Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants and Extension Personnel

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Cereal Aphids in Wheat

There have been some reports of greenbug activity in wheat in the Hays area. For the past decade, greenbug problems in wheat have been limited to the southern edge of the state along the border with Oklahoma, so many farmers further north may have become lulled into assuming they need not be scouting. The past few weeks have been characterized by alternating periods of warm and cold temperatures across central and western Kansas with intermittent precipitation. Cold overnight temperatures affect the development of cereal aphid populations in various ways. Like all insects, the growth and reproduction of aphids is slowed at lower temperatures, but they are quite able to survive short periods at temperatures close to freezing. On the other hand, the beneficial insects that we rely on for biological control of aphids can be more adversely affected. Successful biological control of aphids by coccinellids hinges on the successful reproduction of these beetles and even short periods of cold can diminish reproductive activity. Furthermore, active life stages require warmer temperatures to forage than their aphid prey need to grow and reproduce. However, the wheat's response to cold can also tip the balance for or against economic losses. After dormancy is broken, much of wheat's ability to tolerate aphid feeding is associated with the plant's ability to grow faster than the aphids. Persistent cold weather can significantly slow plant growth and thus permit aphid populations a longer period to feed on, and damage, the crop.

Another important variable to consider is the condition of the wheat. A lot of the wheat that is in poor condition will be less able to tolerate significant aphid feeding. However, if the projected yield is looking like less than 20 bushel per acre, it may not be worth spraying. As we approach boot stage in many areas, it will be easier to see which fields are developmentally delayed and thus most at risk of aphid damage. Such fields should be scouted for aphids without delay, paying attention also to the presence of lady beetles and lacewings that will be feeding on them. If aphids are abundant and lady beetles are scarce, refer to the current wheat management guide for economic thresholds and treatment options, keeping in mind that mixed infestations (e.g. bird cherry-oat aphid and greenbug together) will cause additive damage.

http://www.ksre.ksu.edu/library/ENTML2/MF745.PDF

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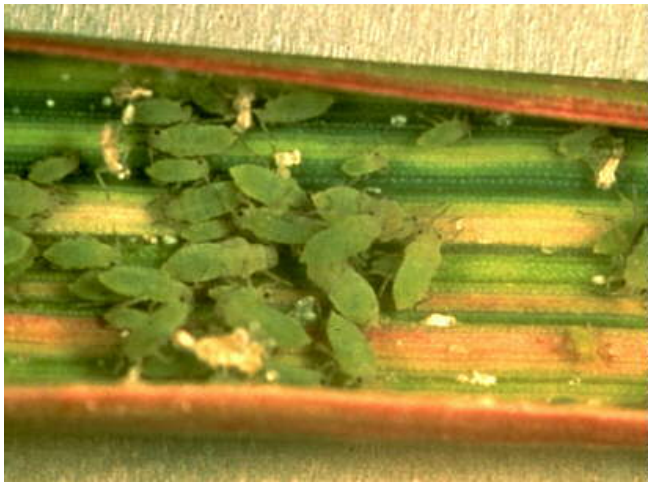
Greenbug

Bird cherry-oat aphid

Russian wheat aphid



J.P. Michaud

Insecticides: What's New In The Market Place?

Two new insecticide products were released by Bayer Advanced (Research Triangle Park, NC) this year for use by homeowners in gardens and landscapes; these are All-In-One Rose & Flower Care, and 12-Month Tree & Shrub Protect & Feed. The All-In-One Rose & Flower Care product contains three active ingredients: tebuconazole (1.06%), imidacloprid (0.11%), and clothianidin (0.05%). Tebuconazole is a systemic fungicide with activity against foliar fungi including black spot, powdery mildew, and rust. The other two active ingredients are systemic insecticides. The product is a granule that once applied to the soil/growing medium needs to be irrigated so that the active ingredients can move through the soil/growing medium profile where they can be absorbed by plant roots. After the active ingredients are absorbed and translocated throughout the plant, the product claims six weeks of protection against certain foliar fungi and a variety of insect pests including aphids, caterpillars, leaf beetles, leafhoppers, leafminers, mealybugs, scales (soft), thrips, and whiteflies. It is important to apply this product when plants are actively growing and remove any mulch because mulch and organic matter may bind to imidacloprid and clothianidin thus inhibiting absorption by the roots.

The 12-Month Tree & Shrub Protect & Feed contains two systemic insecticide active ingredients: imidacloprid (0.55%) and clothianidin (0.275%). In addition, the product contains a fertilizer [2-1-1 (N-$P_2 0_5$-$K_2 0$)]. This insecticide is labeled for "control" of aphids, borers, caterpillars, leafhoppers, leafminers, mealybugs, scales (soft), thrips, and whiteflies with claims of 12 months of protection. The product is a granule so that once applied, irrigation is required in order to move the active ingredients through the soil/growing medium profile where they can be absorbed by the roots. As with All-In-One Rose & Flower Care, it is important to apply this product when plants are actively growing and remove any mulch because mulch and organic matter may bind to imidacloprid and clothianidin thus inhibiting root absorption.

The two insecticide active ingredients, imidacloprid and clothianidin, contained in both products, are neonicotinoid-based systemic insecticides. Of the two, imidacloprid is well-known because it has been around since 1995 (sold commercially under the trade name Merit®), and the patent has expired, which means that imidacloprid may be present in many different generic products. Imidacloprid, like all neonicotinoid-based insecticides, is primarily active against phloem-feeding insects, certain leaf-chewing beetles, and wood-boring insects. However, it has minimal activity on caterpillars and mites. The other neonicotinoid-based insecticide, clothianidin, is less known having been around since 2002; however, this active ingredient, depending on the rate applied and concentration in leaf tissue has activity on caterpillars, which is the primary reason why certain caterpillar pests are included on the labels of both products. Although clothianidin is less water soluble than imidacloprid (0.32 vs. 0.61 g/L at 20ºC) it has a higher binding affinity to the nicotinic acetylcholine receptors, which are the target sites of the neonicotinoid-based insecticides. Clothianidin is also rapidly absorbed by plant roots due to the lipophilicity of this active ingredient. Lipophilicity refers to the ability of compounds to dissolve in fats, oils, and lipids. Compounds that are highly lipophilic are generally not systemic whereas those compounds that are either moderate or intermediate in lipophilicity are able to move through the xylem (water-conducting tissues) to plant shoots. Furthermore, root absorption is greater when compounds are more lipophilic. As such, clothianidin is taken-up rapidly in the transpiration stream, which is responsible for water movement through plants, and may accumulate at higher concentrations in plant parts and tissues than other neonicotinoid-based insecticides. Clothianidin has also been shown to be evenly distributed within the entire leaf lamina. All of these factors may be associated with the activity of clothianidin against caterpillars and other insect pests.

As always, read the label of both pesticides prior to making an application to determine the recommended rates and understand what procedures are required in order to enhance the efficacy of these products in preventing and alleviating infestations of insect pests.

"If all mankind were to disappear, the world would regenerate back to the rich state of equilibrium that existed ten thousand years ago. If insects were to vanish, the environment would collapse into chaos"

-E. O. Wilson

Raymond Cloyd

Alfalfa Weevil Update

Alfalfa weevil populations are mostly in the last (3rd) instar and pupal stages. When cutting, be aware that the pupae are accumulating and watch for feeding on new growth under the windrows.

Jeff Whitworth *Holly Davis*

Which is which? Boring Topic ----- Ash Borers or Lilac Borers?

The following sequence of questions and responses is typical when people call and request information about controlling "borers". Caller A question: "What can I do to control borers?" Response: "What type of borers are you talking about?" Caller response: "The borers attacking my trees!" Response: "What type of trees?" In many instances, people respond with, "My ash trees!" By having narrowed the field of the many different borer species found in Kansas, we arrive at the ash borer.

OR

Caller B question: "What can I do to control borers?" Response: "What type of borers are you talking about?" Caller response: "The borers attacking my shrubs!" Response: "What type of shrubs?" In many instances, people respond with, "My lilacs!" By again having narrowed the field of the many different borer species found in Kansas, we arrive at the lilac borer.

It is now recognized that the ash borer and the lilac borer are one-in-the-same. Thus they are often singly referred to as the ash/lilac borer (ALB). Privet is a preferred third host commonly grown in Kansas. ALB moths are wasp-like in appearance (Figure 1a) and are therefore commonly called "wasp moths". Another common reference for this moth and its relatives is "clearwinged moths" as the wings of most species lack scales (Figure 1b).

Figure 1a

Figure 1b

Control procedures against the ALB commence soon after their seasonal activities begin. And those beginning activities are accurately recorded through the utilization of "sticky traps" baited with clearwing borer pheromone lures. Male moths are attracted to these traps. And when males become active, females also are out-and-about. (aside ---- I do not use sticky traps as I am interested in capturing "clean" specimens for collection purposes Figure 2).

Figure 2

The ash/lilac borer overwinters as a larva in the pupal chamber it created the previous fall. It pupates in the spring. Moth emergence typically begins in mid-April. After mating, eggs are deposited on exposed outer bark as well as bark cracks and crevices. Newly emerged larvae bore through the bark into the tree/shrub. They create galleries as they feed just beneath the bark and into the sapwood. By fall, larvae will have matured. They then tunnel their way out towards the bark and creates the aforementioned pupal chamber with just a thin cover separating it from the outside world.

Moth emergence is a specialized activity. Moths are delicate. It they emerged from their pupal cases within the tree, they would be trapped -- unable to force their way out of the tree. However, the posterior portion of their pupal case is armed with several ringlets of spines (Figure 3a - arrows). By wiggling their "tailends", the spines "dig into" the walls of the pupal chamber forcing the head end of the pupae through the thin covering. With the pupa now exposed outside of the tree, moths are free to exit their pupae (Figure 3b).

Figure 3a **Figure 3b**

While we have had some warmer daytime/afternoon temperatures, cooler morning temperatures have restricted moth emergences during the (roughly) 8:30 – 11:30 window of their daily activities. In Manhattan, the first-of-the year ALB moths (2 specimens) were trapped April 21. An individual moth was trapped April 26. There were no additional specimens collected until May 3 (2). But with a promise of warmer morning temperatures, activities will be increasing. ALB activities may already be in full swing in southern Kansas which has experienced warmer temperatures compared to the rest of the state.

Once becoming successfully established in trees/shrubs, nothing can be done to kill boring caterpillars, and they will feed/develop undeterred. Thus countering ALB consists of barrier insecticide treatments to kill newly emerged larvae as they attempt to bore into their host. People who know that they have a history of ALB activities in their trees may choose to automatically apply insecticide treatments. If individuals are concerned about the presence of ALB, they should inspect their tree(s) for extruded pupal cases or evidence (emergence holes) of previous generations of ALB.

First treatment applications should be made as soon as possible. Because the ALB flight period for extends into mid to late-June, a second insecticide application should be applied 3-4 weeks after the first application. A third treatment may be considered to ensure against “late” stragglers into July. Spray treatments should be applied to

the entire trunk of the tree as well as the larger limbs within reach of their sprayer. It is important to get thorough coverage into the cracks and crevices of the bark. And because moths are attracted to wound sites (typically mower damage to the bases of trees), ensure that these areas receive good coverage. Due to the nature-of-growth of lilac and privet shrubbery, treatment applications may be more difficult.

A dilemma faced by individuals seeking an insecticide recommendation is the multitude of products on the store shelves. For instance, according to the KDA product registrations, there are no products registered under ash/lilac borers, but 246 listed under ash borer, 315 under lilac borer and 379 under clearwing borers. Many of these products are likely to be duplicates. Probably the two most common active ingredients used in the various product lines are permethrin and bifenthrin. Consumers must visit local retail outlets and visit with store personnel on appropriate product availability, or (on their own) read the various products and their labels to ascertain their product-of-choice.

Soon to come ----- "Miller Moths"

Over the past couple of weeks, I have noticed an occasional "miller moth" scooting about seeking cover. And an occasional "miller moth" appears in the blacklight traps that I operate. Given this time of year, it is likely that we are on-the-brink of increased "miller moth" activities.

So what is a "miller moth"? A very wide "umbrella term" describing various moth species with powdery/dusty wings. Because virtually all moth species have wings covered with scales, what moth, then, could not be categorized as a "miller moth"?

The current "miller moths" in question actually are army cutworm moths. While some people may describe them as "plain-looking brown moths", they actually have intricate and distinctive wing markings (Figure 4).

Figure 4

There is considerable variation in the appearance of army cutworm moths. Five morphological forms exist. To further add to the variety of appearances, female moths appear grayish while males tend towards brownish colorations.

Each year in the central plain states, overwintered army cutworms complete their feeding activities in early spring and then pupate towards the end of April and beginning of May. By mid-May, most moths have emerged ---- and this is when they become a nuisance. They seek shelter/cover in any conceivable space: a car window left open overnight is an example – and when one gets ready to drive to work, he/she will be greeted by a flurry of excited moths; open a Polycarp to deposit a trash bag an you may be greeted by excited moths; take an early morning walk and as you pass a line of shrubs, you may be startled by hundreds of excited moths darting out; and so on. In homes, catch or swat a moth on your wall or curtains/sheers and you will find a coating of "dust"/wing scales left behind.

Because moths can exploit very small openings, it is virtually impossible to exclude moths from entering homes/buildings. However, the nuisance period is short-lived. Simply, as if by magic, moths quickly disappear. On an unknown cue, moths from the entire central plains region form massive westward flights to the Rocky Mountains. Feeding throughout the summer at the cooler higher elevations, moths become sexually mature and also accumulate fat reserves. By fall, moths migrate back to the central plains. Each female moth is capable of producing between 1000 – 3000 eggs. Larvae emerge and begin feeding. Partially grown larvae are then the overwintering stage of the species.

An example of the "dust" produced by army cutworm moths can be seen (Figure 5a) where moths gathered from a single blacklight trap are dumped out of a garbage can. Talk about being up-to-you-neck in army cutworm moths!(Figure 5b).

Figure 5a **Figure 5b**

Another interesting tidbit about army cutworm moths: Grizzly bears love them. During summer months, bears move to the higher elevations to feast on army cutworm moths. A single moth possesses ½ calorie of fat content. It has been estimated that bears obtain 20,000 calories of fat on a daily basis by consuming 40,000

moths per day. If a person is concerned about annoying army cutworms when they open in their garage door in the morning, maybe they might want to consider adopting a grizzly bear to control the moths. On second thought, maybe the moths might be a friendlier greeting than the grizzly!

Bob Bauernfeind

Report from the Kansas State University Insect Diagnostic Laboratory:

The following samples were submitted to the Insect Diagnostic Laboratory from April 16th to May 5th.

April 19 2011 – Leavenworth County – Winged subterranean termite in home
April 20 2011 – Shawnee County – Male American dog tick
April 22 2011 – Riley County – Orb weaver spider in home
April 22 2011 – Neosho County – Bark beetles "shothole borers" in apple tree
April 22 2011 – Riley County – Northern mole cricket
April 27 2011 – Sumner County – Garden webworms in canola
April 27 2011 – Harvey County – Indianmeal moth larvae and sawtoothed grain beetle in dried beans
April 28 2011 – Doniphan County – Subterranean termite in home

April 29 2011 – Sherman County – Possible boring damage to Austrian pine
April 29 2011 – Unknown County – Ichneumonid wasp in home
April 29 2011 – Shawnee County – Bird Cherry-Oat aphids on wheat
April 29 2011 – Phillips County – Tipulidae (crane fly)
May 2 2011 – Sherman County – Euonymus scale insects on euonymus
May 2 2011 – Riley County – Parson spider in home
May 2 2011 – Johnson County – Carpenter ants in home
May 3 2011 – Ford County – Spider beetle, *Ptinus* sp., around home and garden
May 3 2011 – Neosho County – Geometrid moth in home
May 4 2011 – Riley County – Luna moth outside home
May 5 2011 – Wyandotte County – Foreign grain beetles in museum

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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