

## New England Apple Pest Management Survey Results

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A 90-question survey was distributed to 600 New England growers in the fall of 2004. Dillman survey methodology was used to design and conduct the survey. Percentages of growers were calculated using the 170 growers who responded to the survey as the denominator, not the number of growers responding to a particular question. Many questions allowed multiple answers, thus percentage responses may sum to more than 100%.

### New England Apple Pest Management Survey Returns

<b>State</b>	<b>#Surveys Sent</b>	<b>#Surveys Returned</b>	<b>%Return</b>	<b>#Growing Apples</b>	<b>#Apple Acres</b>
MA	178	122	69	68	1318.75
NH	147	92	63	23	1157.50
VT	68	28	41	12	785.3
CT	75	35	47	23	621.5
ME	111	56	50	37	609
RI	40	16	40	7	45.5
<b>Total</b>	<b>619</b>	<b>349</b>	<b>56</b>	<b>170</b>	<b>4537.55</b>

**Question A2.** Over the past five years, what is your average annual yield of harvested apples per acre? (N=152)\*

Number of Growers Reporting	<b>147</b>
Percent of Growers	<b>86%</b>
Number of Acres	<b>4082</b>
Percent of Acres	<b>90%</b>
Total Bushels/Year	<b>3,158,797</b>
Average Bushels/Acre	<b>785</b>

\*N is used throughout the entire document and refers to the number of growers who answered the question.

**Question A3.** What percentage of your apple crop is sold through each of these markets?  
(N=167)

Markets	#Acres	%Acres
Fresh market, wholesale	2215	49
Fresh market, retail	866	19
U-Pick/Pick Your Own	577	13
Processing	604	13
Other	122	3

**Question A4.** Which of the following describe you planting densities? (Please estimate the approximate percentage of your apple orchard that is planted at each density.)  
(N=160)

Plant Densities	#Growers	%Growers	#Acres	%Acres
Fewer than 120 trees per acre	110	64	1808	40
121 to 340 trees per acre	89	52	1812	40
More than 340 trees per acre	45	26	492	11

**Question B1.** Which of the following practices do you use? (Circle all that apply.)  
(N=161)

Practices	#Growers	%Growers
dormant pruning	160	94
summer pruning	80	47
growth regulators to suppress shoot growth	36	21

**Question B2.** Do you use tissue analysis to determine fertilizer needs in most years?  
(Circle your answer) (N=163)

Tissue analysis	#Growers	%Growers
No	59	35
Annually	41	24
Every second year	28	16
Every third year	28	16
Do not use fertilizer	1	<1
Every fourth year	1	<1

**Question C1.** Please estimate your average number of pesticide applications for apples used in a typical year: (N=157)

Pests	#Average Number of Sprays
Disease	8.6
Insects	6.7
Mites	1.4
Weeds	1.2

**Question C2.** Do you use Tree Row Canopy Volume for determining pesticide application rates? (please circle your answer) (N=156)

Use Tree Row Canopy Volume	#Growers	%Growers
Yes	72	42
No	69	41
Not Sure	15	9

### Insects and Mites Section

**Question C3.** Which of these insects/mites require routine annual management, require occasional management, or are never a problem on your apple orchard? (N=167)

Rank	Insect/Mite	Weighed Number*	Rank	Insect/Mite	Weighed Number*
1	Plum curculio	624	16	Rosy apple aphid	248
2	Apple maggot	602	17	Apple and/or Spirea aphid	234
3	European red mite	506	17	Wooly apple aphid	234
4	European apple sawfly	504	19	Potato leafhopper	226
5	Tarnished plant bug	446	20	Gypsy moth	204
6	Codling moth, Lesser appleworm	396	21	Stinkbugs	178
7	Tentiform leafminers	390	22	Rose leafhopper	170
8	White apple leafhopper	374	23	Oriental fruit moth	168
9	Twospotted spider mite	296	24	Mullein bug	132
10	Japanese beetles	286	25	European corn borer	86
11	San Jose scale	284	25	Climbing cutworms	86
12	Obliquebanded leafroller	266	27	Green pug moth	84
13	Insect trunk borers	264	28	Apple pith moth	80
14	Redbanded leafroller	258	29	Pear thrips	78
15	Green fruit worm	254			

\*The weighed number was determined by multiplying routine annual management by 4, occasional management by 2, and never a problem by 0.

**Question D1.** Which of the following practices do you use to manage insects and/or mite pests? (Circle all that apply.) (N=166)

#Growers	%Growers	Practices used to manage insect and mite pests
137	81	orchard monitoring of pest and beneficial populations
111	65	orchard floor groundcover/habitat management
84	49	trapping
61	36	border row spraying rather than entire orchards
60	35	use degree-day models to time applications
58	34	remove wild/alternate hosts and abandoned orchards
23	14	insecticide-treated traps
19	11	release predatory mites and insects
19	11	mating disruption
9	5	row cropping and annual tillage of adjacent cropland

The following insect and mites pests (pages 4-) are listed according to the number of growers who used pesticides to manage the pest in 2003. The survey listed several pesticides and some practices. Growers were able to write in additional pesticides and practices.

### Plum Curculio (N=164)

	Number	Percent
Acres Treated	<b>4334</b>	<b>96</b>
Growers	<b>161</b>	<b>95</b>

Pesticide <sup>1</sup>	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Imidan 70 WP	113	66	2542	<b>56</b>	54	45	9
Guthion/AzinphosM 50WP	57	34	2390	<b>53</b>	34	21	0
Sevin F,EC,S, XLR Plus	20	12	346	<b>8</b>	4	9	7
Asana 0.66 EC	12	7	461	<b>10</b>	8	4	0
Avaunt 30DG	12	7	244	<b>5</b>	7	5	0
Danitol 2.4EC	8	5	660	<b>15</b>	5	2	0
Surround 95WP	4	2	103	<b>2</b>	0	2	2
Lorsban 50WS	2	1	3.5	<b>&lt;1</b>	0	2	0
Actara PF	1	<1	96	<b>2</b>	0	1	0
Sniper	1	<1	19	<b>&lt;1</b>	1	0	0
Pounce	1	<1	14	<b>&lt;1</b>	1	0	0
Diazinon	1	<1	4	<b>&lt;1</b>	0	0	1
Lannate 2.4L,90S	1	<1	3.5	<b>&lt;1</b>	0	1	0

Digon EC and Dimate EC were not used by growers

<sup>1</sup>See Appendix A for Brand names and active ingredients

### Apple Maggot (N=163)

**Number**      **Percent**  
**Acres Treated**      **4246**      **94**  
**Growers**      **158**      **93**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Imidan 70WP	130	76	3053	<b>67</b>	91	33	1
Guthion/AzinphosM 50WP	34	20	1302	<b>29</b>	27	7	0
Sevin F, 4EC XLRPlus,80S	19	11	803	<b>18</b>	8	8	2
Danitol 2.4 EC	14	8	974	<b>21</b>	12	2	0
Asana 0.66 EC	5	3	118	<b>3</b>	4	1	0
Avaunt 30DG	5	3	113	<b>2</b>	3	2	0
Surround 95WP	3	2	31	< <b>1</b>	0	2	0
Sniper	1	<1	80	<b>2</b>	0	1	0
Lannate L or 90SP	1	<1	19	< <b>1</b>	1	0	0
Vydate 2L	1	<1	10	< <b>1</b>	0	1	0
Entrust	1	<1	8	< <b>1</b>	0	1	0
Diazinon	1	<1	4	< <b>1</b>	0	0	1
Spintor 2SC	1	<1	0.5	< <b>1</b>	0	1	0
<b>Other Strategies</b>							
Trapping	4	2	138	<b>3</b>	2	2	0
Pesticide Treated Spheres	3	2	44	<b>1</b>	1	0	0

Digon EC, Dimate EC, and Neemix were not used by growers.

### European red mite (N=164)

**Number**      **Percent**  
**Acres Treated**      **3792**      **84**  
**Growers**      **134**      **79**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Oil <sup>1</sup>	107	63	3358	<b>74</b>	43	56	6
Danitol 2.4EC	29	17	1437	<b>32</b>	21	8	0
Pyramite 60WS	28	16	1198	<b>26</b>	17	9	0
Apollo 42SC	19	11	725	<b>16</b>	8	9	2
Agrimek 0.15EC	18	11	941	<b>21</b>	13	5	0
Savey 50WP	17	10	618	<b>14</b>	10	7	0
Acramite 50WS	14	8	493	<b>11</b>	8	6	0

Kelthane 50WP	8	5	128	<b>3</b>	0	6	2
Vendex 50WP	6	4	127	<b>3</b>	2	3	1
M-Pede	3	2	106	<b>2</b>	0	1	2
Vydate 2L	2	1	172	<b>4</b>	0	1	1
Safer's Insecticidal Soap	1	<1	100	<b>2</b>	0	0	1
Valero	0						
<b>Other Strategies</b>							
Predators	4	2	772	<b>17</b>	2	2	0
Summer Pruning	1	<1	13.5	<b>&lt;1</b>	0	1	0
Use beneficial mites	1	<1	0.45	<b>&lt;1</b>	0	1	0

\* Carzol 92SP, Imidan, Sevin, Nexter, Zeal, and A gramel were all used by at least one grower but on less than 2% of the apple acreage.

### European Apple Sawfly (N=163)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>3874</b>	<b>85</b>
<b>Growers</b>	<b>135</b>	<b>79</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Imidan 70WP	84	49	1941	<b>43</b>	44	33	2
Guthion/AzinphosM 50WP	40	24	1395	<b>31</b>	21	18	0
Sevin F, 4EC, XLR Plus, 80S	17	10	302	<b>7</b>	6	8	2
Asana 0.66 EC	14	8	683	<b>15</b>	11	3	0
Pounce EC or 25WP	8	5	171	<b>4</b>	5	3	0
Danitol 2.4EC	6	4	634	<b>14</b>	3	3	0
Avaunt	3	2	27	<b>&lt;1</b>	1	0	1
Lannate L or 90SP	2	1	67	<b>2</b>	0	2	0
Ambush EC or 25WP	2	1	64	<b>1</b>	2	0	0
Calypso	2	1	45	<b>1</b>	1	1	0
Dipel	1	<1	128	<b>3</b>	0	1	0
Surround	1	<1	8	<b>&lt;1</b>	0	1	0

Diazinon and Sniper were not used by growers.

### Tarnished plant bug (N=163)

<b>Acres Treated</b>	<b>Number</b>	<b>Percent</b>
	<b>3412</b>	<b>75</b>
<b>Growers</b>	<b>115</b>	<b>68</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Imidan 70WP	68	40	1679	<b>37</b>	25	33	4
Guthion/AzinphosM 50WP	34	20	813	<b>18</b>	16	16	0
Asana 0.66 EC	18	11	1540	<b>34</b>	14	4	0
Pounce EC or 25WP	14	8	573	<b>13</b>	9	5	0
Sevin F, 4EC XLRPlus,80S	10	6	158	<b>4</b>	3	6	1
Avaunt 30DG	6	4	52	<b>1</b>	2	3	1
Danitol 2.4EC	5	3	546	<b>12</b>	4	1	0
Ambush EC or 25WP	3	2	90	<b>2</b>	2	1	0
Thiodan 50WP	3	2	25	<b>&lt;1</b>	2	1	0
Lorsban 50WS	2	1	4	<b>&lt;1</b>	1	1	0

Aza-Direct 1.2EC, Digon EC, Dimate EC, Lannate 2.4L/25WP, Phaser, Rotenone, Sniper, and Vydate L were not used by growers.

### Codling Moth (N= 161)

<b>Acres Treated</b>	<b>Number</b>	<b>Percent</b>
	<b>2792</b>	<b>62</b>
<b>Growers</b>	<b>97</b>	<b>57</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Imidan 70WP	71	42	1928	<b>43</b>	42	25	0
Guthion/AzinphosM 50WP	21	12	671	<b>15</b>	11	8	1
Asana 0.66 EC	8	5	617	<b>14</b>	7	1	0
Sevin F, 4EC XLRPlus,80S	7	4	75	<b>2</b>	2	4	1
Danitol 2.4EC	4	2	481	<b>11</b>	4	0	0
Avaunt 30DG	4	2	107	<b>2</b>	2	2	0
Bacillus thuringiensis (Agree, Dipel, Javelin, MVP, Xentari)	4	2	105	<b>2</b>	1	2	1
Lorsban 50WS	2	1	4	<b>&lt;1</b>	0	2	0
Lannate L or 90SP	1	<1	191	<b>4</b>	1	0	0
Intrepid 2F	1	<1	50	<b>1</b>	1	0	0
Spintor 2SC	1	<1	50	<b>1</b>	1	0	0

Entrust	1	<1	10	<1	0	2	0
Diazinon	1	<1	4	<1	0	0	1
<b>Other Strategies</b>							
Mating Disruption	2	1	24	<1	0	1	0
Cut down wild apple trees	1	<1	20	<1	1	0	0

Assail 70WP, Confirm 2F, Digon EC, Dimate EC, Esteem 0.86EC/35WP, Methoxychlor, M-Pede, Phaser, Safer's Insecticidal Soap, and Surround 95WP were not used by growers.

### San Jose scale (N=162)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>2761</b>	<b>61</b>
<b>Growers</b>	<b>85</b>	<b>50</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Oil <sup>1</sup>	54	32	1202	<b>27</b>	30	21	2
Imidan 70WP	23	14	266	<b>6</b>	15	6	2
Guthion 50WP	16	9	332	<b>7</b>	6	9	1
Lorsban 4EC with oil	14	8	227	<b>5</b>	9	4	0
Provado 1.6F	8	5	158	<b>3</b>	3	4	1
Lorsban 50WS	6	4	48	<b>1</b>	3	2	1
Diazinon	3	2	90	<b>2</b>	1	2	0
<b>Other Strategies</b>							
Dormant prune off dead wood	1	<1	3	<1	0	1	0

Distance L, Esteem 0.86EC/35WP, and Supracide 25WP were not used by growers.

### Apple blotch and spotted tentiform leafminer (N=162)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>2790</b>	<b>61</b>
<b>Growers</b>	<b>84</b>	<b>49</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Provado 1.6F	24	14	447	<b>10</b>	11	10	1
Asana 0.66 EC	16	9	1339	<b>30</b>	11	4	0
Thiodan 50WP	13	8	372	<b>8</b>	3	10	0
Pounce EC or 25WP	10	6	120	<b>3</b>	4	5	0
Danitol 2.4EC	9	5	643	<b>14</b>	6	2	0
Agriemek 0.15EC	9	5	249	<b>5</b>	8	1	0
Ambush EC or 25WP	3	2	60	<b>1</b>	2	1	0

Vydate 2L	3	2	37	<1	2	1	0
Avaunt	3	2	27	<1	2	1	0
Lannate L or 90SP	2	1	20	<1	2	0	0
Imidan	2	1	10	<1	1	0	1
Actara Pink	1	<1	96	2	0	0	0
Spintor 2SC	1	<1	55	1	1	0	0
Esteem 0.86EC or 35WP	1	<1	26	<1	1	0	0
Calypso	1	<1	8	<1	1	0	0
Sevin/Imidan	1	<1	6	<1	0	0	0
<b>Other Strategies</b>							
Natural Predators	1	<1	31.25	<1	0	1	0

Assail 70WP, Confirm 2F, Digon EC, Dimate EC, Intrepid 2F, M-Pede, Neemix, Phaser and Safer's Insecticidal Soap were not used by growers.

### Apple Aphid (N=161)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>1889</b>	<b>42</b>
<b>Growers</b>	<b>83</b>	<b>49</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Imidan 70WP	43	23	655	14	13	25	4
Thiodan 50WP	22	13	397	9	16	6	0
Sevin F, 4EC XLRPlus,80S	15	9	247	5	5	9	1
Provado 1.6F	7	4	346	8	4	3	0
Asana 0.66 EC	4	2	349	8	2	2	0
Pounce EC or 25WP	3	2	279	6	1	1	1
Lannate L or 90SP	2	1	267	6	1	1	0
Assail 70WP	2	1	30	<1	2	0	0
Diazinon	1	<1	4	<1	0	0	1
Di-syston G	1	<1	4	<1	0	0	1
Phaser	1	<1	2	<1	0	1	0
<b>Other Strategies</b>							
Predators	5	3	579	13	2	2	0
Summer Pruning	2	1	16	<1	1	1	0

Ambush EC/25WP, Aza-Direct 1.2EC, Digon EC, Dimate EC, Distance L, Esteem 0.86EC/35WP, M-Pede, Safer's Insecticidal Soap, Valero L, and Vydate L were not used by growers.

## Twospotted Spider Mite (N=160)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>2386</b>	<b>53</b>
<b>Growers</b>	<b>82</b>	<b>48</b>

<b>Pesticide</b>	<b>#Growers</b>	<b>%Growers</b>	<b>#Acres</b>	<b>%Acres</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
Oil	55	32	1357	<b>30</b>	20	32	2
Danitol 2.4EC	14	8	686	<b>15</b>	7	6	0
Pyramite 60WS	11	6	220	<b>5</b>	4	7	2
Apollo 42SC	11	7	199	<b>4</b>	5	4	2
Agrimek 0.15EC	8	5	206	<b>5</b>	6	2	0
Savey 50WP	6	4	149	<b>3</b>	2	4	0
Acramite 50WS	6	4	133	<b>3</b>	2	3	1
Vendex 50WP	3	2	24	< <b>1</b>	1	2	0
Kelthane 50WP	3	2	3	< <b>1</b>	0	3	0
Nexter	1	<1	10	< <b>1</b>	1	0	0
Sevin	1	<1	6	< <b>1</b>	0	0	0
Imidan	1	<1	6	< <b>1</b>	0	0	0
Valero	1	<1	3	< <b>1</b>	1	0	0
Carzol 92SP	1	<1	1	< <b>1</b>	0	1	0
<b>Other Strategies</b>							
Predators	1	<1	520		1	0	0
Summer pruning	1	<1	14	< <b>1</b>	0	1	0

Aza-Direct 1.2EC, Guthion/Azinphos-M 50WP, M-Pede, Neemix, Safer's Insecticidal Soap, and Vydate L were not used by growers.

## White Apple and Rose Leafhoppers (N=161)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>2058</b>	<b>45</b>
<b>Growers</b>	<b>71</b>	<b>42</b>

<b>Pesticide</b>	<b>#Growers</b>	<b>%Growers</b>	<b>#Acres</b>	<b>%Acres</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
Sevin F, 4EC, XLR Plus, 80S	37	22	1245	<b>27</b>	18	16	2
Provado 1.6F	16	9	364	<b>8</b>	11	5	0
Thiodan 50WP	16	9	233	<b>5</b>	9	7	0
Danitol 2.4EC	11	6	369	<b>8</b>	8	3	0
Avaunt 30DG	4	2	89	<b>2</b>	3	1	0

Asana 0.66 EC	2	1	151	<b>3</b>	2	0	0
Agrimek 0.15EC	2	1	40	<b>1</b>	2	0	0
Diazinon	2	1	4.5	<b>&lt;1</b>	0	1	1
Lannate L or 90SP	1	<1	128	<b>3</b>	1	0	0
Assail 70WP	1	<1	30	<b>&lt;1</b>	1	0	0
Guthion/Imidan	1	<1	8.5	<b>&lt;1</b>	1	0	0
Imidan	1	<1	6	<b>&lt;1</b>	1	0	0
Vydate 2L	1	<1	2	<b>&lt;1</b>	1	0	0
<b>Other Strategies</b>							
Spray along woodlines where wild host would be	1	<1	14	<b>&lt;1</b>	0	1	0

Aza-Direct 1.2EC, Digon EC, Dimate EC, M-Pede, Neemix, Phaser, Pyramite 60WS, Pyrenone, Safer's Insecticidal Soap, and Surround 95WP were not used by growers.

### Redbanded leafroller (N=161)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>2150</b>	<b>47</b>
<b>Growers</b>	<b>60</b>	<b>35</b>

<b>Pesticide</b>	<b>#Growers</b>	<b>%Growers</b>	<b>#Acres</b>	<b>%Acres</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
Imidan 70WP	41	24	1217	<b>27</b>	17	19	1
Guthion/AzinphosM 50WP	16	9	787	<b>17</b>	4	10	0
Sevin F, 4EC XLRPlus,80S	5	3	40	<b>1</b>	2	3	0
Danitol 2.4EC	2	1	280	<b>6</b>	2	0	0
Asana 0.66 EC	2	1	243	<b>5</b>	2	0	0
Ambush EC or 25WP	2	1	1.5		1	1	0
Bacillus thuringiensis (Aagree, Dipel, Javelin, MVP, Xentari)	1	<1	90	<b>2</b>	0	0	1
Surround 95WP	1	<1	90	<b>2</b>	0	0	1
Intrepid 2F	1	<1	50	<b>1</b>	1	0	0
Pounce EC or 25WP	1	<1	20		1	0	0
Thiodan 50WP	1	<1	0.6		0	1	0

Avaunt 30DG, Aza-Direct 1.2EC, Confirm 2F, Lannate L/90SP, M-Pede, Phaser, Safer's Insecticidal Soap, and Sniper were not used by growers.

### Green fruitworms (N=159)

**Acres Treated**                      **Number**      **Percent**  
    **1749**            **39**  
**Growers**                                **60**                **35**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Imidan 70WP	40	27	1199	<b>26</b>	23	13	0
Guthion/Azinphos M 50WP	12	7	290	<b>6</b>	7	5	0
Danitol 2.4EC	6	4	325	<b>7</b>	5	1	0
Pounce EC or 25WP	5	3	56	<b>1</b>	1	4	0
Thiodan 50WP	3	2	10	<b>&lt;1</b>	0	3	0
Asana 0.66 EC	2	1	106	<b>2</b>	0	2	0
Ambush EC or 25WP	2	1	64	<b>1</b>	2	0	0
Bacillus thuringiensis (Agree, Dipel, Javelin, MVP, Xentari)	1	<1	96	<b>2</b>	0	1	0
Actara	1	<1	96	<b>2</b>	0	1	0
Confirm 2F	1	<1	25	<b>1</b>	1	0	0
Spintor	1	<1	12	<b>&lt;1</b>	0	1	0
Sevin	1	<1	6	<b>&lt;1</b>	1	0	0

Lannate L/90SP and Phaser were not used by growers.

### Rosy apple aphid (N=163)

**Acres Treated**                      **Number**      **Percent**  
    **1351**            **30**  
**Growers**                                **59**                **35**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Imidan 70WP	24	14	383	<b>8</b>	5	14	3
Thiodan 50WP	15	9	139	<b>3</b>	7	8	0
Oil <sup>1</sup>	14	8	377	<b>8</b>	5	8	0
Danitol 2.4EC	12	7	474	<b>10</b>	6	5	1
Asana 0.66 EC	9	5	341	<b>8</b>	6	3	0
Sevin F, 4EC XLRPlus,80S	9	5	125	<b>3</b>	4	1	3
Lorsban 4EC with oil	8	5	208	<b>5</b>	5	3	0
Provado 1.6F	6	4	72	<b>2</b>	2	3	1
Pounce EC or 25WP	5	3	69	<b>2</b>	2	2	1
Assail 70WP	2	1	27	<b>&lt;1</b>	1	1	0
Lorsban 50WS	2	1	15	<b>&lt;1</b>	1	1	0
Diazinon	2	1	4.5	<b>&lt;1</b>	0	1	1

Actara	1	<1	96	<b>2</b>	1	0	0
Lannate L or 90SP	1	<1	40	<b>1</b>	1	0	0
Vydate 2L	1	<1	2	<b>&lt;1</b>	1	0	0
Ambush EC or 25WP	1	<1	0.5	<b>&lt;1</b>	0	1	0
<b>Other Strategies</b>							
Weed Control	1	<1	13.5	<b>&lt;1</b>	0	1	0

Aza-Direct 1.2EC, Digon EC, Dimate EC, Distance L, Di-syston G, Esteem 0.86EC/35WP, M-Pede, Phaser, Safer's Insecticidal Soap, Supracide 25WP, and Valero L were not used by growers.

### Borers, Dogwood borer and Roundheaded apple tree borer (N=161)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>686</b>	<b>15</b>
<b>Growers</b>	<b>56</b>	<b>33</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Lorsban 4EC with oil	28	16	501	<b>11</b>	17	11	0
Lorsban 50WS	18	11	102	<b>2</b>	11	7	0
Thiodan 50WP	9	5	334	<b>7</b>	6	1	2
Imidan	6	4	27	<b>&lt;1</b>	3	3	0
<b>Other Strategies</b>							
Remove mouse guards	2	1	32	<b>&lt;1</b>	1	0	0
Keep grass away	2	1	24	<b>&lt;1</b>	1	1	0
Wire Probe in tunnel	2	1	9.4	<b>&lt;1</b>	0	1	0
Clean trunks	1	<1	10	<b>&lt;1</b>	0	0	1
Weed Control	1	<1	5	<b>&lt;1</b>	0	1	0

Asana, Entrust, Dipel, Surround, Lorsban 4e (no oil), Pounce were all used by at least one grower but on less than 1% of the apple acreage.

### Obliquebanded Leafroller (N=159)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>2309</b>	<b>51</b>
<b>Growers</b>	<b>55</b>	<b>32</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Imidan 70WP	29	17	1305	<b>29</b>	11	13	2
Guthion/Azinphos M 50WP	16	9	759	<b>17</b>	6	9	0
Asana 0.66 EC	6	4	634	<b>14</b>	5	1	0

Danitol 2.4EC	6	4	522	<b>12</b>	5	1	0
Bacillus thuringiensis (Agree, Dipel, Javelin, MVP, Xentari)	4	2	271	<b>6</b>	2	1	1
Spintor 2SC	4	2	93	<b>2</b>	4	0	0
Pounce EC or 25WP	3	2	81	<b>2</b>	2	1	0
Sevin F, 4EC XLRPlus,80S	2	1	28	<b>&lt;1</b>	1	1	0
Intrepid 2F	1	<1	15	<b>&lt;1</b>	1	0	0

Ambush EC/25WP, Aza-Direct 1.2EC, Confirm 2F, Diazinon, Digon EC, Dimate EC, Esteem 0.86EC/35WP, Lannate L/90SP, M-Pede, Phaser, Safer's Insecticidal Soap, Sniper, Surround 95WP, and Thiodan 50WP were not used by growers.

### Potato leafhopper (N=157)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>894</b>	<b>20</b>
<b>Growers</b>	<b>49</b>	<b>29</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Sevin F, 4EC XLRPlus,80S	15	9	292	<b>6</b>	8	4	1
Provado 1.6F	13	8	289	<b>6</b>	9	4	0
Danitol 2.4EC	5	3	194	<b>4</b>	4	1	0
Imidan	4	2	42	<b>1</b>	2	2	0
Avaunt 30DG	2	1	80	<b>2</b>	2	0	0
Thiodan 50WP	1	9	241	<b>5</b>	10	6	0
Assail 70WP	1	<1	30	<b>&lt;1</b>	0	1	0
Agrimek 0.15EC	1	<1	20	<b>&lt;1</b>	0	1	0
Surround 95WP	1	<1	5	<b>&lt;1</b>	0	1	0
Diazinon	1	1	4	<b>&lt;1</b>	0	0	1

Asana 0.66EC, Aza-Direct 1.2EC, Digon EC, Dimate EC, Lannate L/90SP, Neemix, Phaser, Pyramite 60WS, Pyrenone, and Vydate L were not used by growers.

## Woolly apple aphid (N=158)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>481</b>	<b>11</b>
<b>Growers</b>	<b>26</b>	<b>15</b>

<b>Pesticide</b>	<b>#Growers</b>	<b>%Growers</b>	<b>#Acres</b>	<b>%Acres</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
Thiodan 50WP	17	10	248	<b>6</b>	6	8	2
Provado 1.6F	3	2	51	<b>1</b>	1	2	0
Imidan	2	1	30	<b>&lt;1</b>	1	1	0
Lorsban	1	<1	60	<b>1</b>	1	0	0
Lannate	1	<1	48	<b>1</b>	1	0	0
Aza-Direct 1.2EC	1	<1	30	<b>&lt;1</b>	0	1	0
Assail 70WP	1	<1	15	<b>0</b>	1	0	0
Sevin	1	<1	6	<b>&lt;1</b>	0	1	0
Vydate 2L	1	<1	5	<b>&lt;1</b>	0	1	0
<b>Other Strategies</b>							
Removal of host shoots	1	<1	43	<b>1</b>	0	0	0
Increase predators	1	<1	15	<b>&lt;1</b>	0	0	0

Digon EC, Dimate EC, Distance L, Di-syston G, M-Pede, Phaser, Safer's Insecticidal Soap, and Valero L were not used by growers.

## Mullein Plant Bug (N=154)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>724</b>	<b>16</b>
<b>Growers</b>	<b>18</b>	<b>11</b>

<b>Pesticide</b>	<b>#Growers</b>	<b>%Growers</b>	<b>#Acres</b>	<b>%Acres</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
Asana 0.66 EC	9	5	501	<b>11</b>	7	2	0
Imidan	4	2	83	<b>2</b>	2	1	1
Provado 1.6F	2	1	25	<b>&lt;1</b>	2	0	0
Actara Pink	1	<1	96	<b>2</b>	0	1	0
Lorsban 50WS	1	<1	15	<b>&lt;1</b>	0	1	0
Pounce	1	<1	13	<b>&lt;1</b>	0	1	0
Sevin	1	<1	6	<b>&lt;1</b>	1	0	0
Diazinon	1	<1	4	<b>&lt;1</b>	0	0	1

Carzol 92SP, Digon EC, Dimate EC, and Lannate L/90SP were not used by growers.

### Climbing cutworm (N=156)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>78</b>	<b>2</b>
<b>Growers</b>	<b>3</b>	<b>2</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Lorsban 4EC with oil	1	<1	70	<b>2</b>	1	0	0
Sevin/Imidan	1	<1	6	<b>&lt;1</b>	0	0	0
Sevin	1	<1	3.7	<b>&lt;1</b>	1	0	0
<b>Other Strategies</b>							
Predators	1	<1	15	<b>&lt;1</b>	0	0	0

Lorsban 50WS and Supracide 25WP were not used by growers.

### Disease Section

**Question C4.** Which of these diseases require routine annual management, require occasional management, or are never a problem on your apple orchard? (Please circle your answers) (N=168)

Rank	Disease	Weighed Number
<b>1</b>	Apple scab	<b>652</b>
<b>2</b>	Fly speck	<b>550</b>
<b>3</b>	Sooty blotch	<b>528</b>
<b>4</b>	Powdery mildew	<b>380</b>
<b>5</b>	Black rot	<b>326</b>
<b>6</b>	Cedar apple rust	<b>296</b>
<b>7</b>	Bitter rot	<b>284</b>
<b>8</b>	Calyx end rot, Dry-eye	<b>242</b>
<b>9</b>	Fire blight	<b>218</b>
<b>10</b>	Post-harvest rots	<b>166</b>
<b>11</b>	Moldy core	<b>150</b>
<b>12</b>	Phytophthora rot	<b>124</b>
<b>13</b>	Quince rust	<b>96</b>

**Question E1.** Which of the following practices do you use to manage diseases? (Circle all that apply.) N=162

#Growers	%Growers	Practices used to manage diseases
143	84	Annual pruning to open tree canopies and promote air circulation
136	80	Mowing of grass middles and within-row weed management
126	74	Spring/Summer monitoring of scab maturity and infection periods
112	66	Pruning out cankered limbs and branches during the dormant season
99	58	Proper fruit thinning
58	34	Pruning out blighted shoots as soon as they appear in the early summer
57	34	Flailing or elimination of leaves
51	30	Pruning systems and nitrogen fertilization practices that avoid excessive and prolonged shoot growth
46	27	Remove wild/alternate hosts and abandoned orchards
38	22	Autumn assessment of potential inoculums levels
33	19	Use scab resistant cultivars
26	15	Application of urea
21	12	The removal of hedgerows or surrounding woodlots
21	12	Avoid highly susceptible cultivars and rootstocks

### Apple Scab (N=165)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>4430</b>	<b>98</b>
<b>Growers</b>	<b>161</b>	<b>95</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Captan or Captec	142	84	4085	90	84	48	7
Topsin-M 70W	63	37	2782	61	38	19	4
Rubigan EC	53	31	1314	29	24	27	1
Flint 50WDG	49	29	1954	43	31	15	2
Polyram 80DF	45	26	1700	38	27	15	2
Syllit 65WP	40	24	1427	31	24	15	0

Nova 40W	40	24	1341	<b>30</b>	26	13	1
Penncozeb 75DF	39	23	1535	<b>34</b>	28	8	1
Sovran 50WG	32	19	976	<b>22</b>	20	8	1
Dithane F-45 or M-45	22	13	1200	<b>26</b>	13	6	2
Manzate 75DF	21	12	333	<b>7</b>	13	8	0
COCS	19	11	680	<b>15</b>	6	13	0
Dithane Rainshield DF	17	10	700	<b>15</b>	13	4	0
Basic Copper 53	8	5	510	<b>11</b>	2	4	2
Kocide	7	4	318	<b>7</b>	3	4	0
Sulfur	7	4	261	<b>6</b>	3	3	1
Champ or Champion	7	4	51	<b>1</b>	0	6	0
Ziram 76DF	6	4	65	<b>1</b>	2	3	1
Maneb 75DF or 80WP	5	3	180	<b>4</b>	3	2	0
Blue Shield	4	2	171	<b>4</b>	0	4	0
Ferbam Granuflo 76WP	3	2	124	<b>3</b>	1	2	0
Thiram 75WDG	4	2	79	<b>2</b>	2	2	0
Vangard WG	4	2	38	<b>1</b>	1	3	0
Manex	2	1	120	<b>3</b>	2	0	0
Procure 50WS	2	1	13	<b>&lt;1</b>	1	1	0
Armicarb	1	<1	3	<b>&lt;1</b>	0	1	0
Basicop	0						
<b>Other Strategies</b>							
Leaf mulching	14	8	197	<b>4</b>	1	2	2
elimination of wild trees	11	6	259	<b>6</b>	2	7	2
Ground Urea Spray	6	4	106	<b>2</b>	0	4	2
lime sulfur	2	1	85	<b>2</b>	0	2	0
raking orchard floor	1	<1	4	<b>&lt;1</b>	0	1	0
orchard mowing	1	<1	3	<b>&lt;1</b>	0	1	0

### Fly Speck and Sooty Blotch (N=164)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>4196</b>	<b>92</b>
<b>Growers</b>	<b>146</b>	<b>86</b>

<b>Pesticide</b>	<b>#Growers</b>	<b>%Growers</b>	<b>#Acres</b>	<b>%Acres</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
Captan or Captec	119	70	3266	<b>72</b>	44	62	10
Topsin-M 70W	68	40	2918	<b>64</b>	32	29	5
Flint 50WDG	27	16	1025	<b>23</b>	13	13	1
Sovran 50WG	13	8	422	<b>9</b>	6	6	1
Ziram 76DF	9	5	188	<b>4</b>	4	4	1
Penncozeb 75DF	9	5	152	<b>3</b>	3	3	3

Dithane Rainshield DF	6	4	108	2	2	4	0
Polyram 80DF	6	4	104	2	1	4	0
Thiram 75WDG	5	3	97	2	0	4	1
Dithane F-45 or M-45	4	2	18	<1	1	3	0
Manex	1	<1	20	<1	1	0	0
Benlate	1	<1	12	<1	0	1	0
Sovran	1	<1	3	<1	0	0	0
Sulfur	1	<1	2	<1	0	0	1
Ferbam Granuflo 76WP	0						
Maneb 75DF or 80WP	0						
<b>Other Strategies</b>							
Summer pruning	19	11	1058	23	4	13	1
Eliminate alternate host	4	2	155	3	0	3	1
Mowing	2	1	85	2	0	1	0
Thorough pruning	1	<1	125	3	0	0	0
Calcium chloride	1	<1	12	<1	0	0	0
JMS Stylet Oil	1	<1	8	<1	0	1	0

### Black Rot (N=156)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>1482</b>	<b>33</b>
<b>Growers</b>	<b>41</b>	<b>42</b>

<b>Pesticide</b>	<b>#Growers</b>	<b>%Growers</b>	<b>#Acres</b>	<b>%Acres</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
Captan or Captec	59	35	1070	24	15	37	4
Topsin-M 70W	17	10	427	9	6	10	0
Sovran 50WG	7	4	72	2	3	2	0
Syllit 65WP	6	4	78	2	1	4	1
Penncozeb 75DF	6	4	72	2	3	3	0
Dithane F-45 or M-45	6	4	69	1	1	5	0
Flint 50WDG	6	4	35	<1	1	3	0
Polyram 80DF	5	3	51	1	0	3	1
Dithane Rainshield DF	4	2	120	3	4	0	0
Ferbam Granuflo 76WP	2	1	25	<1	0	1	1
Manzate 75DF	2	1	7	<1	1	1	0
Maneb 75DF or 80WP	1	<1	24	<1	1	0	0
Manex	1	<1	20	<1	1	0	0
Ziram 76DF	0						

### Powdery Mildew (N=159)

**Acres Treated**                      **Number**      **Percent**  
    **1868**            **41**  
**Growers**                                **68**                **40**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Flint 50WDG	24	14	1028	<b>23</b>	14	9	0
Topsin-M 70W	22	13	437	<b>10</b>	11	8	1
Nova 40W	19	11	634	<b>14</b>	13	5	0
Rubigan EC	18	11	369	<b>8</b>	13	5	0
Sovran 50WG	6	4	74	<b>1</b>	2	4	0
Bayleton 50DF	3	2	18	< <b>1</b>	3	0	0
Captan	1	<1	6	< <b>1</b>	0	1	0
Penncozeb	1	<1	6	< <b>1</b>	0	1	0
Procure 50WS	1	<1	3	< <b>1</b>	1	0	0
Sulfur	0						
<b>Other Strategies</b>							
Pruning	1	<1	21	< <b>1</b>	0	1	0

### Cedar Apple Rust (N=158)

**Acres Treated**                      **Number**      **Percent**  
    **1141**            **25**  
**Growers**                                **62**                **36**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Captan or Captac	32	19	667	<b>15</b>	11	18	2
Rubigan EC	14	8	216	<b>5</b>	10	4	0
Flint 50WDG	9	5	123	<b>3</b>	5	4	0
Polyram 80DF	9	5	102	<b>2</b>	5	4	0
Syllit 65WP	8	5	138	<b>3</b>	2	5	0
Manzate 75DF	8	5	97	<b>2</b>	7	1	0
Sovran 50WG	8	5	82	<b>2</b>	6	1	0
Dithane Rainshield DF	7	4	187	<b>4</b>	3	3	0
Nova 40W	7	4	119	<b>3</b>	3	4	0
Penncozeb 75DF	4	2	118	<b>3</b>	4	0	0
Dithane F-45 or M-45	3	2	74	<b>2</b>	3	0	0
Ziram 76DF	2	1	45	<b>1</b>	1	1	0

Manex	2	1	5	<1	1	1	0
Ferbam Granuflo 76WP	1	<1	14	<1	0	1	0
Bayleton 50DF	1	<1	8	<1	1	0	0
Maneb 75DF or 80WP	1	<1	2	<1	0	1	0
Procure 50WS	0						
<b>Other Strategies</b>							
Eliminate wild alternate host tree	2	1	12	<1	0	1	0

### Bitter Rot (N=159)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>2012</b>	<b>44</b>
<b>Growers</b>	<b>55</b>	<b>32</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Captan or Captec	46	27	1583	35	19	25	1
Topsin-M 70W	19	11	755	17	10	9	0
Flint 50WDG	9	5	543	12	4	5	0
Polyram 80DF	7	4	197	4	0	6	1
Dithane Rainshield DF	5	3	282	6	3	2	0
Penncozeb 75DF	5	3	274	6	2	3	0
Manzate 75DF	5	3	33	<1	3	2	0
Sovran 50WG	3	2	40	1	2	0	0
Ziram 76DF	1	<1	45	1	0	1	0
Ferbam Granuflo 76WP	1	<1	14	<1	0	1	0
Dithane F-45 or M-45	1	<1	0.6	<1	0	1	0
Maneb 75DF or 80WP	0						
Manex	0						
<b>Other Strategies</b>							
Calcium spray	1	<1	11	<1	0	1	0

### Fire Blight (N=161)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>590</b>	<b>13</b>
<b>Growers</b>	<b>33</b>	<b>19</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
COCS	14	8	304	7	3	9	1

AgriMycin 17WP	10	6	115	3	4	6	0
Kocide	7	4	120	3	4	3	0
Basic Copper 53	3	2	132	3	0	3	0
Streptrol	3	2	38	1	1	2	0
Champ or Champion	2	1	52	1	0	2	0
Basicop	1	<1	50	1	1	0	0
Captan	1	<1	6	<1	0	1	0
Penncozeb	1	<1	6	<1	0	1	0
Bac-Master	0						
Blue Shield	0						
<b>Other Strategies</b>							
Pruning	3	2	18	<1	1	1	0

**Phytophthora crown, collar and root rot (N=155)**

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>122</b>	<b>3</b>
<b>Growers</b>	<b>16</b>	<b>9</b>

<b>Pesticide</b>	<b>#Growers</b>	<b>%Growers</b>	<b>#Acres</b>	<b>%Acres</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
Ridomil Gold EC	9	5	17	<1	2	7	0
COCS	3	2	69	1	1	2	0
Kocide	3	2	25	<1	0	2	1
Champ or Champion	2	1	23	<1	1	1	0
Basic Copper 53	1	<1	12	<1	0	0	0
Aliette 80WDG	1	<1	1	<1	0	1	0
Basicop	0						
Blue Shield	0						
Phostrol	0						

## Weed Management Section

**Question C5.** Which of these pests require routine annual management, require occasional management, or are never a problem on your apple orchard? (Please circle your answers) (N=157)

Rank	Weeds	Annual Mgmt	Weighed Number
1	Annual grasses	119	508
2	Perennial grasses	118	492
2	Annual broadleaf weeds	116	492
4	Perennial broadleaf weeds	113	486
5	Perennial woody weeds	85	400

**Question F1.** Which cultural weed management practices did you use? (Please circle the practices used and their effectiveness: excellent, good, poor.) (N=165)

Practices	#Growers	%Growers	Excellent	Good	Poor
Mowing	163	96	54	18	5
Summer pruning	16	9	4	11	1
Growth regulators to suppress shoot growth	9	5	2	6	1
<b>Other Practices</b>					
Herbicides	9	5	6	2	0
Hand pulling	1	<1	1	0	0
Raking	1	<1	0	1	0

### Pre-emergence Annual Grasses (N=158)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>1294</b>	<b>29</b>
<b>Growers</b>	<b>49</b>	<b>29</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Princep Caliber 90DF,4L	20	12	634	14	3	16	1
Simazine 90DF,4L	15	9	402	9	3	12	0
Surflan A S, L	8	5	333	7	1	7	0
Karmex	7	4	212	5	2	4	1
Sinbar W	6	4	303	7	3	2	1
Solicam DF	5	3	230	5	1	4	0

Prowl 3.3EC	3	2	125	<b>3</b>	0	2	1
Casoron G	3	2	21	<1	2	1	0
Direx	2	1	92	<b>2</b>	0	2	0
Roundup	2	1	33	<1	2	2	0
Devrinol 50W,50DF,10G	1	<1	38	<1	0	1	0
Weedar, 2,4-D	1	<1	11	<1	1	0	0
Kerb 50W	0						
Snapshot 2.5TG	0						
<b>Other Strategies</b>							
flailing mowing	1	<1	7	<1	0	1	0

### Pre-emergence Broadleaf Weeds (N=155)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>1197</b>	<b>26</b>
<b>Growers</b>	<b>45</b>	<b>27</b>

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Princep Caliber 90DF,4L	17	10	548	<b>12</b>	1	14	2
Simazine 90DF,4L	14	8	383	<b>8</b>	2	12	0
Sinbar W	7	4	299	<b>7</b>	4	2	1
Direx	5	3	192	<b>4</b>	0	4	1
Karmex	5	3	88	<b>2</b>	0	4	1
Casoron G	3	2	86	<b>2</b>	1	2	0
Roundup	3	2	22	<1	3	0	0
Prowl	1	<1	70	<b>1</b>	0	0	1
Weedar	1	<1	11	<1	1	0	0
2,4-D	1	<1	1	<1	0	1	0
Gallery 75DF	0						
Goal	0						
Snapshot 2.5TG	0						
<b>Other Strategies</b>							
Mowing	1	<1	7	<1	0	1	0

### Post-emergence Grasses (N=162)

**Number**      **Percent**  
**Acres Treated**      **2576**      **57**  
**Growers**      **110**      **65**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Roundup Ultra Max	89	52	2226	<b>49</b>	58	31	0
Glyphomax 4SC	33	19	1262	<b>28</b>	18	12	3
Gramoxone Extra L	7	4	145	<b>3</b>	3	4	0
Sinbar W	5	3	254	<b>6</b>	4	1	0
Touchdown	4	2	104	<b>2</b>	2	2	0
Rely L	3	2	75	<b>2</b>	1	2	0
Poast L	3	2	36	<b>1</b>	0	2	1
Mirage	1	<1	40	<b>1</b>	1	0	0
Fusilade DX L	1	<1	23	<b>&lt;1</b>	0	1	0
2,4-D	1	<1	8	<b>&lt;1</b>	1	0	0
Select 2EC	1	<1	1	<b>&lt;1</b>	0	1	0
Casoron G	0						
Kerb 50W	0						
Rattler	0						
<b>Other Strategies</b>							
Mowing	2	1	10	<b>&lt;1</b>	1	1	0

### Post-emergence Broadleaf Weeds (N=160)

**Number**      **Percent**  
**Acres Treated**      **2554**      **56**  
**Growers**      **105**      **62**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Roundup Ultra Max	77	45	1823	<b>40</b>	43	31	1
Gramoxone Extra L	13	18	1318	<b>29</b>	18	13	0
Amine 4	12	7	514	<b>11</b>	5	7	0
Glyphomax 4SC	9	5	233	<b>5</b>	3	6	0
Rely L	4	2	201	<b>4</b>	2	2	0
Sinbar W	2	1	49	<b>1</b>	2	0	0
Touchdown	2	1	15	<b>&lt;1</b>	0	2	0
Saber	2	1	13	<b>&lt;1</b>	1	1	0
Mirage	1	<1	38	<b>&lt;1</b>	1	0	0
Casoron G	0						

Goal	0						
Rattler	0						
<b>Other Strategies</b>							
Mowing	2	1	10	<1	1	1	0

### Post-emergence Woody Weeds (N=157)

**Number**      **Percent**  
**Acres Treated**      **1692**      **37**  
**Growers**      **86**      **51**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Roundup Ultra Max	69	41	1468	32	30	32	6
Glyphomax 4SC	8	4	129	3	2	5	2
Rely L	2	1	168	4	0	1	1
Amine	2	1	168	4	0	1	0
2,4-D	2	1	42	1	0	2	0
Touchdown	2	1	6	<1	1	1	0
Mirage	1	1	38	1	1	0	0
Crossbow	1	<1	19	<1	1	0	0
Rattler	0						
<b>Other Strategies</b>							
Mowing	1	<1	7	<1	0	1	0
Pruning	1	<1	3	<1	1	0	0
Dig up, cut up, pull out	1	<1	6	<1	0	0	1

### Vertebrate Pest Management Section

**Question C5.** Which of these pests require routine annual management, require occasional management, or are never a problem on your apple orchard? (Please circle your answers) (N-165)

Rank	Vertebrate	Annual Mgmt	Weighed Number
1	Voles	99	492
2	Deer	95	486
3	Rabbits	17	168
4	Turkeys	6	34
5	Humans	6	24
6	Woodchuck	1	18

7	Crows	3	14
7	Porcupine	2	14
9	Field mice	2	8
9	Birds	0	8
11	Moose	1	6
12	Raccoons, Red squirrels, Bear	0	2

**Question G1.** Which strategies do you use to manage deer? (Please circle the strategies that you use and their effectiveness: excellent, good, poor.) (N=162)

**Acres Treated**                      **Number**      **Percent**  
    **2205**            **48**  
**Growers**                                **117**             **68**

Pesticide	#Growers	%Growers	#Acres	%Acres	Excellent	Good	Poor
Well maintained 8 foot metal wire fence	28	16	845	19	18	9	0
3+ wire electric fence	20	12	195	4	6	10	4
Orchard resident dogs	11	7	139	3	4	4	3
Hinder	9	5	58	1	1	6	1
Other wire fence	8	5	116	3	3	4	1
Single wire electric fence	5	3	77	2	0	2	3
Deer Away	5	3	37	1	0	2	3
<b>Other Strategies</b>							
Hunters/Shooting	33	9	929	20	12	9	7
Soap	23	14	376	8	0	13	7
Dryer sheets/Bounce	2	1	24	<1	0	1	0
Fence around young trees	2	1	22	<1	1	0	0
Hair	2	1	1	<1	0	1	1
Thiram	1	<1	25	<1	0	0	0
Nylon Fence	1	<1	5	<1	1	0	0
Rocks	1	<1	4	<1	0	1	0
Wrap small trees with row cover	1	<1	4	<1	0	0	0
Mothballs	1	<1	3	<1	0	1	0
Encourage coyotes	1	<1	2.4	<1	0	0	0

**Question G2.** Which strategies do you use to manage voles? (Please circle the strategies that you use and their effectiveness: excellent, good, poor.) (N=168)

	<b>Number</b>	<b>Percent</b>
<b>Acres Treated</b>	<b>3970</b>	<b>87</b>
<b>Growers</b>	<b>152</b>	<b>89</b>

<b>Practices</b>	<b>#Growers</b>	<b>%Growers</b>	<b>#Acres</b>	<b>%Acres</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
Frequent mowing	115	68	3362	<b>74</b>	30	69	9
Herbicide tree row strips	72	42	2436	<b>54</b>	24	43	4
Physical barriers	71	42	2182	<b>48</b>	24	41	3
Broadcast zinc phosphide oat or pellet bait	67	39	2938	<b>65</b>	24	40	3
Removing drops from orchard floor	49	29	1617	<b>36</b>	10	34	4
Bait station zinc phosphide bait	29	17	628	<b>14</b>	8	18	3
Broadcast zinc phosphide corn bait	13	8	543	<b>12</b>	5	8	0
Bait station anticoagulant (Ramik) bait	9	5	210	<b>5</b>	3	6	0
Vole predator habitat enhancement	8	5	164	<b>4</b>	3	4	0
Broadcast anticoagulant (Ramik) bait	4	2	294	<b>6</b>	0	4	0
<b>Other Strategies</b>							
Cats	9	5	74	<b>1</b>	3	5	0
Coyotes	4	2	129	<b>3</b>	1	3	0
Encourage predators	2	1	25	<b>&lt;1</b>	0	0	0
Foxes	1	<1	24	<b>&lt;1</b>	0	1	0
Wire Guard	1	<1	15	<b>&lt;1</b>	0	0	1
Hawks	1	<1	7	<b>&lt;1</b>	0	1	0
Border collie	1	<1	2	<b>&lt;1</b>	0	1	0
Traps	1	<1	4	<b>&lt;1</b>	0	0	1

**Question G3.** Other Vertebrate Pests and Strategies (Please list vertebrate, list strategies used and circle their effectiveness) (N=17)

<b>Pest and Strategy</b>	<b>#Growers</b>	<b>Excellent</b>	<b>Good</b>	<b>Poor</b>
<b>Turkey</b>	<b>7</b>	0	0	0
Shoot	3	2	0	1
Noise makers	3	0	0	3
Shiny tape	1	0	0	1
Scarecrow	1	0	0	1
Chase out	1	0	0	1
<b>Porcupine-shoot</b>	<b>4</b>	1	2	1
<b>Woodchuck</b>	<b>4</b>	0	0	0
Shoot	2	1	0	1
Trap	1	1	0	0
Coyote, hawk, owl	1	1	0	0
<b>Crows</b>	<b>4</b>	0	0	0
Hunter/Shoot	3	1	0	2
Scarecrow	1	0	0	1
<b>Squirrels-trap</b>	<b>1</b>	1	0	0
<b>Rabbits-coyote,hawk,owl</b>	<b>1</b>	1	0	0
<b>Moose-electric fence</b>	<b>1</b>	0	0	1
<b>Raccoon-shoot</b>	<b>1</b>	0	0	1

### **Pest Management Decision Making Section**

**Question H1.** What kinds of pest monitoring do you use for pest management decisions? (Please circle the answer that fits best) (N=157)

<b>#Growers</b>	<b>%Growers</b>	<b>Pest Monitoring Practices</b>
<b>70</b>	<b>41</b>	Field visits made for purpose of pest observations, but not following a standard procedure and threshold
<b>66</b>	<b>39</b>	Sampling according to standard procedures or traps, and comparing observations to pest threshold
<b>39</b>	<b>23</b>	Use of pest forecast and tracking models and equipment to determine need or adjust timing for sampling or control measures
<b>30</b>	<b>18</b>	Informal observations influence decisions, but no special field visits for pest observations

**Question H2.** If sampling procedures or pest models are used in making pest management decisions, who collects that information? (Please circle all that apply) (N=136)

#Growers	%Growers	Who monitors for pests?
108	64	Grower
33	19	Private IPM scout/consultant
22	13	Farm employee
7	4	Other: University/Extension scout

**Question H3.** How important are these factors to you when choosing pesticides for use on your farm? (Please circle your answers) (N=164)

Factors for choosing Pesticides	Rank	Score	Important		
			Very	Somewhat	Not
Effectiveness against pest compared to alternative products	1	518	118	23	3
Applicator hazard (toxicity to humans)	2	514	109	39	6
Impact on beneficials (parasites, predators, pollinators)	3	510	107	41	3
Label restrictions (reentry and preharvest intervals, protective equipment)	4	488	100	44	5
Customer relations (food safety concerns)	5	464	96	40	10
Cost per treatment	6	444	82	58	6
Other potential nontarget and environmental impacts	7	392	69	58	9
Formulations (liquid vs dry, water soluble bags)	8	320	42	76	23
Size or type of packaging	9	262	29	73	37
Storage requirements	10	236	21	76	38

**Question H4.** How often (frequently, occasionally, never) do you use the following weather information in making your pest management decisions? (please circle your answers) (N=162)

<b>Weather Information</b>	<b>Rank</b>	<b>Score</b>	<b>Frequently</b>	<b>Occasionally</b>	<b>Never</b>
Forecasts for next rain	<b>1</b>	<b>634</b>	<b>157</b>	<b>3</b>	<b>0</b>
Wind speed forecast	<b>2</b>	<b>544</b>	<b>128</b>	<b>16</b>	<b>5</b>
Rainfall total (for effect on spray residues)	<b>3</b>	<b>524</b>	<b>117</b>	<b>28</b>	<b>4</b>
Humidity and/or leaf wetness hours	<b>4</b>	<b>450</b>	<b>96</b>	<b>33</b>	<b>13</b>
Temperatures (for degree day models)	<b>5</b>	<b>394</b>	<b>75</b>	<b>47</b>	<b>13</b>

**Question H5.** If weather information was readily available, would you use it for? (please circle your answers) (N=162)

<b>Weather Information</b>	<b>Yes</b>	<b>No</b>
Forecasts for next rain	<b>156</b>	<b>1</b>
Wind speed forecast	<b>134</b>	<b>8</b>
Rainfall total (for effect on spray residues)	<b>133</b>	<b>8</b>
Humidity and/or leaf wetness hours	<b>123</b>	<b>13</b>
Temperatures (for degree day models)	<b>120</b>	<b>17</b>

**Question H6.** How important are these sources of information in making your pest management decisions? (please circle your answers) (N=163)

<b>Information Sources</b>	<b>Rank</b>	<b>Score</b>	<b>Important</b>		
			<b>Very</b>	<b>Somewhat</b>	<b>Not</b>
New England Pest Management Guide	<b>1</b>	<b>550</b>	<b>127</b>	<b>21</b>	<b>5</b>
University/Extension staff	<b>2</b>	<b>500</b>	<b>109</b>	<b>32</b>	<b>7</b>
Newsletters	<b>3</b>	<b>506</b>	<b>107</b>	<b>39</b>	<b>6</b>
Off season educational meetings	<b>4</b>	<b>400</b>	<b>72</b>	<b>56</b>	<b>13</b>
Other growers	<b>5</b>	<b>352</b>	<b>55</b>	<b>66</b>	<b>17</b>
Twilight meetings	<b>6</b>	<b>350</b>	<b>61</b>	<b>53</b>	<b>28</b>

Suppliers/dealers	7	326	48	67	18
Web sites	8	318	54	51	25
Trade publications	9	288	32	80	22
Other: Crop consultants	10	16	4	0	0

**Question H7.** How would you describe your crop production practices? (please circle your answer) (N=160)

Crop Production	#Growers	%Growers
IPM	116	68
Conventional	54	32
Organic	6	4
Other	3	2

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### Appendix A: Pesticide Product Brand Names and Active Ingredients

<b>Brand Names</b>	<b>Active Ingredient</b>	<b>Brand Names</b>	<b>Active Ingredient</b>
Acramite 50WS	bifenazate	Manex	maneab
Agree	Bacillus thuringiensis	Manzate 75DF	mancozeb
Agrimek 0.15EC	abamectin	Methoxychlor	methoxychlor
AgriMycin 17WP	streptomycin	M-Pede	fatty acids (insecticidal soap)
Aliette 80WDG	fosetyl Al	MVP	Bacillus thuringiensis
Ambush EC or 25WP	permethrin	Neemix	azadirachtin
Amine 4	2,4-D	Nova 40W	myclobutanil
Apollo 42SC	clofentezine	Oil	Brand names: Damoil, Sunspray Ultra Fine, and Volck Sup
Asana 0.66ECEC	esfenvalerate	Penncozeb 75DF	mancozeb
Assail 70WP	acetamiprid	Phaser	endosulfan
Avaunt 30DG	indoxacarb	Phostrol	phosphorus acid
Aza-Direct 1.2EC	azadirachtin	Poast L	sethoxydim
Azinphos-M 50WP	azinphos methyl	Polyram 80DF	metiram
Bac-Master	streptomycin sulfate	Pounce EC or 25WP	permethrin
Basicop	basic copper sulfate	Princep Caliber 90DF,4L	simazine
Basic Copper 53	basic copper sulfate	Procure 50WS	triflumizole
Bayleton 50DF	triadimefon	Provado 1.6F	imidacloprid
Blue Shield	basic copper sulfate	Prowl 3.3 EC	pendimethalin
Captan or Captec	captan	Pyramite 60WS	pyridaben
Carzol 92SP	formetanate hydrochloride	Pyrenone	pyrethrin
Casoron G	dichlobenil	Rattler	glyphosate
Champ or Champion	copper hydroxide	Rely L	glufosinate-ammonium
COCS	copper oxychloride sulfate	Ridomil Gold EC	metalaxyl
Confirm 2F	tebufenozide	Rotenone	rotenone
2,4-D	2,4-dichlorophenoxy acetic acid	Roundup Ultra Max	glyphosate
Danitol 2.4EC	fenpropathrin	Rubigan EC	fenarimol
Diazinon	diazinon	Saber	2,4-D
Digon EC	dimethoate	Safer's Insecticidal Soap	fatty acids
Dimate EC	dimethoate	Savey 50WP	hexythiazox
Dipel	Bacillus thuringiensis	Select 2EC	clethodim
Direx	diuron	Sevin F, 4EC, XLR Plus, 80S	carbaryl

Distance L	pyriproxy fen	Simazine 90DF,4L	simazine
Di-syston G	disulfoton	Sinbar W	terbacil
Dithane F-45 or M-45	mancozeb	Snapshot 2.5TG	trifluralin and isoxaben
Dithane Rainshield DF	mancozeb	Sniper	azinphos methyl
Esteem 0.86EC/35WP	pyriproxy fen	Solicam DF	norflurazon
Ferbam Granuflo 76WP	ferbam	Sovran 50WG	kresoxim-methyl
Flint 50WDG	trifloxystrobin	Spintor 2SC	spinosad
Fusilade DX L	fluazifop-butyl	Streptrol	streptomycin sulfate
Gallery 75DF	isoxaben	Sulfur	sulfur
Glyphomax 4SC	glyphosate	Supracide 25WP	methidathion
Goal 2 XL	oxyfluorfen	Surflan A,S, L	oryzalin
Gramoxone Extra L	paraquat	Surround 95WP	kaolin clay
Guthion 50WP	azinphos methyl	Syllit 65WP	dodine
Imidan 70WP	phosmet	Thiodan 50WP	endosulfan
Intrepid 2F	methoxyfenoxide	Thiram 75WDG	thiram
Javelin	Bacillus thuringiensis	Touchdown	glyphosate
Karmex DF	diuron	Topsin-M 70W	thiophanate methyl
Kelthane 50WP	dicofol	Valero	cinnamaldehyde
Kerb 50W	pronamide	Vanguard WG	cyprodinil
Kocide	copper hydroxide	Vendex 50WP	fenbutatin-oxide
Lannate L or 90SP	methomyl	Vydate 2L	oxamyl
Lorsban 50WS	chlorpyrifos	Weedar	2,4-D
Lorsban 4EC with oil	chlorpyrifos and oil	Xentari	Bacillus thuringiensis
Maneb 75DF or 80WP	maneb	Ziram 76DF	ziram