

## *Pesticide and Fertilizer Storage and Handling*

### WHY BE CONCERNED?

When used properly, pesticides and fertilizers are effective crop management tools. However, these chemicals can endanger water quality and human health if they are not properly stored and handled. The chemicals can enter directly into the groundwater through wells or sinkholes at the farmstead or flow into surface water. When found in water supplies, pesticides normally are not present in concentrations high enough to cause acute health effects. Instead, they typically occur at trace levels that may have effects after prolonged exposure.

Taking voluntary action to prevent pesticide contamination of groundwater and surface water can contribute to continued availability of pesticides for responsible use. *Following proper label instructions is important for storing and handling chemicals safely.*

**The goal of Pennsylvania Farm•A•Syst is to help you protect groundwater and surface water, shared resources that are important to everyone.**

### HOW TO RANK GROUNDWATER AND SURFACE WATER PROTECTION USING THIS WORKSHEET

- You can select from a wide range of pesticide and fertilizer storage and handling conditions and management practices that are related to potential groundwater or surface water contamination.
- You can rank your chemical handling, storage, and disposal practices according to how they might affect groundwater or surface water.
- Based on your overall ratings, you can determine which of your conditions or practices are reasonably safe and effective, and which might require modification to better protect groundwater and surface water.

### HOW TO COMPLETE THE WORKSHEET

Follow the directions listed on page 2 of the worksheet. It should take 15 to 30 minutes to complete the evaluation and determine your ranking. Evaluate each pesticide and fertilizer storage or mixing area on your farmstead for its effect on groundwater and surface water. Space is provided to rank up to three sites on your farmstead. If you have more than three sites, please use another worksheet. If you are unfamiliar with any of the terms used, refer to the glossary provided with this worksheet.

Information derived from Pennsylvania Farm•A•Syst worksheets is intended only to provide general information and recommendations to farmers regarding their own farmstead practices. It is not the intent of this educational program to keep records of individual results. However, they may be shared with others who will help you develop a resource management plan.

## WORKSHEET #2: PESTICIDE AND FERTILIZER STORAGE AND HANDLING PRACTICES

Use a pencil, in case you want to change an answer later. For each feature listed on the left that applies to your farmstead, read across to the right and circle the statement that most closely describes your situation. Leave blank any features that don't apply to your farmstead. Find the corresponding "rank number" (4,3,2,1) for each description you circled and enter that number in the box under "rank." If the conditions and

practices in any one description do not match your situation exactly, use an in-between score of one-half unit; for example, 2.5 or 3.5. Directions on overall scoring appear at the end of the worksheet. Allow 15 to 30 minutes to complete the worksheet and to determine the level of groundwater and surface water protection you are providing through your pesticide and fertilizer storage and handling practices.

### STORAGE AND HANDLING CONDITIONS

	4 Best	3 Good	2 Fair	1 Poor	RANK (up to 3 sites)
<b>STORAGE OF PESTICIDES AND FERTILIZERS</b>					<b>Site Identification</b>
					<b>#1 #2 #3</b>
<b>1. Location of pesticide or fertilizer storage area in relation to:</b>					
<b>A. Well</b>	300 feet or more downslope.	More than 150 feet upslope OR 75 to 300 feet downslope.	75 to 150 feet upslope.	Within 75 feet.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>B. Stream</b>	300 feet or more.	150 to 300 feet.	75 to 150 feet.	Less than 75 feet.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>2. Type of geologic materials in storage and handling areas</b>					
	Granites, shales, or derivatives of these geologic materials, or similar slowly permeable materials.	_____	_____	Limestone, glacial gravels, and sands, or derivatives of these geologic materials.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>3. Amount of fertilizer stored</b>					
<b>A. Dry</b>	None stored at any time.	Less than 1 ton of fertilizer stored.	Between 1 and 20 tons stored.	More than 20 tons of fertilizer stored.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>B. Liquid</b>	None stored at any time.	Less than 55 gallons of fertilizer stored.	Between 55 and 1500 gallons stored.	More than 1500 gallons stored.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>4. Type of fertilizer storage</b>					
<b>A. Dry</b>	Covered on impermeable surface. Spills are collected.	Covered on clay soil. Spills are collected.	Partial cover on loamy soils. Spills are not collected.	No cover on sandy soils. Spills are not collected.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>B. Liquid</b>	Concrete or other impermeable containment that does not allow spill to contaminate soil.	Clay-lined containment. Most of spill can be recovered.	Somewhat permeable soils (loams). No containment. Most of spill cannot be recovered.	Permeable soil (sand). No containment. Spills contaminate soil.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Site Identification #1. \_\_\_\_\_

#2. \_\_\_\_\_

#3. \_\_\_\_\_

	4 Best	3 Good	2 Fair	1 Poor	RANK (up to 3 wells)
<b>STORAGE OF PESTICIDES AND FERTILIZERS (continued)</b>					<b>Site Identification</b> #1 #2 #3
<b>5. Length of time fertilizer is stored</b>	Bought 1 to 2 months before all of it is spread on the fields (seasonal storage).	Stored for 3 to 6 months before being spread.	Over-winter storage.	Storage for more than one growing season.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>6. Amount of pesticide stored</b>					
<b>A. Dry</b>	No pesticides stored at any time.	Less than 10 pounds of each pesticide stored.	More than 10 pounds of each pesticide stored.	More than 500 pounds of each pesticide stored.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>B. Liquid</b>	No pesticides stored at any time.	Less than 1 gallon of each pesticide stored.	More than 1 gallon of each pesticide stored.	More than 55 gallons of each pesticide stored.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>7. Type of pesticide stored</b>					
<b>A. Leachability<sup>a</sup></b>	No chemicals stored.	Pesticides classified with low leaching potential. If proper label instructions are followed, danger of leaching is low.	Pesticides classified with medium leaching potential. Follow proper label instructions.	Pesticides classified with high leaching potential. Follow proper label instructions.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>B. Dry or liquid</b>	No liquids, all dry.	Some liquids, mostly dry.	Mostly liquids, some dry.	All liquids.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>8. Length of time pesticides are stored</b>	Bought 1-2 months before all of it is spread on the fields (seasonal storage).	Stored for 3-6 months before being spread.	Over-winter storage.	Storage for more than one growing season.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>9. Spill or leak control in storage area</b>	Impermeable surface (concrete) does not allow spills to soak into soil. Curb installed on floor to contain leaks or spills.	Impermeable surface with some cracks or impermeable surface with no curb.	Permeable surface (wood). Spills can contaminate wood or soil.	Permeable surface, no floor material. Spills can contaminate soil.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>10. Secondary containment</b>	Original containers are in secondary containment with capacity greater than the original.	-----	Original containers are in secondary containment that can hold volume of slow leaks.	Original containers are in no secondary containment.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>11. Clean-up of spills</b>	Spills are cleaned up immediately.	-----	Spills are cleaned up within an hour.	Spills are not given any special attention.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>12. Security of pesticide storage area</b>	Secured, locked area used for pesticides only. Warning signs posted.	Area is locked and used for storage of other materials, or area is unlocked but used for pesticides only. Warning signs posted.	Area is unlocked and used for storage of other materials. Warning signs badly in need of replacement.	Area is used regularly for other activities. No locks available. No warning signs posted.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>13. Containers<sup>b</sup></b>					
<b>A. Original</b>	Chemicals kept in original containers with original labels.	Chemicals not kept in original container, but are in a sturdy, safe container with the original label transferred to new container.	Chemicals kept in original containers with unreadable or missing labels.	Chemicals in containers without any labels.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
<b>B. Condition</b>	Containers are sturdy, without holes, cracks, or tears that allow leaks.	-----	-----	Containers have holes, cracks, or tears that allow contents to leak.	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

<sup>a</sup> Refer to the "Pesticide Leachability Chart" at the end of the worksheet for a listing of common pesticides and their potential to leach into the soil.

<sup>b</sup> Repacking of pesticides (storing of original, leaking container inside a larger, sturdy container) is acceptable, according to the Pennsylvania Department of Agriculture, as long as the original label is still attached.

	4 Best	3 Good	2 Fair	1 Poor	RANK (up to 3 wells)
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<b>MIXING AND LOADING</b>	<b>Site Identification</b>		
	#1	#2	#3

**14. Location of mixing and/or loading area in relation to:**

<b>A. Well</b>	150 feet or more downslope.	100 to 150 feet downslope OR greater than 300 feet upslope.	50 to 100 feet downslope OR 100 to 300 feet upslope.	Less than 50 feet downslope OR less than 100 feet upslope.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>B. Stream</b>	300 feet or more.	150 to 300 feet.	50 to 150 feet.	Less than 50 feet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>15. Mixing area</b>	Impermeable pad with containment curbs that drain into tank or sump. Pad is cleaned after every use whether there was a spill or not.	Impermeable pad with containment curbs. No collection drain. Pad is cleaned after every 2 to 4 uses per season. Portable pads are acceptable.	Tank loaded on a level, impermeable area. No containment. Pad is cleaned annually. Portable pads are acceptable.	Tank loaded on a sloping, gravel, sod, or soil area. No containment. Pad is not cleaned unless there is a large spill.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<b>16. Backflow prevention on water supply</b>	Separate water source such as a nurse tank (not the well). Could be a stream, pond, or gravity flow tank, as long as precautions are taken not to allow back-flow of chemicals.	Anti-backflow device installed.	No anti-backflow device installed. Air gap maintained.	No anti-backflow device installed. Hose in spray tank below water line (no air gap).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<b>17. Filling supervision</b>	Person never leaves site while container is filling.	Person leaves site for very short amount of time while container is filling. Some potential for overflow.	-----	Person turns on water and leaves while container is filling. Significant potential for overflow, especially for small sprayers.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<b>DISPOSAL PRACTICES</b>	<b>Site Identification</b>		
	#1	#2	#3

<b>18. Pesticide container disposal<sup>a</sup> (Be sure to follow label instructions.)</b>	Containers recycled.	Containers triple-rinsed and sent to approved landfill or incinerator.	Containers triple-rinsed and buried or burned.	Containers not triple-rinsed and are buried, burned, or dumped.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<b>19. Sprayer cleaning and rinsate disposal</b>	Sprayer is washed in the field. Rinse water is spray-applied to a crop listed on the pesticide's label.	Sprayer is washed at farmstead. Rinsate is spray-applied to a crop listed on the label.	Sprayer is washed at farmstead. Rinsate dumped more than 300 feet from well.	Sprayer is washed at farmstead. Rinse water is dumped within 300 feet of a well.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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<sup>a</sup> Check your local area or county for a pesticide container recycling program.

**TOTAL**     
 Use this total to calculate overall performance ranking.

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## HOW TO USE THESE RANKINGS

- Step 1.** Now that you have ranked each feature, add all these rankings together and put that value in the “Total” box at the end of the worksheet. Transfer that number to the box below.
- Step 2.** Divide the value in the “Total” box by the number of features ranked.
- Step 3.** Repeat for the remaining sites. Calculate the average ranking for all sites combined.

_____	divided by	_____	equals	_____
(total of rankings)		(# of features ranked)		(average ranking)*
*carry your answer out to one decimal place				

- Step 4.** Evaluate the overall management practices and site conditions.
- 3.6-4.0 = best management  
2.6-3.5 = good management  
1.6-2.5 = fair management  
1.0-1.5 = poor management
- This ranking indicates how your pesticide and fertilizer storage and handling practices *as a whole* might affect groundwater and surface-water quality. *This ranking should serve only as a general guide, not a precise diagnosis.* Since it represents an average of many individual rankings, it can mask any

individual rankings (such as 1's and 2's) that should be of concern.

- Step 5.** Look over the rankings for individual features of each site:

**Best** (4's): best management according to current guidelines

**Good** (3's): provides reasonable groundwater and surface water protection

**Fair** (2's): inadequate protection in many situations

**Poor** (1's): poses a high risk of polluting groundwater or surface water

*Regardless of your overall ranking, any individual rankings of “1” should receive immediate attention. Some of the conditions describe practices that violate federal and/or state laws (including label instructions). You can take care of some concerns right away; others could be major or costly projects, requiring planning and prioritizing before you take action.*

- Step 6:** Consider how you might modify your farmstead management practices or site conditions to better protect groundwater and surface water. Contact your local conservation district or Cooperative Extension office, the Pennsylvania Department of Agriculture, the USDA Natural Resources Conservation Service, or your agrichemical dealer for ideas, suggestions, or guidance.

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## GLOSSARY

**Air gap:** An air space (open space) between the hose or faucet and the water level in a spray tank. An air gap prevents backflow of a chemical solution into the well or water supply.

**Anti-backflow (anti-backsiphoning) device:** A check valve or other mechanical device to prevent the unwanted reverse flow of liquids back down a water supply pipe into a well. Many types of devices are available from most plumbing supply stores. Check with dairy industry field representatives for recommendations for selection.

**Backflow:** The unwanted reverse flow of liquids in a piping system.

**Burning:** The controlled use of fire to dispose of paper or cardboard containers. Follow local ordinances carefully so that people or animals are not affected.

**Containment:** Impermeable floors and curbs around a chemical storage area or mixing/loading area that prevent pesticides or spray solutions from seeping into the ground or running off due to leaks or spills.

**Cross-connection:** A link or channel between pipes, wells, fixtures, or tanks carrying contaminated water and safe drinking water. If the contaminated water is at a higher pressure, it will enter the safe water system.

**Diking:** A containment system that surrounds pesticide bulk storage containers and that can hold 110% of the largest capacity of liquid if a spill or leak should occur.

**Disposal:** Safely removing hazardous materials. Follow directions on the label.

**Groundwater:** Water beneath the earth's surface that supplies wells and springs.

**Impermeable surface:** A surface into which materials will not penetrate.

**Rinsate:** Waste water from cleaning fertilizer or pesticide tanks.

**Surface water:** Any water source freely existing at ground level such as ponds, lakes, streams, or ditches.

**Triple rinse:** Partially filling a container with fresh water, shaking, and draining to remove residue. Repeat for a total of three rinses.

## PESTICIDE LEACHABILITY CHART

The pesticides listed on this chart are identified by **brand name, common name and rating for movement by leaching (extra small, small, medium, or large)**. Identify the pesticides stored on the farmstead from the listing below. Note the “leachability factor” for each pesticide stored (The symbol “—” indicates unknown rating). Assign an overall “leachability factor ranking” (extra small, small, medium, or large), based on which ranking best represents the pesticides stored. Use this ranking to complete the “leachability factor” feature on the Pennsylvania Farm•A•Syst worksheet.

Brand name	Common name	Rating	Brand name	Common name	Rating	Brand name	Common name	Rating
AAtrex	atrazine	Large	Commence	trifluralin & clomazone	Small Med	Herbicide 273	endothall	Med
Accent	nicosulfuron	Large	Concert	chlorimuron & thifensulfuron	Large Med	Hoelon	diclofop	Ex Small
Alanap	naptalam	Large	Contour	atrazine & imazethapyr	Large Large	Kerb	pronamide	Large
Ally	metsulfuron-methyl	Large	Crossbow	triclopyr & 2,4-D ester	Med Med	Krenite	fosamine	Small
Amiben	chloramben	Large	Curtail	clopyralid & 2,4-D amine	Large —	Laddock	atrazine & bentazon	Large Large
AmitrolT	amitrole	Med	CurtailM	clopyralid & MCPA ester	Med Small	Lariat	alachlor & atrazine	Med Large
Antor	diethatyl-ethyl	Small	Dacthal	DCPA	Small	LassoEC	alachlor	Med
Arsenal	imazapyracid	Large	Detail	imazaquin & dimethenamid	Large —	Lasso Micro	alachlor	Med
Assert	imazethabenz	Large	Devrinol	napropamide	Med	Tech	alachlor	Med
Assure	quizalofop-ethyl	Med	Diquat	diquatdibromide	Ex Small	Lasso II	alachlor	Med
Atrazine	atrazine	Large	Dow	TCA	Large	Lasso-	alachlor & atrazine	Med Large
Avenge	difenzoquat	Ex Small	Dowpon	dalapon	Large	Lexone	metribuzin	Large
Balan	benefin	Small	Dual	metolachlor	Large	Lorox	linuron	Med
Banvel	dicamba	Large	Dual II	metolachlor & safener	Large —	LoroxPlus	linuron & chlorimuron	Med Large
Basagran	bentazon	Large	Dust	tetrachlorvinphos	Small	Marksman	dicamba & atrazine	Large Large
Basis	rimsulfuron & thifensulfuron-methyl	— Med	Eptam	EPTC	Small	MCPA Amine	MCPA amine	Large
Beacon	primisulfuron-methyl	Large	Eradicane	EPTC	Small	MCPAEster	MCPA ester	Small
Betamix	phenmedipham & desmedipham	Small Small	Eradicane	EPTC	Small	Norton	ethofumesate	Med
Betanex	desmedipham	Small	Extra	EPTC	Small	Option	fenoxaprop	Small
Bicep	metolachlor & atrazine	Large Large	Escort	metsulfuron-methyl	Large	Partner	alachlor	Med
Bladex	cyanazine	Med	Evik	ametryn	Med	Passport	imazethapyr & trifluralin	Large Small
Blazer	acifluorfen	Med	Exceed	primisulfuron-methyl & prosulfuron	Large —	Permit	halosulfuron	—
Broadstrike+	flumetsulam & metolachlor	Large Large	Extrazinell	atrazine & cyanazine	Large Med	Pinnacle	thifensulfuron-methyl	Med
Dual	metolachlor	Large	Far-Go	triallate	Small	Poast	sethoxydim	Small
Bronate	bromoxynil & MCPA ester	— Small	Flexstar	fomesafen	Large	Pramitol	prometon	Large
Bronco	glyphosate & alachlor	Ex Small Med	Formula40	2,4-D acid	Med	Preview	metribuzin & chlorimuron	Large Large
Buckle	triallate & trifluralin	Small Small	Frontier	dimethenamid	—	Princep	simazine	Large
Bullet	alachlor & atrazine	Med Large	Fusilade			Prowl	pendimethalin	Small
Buctril	bromoxynil	Small	2000	fluazifop	Small	Prozine	pendimethalin & atrazine	Small Large
Buctril-Atrazine	bromoxynil & atrazine	Small Large	Fusion	fluazifop & fenoxaprop	Small Small	Pursuit	imazethapyr	Large
Butyrac 200	2,4-DB amine	Med	Galaxie	bentazon & acifluorfen	Large Med	Pursuit Plus	imazethapyr & pendimethalin	Large Small
Butyrac Cannon	2,4-DB ester	Small	Genate Plus	butylate	Small	Pyramin	pyrazon	Med
	alachlor & trifluralin	Med Small	Genep	EPTC	Small	Ramrod	propachlor	Small
Canopy	chlorimuron & metribuzin	Large Large	Glean	chlorsulfuron	Large	Ramrod-Atrazine	propachlor & atrazine	Small Large
Carbyne	barban	Small	Goal	oxyfluorfen	Ex Small	Ranger	glyphosate	Ex Small
Casoron	dichlobenil	Large	Gramoxone			Reflex	fomesafen	Large
Clarity	dicamba	Large	Extra	paraquat	Ex Small	Rescue	naptalam	Large
Classic	chlorimuron	Large	Harmony	thifensulfuron-methyl	Med	Resolve	dicamba & imazethapyr	Large Large
Cobra	lactofen	Small	Harness	acetochlor	Large	Rhino	butylate & atrazine	Small Large
Command	clomazone	Med						

Brand name	Common name	Rating	Brand name	Common name	Rating	Brand name	Common name	Rating
Ro-Neet	cycloate	Med	Curzate	maneb	Small	FUNGICIDES		
Roundup	glyphosate	Ex Small	Cygon	dimethoate	Med	Bayleton	triadimefon	Med
Roundup			Cythion	malathion	Small	Benlate	benomyl	Small
Extra	glyphosate	Ex Small	Diazinon	diazinon	Small	Botran	DCNA	Small
Salute	metribuzen & trifluralin	Large Small	Dimilin	diflubenzuron	Small	Bravo	chlorothalonil	Small
Scepter	imazaquin	Large	DiSyston	disulfoton	Med	Captan	captan	Small
Select	clethodim	—	Dyfonate	fonofos	Small	Carbamate	ferbam	Med
Sencor	metribuzin	Large	Dyfonatell	fonofos	Small	Champion	copper-fixed	—
Sinbar	terbacil	Large	Dylox	trichlorfon	Large	Crotothane	dinocap	Small
Sonalan	ethalfuralin	Small	Endocide	endosulfon	Ex Small	Cyprex	dodine	Ex Small
Spike	tebuthiuron	Large	Endocide	endosulfon & Plus	Ex Small	Daconil	chlorothalonil	Small
Squadron	imazaquin & pendimethalin	Large Small	Force	parathion	Small	Dithane	mancozeb	Small
Stampede	propanil	Small	Force	tefluthrin	—	Duter	triphenyltin hydroxide	Ex Small
CM	MCPA ester	Small	Furadan	carbofuran	Large	Dyrene	anilazine	Small
Stinger40EC	dimethoate	Med	Fury	phenoxyphenyl-methyl	—	Karathane	dinocap	Small
Storm	bentazon & acifluorfen	Large Med	Guthion	aziphos-methyl	Small	Kelthane	dicofol	Ex Small
Surflan	oryzalin	Small	Imidan	phosmet	Small	Maneb	maneb	Small
Surpass100	acetochlor & atrazine	Large Large	Karate	lambda-cyhalothrin	Ex Small	Manzate	mancozeb	Small
Sutan+	butylate	Small	Knox-Out	diazinon	Small	Merteck	thiabendazole	Small
Sutazine+	butylate & atrazine	Small Large	Kryocide	cryolite	—	Orbit	propiconazole	Med
Synchrony	chlorimuron & thifensulfuron	Large Med	Lannate	methomyl	Large	Penncozeb	mancozeb	Small
Tandem	tridiphane	Small	Larvadex	cyromazine	Large	Polyram	metiram	Ex Small
Thistrol	MCPB	Large	Larvin	thiodicarb	Small	Protex	maneb	Small
Tillam	pebulate	Small	Lindane	thiodicarb	Med		triphenyltin	—
Tordon	picloram	Large	Lorsban	lindane	Med	Ridomil	metalaxyl	Large
Tough	pyridazine	—	Malathion	chlorpyrifos	Small	Ronilan	vinclozalin	Med
Treflan	trifluralin	Small	Malathion/	malathion & methoxychlor	Small	Rovral	iprodione	Small
Tri-Scept	imazaquin	Large	Mavrik	methoxychlor	Ex Small	Rubigan	fenarimol	Large
	ammomium salt		Metasystox-R	fluvalinate	Ex Small	Telonell	dichloropropene	Med
Turbo	metolachlor & metribuzin	Small Large	Methoxychlor	oxydemeton-methyl	Large	Terrachlor	PCNB	Small
Velpar	hexazinone	Large	Mitac	methoxychlor	Ex Small	Tersan	benomyl	Small
Vernam	vernolate	Small	Mocap	amitraz	Small	Tilt	propiconazole	Med
Weedar	MCPAamine	Large	Monitor	ethoprop	Large	Topsin	thiophanatemethyl	Small
Weedmaster	dicamba & 2,4-Damine	Large Med	Mustang	methamidophos	Med	TripleTin	triphenyltin hydroxide	Ex Small
Weedone-2,4-DP	dichloroprop-ester	Small	Nudrin	diazinon	Small	Vitavax	carboxin	Small
Whip	fenoxaprop	Small	Orthene	methomyl	Large	Vorlex	methyl-isothiocyanate	Large
			Parathion	acephate	Small			
			Penncap-M	parathion methyl-parathion	Small			
			Phosdrin	mevinphos	Small			
			Phoskil	parathion	Small			
			Pounce	parathion	Small			
			Prime	permethrin	Ex Small			
			Provado	flumetralin	Small			
			Pydrin	imidacloprid	—			
			Rampart	fenvalerate	Small			
			Scout-Xtra	phorate	Small			
			Sevin	tralomethrin	Ex Small			
			Somanil	carbaryl	Small			
			Supracide	methidathion	Small			
			Swat	methidathion	Small			
			Temik	phosphamidon	Large			
			Thimet	aldicarb	Large			
			Thiodan	phorate	Small			
			Trigard	endosulfan	Ex Small			
			Vapam	cyromazine	Large			
			Vydate	metamsodium	Med			
			Warrior	oxamyl	Small			
				lambda-cyhalothrin	Ex Small			

Adapted from Becker, R.L., et al. 1990. *Pesticides: Surface Runoff, Leaching, and Exposure Concerns*. Minnesota Extension Service. Data were derived from U.S. Dept. of Agriculture SCS/ARS Pesticides Properties Data Base, Version 1.9, August 1989, developed by R.D. Wauchope et al., and ratings derived by D.W. Goss.

Chart updated using SPISP 2 algorithms by Don Goss and Don Wauchope, 1990. Updates provided by Morgan S. Hugo from USDA NRCS, Amherst, Mass. These ratings are based on the data in the NRCS/ARS/CES pesticide database, dated 4-28-95. Ratings fall into one of the following categories : UNKNOWN, LARGE, MEDIUM, SMALL, EXTRA SMALL. An UNKNOWN rating indicates that there were missing data in the database and the rating could not be computed. The symbol "—" indicates an UNKNOWN rating.

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## ACKNOWLEDGMENTS

The Pennsylvania Farm•A•Syst package contains the following worksheets:

- Introduction
- Farmstead Map
- Preliminary Screening Quiz
- Worksheet #1—Water Well Condition and Construction
- Worksheet #2—Pesticides and Fertilizer Storage and Handling
- Worksheet #3—Household Waste Treatment
- Worksheet #4—Barnyard Management
- Worksheet #5—Milkhouse Waste Management
- Worksheet #6—Stream and Drainageway Management
- Worksheet #7—Petroleum Storage and Handling
- Overall Farmstead Ranking

Material for the Pennsylvania Farm•A•Syst package was developed by revision of Farm•A•Syst material from the University of Wisconsin Cooperative Extension Service, University of Minnesota Extension Service, and the National Farmstead Assessment System Program. The format and style for the Pennsylvania package was based on the Ontario Environmental Farm Plan published by Ontario Farm Environmental Coalition, Ontario, Canada.

For the original version:

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