



Department of
**Agriculture,
Food and the Marine**
An Roinn
**Talmhaíochta,
Bia agus Mara**

Pesticide Usage in Ireland

Top Fruit Crops Survey Report 2014

Pesticide Usage in Ireland

TOP FRUIT CROPS SURVEY REPORT 2014

Pesticide Control Division
DAFM
Backweston Campus
Celbridge
Co. Kildare

Tel: 01 6157578

Fax: 01 6157574

Email: pcs@agriculture.gov.ie

Contents

List of tables	3
Summary	4
Definitions and notes	5
Background	6
Methods	8
Results	
Crops	9
Pesticide usage	10
Pesticide usage survey results 2014	12
Bramley fruiting apples	12
Cider apples	14
Desert apples	16
Other top fruit crops	18
Tables	20
Acknowledgements	31

List of tables

Table		Page
1	Estimated area (hectares) of top fruit crops grown nationally in Ireland, 2014.	20
2	Estimated area (spray-hectares) of top fruit crops treated nationally with each pesticide type in Ireland, 2014.	20
3	Estimated weight (kg) applied to top fruit crops treated nationally with each pesticide type in Ireland, 2014.	20
4	The total area (spray hectares) and the basic area (hectares), of top fruit crops in Ireland 2014 treated with each pesticide type.	21
5	The total quantities (kilograms) of each pesticide type used on top fruit crops in Ireland, 2014.	22
6	Estimated area (spray-hectares) of top fruit crops treated with pesticide formulations in Ireland, 2014.	22
7	Estimated quantities (kilograms) of pesticide formulations used on top fruit crops in Ireland, 2014.	24
8	The twenty active ingredients most extensively used on top fruit crops in Ireland in 2014, ranked by area treated (spray-hectares).	26
9	The twenty active ingredients most extensively used on top fruit crops in Ireland in 2014, ranked by weight (kilograms).	27
10	Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for bramley fruiting apples, 2014.	28
11	Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for desert apples, 2014.	29
12	Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for cider apples, 2014.	30
13	Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for other top fruit crops, 2014.	31

Summary

This is the first survey of pesticide* usage on top fruit crops in Ireland carried out by DAFM. Information on all aspects of pesticide usage was collected from 23 holdings across Ireland representing 80% of the total area of top fruit crops grown. Quantitative data have been adjusted to provide estimates of total pesticide usage.

In 2014 an estimated 617 hectares of top fruit crops were grown in Ireland with an estimated 8443 kgs of active substance applied.

A total of 32 active substances were recorded in use on top fruit crops in the survey.

Fungicides were applied to 81% of the pesticide-treated area, representing 89% of the total weight of pesticides used. Herbicides were applied to 5% of the pesticide-treated area, accounting for 7% of the total weight of pesticides used. Insecticides were applied to 7% of the pesticide treated area, representing 3% of the weight of pesticides applied. Growth regulator usage accounted for 7% of the pesticide-treated area and less than 1% of the weight of active substance applied.

Bramley fruiting apples comprised 47% of the area of top fruit crops in Ireland 2014, accounting for 51% of the total pesticide treated area and 44% of the total weight of pesticides used on all top fruit crops. Bramley fruiting apples accounted for 50% of the area of top fruit crops treated with fungicide and received 41% of the total weight of fungicides applied.

Cider apples comprised 39% of the area of top fruit crops in Ireland 2014, accounting for 31% of the total pesticide treated area and 41% of the total weight of pesticides used on top fruit crops. Cider apples accounted for 33% of the area of crops treated with fungicide and received 43% of the weight of total fungicides applied.

Desert apples comprised 13% of the area of top fruit crops in Ireland 2014, accounting for 17% of the total pesticide treated area and 15% of the total weight of pesticides used on all top fruit crops.

**Pesticide is an over-arching term that includes both plant protection products (including, for the purpose of this report, fungicides, herbicides, insecticides and growth regulators) and biocides.*

Other top fruit crops collectively refers to Plums, Cherries and Pears and compromised 1% of the area of top fruit crops grown in Ireland in 2014, accounting for less than 1% of the total pesticide-treated area and less than 1% of the total weight of pesticides used on all top fruit crops.

Definitions & notes

- ‘Basic area’; refers to the actual planted area of crop treated with a given pesticide.
- ‘Treated area’; refers to the total area treated with a pesticide, which includes all repeated applications to the basic area. This is measured in ‘spray-hectares’ (basic area x number of spray applications = spray hectares (spha)).
- ‘Rounding’; due to rounding of figures there may be slight differences in totals both within and between tables and diagrams.
- ‘Other top fruit crops’; collectively refers to blackberries, blueberries, gooseberries, loganberries, red currants and tayberries.
- ‘Spray applications’; refers to the number of treatments of any pesticide type to the treated areas.
- ‘PPP’; refers to plant protection product.
- ‘Herbicides’; are defined as PPPs used to control and / or prevent unwanted vegetation
- ‘Fungicides’; are defined as PPPs used to control and / or prevent harmful fungal disease

- ‘Insecticides’; are defined as PPPs used to control and / or prevent harmful insects
- ‘Growth regulators’; are defined as PPPs used and / or control physiological process within a plant
- ‘Biocides’; are defined as chemicals that are used to control and / or prevent various types of harmful or unwanted organisms, including disinfectants, preservatives, insect repellents, rodenticides and insecticides

Background

The regulatory system for PPPs in Ireland is based directly on EU legislation which provides a very high level of protection for man, animals and the environment. The hazard of an active substance is an inherent property which can cause a harmful effect and cannot be altered or mitigated.

Legislation has been put in place at both EU and national level to minimise the risks associated with the use of PPPs while ensuring necessary crop protection. Previously legislation has concentrated mainly on the authorisation of PPPs for specific uses and the laboratory testing of food samples for PPP residues. New legislation (Sustainable Use of Pesticides Directive) based on the EU ‘Thematic strategy on the sustainable use of pesticides’ aims to achieve a balance between ensuring human and environmental safety while maintaining continued viability of the farming and amenity sectors. This will involve training and registration of advisers, distributors, operators and inspectors of pesticide application equipment, controls on storage, supply and use, adoption of the principles of IPM and improved statistics on PPP use. To address the requirement for improved statistics, Regulation (EC) No 1185/2009 was adopted on 25 November 2009 which requires each member state to collect

statistics on PPP use. It is the area identified above as “improved statistics on PPP use” that this survey and future surveys will be addressing.

While sales data can provide information on the overall amount of PPPs used in the country, surveys at farm/grower/producer level are required to quantify the amounts used on different crops and to identify where and how they are being used. This type of information is required to clearly identify the risks involved and to develop and defend a strategy for the sustainable use of PPPs. Some of the specific outputs of a usage survey are as follows:

1. Provision of reliable factual data to inform policy makers.
2. Provision of information for the on-going review process of existing PPPs by providing data regarding national and regional usage of PPPs and use patterns for particular crops.
3. Monitoring farm practices to highlight areas where PPP use might be reduced by supplementation with or replacement by alternative pest control strategies e.g. use of resistant varieties, cultivation practices etc.
4. Provision of data to assess likely operator exposure to PPPs and to predict environmental impact of PPP use.
5. Monitoring changes in patterns of PPP use over time in response to government policy or economic factors.
6. Provision of information for residue monitoring programmes to assist with identifying particular areas of risk and to validate findings.

Methods

The sample of holdings to be surveyed was selected across the 26 counties, on the basis of the total area of top fruit crops grown, using data from the Department of Agriculture, Food and the Marine. For the purpose of the survey the country was divided into three geographical regions namely the East, South and the North/West as per Table A. The sample was stratified into four size groups, according to the total area of top fruit crops grown in each region. Holdings were selected at random within each of the size groups and the number of holdings selected was proportional to the total area of crops grown.

Table A: Regions selected for survey and respective counties.

Regions	East	South	North/West
Counties	Louth	Wexford	Donegal
	Meath	Kilkenny	Leitrim
	Dublin	Waterford	Monaghan
	Kildare	Tipperary	Cavan
	Offaly	Limerick	Westmeath
	Laois	Cork	Longford
	Carlow	Kerry	Sligo
	Wicklow		Roscommon
			Mayo
			Galway
			Clare

The purpose of the survey was explained to the occupiers of selected holdings in preliminary correspondence. A total of 23 holdings were contacted during the period April to June 2015 and data collected by personal interview for top fruit crops grown in 2014. The data collected included; the area of crops grown, area treated, target crop, pesticide used and number of treatments applied. Holdings selected in the original sample which were unable to provide data were replaced with ones from the same county and size group held on a reserve list. The total number of farms sampled in each size group is shown in Table B. The collected data were entered using Oracle, a relational database programme. Validated data were downloaded for analysis using SPSS software.

Table B: The total number of farms sampled from each size group.

Region	<6ha Holdings sampled	6<9 ha Holdings sampled	9<14ha Holdings sampled	>14 ha Holdings sampled	Total Holdings sampled
Ireland	3	2	6	12	23

Crops

Information was collected for bramley fruiting apples, desert apples, cider apples and other top fruit crops.

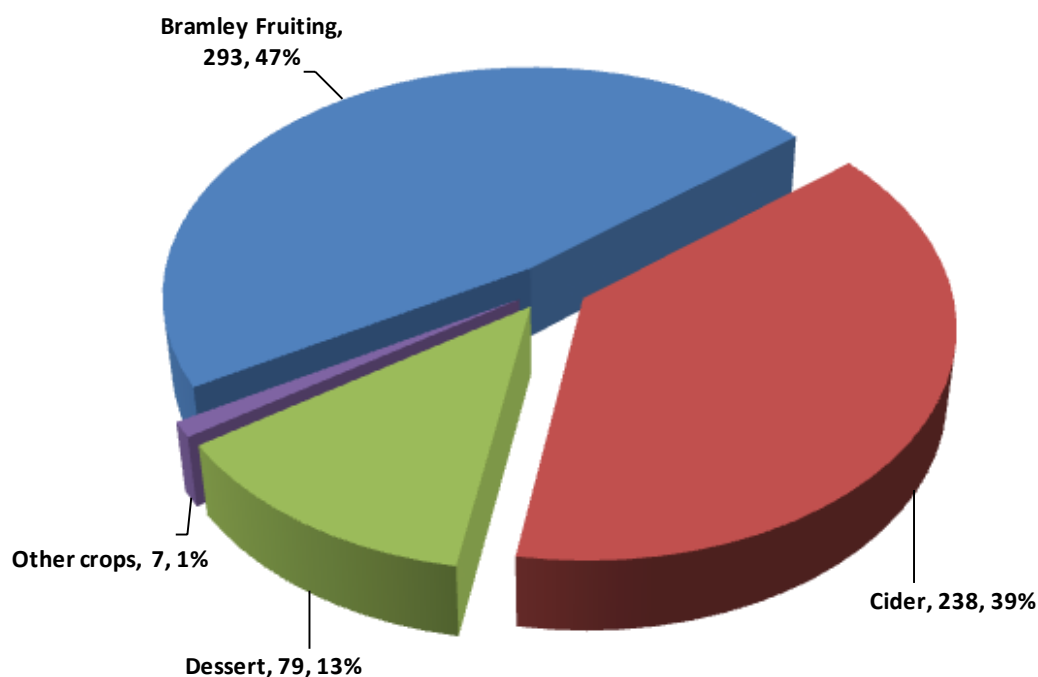
The number and areas of crops surveyed are shown in Table C. Data from 23 growers provided information on 89 examples of 4 crop types. The total area of crops sampled in the survey (492 ha) was representative of the area of top fruit crops grown in Ireland in 2014 (617 ha).

Table C: The total number and area (hectares) of crops sampled, estimated total area and the proportion (%) of the total area of top fruit crops surveyed in Ireland, 2014.

Crop	Number of crops surveyed	Survey area (ha)	Estimated area (ha)	Proportion of crops surveyed (%)
Bramley Fruiting	33	261	293	89%
Cider	17	160	238	67%
Dessert	29	65	79	83%
Other crop	10	5	7	82%
Total	89	492	617	80%

Bramley fruiting apples covered an estimated 47% of the total area of top fruit crops in 2014. Cider and desert apples accounted for 39% and 13% of the area of top fruit crops in 2014 respectively. Other crops accounted for 1% of the total area of top fruit crops in 2014.

Figure 1: Areas of individual top fruit crops grown in Ireland (ha), 2014.



Pesticide usage

Fungicides were applied to 81% of the pesticide-treated area accounting for 89% of the total weight of pesticides used. Herbicides were applied to 5% of the pesticide-treated area and accounted for 7% of the total weight of pesticides used. Insecticides were applied to 7% of the pesticide treated area of top fruit crops, accounting for 3% of the weight of pesticides applied. The use of growth regulators accounted for 7% of the pesticide-treated area and less than 1% of the weight of active substance applied.

Figure 2: Pesticide usage (spha) on top fruit crops treated in Ireland, 2014.

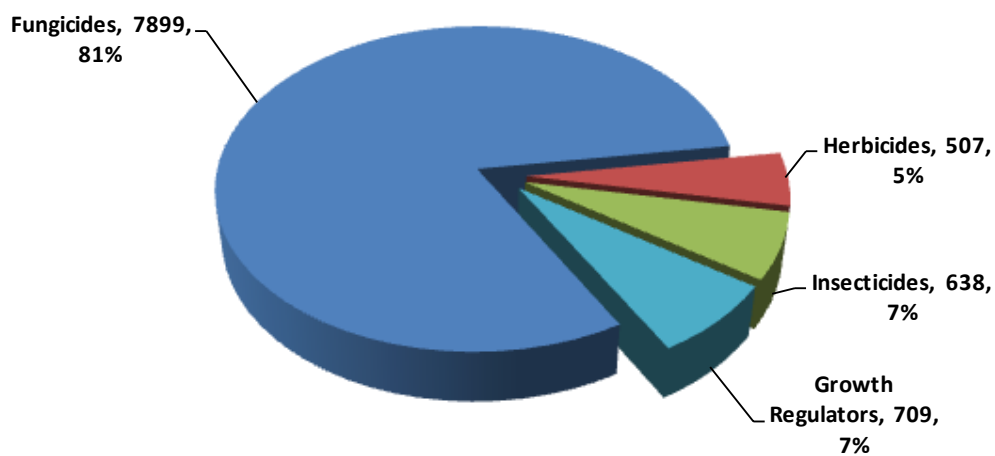
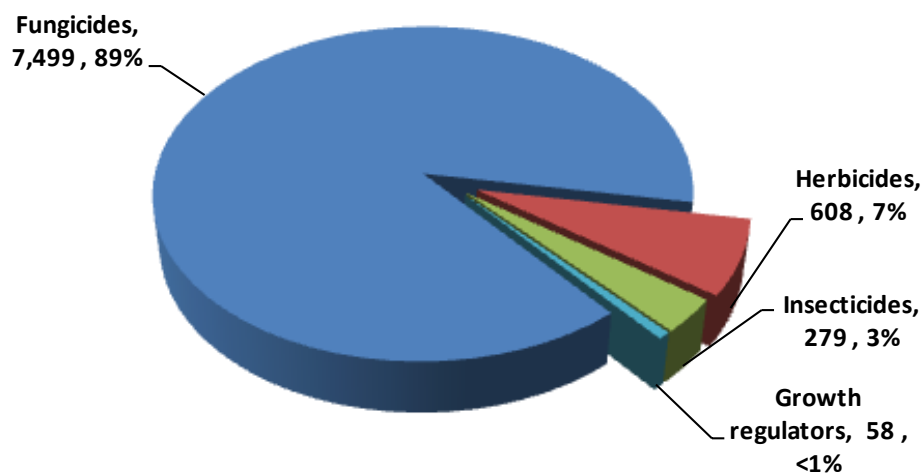


Figure 3: Weight (kgs) of pesticides applied to top fruit crops treated in Ireland, 2014.



Pesticide usage survey results 2014

Pesticide usage on bramley fruiting apples

293 ha of bramley fruiting apples in Ireland.

5,000 treated hectares.

3,682 kilogrammes applied.

100% of the area of bramley fruiting crops received a pesticide treatment.

Figure 4: Pesticide usage (spha) on bramley fruiting apple crops in Ireland, 2014.

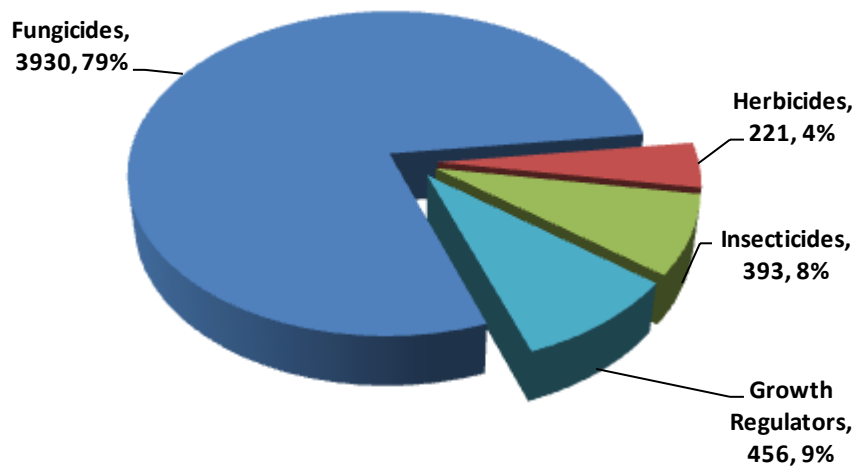


Figure 5: Weight of pesticides (kg) applied to bramley fruiting apple crops in Ireland, 2014.

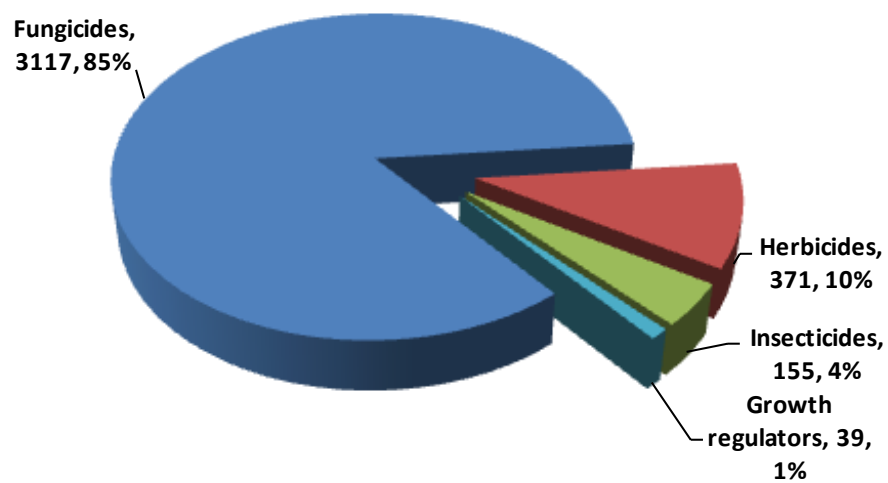


Figure 6: Proportional area of bramley fruiting apple crops treated with each pesticide group in Ireland, 2014.

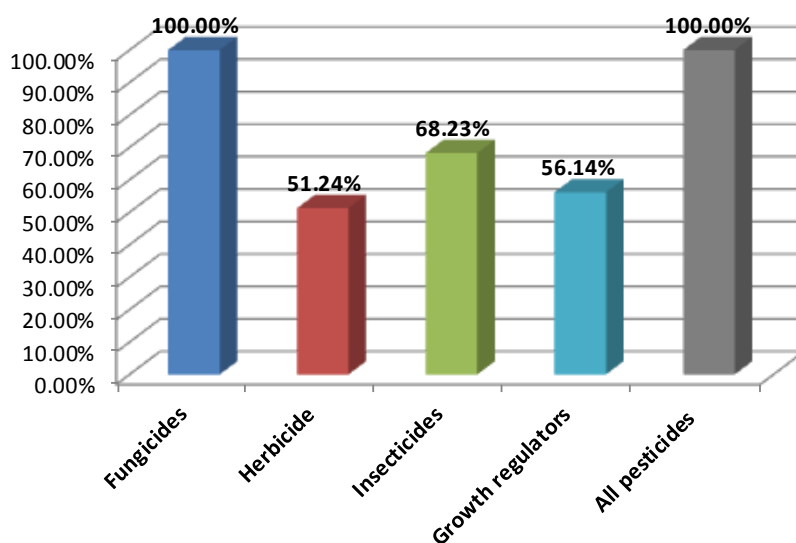


Figure 7: The top 10 active ingredients most extensively used on bramley fruiting apples in Ireland in 2014, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Dithianon	1164	316	1067
Captan	809	252	1204
Myclobutanil	540	148	46
Boscalid	422	192	79
Pyraclostrobin	422	192	35
Paclbutrazol	294	97	22
Chlorpyrifos	244	145	135
Pyrimethanil	232	105	93
Mancozeb	218	71	360
Glyphosate	214	150	363

Figure 8: The top 10 active ingredients most extensively used on bramley fruiting apples in Ireland in 2014, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Captan	1204	809	252
Dithianon	1067	1164	316
Glyphosate	363	214	150
Mancozeb	360	218	71
Chlorpyrifos	135	244	145
Pyrimethanil	93	232	105
Dodine	84	136	86
Boscalid	79	422	192
Myclobutanil	46	540	148
Maneb	43	24	24

Pesticide usage on cider apples

238 ha of cider apples grown in Ireland.

3,027 treated hectares.

3,457 kilogrammes applied.

100% of the area of cider apples received a pesticide treatment

Figure 9: Pesticide usage (spha) on cider apple crops in Ireland, 2014.

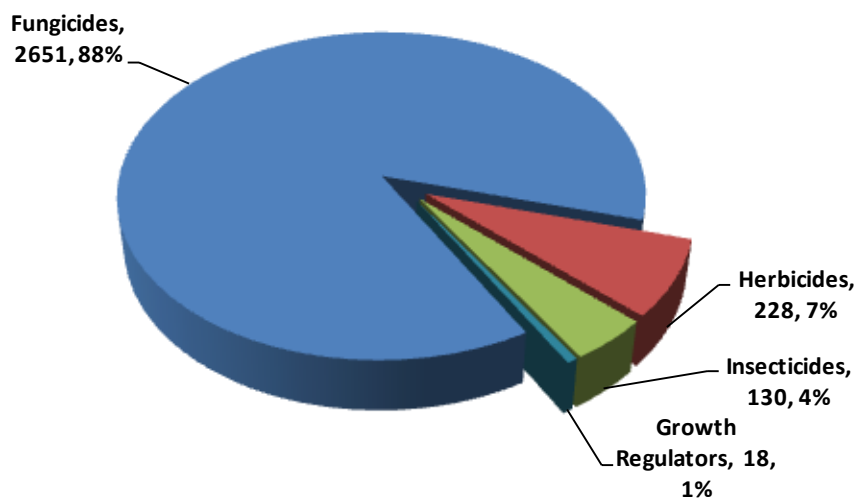


Figure 10: Weight of pesticides (kg) applied to cider apple crops in Ireland, 2014.

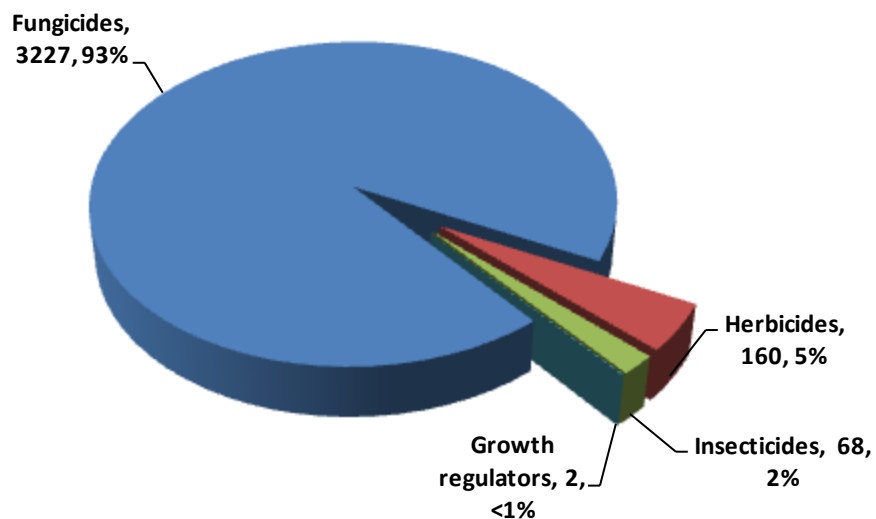


Figure 11: Proportional area of cider apples treated with each pesticide group in Ireland, 2014.

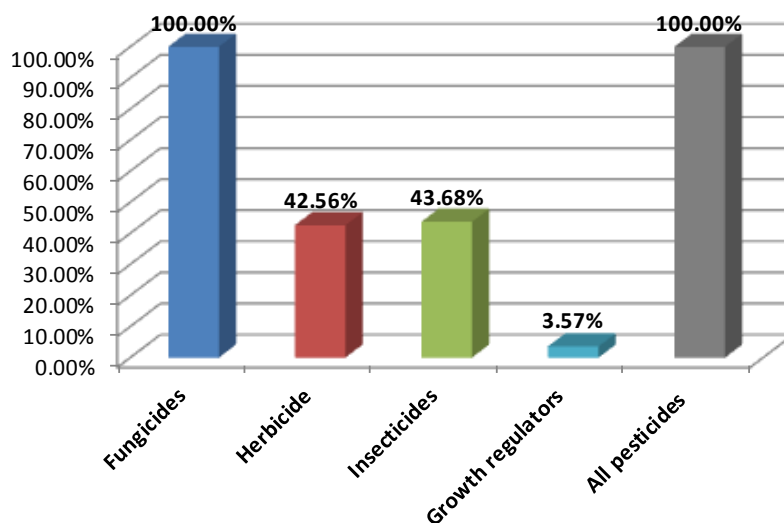


Figure 12: The top 10 active ingredients most extensively used on cider apple crops in Ireland in 2014, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Captan	1,010	283	1,874
Dithianon	461	151	496
Pyrimethanil	257	122	89
Glyphosate	194	116	128
Mancozeb	175	50	232
Myclobutanil	173	113	15
Sulphur	141	30	393
Difenoconazole	136	103	11
Tebuconazole	124	80	28
Chlorpyrifos	94	94	66

Figure 13: The top 10 active ingredients most extensively used on cider apple crops in Ireland in 2014, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Captan	1,874	1,010	283
Dithianon	496	461	151
Sulphur	393	141	30
Mancozeb	232	175	50
Glyphosate	128	194	116
Pyrimethanil	89	257	122
Chlorpyrifos	66	94	94
Dodine	58	64	32
Tebuconazole	28	124	80
Bupirimate	24	86	56

Pesticide usage on desert apples

79 ha of desert apples grown in Ireland.

1,699 treated hectares.

1,294 kilogrammes applied.

100% of the area of desert apples received a pesticide treatment.

Figure 14: Pesticide usage (spha) on desert apple crops in Ireland, 2014.

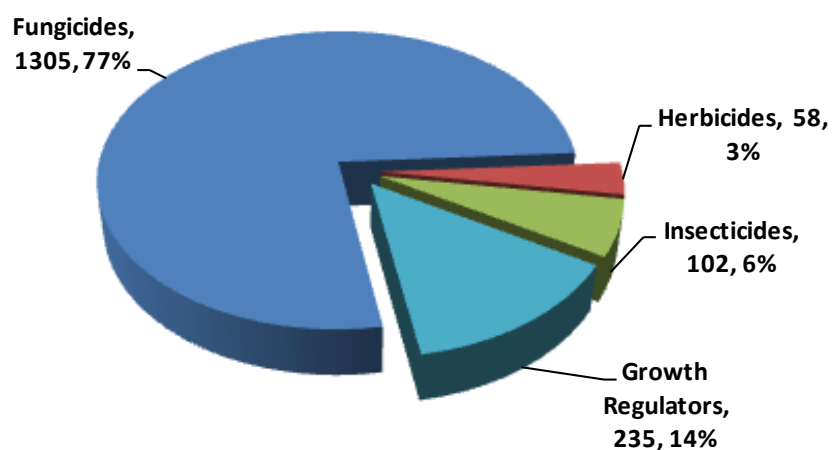


Figure 15: Weight of pesticides (kg) applied to desert apple crops in Ireland, 2014.

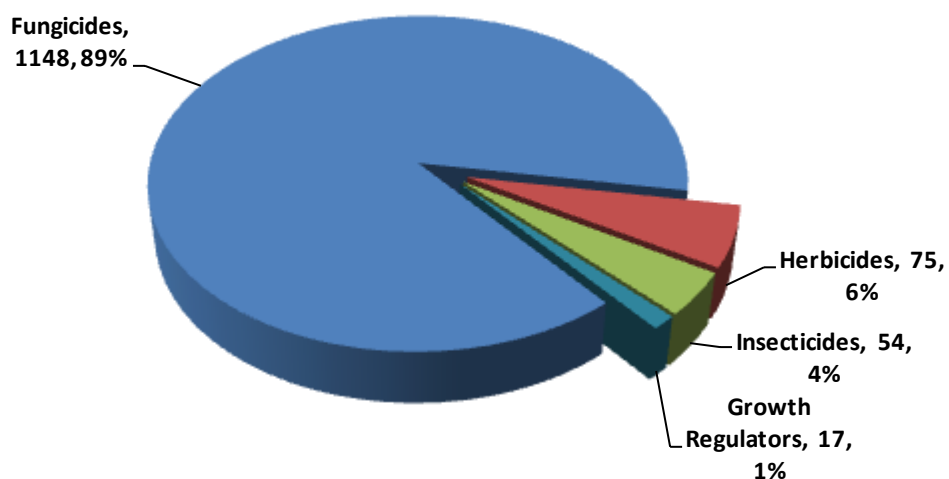


Figure 16: Proportional area of desert apple crops treated with each pesticide group in Ireland, 2014.

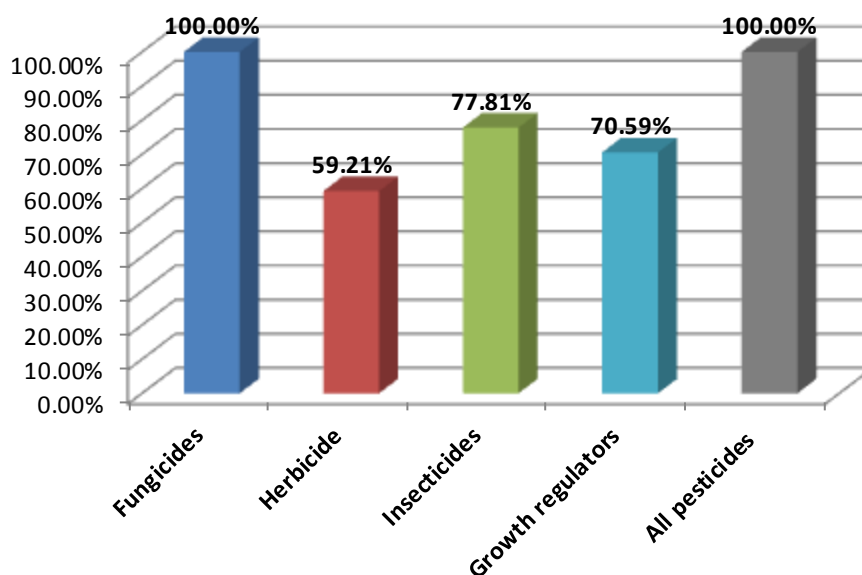


Figure 17: The top 10 active ingredients most extensively used on desert apple crops in Ireland in 2014, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Captan	372	79	655
Dithianon	249	65	229
Paclobutrazol	168	42	11
Myclobutanil	142	51	8
Bupirimate	103	31	18
Chlorpyrifos	91	52	52
Tebuconazole	79	34	22
Pyrimethanil	78	46	29
Mancozeb	78	38	109
Prohexadione-calcium	67	45	7

Figure 18: The top 10 active ingredients most extensively used on desert apple crops in Ireland in 2014, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Captan	655	372	79
Dithianon	229	249	65
Mancozeb	109	78	38
Glyphosate	54	41	38
Chlorpyrifos	52	91	52
Dodine	32	48	29
Pyrimethanil	29	78	46
Tebuconazole	22	79	34
2,4-D	20	16	16
Bupirimate	18	103	31

Pesticide usage on other top fruit crops

7 ha of other top fruit crops in Ireland.

26 treated hectares.

10 kilogrammes applied.

78.42% of the area of other top fruit crops received a pesticide treatment.

Figure 19: Pesticide usage (spha) on other top fruit crops in Ireland, 2014.

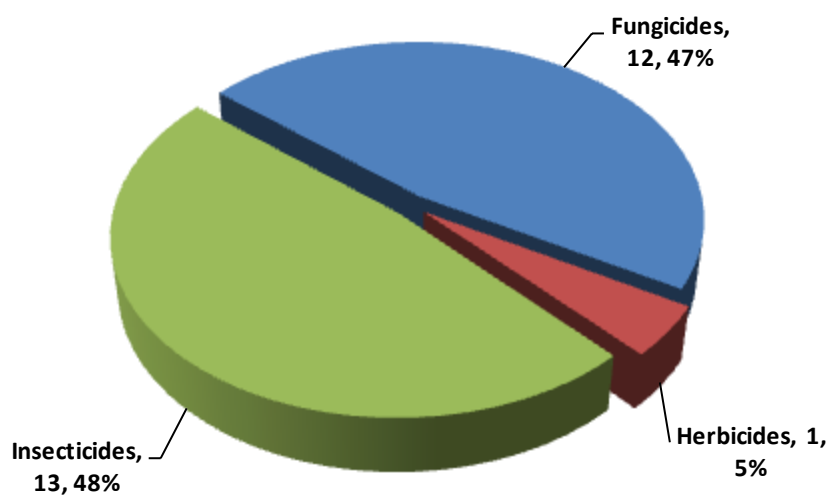


Figure 20: Weight of pesticides (kg) applied to other top fruit crops in Ireland, 2014.

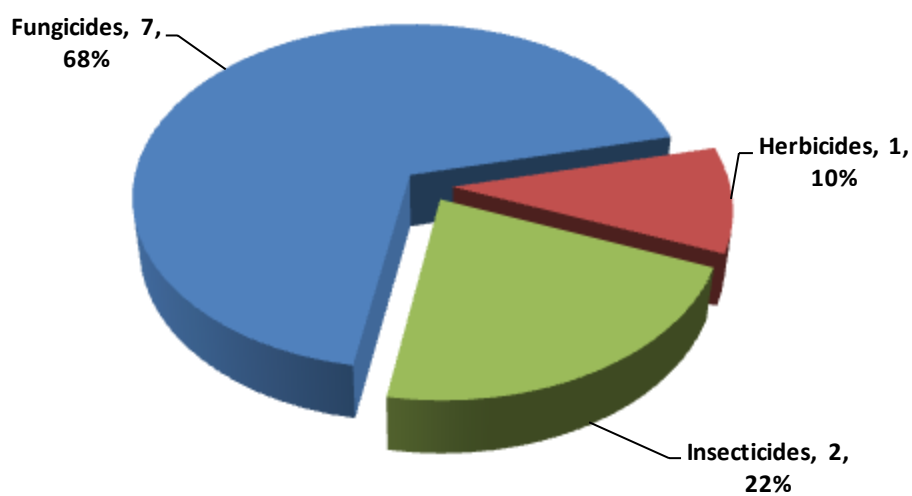


Figure 21: Proportional area of other top fruit crops treated with each pesticide group in Ireland, 2014.

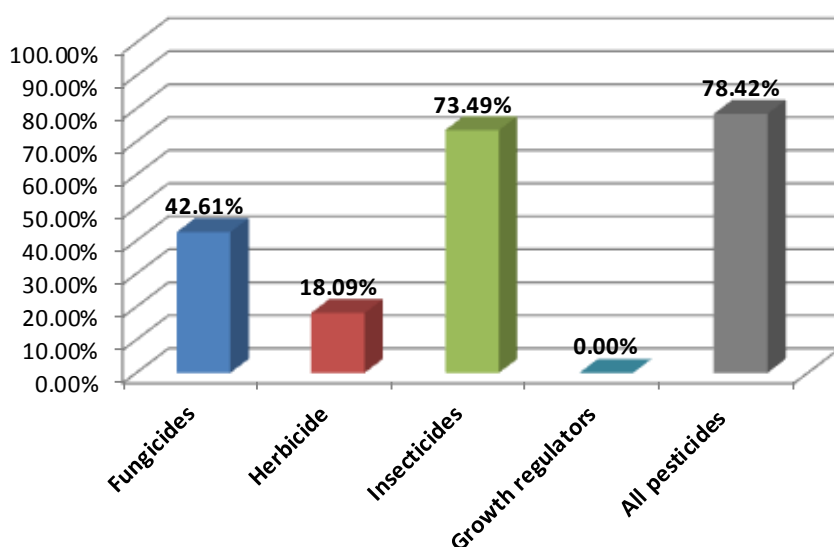


Figure 22: The top 10 active ingredients most extensively used on other top fruit crops in Ireland in 2014, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Pirimicarb	5	4	1
Boscalid	5	2	1
Pyraclostrobin	5	2	0
Thiacloprid	4	3	0
Captan	3	0	3
Myclobutanil	2	2	0
Pyrethrins	2	2	0
Cymoxanil	2	1	3
Chlorpyrifos	1	1	1
Diquat	1	1	0

Figure 23: The top 10 active ingredients most extensively used on other top fruit crops in Ireland in 2014, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Cymoxanil	3	2	1
Captan	3	3	0
Pirimicarb	1	5	4
Boscalid	1	5	2
Glyphosate	1	1	1
Chlorpyrifos	1	1	1
Dithianon	0	1	0
Pyraclostrobin	0	5	2
Myclobutanil	0	2	2
Thiacloprid	0	4	3

Table 1: Estimated area (ha) of top fruit crops grown nationally in Ireland, 2014.

Crop	Ireland
Bramley	293
Cider	238
Desert	79
Other crops	7
Total	617

Table 2: Estimated area (spray-hectares) of top fruit crops treated nationally with each pesticide type in Ireland, 2014.

Pesticide type	Ireland
Fungicides	7,899
Herbicides	507
Insecticides	638
Growth Regulators	709
	0
Total	9,752

Table 3: Estimated weight (kg) applied to top fruit crops treated nationally with each pesticide type in Ireland, 2014.

Pesticide type	Ireland
Fungicides	7,499
Herbicides	608
Insecticides	279
Growth Regulators	58
Total	8,443

Table 4: The total area (spray hectares) and the basic area (hectares), of top fruit crops in Ireland 2014 treated with each pesticide type.

<i>Crop type</i>	Pesticide Type									
	Fungicides		Herbicides		Insecticides		Growth regulators		All Pesticides	
	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(ha) treated (ha) grown
Bramley Fruiting	3,930	293	221	150	393	200	456	164	5,000	293 293
Dessert	1,305	79	58	47	102	62	235	56	1,699	79 79
Cider	2,651	238	228	101	130	104	18	8	3,027	238 238
Other crop	12	3	1	1	13	5			26	5 7
Total	7,899	613	507	300	638	370	709	229	9,752	616 617

Table 5: The total quantities (kilograms) of each pesticide type used on top fruit crops in Ireland 2014.

<i>Crop</i>	<i>Pesticide type</i>				<i>Total weight applied (kg)</i>
	<i>Fungicides</i>	<i>Herbicides</i>	<i>Insecticides</i>	<i>Growth regulators</i>	
Bramley Fruiting	3,117	371	155	39	3,682
Dessert	1,148	75	54	17	1,294
Cider	3,227	160	68	2	3,457
Other crops	7	1	2		10
<i>All crops</i>	<i>7,499</i>	<i>608</i>	<i>279</i>	<i>58</i>	<i>8,443</i>

Table 6: Estimated area (spray-hectares) of top fruit crops treated with pesticide formulations in Ireland, 2014.

<i>Pesticide type & formulation</i>	<i>Crop</i>				
	<i>Bramley Fruiting</i>	<i>Desert</i>	<i>Cider</i>	<i>Other</i>	<i>All crops</i>
<i>Fungicides</i>					
Boscalid/pyraclostrobin	422	58	25	5	510
Bupirimate	135	103	86		324
Captan	809	372	1,010	3	2,194
Cymoxanil				2	2
Cyprodinil/fludioxonil	16	28			44
Difenoconazole	144	38	136		318
Difenoconazole/Tebuconazole	24	6			30
Dithianon	1,164	249	461	1	1,875
Dodine	136	48	64		248
Kresoxim-methyl	5	27			32
Mancozeb	218	78	175		471
Maneb	24	6			30
Myclobutanil	540	142	173	2	857
Pyrimethanil	232	78	257		567
Sulphur	14		141		155
Tebuconazole	46	73	124		243
<i>All fungicides</i>	<i>3,930</i>	<i>1,305</i>	<i>2,651</i>	<i>12</i>	<i>7,899</i>

Table 6 (cont.): Estimated area (spray-hectares) of top fruit crops treated with pesticide formulations in Ireland, 2014.

Pesticide type & formulation	Bramley Fruiting	Crop			
		Desert	Cider	Other	All crops
Herbicides					
2,4-D	7	16			23
Dichlorprop-P/MCPA/mecoprop-P		0	8		8
Diquat					0
Glufosinate-ammonium		0	26		26
Glyphosate	214	41	194	1	450
All herbicides	221	58	228	1	507
Insecticides					
Chlorpyrifos	244	91	94	1	430
Cypermethrin	8		8		16
Deltamethrin			2		2
Pirimicarb	47	9		5	61
Pyrethrins	47	1		2	50
Thiacloprid	47	1	26	4	78
All Insecticides	393	102	130	13	638
Growth regulators					
Paclobutrazol	294	168	9		471
Prohexadione-calcium	162	67	9		238
All growth regulators	456	235	18	0	709
All pesticides	5,000	1,699	3,027	26	9,752

Table 7: Estimated quantities (kilograms) of pesticide formulations used on top fruit crops in Ireland, 2014.

Pesticide type & formulation	Crop				
	Bramley Fruiting	Desert	Cider	Other	All crops
Fungicides					
Boscalid/pyraclostrobin	112	16	7	1	136
Bupirimate	32	18	24		74
Captan	1,204	655	1,874	3	3,736
Cymoxanil				3	3
Cyprodinil/fludioxonil	8	13			21
Difenoconazole	7	2	11		20
Difenoconazole/Tebuconazole	21	5			26
Dithianon	1,067	229	496		1,792
Dodine	84	32	58		174
Kresoxim-methyl	0	3			3
Mancozeb	360	109	232		701
Maneb	43	11			54
Myclobutanil	46	8	15		69
Pyrimethanil	93	29	89		211
Sulphur	28		393		421
Tebuconazole	12	18	28		58
All fungicides	3,117	1,148	3,227	7	7,499
Herbicides					
2,4-D	8	20			28
Dichlorprop-P/MCPA/mecoprop-P		1	14		15
Diquat				0	0
Glufosinate-ammonium		0	18		18
Glyphosate	363	54	128	1	546
All herbicides	371	75	160	1	608

Table 7 (cont.): Estimated quantities (kilograms) of pesticide formulations used on top fruit crops in Ireland, 2014

Pesticide type & formulation	Crop				
	Bramley Fruiting	Desert	Cider	Other	All crops
<i>Insecticides</i>					
Chlorpyrifos	135	52	66	1	254
Cypermethrin	0		0		0
Deltamethrin			0		0
Pirimicarb	13	1		1	15
Pyrethrins	4	0		0	4
Thiacloprid	3	0	2	0	5
<i>All Insecticides</i>	<i>155</i>	<i>54</i>	<i>68</i>	<i>2</i>	<i>279</i>
<i>Growth regulators</i>					
Paclobutrazol	22	10	0		33
Prohexadione-calcium	17	7	1		25
<i>All growth regulators</i>	<i>39</i>	<i>17</i>	<i>2</i>	<i>0</i>	<i>58</i>
<i>All pesticides</i>	<i>3,682</i>	<i>1,294</i>	<i>3,457</i>	<i>10</i>	<i>8,443</i>

Table 8: The twenty active ingredients most extensively used on top fruit crops in Ireland in 2014, ranked by area treated (spray-hectares).

No.	Active ingredient	Treated area (sp ha)
1	Captan	2,194
2	Dithianon	1,875
3	Myclobutanil	857
4	Pyrimethanil	567
5	Pyraclostrobin	510
6	Boscalid	510
7	Paclobutrazol	471
8	Mancozeb	471
9	Glyphosate	450
10	Chlorpyrifos	430
11	Difenoconazole	348
12	Bupirimate	324
13	Tebuconazole	273
14	Dodine	248
15	Prohexadione-calcium	238
16	Sulphur	155
17	Thiacloprid	78
18	Pirimicarb	62
19	Pyrethrins	50
20	Cyprodinil	45

Table 9: The twenty active ingredients most extensively used on top fruit crops in Ireland in 2014, ranked by weight (kilograms).

No.	Active ingredient	Quantity (kgs)
1	Captan	3,735
2	Dithianon	1,792
3	Mancozeb	700
4	Glyphosate	546
5	Sulphur	420
6	Chlorpyrifos	254
7	Pyrimethanil	211
8	Dodine	174
9	Boscalid	95
10	Tebuconazole	76
11	Bupirimate	73
12	Myclobutanil	70
13	Maneb	54
14	Pyraclostrobin	43
15	Paclobutrazol	33
16	2,4-D	28
17	Difenoconazole	28
18	Prohexadione-calcium	25
19	Glufosinate-ammonium	18
20	Pirimicarb	16

Table 10: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for bramley fruiting apples, 2014.

Crop	Active Substance	Quantity (kg) of Active Ingredient	Spray area (spha) of Active Ingredient	Basic area (ha) of Active Ingredient
		Total	Total	Total
Bramley fruiting	Herbicides			
	2,4-D	8	7	7
	Glyphosate	363	214	150
	Fungicides			
	Boscalid	79	422	192
	Bupirimate	32	135	65
	Captan	1204	809	252
	Cyprodinil	5	16	16
	Difenoconazole	13	168	75
	Dithianon	1067	1164	316
	Dodine	84	136	86
	Fludioxonil	3	16	16
	Kresoxim-methyl	0	5	2
	Mancozeb	360	218	71
	Maneb	43	24	24
	Myclobutanil	46	540	148
	Pyraclostrobin	35	422	192
	Pyrimethanil	93	232	105
	Sulphur	28	14	14
	Tebuconazole	27	70	40
	Insecticides			
	Chlorpyrifos	135	244	145
	Cypermethrin	0	8	8
	Pirimicarb	13	47	47
	Pyrethrins	4	47	47
	Thiacloprid	3	47	47
	Growth regulators			
	Paclobutrazol	22	294	97
	Prohexadione-calcium	17	162	114

Table 11: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for desert apples, 2014.

Crop	Active Substance	Quantity (kg) of Active Ingredient	Spray area (spha) of Active Ingredient	Basic area (ha) of Active Ingredient
		Total	Total	Total
Desert apples	Herbicides			
	2,4-D	20	16	16
	Dichlorprop-P	0	0	0
	Glufosinate-ammonium	0	0	0
	Glyphosate	54	41	38
	MCPA	0	0	0
	Mecoprop-P	0	0	0
	Fungicides			
	Boscalid	10	58	38
	Bupirimate	18	103	31
	Captan	655	372	79
	Cyprodinil	8	28	28
	Difenoconazole	4	44	23
	Dithianon	229	249	65
	Dodine	32	48	29
	Fludioxonil	5	28	28
	Kresoxim-methyl	3	27	13
	Mancozeb	109	78	38
	Maneb	11	6	6
	Myclobutanil	8	142	51
	Pyraclostrobin	5	58	38
	Pyrimethanil	29	78	46
	Tebuconazole	22	79	34
	Insecticides			
	Chlorpyrifos	52	91	52
	Pirimicarb	1	9	9
	Pyrethrins	0	1	1
	Thiacloprid	0	1	1
	Growth regulators			
	Paclobutrazol	11	168	42
	Prohexadione-calcium	7	67	45

Table 12: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for cider apples, 2014.

Crop	Active Substance	Quantity (kg) of Active Ingredient	Spray area (spha) of Active Ingredient	Basic area (ha) of Active Ingredient
		Total	Total	Total
Cider apples	Herbicides			
	Dichlorprop-P	7	8	8
	Glufosinate-ammonium	18	26	26
	Glyphosate	128	194	116
	MCPA	4	8	8
	Mecoprop-P	4	8	8
	Fungicides			
	Boscalid	5	25	24
	Bupirimate	24	86	56
	Captan	1,874	1,010	283
	Difenoconazole	11	136	103
	Dithianon	496	461	151
	Dodine	58	64	32
	Mancozeb	232	175	50
	Myclobutanil	15	173	113
	Pyraclostrobin	2	25	24
	Pyrimethanil	89	257	122
	Sulphur	393	141	30
	Tebuconazole	28	124	80
	Insecticides			
	Chlorpyrifos	66	94	94
	Cypermethrin	0	8	8
	Deltamethrin	0	2	2
	Thiacloprid	2	26	26
	Growth regulators			
	Paclobutrazol	0	9	8
	Prohexadione-calcium	1	9	8

Table 13: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for other crops, 2014.

Crop	Active Substance	Quantity (kg) of Active Ingredient	Spray area (spha) of Active Ingredient	Basic area (ha) of Active Ingredient
		Total	Total	Total
Other crops	Herbicides			
	Diquat	0	1	1
	Glyphosate	1	1	1
	Fungicides			
	Boscalid	1	5	2
	Captan	3	3	0
	Cymoxanil	3	2	1
	Dithianon	0	1	0
	Myclobutanil	0	2	2
	Pyraclostrobin	0	5	2
	Insecticides			
	Chlorpyrifos	1	1	1
	Pirimicarb	1	5	4
	Pyrethrins	0	2	2
	Thiacloprid	0	4	3

Acknowledgements

This report was compiled by James Quirke, with invaluable assistance from Michael Lavery AFBI, David Williams AFBI, David Mathews AFBI and Amanda Patton AFBI. Thanks are due to all the top fruit growers who co-operated willingly with the survey and provided the detailed information needed to compile this report. Data collection for the survey was carried out by staff of the Agricultural Environment and Structures (AES) Division of the Department of Agriculture, Food and the Marine. Interviews with growers were conducted by Martina Walsh, Tom Leahy, Michael Cullen and James Quirke.

