



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 Agency

A Review of the Regulations Concerning Pesticide Applications in Vermont Daycare Facilities

Although it is very important to control pests at daycare facilities, it is also important to protect children from exposure to pesticides. Remember that children are particularly susceptible to the effects of toxic material due to their ratio of skin surface area to body weight, their proximity to the ground and other treated surfaces, their developing organs, and their tendency to put their hands and foreign objects in their mouths.

Here is a review of the "Pesticides" section of the Early Childhood Program Licensing Regulations. Those of you who are commercial applicators (pest control operators, landscapers and lawn care professionals) that have accounts at daycare facilities in Vermont, you may want to read further.

[Please note that fulfilling the notification and record keeping requirements is the responsibility of the licensed daycare provider, but it would be a very good idea for you (the applicator) to remind them of this. It will help to ensure that the notification and record keeping requirements are being met, and that your company, the daycare facility, and the children are all protected.]

Continued on page 2→

Following is a direct excerpt from the daycare regulations, which can be found in their entirety online at:

<http://www.dcf.state.vt.us/cdd/licensing/general.html>

Look under Section V – Health and Safety.

[Section] W. Pesticides

Restrictions applying to pesticide use do not include anti-microbial products intended for sanitation or disinfection.

Note: It is everyone's best interest to reduce potential exposure of children to pesticides. Pesticides are designed to kill living organisms; therefore they pose special risks to children. Children play or sit on or near the ground and engage in hand to mouth behaviors. They also have developing organ systems that may not detoxify poisons as adults do. The best method to reduce pests and the possible need for pesticide application includes proper sanitation practices and habitat prevention steps.

1. Pesticide applications shall be used only when other pest prevention and control measures fail. Pesticides shall not be used to control pests for aesthetic reasons alone. Whenever possible the Licensed Family Child Care Home shall use pesticides of least risk.

Note:

- *Integrated Pest Management (IPM) is an environmentally sensitive approach to pest management. IPM uses knowledge of pest life cycles and their interactions with environment in addition to the judicious use of pesticides.*
- *Risk depends upon hazard (toxicity) and exposure. A measure of hazard to humans and other mammals is provided by signal words on pesticide labels. The most toxic are labeled DANGER, followed by WARNING. The least toxic are labeled CAUTION.*

2. All contracted pesticide applications shall be applied only by commercial applicators certified by the Vermont Agency of Agriculture, Food and Markets.

3. Parents of children and staff shall be notified in writing prior to any planned application of pesticides. Notice shall include site of planned application, pest to be treated for, and proposed pesticide to be used.

4. Only pesticides registered with the Vermont Agency of Agriculture, Food and Markets shall be used.



The young ones

5. Application of pesticides shall only be made when children are not present. (For example: Friday afternoons in anticipation of children not being present over the weekend and to allow full ventilation after application)

6. Rodent baits shall not be used unless in childproof bait boxes. Bait boxes shall be inaccessible to children.

7. Prior to application a staff person of the Licensed Family Child Care Home may guide the certified applicator away from surfaces that can be touched or mouthed by children.

Continued on next page→

8. The Licensee or Licensee's Agent shall keep records of all pesticide applications. Records will include:

- the pesticide product name
- EPA Registration Number
- amount used
- dates of application
- location of application
- pests treated for

These records shall be available for inspection by parents and prospective parents during operating hours. (Sample Pesticide Recording Form contained in Appendix D).

Appendix D: Record of Pesticide Application

(The form has been intentionally omitted from this newsletter, which simply consisted of a table with the (6) pieces of information outlined above as the column headings)

NOTE: These records shall be available for inspection by parents and prospective parents during operating hours.

-Matt

* * *

USDA Declares Extraordinary Emergency in Michigan and New York due to Plum Pox Virus

Source: USDA – APHIS Newsroom website
<http://www.aphis.usda.gov/newsroom/index.shtml>

UPDATE: The declaration of extraordinary emergency became effective Friday, May 18.

WASHINGTON, May 9, 2007--Agriculture Secretary Mike Johanns today declared an extraordinary emergency in Michigan and New York and made funds available on a cost-share basis to assist with plum pox virus (PPV) eradication efforts in both states.

“If left unchecked, PPV could have devastating effects on our Nation’s fruit growers,” said Johanns. “USDA is fully committed to stopping the spread of this disease, and we will work with Michigan and New York to support survey, regulation and eradication.”

Both the Michigan Department of Agriculture (MDA) and the New York Department of Agriculture and Markets (NYDAM) requested federal assistance to help eradicate the disease. Through a cooperative survey, USDA’s Animal and Plant Health Inspection Service and NYDAM confirmed PPV in two commercial orchards in Niagara County, N.Y., in July 2006. In August 2006, MDA detected the disease at a single location in southwestern Michigan.

Plum pox strain D, which is the strain detected in both states, is a serious viral disease of stone fruit that first appeared in the United States in Pennsylvania in October 1999. USDA has worked cooperatively with the Pennsylvania Department of Agriculture to eradicate the disease there, and today, the area under quarantine is less than 100 square miles, down from 260 square miles at the height of the outbreak.

PPV affects a number of *Prunus* species, including peaches, nectarines, apricots and plums. Infection eventually results in severely reduced fruit production and poor fruit quality. There is no cure or treatment for the disease; accordingly, infected trees must be destroyed. The disease is spread short distances (a few meters to, rarely, as much as 20 miles) by aphids. Spread over longer distances is usually through the movement of infected budwood and nursery stock. Plum pox strain D is not spread by fruit, so the movement of fruit is not restricted.

Notice of this action is scheduled for publication in the May 23 *Federal Register*.

* * *



Amusing Answers...

In the Pesticide Applicator Report of December 2006 there was an article titled "Choosing the Right Gloves for the Job."

Here are some of the funny answers I got to the extra credit quiz question asking what the gloves pictured below are used for...

Recertification Credits piling up?

Don't forget to send in those recertification credit attendance forms and newsletter quizzes. Please do not wait until your 5-year certification period has expired to send them to me.

Although many of you are certified in several states, and some of those other states want you to hold all of your credits until requested or until your certificate is about to expire, we in Vermont like to do things differently!

Send in your credits as they accumulate, once per year is great. That way, you will have enough credits to automatically renew when your exam expires after the 5-year period, and you will receive the renewal in the mail with no interruption in your certification. This will save us both several phone calls and emails back and forth to get your renewal straightened out, and you will avoid any delays in maintaining your certification.

Just a friendly reminder... *℣*

* * *

Also, let me know if your home or work address changes, so I can keep your contact info up-to-date and you don't miss out on any of these high quality newsletters...



Grilling/BBQ, chemical handling, batter, motocross, no idea, electrical, diving, sloppy handsaw operators, milking cows, handling fuel, fencing, skiing, driving (car or golf?), military gunner, to protect my hands, wrestling, alien autopsy, duck, golf, alien, 3-toed sloth (several answered this), sailing, dress gloves, amputee/table saw accident, use with abrasive products, winter comfort/cold weather, caveman applicators, bowling, and tragic pesticide application accident.

The correct answer was ARCHERY. Many did get it right. Such a smart group.

The boxing gloves: for dealing with customers, labor union negotiators, marital disputes.

* * *

Effect of pH on Pesticide Stability and Efficacy

Winand K. Hock
Extension Pesticides Specialist
Penn State University (Used with Permission)

Has a grower ever come up to you and complained that the insecticide you sold him or that you custom applied for him didn't do a good job of controlling his insect problem? You probably attributed the reduction or lack of control to either a bad batch of chemical, or poor application, or pest resistance, or, maybe the farmer just didn't know what he was talking about. But, how many of you ever bothered to check the pH of the water prior to mixing the chemical?

If you look closely at the pesticide label, chances are you will find a statement cautioning you against mixing the pesticide with alkaline materials such as lime or lime sulfur. The reason for this is that many pesticides, particularly the organophosphate insecticides, undergo a chemical reaction in the presence of alkaline materials which destroys their effectiveness. This reaction is called alkaline hydrolysis and occurs when the pesticide is mixed with alkaline water; water with a pH greater than 7. The more alkaline the water, the more rapid the breakdown of the pesticides.

Lime and lime sulfur are often mentioned on pesticide labels because they are sometimes added to spray tanks. However, they are not the only materials that provide sufficient alkalinity for this reaction to occur. Caustic soda, caustic potash, soda ash, magnesia or dolomitic lime, liquid ammonia--all of these provide alkaline conditions in which susceptible pesticides can readily be hydrolyzed to inactive organic compounds.

It has been shown recently that in many areas of the U.S., water supplies have sufficient natural alkalinity to cause hydrolysis of certain pesticides. This means that a pesticide may begin to break down as soon as it is added to the tank. In practical terms, this means that the degree of pest control may be somewhat less than desirable, or even nonexistent, because a certain amount of the active ingredient will be decomposed to an inactive form before it ever reaches the plant and the pest. And if a spray rig is allowed to stand several hours or overnight before spraying out the contents of the tank, as much as 50% or more of the active ingredient may be decomposed.

Chemistry of Alkaline Hydrolysis

To better understand the phenomenon of alkaline hydrolysis, let's take a brief look at the chemistry using one of the organophosphate insecticides as an example.

Trichlorfon (Dylox, Proxol):

The phosphorous atom sort of divides the compound into two parts. Organophosphate insecticides are effective when the two parts of the chemical are together. When the parts are separated the OP pesticides are generally ineffective.

As you already know, water is made up of H and O . . . 2 parts H, one part O = H₂O. You also find charged particles or ions in water; both H⁺ and OH⁻, and depending on where the water comes from, there may be an abundance of either H⁺ in the water, or an abundance of OH⁻ ions. The more H⁺ in the water, the greater the acidity; the greater the OH⁻, the more alkaline the water.

This may seem rather elementary to all of you, but I feel it is necessary to understand the chemistry of water in order to understand alkaline hydrolysis.

The OH⁻ ion reacts readily with the OP molecule and breaks the molecule into two parts. The more alkaline the water (more OH⁻), the more rapid the breakdown. This is what happens to most of the OP and carbamate pesticides in the presence of alkaline water; the rate of breakdown varies according to the alkalinity and the temperature of the water, and the length of time the spray mix sits in the tank.

pH of Natural Water Sources

If the pH of your spray water is higher than 7.5, it is alkaline enough to affect some pesticides. The next few tables show the pH ranges reported for natural water sources in different areas of the U.S. A pH of 7.5-8.5 is common in many areas of the U.S. and in many surface and ground water sources in Pennsylvania. There have been reports that 5% of the natural water supplies in the U.S. have a pH higher than 9.0.

pH - Rivers in the U.S.

Potomac (MD, PA, WV)	7.8-8.4	Ohio (OH, IN, KY)	7.0-9.0
Delaware (PA, NJ)	7.4-7.6	Colorado (CA, AZ)	7.7-8.5
Hillsborough (FL)	7.1-8.2	Snake (ID)	7.6-8.4
Little (MA)	6.2-6.5	Rio Grande (CO, NM, TX)	7.3-9.0
Arkansas (AR, OK, KS, CO)	7.4-8.6	Brazos, Trinity, Colorado, Guadalupe (TX)	7.2-8.5
Missouri (NE, KS, MO)	7.8-8.5		
Mississippi (MN, WI, IL, MO)	7.6-8.9		

pH - Great Lakes

Lake Michigan (MI, IN, IL, WI)	7.5-8.5
Lake Ontario (NY)	7.9-8.3

Continued on next page →

Which Pesticides Are Affected by Alkaline Water?

Although there is a great deal of variability, in general we find that insecticides are affected more severely by alkaline water than fungicides and herbicides. And, we find among the insecticides that the OP and carbamates are decomposed much more rapidly than the chlorinated hydrocarbons.

Many manufacturers provide information on the rate at which their products hydrolyze. This rate is usually expressed as 'half-life' or the 'time it takes for 50% hydrolysis or breakdown to occur'. With trichlorfon or DYLOX, for example, the time for 50% hydrolysis at pH 8.0 is but 63 minutes; at pH 7.0 50 % breakdown occurs in 386 minutes. and at pH 6, 80 hours.

This means that if the pH of your spray water is 8 and one hour elapses between the time you add the insecticide to your spray tank and the spray dries on the foliage, 50% of the active ingredient has already decomposed. But if your water has a pH of 6, it is not likely that you will lose any significant activity during the process of application.

Let's take a look at a few more examples:

Carbaryl (Sevin)		Imidan	
pH	Half-life	pH	Half-life (20 degrees C)
6	100-150 days	4.0	15 days
7	24-30 days	7.0	1 day
8	2-3 days	8.3	4 hours
9	1 day	10.0	1 min.

Lower the pH in Your Spray Tank

If your water supply is alkaline, especially if the pH is 8 or greater, and you are using a pesticide that is sensitive to hydrolysis, you should lower the pH of the water in the spray tank. A pH in the range 4-6 is recommended for most pesticide sprays. You can adjust your spray solutions to the 4-6 pH range by the use of adjuvants that are marketed as buffering agents. Examples are:

- Buffer-X (Kalo Lab.)
- Nutrient Buffer Spray
 - 0-8-0 Zn Fe
 - 0-16-9 Zn
 - 10-12-0 Zn
 - 8-8-2 Zn Mn
- Spray-Aide (Miller)
- Sorba-Spray(s) (Leffingwell) -- 6 different products
- Unite (Hopkins)

A question that is sometimes asked is whether

acidification increases the residual time of the pesticide on the plant, thus affecting such factors as re-entry time and pre-harvest intervals. Residue tests on foliage sprayed with acidified and unacidified parathion sprays have failed to show any differences in the rate of degradation of the parathion. This would be expected since the pH of the foliage runs around 7.

There are a few pesticide materials which should not be acidified under any circumstances. Sprays containing fixed copper fungicides (including Bordeaux mixture, copper oxide, basic copper sulfate, copper hydroxide, etc.) and lime or lime sulfur should not be acidified. But, if the product label tells you to avoid alkaline materials, chances are good that the spray mixture will benefit by adjusting the pH to 6 or slightly lower.

The major benefit from acidification is obtained during the time the pesticide is in the spray tank; that is, from the time the pesticide is added to the water in the tank to the time the spray has dried on the foliage. If your water source is alkaline, addition of a buffering agent to the spray preparation is an easy and economical way to guarantee maximum results from your pesticide applications.

TRADE NAME	pH COMMON NAME	HYDROLYSIS RATE 50% HYDROLYZED IN
Dylox	trichlorfon	8.0 6.3 minutes 7.0 6.4 hours 6.0 3.7 days
Guthion	azinphos-methyl	9.0 12 hours 7.0 20 days 5.0 17.3 days
Carzol	formetanate	9.0 3 hours 7.0 14 hours 5.0 17.3 days
Imidan	--	8.3 Less than 4 hours 7.0 Less than 12 hours 4.5 13 days
Dimecron	phosphamidon	10.0 30 hours 7.0 13.5 days 4.0 74 days
Sevin	carbaryl	9.0 24 hours 8.0 2-3 days 7.0 24-30 days 6.0 100-150 days
Gardona	tetrachlorvinphos	10.5 80 hours 7.0 44 days 3.0 54 days
Phosdrin	mevinphos	11.0 1.4 hours 7.0 35 days
DiSyston	disulfoton	9.0 7.2 hours 5.0 60 hours
--	EPN	10.0 8.2 hours

6.0 More than 1 year

--	Parathion (Note: Methyl Parathion hydrolyzes several times faster than Parathion.)	11.0 170 minutes 10.0 29 hours 7.0 120 days 5.0 690 days
--	TEPP	10.0 21 minutes 9.0 3.5 hours 6.0 6.8 hours
Lannate	methomyl	At a pH of 9.1, loses 5.0% of its effectiveness in 6 hrs. at a rate of 8 oz. per 100 gal. water. Stable in slightly acid solutions.
--	malathion	Hydrolyzes rapidly at a pH above 7.0 and below pH 3.0.
Dibrom	naled	Hydrolyzes 90-100% in 48 hours in alkaline conditions.
DeFend, Cygon	dimethoate	Unstable in alkaline media. Stability is at a maximum at pH values between 4 and 7.
Benlate	benomyl	Less soluble in alkaline solutions.

News from the UVM Extension Service

Safe Disposal of Pesticides and Containers

Ann Hazelrigg

Pesticide Education and Safety Program, UVM

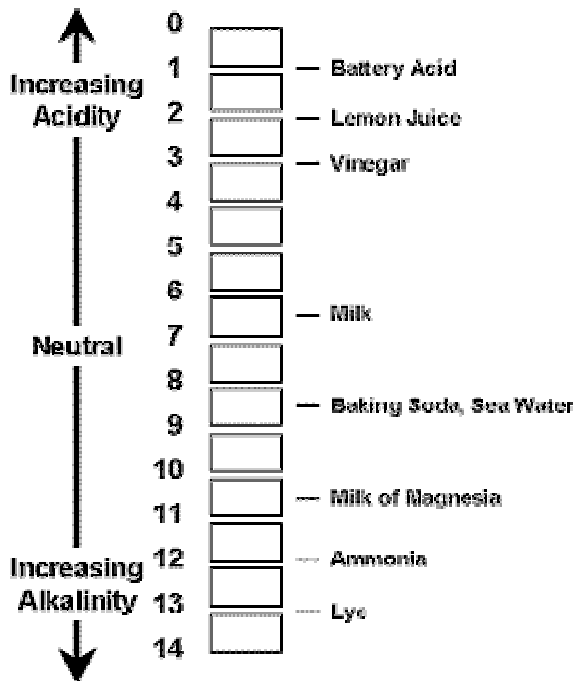
There are many considerations and decisions that go into a safe and effective pesticide application. The applicator must choose the proper pesticide for the crop and pest, select the right personal protective equipment, measure the right amount of pesticide required and calibrate the sprayer. After finishing a pesticide application, the next decision an applicator needs to make is how to safely dispose the surplus pesticide in the sprayer and how to properly dispose of any empty pesticide containers.

As a pesticide applicator, it is wise to not purchase more pesticide than is necessary for a particular application or season. However, even with careful purchasing it is still possible to end up with surplus pesticides;

- The government or pesticide manufacturer may cancel registration of a product.
- The use of a pesticide may no longer be effective.
- The pesticide may have frozen or become damaged if stored improperly.
- The pesticide label may be missing.
- There may be some pesticide left in the tank after application.
- There may be contaminated water leftover from spills, rinsing or cleaning operations.

Preventing Pesticide Surplus

To avoid pesticide surplus, always make sure that the pesticide you are considering is registered by the EPA and Vermont. Be sure the pesticide is labeled for the pest you are trying to control and the crop or site you are spraying. You can always check this before



(This pH scale was not part of the original article, but I inserted it as a visual aid. –Matt)

Want some credit? See quiz on page 9 →

purchase by going to the web and looking up whether the pesticide is registered in Vermont at:

<http://www.kellysolutions.com/VT/pesticideindex.htm>.

This helpful site will also list crop, pest, formulations and more for all the products registered for use in Vermont.

Estimate your pesticide needs and buy only what is necessary. Stockpiling pesticides will only increase the chances for damaged containers, chances of spills, and loss of strength of the material. Mix only enough pesticide for the job at hand so you can finish the job with as little pesticide left in the tank as possible. Preventing surplus is the best way to take care of a pesticide disposal problem.

How to Handle Surplus Pesticides

If you have pesticides you do not want or need, you must dispose of them legally. If the pesticides are still factory-sealed, they may be returned to where they were purchased.

There are several places where homeowners, farmers and businesses can bring in old, unwanted, out-of-date or unusable pesticides, and drop them off for safe disposal. Check the web at

<http://www.vermontagriculture.com/wastepest.htm>

for a listing of locations and dates for drop off. If you don't see your town or a drop off area near you on the list, call your Solid Waste District for upcoming events. Farmers living in towns which do not belong to a district may bring waste pesticides to any collection area. Pesticide collections are free and non-regulatory events.

If you have excess pesticide at the end of an application, you may apply the excess pesticide to another site where the pest and crop are listed on the label. Rinse water should also be applied to the crop and pest listed on the pesticide label. Never discard excess rinse water or pesticides down a drain or sewer.

Empty Pesticide Containers

Empty pesticide containers are not really empty. Each container that held liquid formulations must be triple rinsed immediately after emptying. Do this by filling the container one quarter full with water, close the container, rotate or gently shake so all interior surfaces are rinsed. Add the rinse water to the spray tank and repeat this procedure two more times. This should be sprayed back onto the crop listed on the pesticide label. After triple rinsing, puncture the top and bottom of the container to prevent any reuse and write 'triple rinsed' on it in permanent marker. The container then can be disposed of in a landfill or held for recycling.



A triple rinses!

For containers holding dry formulations, completely empty the contents into the tank. Open both ends of the container to prevent reuse and deposit in a landfill. With aerosol formulation containers, relieve as much pressure as possible and dispose of in a landfill. Do not puncture the container.

Triple rinsed containers can be held for disposal at a later time in a locked storage area away from children or animals.

Finish a Safe Job Properly

Make sure you follow a legal, safe and effective pesticide application with a legal, safe and effective disposal of excess pesticides and pesticide containers.

Get some credit! See quiz on page 11 →

Home Study Quiz 1 – Effect of pH on Pesticide Stability and Efficacy

The following set of questions refers to the **Effect of pH on Pesticide Stability and Efficacy** article on pages 5 - 7. Fill out the information on the back of the completed quiz and mail it to the Vermont Agency of Agriculture to receive (1) **one pesticide recertification credit**.

1. Define alkaline hydrolysis.
2. Name (3) three spray tank additives that could possibly contribute to alkaline hydrolysis, causing the breakdown of pesticide in a spray tank.
3. Up to how much of the active ingredient of a pesticide may be decomposed as a result of a spray mixture sitting in the rig overnight?
4. **True_____ False_____** The more H⁺ ions in the water, the greater the alkalinity.
5. In the case of the organophosphate, the rate of breakdown in the presence of alkaline water depends upon what three factors?
6. **True_____ False_____** If the pH of your spray water is higher than 7.5, it is alkaline enough to affect some pesticides.
7. **True_____ False_____** In general, fungicides and herbicides are more severely affected by alkaline water than are insecticides.
8. What is the best source of information for warnings against mixing a pesticide with alkaline materials such as lime or lime sulfur?
9. What is the recommended pH range for most pest pesticide sprays?
10. List a few of the pesticide materials that should NOT be acidified under any circumstances.

Extra credit: If you mixed a solution of equal parts battery acid, lemon juice, vinegar, milk, baking soda, sea water, milk of magnesia, ammonia and lye, what would the resulting pH probably be? (note: do not try this at home)

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 #:		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:

Mail to:

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

Home Study Quiz 2 – Safe Disposal of Pesticides and Containers

The following set of questions refers to the article **Safe Disposal of Pesticides and Containers** on pages 7 and 8. Fill out the information on the back of the completed quiz and mail it to the Vermont Agency of Agriculture to receive (1) **one pesticide recertification credit**.

1. What problems can arise if you buy more pesticide than you can use?
2. What should you do with rinse water if you can't add it to the tank mix?
3. Where can you dispose of properly rinsed containers?
4. Describe triple rinsing.
5. How can you dispose of surplus pesticides that are still sealed in their original containers?
6. How can you dispose of opened pesticides that are missing their labels?
7. What should you do to containers after triple rinsing to ensure the container is never reused?
8. **True** ___ **False** ___ If you are a homeowner, excess pesticides can safely be poured down the drain.
9. **True** ___ **False** ___ Aerosol cans holding pesticides should be punctured to ensure the pressure and excess pesticides are allowed to escape.
10. Where can you check to find out when and where to dispose of excess pesticides in your community?

Pesticide Applicator Report

June 2007

Vermont Agency of Agriculture, Food & Markets
Agriculture Resource Management & Environmental Stewardship
116 State Street - Drawer 20
Montpelier, VT 05620-2901

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2901
PERMIT No. 74

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 #:		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: