



SUMMIT COUNTY PUBLIC HEALTH

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Summit County Public Health Mosquito Control Program

Program Goals are to reduce the number of disease-carrying and pest mosquitoes in a cost effective and environmentally responsible manner. To educate the public on methods of cultural practices that will reduce the number of mosquito breeding sites and methods to reduce the feeding activities of mosquitoes. To have the ability to monitor mosquito populations in Summit County for mosquito-borne diseases and determine population levels for pest species.

The Summit County Public Health Mosquito Control Program consists of the following components:

- Mosquito Control Education and Information
- Mosquito Surveillance Program
- Mosquito Larviciding Program
- Mosquito Adulticiding Program

Mosquito Education/Information

Summit County Health District (SCHD) provides information to the public on matters such as mosquito ecology, vector-borne disease information, proper cultural practices for mosquito larva reduction, and mosquito control methods used by the Mosquito Control Program. To obtain this information call Summit County Mosquito Control at (330) 923-8856 Monday through Friday from 8am to 4pm.

Integrated Pest Management is the balanced use of cultural, biological and chemical procedures that are environmentally compatible and economically feasible to reduce pest and/or disease-carrying populations to a lower level.

Why Use an Integrated Pest Management (IPM) Program for Mosquito Control?

“Successful IPM utilizes a combination of control strategies, including surveillance, source reduction, larvaciding, adulticiding (only when necessary), biological control and education. Adulticiding alone is ineffective in controlling mosquito populations because it is difficult to get the adulticide to the inaccessible habitat of the adults. Mosquito larvae are left to continue their development and they quickly replace the adults. In fact, mosquitoes can build up a resistance if they are overused. Aside from the ineffectiveness, pesticides can have long term ecological, environmental and health impacts. The EPA encourages nonchemical mosquito control measures; therefore, in an IPM approach to mosquito control, adulticides play only a small part in overall mosquito control.” – *West Virginia Department of Health and Human Resources, Bureau for Public Health, June 2002*

Mosquito Control Methods

- **Cultural/Source Reduction** – involves practices which prevent water from standing for more than four days, such as repairing ditches to prevent seepage, clearing ditches of vegetation to promote rapid flow, and improving drainage channels in irrigated fields.
- **Biological Control** – a naturally occurring bacteria called Bti, which is toxic only to mosquito and black fly larvae, and is not toxic to beneficial insects.
- **Chemical Control** – involves the application of pesticides to reduce the number of mosquitoes in an area. Pesticides can be used to control mosquitoes in various stages of their life cycle. Larvicides are used the most as they are the most efficient in controlling populations. Adulticides are used as a last resort, and only when nuisance threshold values have been exceeded or when mosquito-borne diseases are found.

Mosquito Surveillance Program

What is Mosquito Surveillance?

Surveillance identifies locations where mosquito populations are building, so targeted control measures can be implemented before a problem exists. Surveillance is the foundation on which any mosquito control program should be based. Larval surveillance is done by sampling a wide variety of habitats. Surveillance of adults targets mosquitoes which are no longer in the larval habitat. Traps for adult mosquitoes include CDC light traps which may be baited with carbon dioxide. These traps are used to capture mosquitoes looking for a blood meal. Gravid traps are frequently used to sample Culex mosquitoes ready to lay eggs. Surveillance is also used to determine the mosquito species in a given area, allowing us to recognize the species that can carry disease. Nuisance mosquito calls from the public can serve as places to start mosquito surveillance.

Surveillance Program Objective

The object of this program is to collect mosquito specimens for shipment to the Ohio Department of Health for mosquito-related encephalitis testing. Thousands of Culex specimens per year are submitted from the District and are tested for West Nile Virus and St. Louis encephalitis. These mosquitoes are collected using gravid traps. The District has 130 trap sites in the county and over 800 traps are set at these sites each summer. CDC light traps are used to monitor population levels of pest mosquitoes. Ova traps are used to monitor new infestations of the Asian tiger mosquito, a vector for several diseases. Eastern tree hole egg masses are monitored at these operations as well for LaCrosse Encephalitis Virus.

Mosquito Larviciding Program

What is Larviciding?

Larviciding is the adding of chemical or other products to a water source to kill mosquito larvae and pupae. Controlling the larvae is more effective than adulticiding. Chemicals available include Insect Growth Regulators (IGRs), which prevent the larvae from completing their development. Chemical control of larvae should only be carried out by trained personnel or at their instruction. Several "biological" larvicides (bacteria registered as pesticides), which are safe and easy to use, are available as control agents. These include *Bacillus thuringiensis var. israelensis (Bti)* and *B. sphaericus* which are available commercially.

Larviciding Program

The purpose of the program is to reduce the number of mosquito larvae by treating breeding sites from May through September. Presently there are over 1100 sites totaling nearly 100 acres within Summit County that are inspected, each receiving treatment up to 3 times during the summer. The following larvicides are applied at their appropriate rates: Abate 4E (1oz./acre), Abate 5PG (3lbs/acre), Bonide (3 gallons/acre), and ectolex WDG (8 oz./acre), a naturally occurring bacteria, which is used in environmentally sensitive areas. Material Safety and Data Sheets (MSDS) for these insecticides are available from the District upon request. To report areas of standing water (mosquito breeding sites), please call (330) 923-8856.

Mosquito Adulticiding Program

What is the Goal of our Adulticiding Program?

The goal of this program is to reduce the number of adult disease carrying and pest mosquitoes by evening spraying of residential areas with ultra low-volume (ULV) mist spray equipment. The Health District uses a permethrin-based insecticide, which is a man-made version of Pyrethrin which is derived from plants in the Chrysanthemum family. This adulticide is mixed with ten parts of food grade oil. Driving at 10 miles per hour, 1.031 ounces of Permethrin is sprayed per mile.

Factors that Determine Adulticide Spraying

Adulticiding is the last line of defense in the control of mosquitoes. Other methods of mosquito control such as source reduction and aggressive larviciding should be considered first. Using the system of integrated pest management, the decision of when and where to spray is based on our mosquito surveillance program. SCPH sets out 21 traps per night in Summit County to determine the location of areas of disease and mosquito activity.

How Efficient are Mosquito Adulticides?

In a joint statement on mosquito spraying, the CDC and EPA state that in order to be effective, spraying must be done under extremely precise conditions: at the ideal temperature, with low winds, at the time of day when mosquitoes are most active, and with carefully calibrated equipment to form droplets the right size⁽¹⁾. Furthermore, the spray is only effective against adult mosquitoes and not eggs or larvae. In an April 2001 report, the CDC stated, "Adulticiding, the application of chemicals to kill adult mosquitoes by ground or aerial applications, is usually the least effective mosquito control technique" and also "the most effective and economical way to control mosquitoes is by larval source reduction."⁽²⁾ The EPA and CDC advocate Integrated Pest Management (IPM). They explain, "IPM is an ecologically based strategy that relies heavily on natural mortality factors and seeks out control tactics that are compatible with or disrupt these factors as little as possible. IPM uses pesticide, but only after systematic monitoring of pest populations indicates a need. Ideally, an IPM program considers all available control actions and evaluates the interaction among various control practices, cultural practices, and weather and habitat structure. This approach thus uses a combination of resource management techniques to control mosquito populations with decisions based on surveillance"⁽³⁾

1 <http://www.epa.gov/pesticide/factsheets/mosquitojoint.htm>

2 <http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnv-guidelines-apr-2001.pdf>

3 <http://www.epa.gov/pesticide/factsheets/mosquitojoint.htm>