Handling Pesticides

Suggestions on Pesticide Application

1. Cover foliage uniformly, including undersides of leaves; improper application of the material to foliage results in poor insect and disease control.
2. The use of spray adjuvants (additives) may improve the performance of pesticides in some cases. Adjuvants sometimes provide better distribution and retention of insecticides and fungicides on plant foliage. However, experimental results have been variable. Before use, read the label and follow directions. Also, refer to "Spray Adjuvants or Additives" below.
3. Use recommended amounts of pesticides per acre regardless of volume of spray used.
4. Use specific recommended pesticides to control specific pests.
5. Time spray applications according to recommendations for specific pests. Consider growing rate of the crop for new, unprotected foliage.
6. Regardless of the type of spray equipment used, avoid situations where pesticide drift may be a problem.
7. Do not spray when temperatures exceed 90°F. At high temperatures, oil-based sprays can burn plants.

Spray Adjuvants or Additives

(Source: Cornell Vegetable Recommendations)

The term "adjuvant" describes any chemical that, when added to a liquid spray, makes the spray mix, wet, spread, stick or penetrate better. Water is almost a universal diluent for pesticide sprays. However, water is not compatible with oil-based pesticides, and an emulsifier may be needed to obtain good mixing. Furthermore, water from sprays often remains as large droplets on leaf surfaces.

A wetting agent lowers the interfacial tension between the spray droplet and the leaf surface and thus moistens the leaf. Spreaders are closely related to wetting agents and help to build a deposit on the leaf and improve "weatherability."

Stickers cause pesticides to adhere to the sprayed surface and often are called "spray-stickers." They are oily and increase the amount of suspended solids held on the leaves or fruits by holding the particles in a resin-like film. Because most fungicides benefit greatly from the use of a sticker, most commercial formulations already include spreaders and stickers.

There are a number of adjuvants on the market, and some may be quite specific to crop and pesticide. Labels should be read for dosages, crop uses and compatibility, because some adjuvants must not be used with certain pesticides. Most labels suggest the amounts needed. Although many formulations of pesticides contain adequate adjuvants, some require additions on certain crops, especially broccoli, cabbage, cauliflower, onions and peppers.

Spray adjuvants for use with herbicides often serve a function distinctly different from that of adjuvants used with insecticides and fungicides. For example, adjuvants such as oils, when used with atrazine, greatly improve penetration of the chemical into crop and weed leaves, rather than just providing more uniform coverage. The postemergent grass herbicides require the addition of a crop-oil concentrate. An adjuvant should not be used with herbicides unless there are specific recommendations for its use—either on the container label or from Extension personnel.

Use of Ground Equipment

Boom-Type Sprayers

High-pressure, high-volume sprayers have been used for row-crop pest control for many years. Now, a trend exists toward the use of sprayers that utilize lower volumes and pressures. Due to increased knowledge on pesticide distribution on plant foliage, satisfactory pest control is possible at lower rates.

Boom Sprayer Calibration

1. Clean the sprayer and replace all worn parts.
2. Fill the tank with water.
3. Adjust sprayer pressure and tractor speed for nozzle size and output using manufacturer's directions.

4. Spray 1/8 of an acre (5,445 sq ft). The distance of travel varies with boom width. For example, a 22-ft boom must travel 248 ft to cover 1/8 A.

$$\frac{\text{1/8 A (5,445 sq ft)}}{\text{Boom width (22 ft)}} = \frac{\text{Distance}}{\text{(248 ft)}}$$

5. Measure the amount of water needed to refill the tank. This amount was applied to 1/8 A; thus, 8 times this amount is the gallonage per acre.
6. Adjustment in gallonage can be made by varying tractor speed or changing nozzle sizes or pressure. Recalibrate after making any adjustments.
7. Calculate the acres covered by the tank of spray solution and add the required amount of pesticide for the total area to be sprayed.

It is of utmost importance that the spray unit functions properly. To obtain complete plant coverage and penetration, check the cleanliness of nozzles, nozzle wear, boom height, pressure gauge accuracy, agitation in tank, forward ground-speed, mixing of materials and nozzle spacing.

Also, due to lower pressures and volumes, the effect of wind becomes more important. Avoid using a boom-type sprayer in high winds. For more information, see Ohio State University Extension Bulletin 520.

Airblast-Type Sprayers

Airblast sprayers are used in the vegetable industry to control insects and diseases. However, pest control has been erratic in some cases. The operation of an airblast sprayer is more critical than a boom-type sprayer, and the operator must fully understand the machine and the job.

Do not operate an airblast sprayer under high wind conditions. Wind speed below 5 mph is preferable unless it becomes necessary to apply the pesticide for timely control measures, but drift and nearby crops must be considered.

Do not overextend the coverage of the machine. Considerable visible mist from the machine moves into the atmosphere and does not deposit on the plant. If in doubt, use black plastic indicator sheets in the rows to determine deposit and coverage before a pest problem appears as evidence.

Use correct gallonage and pressures to obtain proper droplet size to ensure uniform coverage across the effective swath width.

Adjust the vanes and nozzles on the sprayer unit to give best coverage. Vane adjustment must occur in the field, depending on terrain, wind and crop.

Cross drives in the field allow the material to be blown down the rows instead of across them and help to give better coverage in some crops, such as tomatoes.

Use of Aerial Application Sprayers

Aerial application of pesticides by helicopter and fixed-wing aircraft is common among Ohio growers.

Spraying should occur when wind is not excessive—less than 6 mph. A slight crosswind during spraying is advantageous in equalizing the distribution of the spray within the swath and between swaths. Proper nozzle angle and arrangements along the boom are critical and necessary to obtain proper distribution at ground level. Use black plastic indicator sheets in the rows to determine deposit and coverage patterns.

The spraying system must function properly. There are practical limits on how much solid matter can be suspended in water and delivered through the spray boom and nozzles without clogging. Cleanliness of nozzles and screens, accuracy of pressure gauge and agitation in the tank are among factors to consider.

Cover a swath no wider than is reasonable for the aircraft and boom being used. Do not skip areas in the field. Fields of irregular shape or topography and ones bounded by woods, power lines or other flight hazards should not be sprayed by aircraft.

Sprayer Delivery Rates

It is essential that pesticides are applied at the specified rate for best control and protection and also to not exceed residue tolerance. Sprayers should be checked carefully several times a season for accurate delivery rates. New nozzle disks should be used when needed. A speedometer operated from a nondriven wheel should be used to determine the speed and delivery rate of the sprayer.

How to Improve Pest Control

(Source: 1985 New Jersey Commercial Vegetable Production Recommendations)

Failure of pest control can be due to any of the following reasons:

1. Delaying applications until pests are large and numerous.
2. Making applications with insufficient gallonage or badly worn nozzles.
3. Selecting the wrong pesticide.

More effective pest control can be achieved through the following actions:

1. *Inspect fields* at least twice a week for pest buildup.
2. *Control insects and mites* according to recommended control guidelines or schedules. Control guidelines are determined to prevent economic loss from pest damage. Rather than using a "wait-and-see" approach, many pest problems can be predicted to occur at approximately the same time each year. Examples of these are cabbage looper and Colorado potato beetle.
3. *Provide adequate coverage of plants*. The principal reason aphids, mites, cabbage loopers and diseases become serious problems is that they may occur beneath leaves, protected from spray deposit.
4. *Apply sprays with sufficient spray volume and pressure*. Sprays from high-volume, high-pressure (air-blast) sprayers should be applied at rates of 40-100 gal/A at approximately 400 psi. Boom-type sprayers (low volume, low pressure) should apply rates of 50-100 gal/A at approximately 100-300 psi. The addition of a spreader-sticker improves coverage and control when wettable powders are applied to waxy leaved crops, such as crucifers and onions.
5. *Select the proper pesticide*. Herbicide selection should be based on weed species and cropping systems. Fungicides, bactericides and insecticides generally control only a limited spectrum of pests. It should be verified that the pest being sprayed for is controlled by the selected pesticide.
6. *Calibrate the application equipment*. Control usually is poor if less than the required amount of product is applied to the crop. Too much per acre is hazardous to the applicator and frequently phytotoxic to the crop, or it might result in excessive crop residues.
7. *Select correct nozzle tips*. Flat fan nozzles are designed for pre- and postemergent herbicides. Flat fan tips produce a tapered-edge spray pattern for uniform coverage where spray patterns overlap. They usually are designed to operate at lower spray pressures of 15-40 psi. Spray nozzles with even, flat spray tips (designated E) are designed for band spraying, where uniform distribution is desired over a zone of 8-14 inches. Flood-type tips are used for complete fertilizer, liquid nitrogen and some herbicides incorporated into the soil. Wide spray angle tips with full or hollow cone patterns usually are used for fungicides and insecticides. They are used at water volumes and spray pressures higher than commonly recommended for herbicide application with flat fan nozzles.
8. *Check the pH of the water.* Some pesticide applicators have experienced poor results even when problems cannot be traced to technique or resistant pests. One reason can be the pH of the mixing water. The following section provides more information.

Water pH Effect on Pesticide Sprays

pH is the measure of acidity or alkalinity of solutions. It is based on a scale of 0-14, with the midpoint 7 deemed neutral. In the range 7-14, the solution is alkaline; the higher the number, the greater the alkalinity. In the range 0-7, the solution is acidic; the lower the number, the greater the acidity.

Organophosphate and carbamate insecticides are the principal types of pesticides affected by water pH. Certain pesticides decompose quite rapidly in alkaline water. If a spray mix stands for several hours or overnight before use, 50% or more of the active ingredient can decompose under alkaline conditions. Decomposition is due to a reaction called "alkaline hydrolysis," in which the pesticide molecule is split by the water and converted to an inactive form. Decomposition rates are determined by the pesticide chemical makeup; each compound's rate is different.

Usually, the more alkaline the water in the mixture, the more rapid the decomposition. Warmer temperatures also interact with pH to speed hydrolysis. Some pesticides subject to alkaline hydrolysis are listed in the table on pages 52-53.

pH and hardness of the spray water should be frequently checked from any water source, because algae can change water pH. Water pH can be checked with indicator paper or a pH meter.

Always read the label to determine pesticide restrictions in alkaline water. Apply pesticides soon after mixing in the spray tank and avoid mixed pesticides left in the spray tank overnight.

Hardness of the water interacts with pH. If water has a pH above 7.0 and contains more than 12 grains (205 ppm) of hardness, adjust the pH range by use of commercial adjuvants. Sprays containing lime or lime sulfur and fixed-copper fungicides should not be acidified.

Evaluating Physical Compatibility of Pesticides on a Small Scale Before Tank Mixing

1. Read the label and follow directions: if the label states, "Do not mix with other products," this must be followed.
2. Order of addition to the carrier is important:
   a) Wettable powders
   b) Flowables
   c) Water-solubles
   d) Adjuvants
   e) Emulsifiable concentrates
3. If using different products, and the label of one states, "Add last to spray tank," this must be followed.
4. If the label states, "Do not use adjuvants," this must be followed.
5. Add 1 pt of the carrier to a 1-qt jar. Use the same water or liquid fertilizer that will be used in the field.
6. Add 1 1/2 teaspoon of the wettable product(s) for each lb/A to be used.
7. Next, add 1 teaspoon for each qt/A of the liquid to be used.
8. These ratios will approximate 25 gal/A.
9. Shake the jar after the addition of each ingredient, and let it stand for a few minutes to see if there is a reaction. Then add the next ingredient, until all are added.
10. If there is a precipitate, or the material greases out, don't use it in the field.
11. The allowable separation in the jar depends on the amount of agitation in your equipment.
12. Good agitation is very important.
13. Storage conditions also are important.
    - Temperature: Read the label for precautions.
    - Avoid contamination.
    - Do not leave material in the spray tank overnight or for more than several hours.
14. Normally, if there are problems, a compatibility agent will help.
15. This test only indicates physical compatibility; it does not indicate chemical reactions between products.

Pesticide Formulations

The common types of pesticide formulations are:

- **Emulsifiable concentrates (EC):** the toxicant is dissolved and the emulsifying agent is added to an organic solvent.
- **Wettable powders (WP or W):** the toxicant is absorbed or adsorbed on powders that can be mixed with water because of an added wetting agent.
- **Dusts (D):** the toxicant is diluted with finely divided and ground materials.
- **Solutions:** the toxicant has a molecular mixture with the solvent.
- **Microencapsulated:** the toxicant is placed in pin head-sized capsules that disintegrate slowly over a period of time.

Pesticides must be properly formulated and diluted to prevent injury to plants. Often, physical properties of certain pesticides make dilution difficult, leaving lasting residues that are hazardous to edible crops. New formulations enter the market each year.

All fungicide and insecticide recommendations in this bulletin are given on the basis of pounds (lb) or pints (pt) of formulation per acre (A) of crop, unless otherwise stated.

Metric Measurement

Metric measurement has been used in photography for many years. Most slide film companies today use 35 millimeter (mm) film, home movies usually are 8 mm, and most theater movies are 16 or 35 mm.

A standard paper clip can provide a rough visual estimate for several basic metric measures. In approximate terms, the paper clip weighs about 1 gram, is about as wide as 1 centimeter; and the wire is about 1 millimeter in diameter.

Useful Equivalents				
Liquid				
1 gallon	=	4 quarts	=	128 ounces
1 quart	=	2 pints	=	32 ounces
1 pint	=	2 cups	=	16 ounces
1 tablespoon	=	3 teaspoons	=	1/2 ounce
16 tablespoons	=	1 cup	=	8 ounces
1 ounce	=	29.5 ml or cc		
1 tablespoon	=	15 ml	=	1/2 ounce
Dry				
1 pound	=	16 ounces	=	454 grams
1 ounce	=	28.25 grams		
Metric				
Degrees Fahrenheit	=	(°C x 1.8) + 32		
Degrees Celsius	=	(°F - 32) x 5/9		
1 acre	=	0.405 hectare		
1 hectare	=	2.471 acres		
1 mile	=	1.609 kilometer		
1 kilometer	=	0.621 mile		
1 pound	=	0.454 kilograms		
1 kilogram	=	2.205 pounds		
1 yard	=	0.914 meter		
1 meter	=	1.094 yards		
1 quart	=	0.946 liter		
1 liter	=	1.057 quart		
1 short ton (2,000 pounds)	=	0.907 metric ton (tonne)		
1 tonne	=	1.103 short ton	=	2,204 pounds
1 long ton (metric or tonne)	=	2,204 pounds		
10,000 square meters	=	1 hectare	=	2.47 acres
1,000 kilograms	=	1 metric ton (tonne)	=	2,204 pounds
1.0 pound per acre	=	1.12 kilogram per hectare		

Storing Pesticides for Next Season

Growers storing pesticides always should consider safety and product quality, whether storage is for a few weeks or a year or more. It is best not to have leftover pesticides. However, there usually are surplus pesticides at the end of the season because preseason purchases often are very economical.

These practices should be followed:

1. Read the label. Certain formulations or products have special storage requirements. Restrictions or directions are printed on the label.
2. Make certain that the label is in good condition—that is, it is readable—in order to know what is in the container and for directions for safe, effective and legal use.
3. Write the purchase or delivery date on the label. Store oldest materials near the front of the storage area and use older or opened products first. Products several years old may not be effective.
4. Keep an up-to-date inventory on pesticides to assist in purchase decisions and in emergencies.
5. Storage temperatures should not be below 32°F or above 100°F. Ventilation is important for storage of most pesticides. Keep pesticides dry and out of direct sunlight.
6. Store herbicides away from other pesticides to prevent use mix-up, contamination and possible plant damage. Never store pesticides with food or seed or near food or drinking water.
7. Pesticide storage areas should be permanently identified and locked away from animals, children and irresponsible adults.
8. Keep a supply of cat litter or other absorbent material in the storage to scatter over spills of liquid chemicals.
9. Hang a Class B inflammable liquids fire extinguisher nearby.

Some common pesticides are listed below with observations on their shelf-life under normal conditions:

Insecticides

- acetamiprid (Assail): Several years.
- Carbaryl (Sevin) WP: Several years.
- Carbaryl (Sevin) F: Watch for settling.
- Diazinon EC: 5-7 years if tightly sealed.
- Disulfoton (Di-Syston): 2 years.
- Malathion WP: Many years, but decomposes under high temperatures.
- Metasystox-R: 2 years.
- Methoxychlor: Many years.
- Phosmet (Imidan) WP: 2-3 years.

Herbicides

- Glyphosate (Roundup): 2 years, but do not allow to freeze.
- Casoron (G): 2 years if cool and dry.
- Dacthal (WP): 2 years.
- Kerb (WP): 2 years.
- Simazine (Princep) (G, WP): Many years.
- Surflan (G): 3 years, must be mixed well.
- Treflan (G): 3 years if dry and under 80°F.

Susceptibility of Commonly Used Agricultural Chemicals to Alkaline Hydrolysis			
Brand Name	**Common Name**	**Class**	**Half-Life**
Insecticides			
Ambush	permethrin	PY	Stable at pH 6-8. Less soluble at high or low pH.
Assail	acetamiprid	NN	Stable at pH 5-9.
Cygon	dimethoate	OP	Generally unstable in alkali media. Optimum pH between 4 and 7.
Diazinon	diazinon	OP	pH 4.5 - 0.45 weeks
			pH 5.0 - 2.0 weeks
			pH 7.0 - 10 weeks
			pH 8.0 - 2.7 weeks
Guthion	azinphos methyl	OP	pH 5.0 - 17.3 days
			pH 7.0 - 10 days
			pH 9.0 - 12 hours
Imidan	phosmet	OP	pH 7.0 - 1 day
			pH 8.3 - 4 hours
			pH 10.0 - 1 minute
Lannate	methomyl	CB	pH 6.0 - 54 weeks
			pH 7.0 - 38 weeks
			pH 8.0 - 20 weeks
Lorsban	chlorpyrifos	OP	pH 4.7 - 63 days
			pH 6.9 - 35 days
			pH 8.1 - 22 days
Malathion	malathion	OP	pH 6.0 - 7.8 days
			pH 7.0 - 3.0 days
			pH 8.0 - 19 hours
			pH 10.0 - 2.4 hours
Penncap-M	methyl parathion	OP	Hydrolyzes several times faster than parathion
Pounce	permethrin	PY	Stable at pH 5.7-7.7 11% loss after 42 days at pH 9.
Sevin	carbaryl	CB	pH 7.0 - 24-30 days
			pH 8.0 - 2-3 days
			pH 9.0 - 1 day
Thiodan	endosulfan	CH	70% loss after 1 week at pH 7.3-8.0
Vydate	oxamyl	CB	Stable at pH 4.7
			3% loss after 24 hours at pH 6.9
			45% loss after 24 hours at pH 9.1
Miticides			
Kelthane	dicofol	CH	pH 5.0 - No degradation after 20 days
			pH 7.0 - 5 days
			pH 10.0 - 15 minutes
Vendex	fenbutatin-oxide	OT	Compound extremely stable; Formulation forms suspension, not solution, with water

Key to classes:

BZ	benzamidazole	PD	pyrimidine	CB	carbamate	PT	phtalimide
CH	chlorinated hydrocarbon	PZ	piperizine	FA	formamidine	PY	pyrethroid
OC	organic compound	OT	organotin compound	OH	organic hydrocarbon	TZ	triazole
OP	organophoshate	NN	neonicotinoid				

Susceptibility of Commonly Used Agricultural Chemicals to Alkaline Hydrolysis			
Brand Name	**Common Name**	**Class**	**Half-Life**
Plant Growth Regulators			
Ethrel	ethephon		Neutralized by only slightly alkaline water
Fungicides			
Bayleton	triadimefon	TZ	Stable over a wide range of pH
Captan	captan	PT	pH 4.0 - 32.4 hours
			pH 7.0 - 8.3 hours
			pH 10.0 - 2 minutes
Funginex	triforine	PZ	Stable to pH 10 or 11
Rubigan	fenarimol	PD	Stable over a wide range of pH

Key to classes:

BZ	benzamidazole	PD	pyrimidine	CB	carbamate	PT	phtalimide
CH	chlorinated hydrocarbon	PZ	piperizine	FA	formamidine	PY	pyrethroid
OC	organic compound	OT	organotin compound	OH	organic hydrocarbon	TZ	triazole
OP	organophoshate	NN	neonicotinoid				

Conversion Tables for Use of Pesticides on Small Areas

(Source: 2006-07 Vegetable Production Guide for Commercial Growers, University of Kentucky.)

Liquid Materials		
Recommended Rate/A	**Approximate Rate/1,000 Sq Ft**	**Approximate Rate/100 Sq Ft**
1 pt	¾ tbs	¼ tsp
1 qt	1½ tbs	½ tsp
2 qt	3 tbs	1 tsp
1 gal	6 tbs	2 tsp
25 gal	4½ pt	1 cup
50 gal	4½ pt	1 pt
75 gal	7 qt	1½ pt
100 gal	9 qt	1 qt

Dry Materials		
Recommended Rate/A	**Approximate Rate/1,000 Sq Ft**	**Approximate Rate/100 Sq Ft**
1 lb	2¼ tsp	¼ tsp
2 lb	4½ tsp	½ tsp
3 lb	2¼ tbs	¾ tsp
4 lb	3 tbs	1 tsp
5 lb	4 tbs	1¼ tsp
6 lb	4½ tbs	1½ tsp
8 lb	2/5 cup	1¾ tsp
10 lb	½ cup	2 tsp
100 lb	2¼ lb	¼ lb
200 lb	4½ lb	½ lb
400 lb	9 lb	1 lb

Pesticide Dilution Tables

(Source: 2006-07 Vegetable Production Guide for Commercial Growers, University of Kentucky.)

These tables provide quantity of either liquid or wettable powder concentrates to use per acre to give desired dosage of active ingredient per acre.

How to Use the Tables

Example: Look at the Liquid Concentrate Table.

Suppose that this publication recommends .50 pounds of actual Guthion per acre to treat a specific problem. You have Guthion 2L (2 lb active ingredient per gal) liquid.

Find 2 lb in the left-hand column. Then, locate .50 in the heading across the top. These two columns intersect at 2.0. Thus you would add 2 pt of Guthion 2L in enough water to treat an acre.

The other two tables work the same way.

Table of Measures

3 teaspoonfuls (tsp) = 1 tablespoonful
2 tablespoonfuls (tbs) = 1 fluid ounce
16 tablespoonfuls (tbs) = 1 cup
8 fluid ounces (fl oz) = 1 cup
2 cups (c) = 1 pint
2 pints (pt) = 1 quart
4 quarts (qt) = 1 gallon

All recommendations that are given for the various crop pests in this bulletin are on the basis of pounds or pints of formulation per acre of crop unless stated otherwise.

Liquid Concentrate—Amount to use, in PINTS/acre.

Pounds A.I./Gallon	Pounds/Acre of Active Ingredient Recommended							
	.125	.25	.50	.75	1	2	3	4
1 lb	1.0	2.0	4.0	6.0	8.0	16.0	24.0	32.0
1 ½ lb	6.7	1.3	2.6	4.0	5.3	10.6	16.0	21.3
2 lb	.50	1.0	2.0	3.0	4.0	8.0	12.0	16.0
3 lb	.34	.67	1.3	2.0	2.7	5.3	8.0	10.7
4 lb	.25	.50	1.0	1.5	2.0	4.0	6.0	8.0
5 lb	.20	.40	.80	1.2	1.6	3.2	4.8	6.4
6 lb	.17	.34	.67	1.0	1.3	2.6	4.0	5.3
7 lb	.14	.30	.60	.90	1.1	2.3	3.4	4.6
8 lb	.125	.25	.50	.75	1.0	2.0	3.0	4.0
9 lb	.11	.22	.45	.67	.9	1.8	2.7	3.6
10 lb	.10	.20	.40	.60	.8	1.6	2.4	3.2

Remember, the numbers in the body of this table are PINTS/acre.

Wettable Powder—Amount to use, in POUNDS/acre.

% A.I.	Pounds/Acre of Active Ingredient Recommended							
	.125	.25	.50	.75	1	2	3	4
15%	13/16	1 3/4	3 1/3	5	6 1/2	13	20	26 1/2
25%	1/2	1	2	3	4	8	12	16
40%	5/16	5/8	1 1/4	1 3/4	2 1/2	5	7 1/2	10
50%	1/4	1/2	1	1 1/2	2	4	6	8
75%	3/16	3/8	11/16	1	1 1/3	2 2/3	4	5 1/3

Remember, the numbers in the body of this table are POUNDS/acre.

Dust or Granules—Amount to use, in POUNDS/acre.								
% A.I.	Pounds/Acre of Active Ingredient Recommended							
	.125	.25	.50	.75	1	2	3	4
2 1/2%	5	10	20	30	40	80	120	160
5%	2 1/2	5	10	15	20	40	60	80
10%	1 1/4	2 1/2	5	7 1/2	10	20	30	40
20%	5/8	1 1/4	2 1/2	3 3/4	5	10	15	20
25%	1/2	1	2	3	4	8	12	16
Remember, the numbers in the body of this table are POUNDS/acre.								