Kansas State University Extension Entomology Newsletter

For Agribusinesses, Applicators, Consultants, Extension Personnel & Homeowners

Department of Entomology
123 West Waters Hall
K-State Research and Extension
Manhattan, Kansas 66506
785-532-6154
http://blogs.k-state.edu/kansasbugs/
http://www.entomology.ksu.edu/extension

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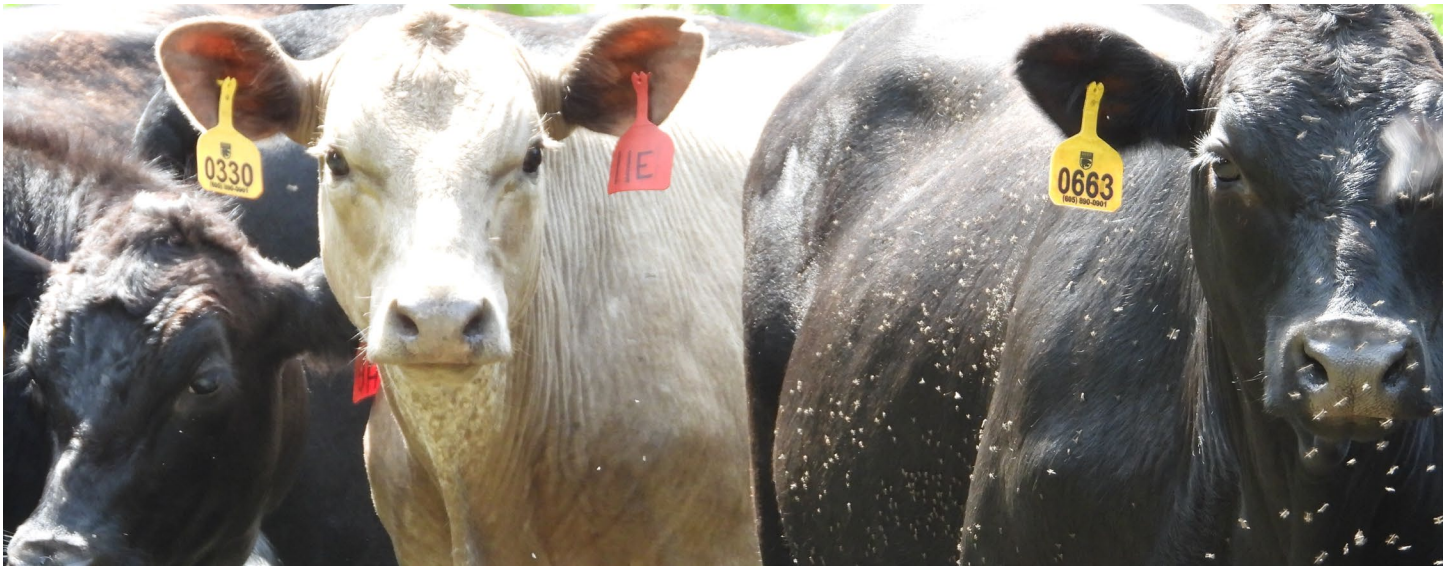
Learning Corner

- Insecticide rotation for veterinary pests

LEARNING CORNER

Insecticide rotation for veterinary pests



Studies have repeatedly shown that Kansas has some of the most insecticide resistant fly populations in the nation. How does this happen and what can be done about it?

All organisms naturally acquire changes in their genetic code over time, these changes can sometimes make an organism better able to survive. This change is passed onto the next generation through their offspring.

With each generation, the organisms with the mutation spread and become dominant within the population. When a pesticide is used repeatedly, any mutations allowing the insect to survive the toxic effects will not die. These insects will go on to breed and the next generation will all share the resistance mutation. Behavioral resistance occurs when aversion behaviors (learned or based on repellency) result in pests changing their preference and not coming into contact with the host in the same manner as before. The more often the pesticide is used, the stronger the selection pressure is and the faster the mutation will be fixed in the population. If you use a pyrethroid (IRAC group 3A), the chemical interferes with sodium gated ion channels while if you use an organophosphate (IRAC group 1B), the acetylcholinesterase enzymes are targeted. Macrocyclic lactones (IRAC group 6) on the other hand target glutamate-gate chloride channels. Alternating annually between groups means that the selection pressure is not too long on any one method of action. For veterinary pests, alternating between pesticide groups annually is recommended to slow this spread of resistance. Products of different formulations (back rubber, pour-on, ear tags etc.) can be used conjunction if they belong to the same group. For example, pairing Permectrin CDS pour on with an Python II ear tag can be done because active ingredients in each belong to the pyrethroid groups 3A. Pairing Permectrin CDS with a Corathon ear tag is not recommended because Corathon ear tags contain an organophosphate (group 1B) active ingredient. More information on active ingredient IRAC group codes can be found here (https://irac-online.org/mode-of-action/classification-online/) and lists of available products can be searched for using the veterinary entomology database (https://www.veterinaryentomology.org/vetpestx).

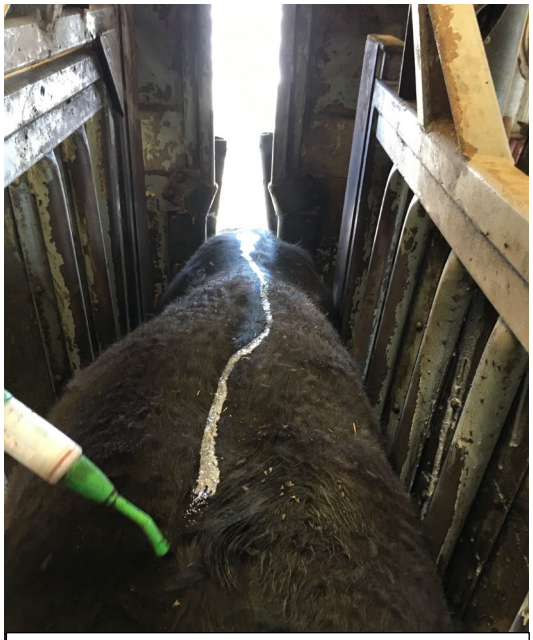


Figure 1. Ensure full coverage of pour-ons from neck to tail (Dr. Tarpoff).

Other best practices include getting accurate weights for animals when using a pour-ons. Underdosing larger animals will promote the rate of resistance developing as flies will be exposed to sub-lethal doses. For pour-ons, ensure full coverage along the full length of the back (Figure 1).

Ear tags should be placed directly into the ear and not daisy chained onto other tags. For ear tags to work, they must come into direct contact with the animal's skin. Daisy chaining allows very little surface area contact between tag and animal. Although often labeled for multiple months of use, field trails have shown that ear tags provide 90-100 days of protection. If possible, remove ear tags after this period to reduce exposure to sub-lethal doses of chemical. Do not tag bulls as their neck range of motion isn't enough for tags to be successful. Tag both ears to allow product coverage on both sides of the animal.

HOME

Sincerely,

Cassandra Olds
Assistant Professor
Veterinary Entomology
Phone: (785) 706-8599
e-mail: colds@ksu.edu

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