II. Pome Fruits
Pesticide Use Survey
1. Apple - 1989

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Pesticide Use Survey Results: a summary

One thousand original survey forms were sent to apple growers from throughout Washington. At least 20% of the names on the mailing list of the Washington Apple Commission were not valid apple growers due to retirement or death, selling of the orchard, removal of all apple trees, etc. Thus, only about 800 surveys were sent to active apple growers with 360 or 45% completed and returned. The growers surveyed produced apples on a total of 20,500 acres or about 12% of the total apple acreage in Washington.

Descriptive information

Full-time grower	76%
Part-time grower *	24%

* obtains a significant portion of income from off-farm work

Farm size in acres (full-time grower)

Average	Low	High	Sample number
94.7	7	830	272

Farm size in acres (part-time grower)

Average	Low	High	Sample number
13.8	2	50	85

Percent of growers following different categories of farming practices

Conventional (synthetic pesticides)	98.6%
Conventional/Organic (mixed acres)	0.5%
Transitional Organic	0.3%
Organic	0.6%

Number of acres of crops grown by survey respondents

Crop	Average	Low	High	Sample number
Apple	56.7	1.0	750	362
Pear	18.9	0.3	120	180
Cherry	21.2	0.5	160	95
Apricot	9.0	0.5	40	15
Peach	11.6	0.3	80	24
Nectarine	11.5	0.3	60	21
Plum	4.4	2.0	10	5
Prune	9.1	0.02	41	15

Average percentage of apple varieties grown by survey respondents.

Variety	Average	Number of growers
Red Delicious	68.3	352
Golden Delicious	17.8	307
Granny Smith	4.0	46
Gala	2.9	59
Rome	3.0	88
Fuji	1.3	31
Jonagold	0.7	15
Winesap	0.7	46
Jonathan	0.3	18
Others	1.9	53

Average apple production (bins per acre)

Average	Low	High	Sample number
35.4	0.7	165	342

Percentage of growers indicating the level of pesticide use over the past 5 years.

Increased	17%
Decreased	27%
Stayed the same	56%

Percentage of growers who said they used these IPM practices in managing their pest problems.

Field monitoring	91%
Alternate row spraying	28%
Economic thresholds	37%
Biological control	34%
Reduced pesticide rates	54%
Pheromone traps	66%

Growers rated the following for their relative importance in helping make pest management decisions

Group	Very important	Somewhat important	Not important
advice from private consultants	31%	17%	34%
advice from agricultural chemical industry representative	45%	36%	14%
recommendations from Cooperative Extension	27%	46%	12%
advice from warehouse fieldman	37%	29%	22%
consultation with other growers	19%	54%	15%

Reporting block information

Each grower was asked to report pesticide use from that portion of his farm (reporting block) that he felt represented a "typical" pesticide use pattern for his operation. The information below summarizes the information for the reporting blocks.

Block size of the reporting blocks in acres

Average	Low	High	Sample number
19.3	1	592	358

Tree planting density - number of trees per acre in the reporting blocks

Average	Low	High	Sample number
193.7	64	800	354

Percent Red Delicious variety in the reporting block

Average	Low	High	Sample number
75.7	0	100	358

Percent of orchards with trees in different age ranges

5-9 years	10-15 years	16-20 years	21-29 years	>30 years
4%	33%	31%	18%	14%

Percent of orchards with different tree training systems

Central leader	Open center	Slender spindle	Trellis	Vertical axis
35%	63%	0.6%	0.3%	0.6%

Percent of orchards with different irrigation methods

Impact sprinklers		Micro sprinklers			
Under-tree	Over-tree	Under-tree	Over-tree	Drip	Rills
64.1%	23.5%	4.5%	0.3%	1.4%	5.9%

Percent of orchards with different ground cover management types

Grass strips	Mixed weeds	No cover crop	Solid grass
63.6%	14.1%	2.5%	19.8%

Pesticide use data

Number of spray applications (not including herbicides) made during 1989

Average	Low	High	Sample number
8.0	2	18	357

1 More than one class of pesticide can be included in one spray.

Number of pesticides in a spray application (not including herbicides)

Average	Low	High	Sample number
2.1	1	11	2688

Number of sprays (not including herbicides) applied at different times of year

Period	Average	Low	High	Sample number
Pre-bloom	1.6	1	4	351
Bloom	1.5	1	3	306
Post-bloom	5.1	1	14	357

Number of sprays of each chemical type applied during 1989

Class	Average	Low	High	Sample number
Insecticides	5.0	1	18	356
Fungicides	1.7	1	6	184
Nutrients	3.6	1	10	313
Plant growth regulators	2.3	1	6	312
Herbicides	1.5	1	4	358

Number of applications of the three most often used pesticides within a class and the percentage of pesticide use compared to all other products within the class and to ALL pesticides reported.

Class	Chemicals	Ave. no. applications	Ave. percent of pesticide class	Ave. percent of all pesticides
Fungicides	Rubigan	1.33	28.0	1.77
	Bayleton	1.31	26.1	1.65
	Ziram	1.16	11.6	0.73
Insecticides	Guthion	2.99	36.9	17.40
	Phosphamidon	1.85	16.2	7.65
	Oil	1.09	12.6	5.94
Nutrients	Calcium	2.70	39.8	10.88
	Boron	1.43	15.7	4.30
	Zinc	1.24	15.4	4.21
Plant growth regulators	Elgetol	1.07	22.1	5.00
	Sevin	1.22	21.5	4.13
	NAA	1.30	21.3	4.10