

Pesticide Applicator Report



a Publication of the Vermont Agency of Agriculture, Food & Markets
For Vermont's Pesticide Applicators

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News from the Vermont Agency of Agriculture, Food & Markets

6th Circuit Court / NPDES Permit Issue

On January 7, 2009 the 6th Circuit Court of Appeals struck down a rule issued by the Environmental Protection Agency (EPA) in 2006 regarding the application of aquatic pesticides. The court held that Clean Water Act (CWA) permits are required for pesticide applications "in, over, or near" waters of the U.S. This decision has significant impacts on agricultural production in the U.S. as it would require permits for all aquatic pesticide applications and likely a large number of terrestrial applications.

NASDA (National Association of State Departments of Agriculture) sent a letter April 7, 2009 to EPA administrator Lisa Jackson urging the agency to file a request to the 6th Circuit Court for a rehearing of the court's ruling on Clean Water Act permits for certain pesticide applications. NASDA believes the court's ruling is in direct conflict the agriculture exceptions in the Clean Water Act and urged EPA to appeal the ruling to the U.S. Supreme Court if necessary. However, on April 9, EPA announced it would not seek a rehearing, but will file a Motion for Stay of the Mandate for a period of two years.

Although EPA refused to ask for a rehearing, a coalition of agriculture interests has requested that the full 6th Circuit rehear the case. On April 24, the court directed the environmental groups participating in the case to respond by May 8 to a rehearing petition filed by a coalition of agriculture interests, and supported by NASDA.

Continued →

Questions or comments regarding this newsletter?
Please contact **Matthew Wood** at the Vermont Agency of Agriculture at 802-828-3482 or email matthew.wood@state.vt.us

If the Court's decision stands, agricultural producers will be required to obtain a permit for an estimated 5.6 million pesticide applications annually. Currently, no permitting system is in place to handle the dramatic increase in permit applications. Furthermore, the Court's ruling has placed producers in legal jeopardy under the Clean Water Act's citizen-action provisions.

Subsequent Legislative Fixes...

Lucas Introduces NPDES Fix in House - News Date August 17, 2010

Rep. Frank Lucas (R-OK), Ranking Member of the House Agriculture Committee, introduced legislation (H.R. 6087) in the House last week that would amend the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) to clarify that additional permits are not required for pesticide applications made in accordance with FIFRA. Lucas's bill is companion legislation to S. 3735 which was introduced earlier this month in the Senate by Sens. Blanche Lincoln (D-AR) and Saxby Chambliss (R-GA). Both bills would clarify that permits under the Clean Water Act (CWA), for example, are not required for pesticide applications that comply with FIFRA.

NASDA joined last week with a number of other agricultural organizations in signing a letter of support of the Lincoln/Chambliss legislation.

Peterson Introduces NPDES Fix - News Date October 05, 2010

House Agricultural Committee Chairman Colin C. Peterson (D-MN) introduced legislation (H.R. 6273) last week to amend FIFRA and the Clean Water Act (CWA) to clarify that NPDES permits under the CWA are not required for pesticide applications made in accordance with FIFRA.

This bill follows in the wake of the 2009 case of *National Cotton Council of America v. EPA*, in which the 6th Circuit Court of Appeals overturned a 2006 EPA rule which exempted permitting of certain pesticides under the CWA. Similar legislation has been introduced in the Senate (S. 3735) by Sens. Blanche Lincoln (D-AR) and Saxby Chambliss (R-GA) and by Rep. Frank Lucas (R-OK) in the House (H.R. 6087).
By Nathan Bowen, NASDA, used with permission.

Back to Backpack Sprayer School!

Another Way to Calibrate a Backpack Sprayer

Emelie Swackhamer, Penn State Cooperative Extension

When do you need to calibrate a backpack sprayer? Read the label!

Many pesticides specify using defined amount of a formulation per gallon of water and spraying the foliage to the point of runoff. That works for some applications.

Example: *Entrust Naturalyte Insect Control*: "For small plantings or spot sprays, add the required amount of Entrust to the recommended amount of water, mix thoroughly, and apply uniformly to plant foliage to the point of runoff. Do not use more than 3 gallons of spray per 1000 sq. ft. of area."

But what about pesticides that specify a defined amount of product should be applied per acre?

Example: *Champ WG for Tomato Early and Late Blight*: "Apply 2 to 4 pounds per acre in a minimum spray volume of 20 gallons." In this case you need to know how much spray volume will cover an acre or a fraction of an acre. You want to apply the product uniformly with good coverage, but you don't want to over apply or mix too much in the tank to do the job. Calibrate to find out what your sprayer will do.

Pressure: has to be constant to be uniform for the whole application. Use a pressure gauge and better yet, also use a compressed air or CO₂ pressure source.

Nozzle: select one with a uniform pattern.

Applicator: each applicator will apply at a slightly different rate, so it is important to calibrate for each applicator that will be doing the job.

Many backpack spray calibration methods use a linear test area. You have to determine the sprayer swath width in feet, and then set the calibration course length so you are calibrating on a certain

number of square feet. The problem with this method is that many applications are not linear in a band. Many applications are made to a patch that is wider than the sprayer swath width. The following method calibrates on a patch that measures 18.5' x 18.5' and uses a very simple calculation to determine the gallons delivered per acre.

1. Measure an area 18.5' x 18.5'.
2. Measure number of seconds necessary to spray this area.
3. Spray into a container that measures ounces for the same time measured in Step 2.
4. # of ounces collected = Gallons per acre.

Why? $18.5' \times 18.5' = 340 \text{ ft}^2 = 1/128$ of an acre.
There are 128 ounces in 1 gallon.
Thus, ounces = gallons in the calculation.

Example:

- It takes 40 seconds to spray the 18.5' x 18.5' area.
- In 40 seconds, 30 ounces of spray solution is collected.
- So, you are applying at 30 GPA.
- You have a 3 gallon sprayer.
- 30 Gallons needed to treat 1 acre.
- One full sprayer will treat 10% of an acre.

Converting Pesticide Rates into Practical Amounts

Emelie Swackhamer, Penn State Horticulture Extension Educator

If you need to make a pesticide application, the quality of your crop absolutely depends on your ability to apply the labeled rate, while taking the acreage of crop and/or the volume of your application equipment into account. Accurate calculations allow you to use the correct amount to be effective. You'll also avoid using more pesticide than you need which is wasteful, and can be harmful to the crop (and could leave an illegal residue on food).

But, how often have you found yourself looking at a pesticide label, trying to figure out how much of the product to use on a small area?

No matter what calculation you need to make, you can almost always use conversion factors to translate what you do know, (for example the recommended rate of a product), into what you need to know (for example, how much product to use for a small area application).

Start with the recommended rate and line up conversion factors so the units in the numerator (the top part of the fraction) cancel the units in the denominator (the bottom part of the fraction) until you get it expressed in a unit of measure you can work with

Example 1: A liquid pesticide (if the label says to use a certain liquid volume per acre)

Your patch measures 4 ft X 40 ft = 160 ft²

Labeled rate = 12 oz per acre

How much product do you need to treat the patch?

$$\frac{12 \text{ oz}}{\text{A}} \times \frac{1 \text{ A}}{43,560 \text{ ft}^2} \times \frac{160 \text{ ft}^2}{1 \text{ patch}} = \frac{0.044 \text{ oz}}{\text{patch}}$$

Notice, the units A (acres), and ft² (square feet) cancel out of the numerator and denominator in this equation, and you are left with oz (ounces) needed to treat the patch.

Continued →

(Remember, when you have the same thing on the top of a fraction and the bottom, they cancel each other out). But how do you measure out 0.044 oz of product? Use one more conversion factor in your equation to translate it into units you can measure, for example milliliters (ml).

$$\frac{12 \text{ oz}}{\text{A}} \times \frac{1 \text{ A}}{43,560 \text{ ft}^2} \times \frac{160 \text{ ft}^2}{1 \text{ patch}} \times \frac{29.6 \text{ ml}}{1 \text{ oz}} = 1.3 \text{ ml needed}$$

Most growers can find something to measure out 1.3 ml, and keep it in the pesticide shed with other measuring equipment. If you need something to measure ml, you could try asking at a drug store; they usually stock syringes without needles to help people measure out small amounts of medicines.

How much water do you need in the tank to cover your plot? Check the label first. Otherwise, the minimum volume recommended for insect control is 40 G/A.

$$\frac{40 \text{ G}}{\text{A}} \times \frac{1 \text{ A}}{43,560 \text{ ft}^2} \times \frac{160 \text{ ft}^2}{\text{patch}} \times \frac{128 \text{ oz}}{\text{G}} = 18.8 \text{ oz}$$

Make sure you can spray the mixture evenly over the whole patch-- practice with water first.

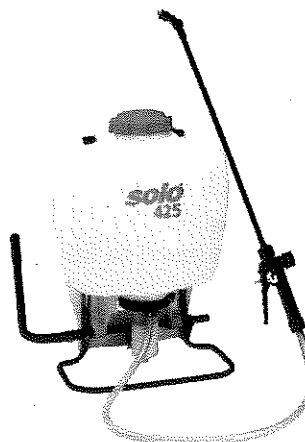
Here are a few conversion factors and facts to help you make the calculations:

1 acre = 43,560 square feet	1 pint = 473.2 milliliters	1 teaspoon = 4.93 ml
1 fluid ounce = 29.6 milliliter	1 tablespoon = 3 teaspoons	1 quart = 2 pints = 4 cups
1 gallon = 128 ounce	1 cup = 16 tablespoons = 48 teaspoons	1 pint = 96 teaspoons
1 ounce = 28.35 grams	1 pound = 454 grams	1 hectare = 2.47 acres

Insecticides should be applied in a minimum volume of 40 gallons per acre or more at a higher pressure.

Herbicide sprays should be applied in a volume between 15 and 50 gallons of spray solution per acre using low pressure (30-45 psi).

See the quiz on Page 9 for some credit...



Web Distributed Labeling

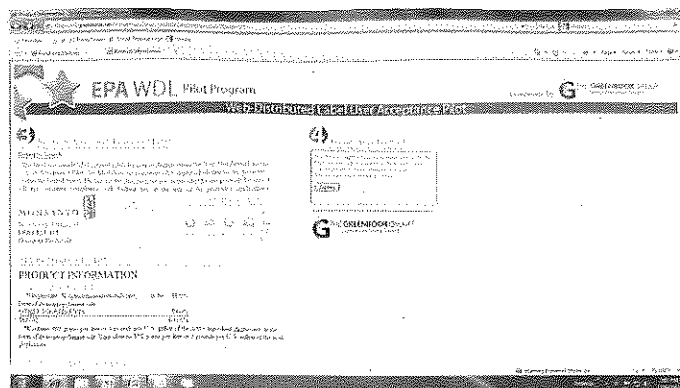
EPA's Office of Pesticide Programs (OPP) is exploring a new initiative called "web-distributed labeling" (WDL) that would make the most current version of some pesticide labeling available to users via the Internet. Through a Federal Register Notice, OPP is announcing its intention to conduct a web-distributed labeling "User Acceptance Pilot" and is soliciting interest from entities potentially willing to participate in this pilot program. (*Translation: That's 'government-speak' for "looking for some people to try it out ahead of time"*).

Through the User Acceptance Pilot, EPA intends to demonstrate how users could access labeling information using the Internet, thereby helping EPA determine whether the benefits of web-distributed labeling would be sufficiently appealing to users that they would be willing to visit a website to download and use labeling (*Translation: They want to find out if you think you would actually use it*). This notice provides a brief description of a pilot website and invites participation in developing a pilot web-distributed labeling website by interested parties (*Translation: They asked the participating companies to make the website for them*).

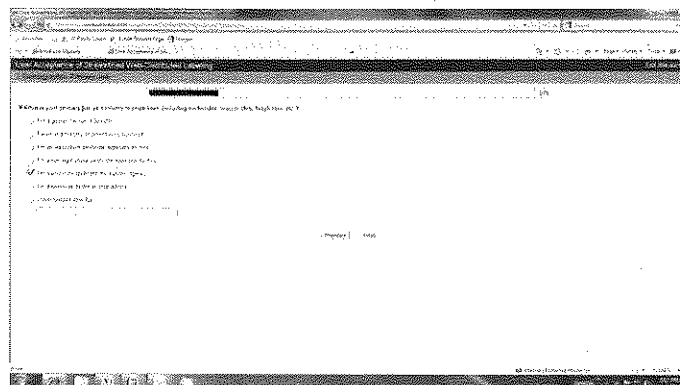
Well, now the website is in place and includes an online survey for users to respond through "Survey Monkey." If you are interested in trying this online, visit the Greenbook site and follow steps 1 through 4. Step 4 is the online survey. Complete the survey, answering each question honestly and thoughtfully, and only do it once, please.

Website: Greenbook: <http://wdl.greenbook.net/>

Remember: The product labeling generated from use of this WDL Pilot Program is NOT INTENDED OR APPROVED FOR USE IN ACTUAL APPLICATION PRACTICES. ALWAYS READ AND FOLLOW THE FULL PRODUCT LABELING. (This whole system is still in the testing stages.)



Greenbook page with link to survey at step 4.



A page from the survey.

News from UVM Extension

New Hire

Agronomist Dan Hudson has recently joined the agronomy team at the University of Vermont Extension. Based at the Extension office in St. Johnsbury, Hudson will focus primarily on the Northeast Kingdom and the Connecticut River watershed, while also being part of Extension's statewide team of agronomists and working with local producers to address issues with forage and field crop production, nutrient management and water quality protection.

Continued →

Hudson has most recently worked with Michigan State University Extension where primary crops are corn, soybeans, wheat, alfalfa/grass hay, and pasture. Nearly all of his time focused on sustainable production of those crops, while he also enjoyed working with organic farmers and alternative crops including barley, field peas, and canola.

As he acclimatizes himself to Vermont, Hudson is busy learning what farmers are doing and why, and meeting as many farmers and members of farm-related organizations as possible. He says he looks forward to working alongside local farmers who have been dealing with the challenges of steep slopes, small fields, and short growing seasons with determination and ingenuity.

His phone in St. Johnsbury is (802) 751-8307 x356 and e-mail is daniel.hudson@uvm.edu.

Some funding for this portion of the newsletter came from USDA's Risk Management Agency (RMA)



The RMA provides risk management and financial tools to Vermont's farmers with information through education and outreach programs. More information is available at: www.rma.usda.gov

Nutrient Deficiencies in Plants

Ann Hazelrigg, UVM Extension

Not all dieback and spotting in plants is caused by insects or diseases. Sometimes an unhealthy plant can be a result of not enough nutrients or too much of one or several nutrients. Trying to figure out nutrient problems can be tricky since many problems often have similar symptoms. There may be a combination of nutrients or factors involved in the plant symptoms complicating diagnosis. Previous weather conditions such as water stress or too much rain can also contribute to nutrient deficiencies and confuse diagnosis. Root injuries or rots affect the uptake of nutrients from the soil, also leading to deficiency symptoms. It is important to know what the healthy plant species looks like

(especially important in ornamental plants!) so nutrient deficiencies are not confused with a selected variegation in the plant or a bright yellow hue of new foliage.

Look for a pattern

To determine if a nutrient deficiency is involved look for a pattern to the damage. An insect or infectious disease problem is often random on the leaf or within the field. Nutrient deficiencies are usually consistent throughout the field or on the leaf, such as tip burn or leaf edge scorch.

Macro nutrients and Micro nutrients

There are two categories of plant nutrients; macronutrients and micronutrients. Macro nutrients are those needed in fairly large amounts like nitrogen, potassium, phosphorus, calcium, magnesium and sulfur. Micronutrients are needed in small or trace amounts and include iron, boron, manganese, zinc, copper, chlorine and molybdenum. All the plant nutrients are taken up by the roots but certain requirements must be met before this will work. The soil must be sufficiently moist for the roots to take up and transport the nutrients. Sometimes correcting the soil moisture issues will alleviate deficiency symptoms in the plants. The pH of the soil must be in the correct range for the nutrients to be available to the plant. This range will vary for different nutrients. Having the soil temperature in the right range for nutrient uptake is the third requirement for uptake of nutrients. So keep in mind soil test results are just one piece of the nutrient deficiency puzzle!

Looking at the part of the plant affected is a good clue

Looking at the part of the plant that is affected can be a good clue as to which nutrient may be lacking. The symptoms of deficiencies of mobile or easily translocated nutrients such as N, P, K and Mg will be seen at the base of the plant whereas the immobile nutrients or those not easily transported within the plant like boron, calcium, iron, manganese, zinc and copper will be seen at the top of the plant or the new growth. Those nutrients that are partially mobile (sulfur and molybdenum) will cause symptoms in the entire plant.

Continued →

Mobile Nutrients-Symptoms often seen at the base of the plant or on older leaves

For the easily transported nutrients such as nitrogen (N), phosphorus (P), and potassium (K) and magnesium (Mg) the first general symptom you will see is chlorosis or yellowing. For nitrogen and phosphorus deficiencies, you will see uniform yellowing at the base of the plant followed by death of the older leaves in severe cases. Nitrogen deficiency can also cause severe stunting, early flowering, possible red coloring and leaf abscission. Phosphorus deficiencies can often produce compact plants with dark green foliage followed by severe stunting, possible purpling of foliage and longer and fewer roots. Magnesium deficiency causes interveinal yellowing (yellowing of tissue while the veins remain green) on the older or lower leaves. This deficiency is often seen in greenhouse tomatoes at the base of the plants as the season progresses. Potassium deficiency causes a rapid yellowing with death of older leaf edges (often called "scorch") or leaf tips. Dead spots may also be seen on the older leaves due to potassium deficiency.

Non Mobile Nutrients-symptoms often seen at the top of the plant on youngest leaves

Non mobile nutrients include boron (B), calcium (Ca), iron (Fe), manganese (Mn), zinc (Zn) and copper (Cu.) Deficiencies of these nutrients would be seen more at the top of the plant. General chlorosis at the top of the plant could be a symptom of either iron or manganese. Iron deficiency is usually expressed by an interveinal chlorosis in the young growth. Manganese shows general chlorosis at the top often with tan flecking. Necrosis and distortion at the upper part of the plant is typically associated with calcium or boron deficiency. Both can cause incomplete flower formation and short, densely branched and thick root systems. Boron can cause short internodes causing a "rosetting" symptom along with thickened leaves. Calcium deficiency causes tissue breakdown as evidenced in blossom end rot of tomatoes or cork spot in apples. Copper and zinc deficiencies are seen in the young and recently mature leaves of the plant. For both, the upper leaves may curl and roll, variable chlorosis may occur and there can be rapid death of young fully expanded leaves. Copper deficiency may cause smaller, fewer and lighter colored flowers in ornamentals. Zinc deficiency may result in smaller leaves and shortened internodes.

Partially Mobile Nutrients

Sulfur(S) and Molybdenum (Mo) are partially mobile in the plant and the symptoms associated with these deficiencies are seen throughout the entire plant, not specifically the top or bottom. Sulfur deficiency can cause chlorosis and death of young leaves and color fading of flowers in ornamentals. Molybdenum deficiency in poinsettia causes a chlorotic band around the leaf margin followed by death. Stunting and failure to develop dark green color in foliage is another symptom of molybdenum deficiency. This nutrient is important in nitrogen fixing legumes, so its absence can cause interveinal leaf chlorosis followed by death of the tissue, stunting of the plants and symptoms similar to those caused by nitrogen deficiencies.

See the quiz on page 11 for a credit...

Some UVM Extension Meetings in 2011

Feb 3 - Commercial Pesticide Applicators Meeting for Field and Forages, Schoolhouse VTC, 5-6 credits in category 1a pending approval, CCA credits pending approval. \$20.00 Contact ann.hazlrigg@uvm.edu or 656-0493.

Feb 7 - Vermont Agronomy Plus: Best Strategies for Weathering the Storm. East Side Restaurant in Newport: 47 Landing St # 3, Newport, VT. 1-2 pesticide credits pending approval. CCA credits pending approval. \$15.00 incl. lunch. Contact Daniel.Hudson@uvm.edu or 751-8307.

Feb 8 - Vermont Agronomy Plus: Best Strategies for Weathering the Storm. Vergennes American Legion. 1-2 pesticide credits pending approval. CCA credits pending approval. \$15.00 incl. lunch. Contact Daniel.Hudson@uvm.edu or 751-8307.

March 9 - Northern Grain Growers Meeting. The University of Vermont's Davis Center, Burlington. \$40.00 contact Heather.Darby@uvm.edu 524-6501.

Oriental Beetle Grubs in Vermont

Sid Bosworth and Taylor LaFluer¹

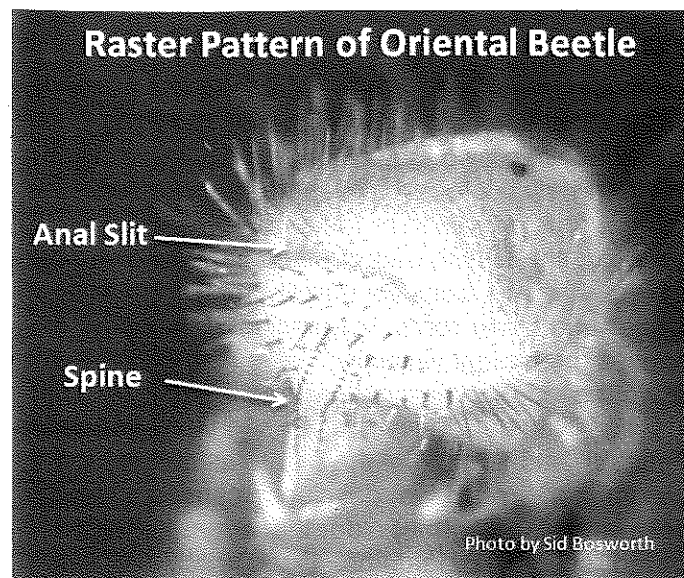
There was a fair amount of grub damage to turf in the Chittenden County area this past August and September. One particular grub we found that, according to state entomologist Jon Turmel, had not been detected in Vermont before. This new invader was the oriental beetle (*Exomala orientalis*). In five sites evaluated in September, the majority of the grubs were Oriental and a few were Asiatic garden beetle grubs. We did not find any Japanese beetles at those particular sites even though it commonly shows up in Vermont.



Example of oriental beetle damage.

Like the Japanese beetle, this grub has one life cycle per year and feeds on grass roots. It emerges from the soil as an adult in mid-summer and begins laying eggs in late July/early August. The young grubs will feed on roots until mid-autumn, over winter usually in the larval stage, and resume feeding on roots in the spring until they pupate. Although the adult oriental beetle will feed on roses, phlox and petunias, their damage is not nearly as extensive as the Japanese beetle adults. Also, the adults tend to feed at night and may not be observed as readily since their coloration (light brown to black often with darker mottling on the wings) is not as noticeable as the Japanese beetle. It is the grubs that cause the most damage, and not only to turf grass but also to many perennial plants, nursery stock and potted plants. Symptoms of turf damaged by oriental beetle grubs are similar to

other grubs. They are very effective at severing the roots, so leaf blades pull up easily from damaged tillers. Secondary damage is often caused by skunks and birds digging up to turf to get to the grubs.



Close-up of you-know-what on the grub.

Identification of Grubs – Since we have about four or five species of grubs in Vermont, it is important to be able to identify them in order to better manage them. The best way to ID them is to gently roll the grub out and look on the underside of the posterior segment with a 10X or greater magnifying glass. For the oriental beetle, there are distinct raster patterns different than the other white grubs. One is the broad transverse anal slit across the end of the posterior segment in combination with the parallel line of spines running up the segment perpendicular to the anal slit. Japanese beetle has a similar anal slit shape but its spines form a V shape.

Keep an eye out for another article from Sid on the management of these grubs in next spring's newsletter.

¹ Associate Extension Professor in the Plant and Soil Science Dept. and UVM Senior in Sustainable Landscape Horticulture, University of Vermont

The following information is required. Mail the completed quiz to the Vermont Agency of Agriculture to receive one (1) pesticide recertification credit.

Name:			
Certificate #:		Please check: <input type="checkbox"/> Commercial <input type="checkbox"/> Non-Commercial <input type="checkbox"/> Government <input type="checkbox"/> Private	
Street Address:			
City/State/Zip			
Company/Farm:			
Signature:	Date:		
OPTIONAL: Please include your E-MAIL ADDRESS so we can start moving toward electronic dissemination of certification-related materials (?)	Company/Farm email:		
	Personal email:		

Mail to:

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

Home Study Quiz 2 – Nutrient Deficiencies in Plants

The following questions refer to the article on pages 6 and 7. Fill out the information on the back of this completed quiz and mail it to the Vermont Agency of Agriculture to receive **(1) one pesticide recertification credit.**

1. Name three conditions that need to be met before nutrients are available to plants.

2. Name the macro nutrients

3. Name the micro nutrients

4. What is meant by mobile nutrients?

5. What are the mobile nutrients?

6. Where are symptoms seen for the mobile nutrients?

7. Where are the symptoms seen for the non mobile nutrients?

8. What nutrients could be limiting if you see yellowing at the base of the plant?

9. Which nutrient would cause interveinal chlorosis at the top of the plant or on the newer growth?

10. Which nutrient could cause interveinal chlorosis at the base of the plant or on the lower leaves?

11. Which nutrient would be responsible for lower leaf chlorosis with purpling?

12. Which nutrient would cause leaf scorch on the leaf edges on the lower part of the plant?

Pesticide Applicator Report
 Fall 2010

Vermont Agency of Agriculture, Food & Markets
 Agriculture Resource Management Division
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 Montpelier, VT 05620-2901

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Street Address:		
City/State/Zip		
Company/Farm:		
Signature:	Date:	
OPTIONAL: Please include your E-MAIL ADDRESS so we can start moving toward electronic dissemination of certification-related materials (?)	Company/Farm email:	
	Personal email:	