MOSQUITO CONTROL AND PESTICIDES IN NEW HAMPSHIRE

Why should mosquitoes be controlled?
The most important reason to control mosquitoes is to reduce the likelihood of diseases such as Eastern Equine Encephalitis (EEE) and West Nile Virus (WNV) being transmitted to people through mosquito bites.

What are the primary methods used for mosquito control?
The life cycle of a mosquito consists of four distinct stages: egg, larva, pupa, and adult. Control of mosquitoes at each stage of development requires different pesticides with different methods of application. Larviciding is the application of chemicals or bacterial products to mosquito breeding areas to kill or inhibit the growth of mosquito larvae from developing into the adult form. Adulticiding is the application of fine "mists" of pesticide by spraying to bring about the rapid knockdown of large numbers of adult mosquitoes.

LARVICIDES

What types of larvicides are used in New Hampshire?
Common larvicides include Altosid *(Methoprene),* Vectolex *(Bacillus sphaericus),* and Vectobac *(Bacillus thuringiensis israelensis).* These products have been approved for mosquito control by the United States Environmental Protection Agency (U.S. EPA). Altosid mimics an insect growth hormone and prevents the development of adult mosquitoes from pupae. Vectolex and Vectobac contain bacteria that can damage the gut of the mosquito larvae that feed on the, causing the larvae to starve to death.

Where are larvicides applied?
Larvicides are applied in storm drains, catch basins, salt marshes, and other areas in which the general public does not have access. Larvicides are not applied in areas that drain into waters consumed by humans.

When are larvicides applied?
Depending on the location in New Hampshire and conditions that determine the risk for EEE/WNV transmission, initial application of larvicides take place during the last two weeks of April and through mid-May of any given year. Follow-up applications may take place periodically afterward, and after heavy rains.

How safe are larvicides for the environment?
The bacteria contained in Vectobac and Vectolex occurs naturally in the soil, and are harmless to mammals. The bacteria are short-lived, and their toxins do not appear to be harmful to fish and most other aquatic organisms. Altosid is rapidly biodegradable and breaks down quickly in water and sunlight. It does not remain in the ground.

Are larvicides harmful to humans?
Direct contact with highly concentrated forms of larvicides can cause mild eye and skin irritation, but there are no known serious effects.

What should I do if I'm exposed to these larvicides?
If you experience eye or skin irritation as a result of exposure to a larvicide, rinse your eyes with tap water for 20 minutes and wash your skin thoroughly with soap and water. If the symptoms persist, first contact your local doctor or emergency department, then contact the New Hampshire Poison Control Center at 1-800-222-1222.

ADULTICIDES

What types of adulticides are used in New Hampshire?
Licensed applicators may use one of several different pesticide products for mosquito spraying. The specific agent will depend on a number of factors including application environment, immediate availability of the product, and cost. However, the pesticides of choice that are currently registered for this type of use in New Hampshire are primarily pyrethroid-based products. Pyrethroids are a group of synthetic pesticides similar to the natural pesticide pyrethrum (pyrethrins) produced by chrysanthemum flowers. Permethrin, sumithrin, and resmethrin are pyrethroid insecticides that may be used for adulticiding. These products act on insect nervous systems by inactivating sodium channels. To further increase effectiveness against insects, pyrethroid-based pesticides commonly contain piperonyl butoxide (PBO). PBO is not a pesticide; rather it enhances the insecticidal activity of the pyrethroid by further decreasing the insect's ability to detoxify the pesticide. These products are approved by the U.S. EPA for control of adult mosquitoes in both urban and rural residential environments.

Where and how are adulticides applied?
Cities and towns in New Hampshire may spray for mosquitoes if such a decision is made based upon the presence of WNV or EEE in mosquitoes, animals, or humans within the community. Applications made on the ground may be made on foot using backpack sprayers, or by vehicle, using ultra-low volume (ULV) sprayers mounted on trucks. Most spraying is completed at night between sunset and midnight. Aerial applications may be considered as a method of last resort when it becomes evident that a spray program will need to be implemented that covers broader or more remote areas than can reasonable be addressed through ground applications.

How will I be notified if it is decided that spraying is necessary in my neighborhood?
Should spraying be deemed necessary, whoever holds the required permit to apply (typically the local municipalities) will alert people of the spraying schedule as early as possible. Likely forms of notification would be by best available means, which may include one or more of the

following: notice(s) in the newspapers, announcements on the radio and/or television, or notification by telephone or mail, etc. If the need to spray is identified, efforts will be made to initiate spraying as quickly as possible (possibly within 48 hours). The applicant is required by the Division of Pesticide Control to notify town officials and the public at least 24 hours in advance of spraying.

How safe are adulticides for the environment?
Pyrethroids have a relatively low persistence in the environment and break down very quickly in sunlight. They readily bind to soils and thus are not expected to contaminate groundwater. Pyrethroids are toxic to bees, fish, and other aquatic life forms and are not to be applied to bodies of water. Beehives should be covered with burlap and kept moist during the spraying and for two to three hours after the spraying has occurred.

Are adulticides harmful to humans?
In general, at the concentrations used, most people would not be expected to experience any symptoms. Upon direct contact with pyrethroid-containing products, some people may develop temporary skin irritations, stuffy or runny nose, or mild respiratory, throat, or eye irritation. Based on experience from past applications, state officials have received very few complaints of symptoms from citizens in the areas where applications occurred.

What precautions should be taken to protect against pesticide exposure during spraying?
Common sense steps that can be followed in areas where adulticide spraying is scheduled to take place include:

- Some individuals are sensitive to pesticides. Persons with asthma or other respiratory conditions are especially encouraged to stay inside during spraying since there is a possibility that spraying could worsen those conditions.
- Whenever possible, stay indoors during spraying. Pets should be kept indoors also.
- Close windows and doors and turn off air conditioning units.
- Remove children's toys, outdoor equipment, and clothes from outdoor areas. (If toys are left outside, wash with soap and water before using again.)
- Prevent children from accessing the immediate spray area for approximately 1 hour after spraying to allow drying of any pesticide residue.
- Wash skin and clothing exposed to pesticides with soap and water
- Wash any homegrown fruit and vegetables exposed to the spray before eating them.
- Anyone experiencing adverse reactions to pesticides should call their doctor or the New Hampshire Poison Control Center at 1-800-222-1222.

For general information on pesticides, please call the
NH Department of Agriculture, Pesticides Division at 271-3550

For more information about potential health effects of pesticide exposure,
Please call the NH Department of Environmental Services
1-800-852-3345, extension 4664, or 271-4664