

Considerations for Community Mosquito Control in Wisconsin

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Mosquito control is an involved process. Presently there are very few communities in Wisconsin that treat for mosquitoes. The type of control program needed will depend on the types of mosquitoes, the habitat, budget, and if you are treating for nuisance mosquitoes or mosquitoes that transmit diseases. Programs developed in other states may not be suitable—you need to know the local situation. Survey work must be done to properly design a control program.

Fifty three different species of mosquitoes have been recorded in Wisconsin. To understand the problem you need to find out what species are locally active. Once you know which species are present you will know what type of water environment the mosquitoes require to breed, when they will be active, how far will the mosquitoes fly from the breeding habitat, and if the species involved are capable of transmitting human diseases.

It takes mosquitoes 10-14 days to go from egg to adults during the summer. We do have some species that overwinter as adults, so mosquitoes can be found any time during the year. Adults on average live 4-6 weeks. **Rainfall patterns will be the single most significant factor in affecting populations with flooding rains triggering a hatch.** Over 90% of the mosquitoes come from less than 10% of the available water. Lakes, permanent ponds with fish, and streams are usually not serious breeding sources. Floodplains and temporary water sources are usually the source of most problems.

As a rule, adult mosquitoes are not active when wind speeds are above 10 mph, during mid day (there are some exceptions) or temperature below 55 degrees. Adults hide during the day in sheltered, shady sites and lush vegetation and become active during low light, calm winds and warm humid conditions. The mosquito season ends after three significant freezes in the fall.

The biggest concern for disease transmission includes the container breeding mosquitoes in the genus Culex. They breed on tin cans, old tires, bird baths, storm sewers, polluted waters, and open septic systems. Culex mosquitoes can go through multiple generations and adults show a preference for feeding on birds. These mosquitoes fly only short distance from where they breed, but will readily come indoors. This group is important for the transmission of St. Louis Encephalitis, Western Equine Encephalitis, and West Nile Virus.

Most of the major nuisance mosquitoes are in the genera Aedes and Ochlerotatus. Many of these mosquitoes breed in temporary flooded areas after heavy rainfalls and spring

snow melts. As a group they are fierce biters, and adults can fly 20 miles or more from their breeding sites. They do have some importance as vectors of Eastern Equine Encephalitis. Some species are capable of transmitting West Nile, but they are not very efficient and only become important during an epidemic. These are the major pest mosquitoes in Wisconsin. Because they breed in flood plains, drainage ditches, and other temporary water situations and fly such great distances, we find many times the breeding source is miles away from the area with mosquito are problems. Some of the more important mosquitoes in more southern states--like the Asian Tiger Mosquito--are not found in Wisconsin.

The most important aspect in reducing West Nile Virus in humans is public education. Reducing breeding sites such as bird baths, old tires, clogged drain pipes and eaves troughs will knock down the number of Culex mosquitoes. Because Culex mosquitoes are most active at dawn and dusk, reducing time outdoors during times of activity or wearing long pants and shirts and applying mosquito repellent to exposed skin will lessen the chance of contacting the disease.

Controlling mosquitoes:

You must contract with a certified applicator or be certified and licensed with the Wisconsin Department of Agriculture(WDATCP) to apply products for mosquito control in Wisconsin. Any public waters that are treated also require a WDNR permit.

Adult mosquitoes - This form of control is called adulticiding. Materials are applied as ground or aerially treatments and use contact type insecticides that are fogged, sprayed or misted (ULV treatments). They must contact the mosquito and generally have no residual. What they do is clean out the mosquitoes in an area. Proper timing of treatment is from sunset to 1 a.m. when mosquitoes are most active. An early morning alternative between 5-6:30 is used in areas that do not allow the dusk treatment. This is a temporary treatment as new populations of mosquitoes can move into the area within hours. Ultra-low volume (ULV) is the most efficient but requires special training in the use and maintenance the equipment. The size of the droplets is critical for effective and legal treatments and equipment needs to be re-calibrated each season. Poor maintenance can result in misapplication of an insecticide. Ground treatments are best applied at temperatures between 60-85 °F and with little or no wind.

Adulticiding is the treatment of choice in emergency situations. It can be expensive, and many communities have moved away for this type of treatment during the past 20 years. Even when there are human health issues the use of sprays for adult control is controversial with some people not feeling comfortable with these treatments. Potential questions of proper use, drift, liability, and toxicity issues often become part of a public debate, Adult sprays do not address any long term solutions to mosquito activity in an area.

Larvacides are products applied to breeding sites and kills the immature stage of mosquitoes. There are oils, surface films, bacteria, insect growth regulators and organophosphate insecticides used for these types of treatments. Overall the choices among larvacides include far more environmentally selective products. The key is to identify and monitor active or potential breeding sites and treat when needed. Residuals can last from 7-30 days depending on product and site. Various formulations including liquids, granules, pellets and briquettes are used in different situations. This requires having breeding sites identified and being prepared before the onset of a problem. Because some breeding sites can be outside the jurisdiction of a community, the most effective programs are organized on an area wide basis.

All potential water sites should be identified and monitored for activity. This includes storm sewers, culverts, and drainage areas. The only way you can assess if a water source is a breeding site is to look for mosquito larvae. Sites should be inspected and monitored during the breeding season. Surveying and mapping will identify the prime areas needing treatment or modification in the future. Ground sampling may rule out wetlands and other areas that may seem to be a problem but in reality are not good mosquito breeding sites. Monitoring will eliminate wasting treatments on sites that are not important in the overall mosquito populations for an area. It is important to know what species of mosquitoes are present when choosing control options. Private firms can be hired to help a community with mapping and monitoring.

Water management - Temporary water sites--even as small as a boot print filled with water--can breed mosquitoes if water remains for more than 7-10 days. Proper drainage that prevents water from pooling is important. If areas dry up before 10 days larvae will die. Permanent water that has fish activity is usually not a good site for breeding. Fluctuating water levels promote more mosquitoes than more constant water levels. Spring flooded woodland ponds and river flood plains are often the most critical sites for breeding. Shallow water is better mosquito habitat. Retention ponds should have vegetation removed from the margins and banks should be steep (ratios of 3:1) to help reduce mosquito numbers. For permanent water consider adding top feeding minnows to help reduce mosquito numbers. Gambusia mosquito fish are not native to Wisconsin and should not be used here. They would require a WDNR permit for release and it is unlikely they will grant the permit.

Communities need to take time to evaluate what is in their best interest as far as any involvement in mosquito control. Even with highly organized abatement programs people still contract diseases such as West Nile Virus. Historically, Wisconsin has not had major outbreaks of mosquito transmitted diseases and had a much lower disease count than the states around us in 2002. When outbreaks do occur it is important for a community to assess carefully the local situation and make decisions on mosquito control based on sound, effective solutions.