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Kansas Insect Newsletter

For Agribusinesses, Applicators, Consultants, and Extension Personnel

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Grasshoppers in the Garden:

Across Kansas, many people are reporting grasshoppers moving into vegetable gardens and flower beds. These hungry invaders do not discriminate when it comes to what they feed on. As they move about, they will feed on whatever is in their path. At least, in general, that is the perception.

Kansas is credited for having approximately 115 different grasshopper species. Most of these species feed on preferred “wild” host plants. Or, if they do have a taste for our vegetables and flowers, the population levels of certain species [for whatever reason(s)] remain at low, sub-economic levels. There are, however, 4 species which are recognized as major grasshopper pests: the lesser migratory, red-legged, differential and two-striped. Of these, the latter two are those which people report. They are large and conspicuous.

The “big yellows” are differential grasshoppers (Figure 1). Some are very pronounced yellow, while others may have a more grayish to brownish overall look, but definitely with some hint of yellow. All differential grasshoppers have distinct black chevron markings on the outer side of their hind leg femurs.



Figure 1

The “striped ones” are two-striped grasshoppers (Figure 2). When viewed from above, light stripes begin over each eye and course down the outer dorsal edges, converging posteriorly. The hind legs also have black markings, but only on the top half of the femur.



Figure 2

The oft asked question is: “Where have these grasshoppers come from, and why always do they invade at this time of year?” One needs to have a basic understanding of grasshopper seasonal life histories. Grasshoppers prefer depositing their eggs/egg cases in undisturbed, uncultivated, “natural/native” areas. These areas are referred to as hatching beds. When grasshopper nymphs emerged in the spring, they are small and relatively restricted in their movements. Adequate amounts of vegetation in the hatching beds and the immediate adjacent areas are sufficient to support these nymph populations for most of the summer. However, as nymphs grow and rapidly devour the remaining vegetation, they must move out “on foot” to seek food sources further out from hatching bed areas. After they complete their final molt, the new adults have the capability of flight ----- thus greatly expanding their foraging range to include gardens and flower beds which may actually be quite far removed from the original hatching beds.

The dilemma for gardeners and homeowners is how to cope with this constant movement of grasshoppers from “outside areas” onto their property. Unfortunately, there is no easy method, no one-time “magic” spray. Any number of insecticidal active ingredients are labeled for grasshopper control in vegetable gardens and on flowers, shrubs and ornamentals. **THEY ALL KILL GRASSHOPPERS.** However none of these products provide sufficient residual control to knock down the continual flow of newly arrived grasshoppers. Thus, repeated insecticide applications are required for as long as grasshopper movements persist in relation to how much vegetable produce is wanted/needed, and flower and ornamental “show” is desired.

For those people preferring not to use synthetic insecticides, the only alternative method of combating grasshoppers would be the exclusionary tactic of placing a netting or cage over the commodity to be protected. People will have to decide how practical this is. If a plant or two is to be protected, this method may have some applicability. Screening/netting an entire garden may be cost prohibitive and/or impractical. Even with a protective covering in place, it is possible that grasshoppers might chew through or crawl under the edges of the cover.

People read and hear about microbial products which incorporate spores of the protozoan *Nosema locustae* onto a bran bait which, when spread on the ground, is consumed by grasshoppers. Ingested spores become activated after entering the grasshopper digestive system. The protozoans then attack the fat bodies within the grasshopper. Fat body content is especially important for nymphs ----- they rely on the fat bodies for nourishment during the molting and hardening process. “Starved” nymphs may die, or, if they survive, are greatly weakened. Those surviving to adulthood will produce fewer eggs, and the hatchlings be further weakened.

Products containing *Nosema locustae* spores are neither intended for use against adult grasshoppers nor expected to provide knockdown kill. As is stated in product literature, **“Kills grasshoppers at their source — the hatching beds — where they are concentrated, before they can migrate to your crop”**. It further states, **“killing about half those in the hatching area, and infecting most of the remainder”**.

A further acknowledgment that *Nosema locustae* does not provide complete control is the recommendation that a bran bait containing a synthetic insecticide be spread between the hatching beds and crops to be protected, for the purpose of killing those grasshoppers that make it out of the hatching beds.

People must realize that products containing the spores of *Nosema locustae* are not intended for use against adult grasshoppers already moving into and feeding on vegetable crops, flowers, shrubs and ornamentals. This is not to say that products containing *Nosema locustae* spores should not be used in attempts to reduce grasshopper populations ----- but they need to be used when grasshoppers are most susceptible (nymph stages), well in advance of when they become highly mobile adults. Over several seasons of use, and when properly applied to hatching areas, grasshopper population suppression may be achieved.

Robert Bauernfeind

Wilting Pumpkin Plants:

As pumpkin plant vines spread, and small pumpkins are set and growing, gardeners and young children think forward to harvesting pumpkins for decorations and jack-o-lanterns at Halloween and Thanksgiving. However, they become dismayed when plants begin to look limp/flaccid. Several potential problems could be at work. One of the common causes of “flagging” plants is squash vine borers.

The presence of squash borers can be confirmed by tracing backwards along the vine to the main stalk of the pumpkin plant. Examine the stem and base of the plant. If one sees wet frassy exudates being pushed, (Figure 3), the squash vine borer is certain to be present. By slitting the “affected area”, the squash vine borer larva can be seen (Figure 4). Squash vine borers are the larvae of the colorful clear-winged squash vine borer moth (Figure 5).



Figure 3



Figure 4



Figure 5

Moths appear earlier in the growing season, primarily depositing eggs at the base of the pumpkin plants, and anywhere along the vine. The larvae bore into the stems where they feed away undetected until such time that they have grown to the extent that their feeding activities have disrupted the flow of vascular liquids, thus explaining the wilt symptoms.

At this point in time, little can be done to reverse the damage. The larvae within the stems/vines are protected from insecticides applied to the outer surface areas. However, some people will slice open the stems/vines and physically remove the larvae. The slit

can than be squeezed together/closed. Dirt can be mounded over the “surgical area” and kept moist. If the internal damage was not too severe, the plant may produce supplementary runners and/or new root growth, thus allowing plants to recover and pumpkin development to proceed.

Robert Bauernfeind

USDA ISSUES CONDITIONAL LICENSE FOR WEST NILE VIRUS TREATMENT FOR HORSES:

On August 19, 2003 the U.S. Department of Agriculture announced that it has issued a conditional license to Novartis Animal Vaccines Inc. Larchwood, Iowa, for a product (an equine-origin antibody) intended to aid in the treatment of horses with the disease caused by West Nile virus.

West Nile virus (WNV) is a mosquito-borne virus that was first detected in the United States in 1999. The virus, which can cause encephalitis or inflammation of the brain in animals and, in some cases, humans, has been found in Africa, western Asia, the Middle East and the Mediterranean region of Europe. Since 1999, the WNV has spread to most regions of the United States.

West Nile virus infection in horses may include both central nervous system and peripheral nervous system signs. Although horses can be infected by the virus, there is no documentation that infected horses can spread the virus to uninfected horses or other animals. In 2002, there were 14,717 reported cases of horses infected with the virus in the U.S.

The most common signs of WNV infection in U.S. horses have been stumbling or lack of coordination, weakness of limbs, partial paralysis, muscle twitching and death. Fever has been detected in less than one-quarter of all confirmed cases. Approximately one-third of horses that become ill with WNV die or must be euthanized.

USDA’s Animal and Plant Health Inspection Service issues conditional licenses for veterinary biologics products to meet an emergency situation, limited market, local situation or special circumstance. The special circumstance addressed here is the need for a product to aid in the treatment of disease caused by WNV.

Conditional licenses are generally issued with restrictions and for a limited period of time. At the end of the conditional license period, data obtained in support of the product’s efficacy, potency and product performance are evaluated to determine if the conditional license should be renewed or if a regular product license may be issued.

In keeping with these regulations, the product described above has been issued a conditional license for 1 year. The product is restricted to use by a veterinarian in those states where use of the product has been approved by the appropriate state regulatory authorities.

For more information on mosquitoes, WNV cases and distribution in Kansas, and personal protection visit: <http://www.oznet.ksu.edu/westnilevirus/>

Ludek Zurek

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned.

Sincerely,

Robert Bauernfeind
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Ludek Zurek
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