

Pesticide Applicator Report



A Publication of the Vermont Agency of Agriculture, Food & Markets For Vermont Pesticide Applicators

News from the Agency

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News from the Agency1
EPA Finalizes Approach1
Vermont Tree Fruit Exotic Pest Surv2
Filling Out Your Annual Pesticide Usage Report3
Notice to Vermont Pesticide Dealers3
2005 Forest Tent Caterpillar Suppression Project4
Revised 2005 Worker Protection Standard Manual Available4
Pesticide Applicators: Take Advantage of Pesticide Disposal5
What Can I Do With Empty Pesticide Containers?5
New Web page Provides Pesticide Labeling Information and Vehicle for Submitting Questions5
Priority Pests of the Nursery, Greenhouse and Garden Center6
How Soil Properties Affect Groundwater Vulnerability to Pesticide Contamination
Agency Hires New Pesticide C & T Coordinator10
New Category 3 Manual10
News from the UVM Extension Service11
First Aid and Pesticide Poisonings11
Home Study Quiz 112

Home Study Quiz 215

	program through pesticide label statements that refer users to Endangered
rsery, n Center6	Species Protection Bulletins (Bulletins), as appropriate, when geographical
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Bulletins (Bulletins), as appropriate, when geographically ns are necessary to protect federally listed species or their abitat. Bulletins will generally include a map of the county or parish to which it applies, a description of the species being protected, a list of the pesticides of concern and their use limitations. These use limitations will be enforceable under the misuse provisions of FIFRA. Once pesticide labels with such labeling appear in the marketplace, Bulletins will be available via the EPA's website or via a toll free number; both of which will be identified on the pesticide label.

EPA Finalizes Approach to Field Implementation of **Endangered Species Protection Program**

EPA published in the Federal Register (FR) a notice that outlines the Agency's

approach to field implementation of its Endangered Species Protection Program (ESPP). The notice also responds to comments received from the public in response to the Agency's December 2002, FR notice proposing its

The goal of the ESPP is to carry out responsibilities under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) in compliance with the Endangered Species Act (ESA) by providing appropriate protection to listed species and their designated critical habitats from potential harm due to pesticide use, while at the same time not placing unnecessary burden on the agriculture community and other pesticide users. EPA will implement its

Source: USEPA, November, 2005

approach to field implementation.



Vermont Tree Fruit Exotic Pest Survey



Survey Methodology (trapping protocol):

The tree fruit exotic pest survey for 2005 occurred at three abandoned apple orchards in two counties; Chittenden and Washington. Survey targets for 2005 included; summer fruit tortrix moth, Adoxophyes orana, false coddling moth, Cryptophlebia leucotreta, plum fruit moth, Cydia funebrana, light brown apple moth, Epiphyas postvittana, apple ermine moth, Yponomeuta malinellus, and pear leaf blister moth, Leucoptera malifoliella. A control trap was also included at each site. Winged Sticky Traps with pest specific lures provided by OTIS Methods Development Lab were used following the general trapping guidelines from the Exotic Pest Detection Manual (USDA 2002). One trap was placed per tree. Traps were suspended from limbs at approximately 1.5 meters off the ground except for those of Y. Malinellus, which were placed within the crown of the tree. Traps were spaced at a minimum of 10 meters except for A. orana which were placed at least 50 meters away from any other traps. Trap bottoms were replaced every two weeks and lures were changed according to protocols.

Rationale underlying survey methodology:

The primary objective of this survey was to obtain current information on the occurrence and distribution of exotic apple pests. The New England states combined (CT, MA, ME, NH, RI and VT) rank 7th nationally in apple production and growing areas (Basic Commodity Information is from the USDA, NASS, Agricultural Statistics Board Non-citrus Fruits and Nuts 2001 Summary, July 2002). There are approximately 90 commercial apple growers in Vermont which produce 900,000 bushels of apples on approximately, 4,800 acres (UVM Extension). The apple industry in Vermont alone is valued at over \$9 million (USDA, NASS). Selected target pests included in the 2005 tree fruit pest survey have been identified as exotic, some with limited distribution or as National Priority pests. Those pests which have been identified as having limited distribution in parts of the U.S. have unknown and undocumented distribution in Vermont. Trapping for target pests following guidelines set forth by the Exotic Pest Manual (USDA 2002) allowed the CAPS program to enhance early detection capabilities of pests threatening tree fruit crops that are economically and ecologically valuable at both the regional and national level.

Survey dates:

This survey occurred over a 16 week period. Traps were deployed during the third week of May. Trap bottoms were replaced every two weeks and lures changed in accordance with OTIS protocols. All traps were collected and removed from the survey locations during the second week in September.

Taxonomic services:

Trap contents were screened by the Agency of Agriculture (CAPS coordinator and state entomologist) and University of Vermont, Plant Diagnostic Clinic.

Benefits and results of survey:

During the 16 week survey period a total number of 168 trap bottoms from three different locations were collected and screened for target pests. In addition to NAPIS data entry, detection results from the survey are being included as part of the UVM Extension-Apple Resources. This survey also provided support to the export (trade) of apple and tree fruit crops by obtaining current information on the occurrence and distribution of exotic apple pests.

Joint project, completed by the University of Vermont, Plant Diagnostic Clinic and VAAFM



Filling Out Your Annual Pesticide Usage Report

When reporting the "total amount of product used", please report only that amount of manufactured product used, not the total amount of the diluted product used in the application. For example, if you apply ½ gallon of "product X" in 10 gallons of water, you would report the use of ½ gallon of product, not 10 gallons, on your usage report. Reporting the total amount of diluted product will lead to an over-reporting of the amount of pesticide active ingredient used.

Please: To expedite data entry on our end, please specify "solid" or "liquid" when reporting usage in ounces.

Also, remember that your usage report must list the use of pesticides by all individuals employed by you over the past year, whether or not they are still working for you. If you have any questions about filling out the usage report, call Cary Giguere at 802-828-6531.

NOTE: Private applicators do not need to submit an annual pesticide usage report, but must keep records of restricted use pesticide usage for a period of 2 years and submit them to the Department if requested.



Notice to Vermont Pesticide Dealers

Are You Selling Pesticides for the Control of Weeds or Algae in Water Bodies in Vermont?

(<u>Note</u>: This notice does not pertain to products sold for use in swimming pools or fountains.)

If you are selling or purchasing these products or other products designed to control nuisance aquatic plants or animals in water bodies in Vermont:



PLEASE READ THE FOLLOWING IMPORTANT INFORMATION

Most pesticides labeled for use exclusively in water bodies are classified as <u>restricted-use pesticides</u> in Vermont. An individual purchasing a restricted-use pesticide must be a <u>certified pesticide applicator</u>. Anyone wishing to use a restricted-use pesticide in Vermont waters needs to contact the Vermont Department of Environmental Conservation (VTDEC) to obtain an <u>Aquatic Nuisance Control Permit</u> prior to using the product. Only those pesticide dealers possessing a <u>Class A Dealer's License</u> are authorized to sell these restricted-use products. Dealers should familiarize themselves with the list of currently registered aquatic-use products by visiting the Agency of Agriculture's website at

http://www.vermontagriculture/pest.htm

For more information regarding Aquatic Nuisance Control Permits required under 10 V.S.A. §1263a contact: VTDEC, Water Quality Division at (802) 241-3777 or <u>www.vtwaterquality.org</u>.

2005 Forest Tent Caterpillar Suppression Project



In 2005 landowners in **7 counties and 14 towns** in Vermont requested assistance from the Department of Forests, Parks and Recreation in spraying their sugarbushes to protect tree foliage from defoliation by forest tent caterpillar. While most individual spray areas were small, the total area to be treated statewide was around 1,300 acres. The spraying was timed to occur **mid-May to early-June**, depending on weather conditions and when eggs would hatch.

The material used was a biological insecticide, *Bacillus thuringiensis subspecies kurstaki* (B.t.k.). It is a bacterium that acts specifically on defoliating caterpillars. It is not a contact insecticide so needs to be swallowed to be effective. One reason for using this pesticide is that it is safe for use on food products as in the case of trees used for maple syrup production. It is also **approved for use by organic farmers**. Applied was a formulation called **Foray 48B** at a rate of 1 quart per acre.

Sugar makers interested in having their trees surveyed for 2006 should contact:

Scott Pfister

Forest Resource Protection Chief Dept. of Forests, Parks & Recreation

Final deadline to sign up for population survey request is February 15, 2006.

Revised 2005 Worker Protection Standard How-to-Comply Manual Available

EPA is releasing its revised 2005 Worker Protection Standard for Agricultural Pesticides How-to-Comply Manual. This compliance assistance tool has been updated to reflect amendments to the Worker Protection Standard (WPS), a regulation designed to protect agricultural workers and pesticide handlers. The revised manual provides detailed information on who is covered by the WPS and how to meet regulatory requirements. The updated manual will facilitate better protection of pesticide workers and handlers in agriculture from the potential risks of pesticides.



The new 2005 WPS How-to-Comply (HTC) Manual supersedes the 1993 version. Changes to the WPS since 1993 have made the earlier version obsolete, and its continued use may lead an employer to be out of compliance. The 2005 HTC manual revision was coordinated by EPA's National Agricultural Compliance Assistance Center and a workgroup consisting of representatives from EPA Headquarters, EPA Regional Offices, and several state agencies, with input solicited from USDA and other state and tribal pesticide agencies.

For further information about the revised manual and how to obtain print and/or CD-ROM versions of the manual, or for additional information about the WPS, please visit: http://www.epa.gov/agriculture/htc.html. For copies of the manual or questions regarding the WPS, please contact Annie Macmillan at 828-3479 or annie@agr.state.vt.us.

Pesticide Applicators: Take Advantage of Pesticide Disposal

Anyone with unwanted pesticides is able to dispose of these at no charge at household hazardous waste collections across the state. The pesticide disposal program, started in 1996, will pay for disposal costs of all unwanted and banned pesticides. To date, Vermont has collected over 165,000 pounds of waste pesticides. Funding for this program comes from the registration fees pesticide manufacturers pay for their products to be sold in Vermont. Be sure to contact your local Solid Waste District at

www.anr.state.vt.us/dec/wastediv/solid/swmdlist.htm or visit <u>http://www.state.vt.us/agric/wastepest.htm</u> to see dates and times for pesticide collection events nearest you. Some Districts require pre-registration, so be sure to call before you head down to the event.

Farms, homes and businesses will become safer places with the removal of these unwanted toxic materials. It is very important to remove these products from barns, and household or business cellars. Unwanted or banned pesticides are an accident waiting to happen. People often buy more than they need and it is important to dispose of them properly. Animals and children are especially at risk, and leaking containers can be an unknown hazard. Look in storage sheds, garages, barns, and basements to see if you have any of these unwanted products and get rid of them today, for free!

* * *

What Can I Do With Empty Pesticide Containers?

Always triple rinse or pressure rinse containers clean at the time of use, and then pour the rinsate into the spray tank so that all of the product is used according to the label instructions. Many pesticide dealers sponsor collections to recycle clean pesticide containers from farms. Call the Vermont Agency of Agriculture for more information.

WARNING: IT IS ILLEGAL TO BURY, BURN OR DISCARD A PESTICIDE OR ITS CONTAINER ON YOUR PROPERTY, REGARDLESS OF THE INSTRUCTIONS ON THE LABEL.

Unusable pesticides should always be safely stored for a special collection. Containers, once properly cleaned, can be recycled in a special collection program.

New Web page Provides Pesticide Labeling Information and Vehicle for Submitting Questions

EPA's Office Pesticide Program (OPP) Labeling Committee has made available on the Web information about pesticide labeling. The new Web page contains Questions and Answers about pesticide labeling and guidance (Label Review Manual, PR Notices, etc.) to companies that generate pesticide labels and to EPA staff who review them. It also contains contact information for specific label issues and a form to submit questions on cross-cutting pesticide labeling issues.

The Web site address is: <u>www.epa.gov/pesticides/regulating/labels/label_review.htm</u>.

Formed in response to recommendations of the Pesticide Program Dialogue Committee, the EPA OPP Labeling Committee coordinates pesticide labeling policies, updates the Agency's Pesticide Label Review Manual, and will maintain the labeling Web site and address labeling consistency e-mail submissions.

Source: USEPA, December, 2005



Priority Pests of the Nursery, Greenhouse and Garden Center

Taken from the Vermont 2005 CAPS Final Report

British yellowhead, *Inula britannica*: British yellowhead is native to Europe and Asia. This aggressive weed was first noticed in several nurseries in Michigan around 1990. It has been found primarily with hostas imported from the Netherlands. In 2005, data collected during the nursery inspection season indicated that approximately 38% of nurseries inspected sold hosta plants. No signs or symptoms suggesting the presence of British yellowhead were detected during inspections conducted in 2005. All data has been entered into NAPIS.

Chrysanthemum white rust, Puccinia horiana: A destructive fungal disease that has the potential to be extremely damaging to the commercial horticulture and florist industries if it becomes established in the United States. The disease is indigenous to China and Japan, but has since spread to Europe, Australia, South America and Africa. Chrysanthemum white rust (CWR) has been accidentally introduced several times in the United States over the past several decades by chrysanthemum hobbyists, but aggressive eradication programs have successfully prevented establishment. In 2005, data collected during the nursery inspection season indicated that approximately 43% of nurseries inspected sold chrysanthemums. No signs or symptoms suggesting the presence of CWR were detected during inspections conducted in 2005. All data has been entered into NAPIS.

Daylily rust, *Puccinia hemerocallidus*: An Asian fungal disease of daylily foliage detected in 2000 in GA, MD, in NH (2003) and most recently in MA (July, 2005). Many different varieties of daylily have variable susceptibilities to the rust. Its' distribution includes tropical to temperate climates. Therefore, it could conceivably survive in a wide range of climates in the U.S. In 2005, data collected during the nursery inspection season indicated that approximately 45% of nurseries inspected sold daylilies. Numerous samples were brought into the lab for screening after finding symptoms similar to those of the target rust. All samples were examined and found to be negative for the target pest. All data has been entered into NAPIS.

Southern bacterial wilt, *Ralstonia solanacearum* race 3 biovar 2: A bacterial pathogen that causes a wilt disease in several important ornamental and agricultural crops. *Ralstonia* is present in Europe, Asia, South and Central America and Australia. This pathogen was detected in a neighboring state (NH) in early 2003 in greenhouses that received imported geranium plants, and was subsequently eradicated. In 2005, data collected during the nursery inspection season indicated that

approximately 41% of nurseries inspected sold geraniums. No signs or symptoms suggesting the presence of Southern bacterial wilt were detected during inspections conducted in 2005. All data has been entered into NAPIS.

Viburnum leaf beetle, *Pyrrhalta viburni*: Viburnum leaf beetle is an invasive, non-native beetle that first appeared in Vermont in 2000 and has steadily spread throughout the state. The beetle, first found in North America in 1947 in the Niagara Peninsula of Ontario, Canada, was discovered in New York State in northern Cayuga County in July 1996. The native range of this



pest includes most of Europe. It is a voracious eater that can defoliate viburnum shrubs entirely. Plants may die after two or three years of heavy infestation. This insect is considered to be distributed throughout

Vermont. Nursery inspections conducted in 2005 documented the presence of this insect at 16 different nurseries in 8 counties. It was determined from data collected that approximately 27% of the 59 nurseries selling viburnum stock experienced defoliation resulting from VLB. Outreach activity included the publication of a brochure specific to the viburnum leaf beetle. Brochures were distributed to nurseries as well as to members of the public who requested material on this insect. All data has been entered into NAPIS

Lily leaf beetle, Lilioceris lilii: The lily leaf beetle is an invasive, non-native beetle that first appeared in Vermont sometime in early 2000. This beetle attacks true lilies and Fritillaria species but has also been reported feeding on Solomon's seal, bittersweet, potato hollyhock and various Hosta species. Adult beetles are strong fliers which may facilitate their distribution statewide. Beetles and larvae are also dispersed on host plants. This insect is considered to be distributed throughout Vermont. Nursery inspections conducted in 2005 documented the presence of this insect in 2 nurseries located in different counties. Telephone calls with requests from the general public about information on lilv leaf beetle were also fielded in the office. Due to the fact that this insect generated much activity from the general public, outreach activity included the publication of a brochure specific to the lily leaf beetle. Brochures were made available upon request. All data has been entered into NAPIS.

Brown marmorated stink bug, Halymorpha halys: The brown marmorated stink bug (BMSB) is native to Asia and is considered an agricultural pest in Japan. The first occurrence of this insect in the United States was from Allentown, PA in 1998. This insect has spread to additional areas in PA, DE, MD and NJ. Host plants include shade and fruit trees as well as vegetable crops. Adult insects are ~17 mm long and are generally brown in color with distinguishing lighter bands on the antennae and patches of coppery or bluish metallic-colored punctures on the head and pronotum. In 2005, data collected during the nursery inspection season indicated that approximately 30% of nurseries inspected sold host material associated with BMSB. No signs or symptoms suggesting the presence of BMSB were detected during inspections conducted in 2005. Data has not been entered into NAPIS. This was primarily an outreach pest for us, we distributed material about this insect to all registered nurseries statewide.

Hemlock woolly adelgid, Adelges tsugae: The hemlock woolly adelgid (HWA) is native to Asia. It is a serious pest of eastern hemlock and Carolina hemlock. In the eastern US, it is present from the Smoky Mountains, north to the mid-Hudson River Valley and southern New England. The pest sucks sap from the young twigs, depriving the needles and causing them to turn a grayish green. Following the detection of a low level infestation of hemlock woolly adelgid at a wholesale nursery in central Vermont in 2004, the Agency of Agriculture and the Vermont Department of Forests. Parks and Recreation amended the joint state guarantine rules for hemlock woolly adelgid. The emergency rule became effective on February 18th, 2005 and was subsequently passed by state congress to law on June 30th, 2005. Pursuant to the amendment, importation of hemlocks seedlings and nursery stock into Vermont from areas of the United States that are infested with hemlock woolly adelgid is prohibited. Hemlock seedlings and nursery stock that are imported from non-infested areas of the United States are required to be accompanied by a copy of the State Phytosanitary Certificate of Origin (within 3 days of issuance) signed by a plant regulatory official. Hemlock seedlings and nursery stock may not be sold or further distributed unless a written release is issued by the Vermont Agency of Agriculture.

Outreach regarding hemlock woolly adelgid and the amendment to the joint state quarantine rules for hemlock woolly adelgid included the distribution of the new quarantine rule to all registered nurseries and 'follow-up' telephone calls to the 79 nurseries in Vermont known to sell hemlocks. In 2005, 14 nurseries imported hemlocks into the state and 733 hemlocks were released for sale. Two nurseries imported 40 hemlocks that were not in accordance with the quarantine rule and consequently all 40 hemlocks were denied for sale and shipped back to the originating nurseries. In 2005, data collected during the nursery inspection season indicated that approximately 13% of nurseries inspected sold hemlock stock, most of which were residual stock from previous years. No signs or symptoms suggesting the presence of HWA were detected during inspections conducted in 2005. All data has been entered into NAPIS.

Asian long horn beetle, *Anoplophora glabripennis*: The Asian long horn beetle (ALB) is native to China and Korea. The beetle was introduced into New York City (1996), Chicago (1998) and New Jersey (2002 and 2004) and is a serious pest of many hardwood trees, such as maple, elm and ash. The beetle has the potential to damage such industries as lumber, maple syrup, nursery, and tourism accumulating over \$41 billion in losses. In 2005, data collected during the nursery inspection season indicated that approximately 37% of nurseries inspected sold host material for this pest. No signs or symptoms suggesting the presence of ALB were detected during inspections conducted in 2005. All data has been entered into NAPIS.

Emerald ash borer, *Agrilus planipennis*: The emerald ash borer (EAB) is native to China, Korea, Japan and other Asian countries. In the summer of 2002, this insect was discovered in Detroit, MI. More recent infestations



have been detected in OH, VA, MD and Ontario, Canada. The larvae can be found beneath the bark of ash trees, in tunnels, from June though the fall. All species of ash seem to be susceptible. In 2005, data collected during the nursery inspection season indicated that approximately 18% of nurseries inspected sold ash trees. No signs or symptoms suggesting the presence of EAB were detected during inspections conducted in 2005. Outreach activity included the publication of brochures and posters (modified using Purdue University's original design). Outreach materials were distributed upon request from the general public, at trade shows, through environmental groups and handed out during inspections. Posters were distributed to state parks, private campgrounds and the National Park Service. All data has been entered into NAPIS. •

Source: Vermont 2005 CAPS Final Report

How Soil Properties Affect Groundwater Vulnerability to Pesticide Contamination

J.H. Huddleston

Taken from: Oregon State University Extension Service

Four factors govern the potential for ground-water contamination by pesticides passing through the soil:

- Properties of the soil
- Properties of the pesticide
- Hydraulic loading on the soil
- Crop management practices

This publication focuses mainly on soil properties. Interactions among all four factors must be considered to fully assess groundwater vulnerability. Soils whose properties allow rapid transmission of a pesticide to groundwater are called *sensitive* soils. Just because a soil is sensitive, however, does not necessarily mean there is a high risk of groundwater contamination. Good water management, low application rates, proper timing of applications, and careful handling of pesticides all compensate for sensitive soils and reduce the risk of groundwater contamination. The opposite of these conditions can increase the risk even on soils that are not particularly sensitive.

Soil sensitivity factors

Soil sensitivity depends on four soil properties:

- Permeability
- Water table conditions
- Organic matter content
- Clay content

Permeability and water table conditions together control the *leaching potential*. Soils with high leaching potentials are more sensitive than soils with low leaching potentials.

Organic matter and clay content together control the *sorption potential*. Soils with low sorption potentials are more sensitive to groundwater contamination than soils with high sorption potentials.

Interactions between leaching potential and sorption potential govern the overall sensitivity of the soil. A soil that has both a high leaching potential and a low sorption potential is the most sensitive. A soil that has both a low leaching potential and a high sorption potential is the least sensitive.

Assessment of leaching potential

Leaching refers to the removal of soluble materials by water passing through soil. Naturally occurring salts, chemical fertilizers, and pesticides are subject to leaching. Whether leaching actually occurs depends on the amount of water passing through the soil and the rate of water movement.

Leaching potential refers to the risk that soluble pesticides will be transmitted through the soil to the groundwater reservoir. Leaching potential depends on soil permeability, water table conditions, and hydraulic loading.

Permeability refers to the rate at which water moves through soil. Permeability is controlled by the size and continuity of the soil pores.

Factors that influence soil permeability include:

- Texture
- Organic matter
- Structure
- Root and animal activity
- Density

Soil texture refers to the proportions of sand, silt, and clay in a soil. A "loam" is a balanced mixture of sand, silt, and clay. Unbalanced mixtures dominated by increasing amounts of sand are called sandy loam, loamy sand, and just plain sand. If clay dominates, the texture is called clay loam, or, with more clay, just plain clay. Silty soils that contain little or no sand are called, in order of increasing clay content, silt loams, silty clay loams, or silty clays.

Coarse-textured sandy and gravelly soils have the largest pores and the most rapid permeabilities. Finetextured clayey soils have very tiny pores and very slow permeability rates. Medium-textured loams, silt loams, and clay loams have intermediate rates of soil permeability.

Organic matter helps create and stabilize aggregates of the grains of sand, silt, and clay. These aggregates, or units of soil structure, have relatively large spaces between them, permitting more rapid water movement.

Roots and burrowing insects and animals create large voids, or "macropores," that can transmit water very rapidly under saturated conditions. Macropores also are common in very coarse-textured soils and in soils that crack extensively upon drying.

Macropores are especially important where they are connected to the soil surface. Heavy rainfall or irrigation

events may create temporarily saturated surface soil, which can lead to rapid flow through macropores. If soluble pesticides also are present, they can be carried deep into the soil in a short time. If pesticides are bound tightly to soil particles, however, macropore flow may reduce groundwater vulnerability because water moving through macropores does not have a chance to react with the pesticides and remove them from the soil. Tillage generally reduces the number of macropores that are open to the soil surface.

Dense, compact, or cemented soil layers have very slow rates of permeability.

Permeability of soil in its natural setting is highly variable and extremely difficult to measure. Soil permeability can be determined in a laboratory by measuring the rate of flow through a column of soil under a constant head of water.

Permeability rates are given in inches per hour. Typical rates are 0.01 inches per hour for compact clay, 0.5 inches per hour for a loam with good structure, and 15 inches per hour for a loamy sand.

Soil permeability rates are published in each county soil survey report. These rates are mostly estimates based on soil properties, rather than the results of actual measurements, but they are useful for evaluating leaching potentials of different soils.

Water table conditions refer to the height and duration of water tables in the soil. Shallow water tables that persist for long periods increase the risk of groundwater contamination.

Well-drained soils rarely have water tables that persist for long periods above a depth of 6 feet. They are much less sensitive than poorly drained soils, which may have water tables at or near the surface for several months.

Two types of water tables occur in soils: perched and apparent. A perched water table is the top of a zone of saturation that is separated from permanent groundwater by a soil layer of very slow permeability. An apparent water table is the top of a zone of saturation in a soil in which there are no dense or confining layers.

Perched water tables do not increase the risk of groundwater contamination as much as apparent water tables do. The soil layer that perches water acts as a barrier to prevent contaminants from moving to the permanent groundwater supply. Perched water, however, is more likely to move into a surface water source, creating a concern for surface water quality.

Soil survey reports contain information on water table conditions in soils. The depth to the water table, the

months during which it persists, and whether it is perched or apparent all are given in tabular format. This information is very useful in assessing soil sensitivity.

Hydraulic loading refers to the total amount of water applied to the soil. No matter how permeable the soil, the leaching potential remains low if there is insufficient water to move completely through the soil.

Where rainfall exceeds both plant consumptive use and the soil's ability to store water, leaching occurs. Water moving below the root zone ultimately reaches groundwater, carrying with it soluble soil constituents. In these soils, the leaching potential is highly correlated with soil permeability.

Irrigation compensates for water deficits in dry areas. Most irrigation water is taken up by plants, but some usually passes through the soil out of the root zone. Thus irrigation can increase groundwater vulnerability. Careful management of the amount and timing of irrigation water applications can be very effective in reducing the risk of groundwater contamination.

The position of a soil in the landscape also influences its hydraulic loading. Soils near a hilltop often shed water, either by runoff over the surface or by lateral flow within the soil. Soils lower on the hillside and where the slope begins to flatten out often receive excess water from the higher positions. These soils are more susceptible to leaching from the added hydraulic loading.

Assessment of sorption potential

Sorption refers to the binding of chemicals to particles of organic matter and clay in the soil. Sorption retains chemicals in the soil, where they can be degraded. Thus the higher the sorption potential, the lower the risk of groundwater contamination. Sorption potential depends on organic matter content and clay content.

Organic matter content is the most important variable affecting sorption of pesticides. Organic matter provides the greatest number of binding sites because it has an extremely large surface area and is very reactive chemically.

Organic matter content in soil depends on climate, vegetation, position in the landscape, soil texture, and farming practices. Abundant rainfall, combined with lush natural vegetation, gives rise to soils with high organic matter contents. Desert soils have very low organic matter contents. Grassland vegetation generally produces more organic matter deeper in the soil than forest vegetation.

Organic matter decomposes more slowly in wet soils. As a result, poorly drained soils in low-lying areas tend to **>**

have more organic matter than better drained soils higher in the landscape.

Sandy and gravelly soils tend to be droughty soils that support less vegetation. Under similar climatic conditions, these coarse-textured soils have less organic matter than medium-and fine-textured soils. The difference is particularly marked where rainfall is limiting for plant growth.

Farming practices that return crop residues and animal wastes to soils help maintain soil organic matter content. Practices that harvest or destroy residues tend to reduce soil organic matter.

Data on organic matter content and distribution in soils are too few to permit evaluation of sorption potential for all soils. Instead, we use knowledge of soil properties and their relationships with climate, vegetation, and landscape to rate soil organic matter content from very low to very high.

Clay content refers to the percentage of microscopic plate-shaped grains in the soil. These tiny, flat particles have a tremendous amount of surface area per unit weight of soil, and their surfaces are chemically reactive. The higher the clay content, the greater the number of binding sites for pesticide retention. Clay content is particularly important in the subsoil, where the organic matter content is generally much lower than in the surface soil.

Data on clay content are readily available in soil survey reports. For evaluation of sorption potential, it is sufficient to classify soils in generalized groups ranging from low sorption for the coarse-textured sands and gravels to high sorption for the fine-textured silty clays and clays.

Assessment of overall sensitivity

The combined effects of leaching potential and sorption potential determine a soil's sensitivity with respect to groundwater vulnerability. The *most sensitive soil* is an irrigated sandy soil with very low organic matter content. The *least sensitive soil* is a well-drained clayey soil with high organic matter content.

Fine-textured soils--silty clays and clays--generally have low sensitivities because they have slow or very slow permeabilities and high sorption potentials. Macropore flow in large cracks may be a problem, however.

Medium-textured soils--silt loams, silty clay loams, loams, and clay loams-generally have low to moderate sensitivities, even in humid areas, because they have relatively slow permeabilities and relatively high sorption potentials. Coarse-textured soils--sands, loamy sands, and sandy loams--generally have moderate to high sensitivities because they are more permeable and tend to have lower sorption potentials. Small differences in hydraulic loading and organic matter content in these soils impact sensitivity much more than in loamy and clayey soils.

Organic soils--those that consist almost entirely of decomposed plant material--have extremely high sorption potentials. Though these soils have naturally high water tables, cultivated organic soils have been artificially drained, which lowers the water table. Thus the cultivated organic soils have low sensitivities. \blacklozenge

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Agency Hires New Pesticide Certification & Training Coordinator

The Vermont Agency of Agriculture is pleased to welcome **Matthew Wood** as the New Pesticide Certification & Training Coordinator to replace **Wendy Anderson**. Matt has an MS in Horticulture from UVM and 7 years experience in the nursery industry. He is looking forward to using his experience to help applicators around the state get the most out of their certification. "I hope to attend as many workshops as possible within the coming year so that I can meet Vermont's Applicators from all areas. I want to see as many people as I can and I hope they are open with me regarding any questions they might have about certification," said Wood.

Wendy has moved on to become the Compliance Coordinator of the Enforcement Section within ARMES (Agriculture Resource Management & Environmental Stewardship), and we would like to wish her all the best in her new position.

Please feel free to contact Matt with any questions you may have regarding certification categories, credits, this newsletter, etc. at **802-828-3482** or **mwood@agr.state.vt.us**.

* * *

New Category 3 Manual

The new Category 3 manual combines the two previously separate categories (3a, Ornamentals and Shade Trees and 3b, Turf) into one. The exams are still separate, so we need to know which manual you have when scheduling your exam so we can give you the appropriate one. The old manuals have covers of yellow and green, the new ones are white and blue. ◆

News from the UVM Extension Service

First Aid and Pesticide Poisonings

Ann Hazelrigg, UVM Pesticide Education and Safety Coordinator

In spite of following safety precautions when working with pesticides, accidents can and do happen. According to data collected in 2005 by the Northern New England Poison Center (NNEPC) in Maine, there were 191 calls from Vermonters regarding potential pesticide poisonings.

The NNEPC was created in 2001, merging the poison control centers in Vermont and Maine (and now New Hampshire) to provide one regional center armed with experts to immediately respond to poison emergencies and answer poison-related questions. All Vermonters can access the physicians, nurses and pharmacists available 24 hours a day at the Center by calling 1-800-222-1222. This 1-800 number can also be used anywhere in the country to access the nearest poison center.

The NNEPC tracks the causes of the pesticide exposures and separates each call/exposure into the following pesticide categories; fungicides, fumigants, herbicides (includes algaecides, defoliants, desiccants, plant growth regulators,) insecticides, repellants and rodenticides. Each of these types of pesticides is further broken down into chemical groups for further tracking.

The majority (61%) of the Vermont pesticide calls received in 2005 concerned insecticide exposure. Fungicide and herbicide exposure calls were low, at 1% and 1.5% respectively. Pesticide repellant (DEET, etc) exposure calls made up 28% of the total for Vermont.

What are the symptoms associated with pesticide poisoning? Pesticide poisoning symptoms can vary depending on the chemical family of the pesticide, the formulation, concentration, toxicity and the route of exposure of the chemical. Some of the common pesticide poisoning symptoms can include nausea, headache, weakness, dizziness, blurred vision, tearing, excessive sweating, reduced heart rate and others.

"First aid" is the initial help you provide someone before medical personnel arrive on the scene. Prompt action may help to prevent further injury to yourself or a victim of a suspected pesticide poisoning. If you suspect pesticide poisoning in a coworker or yourself, follow these steps to prevent further injury:

- Call for help! IF PERSON IS NOT BREATHING CALL 911. Call the NNEPC at 1-800-222-1222 to speak with medical personnel well versed with pesticide poisonings.
- 2. If you are alone with the victim, be sure the person is breathing and not still being exposed to the pesticide. Remember, you may need to be wearing protective clothing and equipment when helping!
- 3. If possible, have the pesticide label or Material Safety Data Sheet (MSDS) responsible for the poisoning available for the doctor or medical personnel.

If pesticide is on the skin (dermal exposure) or clothing: Absorption of the pesticide will continue as long as the pesticide remains in contact with the skin. Remove contaminated clothing immediately and wash skin thoroughly with soap and water. Rinse with water and wash again and rinse. Avoid scrubbing skin. Do not use ointments, creams or powders unless instructed by medical personnel. Cover affected area with a clean, soft cloth.

If the pesticide enters the eye: Hold eyelid open and gently wash with a stream of clean running water. Continue washing for 15 minutes or more with at least 5 gallons of water to completely flush. Do not use chemicals or drugs in the wash water. Cover the eye with a clean cloth and seek medical help immediately.

If the pesticide has been inhaled (dusts, vapors, gases): If the victim is in an enclosed space, do not go in unless you have an air-supplied respirator. CARRY the victim to fresh air immediately. Have the victim lie down, loosen clothing and keep the person warm and quiet. Keep the chin up to keep air passages free for breathing and watch for interrupted breathing or convulsing.

If the pesticide has been swallowed: Induce vomiting ONLY if a physician, poison center or the label of the pesticide says to do so. Some pesticides will cause more damage if vomiting is induced! Never induce vomiting if the victim is unconscious or convulsing. Never induce vomiting if the victim has swallowed EC formulations of pesticides or any other petroleum based products. Never induce vomiting if the person has swallowed a corrosive poison such as a strong acid or alkali (base.) Determine what the victim has ingested and dilute the poison as quickly as possible. For acids and alkalis, the patient can be given lots of water or milk. Get the victim to a hospital immediately.

The key to surviving and recovering from a pesticide poisoning is *rapid* treatment. Take emergency action immediately when you suspect a pesticide poisoning. ◆

Important Contacts

Pesticide Contacts at the Vermont Agency of Agriculture, Food & Markets <u>http://www.vermontagriculture.com/pid.htm</u> Philip R. Benedict, Director				
Jeff Comstock Soil Scientist	(802) 828-3473	jcomstock@agr.state.vt.us		
Cary Giguere Pesticide Research and Info.Specialist	(802) 828-6531	cary@agr.state.vt.us		
Emily Inoue State Survey Coordinator	(802) 241-3544	einoue@agr.state.vt.us		
James Leland Agrichemical Program Supervisor	(802) 828-3478	jim@agr.state.vt.us		
Annie Macmillan Agrichemical Toxicologist	(802) 828-3479	annie@agr.state.vt.us		
Tim Shmaltz Plant Pathologist	(802) 241-3544	tim@agr.state.vt.us		
Jon Turmel Entomologist	(802) 241-3545	jon@agr.state.vt.us		
Matthew Wood Pesticide Certification & Training Coordin	(802) 828-3482 ator	mwood@agr.state.vt.us		

Pesticide Contacts at the University of Vermont Extension Service <u>http://www.uvm.edu/~uvmext/</u>		
Lorraine Berkett IPM Specialist	(802) 656-2630	
Sid Bosworth Agronomist, UVM	(802) 656-0478	
Jeff Carter Field and Forage Specialist	(802) 388-4969	
Heather Darby Agronomist, Northeast Region	(802) 524-6502, X206	
Vern Grubinger Berries and Vegetables Specialist	(802) 257-7967	
Ann Hazelrigg Plant Diagnostic Clinic, Pesticide Education and Safety Program	(802) 656-0493	
Rick LeVitre Dairy Specialist	(802) 773-3349	
Leonard Perry Greenhouse and Nursery Specialist	(802) 656-0479	
Margaret Skinner Entomologist	(802) 656-5440	

Home Study Quiz 1 – First Aid and Pesticide Poisonings

The following set of questions refers to the **First Aid and Pesticide Poisoning** article on page 11. Fill out the information on the back of the quiz and mail the completed quiz to the Vermont Agency of Agriculture to receive **one pesticide recertification credit.**

- 1. What is the most important thing to do if a pesticide is on a person's skin or in their eyes?
- 2. What do you do first if the victim has inhaled the poison? How do you protect yourself?
- 3. What does is the number used for the Northern New England Poison Center? What are the hours of the Center?
- 4. If a person has swallowed a poison, you should always make him vomit except in which three cases.
- 5. What is the first thing to do if someone has been poisoned by a pesticide?
- 6. What is meant by "first aid?"
- 7. If a victim is conscious and has swallowed pesticides that are not corrosive or petroleum based, what should you do?
- 8. Name four potential symptoms of pesticide poisoning
- 9. What is a key factor in surviving and recovering from a pesticide exposure poisoning?
- 10. After pesticides are on the skin and they have been washed off, what is the next step of treatment?

Fill out the following information and mail the completed quiz to the Vermont Agency of Agriculture to receive one (1) pesticide recertification credit.

Name:	
Certificate #:	
Street Address:	
City/State/Zip	
Company/Farm:	
Signature:	Date:

Mail to:

Vermont Agency of Agriculture Attn: Matthew Wood 116 State Street - Drawer 20 Montpelier, VT 05620-2901

Home Study Quiz 2 – How Soil Properties Affect Groundwater Vulnerability to Pesticide Contamination

The following set of questions pertains to the **How Soil Properties Affect Groundwater Vulnerability to Pesticide Contamination** article on pages 8 - 10. Fill out the information on the back of the quiz and mail the completed quiz to the Vermont Agency of Agriculture to receive **one pesticide recertification credit.**

- 1. Name the (4) four factors that govern the potential for groundwater contamination by pesticides passing through the soil.
- 2. <u>Fill in the blank:</u> ______ refers to the removal of soluble materials by water passing through the soil.
- 3. Name the (5) five factors that influence soil permeability:
- 4. Define a "Macropore."
- 5. Explain why macropores are especially important where they are connected to the soil surface.
- 6. <u>Complete the sentence:</u> Regarding its sorption of pesticides, **Organic Matter** provides the greatest number of binding sites because it has...
- 7. <u>Multiple choice:</u> Clay content refers to the percentage of microscopic _____--shaped grains in the soil.
 - a. Napkin
 - b. Plate
 - c. Cup
 - d. Spoon
 - e. Fork
- 8. True___, False___ The least sensitive soil is a well drained clayey soil with high organic matter content.
- 9. <u>Circle the correct answer:</u> Cultivated organic soils have (High Low) sensitivities with respect to groundwater vulnerability to pesticide contamination.
- 10. Which tend to have the greatest hydraulic loading, soils near a hilltop or soils near the bottom of a slope?

Pesticide Applicator Report

January 2006

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Fill out the following information and mail the completed quiz to the Vermont Agency of Agriculture to receive <u>one (1) pesticide recertification credit.</u>

Name:	
Certificate #:	
Street Address:	
City/State/Zip	
Company/Farm:	
Signature:	Date: