



Cleanup, precautions dramatically lower

By Barbara M. Kizer, DVM

Outbreaks in the last several years of bluetongue virus, West Nile virus, and vesicular stomatitis (VS) virus in Wyoming were all transmitted by flying insects.

In 2005, I investigated livestock cases in the VS outbreak and noticed the VS-affected ranches had higher numbers of flying insect pests than the unaffected ranches.

After many ranch visits across Wyoming, a pattern emerged.

Affected ranches typically had any combination of tall grasses, weeds, standing water, piles of decaying hay/manure/wood, man-made structures, and junk piles that served as insect breeding and hiding places. All of these properties had a high number of flying insects. The mitigation methods described reduced pest species but did not affect beneficial insects.

A few months after the VS outbreak ended, I purchased a ranch in eastern Wyoming that surprised me with not a few but ALL of the ideal insect breeding grounds listed above. My first spring was unbearable for both humans and animals. Name an insect pest and I can guarantee it was here in quantity. I went to work immediately researching flying insect behaviors and life cycles. After the research, I began locating and destroying insect breeding grounds that most likely were breeding grounds for insect pests.

There were many.

After sleuthing out the insect breeding grounds and applying the

methods below, I reduced the flying pest load to where spraying is an effective option.

This article is to help livestock owners understand the basic principles of insect control at the breeding ground level. Also offered are low-environmental impact and cost-effective methods to kill the problem insects before they grow to the adult (disease transmitting) stage.

Insect Breeding Grounds

Many populations of biting, flying insects do not fly far from the larval breeding habitat or into the open. High insect numbers will remain unnoticed as they stay in a small area. Animals walking into these areas are then swarmed by insects in high numbers.

Other flying insect populations travel great distances covering entire ranch areas.

With such varied flying insect behaviors, the reduction of breeding grounds will reduce all sorts of flying insects dramatically over an



Discarded tires can be breeding grounds for many flying insect pests.

entire ranch area. For example, the common Western gnat, *Culicoides variipennis*, was the subject of an experiment in Australia that involved the destruction of one huge larval breeding site with one-time spraying for adults. This reduced the summer gnats on cattle by more than 99 percent. Spraying only for the gnats would have been ineffective. The breeding ground would have only produced more flying adults. This is why destroying the insect breeding grounds is so important.

Gnats – Breeding Habitat

Gnats breed and grow in anything, from beach sand to muck, freshwater or saltwater sites, lakes, streams, puddles, and grasses. Many of these species breed in rotting plant material or even a puddle in an oil slick. Some species breed only in cattle, horse, or sheep dung. Either way, the end result is many adult gnats.

Mosquitoes – Breeding Habitat

Water is the main ingredient for the breeding of mosquitoes. Small pools can breed large numbers of mosquito larvae. In the aftermath of Hurricane Katrina, there were up to 2,000 mosquito larvae counted in each water-filled discarded tire examined.

Areas that stay wet, such as dense weeds and grasses, also support mosquito breeding.

If left undisturbed, these wet areas provide a continuous breeding



flying insect pests on your property

ground for mosquitoes throughout the summer months.

Flies – Breeding Habitat

Flies share similar breeding habitats as gnats, with the addition of putrefying carcasses.

Overwintering/Hiding of Gnats, Flies, and Mosquitoes

Flying insects hide as a survival tactic; it keeps them out of reach of predators. Any nook and cranny is a potential hiding place. Those that survive into autumn seek warm hiding places. If protected from freezing, the insect survives to breed again in spring. Minimizing these warmer hiding areas will reduce next year's breeding insect population.

You can take steps to dramatically reduce the number of the flying insect pests on your property.

Materials in Pasturelands

Complete removal and proper disposal of debris is recommended to allow grazing and mechanical mowing. Spraying these places with insecticide is ineffective; removal is required (no, you won't "need that later").

Remove:

- Accumulated brush, downed wood, and standing dead trees from tree windbreaks. Leave only live trees and standing bushes.
- Years of tumbleweed debris and old wooden fence posts accumulated against fences.
- Old equipment that hasn't been moved/used in years.



Stored, undisturbed items are excellent breeding grounds for flying insect pests.

- Piles of lumber, brush, and fence posts.
- Old manure and hay piles.
- Dead grass and weeds accumulated in ditches.
- Old hoses, pipes, culverts, or containers lying on the ground.
- Piles of broken concrete.
- Piles of tangled fence wire.
- Abandoned vehicles.

Ranch Structures

The climate in Wyoming has a tendency to weather structures rapidly. This creates many spaces that harbor flying insect pests.

For ALL outdoor wooden structures, remove contents and dispose of unneeded items, especially cloth. Sweep up debris. Spray inside and outside of walls with residual insecticide (pyrethrin- or malathion-based). Read and follow label instructions carefully. Contact your local University of Wyoming Cooperative Extension Service county office (contact information is at <http://ces.uwyo.edu/COUNTIES.asp>) and/or county weed and pest control district (www.wyo-weed.org/addresses.html) for further advice about specific products. The most effective spraying of buildings is in the spring, just before the overwintering insect adults emerge to breed.



- These structures include:
- Sheds with many unused, piled items stored inside for years.
 - Abandoned houses beyond repair: If used as a shed, gut interior to make a single-walled structure. If abandoned house is not able to be used, knock down or burn building in winter. Local fire departments are often happy to use the buildings for training. Remove remaining debris and cover with soil to ground level.
 - Weathered wooden windbreaks.
 - Older wooden barns – eliminate double-walled areas as practical. Repair patched areas of walls so they are as close to original construction as possible, eliminating a layering effect.
 - Double-walled construction of outbuildings – spray between the walls, where accessible.
 - Underground structures (potato cellars, spring houses, well houses, etc.) – periodically open room to allow drying of interior.

Water Treatment

The ideal is to drain and physically brush/wipe out water tanks every week. This removes and kills mosquito larvae before they turn into flying adults.

The same area after debris was cleared. Flying insect numbers decreased dramatically.

Where draining tanks weekly is not possible, the water may be treated by filling a small hand pump sprayer with a mixture of one-half water and one-half vegetable oil (for example, canola or peanut oil). Before using, shake the bottle to break the oil into droplets. LIGHTLY mist the surface of the water tank. It does not take much oil to block the breathing apparatus of the mosquito larvae and smother them. This needs to be done weekly to kill the larvae before they mature into adults.

Alternatively, a piece of cheesecloth attached to a wire loop with clothespins can be used weekly to skim larvae off the water surface, much like a swimming pool skimmer. The cloth can then be discarded with the larvae inside.

Other Benefits of Control

Removal of flying insect pest breeding and overwintering grounds

decreases their numbers at the source and minimizes their numbers throughout the warmer seasons. Thus, insect control on livestock is more effective, and the chance of acquiring disease from insect vectors is reduced.

There are other benefits to the removal of gnat/fly/mosquito breeding and overwintering environments. It reduces the breeding/overwintering grounds and food supply of other nuisance species such as mice, ticks, deer flies, bot flies, spiders, moths (millers), skunks, and other pests.

These suggestions will decrease insect stress on livestock, contributing to overall rate of gain. There will be more useful areas of pasture and ranch space, increasing overall property values. Also, the reduction of biting insects is a step toward improving relationships with next-door neighbors.

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