Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants and Extension Personnel

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Homeowner Products: Insecticides For Use On Vegetables And Fruits

We have received inquires regarding two insecticide active ingredients that are commercially-available for purchase by homeowners, and are labeled for use on vegetables and fruits. The active ingredients are imidacloprid and acetamiprid. Both of these are in the chemical class, neonicotinoid. This chemical class of insecticides is most active on phloem-feeding insects such as aphids, whiteflies, mealybugs, soft scales, and certain leaf-feeding beetles. They have minimal (if any) activity on caterpillars and spider mites. Both active ingredients kill insects by affecting the central nervous system. The specific mode of action involves acting as an agonist on the neurotransmitter acetylcholine by competing with acetylcholine for binding sites on the post-synaptic nicotinergic acetylcholine receptors.

Both imidacloprid and acetamiprid have systemic activity, which refers to the active ingredients being translocated throughout the plant. The key is that a lethal concentration of active ingredient resides in locations where insect pests are feeding. Both active ingredients also have translaminar properties, which mean that the material penetrates leaf tissues and forms a reservoir of active ingredient within the leaf. So, even after spray residues dry, if an insect feeds on any treated leaves, they may still be killed. However, this only applies to foliar applications of acetamiprid.

Imidacloprid is the active ingredient in the product Bayer Advanced Fruit, Citrus, and Vegetable Insect Control. The percent concentration of active ingredient is 0.235%. The product is labeled for regulation of a number of insect pests including aphids, beetles, leafhoppers, scales, thrips, and whiteflies. The product can only be applied as a drench to the soil, near the base of plants, where the active ingredient is absorbed by plant roots. The active ingredient is then translocated throughout the plant, moving into new growth where a lethal concentration of the active ingredient is present in plant parts fed upon by insect pests. Plant size or age may impact the time required for the active ingredient to translocate, which ranges from one-week to three months. The pre-harvest interval associated with fruit and nut trees is between 7 and 21 days whereas for vegetables the pre-harvest interval is between 14 and 45 days. The product is labeled for use on the following vegetables: 1) curcubits; 2) fruiting vegetables; 3) cole crops (brassica), and leafy and petiole vegetables; 4) beans and peas; and 5) root vegetables. It is interesting to note that this product is also labeled for use on herbs. This product is toxic to fish and should never be applied when bees are active.

The other product is OrthoMax Flower, Fruit, and Vegetable Insect Killer, which is a ready-to-use (RTU) formulation. The active ingredient is acetamiprid at 0.006%. This product can only be applied as a foliar spray. It is labeled for regulation of the following insect pests; aphids, beetles, leafhoppers, leafminers, mealybugs, scales, thrips, and whiteflies. The pre-harvest interval is 7 days. This product is registered for use on the

following vegetables: broccoli, cabbage, celery, egg plant, kale, kohlrabi, lettuce, spinach, pepper, and tomato. The product is also labeled for use on apple and pear trees. Similar to imidacloprid, this product should not be applied when bees are active.

The percentage of active ingredients for both products is relatively "low," and the active ingredients in both products have low water solubilities, which mean they are not likely to accumulate in floral parts. For example, imidacloprid has a water-solubility of 0.51 g/L and acetamiprid has a water solubility of 2.9 g/L. Overall, when used properly, both products are effective in regulating the designated labeled insect pests. However, if homeowners are concerned about using these products on vegetables and/or fruits then they should consider utilizing alternative active ingredients such as potassium salts of fatty acids (Insecticidal Soap), petroleum and/or paraffinic oils, and clarified hydrophobic extract of neem oil. These active ingredients are present in many contact insecticides, which have short-residual activity, so multiple applications may be required. Remember, it is important to read the label of any pest control material (in this case, insecticides) prior to application.

Raymond Cloyd

High Noon – 1871 versus High Noon, March 31, 2010 …….. A real stretch

"High Noon" is a classic 1952 movie starring Gary Cooper as Sheriff Will Kane who faces a shootout against a killer and 3 of his henchmen on a dusty street of Hadleyville, New Mexico Territory in 1871 at High Noon (12:00 P.M.). [As an aside, one of the bad guys is played by Sheb Wooley. Does that ring a bell???? If not, refer back to last week's Kansas Insect Newsletter and see what Sheb Wooley did 6 years **after** appearing in "High Noon"].

Fast-forward to High Noon, Wednesday, March 31, 2010. Actually, it wasn't exactly High Noon ----- it was 11:58 A.M. **Eastern tent caterpillars** (ETC) were emerging from 3 of 4 egg masses under observation (Figure 1).

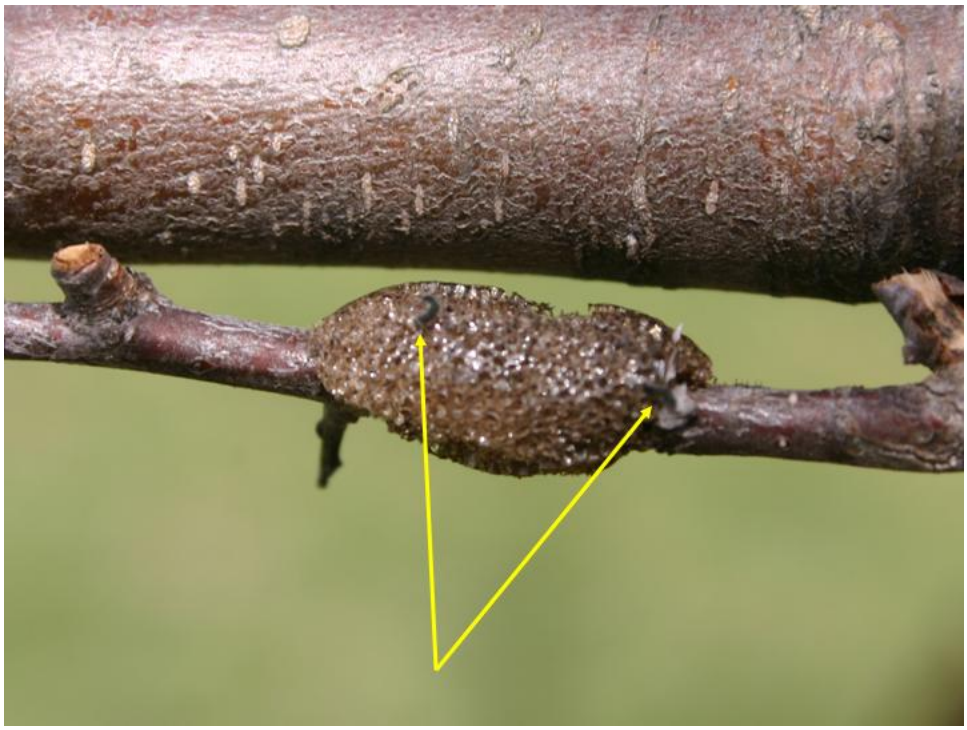

Figure 1

The emergence had not yet begun when last checked earlier that morning (6:30 prior to leaving for work). The current activity is comparable to those recorded for the past 8 years' March time frame of emergence patterns (Table 1). This further substantiates the ability of a "native species" to survive the rigors of a Kansas winter (see the reference to bagworm/white grub survivability in last week's Kansas Insect Newsletter).

March 16	March 20	March 21	March 23	March 26	March 28	March 29	March 30	**March 31**
2007	2002	2004	2009	2003	2008	2005	2006	**2010**

Table 1

Eastern tent caterpillars have a preference host plants in the Genus ***Malus*** which includes 30 – 35 species of small deciduous trees and shrubs such as fruit producing trees, crabapple trees and flowering crab landscape plantings. Feeding damage is inconsequential to overall tree/shrub health and vigor because the ETC seasonal cycle begins early/now with the feeding phase being completed in 6-7 weeks. Thus a new flush of foliage quickly issues forth and replaces that which was consumed.

One might ask, "If you are dismissing ETC as being inconsequential, what, then, are the objections to the ETC?" The answer is that it really comes down to aesthetic expectations of homeowners who object to the presence of the "tent" webmasses which serve as a home base where larvae congregate when not actively foraging, and the presence of mature caterpillars as they get squished underfoot as they meander and wander about seeking sites in which to construct their cocoons (inside of which they eventually pupate).

This being said, people may still wish to know whether or not ETC are likely to be present in their trees. Advice in the literature recommends inspecting plantings for the presence of egg masses. This is easier said than done. While egg masses are relatively large (1/2-inch) and conspicuous late in the fall, during winter and early spring (when branches are leafless), consider the size of the host. On short shrubby *Malus*/*Prunus* species detection is feasible (Figure 2).

Figure 2

But it is impossible to thoroughly/completely inspect larger/taller densely-branched trees (Figure 3).

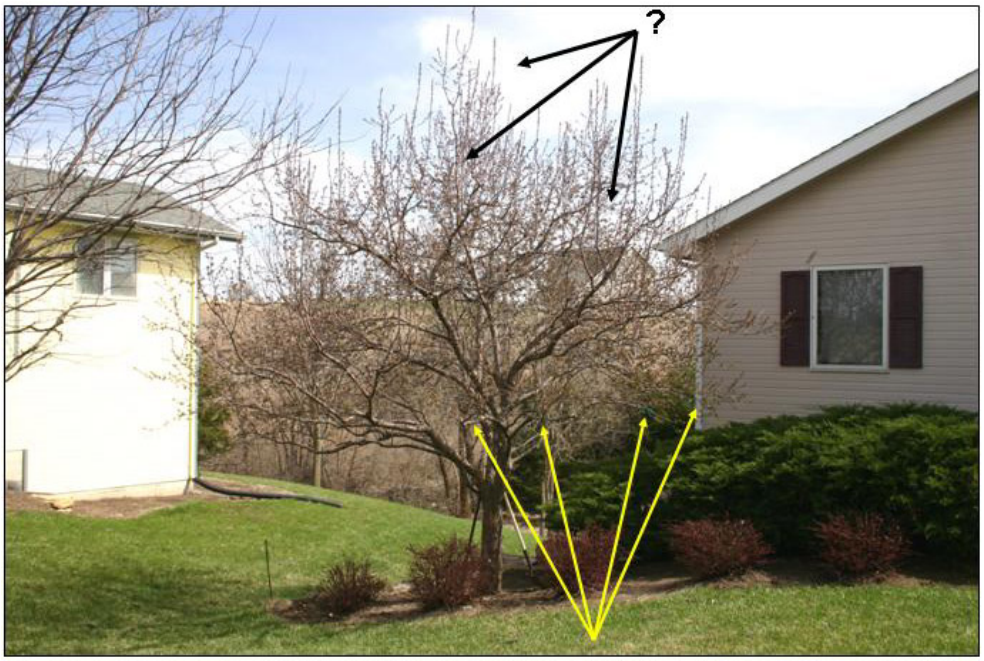

Figure 3

While I am able to monitor egg masses that I have collected and attached to lower branches (yellow arrows), I know that there are "naturally occurring egg masses higher in the canopy. But they are beyond my ability to locate. Every year, "tents" eventually appear in the upper canopy.

Following the current progress: 24-hours after their initial emergence, evidence of their "community effort" is in the form of their initial tent (Figure 4) where they tend to congregate. Only after this construction phase do the larvae begin seeking food --- as illustrated by several larvae forming a "foraging procession" (arrows).

Figure 4

Foraging larvae currently measure 2-mm in length. Their food is the tender recently-emerged leaves (Figure 5).

Figure 5

Of interest is a “trailer”/thread of webbing (Figure 6) which serves as a pathway guide back to their “home” tent quarters.

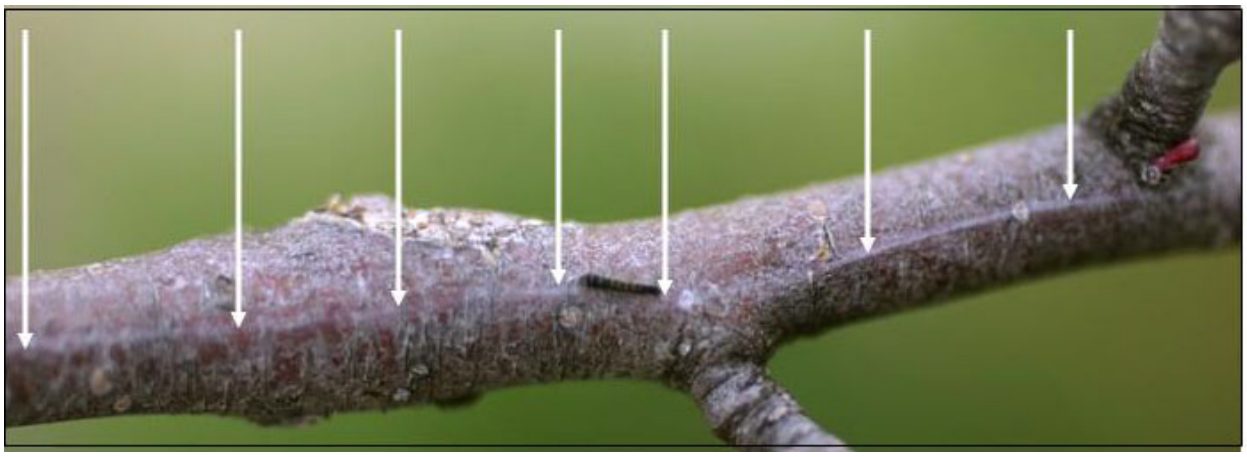

Figure 6

The ETC activities will be followed in the ensuing weeks and their developmental status monitored.

Bob Bauernfeind

Alfalfa Weevils

First indications of alfalfa weevil feeding were observed in central KS on 1 April. Close inspection of young leaf tissue indicated pin prick-sized holes which are characteristic of feeding by the newly-hatched larvae. Larvae will continue to emerge over the next 2-4 weeks. Thus, if the infestation level justifies a chemical application, and the weather continues as predicted (40-70°F) over that timeframe, 10-20 days (12-21 April) from now would probably be ideal timing for controlling alfalfa weevils in central KS.

Jeff Whitworth *Holly Davis*

Sincerely,

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