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

Pesticide Usage in Ireland

Top Fruit Crops

Survey Report 2023

Pesticide Usage in Ireland

TOP FRUIT CROPS SURVEY REPORT 2023

Pesticide Control Division,

Department of Agriculture, Food and Marine (DAFM),

Backweston Campus,

Celbridge,

Co. Kildare,

Ireland

W23 X3PH

Tel: +353 1 615 7552

Email: pcs@agriculture.gov.ie

Contents

Contents 3

List of Figures 4
List of Tables 5

Top Fruit Crops Survey Report Summary 7

Background 8
Methods 9
Definitions 10
Crops 11
Pesticide usage 12

Pesticide Usage Survey Results 2023 14

Pesticide usage on bramley fruiting apples 14
Pesticide usage on cider apples 18
Pesticide usage on other top fruit crops 20
Acknowledgements 35
References 35

List of Figures

FIGURE 1. AREAS OF INDIVIDUAL TOP FRUIT CROPS GROWN IN IRELAND (HA), 2023. 12
FIGURE 2. PESTICIDE USAGE (SPHA) ON TOP FRUIT CROPS TREATED IN IRELAND, 2023. 13
FIGURE 3. WEIGHT (KGS) OF PESTICIDES APPLIED TO TOP FRUIT CROPS TREATED IN IRELAND, 2023. 13
FIGURE 4. PESTICIDE USAGE (SPHA) ON BRAMLEY FRUITING APPLES IN IRELAND, 2023. 14
FIGURE 5. WEIGHT OF PESTICIDES (KG) APPLIED TO BRAMLEY FRUITING APPLES IN IRELAND, 2023. 15
FIGURE 6. PESTICIDE USAGE (SPHA) ON DESSERT APPLES IN IRELAND, 2023. 16
FIGURE 7. WEIGHT OF PESTICIDES (KG) APPLIED TO DESSERT APPLES IN IRELAND, 2023. 17
FIGURE 8. PESTICIDE USAGE (SPHA) ON CIDER APPLES IN IRELAND, 2023. 18
FIGURE 9. WEIGHT OF PESTICIDES (KG) APPLIED TO CIDER APPLES IN IRELAND, 2023. 19
FIGURE 10. PESTICIDE USAGE (SPHA) ON OTHER TOP FRUIT CROPS IN IRELAND, 2023. 20
FIGURE 11. WEIGHT OF PESTICIDES (KG) APPLIED TO OTHER TOP FRUIT CROPS IN IRELAND, 2023. .. 20

List of Tables

TABLE 1. REGIONS SELECTED FOR THE SURVEY AND RESPECTIVE COUNTIES. 10
TABLE 2. THE TOTAL NUMBER OF FARMS SAMPLED FROM EACH SIZE GROUP. 10
TABLE 3. THE TOTAL NUMBER, AREA (HECTARES) OF CROPS SAMPLED AND THE PROPORTION (%) OF THE TOTAL AREA OF TOP FRUIT CROPS SURVEYED IN IRELAND, 2023. 11
TABLE 4. THE TOP 10 ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON BRAMLEY FRUITING APPLES IN IRELAND IN 2023, RANKED BY AREA TREATED (SPRAY-HECTARES). 15
TABLE 5. THE TOP 10 ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON BRAMLEY FRUITING APPLES IN IRELAND IN 2023, RANKED BY WEIGHT (KG). 16
TABLE 6. THE TOP 10 ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON DESSERT APPLES IN 2023, RANKED BY AREA TREATED (SPRAY-HECTARES). 17
TABLE 7. THE TOP 10 ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON DESSERT APPLES IN IRELAND IN 2023, RANKED BY WEIGHT (KG). 18
TABLE 8. THE TOP 10 ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON CIDER APPLES IN 2023, RANKED BY AREA TREATED (SPRAY-HECTARES). 19
TABLE 9. THE TOP 10 ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON CIDER APPLES IN IRELAND IN 2023, RANKED BY WEIGHT (KG). 19
TABLE 10. THE TOP 10 ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON OTHER TOP FRUIT CROPS IN 2023, RANKED BY AREA TREATED (SPRAY-HECTARES). 21
TABLE 11. THE TOP 10 ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON OTHER TOP FRUIT CROPS IN IRELAND IN 2023, RANKED BY WEIGHT (KG). 21
TABLE 12. ESTIMATED AREA (HECTARES) OF TOP FRUIT CROPS GROWN IN IRELAND, 2023. 21
TABLE 13. ESTIMATED AREA (SPRAY-HECTARES) OF TOP FRUIT CROPS TREATED REGIONALLY WITH EACH PESTICIDE TYPE IN IRELAND, 2023. 21
TABLE 14. ESTIMATED WEIGHT (KGS) OF PESTICIDES APPLIED TO TOP FRUIT CROPS TREATED IN IRELAND, 2023. 22
TABLE 15. THE TOTAL AREA (SPRAY HECTARES) AND THE BASIC AREA (HECTARES), OF TOP FRUIT CROPS IN IRELAND 2023 TREATED WITH EACH PESTICIDE TYPE. 23
TABLE 16. THE TOTAL QUANTITIES (KILOGRAMS) OF EACH PESTICIDE TYPE USED ON TOP FRUIT CROPS IN IRELAND 2023. 23
TABLE 17. ESTIMATED AREA (SPRAY-HECTARES) OF TOP FRUIT CROPS TREATED WITH PESTICIDE FORMULATIONS IN IRELAND, 2023. 24
TABLE 18 (CONT.) ESTIMATED AREA (SPRAY-HECTARES) OF TOP FRUIT CROPS TREATED WITH PESTICIDE FORMULATIONS IN IRELAND, 2023. 25
TABLE 19 (CONT.) ESTIMATED AREA (SPRAY-HECTARES) OF TOP FRUIT CROPS TREATED WITH PESTICIDE FORMULATIONS IN IRELAND, 2023. 25
TABLE 20 (CONT.) ESTIMATED AREA (SPRAY-HECTARES) OF TOP FRUIT CROPS TREATED WITH PESTICIDE FORMULATIONS IN IRELAND, 2023. 26
TABLE 21 (CONT.) ESTIMATED AREA (SPRAY-HECTARES) OF TOP FRUIT CROPS TREATED WITH PESTICIDE FORMULATIONS IN IRELAND, 2023. 26

TABLE 22. ESTIMATED QUANTITIES (KILOGRAMS) OF PESTICIDE FORMULATIONS USED ON TOP FRUIT CROPS IN IRELAND, 2023.....27
TABLE 23. (CONT.) ESTIMATED QUANTITIES (KILOGRAMS) OF PESTICIDE FORMULATIONS USED ON TOP FRUIT CROPS IN IRELAND, 2023. 28
TABLE 24. (CONT.) ESTIMATED QUANTITIES (KILOGRAMS) OF PESTICIDE FORMULATIONS USED ON TOP FRUIT CROPS IN IRELAND, 2023. 28
TABLE 25. (CONT.) ESTIMATED QUANTITIES (KILOGRAMS) OF PESTICIDE FORMULATIONS USED ON TOP FRUIT CROPS IN IRELAND, 2023. 29
TABLE 26. (CONT.) ESTIMATED QUANTITIES (KILOGRAMS) OF PESTICIDE FORMULATIONS USED ON TOP FRUIT CROPS IN IRELAND, 2023. 29
TABLE 27. THE ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON TOP FRUIT CROPS IN IRELAND IN 2023 RANKED BY AREA TREATED (SPRAY-HECTARES). 30
TABLE 28. THE ACTIVE INGREDIENTS MOST EXTENSIVELY USED ON TOP FRUIT CROPS IN IRELAND IN 2023 RANKED BY WEIGHT (KILOGRAMS).....31
TABLE 29. ESTIMATED QUANTITY (KG), SPRAY AREA (SPHA) AND BASIC AREA (HA) OF ACTIVE SUBSTANCE FOR BRAMLEY FRUITING APPLES, 2023.....32
TABLE 30. ESTIMATED QUANTITY (KG), SPRAY AREA (SPHA) AND BASIC AREA (HA) OF ACTIVE SUBSTANCE FOR DESSERT APPLES, 2023. 33
TABLE 31. ESTIMATED QUANTITY (KG), SPRAY AREA (SPHA) AND BASIC AREA (HA) OF ACTIVE SUBSTANCE FOR CIDER APPLES, 2023.....34
TABLE 32. ESTIMATED QUANTITY (KG), SPRAY AREA (SPHA) AND BASIC AREA (HA) OF ACTIVE SUBSTANCE OTHER TOP FRUIT CROPS, 2023. 34

Top Fruit Crops Survey Report Summary

This is the third survey of pesticide[1] usage on top fruit crops in Ireland carried out by the Department of Agriculture, Food and the Marine (DAFM), providing comparative datasets obtained from surveys previously completed in 2014, 2018 and 2023.

Information on all aspects of pesticide usage was collected from 25 holdings across Ireland representing 69% of the total area of top fruit crops grown.

Quantitative data have been adjusted to provide estimates of total pesticide usage.

In 2023, an estimated 784 hectares (ha) of top fruit crops were grown which represents an overall 17.8% increase compared to the total estimated area for the years 2014 and 2018.

In 2023, an estimated 7,909 kgs of active substance was applied to top fruit crops which represents an 20.3% decrease compared to 2018 and 6.3% decrease compared to 2014 in total weight of pesticide applied.

The total pesticide treated area of the crops in 2023 surveyed has increased by 1.8% compared to the combined average of years 2014 and 2018.

A total of 31 active substances were recorded in use on top fruit crops in the survey compared to 43 in 2018 and 32 in 2014.

Fungicides were applied to 81% of the pesticide treated area, representing 88% of the total weight of pesticides used.

Herbicides were applied to 8% of the pesticide treated area, accounting for 9% of the total weight of pesticides used.

Insecticides were applied to 8% of the pesticide treated area, representing 2% of the weight of pesticides applied.

Growth regulator usage accounted for 3% of the pesticide treated area and 1% of the weight of active substance applied.

[1] *Pesticide is an over-arching term that includes both plant protection products (including, for the purpose of this report, fungicides, herbicides, insecticides, molluscicides, biological controls and seed treatments) and biocides.*

Bramley fruiting apples comprised 45% of the area of top fruit crops in Ireland in 2023, accounting for 39% of the total pesticide treated area and 38% of the total weight of pesticides used on all top fruit crops.

Dessert apples comprised 32% of the area of top fruit crops in Ireland in 2023, accounting for both 55% of the total pesticide treated area and the total weight of pesticides used on all top fruit crops.

Cider apples comprised 21% of the area of top fruit crops in Ireland in 2023, accounting for 4% of the total pesticide treated area and 6% of the total weight of pesticides used on top fruit crops.

Other top fruit crops accounted for 2% of the area of top fruit crops grown in Ireland in 2023, accounting for less than 1% of the total pesticide treated area and 2% of the total weight of pesticides used on all top fruit crops.

Background

The regulatory system for PPPs in Ireland is based directly on EU legislation which provides a very high level of protection for humans, animals and the environment.

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. This legislation addresses the authorisation of PPPs for specific uses, residues of pesticides on food and feed and the sustainable use of pesticides. The Sustainable Use Directive (EU Directive (EC) No. 128/2009) aims to achieve a balance between ensuring human and environmental safety while maintaining continued viability of the farming and amenity sectors. This involves training and registration of advisors, 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. Regulation (EC) No. 1185/2009 was adopted on 25 November 2009 and requires each member state to collect statistics on PPP use.

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 programs to assist with identifying particular areas of risk and to validate findings.

Methods

The samples of holdings to be surveyed was selected from each of the 26 counties, on the basis of the total area of top fruit crops grown, using data from DAFM. 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 1. The samples were categorised 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 1. Regions selected for the survey and respective counties.

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

The purpose of the survey was explained to the occupiers of selected holdings in preliminary correspondence. A total of 25 holdings were contacted during the period March to May 2024 and data collected by phone and or physical interview for top fruit crops harvested in 2023. The data collected included; the area of crops grown, area treated, target pests, pesticide used, rates applied 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 for top fruit crops are shown in Table 2. The collected data were entered using Oracle, a relational database programme. Validated data were downloaded for analysis using SPSS software.

Table 2. The total number of farms sampled from each size group.

	Sizing Group (Hectares)				
Region	<6	6<9	9<14	14+	Total
Ireland	*7*	*5*	*2*	*11*	*25*

Definitions

- 'Basic area'; refers to the actual planted area of crop treated with a given pesticide.
- '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.
- 'Fungicides'; are defined as PPPs used to control and/or prevent harmful fungal disease.
- 'Growth regulators'; are defined as PPPs used to control/regulate the growth of the plant.

- 'Herbicides'; are defined as PPPs used to control and/ or prevent unwanted vegetation.
- 'Insecticides'; are defined as PPPs used to control and/or prevent harmful insects.
- 'Other top fruit crops'; collectively refers to pears and cherries.
- 'PPP'; refers to plant protection product.
- 'Rounding'; due to rounding of figures there may be slight differences in totals both within and between tables.
- 'Spray applications'; refers to the number of treatments of any pesticide type to the treated areas.
- '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).

Crops

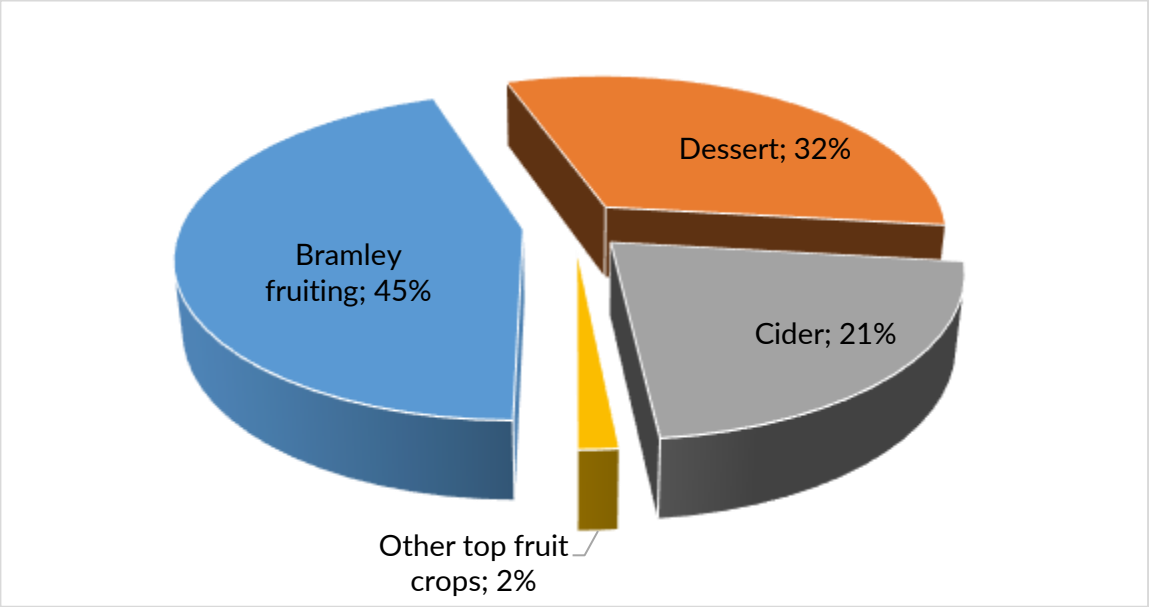
Information was collected for bramley fruiting apples, dessert apples, cider apples and other top fruit crops. The number and areas of crops surveyed are shown in Table 3. Data from 25 growers provided information on 58 examples across four crop types. The total area of crops sampled in the survey (537 ha) was representative of the area of top fruit crops grown in Ireland in 2023 (784 ha).

Table 3. The total number, area (hectares) of crops sampled and the proportion (%) of the total area of top fruit crops surveyed in Ireland, 2023.

Crop	Number of crops surveyed	Survey area (ha)	Estimated area (ha)	Proportion of crops surveyed (%)
Bramley fruiting	23	253	351	72%
Dessert	16	159	252	63%
Cider	12	117	169	69%
Other top fruit crops	7	8	13	63%
Total	***58***	***537***	***784***	***69%***

Bramley fruiting apples covered an estimated 45% of the total area of top fruit crops in 2023. Cider and dessert apples accounted for 21% and 32% of the area of top fruit crops in 2023 respectively. Other top fruit crops accounted for 2% of the total area of top fruit crops in 2023.

Figure 1. Areas of individual top fruit crops grown in Ireland (ha), 2023.



Pesticide usage

Fungicides were applied to 81% of the pesticide treated area, accounting for 88% of the total weight of pesticides used. Herbicides were applied to 8% of the pesticide treated area, representing 9% of the total weight of pesticides used. Insecticides were applied to 8% of the pesticide treated area, representing 2% of the weight of pesticides applied.

Growth regulator treatments represented 3% of pesticide treated area representing 1% of the weight of pesticides applied.

Figure 2. Pesticide usage (spha) on top fruit crops treated in Ireland, 2023.

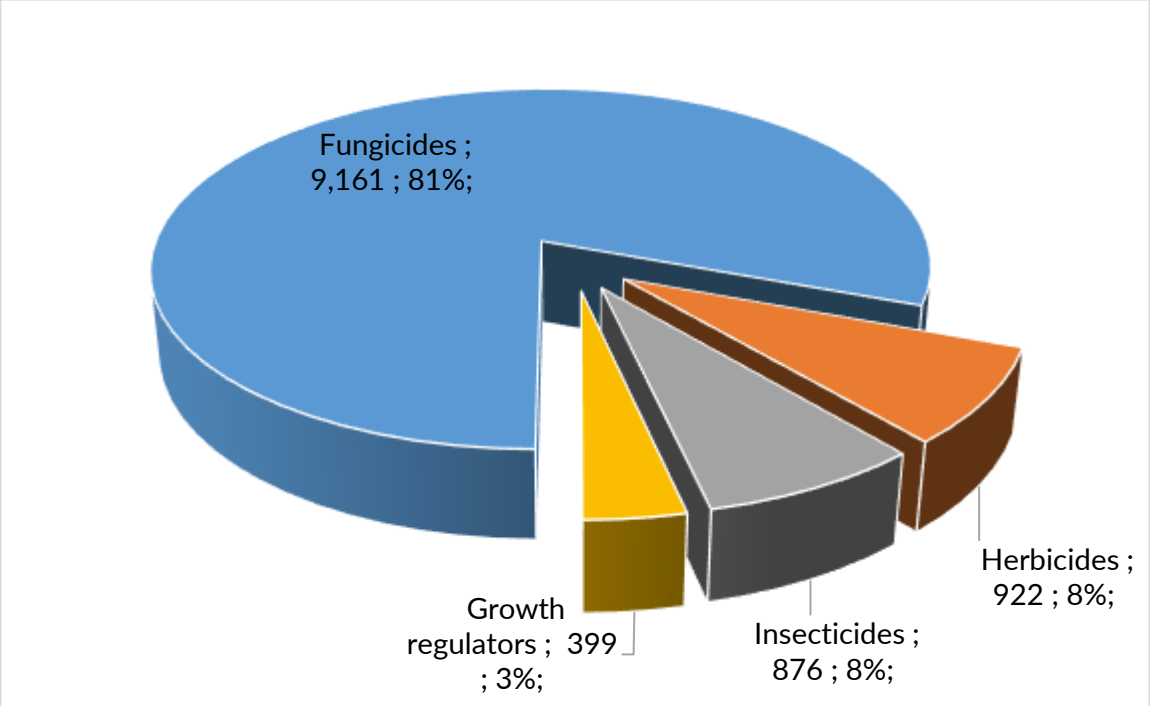
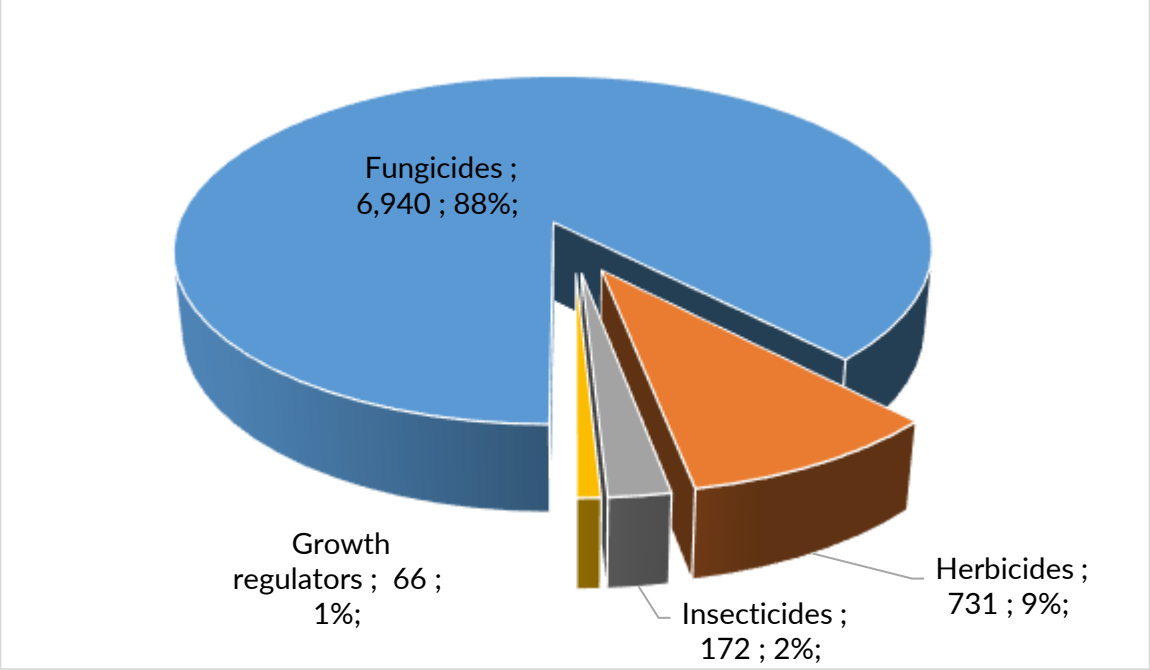


Figure 3. Weight (kgs) of pesticides applied to top fruit crops treated in Ireland, 2023.



Pesticide Usage Survey Results 2023

Pesticide usage on bramley fruiting apples

- 351 ha of bramley fruiting apples in Ireland.
- 4,462 treated hectares (spha).
- 3,005 kilograms applied.

Figure 4. Pesticide usage (spha) on bramley fruiting apples in Ireland, 2023.

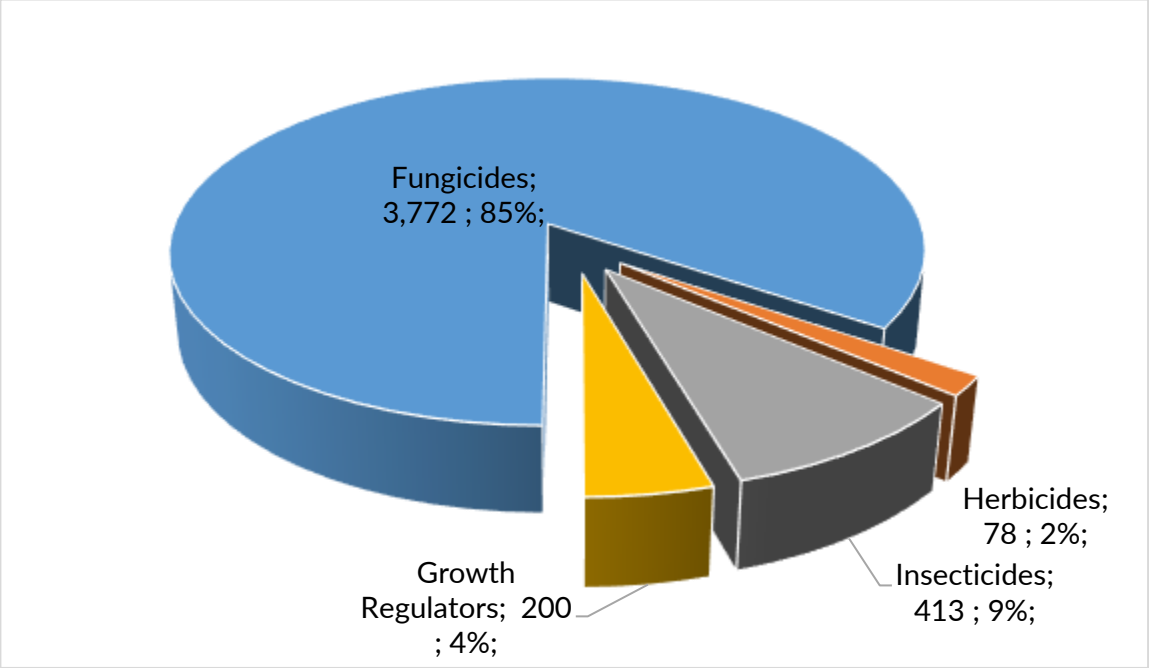


Figure 5. Weight of pesticides (kg) applied to bramley fruiting apples in Ireland, 2023.

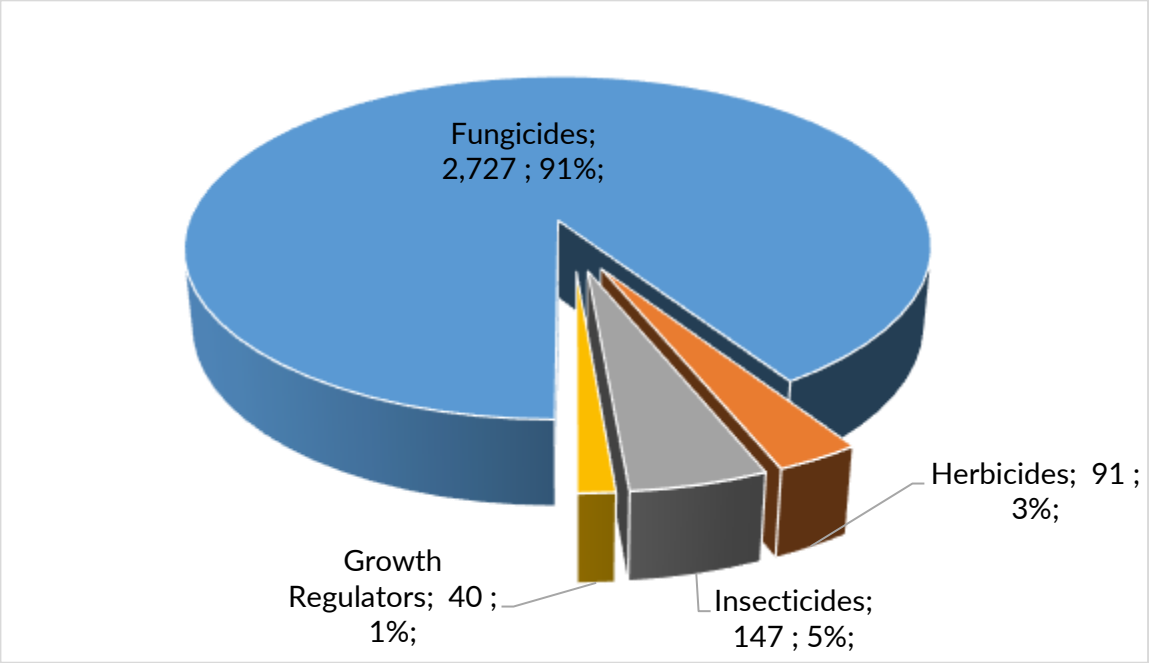


Table 4. The top 10 active ingredients most extensively used on bramley fruiting apples in Ireland in 2023, ranked by area treated (spray-hectares).

Active Substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Captan	1,065.50	254.71	1,226.48
Dithianon	744.78	199.34	185.13
Potassium phosphonates	633.50	188.73	656.06
Boscalid	510.92	179.37	99.47
Pyraclostrobin	510.92	179.37	50.52
Pyrimethanil	421.50	194.76	156.41
Dodine	369.39	203.17	212.64
Difenoconazole	231.64	65.55	14.04
Bupirimate	218.67	113.34	28.49
Prohexadione	193.07	176.40	40.26

Table 5. The top 10 active ingredients most extensively used on bramley fruiting apples in Ireland in 2023, ranked by weight (kg).

Active Substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Captan	1,226.48	1,065.50	254.71
Potassium phosphonates	656.06	633.50	188.73
Dodine	212.64	369.39	203.17
Dithianon	185.13	744.78	199.34
Pyrimethanil	156.41	421.50	194.76
Fatty acids	100.76	35.00	35.00
Boscalid	99.47	510.92	179.37
Glyphosate	91.05	77.55	77.55
Sulphur	89.64	45.97	45.97
Copper oxychloride	61.46	35.00	35.00

Pesticide usage on dessert apples

- 252 ha of dessert apples in Ireland.
- 6,254 treated hectares (spha).
- 4,315 kilograms applied.

Figure 6. Pesticide usage (spha) on dessert apples in Ireland, 2023.

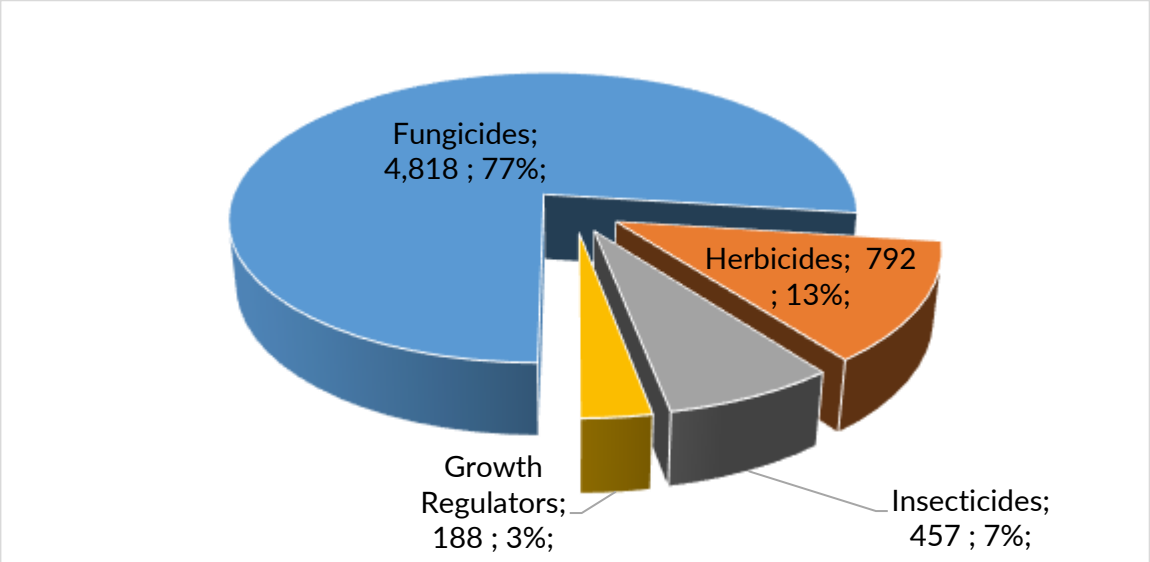


Figure 7. Weight of pesticides (kg) applied to dessert apples in Ireland, 2023.

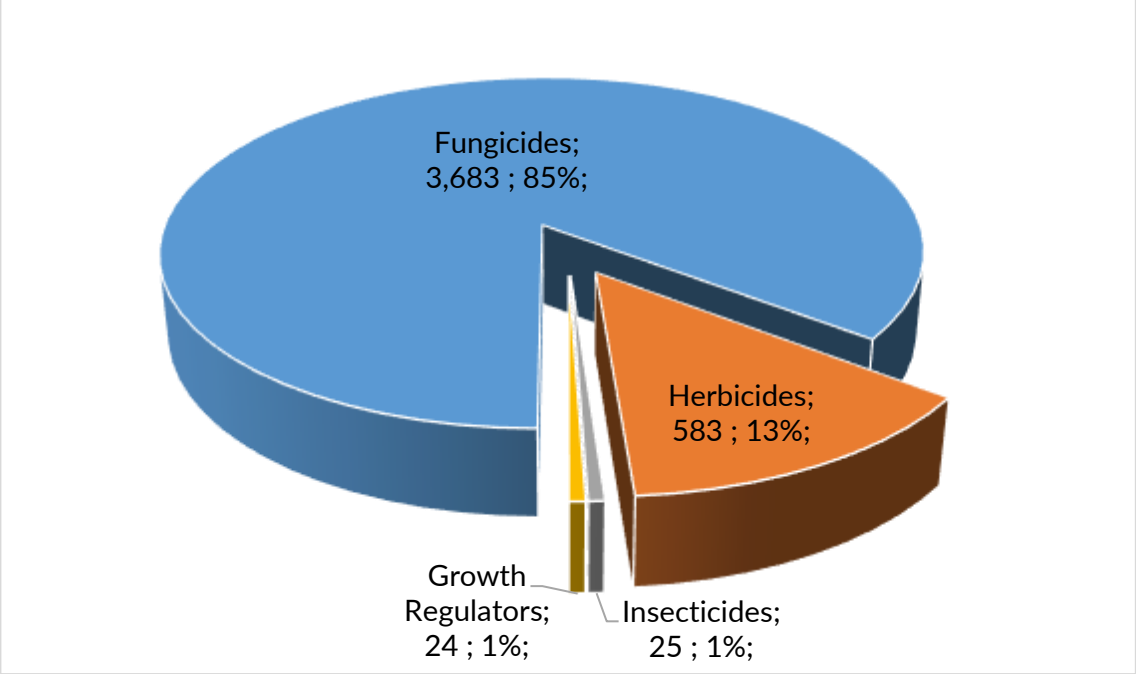


Table 6. The top 10 active ingredients most extensively used on dessert apples in 2023, ranked by area treated (spray-hectares).

Active Substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Dodine	1,143.30	154.41	754.25
Dithianon	839.42	168.90	259.00
Captan	663.61	172.71	863.58
Pendimethalin	598.18	119.64	267.99
Pyrimethanil	563.74	172.41	180.52
Deltamethrin	364.64	125.36	5.61
Bupirimate	325.07	154.22	60.26
Proquinazid	291.90	154.22	14.60
Fluxapyroxad	261.30	138.69	20.65
Boscalid	207.04	161.86	41.36

Table 7. The top 10 active ingredients most extensively used on dessert apples in Ireland in 2023, ranked by weight (kg).

Active Substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Sulphur	1,194.56	186.65	145.79
Captan	863.58	663.61	172.71
Dodine	754.25	1,143.30	154.41
Glyphosate	314.39	187.64	91.01
Pendimethalin	267.99	598.18	119.64
Dithianon	259.00	839.42	168.90
Pyrimethanil	180.52	563.74	172.41
Copper oxychloride	134.89	76.81	35.96
Potassium phosphonates	113.41	171.63	145.36
Bupirimate	60.26	325.07	154.22

Pesticide usage on cider apples

- 169 ha of cider apples in Ireland.
- 485 treated hectares (spha).
- 437 kilograms applied.

Figure 8. Pesticide usage (spha) on cider apples in Ireland, 2023.

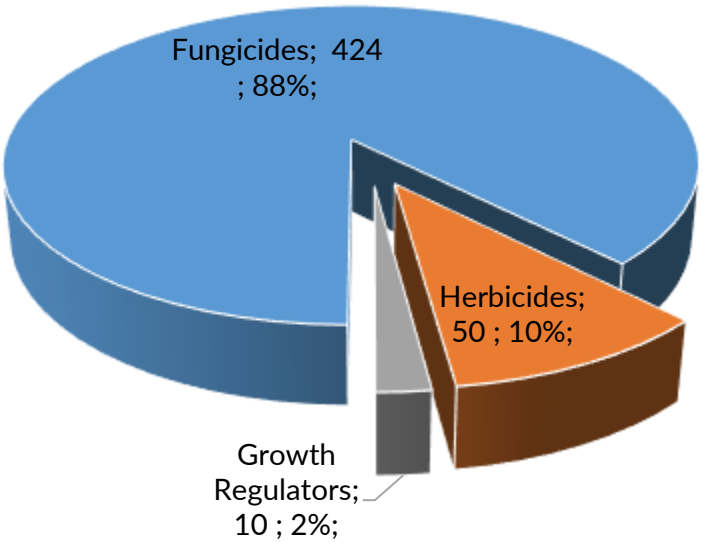


Figure 9. Weight of pesticides (kg) applied to cider apples in Ireland, 2023.

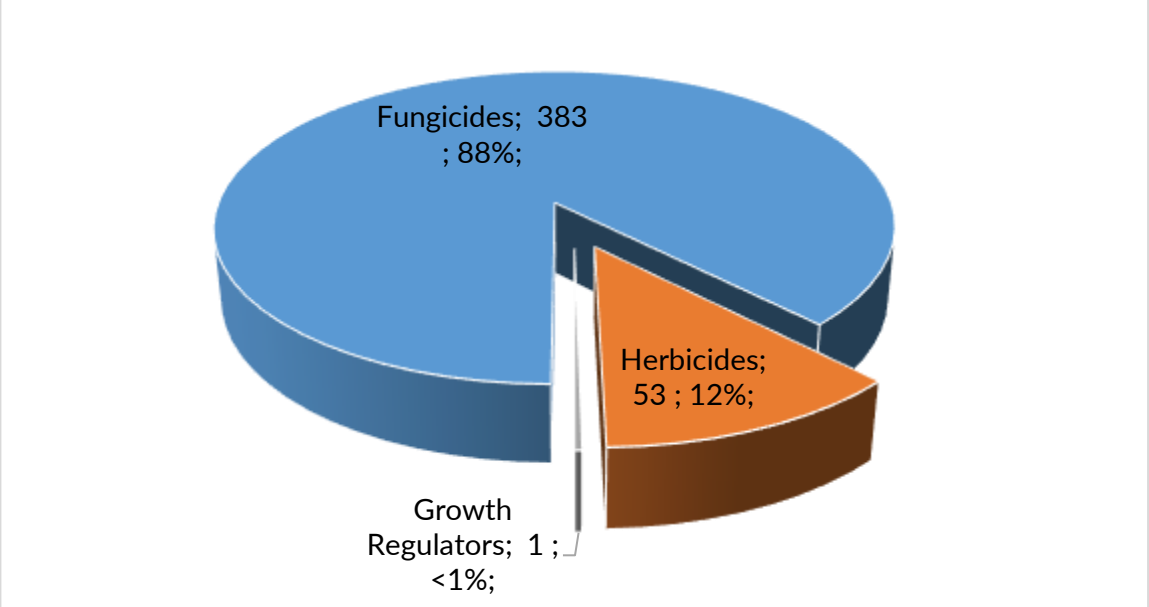


Table 8. The top 10 active ingredients most extensively used on cider apples in 2023, ranked by area treated (spray-hectares).

Active Substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Captan	165.45	54.22	264.73
Dodine	51.42	31.82	22.77
Pyrimethanil	51.16	41.36	15.57
Glyphosate	50.15	50.15	53.06
Sodium chloride	34.24	34.24	81.58
Bupirimate	33.85	22.02	7.62
Dithianon	33.85	22.02	11.85
Copper oxychloride	29.53	29.53	51.85
Boscalid	19.73	19.73	3.98
Fluxapyroxad	19.73	19.73	1.54

Table 9. The top 10 active ingredients most extensively used on cider apples in Ireland in 2023, ranked by weight (kg).

Active Substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Captan	264.73	165.45	54.22
Sodium chloride	81.58	34.24	34.24
Copper sulphate	59.18	11.84	11.84
Glyphosate	53.06	50.15	50.15
Copper oxychloride	51.85	29.53	29.53
Dodine	22.77	51.42	31.82
Pyrimethanil	15.57	51.16	41.36
Dithianon	11.85	33.85	22.02
Bupirimate	7.62	33.85	22.02
Boscalid	3.98	19.73	19.73

Pesticide usage on other top fruit crops

- 13 ha of other top fruit crops in Ireland.
- 157 treated hectares (spha).
- 151 kilograms applied.

Figure 10. Pesticide usage (spha) on other top fruit crops in Ireland, 2023.

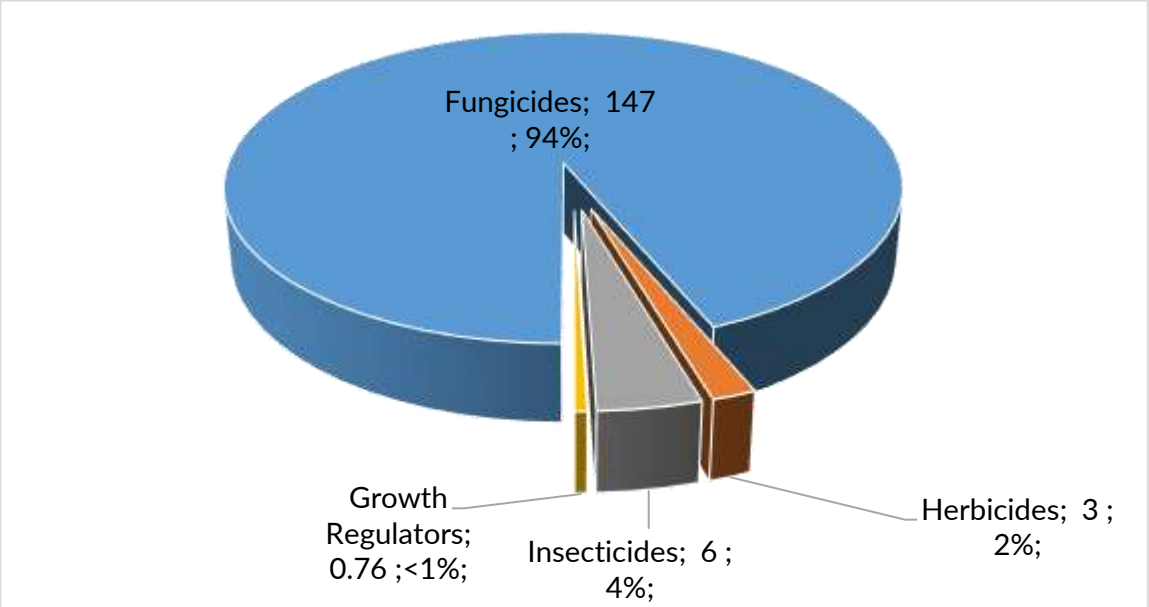


Figure 11. Weight of pesticides (kg) applied to other top fruit crops in Ireland, 2023.

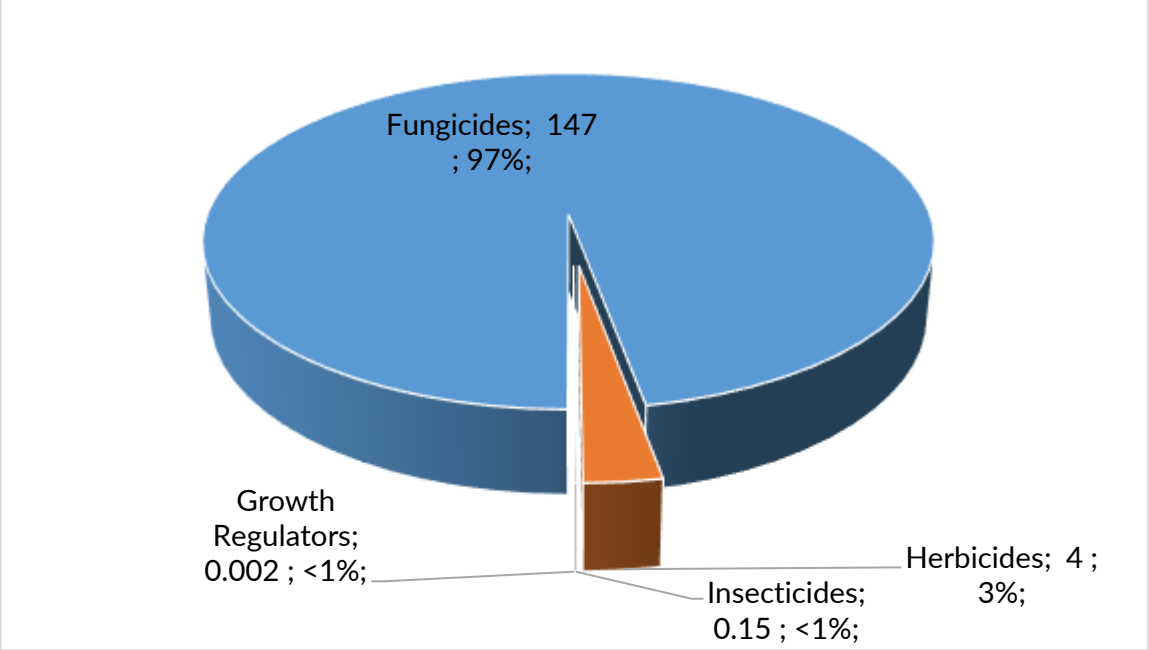


Table 10. The top 10 active ingredients most extensively used on other top fruit crops in 2023, ranked by area treated (spray-hectares).

Active Substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Captan	81.74	8.64	100.04
Dithianon	31.61	8.64	7.77
Potassium phosphonates	27.90	6.78	29.08
Bupirimate	25.61	6.40	3.20
Copper oxychloride	6.78	6.78	6.29
Chlorantraniliprole	6.40	6.40	0.15
Glyphosate	1.42	1.42	2.56
Glyphosate	0.93	0.93	1.67
Boscalid	0.76	0.38	0.15
Dodine	0.76	0.38	0.38

Table 11. The top 10 active ingredients most extensively used on other top fruit crops in Ireland in 2023, ranked by weight (kg).

Active Substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Captan	100.04	81.74	8.64
Potassium phosphonates	29.08	27.90	6.78
Dithianon	7.77	31.61	8.64
Copper oxychloride	6.29	6.78	6.78
Bupirimate	3.20	25.61	6.40
Glyphosate	2.56	1.42	1.42
Glyphosate	1.67	0.93	0.93
Dodine	0.38	0.76	0.38
Boscalid	0.15	0.76	0.38
Chlorantraniliprole	0.15	6.40	6.40

Table 12. Estimated area (hectares) of top fruit crops grown in Ireland, 2023.

Crop	Ireland
Bramley fruiting	351
Dessert	252
Cider	169
Other top fruit crops	13
Total	***784***

Table 13. Estimated area (spray-hectares) of top fruit crops treated regionally with each pesticide type in Ireland, 2023.

Pesticide type	Ireland
Fungicides	9,161
Herbicides	922
Insecticides	876
Growth regulators	399
Total	***11,358***

Table 14. Estimated weight (kgs) of pesticides applied to top fruit crops treated in Ireland, 2023.

Pesticide type	Ireland
Fungicides	6,940
Herbicides	731
Insecticides	172
Growth regulators	66
Total	***7,909***

Table 15. The total area (spray hectares) and the basic area (hectares), of top fruit crops in Ireland 2023 treated with each pesticide type.

Pesticide Type											
	Fungicides		Herbicides		Insecticides		Growth regulators		Total all pesticides		
Crop type	(ha)	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(sp ha)	(ha) treated	(ha) grown
Bramley fruiting	3,772	255	78	255	413	195	200	179	4,462	255	351
Dessert	4,818	198	792	198	457	156	188	156	6,254	198	252
Cider	424	74	50	74			10	10	485	74	169
Other top fruit crops	147	9	3	9	6	6	1	0	157	10	13
Total	***9,161***	***535***	***922***	***535***	***876***	***357***	***399***	***346***	***11,358***	***536***	***784***

Table 16. The total quantities (kilograms) of each pesticide type used on top fruit crops in Ireland 2023.

Pesticide Type					
Crop	Fungicides	Herbicides	Insecticides	Growth regulators	Total weight applied (kg)
Bramley fruiting	2,727	91	147	40	3,005
Dessert	3,683	583	25	24	4,315
Cider	383	53		1	437
Other top fruit crops	147	4	0	0	151
Total	***6,940***	***731***	***172***	***66***	***7,909***

Table 17. Estimated area (spray-hectares) of top fruit crops treated with pesticide formulations in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Fungicides					
Boscalid/pyraclostrobin	510.92	207.05	19.73	0.76	738.46
Bupirimate	218.67	325.07	33.85	25.61	603.21
Captan	1,065.50	663.62	165.45	81.73	1,976.31
Copper oxychloride	35.00	76.81	29.53	6.78	148.12
Cyprodinil/fludioxonil	82.24	23.16			105.41
Difenoconazole	231.64	157.82	19.60		409.05
Dithianon	111.28	667.79	33.85	3.71	816.64
Dithianon/potassium phosphonates	633.50	171.63		27.90	833.03
Dodine	369.39	1,143.30	51.42	0.76	1,564.87
Fluopyram	1.40	27.54			28.94
Fluxapyroxad	22.62	261.30	19.73		303.65
Kresoxim-methyl	9.00	9.00			18.00
Penthiopyrad		5.73			5.73
Proquinazid	59.02	291.90			350.91
Pyrimethanil	421.50	563.74	51.16		1,036.40
Sodium bicarbonate		35.89			35.89
Sulphur		186.65			186.65
All fungicides	***3,771.68***	***4,818.01***	***424.33***	***147.26***	***9,161.28***

Table 18 (cont.) Estimated area (spray-hectares) of top fruit crops treated with pesticide formulations in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Herbicides					
Fluazifop-P-butyl		5.73		0.38	6.11
Glyphosate	77.55	187.64	50.15	2.35	317.69
Pendimethalin		598.18			598.18
All herbicides	***77.55***	***791.55***	***50.15***	***2.73***	***921.98***

Table 19 (cont.) Estimated area (spray-hectares) of top fruit crops treated with pesticide formulations in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Insecticides					
Acetamiprid		11.45			11.45
Chlorantraniliprole	47.39	47.69		6.40	101.49
Deltamethrin		364.64			364.64
Fatty acids	35.00	3.82			38.82
Flonicamid	147.79				147.79
Spirotetramat	182.43	29.06			211.49
All insecticides	**412.60**	**456.67**		**6.40**	**875.67**

Table 20 (cont.) Estimated area (spray-hectares) of top fruit crops treated with pesticide formulations in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Growth regulators					
2-chloroethylphosphonic acid		119.64			119.64
Gibberellins	7.17	24.51		0.76	32.44
Prohexadione	193.07	43.63	10.18		246.88
All growth regulators	**200.24**	**187.77**	**10.18**	**0.76**	**398.96**

Table 21 (cont.) Estimated area (spray-hectares) of top fruit crops treated with pesticide formulations in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Total all pesticides	***4,462.08***	***6,254.00***	***484.65***	***157.16***	***11,357.89***

Table 22. Estimated quantities (kilograms) of pesticide formulations used on top fruit crops in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Fungicides					
Boscalid/pyraclostrobin	150.00	62.36	6.00	0.23	218.59
Bupirimate	28.49	60.26	7.62	3.20	99.57
Captan	1,226.48	863.58	264.73	100.04	2,454.83
Copper oxychloride	61.46	134.88	51.85	6.29	254.48
Cyprodinil/fludioxonil	29.07	10.63			39.69
Difenoconazole	14.04	8.92	1.23		24.18
Dithianon	38.95	233.73	11.85	1.30	285.82
Dithianon/potassium phosphonates	802.23	138.67		35.55	976.46
Dodine	212.64	754.25	22.77	0.38	990.05
Fluopyram	0.16	3.10			3.26
Fluxapyroxad	2.72	20.65	1.54		24.91
Kresoxim-methyl	0.90	0.90			1.80
Penthiopyrad		0.86			0.86
Proquinazid	2.95	14.59			17.55
Pyrimethanil	156.41	180.52	15.57		352.50
Sodium bicarbonate		0.54			0.54
Sulphur		1,194.56			1,194.56
All fungicides	***2,726.50***	***3,682.99***	***383.14***	***147.00***	***6,939.64***

Table 23. (cont.) Estimated quantities (kilograms) of pesticide formulations used on top fruit crops in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Herbicides					
Fluazifop-P-butyl		*0.72*		*0.05*	*0.76*
Glyphosate	*91.05*	*314.39*	*53.06*	*4.23*	*462.73*
Pendimethalin		*267.99*		-	*267.99*
All herbicides	***91.05***	***583.09***	***53.06***	***4.28***	***731.48***

Table 24. (cont.) Estimated quantities (kilograms) of pesticide formulations used on top fruit crops in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Insecticides					
Acetamiprid		0.86			0.86
Chlorantraniliprole	1.28	1.87		0.15	3.30
Deltamethrin		5.61			5.61
Fatty acids	100.76	10.99			111.75
Flonicamid	9.53				9.53
Spirotetramat	35.91	5.18			41.09
All insecticides	***147.48***	***24.51***		***0.15***	***172.14***

Table 25. (cont.) Estimated quantities (kilograms) of pesticide formulations used on top fruit crops in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Growth regulators					
2-chloroethylphosphonic acid		20.10			20.10
Gibberellins	0.03	0.09		0.00	0.12
Prohexadione	40.26	4.28	1.27		45.81
All growth regulators	***40.29***	***24.47***	***1.27***	***0.00***	***66.03***

Table 26. (cont.) Estimated quantities (kilograms) of pesticide formulations used on top fruit crops in Ireland, 2023.

Pesticide Type					
Pesticide type and formulation	**Bramley fruiting**	**Dessert**	**Cider**	**Other top fruit crops**	**All crops**
Total all pesticides	***3,005.33***	***4,315.07***	***437.47***	***151.43***	***7,909.30***

Table 27. The active ingredients most extensively used on top fruit crops in Ireland in 2023 ranked by area treated (spray-hectares).

No.	*Active Ingredient*	Treated area (sp ha)
1	*Captan*	1,976
2	*Dithianon*	1,650
3	*Dodine*	1,565
4	*Pyrimethanil*	1,036
5	*Potassium phosphonates*	833
6	*Boscalid*	738
7	*Pyraclostrobin*	738
8	*Bupirimate*	603
9	*Pendimethalin*	598
10	*Difenoconazole*	409
11	*Deltamethrin*	365
12	*Proquinazid*	351
13	*Glyphosate*	318
14	*Fluxapyroxad*	304
15	*Prohexadione*	247
16	*Sulphur*	233
17	*Spirotetramat*	211
18	*Copper oxychloride*	148
19	*Flonicamid*	148
20	*2-chloroethylphosphonic acid*	120
21	*Cyprodinil*	105
22	*Fludioxonil*	105
23	*Chlorantraniliprole*	101
24	*Fatty acids*	39
25	*Sodium bicarbonate*	36
26	*Gibberellins*	32
27	*Fluopyram*	29
28	*Kresoxim-methyl*	18
29	*Acetamiprid*	11
30	*Fluazifop-P-butyl*	6
31	*Penthiopyrad*	6

Table 28. The active ingredients most extensively used on top fruit crops in Ireland in 2023 ranked by weight (kilograms).

No.	*Active Ingredient*	Quantity (kgs)
1	*Captan*	2,455
2	*Sulphur*	1,284
3	*Dodine*	990
4	*Potassium phosphonates*	799
5	*Dithianon*	464
6	*Glyphosate*	463
7	*Pyrimethanil*	353
8	*Pendimethalin*	268
9	*Copper oxychloride*	254
10	*Boscalid*	145
11	*Fatty acids*	112
12	*Bupirimate*	100
13	*Pyraclostrobin*	74
14	*Prohexadione*	46
15	*Spirotetramat*	41
16	*Fluxapyroxad*	25
17	*Difenoconazole*	24
18	*Cyprodinil*	24
19	*2-chloroethylphosphonic acid*	20
20	*Proquinazid*	18
21	*Fludioxonil*	16
22	*Flonicamid*	10
23	*Deltamethrin*	6
24	*Chlorantraniliprole*	3
25	*Fluopyram*	3
26	*Kresoxim-methyl*	2
27	*Acetamiprid*	1
28	*Penthiopyrad*	1
29	*Fluazifop-P-butyl*	1
30	*Sodium bicarbonate*	1
31	*Gibberellins*	0.1

Table 29. Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for bramley fruiting apples, 2023.

Crop	*Active Ingredient*	Quantity (kg) applied	Treated area (sp ha)	Basic area (ha) treated
Bramley fruiting	***Fungicides***			
	Boscalid	99.47	510.92	179.37
	Bupirimate	28.49	218.67	113.34
	Captan	1,226.48	1,065.50	254.71
	Copper oxychloride	61.46	35.00	35.00
	Cyprodinil	17.44	82.24	80.97
	Difenoconazole	14.04	231.64	65.55
	Dithianon	185.13	744.78	199.34
	Dodine	212.64	369.39	203.17
	Fludioxonil	11.63	82.24	80.97
	Fluopyram	0.16	1.40	1.40
	Fluxapyroxad	2.72	22.61	12.01
	Kresoxim-methyl	0.90	9.00	9.00
	Potassium phosphonates	656.06	633.50	188.73
	Proquinazid	2.95	59.01	47.01
	Pyraclostrobin	50.52	510.92	179.37
	Pyrimethanil	156.41	421.50	194.76
	Sulphur	89.64	45.97	45.97
	Herbicides			
	Glyphosate	91.05	77.55	77.55
	Insecticides			
	Chlorantraniliprole	1.28	47.39	45.99
	Fatty acids	100.76	35.00	35.00
	Flonicamid	9.53	147.79	147.79
	Spirotetramat	35.91	182.43	147.43
	Growth regulator			
	Gibberellins	0.03	7.17	4.37
	Prohexadione	40.26	193.07	176.40

Table 30. Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for dessert apples, 2023.

Crop	*Active Ingredient*	Quantity (kg) applied	Treated area (sp ha)	Basic area (ha) treated
Dessert	***Fungicides***			
	Boscalid	41.36	207.04	161.86
	Bupirimate	60.26	325.07	154.22
	Captan	863.58	663.61	172.71
	Copper oxychloride	134.89	76.81	35.96
	Cyprodinil	6.38	23.16	15.53
	Difenoconazole	8.92	157.82	131.09
	Dithianon	259.00	839.42	168.90
	Dodine	754.25	1,143.30	154.41
	Fludioxonil	4.25	23.16	15.53
	Fluopyram	3.10	27.54	21.81
	Fluxapyroxad	20.65	261.30	138.69
	Kresoxim-methyl	0.90	9.00	9.00
	Penthiopyrad	0.86	5.73	5.73
	Potassium phosphonates	113.41	171.63	145.36
	Proquinazid	14.60	291.90	154.22
	Pyraclostrobin	21.00	207.04	161.86
	Pyrimethanil	180.52	563.74	172.41
	Sodium bicarbonate	0.54	35.89	5.98
	Sulphur	1,194.56	186.65	145.79
	Herbicides			
	Fluazifop-P-butyl	0.72	5.73	5.73
	Glyphosate	314.39	187.64	91.01
	Pendimethalin	267.99	598.18	119.64
	Insecticides			
	Acetamiprid	0.86	11.45	5.73
	Chlorantraniliprole	1.87	47.69	32.62
	Deltamethrin	5.61	364.64	125.36
	Fatty acids	10.99	3.82	3.82
	Spirotetramat	5.18	29.06	25.24
	Growth regulator			
	2-chloroethylphosphonic acid	20.10	119.64	119.64
	Gibberellins	0.09	24.51	12.06
	Prohexadione	4.28	43.63	27.54

Table 31. Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for cider apples, 2023.

Crop	Active Ingredient	Quantity (kg) applied	Treated area (sp ha)	Basic area (ha) treated
Cider	**Fungicides**			
	Boscalid	3.98	19.73	19.73
	Bupirimate	7.62	33.85	22.02
	Captan	264.73	165.45	54.22
	Copper oxychloride	51.85	29.53	29.53
	Difenoconazole	1.23	19.60	9.80
	Dithianon	11.85	33.85	22.02
	Dodine	22.77	51.42	31.82
	Fluxapyroxad	1.54	19.73	19.73
	Pyraclostrobin	2.02	19.73	19.73
	Pyrimethanil	15.57	51.16	41.36
	Herbicides			
	Copper sulphate	59.18	11.84	11.84
	Glyphosate	53.06	50.15	50.15
	Growth regulator			
	Prohexadione	1.27	10.18	10.18

Table 32. Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance other top fruit crops, 2023.

Crop	Active Ingredient	Quantity (kg) applied	Treated area (sp ha)	Basic area (ha) treated
Other top fruit crops	**Fungicides**			
	Boscalid	0.15	0.76	0.38
	Bupirimate	3.20	25.61	6.40
	Captan	100.04	81.74	8.64
	Copper oxychloride	6.29	6.78	6.78
	Dithianon	7.77	31.61	8.64
	Dodine	0.38	0.76	0.38
	Potassium phosphonates	29.08	27.90	6.78
	Pyraclostrobin	0.08	0.76	0.38
	Herbicides			
	Fluazifop-P-butyl	0.05	0.38	0.38
	Glyphosate	4.23	2.35	2.35
	Insecticides			
	Chlorantraniliprole	0.15	6.40	6.40
	Growth regulator			
	Gibberellins	0.00	0.76	0.38

Acknowledgements

This report was compiled by Angela Ryan, DAFM. Sincere thanks to the invaluable assistance from the team in AFBI of Michael Lavery, Joanna Kirbas, David Matthews, Trudyann Kelly and Amanda Browne. Thanks to all the survey participants 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 Pesticides Controls Division (PCD) Division of the Department of Agriculture, Food and the Marine. Interviews with survey participants were conducted by Angela Ryan and Mary Ryan.

References

Pesticide Control Service, Department of Agriculture and Food Laboratories (2015), *Pesticide Usage Survey*, *Report Number 1*, *Top Fruit Crops*, *(2014)*.

Pesticide Control Service, Department of Agriculture and Food Laboratories (2019), *Pesticide Usage Survey*, *Report Number 2*, *Top Fruit Crops*, *(2018)*.