Alaska
Mosquito and Biting Fly
Pest Control Manual

Category Ten

In general, applicators who apply pesticides to property other than their own must obtain certification from the Alaska Department of Environmental Conservation (DEC) Pesticide Program. Applicators who apply restricted-use pesticides, regardless of location, must also be certified.

All individuals who apply pesticides on land to control mosquitoes or biting flies must be certified by the DEC in the Mosquito and Biting Fly Pest Control Category (Category Ten). Individuals who intend to apply pesticides to water as part of mosquito control must be certified in Category Six, Aquatic Pest Control. Certification in Category Ten does not authorize an applicator to apply to any type of water, no matter how limited in size.

The information needed to successfully complete the written core examination required for all certified pesticide applicators in Alaska includes:

1. National Pesticide Applicator Certification Core Manual;
2. Alaska Core Manual; and
3. State of Alaska Pesticide Regulations in Title 18, Chapter 90 of the Alaska Administrative Code (18 AAC 90)

The information needed to successfully obtain certification in Category Ten in Alaska is included in this Alaska Manual.

Learning Objectives

General

- Explain when and what types of permits are required from DEC for applying pesticides.
- Describe which common types of mosquito control activities require a different category of certification and are NOT allowed under Category Ten certification.
- Explain why mosquitoes do not transmit diseases in Alaska.
- Describe the disease tularemia, and list carrier insects.
- List the main four types of biting insects found in Alaska.

Flies

- Describe the four life stages of a fly.
- Describe the identification, biology, development, behaviors, and damage of various types of flies.
- Explain why identification of the species of fly is needed to achieve adequate control.

Mosquitoes

- List the two genus of mosquitoes found in Alaska.
- Describe the four life stages of a mosquito.
- State how far some mosquitoes may travel from the water source where they spent their larval stage.
- Explain why identification of the species of mosquito is needed to achieve adequate control.
- Describe the characteristics of environments that Culiseta mosquito larvae typically inhabit.
- Describe the characteristics of environments that Aedes mosquito larvae typically inhabit.

Controls

- Describe some non-chemical control measures that can help prevent development of biting flies.
- Explain reasons why adulticide applications are not effective.
- Describe barrier treatments.
- Explain why larval controls are not authorized under this certification.
- Describe which type of area-wide biting fly controls can be initiated under this certification, and the additional permits required.

Misters

- Explain why the use of residential misters is discouraged.
- Describe precautions required when installing residential misters.
- List the types of monitors that are required on each automatic insect mister.

CALCULATIONS

Precise calculations related to mosquito and biting fly pesticide applications are necessary. Applicators in this category are expected to have very strong math skills. Applicators must be able to calculate odd shaped areas, mixing ratios, rates of application, etc. to successfully pass the Category Ten Exam. You will need to carefully review pages 164-165, and 190-192 in the National Core Manual. Additional resources for pesticide applicator math are available online from the Purdue Pesticide Program.

INFECTIOUS DISEASES CARRIED BY INSECTS IN ALASKA

Outside of tropical areas, mosquitoes carry relatively few viruses. The main mosquito-borne viruses prevalent in the United States are various types of encephalitis and West Nile Virus, although other diseases are becoming more prevalent recently. Due to a variety of factors such as environmental conditions and absence of specific mosquito carrier species, these viruses do not currently occur in Alaska.

Tularemia is present in Alaska, although it rarely presents any human health problems. Tularemia is a bacterial disease that causes flu-like symptoms and other problems, and can be fatal if untreated. It can occur in hares and other small mammals in Alaska, and is sometimes, although rarely, transmitted to humans or pets. It can be carried by black flies, biting midges, and deer flies.

Because few infectious diseases are transmitted through insect vectors in Alaska, mosquito and biting fly control is implemented primarily to reduce nuisance insect populations. Large scale mosquito and biting fly control, such as aerial or village-wide spraying is rarely carried out in Alaska.

PERMIT REQUIREMENTS

All applications of pesticide to water bodies require a pesticide-use permit. This includes manmade ponds, seasonally wet areas, and any other type of surface water, regardless of who owns the surrounding property.

Individuals who intend to apply pesticides to water as part of mosquito control must be certified in Category Six, Aquatic Pest Control. Certification in Category Ten **does not authorize** an applicator to apply to any type of water, no matter how limited in size. This includes 'mosquito dunkits' and similar products.

All application of pesticides using aircraft of any type requires a pesticide-use permit. Individuals who intend to apply pesticides aerially must be certified in Category Eleven, Aerial Pest Control. Certification in Category Ten **does not authorize** an applicator to apply pesticides aerially.

Application by a government entity to more than one property requires a both a pesticide-use permit and specific permission from each land owner. One example of this would be spraying along the roads of a village with a truck mounted sprayer.

As a result of the permit requirements noted above, essentially all community-wide control efforts will require a Pesticide Use Permit. Please refer to the Alaska Core Manual for further information regarding permits.

Permits are required for all pesticides that are applied:

- By aircraft (by anyone)
- To any type of water body (by anyone)
- To more than one property (by government entities)

BITING FLIES

Flies belong to the order Diptera, which is one of the largest and most variable orders of insects. Adult flies are characterized by having only one pair of wings and one pair of halters (small knoblike structures located behind the wings). Alaska is home to four main categories of biting flies; black flies, deer flies, biting midges, and mosquitoes. The first three are addressed in the following section; mosquitoes are addressed separately in their very own section.

Around the world, flies create some of the most common public-health insect problems, but in Alaska there are few fly-borne diseases present. Non-biting, or nuisance flies can be a problem to people in their work, home, or recreational environment. However, this category addresses only biting flies.

Developmental Stages

All flies go through a series of stages, beginning with eggs, and developing through larval and pupal stages before fully grown adults emerge. Each type of fly has a specific habitat in which it lays eggs, into which larvae will hatch. All biting flies in Alaska lay eggs in moist or wet areas.

In many species, large numbers of females deposit eggs at the same location, resulting in large egg clusters and concentrations of larvae.

The larvae of most flies are legless, cylindrically tapered maggots with a pair of mouth hooks at the tapered end, and a pair of breathing spiracles at the blunt end. Larvae are often identified by the characteristic shape of the posterior spiracle. The mouth hooks are used primarily for tunneling. Larvae may secrete enzymes to liquefy their foods. Larvae go through several instars, or moltings before they develop into pupae.

During the prepupal stage, the larval skin contracts and hardens into a protective shell for the fly developing within. This shell is usually capsule-shaped and brown. After undergoing metamorphosis the fly escapes the shell. Newly emerged flies have shriveled wings and are usually pale and soft-bodied. They do not acquire their typical colors and shape until they have had sufficient time to dry and harden. Flies that pupate under soil are able to reach the surface even after being buried under several feet of moderately packed soil.

Many nuisance flies have lapping-sponging mouthparts that require all solid food to be liquefied before ingestion. However, biting flies are blood feeders. They have specialized piercing-sucking mouthparts. In some groups both sexes feed on blood, whereas in others only the females do so. Flies may have more than one generation per year, which varies widely between species and depending on environmental conditions.

Life Cycle and Habitat

Black Flies

Alaskan black flies are in the *Simulid* family. They are also called buffalo gnats or white sox, after the white stripes on their legs. These insects crawl under clothing or near the hairline to bite the skin with blade-like mouthparts. The anticoagulants pumped into the wound to aid the fly in sucking blood may cause an itchy, swollen bump that persists for over a week. Only the females are capable of taking a blood meal.

Black flies release their eggs during flight, dropping them into flowing waters. The eggs settle to the bottom and accumulate in slower moving areas such as eddies or pools. Some eggs are laid on rocks or other objects over which water flows. Eggs may hatch within a few days or may not hatch until the next spring, depending on conditions and species. Eggs can survive even when the streams dry up, but will hatch soon after the water reappears.

Black fly larvae attach themselves to vegetation, stones, or sticks that trail in the water. Although most of the species prefer turbulent streams, a few are more abundant in slow-moving streams. Large brushes near the mouth screen food from flowing water. The food is largely bacteria, algae and protozoa.

After several moltings, the mature larvae spin a slipper-shaped cocoon that is attached to rocks, vegetation or other surfaces. Within the cocoon the larvae transform into pupae. In a few days the pupae develop into adults.

Adult black flies emerge from the cocoons and rise quickly to the surface of the water. They have large flight muscles which makes them strong fliers; newly hatched black flies can immediately fly away from the water. They disperse rapidly, and commonly fly a mile or more.

Some species have a single brood each year that may emerge very early in the spring or in early summer. Species that produce several broods each year may be found in warmer streams.

Deer flies

Deer flies belong to the family *Tabanidae*. They are large flies, ¼ to ½ inch long, with broad heads. Deer flies have bulging eyes that are often brightly colored. Tabanid bodies range from green to tan and black. Their wings often have a characteristic light and dark pattern. Their bites are painful, and some species are vectors for tularemia. Only the females are capable of taking a blood meal, which is necessary before they can reproduce.

Female deer flies deposit an egg mass on plants, rocks, sticks, or other similar objects which are located near water. Upon hatching, the larvae burrow into mud or moist earth and begin feeding. They are often associated with moist situations such as marshes, swamps, and shorelines of lakes and ponds. Deer fly larvae feed primarily on decaying organic matter. The larvae may molt more than 10 times before pupating and emerging as adults.

Adults are often found around the larval habitat, but they are strong fliers and may move considerable distances to find food. Both sexes feed on plant nectar and pollen to obtain energy, but the female must feed on blood to be able to develop eggs. Depending upon the species and climate, there are usually one or two generations per year.

Biting Midges

Biting midges belong to the genera *Culicoides* and *Leptoconops*. They are often called no-see-ums, punkies, or sand flies. These tiny flies are small enough to go through the mesh on head nets and tent screens, and can cause a painful bite. Like other biting flies, only the females feed on blood. Several species of biting midges may be vectors of tularemia.

Biting midges breed in areas that are moist or occasionally flooded, including fresh, brackish or saltwater areas. Specific species are often associated with specific types of grasses or vegetation. Intertidal areas along the coasts are especially common habitat for biting midges.

MOSQUITOES

There are approximately 3,500 species of mosquitoes in 37 genera. Mosquitoes live in almost any climate, including Alaska. There are approximately 35 different species of mosquito known in Alaska. The most common mosquitoes belong to the genus *Aedes*. Mosquitoes of the genus *Culiseta* are also present, and are often the first to emerge in spring.

Order: Diptera (flies)
Family: Culicidae
Subfamily: Anophelinae
Genus: Aedes
Genus: Culiseta

Most people are familiar with the appearance of mosquitoes and the itchy bumps caused by their bites. Both males and females feed on plant nectars. Only the females are capable of taking a blood meal, which ensures larger egg clutches.

Developmental Stages

A single female mosquito may lay up to 3,000 eggs, with up to 80 percent hatching. Mosquito eggs are white in color when first deposited but darken within 12 to 24 hours. Most species' eggs appear similar when seen by the naked eye. When viewed with magnification, eggs of different species can be seen to vary in shape. Some species lay eggs singly, and others glue them together to form rafts. The incubation period (time between when eggs are laid and when they hatch) varies with species and is also influenced by environmental factors. All eggs require slow moving or stagnant water at some point before hatching will occur.

Based on where they lay their eggs, mosquitoes are divided into two basic categories: floodwater species and permanent water species. Floodwater species deposit their eggs in dry areas that are subject to periodic flooding, such as soil in depressions, areas of marshes that are not always submerged, inside tree holes, or artificial containers including discarded cans, tires, rain barrels, gutters, and other areas where water may accumulate. These eggs need to dry out for a period of time before they will can hatch. Once they have passed through the critical drying time, they may hatch if the area is flooded by snow melt, rain, or seasonal flooding. Eggs may accumulate over time as more eggs are laid and await the right conditions for hatching. When temporarily flooded, all the eggs hatch at once, which can rapidly increase populations. Some species have eggs which require freezing temperatures in order to hatch. They produce one to several generations annually. In most floodwater species the adult mosquitoes die off during winter, but the eggs survive to hatch the next year.

Standing water species deposit their eggs on the surface of permanent pools of standing water, including lakes, ponds, and wet areas of swamps. Eggs are deposited either as single eggs, or in rafts of several hundred eggs. These eggs will not survive being dried out. Eggs may hatch in one to four days, depending on temperature. They usually produce several generations each year, and overwinter as mated, engorged females.

The larvae of all mosquitoes live in water, usually near the surface. They are often called 'wigglers' in this stage because of how they move in the water. In most species there is a siphon or air tube near the last abdominal segment. This allows the larvae to breath while remaining below the surface of the water. Mosquito larvae hang with their heads down. The brushes near their mouths filter the water for algae, plankton, fungi, bacteria and other microorganisms.

Depending on the species and environmental conditions, mosquitoes may take anywhere from a few days to several weeks to complete larval development. During the larval stage, the mosquito will shed its skin, or molt, four times. Each of the periods in between the molts is called an instar. Towards the end of the fourth instar the mosquito larva stops feeding as it prepares to become a pupae.

The pupal stage of the mosquito is also aquatic. The mosquito pupa is shaped like a comma. They generally float near the surface, but can be very active when disturbed. They are often called "tumblers" because of their rapid, tumbling movements. Mosquito pupae breathe through two respiratory "horns" when at the water's surface. They do not feed at this stage. They typically transform into adults in two or more days. Once it is developed, the adult mosquito splits the pupal case and emerges to the surface of the water, where it rests until its body dries.

Female adult mosquitoes have piercing-sucking mouthparts. They feed on plant nectar and animal blood. They use the sugar meals for energy, and the blood meals for egg development.On male adult mosquitoes the mouthparts are modified to suck nectar and plant secretions only; they are not capable of piercing skin to suck blood.

The adults of some species remain within a few hundred feet of where they spent the larval stage, but others may migrate up to 50 miles or more. A few days after females take a blood meal they begin to develop eggs. Mosquitoes live for varying amounts of time depending on the species. Most floodwater species die off during winter months, while some standing water species hibernate during winter and emerge in spring. Some species are limited to a single generation per year, while others have multiple generations.

Life Cycle and Habitat

There are many differences in appearance between different species of mosquitoes, which allows for accurate identification. Behavioral differences permit various species to occupy numerous ecological niches with relatively little overlap. Knowledge of the source or breeding habitat of mosquitoes can allow for accurate identification.

Identifying the species of mosquito can be extremely helpful in determining life cycles, feeding preferences, larval habitats, adult resting places, and flight ranges. This information is used to develop effective control strategies.

Aedes

Mosquitoes in the genus *Aedes* lay their eggs singly, usually on damp soil. Eggs can withstand long periods of dry and cold. Adults die off during winter, while eggs remain dormant over winter until spring snow melt or wet weather dampens them and allows them to hatch. Eggs can hatch even when water temperatures are near freezing.

The larvae live in puddles, pools, marshes and other areas of temporary standing water. Larvae can develop and emerge as adults in less than a month, even if water temperatures are very low. Warmer water results in more rapid maturation. *Aedes* are strong fliers and are known to fly

many miles from their larval developments sites.

Culiseta
Mosquitoes in the genus *Culiseta* lay their eggs on the surface of permanent water in rafts of up to 200 eggs. Culisetta overwinter as adults, going dormant under the snow and then emerge to feed shortly after snow melt begins. Snow mosquitoes, big, slow moving mosquitoes that appear when snow is still on the ground belong to this genus. Adults are active in cooler temperatures. Activity declines in warmer temperatures over the mid-70s F.

Some mosquitoes in hibernation have been shown to survive temperatures down to -25 F, as long as they are protected by snowpack. Winters with limited snowpack may cause a reduction in mosquito populations, as the hibernating insects freeze and die and die off. However, mosquito eggs are not impacted by amount of snowpack.

CONTROL OF BITING FLIES AND MOSQUITOES

The use of pesticides for mosquito and biting fly control is only a temporary, short term solution. It is not possible to completely eliminate the next generation of insects, so relying on chemical control means that the process will have to be repeated frequently to achieve any significant reduction in populations.

Preventative measures are more effective and long term solutions for controlling the number of biting insects in an area. Eliminating breeding grounds is a very effective way to reduce the number of adult mosquitoes that become a nuisance. Alaska is covered with ponds, lakes, and swamps, so it is not possible to remove all sources of water. However, in specific areas, reducing potential breeding grounds can have a significant impact on mosquito populations. This can include simple source reduction measures such as removing discarded buckets, tires, and other items where water may water collect or raking up leaves. It can also include more complex habitat modification measures such as grading or drainage efforts to reduce potential for water to accumulate in an area.

The application of larvacides to kill immature mosquitoes is typically more effective than spraying adulticides to treat airborne mosquitoes. Larvae are usually concentrated in smaller areas and are relatively immobile compared with adults, which may rapidly disperse over large areas. Larvacides include some types of bio-controls such as diptera-specific bacteria, insect growth regulators, chitin synthesis inhibitors, some conventional types of insecticides, as well as several nonpetroleum oils which smother the larvae.

Most biting flies are capable of migrating significant distances from their breeding grounds to obtain a blood meal. For this reason, it can be difficult to identify the breeding ground where larvae develop. For most of these insects, larval habitat can be large, diverse and ecologically sensitive, which makes treatment even more problematic. Visual observations of adult flies can help determine which species are present, and helps narrow the search for larval habitat.

However, larval populations generally reside in water bodies. Application of pesticides to any type of water body, including temporary puddles, requires certification in Category Six, Aquatic

Pest Control. Applicators certified in Category Ten, Mosquito Control, **are NOT certified to apply pesticides to water**. Application to water also requires the applicator to obtain a Pesticide Use Permit from DEC.

The application of chemicals to kill adult insects is usually the **least efficient** control technique. Use of adulticides should be minimized as much as possible, due to low effectiveness and potential for exposure to people, pets, and other non-targets. If adulticides are used, they should be applied between dusk and shortly after dawn when mosquitoes are active but most beneficial insects are resting. Some labels have limitations designed to protect pollinators, such as prohibiting application near flowering plants. These restrictions must be strictly adhered to. Adulticides labeled for biting fly and mosquito control include organophosphates, natural pyrethrins and synthetic pyrethroids.

A small power mister or hand held fogger can be used to clear a small outdoor area for a few hours. Outdoor sprays can also be applied with fogging attachments on vehicles. However, the pests quickly re-infest the treated areas and the relief is only temporary.

Barrier treatments can be made by applying residual pesticides to the vegetation along property borders. This typically entails applying a high volume, low concentration liquid with hand-held spray equipment.

Insect electrocutors (bug zappers) and other types of insect or mosquito traps commonly claim they can reduce the numbers of mosquitoes or other biting flies in an outdoor setting. Some mosquito traps are designed to mimic a potential mammalian host by emitting a combination of carbon dioxide, heat, moisture, and or an attractant such as octenol, to lure in biting flies. There is little scientific data showing that these products are effective at controlling insect populations.

Adult mosquitoes prefer to rest on weeds and other vegetation. Cutting down weeds, mowing the lawn regularly, and reducing vegetation near houses can reduce the number of areas where adult mosquitoes can find shelter. Insecticides may be applied as coarse sprays to the lower limbs of trees, shrubs and other vegetation to further reduce mosquitoes in a limited area. Products containing synthetic pyrethroids such as deltamethrin and lambda-cyhalothrin have proven effective.

Biological controls are popular in theory because they can be specifically targeted to a pest, with virtually no nontarget impacts. Fish that eat mosquito larvae are the most extensively used biocontrols for mosquitoes. However, none of the fish effective in control of mosquito larvae are suitable for introduction to Alaskan waters. Other predators and parasites of mosquitoes have not been found to be effective for control of mosquito populations.

Black flies are highly susceptible to pesticide formulations consisting of dead bacteria. These products must be applied to the streams where black flies breed, and are consumed by the filter-feeding larvae. However, as noted above, application of pesticides to water requires certification in Category Six and a Pesticide Use Permit; it is not authorized under this category.

Aerial control of mosquitoes or other insects is commonly used in many parts of the country. However, it is impractical in Alaska where potential breeding grounds dominate the landscape. Wide-spread adulticiding is very expensive in terms of manpower, equipment, and quantity of pesticide required. It is also more likely to affect non-target organisms. For these reasons, aerial control of insects is rarely attempted in Alaska. Also, as noted above, application of pesticides by aircraft requires certification in Category Eleven and a Pesticide Use Permit; it is not authorized under this category.

Space sprays, generated by portable Ultra Low Volume equipment, are often used to provide indoor mosquito control in houses, tents, trailers, warehouses, etc. Space sprays are not effective outdoors, where insecticide particles disperse rapidly and may not kill many mosquitoes.

MISTERS

An increasing number of households have purchased timed-release outdoor residential misting systems which spray pesticides in a fine mist to control mosquitoes and other outdoor insects. Misting systems include spray nozzles that are mounted around the perimeter of a home in the lawn or landscaping, or on parts of the house or fence. The spray nozzles are connected by tubing to a supply of insecticide. Some misting systems are turned on at preset intervals using a timer, while others are turned on manually. Misting systems typically spray pyrethrins or permethrin, often along with piperonyl butoxide.

There are a number of concerns over the use of residential misting systems. As noted above, adulticides are not particularly effective in controlling mosquitoes and other biting flies. EPA has stated concerns over the effectiveness of misting products, and have required manufacturers to provide efficacy data. The American Mosquito Control Association also states a number of concerns, and does not recommend their use. Timed applications may result in pesticides being sprayed when conditions are not appropriate, such as during high winds or rain events. Pesticides may also be dispensed when people or pets are present, representing an exposure risk particularly through inhalation of fine mists. Timed applications also result in pesticides being sprayed when outdoor activities are not planned, and thus control is not needed, or when pest density does not warrant control. Unnecessary spraying can contribute to the development of insecticide resistance. Poor siting of nozzles can result in pesticide drift onto other properties. Pesticide reservoirs or delivery systems may develop leaks that go unnoticed. Beneficial insects and other non-target organisms may be impacted. For these reasons, residential misting systems are not recommended.

DEC strongly discourages the use of automatic misting systems. However, if one is to be installed and used, great care must be taken. Certified applicators who install or maintain such systems may be liable for any label violations or negative impacts that occur due to use of the system.

- Place nozzles at the interval required by label instructions.
- Install nozzles less than 10 feet from the ground to reduce drift of pesticides. Allowing pesticide to drift off target is prohibited by law.
- Make sure the nozzles are sited and directed so that spray cannot impact any nearby water bodies. Allowing pesticide to drift into water is prohibited by law.

- Site and orient nozzles so that they will not impact outdoor cooking or eating areas
- Ensure that pesticide is not sprayed near an air conditioning vent or other home air intake.
- Make sure both the reservoir and operating system are securely locked and inaccessible to children at all times to avoid potential poisoning accidents.
- Calibrate the system to ensure it applies no more than the maximum daily application rate as specified on the pesticide label.
- Examine automatic systems regularly for any leaks or malfunctions. Nozzles must be examined to ensure they continue to be directed in the correct direction. Timing systems should be checked for correct operation. Recalibration should be performed regularly to ensure correct application rates.
- Establish a specific schedule for system maintenance and recalibration, and make sure the client understands that these activities are mandatory to ensure safe operation. Follow up maintenance and calibration should be included and required in any installation contract.

All automatic misting or spraying systems intended for outdoor insect control are required by law to automatically monitor conditions and cease operation when ambient conditions are unsafe or not conducive to pest control (18 AAC 90.610). Equipment must include:

- Wind speed monitors, which will suspend application of pesticide whenever wind speeds are greater than 7 miles per hour (or a lower wind speed specified on the product label);
- Rain monitors which will suspend application of pesticide during rainfall exceeding 0.1 inches per hour;
- Thermometers which will suspend application of pesticide whenever ambient temperatures fall below 50 degrees Fahrenheit; and
- Motion detectors which will suspend application of pesticide whenever people or pets are active in the application area.

SUMMARY OF ACTIVITIES ALLOWED UNDER CATEGORY TEN

Applicators certified in this category are most likely to be engaged in the following sorts of activities:

- Outdoor space spraying to temporarily reduce the number of insect pests from an area.
- Applying residual pesticides to the vegetation along property borders to form a barrier to reduce entry of insects into an area.
- Installation of residential misting units, although careful measures must be taken to ensure spray occurs only under appropriate conditions.

Applicators certified in this category may also be involved in area-wide control of mosquitoes and biting flies by applying insecticides over large areas using hand held or vehicle mounted sprayers or foggers. Applicators conducting this sort of insect control must obtain permission of each landowner in the area to be treated, and often must also obtain a Pesticide Use Permit.

Due to limitations described above, applicators certified under Category Ten, Mosquito and Biting Fly Pest Control are **not** authorized to conduct the following types of mosquito and biting fly control activities:

- Application of pesticides to any type of water body, including seasonal puddles.
- Application of pesticides by aircraft.

Citations:

- Florida Public-Health Pesticide Applicator Training Manual: http://entnemdept.ufl.edu/fasulo/vector/manual.htm
- EPA webpage "Mosquito Misting Systems": www.epa.gov/mosquitocontrol/mosquito-misting-systems
- American Mosquito Control Association webpages: www.mosquito.org

Before Using Any Pesticide

STOP

All pesticides can be harmful to health and environment if misused.

Read the label carefully. Use only as directed.