



Tips for Mosquito Control

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This year is the third year that West Nile Virus has been a concern for horse owners and others in Illinois. By now many of you have heard the hype about controlling mosquito populations, as they are the transmitters of the virus. It is much more than just hype though. Mosquito control is an extremely powerful tool in the reduction of the number of cases of West Nile Virus in horses, but more importantly in humans as there is no human vaccine for West Nile Virus. Therefore, each of us has a responsibility to ourselves and our neighbors to implement mosquito control practices.

One of the most common mosquitoes in Illinois is the *Culex pipien*, or house mosquito, which bites from dusk to dawn. The *Culex* is the main carrier of West Nile Virus, in addition to St. Louis encephalitis. The *Culex*, like all other mosquitoes goes through four separate stages of its life cycle: Egg, Larva, Pupa and Adult. *Culex* species lay their eggs at night on the water surface and stick them together to form a “raft” of up to 300 eggs. A raft of eggs looks like a speck of small soot floating on the water approximately ¼ inch long and 1/8 inch wide. Most eggs hatch into larvae within 48 hours and the larvae live in the water from 4-14 days depending on water temperature. They hang upside down from the water surface so that they can breathe. During this stage, the larvae feed on microorganisms and organic matter in the water. The pupal stage is a non-feeding, resting stage of the life cycle. Pupae are mobile, responding to light changes by moving (tumbling) with a flip of their tails toward protective areas or deep water. The pupae are very easy to see in the water, as they are so reactive to shadows appearing on the water’s surface. Depending on species and temperature, the mosquito pupae will live in water from 1-4 days. At the end of the pupal stage, the pupal skin splits and the adult mosquito emerges which will rest on the water surface for a short time allowing its wings to dry so that it can fly. *Culex* mosquitoes usually only live for a few weeks during the warm summer months. However, they are capable of “hibernating” in warm, sheltered areas (heated garage, barn or house) through the winter months and laying eggs the following summer. There are two general categories of mosquito control: physical control and biological control. Physical control is a very effective method of controlling mosquitoes because it eliminates their breeding sites. Mosquitoes reproduce in as little as two tablespoons of water and under ideal breeding conditions that small amount of water only needs to exist for a mere 5 days for adult mosquitoes to develop.

There are many simple steps you, as a homeowner, can take to eliminate mosquito breeding on your property.

- Eliminate all unnecessary sources of standing water on your property. This includes, old tires, tin cans, bottles, buckets, unused swimming pools, or anything that can hold even the smallest amount of water.
- Clean clogged gutters and remove standing water under or around structures. Check around faucets and air conditioner units and repair leaks or eliminate puddles that remain for several days.
- Do not let water accumulate in the saucers of flowerpots, cemetery urns or pet dishes for more than two days.
- Change the water in birdbaths and wading pools at least once a week
- Cover boats and wheelbarrows with a tarp or store them upside down.
- Fill in holes or depressions on your property that hold water.
- Drain water from pool covers and tarps covering other equipment, etc
- Increase water movement in ponds, water gardens and pools.

Biological control of mosquitoes is also a necessary part of a complete mosquito control program. Biological control includes stocking ornamental pools/ponds and livestock tanks with top feeding predacious fish. This includes minnows, goldfish, and *Gambusia affinis* (related to guppies) also known as “mosquito fish”. One small fish can eat up to 100 mosquito larvae a day. *Gambusia* are aggressive fish that eat other fish and should not be released where they can escape into natural bodies of water. Koi and other bottom feeding fish are not effective in controlling mosquito control as mosquito larvae live on the water’s surface. It is also important to note, that none of these fish are not effective at eliminating mosquito larvae when dense vegetation is present as it provides cover for the larvae and makes it difficult for fish to locate and eat them.

A second biological control mechanism is using a natural larvicide. There are two that specifically target mosquito larvae, *Bacillus thuringiensis israeliensis*, abbreviated Bti, and *Bacillus sphaericus* (Bs), which may work better in the dirty water sources that the *Culex* species prefers. Bti and Bs are natural insecticides that kill only mosquitoes and flies. When



larvae ingest the Bti, the toxin reacts with stomach secretions and causes gut paralysis and death. Bti and Bs are non-toxic to fish, pets, people, livestock and plants. If used according to label directions, it is an excellent method of mosquito control in livestock troughs. Additionally, research has shown that Bti and Bs have no detrimental effects on beneficial insects such as honeybees or on aquatic insects such as mayflies and dragonflies. Both larvicides come in two forms (granular and solid) and both are usable wherever mosquitoes breed. Many hardware or farm and garden stores carry these products which are sold under the brand names Mosquito Dunk, Mosquito Bits, Aquabac, Teknar, Bactimos, Vectobac among others

Still another biological control mechanism is through the use of products containing S-methoprene insect growth regulator, which also controls mosquitoes before they can become adults. This granular product kills the mosquito in the pupal stage rather than in the larval stage. When used as directed S-methoprene will not adversely affect, humans, animals, fish or vegetation according to the product labeling on two of the brand name S-methoprene products Pre-Strike and Altosid.

There is also anecdotal evidence of a home remedy that is effective in the control of mosquitoes in water sources. Putting a few tablespoons of mineral oil in your water source many kill many mosquito larvae. You need enough oil to create a thin film across the entire surface of the water. The oil prevents the larvae from being able to breathe causing them to suffocate. Livestock usually will still drink from the water, so it is a great mosquito control method for stock tanks. However, adding oil to the water is not healthy for fish.

Recently another method of larval control has become available. The LarvaSonic is an acoustic larvicide system. Sound energy transmitted into water at a high enough frequency ruptures the air bladder of the mosquito larvae resulting in major tissue damage and death.

It is important to know that some insect control methods are not very effective for mosquitoes. This includes bug zappers and ultrasonic buzzers. In fact, in many cases it seems that the light given off by bug zappers actually attracts more insects to the area than if the unit had not been used.

Bats and various birds such as purple martins are recognized for their mosquito control capabilities. However, there is great skepticism that bats and birds do an adequate job of reducing mosquito populations.

The above mosquito control mechanisms will reduce the incidence of West Nile Virus in both horses and humans by reducing the mosquito population, in addition to making backyard activities much more enjoyable in the absence of these nuisances.

