

Franklin County Extension Pesticide Survey, 2002

Marilyn Golightly, Dorothy Pettenski, and Jane C. Martin

Summary

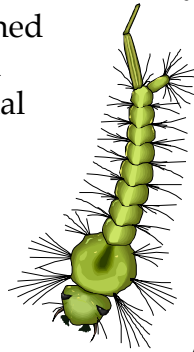
A team of Franklin County Master Gardener volunteers (MGs), directed by Extension Agent Jane Martin, conducted monthly surveys (March through August of 2002) at 10 retail outlets in Franklin County, looking for specific pesticides available for homeowner use. Three outlets were independent family-owned garden centers; two were Ohio-based chain stores; and the rest were national multi-purpose chain stores.

Each month, a fungicide, an herbicide, and an insecticide were surveyed. Forty-three active ingredients or combinations of products were surveyed, and 141 brand names were found, which represented different manufacturers, formulations, or product combinations.

In the period from March through August, each of the three independent family-owned garden centers had more brands of pesticides for homeowner use and products with a greater variety of active ingredients than each of the other seven retail outlets. In this survey, retail outlets carried similar pesticide merchandise in

comparable corporate branches, regardless of whether Ohio-based stores or different national multi-purpose chains were evaluated.

The biological pesticides found were corn gluten (a pre-emergent herbicide), *Bacillus thuringiensis* var. 'Israelensis' (for mosquito larvae), and *Bacillus thuringiensis*



var. *kurstaki* (for caterpillars). All outlets carried lawn fertilizers which contained an insecticide (Step 3), a long residual control product for grubs, and a dormant or horticultural oil, but disulfoton (Di-syston®) was slightly more difficult to find.

All stores carried triforine (Funginex®), a fungicide for ornamental plants, but other fungicides were less available, including captan, copper, propiconazole, and those for treating lawns. Herbicides appeared to be widely available in the seasons for successful control of weeds.

A variety of controls for deer, moles, and slugs were widely available.

Introduction

The *Buckeye Yard and Garden Line* (BYGL) is one of the key ways through which Ohio State University Extension and the Extension Nursery, Landscape, and Turf Team (ENLTT) provide information to the

Marilyn Golightly, Franklin County Master Gardener; Dorothy Pettenski, Franklin County Master Gardener; Jane C. Martin, Ohio State University Extension, Franklin County.

green industry, Extension offices, and the general public.

A pesticide survey was proposed by ENLTT for 2002 to gather information for *BYGL* on specific products available for homeowner use throughout the growing season. Garden centers of different types in different geographic locations in Franklin County were chosen to provide the Franklin County Extension office consumer garden information line with local market place information.

This report includes a compilation of pesticide information collected in monthly surveys conducted by nine Master Gardeners (MG) in 10 retail outlets during March through August 2002.

Methods and Materials

Ten retail outlets of three different types and representing different geographic locations in Franklin County were selected for this survey (Table 1).

Garden centers 1, 2, and 3 are local family-owned and operated stores. Each has a large production facility and has multiple locations in the Columbus area. They included Oakland Nursery at 1156 Oakland Park, Plantland at 2900 Bethel Road, and Strader's at 5350 Riverside Drive.

Both garden centers 4 and 5 are associated with Ohio general stores that have branches throughout the state. In this report, these two popular garden centers represent a transition between a family-owned garden store and those in national chain stores. These included Anderson's East at Brice Road and Anderson's North at 700 Bent Tree Blvd.

The remaining five garden centers are connected to large multi-purpose, national chain stores and included Home Depot at

6333 Cleveland Avenue, Lowe's Central at 2345 Silver Drive, and Lowe's East at 2888 Brice Road, Sears Hardware at 90 Graceland Boulevard, and Wal-Mart at 5900 Britton Parkway.

The method used for gathering pesticide information for *BYGL* and Franklin County Extension involved a five-step process:

1. Three types of pesticides were selected every month, from March to August by the ENLTT. Pesticides were usually surveyed at the appropriate time for availability and application. The names of the active ingredients on the monthly survey were sent to co-leaders of the MG survey team.
2. One of the co-leaders went to six garden centers in the northern half of Franklin County to find brand-name products that contained the active ingredients. The six sites used for this purpose were garden centers 1, 2, 3, 5, a corporate branch of 6, and a corporate branch of 7 and 8 that previously were chosen for the official survey of pesticides (Table 1). These were Oakland Nursery at 1156 Oakland Park, Plantland at 2900 Bethel Road, Strader's at 5350 Riverside Drive, Andersons at 700 Bent Tree Boulevard, Home Depot at 5858 Sawmill Road, and Lowe's at 3600 Park Mill Run Drive.
3. Information collected at these six garden centers was organized into a preliminary table that listed active ingredients, product names, and product formulations. Both trade names and chemical nomenclature were provided when a need was anticipated as an aid for MGs to

Text continues on page 149

Table 1. 2002 Pesticide Survey, Franklin County.

	Oak-land	Plant-land	Straders	Ander E	Ander N	Home Depot	Lowes E	Lowes Cen	Sears Hrdw	Wal-mart	%*	Comment
Type of Store	family	family	family	Ohio	Ohio	nat'l	nat'l	nat'l	nat'l	nat'l		
Garden Center Code	1	2	3	4	5	6	7	8	9	10		
County Location	Centrl	NW	W	SE	NW	NE	SE	Centrl	N	W		
Month/Pesticide Surveyed												
MARCH												
Pendimethalin	x	x	x	x	x	x	x	x	x	x	100	
Thiophanate-methyl	x	x	x	x	x		x	x			70	
Dormant oils	x	x	x	x	x	x	x	x	x	x	100	
Horticultural oils	x	x	x	x	x	x	x	x	x		90	
Corn gluten	x	x	x								30	
APRIL												
Trifluralin	x	x	x	x	x	x	x	x	x	x	100	
Captan	x	x	x	x	x				x		60	
Imidacloprid (Merit)	x	x	x			x	x	x	x	x	80	
Halofenozide (Mach2)	x	x	x	x	x	x		x	x	x	90	
Dursban			x?								10?	false positive?
MAY												
Triforine (Funginex)	x	x	x	x	x	x	x	x	x	x	100	
Triclopyr	x	x	x			x	x	x	x	x	80	
Disulfoton (Di-Syston)	x	x	x	x	x					x	60	
Lindane											0	
Triadimefon (Bayleton)									x		10	
JUNE												
Metaldehyde	x	x	x			x	x	x			60	
Metaldehyde + Carbaryl (Sevin)	x	x	x		x		x				50	
Iron phosphate	x	x									20	
Aluminum sulfate			x								10	
Diatomaceous earth						x					10	
<i>Bt</i> var. <i>kurstaki</i>	x		x								20	
<i>Bt</i> var. 'Israelensis'	x	x									20	

Table 1 (continued). 2002 Pesticide Survey, Franklin County.

	Oak-land	Plant-land	Straders	Ander E	Ander N	Home Depot	Lowes E	Lowes Cen	Sears Hrdw	Wal-mart	%*	Comment
Type of Store	family	family	family	Ohio	Ohio	nat'l	nat'l	nat'l	nat'l	nat'l		
Garden Center Code	1	2	3	4	5	6	7	8	9	10		
County Location	Centrl	NW	W	SE	NW	NE	SE	Centrl	N	W		
Month/Pesticide Surveyed												
JUNE (contd)												
<i>Bt</i> var. 'San Diego'											0	
4-Step Lawn Care Programs												
Step 1												
Pendimethalin (Lesco)						x					10	
Pendimethalin (Scotts)	x	x			x	x	x	x			60	
(Benefin), trifluralin	x				x						20	store brand
Dithiopyr		x				x					20	
Prodiamine		x									10	store brand
Step 2												
2,4-D, MCPP						x	x	x		x	40	
2, 4-D, MCPP, dicamba		x		x	x	x	x	x	x		70	
2,4-D, MCPP, dichlorprop	x			x	x	x				x	50	
Step 3												
Bifenthrin	x	x	x	x	x	x	x		x	x	90	
Diazinon				x	x	x		x			40	store brand
Step 4												
Fertilizer only	x	x	x	x	x	x	x	x			80	store brand
JULY												
Mole control products:												
Castor oil	x	x		x	x						40	
Castor oil and soybean oil						x	x	x			30	
Zinc phosphide	x	x	x	x	x		x	x			70	
Sulfur, potassium nitrate, char	x		x	x	x						40	
Mechanical trap	x			x	x	x	x	x			60	
Propiconazole (Banner)	x	x	x								30	

Table 1 (continued). 2002 Pesticide Survey, Franklin County.

	Oak-land	Plant-land	Straders	Ander E	Ander N	Home Depot	Lowes E	Lowes Cen	Sears Hrdw	Wal-mart	%*	Comment
Type of Store	family	family	family	Ohio	Ohio	nat'l	nat'l	nat'l	nat'l	nat'l		
Garden Center Code	1	2	3	4	5	6	7	8	9	10		
County Location	Centrl	NW	W	SE	NW	NE	SE	Centrl	N	W		
Month/Pesticide Surveyed												
JULY (contd)												
Fixed copper or Bordeaux mix	x	x	x	x	x						50	
AUGUST												
Deer repellents	x	x	x	x	x	x		x			70	
Trimec	x	x	x	x	x		x	x			70	
* = Percent of retail outlets carrying product												

identify additional brand names of products. Trade names and the chemical nomenclature for active ingredients were obtained from the Pesticide and Metabolite Standards Catalog from Chem Service, Inc., West Chester, Pa.

4. Preliminary tables were sent to the nine MGs who were asked to record pesticide data anytime during the particular month at their assigned garden center. They were asked to add brand names of additional products that contained the active ingredients on the survey, if found.
5. Members of the survey team reported their findings to two co-leaders who prepared a summary table of results at the end of each month. The six summary tables were sent to the Extension agent, who interpreted and distributed the results to others.

Results and Discussion

On average, more surveyed pesticides and more brands were found in the family-owned and operated garden centers (1, 2, and 3) than in garden centers in Ohio general stores (4 and 5) or in garden centers associated with national chains (6, 7, 8, 9, and 10) (Table 1). Surveys indicated that both branches of the Ohio general store had remarkably similar types of pesticides, although managers at each branch could determine quantity and types of products for their store.

Garden center 6 is connected to a national home improvement center. The brand names of pesticides found in a corporate branch of this home improvement center were collected for the preliminary table sent to the nine MGs. Comparison of the data from these two branches indicated that garden center 6 had a few more brand-name products, especially in March and April, than the garden center which was used for collecting preliminary data. However, a real difference may not exist

because data from these two garden centers often were collected approximately one month apart.

Garden centers 7 and 8 are branches of a large national chain of home improvement centers. Information for the preliminary table was obtained from a corporate branch of these two home-improvement centers. Results indicated that the brand names sold in these garden centers were virtually identical for all active ingredients surveyed in all six months of the survey.

Master Gardeners could not find products on both the July and August surveys in garden centers 9 and 10. In addition, the sum of all pesticide merchandise for garden use in these two stores was reported to be low during the August survey.

Forty-three active ingredients (or combinations of active ingredients) were surveyed, and 141 separate brand-name products were found in 10 retail outlets in Franklin County from March through August 2002 (Table 2). A few brand names are followed by "not on list" to indicate these products were not listed on the preliminary table sent to MGs at the beginning of each month. These brand names were later found to contain the active ingredients of interest. Some brand names are followed by "not on list, but reported" because a MG reported finding a product that had not been listed.

Nine deer repellants were found representing six different active ingredients or combinations. Some of these products may also repel other mammals and birds, because manufacturers used a variety of ingredients known to have unpleasant flavors and offensive odors to discourage deer and rabbits. Seven garden centers carried at least one deer repellent in August.

The question was asked: "Are recently discontinued pesticides still available?" The report for chlorpyrifos (Dursban®), a pesticide discontinued in December 2001, may be a "false positive" for one center, since no brand name was given with the report and no product, including sealed ant baits that were approved for sale in 2002, was found at this location by a co-leader of the survey before or after the reported finding. Lindane was not found at any of the retail outlets. Only two fertilizer bags containing triadimefon (Bayleton®) were found at one garden center.

Six active ingredients for controlling fungal diseases were surveyed. Some products containing captan, triforine, and copper also contained insecticides and miticides. Label reading was important for fungicides because they could be packaged as wettable powders, liquid concentrates, ready-to-use liquids, or aerosols. Also, the concentration of active ingredients ranged widely from product to product, even in products packaged by the same manufacturer or for controlling diseases on similar plants.

Six of the 10 stores had thiophanate-methyl, a control for certain lawn diseases, but all stores carried triforine (Funginex®), a product used on roses and other ornamental plants susceptible to fungal diseases. The pesticide manager for a family-owned garden center remarked that he "orders only a small quantity of products for controlling fungus in lawns, because lawn fungus is not a big problem most years in central Ohio."

Only one national chain store had captan, and none had copper-containing fungicides; however, both family-owned (1, 2, and 3) and the Ohio general stores

Text continues on page 158

Table 2. Pesticides Available for Homeowner Use Surveyed in Franklin County, 2002.

Active Ingredient	Month Surveyed	Commercial Name of Products
Deer Repellents		
Ammonium Soaps of Higher Fatty Acids	August	Hinder Deer & Rabbit Repellant
		Grant's Deer & Rabbit Repellant
Dried Animal Blood Plasma		Repellex Deer Repellent Ready to Use
Garlic, Potassium Sorbate, Sodium Lauryl Sulfate		Liquid Fence Animal Repellent
Putrescent Whole Egg Solids		Concern Deer Away
Putrescent Whole Egg Solids, Capsaicin, Related Capsaicinoids & Garlic		Bonide Shot-Gun Deer & Rabbit Repellent
		Deer-Off
Benzyl-diethyl (Bitrex® or Bitterguard®)		Ferti-lome This-1-Works
		Ro-pel Animal, Rodent & Bird Repellent
Fungicides		
Thiophanate-methyl	March	Scotts Lawn Fungus Control
		Scotts Summer Insect & Disease Control & Lawn Fertilizer
Captan	April	Bonide Captan
		Bonide Complete Fruit Tree Spray
		Bonide Insecticide, Miticide, Fungicide
		Bonide Rose & Flower Spray or Dust
		Bonide Rose Rx Insect & Disease Control
		Bonide Rose Spray II Concentrate
		Bonide Rose Spray II Aerosol
		Ferti-lome Fruit Tree Spray
		High Yield Captan
		Ortho Home Orchard Spray

Table 2 (continued). Pesticides Available for Homeowner Use Surveyed in Franklin County, 2002.

Active Ingredient	Month Surveyed	Commercial Name of Products
Triforine (Funginex®)	May	Ortho Orthenex Insect & Disease Control
		Ortho Rose Pride Funginex
		Ortho Rose Pride Insect & Disease & Mite Control
		Ortho Rose Pride Orthenex Insect & Disease Control
Triadimefon (Bayleton®)		
Triadimefon (Bayleton®)	May	Bayer Advanced Lawn Fungus Control
Propiconazole (Banner)		
Propiconazole (Banner)	July	Ferti-lome Systemic Fungicide
Fixed Copper (or Bordeaux)		
Fixed Copper (or Bordeaux)	July	Bonide Copper Spray or Dust
		Bonide Liquid Copper
		Bonide Rotenone + Copper Dust
		Dragon Copper
Herbicides		
Pendimethalin		
Pendimethalin	March	Scotts Crabgrass Preventer + Fertilizer (Step 1)
		Scotts Halts
		Scotts Turfbuilder + Halts
		Scotts Super Turfbuilder + Halts
Corn Gluten		
Corn Gluten	March	Concern All Natural
Trifluralin		
Trifluralin	April	Andersons Crabgrass Preventer + Lawn Food
		Greenview Preen Prevents Weeds
		Greenview Preen 'n Green & Fertilizer
		Miracle-Gro Garden Weed Prevent
		Miracle-Gro Garden Weed Prevent & Plant Food
Triclopyr		
Triclopyr	May	Bonide Stump Out
		Ferti-lome Brush Killer, Stump Killer
		Greenlight Vine & Stump

Table 2 (continued). Pesticides Available for Homeowner Use Surveyed in Franklin County, 2002.

Active Ingredient	Month Surveyed	Commercial Name of Products
		Ortho Brush-B-Gone Poison Ivy, Poison Oak & Brush Killer (Conc.)
		Ortho Brush-B-Gone Poison Ivy, Poison Oak & Brush Killer (RTU)
		Ortho Weed-B-Gone Chickweed, Clover, & Oxalis Killer
Trimec	August	Bonide Lawn Weed Killer
		Ferti-lome Weed Out
		Ferti-lome Weed Out Lawn Weed Killer (Conc.)
		Ferti-lome Weed Out plus Lawn Fertilizer
		Plantland Weed & Feed
		Spectracide Brush Killer Spray (Conc.)
Insecticides		
Dormant Oil	March	Ortho Volck Spray
Horticultural Oil	March	Bonide All Season Oil
		Ferti-lome Dormant & Summer Oil
		Scalecide
		Sunspray Ultra-fine Year Round Oil
Imidacloprid (Merit®)	April	Bayer Advanced Tree & Shrub Insect Control
		Bayer Advanced Garden 2-in-1 Plant Spikes
		Bayer Advanced Lawn Season Grub Control
		Bayer Advanced Lawn Season-Long Grub Control
		Bayer Advanced Rose & Flower Insect Killer
		Scotts Grub-ex
Halofenozide (MACH2)	April	

Table 2 (continued). Pesticides Available for Homeowner Use Surveyed in Franklin County, 2002.

Active Ingredient	Month Surveyed	Commercial Name of Products
Disulfoton (Di-Syston®)	May	Bayer Advanced Rose & Flower Care
		Bayer Advanced Rose and Flower Care
		Bonide Systemic Granules
		Bonide Systemic Rose & Flower Care
		Ferti-lome Systemic Insecticide Granules for Roses, Shrubs, Flowers & Tomatoes
		Hi-Yield Di-Syston® Systemic Insecticide
<i>Bt.</i> var. 'kurstaki' (caterpillars)	June	American Thuricide
		Bonide Bacillus Thuringensis
		Bonide Thuricide
		Ortho <i>Bt.</i> Biospray
		Ortho Dipel Caterpillar Spray
<i>Bt.</i> var. 'Israelensis' (mosquito larvae)	June	Summit Mosquito Dunks
<i>Bt.</i> var. 'San Diego' (beetle larvae)	June	none found
Lawn Fertilizer + Pesticides		
Step 1 – pre-emergent herbicides	June	
Pendimethalin		Lesco Pre-M Starter Fertilizer (not on list, but reported)
		Scott's Step 1-Crabgrass Preventer + Fertilizer
		Scott's Turfbuilder + Halts (not on list)
		Scott's Super Turfbuilder + Halts (not on list)
Benfluralin (Benefin®) & Trifluralin		Andersons Crabgrass Preventer
		Fortify
		Oakland Step 1
Dithiopyr		Vigro Pre-emergent Crabgrass Control + Fertilizer

Table 2 (continued). Pesticides Available for Homeowner Use Surveyed in Franklin County, 2002.

Active Ingredient	Month Surveyed	Commercial Name of Products
Prodiamine	June (cont'd)	Ferti-lome Lawn Food + Crabgrass & Weed Preventer
Step 2 — broadleaf weed herbicide(s)		
2,4-D, Mecoprop		Scott's Step 4 (Turf Builder + Weed Control)
2,4-D, Mecoprop, Dicamba		Ferti-lome Weed-Out + Lawn Fertilizer
		Green Sweep Weed & Feed
		Lesco Weed & Feed (liquid conc.)
		Lesco Weed & Feed (liquid conc.)
		Lesco Weed & Feed (granules)
		Plantland Weed & Feed
		Scott's Weed & Feed
		Sta-Green Weed & Feed
		Sta-Green 200 Plus Weed & Feed
		Vigro Weed and Feed
2,4-D, Mecoprop, Dichlorprop		Andersons Weed & Feed
		Fortify Weed and Feed
		Lesco Weed & Feed (granules)
		Scott's Green Sweep Weed & Feed
Step 3 — insecticide		
Bifenthrin		Scott's Step 3 (Scott's Summer Guard Insect Control)
Diazinon		Andersons Lawn Insect Control + Lawn Food
		Scott's Fertilizer with Insect Control
		Vigro Lawn Insect Control + Fertilizer
Step 4		
Fertilizer, only		Andersons Lawn Food
		Lesco Starter Fertilizer
		Lesco Turf Fertilizer

Table 2 (continued). Pesticides Available for Homeowner Use Surveyed in Franklin County, 2002.

Active Ingredient	Month Surveyed	Commercial Name of Products
		Parker's Lawn & Garden Fertilizer
		Plantland Fall/Winter Fertilizer
		Scott's Step 4 (Turfbuilder Lawn Fertilizer)
		Sta-Green Lawn Fertilizer
		Vigro Lawn Fertilizer
		Vigro Starter Fertilizer
2,4-D, Mecoprop		Scott's Super Winterizer + Weed Control (not on list)
2,4-D, Mecoprop, Dicamba		Sta-Green Lawn Fertilizer + 3 Weed Control (not on list, but reported)
Mole Control		
Castor Oil	July	Bonide Shot-Gun Mole & Gopher Repellant
		Ferti-lome Mole Go
		Mole-Med
Castor Oil, Soybean Oil		Spectracide Mole Stop Mole Repellant
Zinc Phosphate		Bonide Moletox
		Sweeney's Poison Peanuts
		U.S. Garden Sales
Sulfur, Potassium Nitrate, Charcoal		Revenge Rodent Smoke Bomb
Mechanical Metal Trap		Nash's Choker Loop Mole Trap
		Victor Mole Trap
Sonic Device		Victor Sonic Pest Chaser Model 700
Slug Control		
Metaldehyde	June	Force II Deadline
		Hi-yield Snail & Slug Killer
		Ortho Bug-Geta Snail & Slug Killer

Table 2 (continued). Pesticides Available for Homeowner Use Surveyed in Franklin County, 2002.

Active Ingredient	Month Surveyed	Commercial Name of Products
		Ortho Snail & Slug Killer
		Spectracide Snail & Slug Killer
Metaldehyde + Carbaryl (Sevin_)		Bonide No Escape Slug & Snail Killer
		Bonide No Escape Slug & Snail Killer
		Bonide + Snail, Slug & Sowbug Bait
		Bonide Slug Bait
		Ferti-lome Eliminate
		Ferti-lome Snail, Slug & Bug Bait
		Green Light Bug & Snail Bait
		Ortho Bug-Geta + Snail, Slug + Insect Killer
		Ortho Bug-Geta + Snail, Slug + Sowbug Bait
Iron Phosphate		Sluggo
		Schultz Garden Safe Slug & Snail Bait
Aluminum Sulfate		Farmer McGregor's Snail & Slug Slaughter
Diatomaceous Earth		(not on list, but reported)

(4 and 5) stocked both of these products. Propiconazole was found in only two products, which were packaged by one company, and these products were found only in family-owned garden centers (1, 2, and 3).

The active ingredients for controlling weeds are listed in Table 2 under the heading *Herbicides* and also under *Lawn Fertilizers + Pesticides* (4-Step products). Eleven active ingredients or combinations were surveyed. Concern All Natural, which contains corn gluten, was the only brand found of any biological pre-emergent, and it was seen only at the three family-owned garden centers (1, 2, and 3).

Triclopyr, a liquid sold in ready-to-use forms or as a concentrate, is intended for use in non-crop, industrial, and wildlife openings, as well as in lawns to treat stumps and to control broadleaf weeds or woody brush. In May, triclopyr was found at eight garden centers (1, 2, 3, 6, 7, 8, 9, and 10). Pendimethalin and trifluralin, both pre-emergent herbicides, were available as individual products and mixed with fertilizers for the lawn.

Trimec herbicides for broadleaf post-emergent weed control, were available as individual products and mixed with fertilizers for the lawn. The herbicides for lawns will be discussed further with 4-Step lawn products.

Ten active ingredients for controlling insects were surveyed, but additional insecticides, such as malathion, pyrethrin isomers, permethrin and malathion, were found in combination products with fungicides that were surveyed. Disulfoton (Di-System®) is a systemic, organophosphate insecticide currently licensed for working into the soil around roses and non-edible ornamental plants and in the transplant hole for tomatoes.

Although disulfoton can control a wide variety of garden pests, it should never be broadcast in vegetable gardens or on lawns. Disulfoton breaks down quickly and has little residual effect, and it was found in products in six of the 10 garden centers.

All retail garden centers carried a Step-3 lawn fertilizer with an insecticide (either bifenthrin or diazinon), a dormant or horticultural oil, and a long residual product for grub control (imidacloprid or halofenozide).

Products containing insecticidal *Bacillus thuringiensis* (*Bt.* var. 'Israelensis' and *Bt.* var. *kurstaki*) were found only at the family-owned garden centers (1, 2, and 3). One manager said he "did not stock *Bt.* var. 'San Diego' because potato beetles are not a serious problem for homeowners in central Ohio."

Timing was important for finding *Bt.* var. 'Israelensis,' a biological agent for killing mosquito larvae. This mosquito control was not found at the beginning of June. However, Summit Mosquito Dunks, which may be floated in standing water, were found at two family-owned garden centers in mid-June. Quantities of Mosquito Dunks fluctuated greatly through July and August in the garden center that displayed this product at eye level and also sold water garden plants and supplies.

The noted fluctuation probably was a response to news reports of the recent spread of West Nile virus, a disease spread by mosquitoes that are plentiful in central Ohio, and the ability of the garden center to replenish its supply.

The preliminary table for 4-Step lawn products was unusually long and contained both national brands and store brand products. Unfortunately, a few Step-1 and Step-4 herbicide-containing

products were not listed on the preliminary table because either they were not seen in late May in any of the six garden centers used to obtain brand name information or were seen, but inadvertently not listed, which was the situation for Scott's Super Winterizer Plus Weed Control.

Careful label reading was needed to determine the active ingredients for pre-emergent herbicides combined with lawn fertilizers (Step-1), because the bags could contain one or two of five chemicals, and this information could be in small print on either the front or the back of a heavy bag. However, reading the labels on broadleaf post-emergent herbicides (Step-2) required even greater skills, because the active ingredients could be one of three combinations of chemicals, and all were listed with the long chemical names rather than the shorter common names.

Products from one manufacturer illustrate how confusing herbicide-label reading can be for homeowners. For example, Lesco's Weed and Feed was applied to both a liquid concentrate and two granular products, all with three active ingredients. The last active ingredient listed on one bag was the long chemical name for dicamba, and on a similar bag was the long chemical name for dichlorprop.

Pre-emergent herbicides (*e.g.*, pendimethalin, trifluralin, benfluralin, dithiopyr, and prodiamine) are applied to soil and are absorbed by root systems or by emerging shoot tips during germination. Most must be dissolved in moist soil to kill newly germinated seedlings.

A comparison of the abundant amounts of pendimethalin and trifluralin in every garden center in March and April, with a only a few garden centers having a sparse quantity of these products (Step-1) in June,

suggests that these products sold early in the spring but were not restocked once the season for successful control of weeds with these chemicals had passed.

Selective post-emergent herbicides (*e.g.*, trimec; 2,4-D; mecoprop; dicamba; and dichlorprop) generally perform best at warmer air temperatures because the rate of uptake increases as temperature rises. These herbicides are generally most effective when applied to young plants, and several days may be required for the effects to be seen. These herbicides are effective against all types of broadleaf weeds, but are especially valued for controlling perennial weeds in lawns.

Low supplies of post-emergent herbicides (Step-2) in June, especially in popular family-owned garden centers (1, 2, and 3), might be the result of unanticipated demand by consumers who wished to control the many weeds that had germinated during the wet spring of 2002. Only one Step-4 fertilizer was reported.

The fact that Scott's Super Winterizer Plus Weed Control was not given on the preliminary list undoubtedly contributed to the fact that no one reported this product in June. But other factors should be considered to explain why only one late-season fertilizer with broadleaf weed control was found. June may have been too early for some garden centers to accept delivery of Step-4 weed-and-feed products. Another plausible explanation is that the Step-2 weed-and-feed fertilizers are also sold for controlling late-season lawn weeds.

This survey did not evaluate formulations of post-emergent broadleaf herbicides used for spot removal of a few isolated weeds from lawns.

Both moles and slugs may significantly damage valued plants. Therefore, many

manufacturers have created products for controlling populations of these pests. Controls for moles ranged from biological and chemical poisons to smoke bombs, mechanical traps, and even sonic devices.

Many products sold for slug control are the widely available baits containing metaldehyde alone or combined with carbaryl (Sevin®). However, three brands containing iron phosphate or aluminum phosphate were found at family-owned garden centers, and these substances can be used safely around domestic animals and wildlife.

Our experience in gathering pesticide information from Internet resources and by contacting individual manufacturers for *BYGL* may be of interest to other groups who wish to do a pesticide survey. Unfortunately, searching the Pesticide Action Network Database at <http://www.pesticideinfo.org/> and the web sites of individual manufacturers for pesticides found in the three local family-owned garden centers (February 2002) proved to be of limited value.

One problem with Internet searches for pesticides was that some web sites provided only a little information about a few products in the entire line a manufacturer produces for homeowner use, whereas other web sites listed all pesticides the company had ever manufactured, even those no longer licensed for homeowner use.

One MG contacted an employee at The Scott's Company and was able to obtain a list of Scott's and Ortho products

currently licensed for homeowner use, along with the active ingredients and formulation. Another MG contacted Bayer, Bonide, and Voluntary Purchasing Group, Inc., (Fertilome) and obtained similar information from these companies. These four lists were very useful for sketching a template for recording what pesticide products would likely be available and where these products might be located within retail outlets.

Acknowledgements

Special thanks are extended to the nine Master Gardeners who completed the pesticide surveys at the 10 garden centers. They are Karen Demboski, Marilyn Golightly, Debbie House-Cohen, Barbara Merritt, Theresa Merva-Sico, Dorothy Pettenski, Jeanne Sutton, Lynne Sutton, and Juliet Taylor. This truly was a team effort, and the cheerfulness and attention to detail of all is greatly appreciated.

Much appreciation is extended to the managers of the retail outlets who permitted MGs to search for pesticide information in their stores and generously helped find products.

Also, gratitude is expressed to the various employees of the garden centers who helped the MGs pursue pesticide information for this survey.

Where trade names are used, no discrimination is intended and no endorsement by Ohio State University Extension is implied.