim*. Of the 4,437 periodicals that I collected from 37 counties in 1998, 98.7% were *cassinii*.



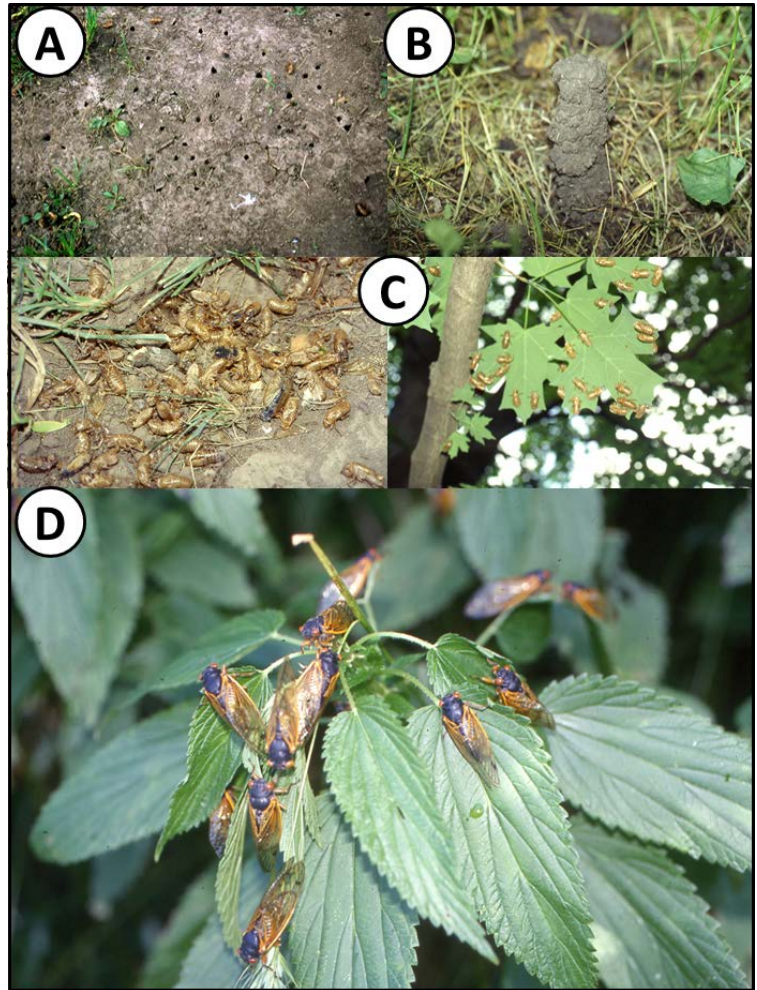
Without seeing an actual specimen, one can discern whether *cassinii* or *septendecim* are present. That is, the call produced by *cassinii* is a continuous somewhat high-pitched buzzing possibly with some ticks interspersed, while the call of *septendecim* is a more hollow “weeeee whoa weeeee whoa” (sometimes people say it sounds like “pharaoh” . Only males are capable of calling/chorusing ---- the purpose being to attract females for mating purposes.

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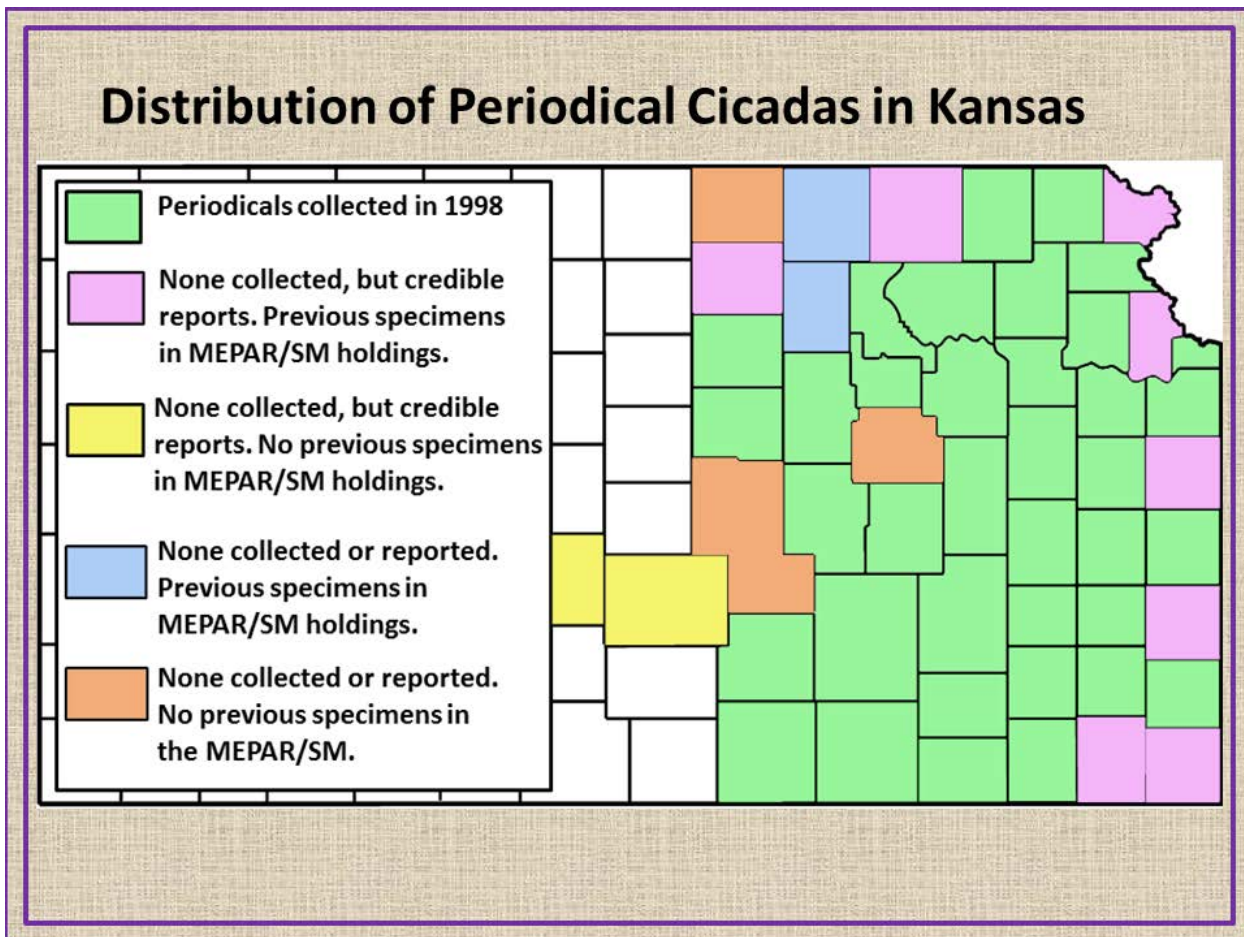
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Probably the main complaints lodged by people against periodical cicadas have to do with the appearance of emergence holes in the ground (A), occasionally mud turrets produced by nymphs prior to their emergence (B), large number of nymphal exuvia (“skins”) from which adult cicadas emerged (C), and the noise created by the clusters of congregated males (D).

Also, the egg-laying activities can kill tips of branches thus causing the appearance of dead branch tips which is but an aesthetically brief and inconsequential event.



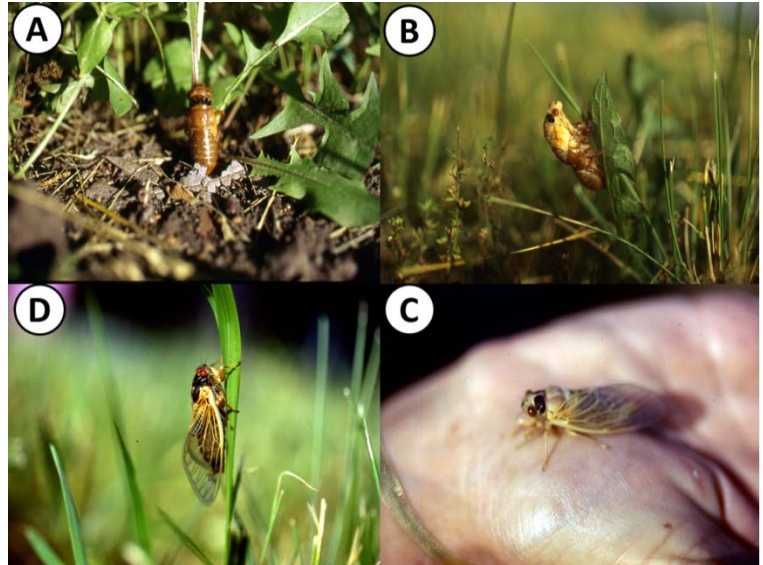
The following color-coded map details the documented distribution of periodical cicadas in Kansas. I would appreciate receiving any reports of periodical cicada activities that you encounter ----- Phone: 785-539-7510; e-mail: rbauernf@ksu.edu. Of special interest to me would be reports from Morris, Republic, McPherson and Harvey counties. I would visit those counties/sites for the purpose of collecting specimens for incorporation into our Departmental MEPAR holdings. I plan on visiting specific sites in Reno and Stafford counties (where periodicals were reported in 1998) for collection purposes. And I would especially appreciate reports from “uncolored/blank counties” for the purpose of possibly determining the western range of periodical cicadas in Kansas.



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All this being said, the 2015 emergence of Brood IV periodical cicadas (which includes portions of Iowa, Nebraska, Missouri and Oklahoma) was initiated in 1998 when 1st instar nymphs hatched, dropped to the ground and burrowed in. During the past 16 years, they fed by inserting their piercing sucking mouthparts into the xylem tissues of tree and woody shrub hosts. The now fully-developed 5th instar nymphs currently are waiting for soil temperatures to reach the proper temperature (cited to be 64°F) which signals them that the time has come that they should emerge from their underground habitat. After emerging (A), the skin down its back will split, and a “new adult” will emerge (B). Initially it will be white and soft (C). Over the next several hours, it will darken and take on its characteristic coloration (D). However, the exoskeleton will still be soft. An additional 4-5 days will be required for the exoskeleton to harden. It is at this point that cicadas will take flight, males will call, females will respond and mating will occur.



The female then will use her serrated ovipositor to slice into and create cavities in twigs into which she will insert up to 20 eggs. She will repeat this activity as many times as is required for her to deposit her full complement of eggs which may total up to 600. Six to 10 weeks later (a time at which all of the periodical cicadas will have died), the newly hatched nymphs drop to the soil burrow into the ground, feed for 16 years and reappear/emerge in **2032!**

Bob Bauernfeind

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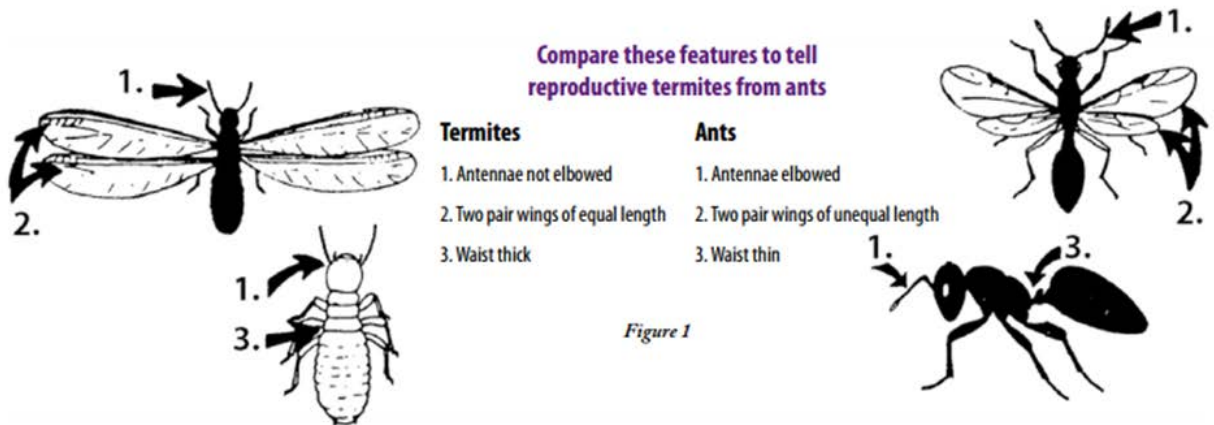
Termites

We have received several calls from south central and north central Kansas about termite and ant swarming (see photo). We have probably had more calls so far this year than in the last two years combined. Not sure what that means, but apparently this year the weather has been more conducive to swarming behavior, or possibly last year's weather was more conducive to population increase, than the previous couple of years. Ants are generally antagonistic towards termites. However, while termite and ant colonies are located a distance apart, the swarmers (adult, winged reproductives) may occasionally end up together at a window or on a sunny wall, etc. Therefore, it can sometimes be a little difficult for the homeowner to distinguish ant swarmers from termite swarmers (see photo). But, it is imperative to make proper identification to ensure proper treatment is performed as treating for ants is much different (and less expensive) than treating for

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termites! For more information on termite identification, biology and control please visit:
<http://www.ksre.ksu.edu/bookstore/pubs/MF722.pdf>



Taken from MF-722, *Termites*, Kansas State University

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Alfalfa – Weevils and Aphids

Alfalfa weevil feeding is winding down in north central Kansas, but not as fast as usual. If treatment is still considered prior to swathing do not forget to read the label and follow the PHI (post-harvest interval) required by the product you choose. The untreated control plots in our insecticide efficacy trials are still above our treatment threshold of 1 larva/2 stems, or 50% infestation, and contain many small larvae. Remember, larvae were 1st detected on 13 March so they have been actively feeding for six weeks. However, the good

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news is many insecticides are still providing excellent protection from one application three weeks ago. See below:

Plots treated 7 April, 2015

	Treated Plots (plants randomly selected)	Untreated Plots (plants randomly selected)
Infestation Level	≤10%	≥50%
1st Instar	20%	20%
2nd Instar	-	20%
3rd Instar	80%	60% - Also many pupae/empty pupal cells and a few adults

Aphids continue to increase in alfalfa fields. They are primarily pea aphids with a few spotted aphids. Have not seen or heard of any at, or even close to, treatment thresholds, but populations are increasing. Lady beetle and parasitic wasp populations seem to be rebounding which should help slow down these aphid populations.

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Wheat - Aphids

Wheat aphids, primarily greenbugs, but bird cherry oat and English grain aphids as well, continue to migrate into wheat fields all over the state. However, there are increasing numbers of lady beetles and parasitic wasps (see photo of mummy). Hopefully these beneficials will keep these aphids well below treatment thresholds.

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Holly Schwarting

J.R. Ewing

Salehe Abbar

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Insect Diagnostic Laboratory Report

<http://entomology.k-state.edu/extension/diagnostician/recent-samples.html>

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