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

Pesticide Usage in Ireland

Grassland & Fodder Crops Survey Report 2013

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GRASSLAND & FODDER CROPS SURVEY REPORT 2013

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Summary

This is the second survey of pesticide usage on grassland and fodder crops in Ireland carried out by DAFM, providing comparative data to that obtained in the previous survey in 2003.

Information on all aspects of pesticide usage was collected from 500 holdings across Ireland representing 0.006% of the total area of grassland and fodder crops grown. Quantitative data have been adjusted to provide estimates of total pesticide usage.

In 2013 an estimated 4,698,451 hectares of grassland and fodder crops were grown which represents an 8 % increase compared to total estimated area in 2003. In 2013 an estimated 596,487 kgs of active substance was applied to grassland and fodder crops which represents a 5% increase in weight of pesticide applied compared to 2003.

A total of 78 active substances were recorded in use on grassland and fodder crops in the survey.

Herbicides were applied to 93% of the pesticide-treated area, representing 98% of the total weight of pesticides used. Fungicides were applied to 2% of the pesticide-treated area, accounting for 1% of the total weight of pesticides used. Insecticides were applied to less than 1% of the pesticide treated area, representing less than 1% of the weight of pesticides applied. Molluscicide treatments represented 1% of pesticide treated area and less than 1% of the weight of pesticides applied. Growth regulator usage accounted for less than 1% of the pesticide-treated area and less than 1% of the weight of active substance applied. Seed treatments were applied to 3% of the pesticide-treated area, representing less than 1% of the weight of active substances applied.

Permanent grassland comprised 61% of the area of grassland and fodder crops in Ireland 2013, accounting for 44% of the total pesticide treated area and 54% of the total weight of pesticides used on all grassland and fodder crops. Permanent grassland accounted for 47% of the area of grassland and fodder crops treated with herbicide and received 54% of the total weight of herbicides applied.

Grass silage 1st cut comprised 19% of the area of grassland and fodder crops in Ireland 2013, accounting for 19% of the total pesticide treated area and 17.0% of the total weight of pesticides used on grassland and fodder crops. Grass silage 1st cut accounted for 20% of the area of crops treated with herbicide and received 17% of the weight of total herbicides applied.

Grass reseed comprised 2% of the area of grassland and fodder crops in Ireland 2013, accounting for 13% of the total pesticide treated area and 16% of the total weight of pesticides used on all grassland and forage crops. Grass reseeds accounted for 14% of the area of crops treated with herbicide and received 16% of the total weight of herbicides applied.

Fodder maize compromised less than 1% of the area of grassland and fodder crops grown in Ireland in 2013, accounting for 7% of the total pesticide-treated area and 5% of the total weight of pesticides used on all grassland and fodder crops. Fodder maize accounted for 5% of the area of crops treated with herbicide and received 4% of the total weight of herbicides applied. Applications of fungicides to fodder maize represented 7% of the area of crops treated with fungicides and 6% of the total weight of fungicides applied.

Fodder beet compromised less than 1% of the area of grassland and fodder crops grown in Ireland in 2013, accounting for 10% of the total pesticide-treated area and 4% of the total weight of pesticides used on all crops. Fodder beet accounted for 8% of the area of crops treated with herbicide and received 4% of the total weight of herbicides applied. Applications of fungicides to fodder beet represented 28% of the area of crops treated with fungicides and 24% of the total weight of fungicides applied.

No applications of pesticides to 3rd and 4th cut grass silage were noted during the survey.

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.

- 'Arable silage'; is defined as arable crops particularly cereals, which has been ensiled whole and has not been combined for grain.

- 'Rough grazing'; is defined as land containing semi natural vegetation including heathland, heather moorland, bog and rough grassland suitable only for use as grazing.

- 'Spray applications'; refers to the number of treatments of any pesticide type to the treated areas.

- 'PPP'; refers to plant protection product.

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 from each of the 26 counties, on the basis of the total area of grassland and fodder crops grown, using data from the Department of Agriculture Food and 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 six size groups, according to the total area of grassland and fodder 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 500 holdings were contacted during the period April to June 2014 and data collected by phone interview for grassland and fodder crops grown in 2013. 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	<10 ha Holdings sampled	10<20 ha Holdings sampled	20<30 ha Holdings sampled	30<50 ha Holdings sampled	50<100 ha Holdings sampled	>100 ha Holdings sampled	Total Holdings sampled
East	6	8	7	27	24	10	82
South	16	21	24	45	72	21	199
North/West	9	35	41	59	51	24	219
Ireland	***31***	***64***	***72***	***131***	***147***	***55***	***500***

Crops

Information was collected for permanent grassland, grass silage (1st, 2nd, 3rd & 4th cuts), rough grazing, arable silage, grass reseed, fodder maize, fodder beet, hay & haylage , fodder turnip & fodder swedes and fodder kale & fodder rape.

The number and areas of crops surveyed are shown in Table C. Data from 500 farms provided information on 1461 examples of 12 crop types. The total area of crops sampled in the survey (31,419 ha) was representative of the area of grassland and fodder crops grown in Ireland in 2013 (4,698,451 ha).

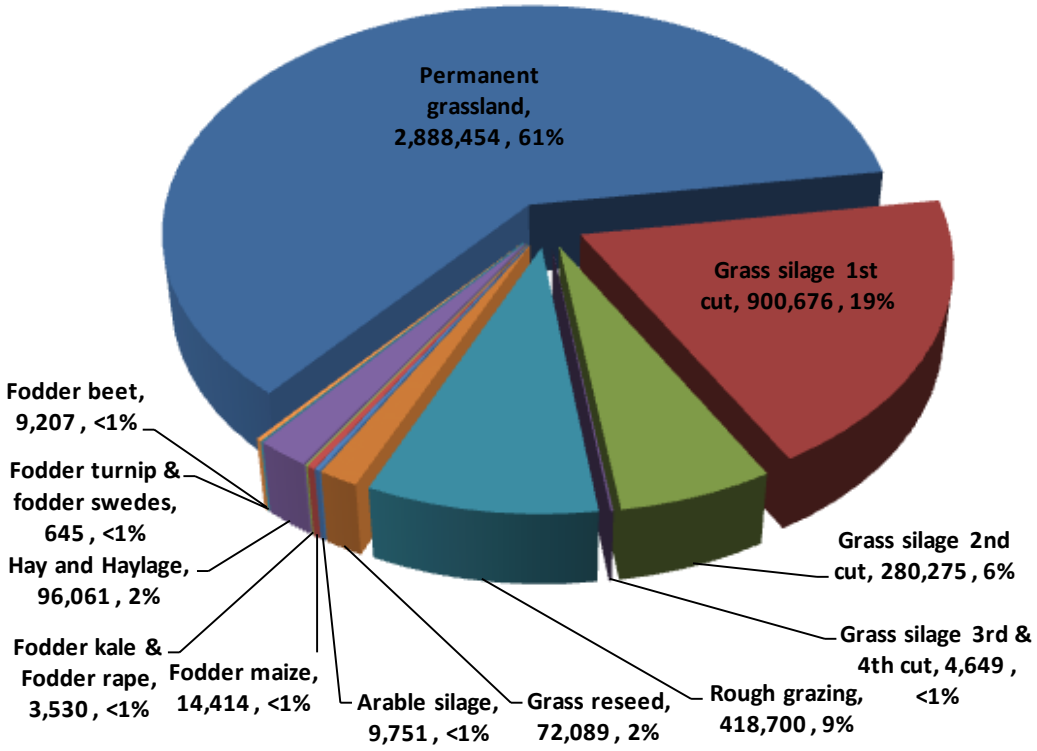
Table C: The total number and area (hectares) of crops sampled, estimated total area and the proportion (%) of the total area of grassland and fodder crops surveyed in Ireland, 2013.

Crop	Number of crops surveyed	Survey area (ha)	Estimated area (ha)	Proportion of crops surveyed (%)
Permanent grassland	546	19,705	2,888,454	0.68%
Grass silage 1st cut	361	5,795	900,676	0.64%
Grass silage 2nd cut	152	1,984	280,275	0.71%
Grass silage 3rd & 4th cut	3	40	4,649	0.86%
Rough grazing	32	1,069	418,700	0.26%
Grass reseed	100	493	72,089	0.68%
Arable silage	51	616	9,751	6.32%
Fodder maize	41	534	14,414	3.71%
Fodder Kale & Fodder Rape	16	175	3,530	4.95%
Hay and Haylage	111	631	96,061	0.66%
Fodder Turnip & Fodder swedes	6	26	645	3.98%
Fodder beet	42	350	9,207	3.80%
Total	***1461***	***31,419***	***4,698,451***	***0.67%***

Permanent grassland covered an estimated 61% of the total area of grassland and fodder crops in 2013. Grass silage 1st and 2nd cuts accounted for 19% and 6% of the area of grassland and fodder crops in 2013 respectively. Grass reseed and rough grazing accounted for 2% and 9% of the total area of grassland and fodder crops in 2013 respectively. Hay and haylage accounted for 2% of the total area of grassland

and fodder crops in 2013. Fodder maize and fodder beet each accounted for <1% of the total area of grassland and fodder crops in 2013.

Figure 1: Areas of individual grassland and fodder crops grown in Ireland (ha), 2013.



Regional distribution of crops

The North/West region had the largest area of grassland and forage crops during 2013, accounting for 45% of the area of grassland and fodder crops grown and 43% of the total pesticide-treated area. Overall, 53% of the weight of herbicides, 16% of the weight of fungicides, 3% of the weight of molluscicides, 9% of the weight of growth regulators and 27% of the weight of seed treatments were applied to grassland and fodder crops in this region.

The South region accounted for 43% of the total area of grassland and fodder crops grown and 39% of the total pesticide-treated area. Overall 34% of the weight of herbicides, 46% of the weight of fungicides, 71% of the weight of insecticides, 95% of the weight of molluscicides, 77% of the weight of growth regulators and 40% of the weight of seed treatments were applied to grassland and fodder crops in this region.

The East region accounted for 12% of the total grassland and fodder crop area and 18% of the pesticide treated area. Overall, 14% of the weight of herbicides, 37% of the weight of fungicides, 29% of the weight of insecticides, 3% of the weight of molluscicides, 14% of the weight of growth regulators and 32% of the weight of seed treatments were applied to grassland and fodder crops in this region.

Figure 2: Regional distribution (ha) of grassland and fodder crops grown in Ireland, 2013.

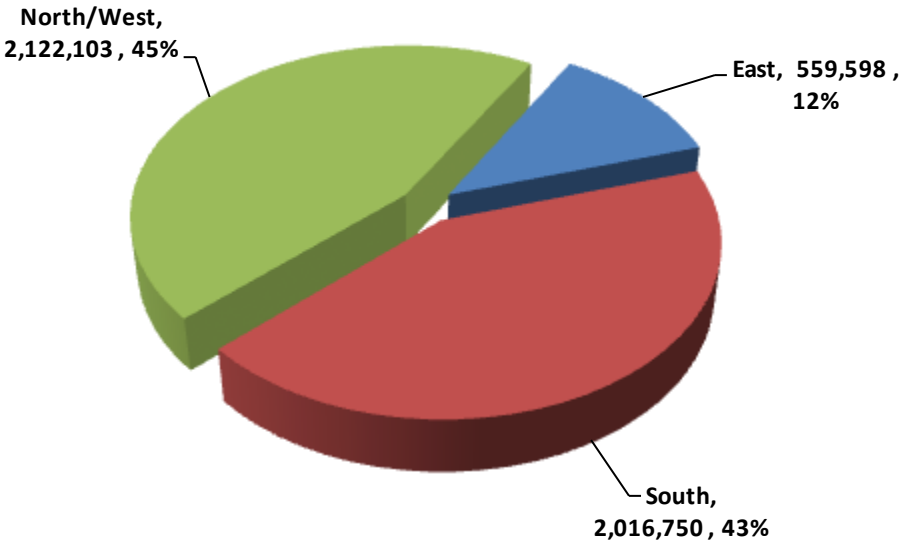


Figure 3: Regional distribution (ha) of individual grassland and fodder crops grown in Ireland, 2013.

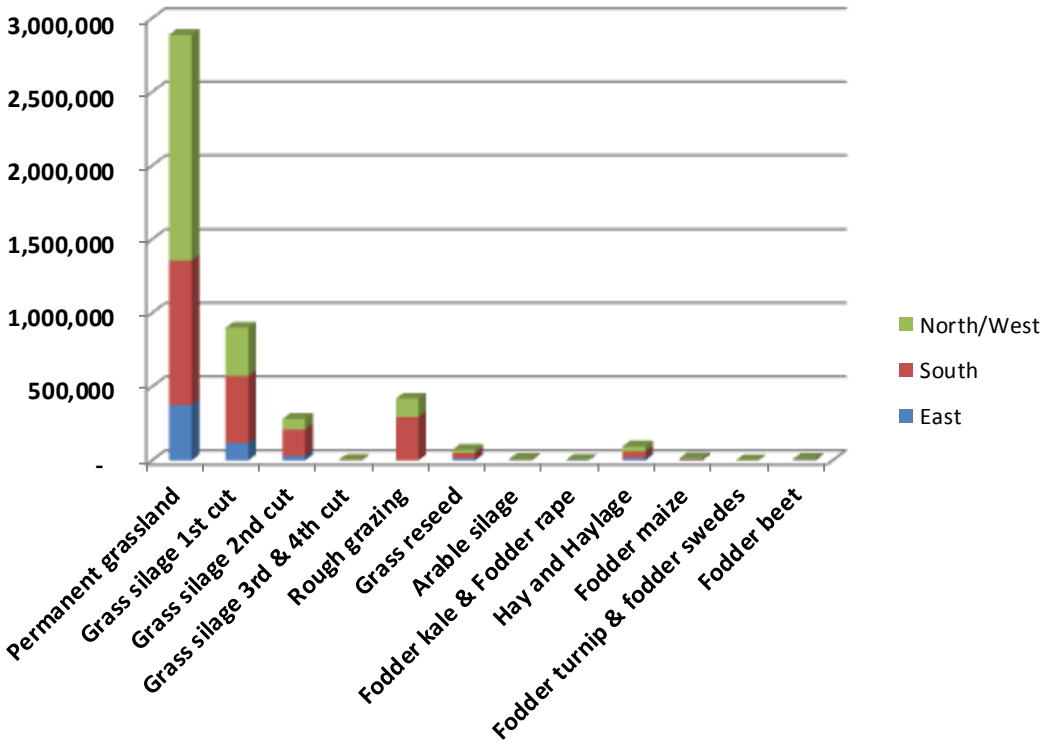


Figure 4: Regional distribution (ha) of all grassland crops grown in Ireland, 2013.

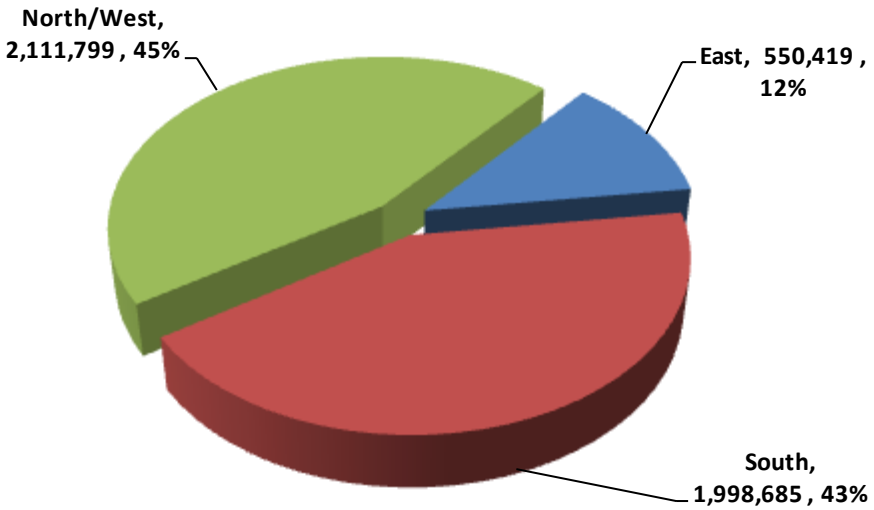
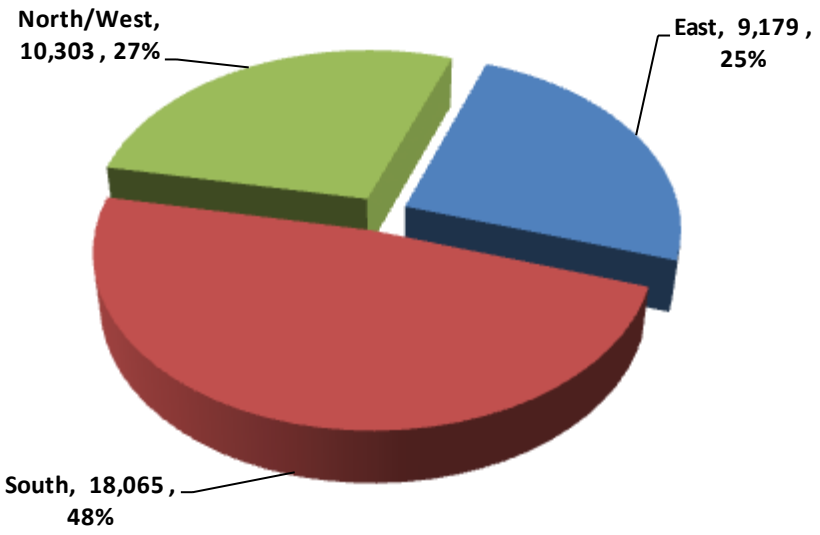


Figure 5: Regional distribution (ha) of fodder crops grown in Ireland, 2013.



Pesticide usage

Herbicides were applied to 93% of the pesticide-treated area accounting for 98% of the total weight of pesticides used. Fungicides were applied to 2% of the pesticide-treated area and accounted for 1% of the total weight of pesticides used. Insecticides were applied to less than 1% of the pesticide treated area of grassland and fodder crops, accounting for less than 1% of the weight of pesticides applied. Molluscicide treatments represented 1% of pesticide treated area and less than 1% of the weight of pesticides applied. The use of growth regulators accounted for less than 1% of the pesticide-treated area and less than 1% of the weight of active substance applied. Seed treatment usage accounted for 3% of the pesticide-treated area, representing less than 1% of the weight of active substances applied.

Figure 6: Pesticide usage (spha) on grassland and fodder crops treated in Ireland, 2013.

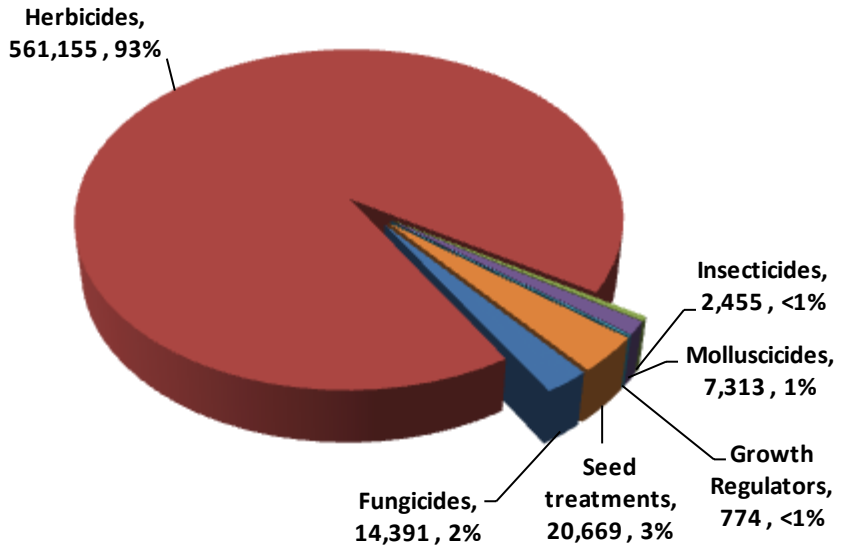
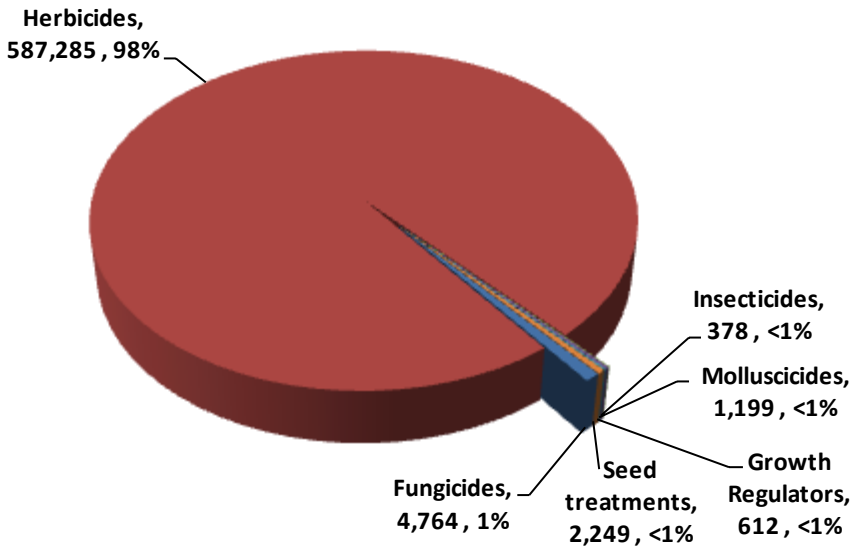


Figure 7: Weight (kgs) of pesticides applied to grassland and fodder crops treated in Ireland, 2013.



The use of herbicide on grassland crops accounted for 99% of the grassland pesticide treated area and 99% of the total weight of pesticides applied to grassland crops. The use of molluscicides on grassland crops accounted for less than 1% of the grassland pesticide treated area and less than 1% of the total weight of pesticides applied to grassland crops.

Figure 8: Pesticide usage (spha) on grassland crops treated in Ireland, 2013.

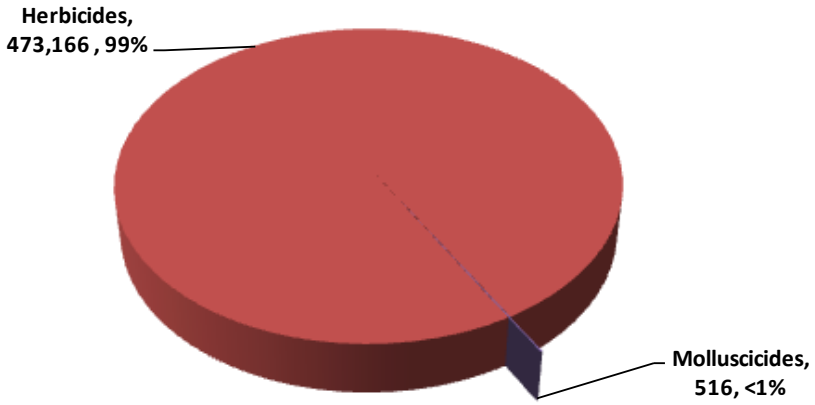
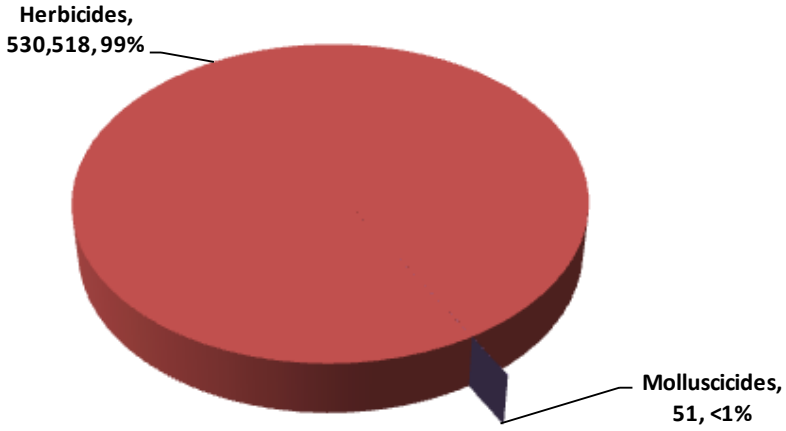


Figure 9: Weight (kgs) of pesticides applied to grassland crops treated in Ireland, 2013.



The use of herbicide on fodder crops accounted for 66% of the fodder crop treated area and 86% of the total weight of pesticides applied to fodder crops. The use of fungicides on fodder crops accounted for 11% of the fodder crop pesticide treated area and 7% of the total weight of pesticides applied to fodder crops. Seed treatments on fodder crops accounted for 15% of the pesticide treated area and 3% of the total weight of pesticides applied to fodder crops. The use of molluscicides on fodder crops accounted for 5% of the pesticide treated area and 2% of the total weight of pesticides applied to fodder crops.

Figure 10: Pesticide usage (spha) on fodder crops grown in Ireland, 2013.

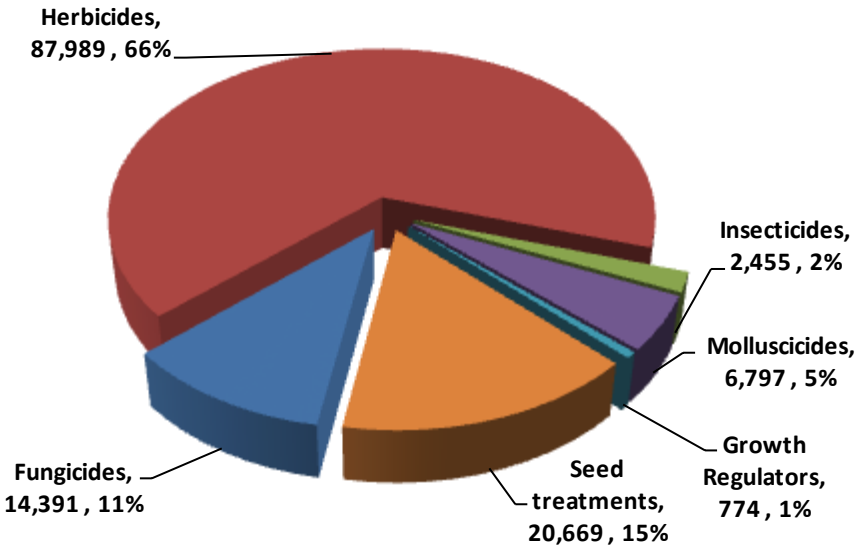
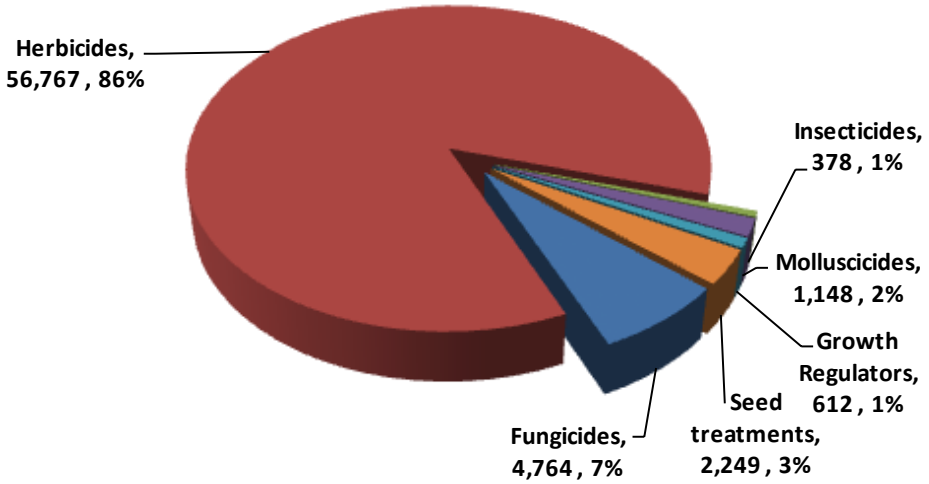


Figure 11: Weight of pesticides (kg) applied to fodder crops grown in Ireland, 2013.



Grassland & fodder crop areas 2003-2013

The largest proportional change in crop areas when comparing 2003 with 2013 data is fodder kale and rape where the area has increased from 800 ha to 3,530 ha. The second largest increase is in fodder beet where the area has increased from 3,239 ha to 9,207 ha. Grass area has increased from 4,300,032 ha to 4,660,903 ha. Arable silage as well as turnips & swedes witnessed a reduction in areas grown of 67% and 46% respectively when compared to 2003 areas. Details of changes in crop areas between 2003 and 2013 are outlined in Table D below.

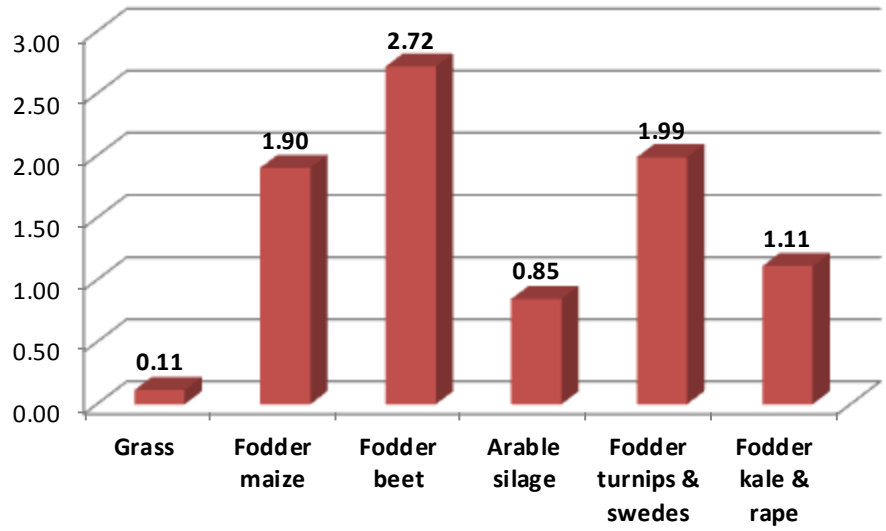
Table D: Grassland and fodder crops areas (ha) for surveys in 2003 and 2013 and percentage (%) change in areas grown.

	Ha grown		
Crop	2003	2013	% change
Grass	4,300,032	4,660,903	8
Fodder maize	14,541	14,414	-1
Fodder beet	3,239	9,207	184
Arable silage	29,400	9,751	-67
Fodder turnips & swedes	1,200	645	-46
Fodder kale & rape	800	3,530	341
All crops	4,349,212	4,698,451	8

Quantity of pesticide applied per crop, 2003-2013

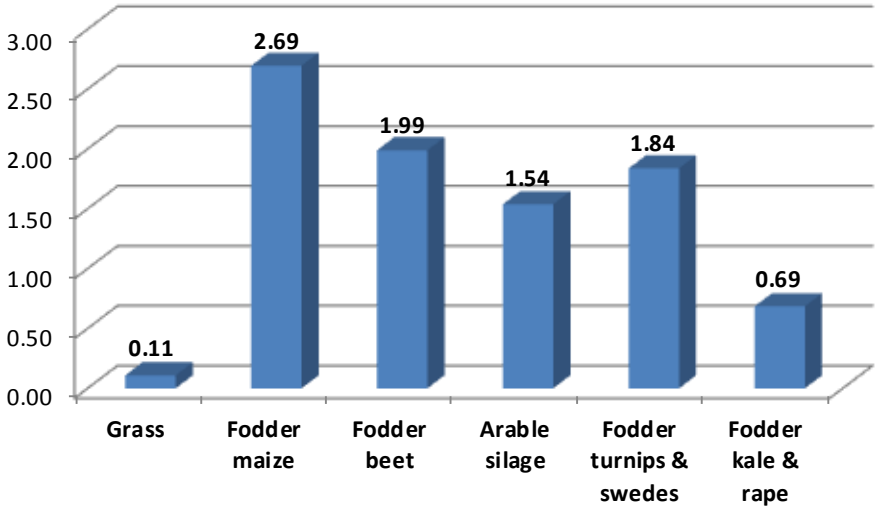
The average weight of pesticide applied per hectare of crop grown for each crop in 2013 is provided in Figure 12. Average weights were calculated as the total weight of pesticides applied divided by the total area of crop grown (whether treated or untreated).

Figure 12: Average weight of pesticides applied per hectare of crop grown in Ireland (kg/ha), 2013.



The highest weight of pesticides applied per hectare was on fodder beet (2.72kg/ha). Fodder turnips & swedes had the next highest levels of pesticide use (1.99kg/ha) followed by fodder maize (1.90kg/ha). The average weight of pesticide applied per hectare of crop grown as per 2003 survey is provided in Figure 13.

Figure 13: Average weight of pesticides applied per hectare of crop grown in Ireland (kg/ha), 2003.



The quantity of pesticides applied to fodder maize decreased from 2.69kgs/ha (2003) to 1.90kg/ha (2013). In addition the quantity of pesticides applied to arable silage crops has reduced from 1.54 kgs/ha (2003) to 0.85 kg/ha (2013). The quantity of pesticides applied to fodder beet has increased from 1.99 kg/ha (2003) to 2.72 kg/ha (2013).

Pesticide applied on crop growing area, 2003-2013.

The average weight of pesticide applied per hectare of crop grown for 2003 and 2013 including percentage change is provided.

Grass

Quantities (kg/ha) of insecticides decreased by 100% when comparing 2003 and 2013. Quantities of herbicide applied increased by 3% over the same period. Quantities of molluscicides increased by 100% over the same period. No applications of fungicides, seed treatments and growth regulators to grassland were noted during the survey. Overall the quantity of pesticides applied to grassland increased by 3% when comparing 2003 and 2013.

Figure 14: Quantity of pesticide type (kg/ha) and percentage change (%) for grass for surveys in 2003 and 2013.

	Kg/ha on area grown		
Pesticide type	2003	2013	% change
Fungicides			
Herbicides (incl. spot tr)	0.11	0.11	3
Insecticides	0.00005	0.00000	-100
Molluscicides	0.00000	0.00001	100
Growth Regulators			
Seed treatments			
All pesticides	0.11	0.11	3

Fodder crops

Quantities (kg/ha) of fungicides, insecticides, growth regulators and seed treatments decreased by 51%, 50%, 90% and 25% respectively when comparing 2003 and 2013. Quantities (kg/ha) of herbicides & molluscides increased by 11% and >100% respectively when comparing 2003 and 2013. Overall the quantity of pesticides applied to fodder crops decreased by 7% when comparing 2003 and 2013.

Figure 15: Quantity of pesticide type (kg/ha) and percentage change (%) for fodder maize for surveys in 2003 and 2013.

	Kg/ha on area grown		
Pesticide type	2003	2013	% change
Fungicides	0.26	0.13	-51
Herbicides	1.36	1.51	11
Insecticides	0.02	0.01	-50
Molluscicides	0.0013	0.03	>100
Growth Regulators	0.17	0.02	-90
Seed treatments	0.08	0.06	-25
All pesticides	1.89	1.76	-7

Pesticide usage survey results 2013

Pesticide usage on permanent grassland

2,888,454 ha of permanent grassland in Ireland.

264,129 treated hectares.

319,156 kilogrammes applied (100% pesticides)

8.4% of the area of permanent grassland received a pesticide treatment

Figure 16: Proportional area of permanent grassland treated with each pesticide group in Ireland, 2013.

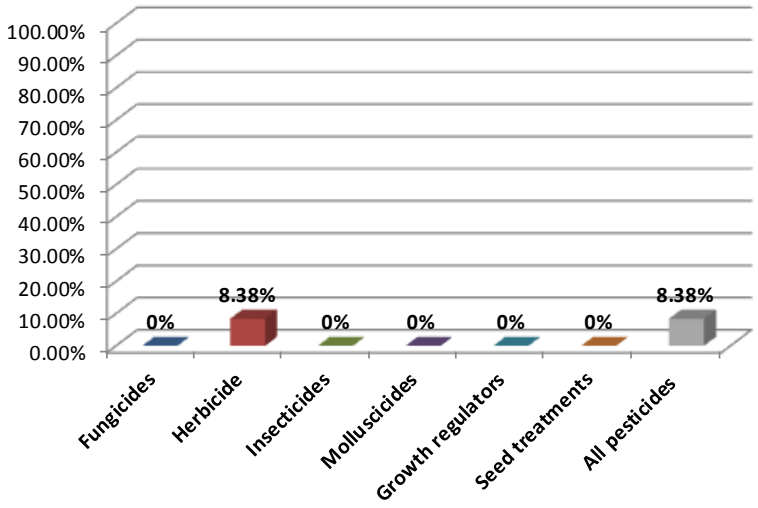


Figure 17: The top 10 active ingredients most extensively used on permanent grassland in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
MCPA	136,998	134,179	207,316
Triclopyr	55,888	55,373	15,473
Fluroxypyr	36,370	36,370	8,142
Clopyralid	26,437	26,437	2,611
Glyphosate	22,541	22,541	23,601
2,4-D	20,251	20,251	26,229
Mecoprop-P	20,196	17,592	14,355
Dicamba	19,398	16,794	4,063
Amidosulfuron	10,397	10,397	399
Pendimethalin	8,815	8,815	12,341

Figure 18: The top 10 active ingredients most extensively used on permanent grassland in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
MCPA	207,316	136,998	134,179
2,4-D	26,229	20,251	20,251
Glyphosate	23,601	22,541	22,541
Triclopyr	15,473	55,888	55,373
Mecoprop-P	14,355	20,196	17,592
Pendimethalin	12,341	8,815	8,815
Fluroxypyr	8,142	36,370	36,370
Dicamba	4,063	19,398	16,794
Dichlorprop-P	3,946	5,092	5,092
Clopyralid	2,611	26,437	26,437

Pesticide usage on grass silage 1st cut

900,676 ha of grass silage 1st cut in Ireland.

112,626 treated hectares.

99,617 kilogrammes applied (100% herbicides).

12.1% of the area of 1st cut silage received a pesticide treatment.

Figure 19: Proportional area of grass silage 1st cut treated with each pesticide group in Ireland, 2013.

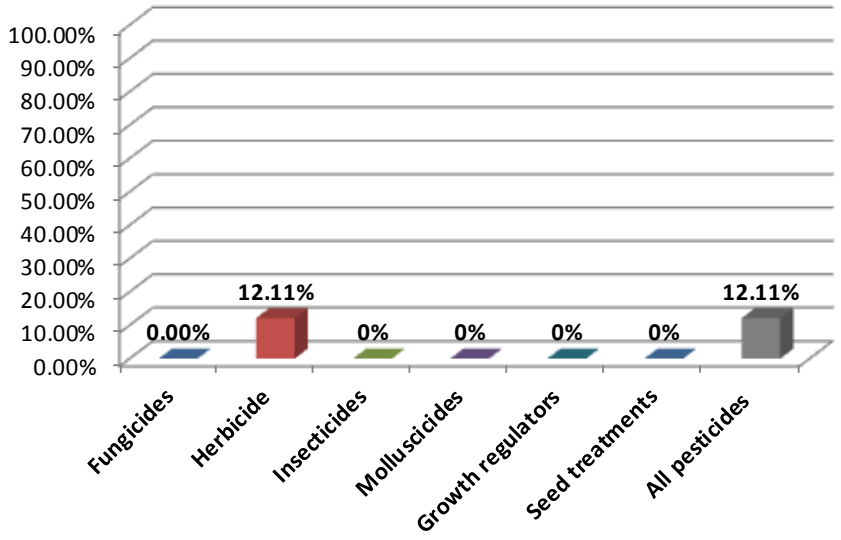


Figure 20: The top 10 active ingredients most extensively used on grass silage 1st cut in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Triclopyr	44,615	44,615	12,700
Fluroxypyr	32,770	32,770	8,655
MCPA	32,010	32,010	45,552
Dicamba	21,337	21,337	3,663
Mecoprop-P	17,152	17,152	14,956
Amidosulfuron	13,067	13,067	504
Clopyralid	11,406	11,406	1,134
2,4-D	9,688	9,688	11,643
Thifensulfuron-methyl	978	978	11
Aminopyralid	823	823	49

Figure 21: The top 10 active ingredients most extensively used on grass silage 1st cut in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
MCPA	45,552	32,010	32,010
Mecoprop-P	14,956	17,152	17,152
Triclopyr	12,700	44,615	44,615
2,4-D	11,643	9,688	9,688
Fluroxypyr	8,655	32,770	32,770
Dicamba	3,663	21,337	21,337
Clopyralid	1,134	11,406	11,406
Glyphosate	750	696	696
Amidosulfuron	504	13,067	13,067
Aminopyralid	49	823	823

Pesticide usage on grass silage 2nd cut

280,275 ha of grass silage 2nd cut in Ireland.

10,497 treated hectares.

6,209 kilogrammes applied (100% herbicides)..

3.8% of the area of grass silage 2nd cut received a pesticide treatment

Figure 22: Proportional area of grass silage 2nd cut treated with each pesticide group in Ireland, 2013.

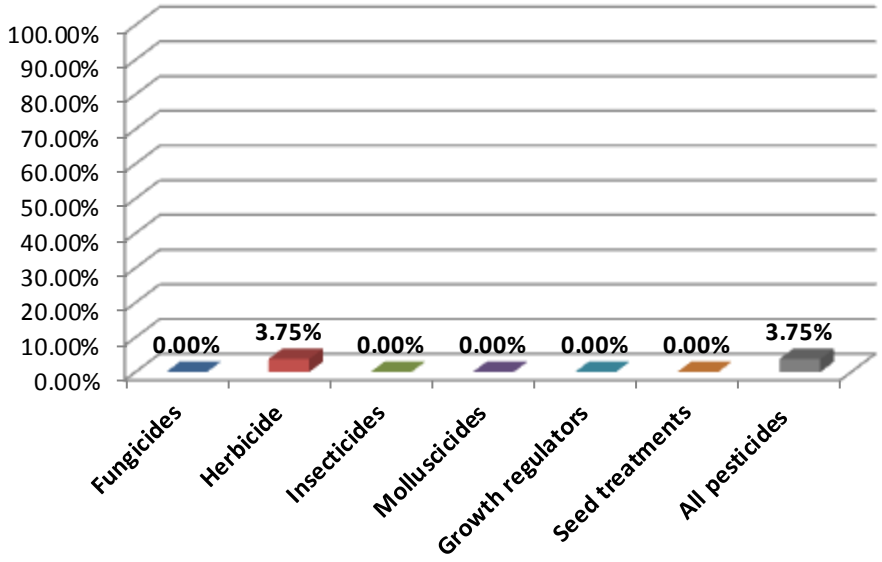


Figure 23: The top 9 active ingredients most extensively used on grass silage 2nd cut in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Triclopyr	4,277	4,277	1,018
Dicamba	3,716	3,716	1,002
Amidosulfuron	3,309	3,309	99
Fluroxypyr	2,706	2,706	642
2,4-D	2,625	2,625	2,100
Aminopyralid	1,468	1,468	123
Mecoprop-P	1,091	1,091	818
Clopyralid	415	415	26
Glyphosate	352	352	380

Figure 24: The top 9 active ingredients most extensively used on grass silage 2nd cut in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
2,4-D	2,100	2,625	2,625
Triclopyr	1,018	4,277	4,277
Dicamba	1,002	3,716	3,716
Mecoprop-P	818	1,091	1,091
Fluroxypyr	642	2,706	2,706
Glyphosate	380	352	352
Aminopyralid	123	1,468	1,468
Amidosulfuron	99	3,309	3,309
Clopyralid	26	415	415

Pesticide usage on rough grazing

418,700 ha of rough grazing in Ireland.

5,045 treated hectares.

8,293 kilogrammes applied (100% herbicides).

1.2% of the area of rough grazing received a pesticide treatment.

Figure 25: Proportional area of rough grazing treated with each pesticide group in Ireland, 2013.

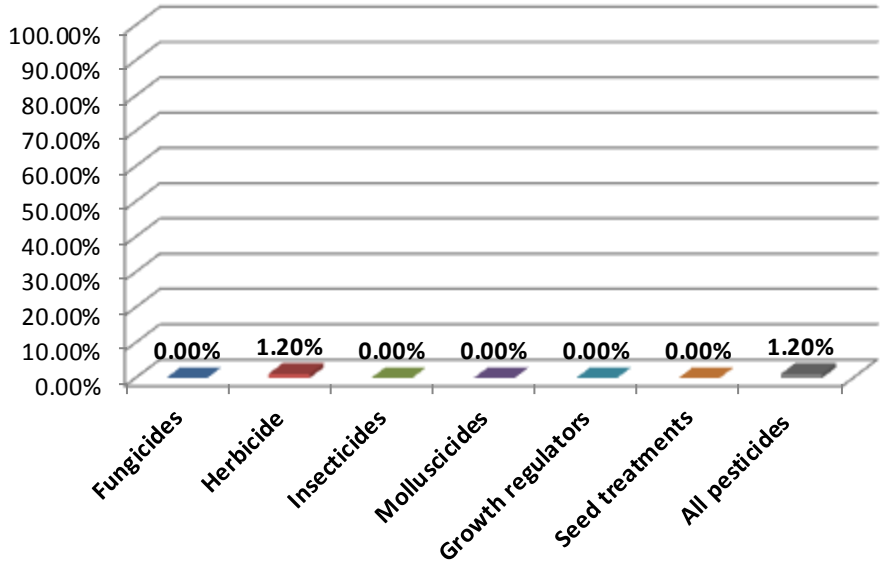


Figure 26: The top 2 active ingredients most extensively used on rough grazing in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Glyphosate	2,668	2,668	4,802
MCPA	2,378	2,378	3,492

Figure 27: The top 2 active ingredients most extensively used on rough grazing in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Glyphosate	4,802	2,668	2,668
MCPA	3,492	2,378	2,378

Pesticide usage on grass reseed.

72,089 ha of grass reseed in Ireland.

80,075 treated hectares.

96,560 kilogrammes applied.

92.4% of the area of grass reseed received a pesticide treatment

Figure 28: Proportional area of grass reseed treated with each pesticide group in Ireland, 2013.

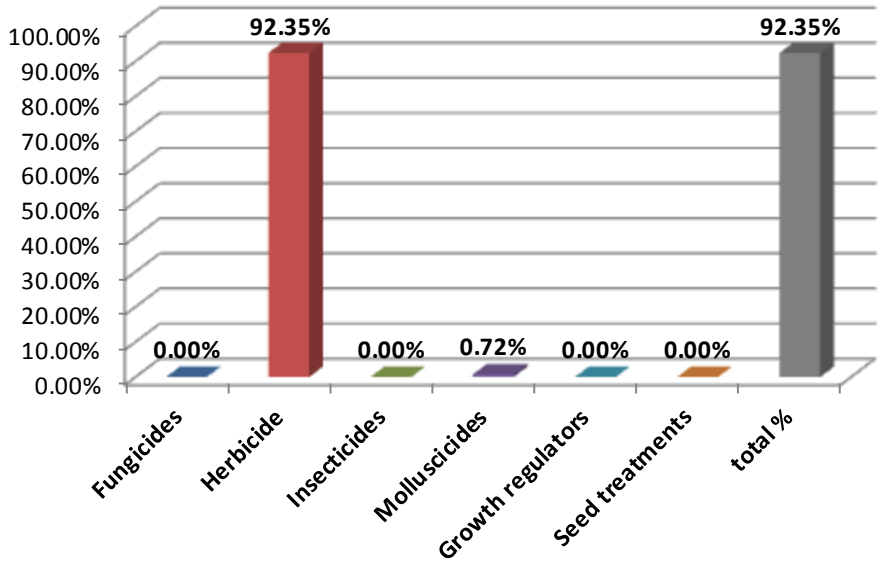


Figure 29: The top 10 active ingredients most extensively used on grass reseed in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Glyphosate	59,373	59,373	75,159
2,4-DB	9,513	9,513	12,211
MCPA	7,959	7,959	2,254
Mecoprop-P	6,326	6,326	3,077
Fluroxypyr	5,557	5,557	1,172
Triclopyr	3,847	3,847	1,265
Dicamba	3,659	3,659	427
Clopyralid	3,495	3,495	575
Florasulam	2,061	2,061	8
Methiocarb	516	516	51

Figure 30: The top 10 active ingredients most extensively used on grass reseed in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Glyphosate	75,159	59,373	59,373
2,4-DB	12,211	9,513	9,513
Mecoprop-P	3,077	6,326	6,326
MCPA	2,254	7,959	7,959
Triclopyr	1,265	3,847	3,847
Fluroxypyr	1,172	5,557	5,557
Clopyralid	575	3,495	3,495
Dicamba	427	3,659	3,659
2,4-D	352	352	352
Methiocarb	51	516	516

Pesticide usage on hay and haylage.

96,061 ha of hay and haylage grown in Ireland.

1,309 treated hectares.

733 kilogrammes applied (100% herbicides).

1.4% of the area of hay and haylage received a pesticide treatment.

Figure 31: Proportional area of hay and haylage treated with each pesticide group in Ireland, 2013.

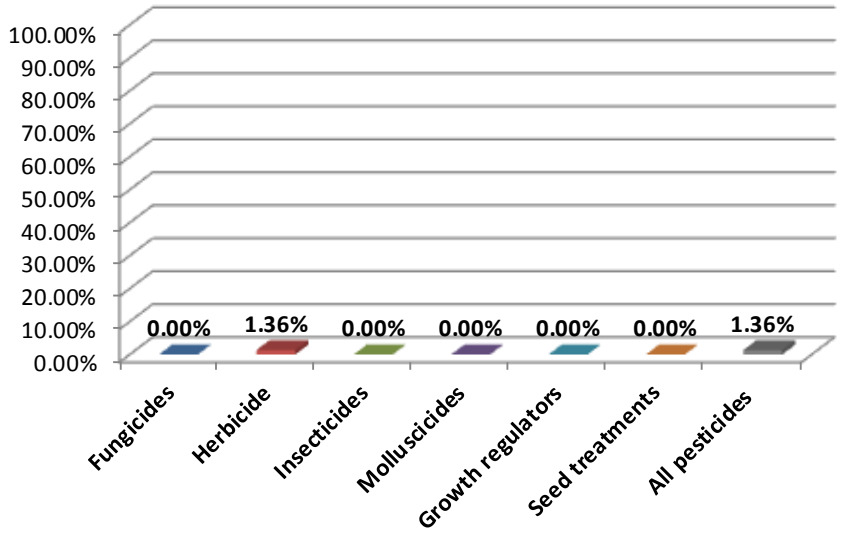


Figure 32: The top 6 active ingredients most extensively used on hay & haylage in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Mecoprop-P	545	545	409
Dicamba	545	545	55
Fluroxypyr	393	393	98
Triclopyr	393	393	98
Amidosulfuron	344	344	15
MCPA	27	27	58

Figure 33: The top 6 active ingredients most extensively used on hay & haylage in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Mecoprop-P	409	545	545
Fluroxypyr	98	393	393
Triclopyr	98	393	393
MCPA	58	27	27
Dicamba	55	545	545
Amidosulfuron	15	344	344

Pesticide usage on arable silage.

9,751 ha of arable silage grown in Ireland.

18,400 treated hectares.

8,262 kilogrammes applied.

53.7% of the area of arable silage received a pesticide treatment

Figure 34: Pesticide usage (spha) on arable silage crops in Ireland, 2013.

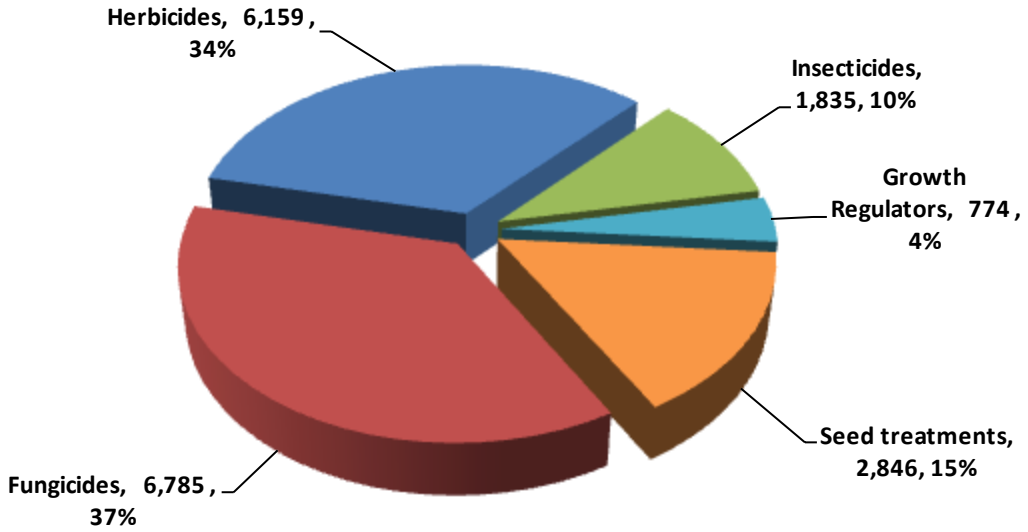


Figure 35: Weight of pesticides (kg) applied to arable silage crops in Ireland, 2013.

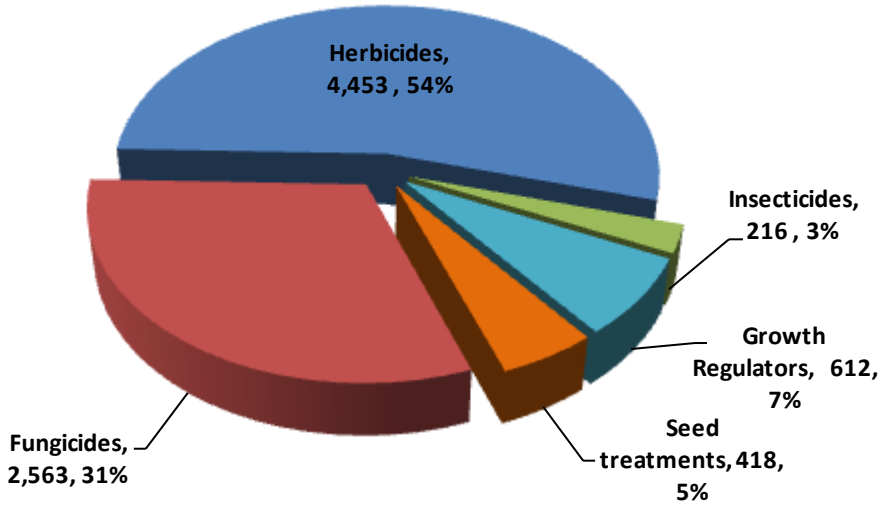


Figure 36: Proportional area of arable silage crops treated with each pesticide group in Ireland, 2013.

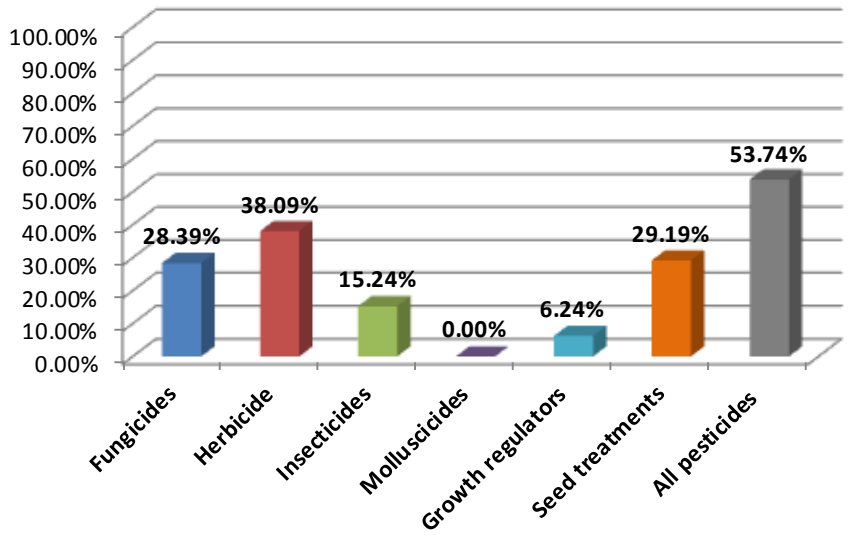


Figure 37: The top 10 active ingredients most extensively used on arable silage in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Glyphosate	2,262	2,117	2,510
Chlorothalonil	2,212	1,909	1,277
Carboxin	2,189	2,189	201
Thiram	2,189	2,189	201
Boscalid	1,846	1,702	425
Pyraclostrobin	1,707	1,563	97
Epoxiconazole	1,160	696	68
Tribenuron-methyl	902	902	8
Pendimethalin	841	841	887
Cypermethrin	837	837	22

Figure 38: The top 10 active ingredients most extensively used on arable silage in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Glyphosate	2,510	2,262	2,117
Chlorothalonil	1,277	2,212	1,909
Pendimethalin	887	841	841
Boscalid	425	1,846	1,702
Chloremequat	407	425	425
2,4-DB	347	410	410
Mecoprop-P	292	688	688
Fenpropimorph	247	621	621
Carboxin	201	2,189	2,189
Thiram	201	2,189	2,189

Pesticide usage on fodder maize.

14,414 ha of fodder maize grown in Ireland.

43,935 treated hectares.

27,417 kilogrammes applied.

100% of the area of fodder maize received pesticide treatment.

Figure 39: Pesticide usage (spha) on fodder maize crops in Ireland, 2013.

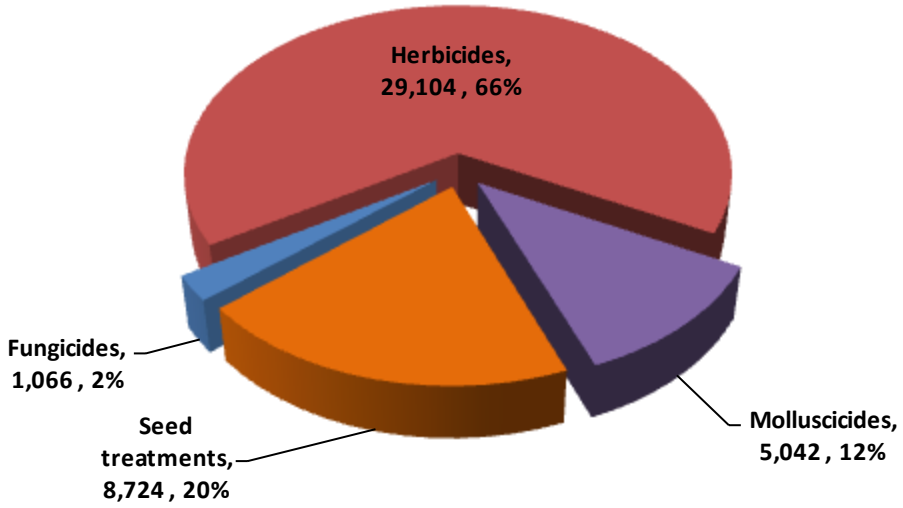


Figure 40: Weight of pesticides (kg) applied to fodder maize crops in Ireland, 2013.

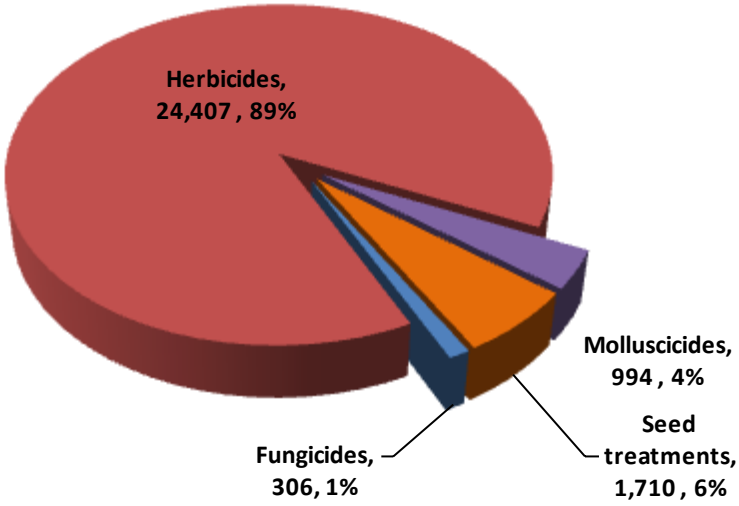


Figure 41: Proportional area of fodder maize crops treated with each pesticide group in Ireland, 2013.

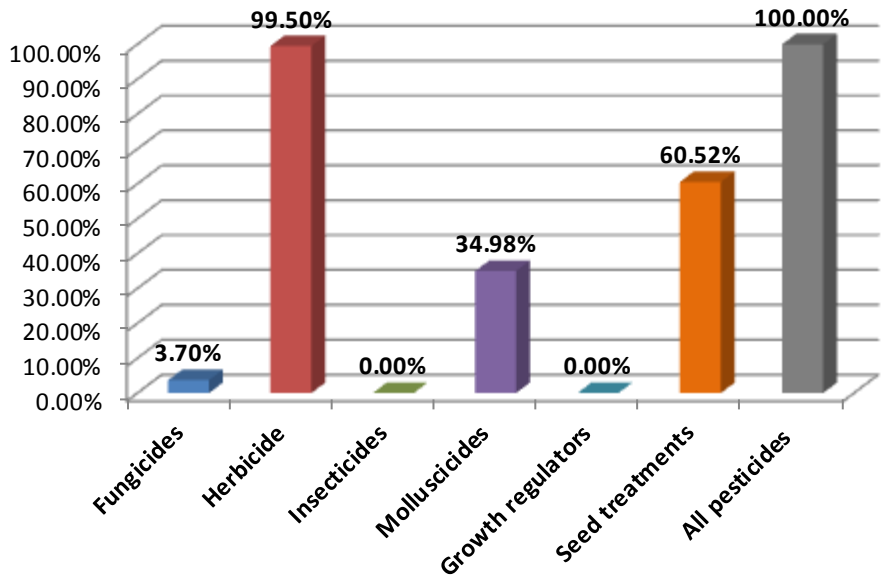


Figure 42: The top 10 active ingredients most extensively used on fodder maize in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Methiocarb	13766	13766	2704
Pendimethalin	12140	12140	15027
Mesotrione	11885	11885	992
Terbuthylazine	11885	11885	4674
Glyphosate	3117	3117	3090
Flufenacet	1259	1259	430
Isoxaflutole	1259	1259	90
Fluroxypyr	703	703	104
Chlorothalonil	533	533	267
Epoxiconazole	533	533	40

Figure 43: The top 10 active ingredients most extensively used on fodder maize in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Pendimethalin	15,027	12,140	12,140
Terbuthylazine	4,674	11,885	11,885
Glyphosate	3,090	3,117	3,117
Methiocarb	2,704	13,766	13,766
Mesotrione	992	11,885	11,885
Flufenacet	430	1,259	1,259
Chlorothalonil	267	533	533
Fluroxypyr	104	703	703
Isoxaflutole	90	1,259	1,259
Epoxiconazole	40	533	533

Pesticide usage on Fodder Beet.

9,207 ha of fodder beet grown in Ireland.

61,965 treated hectares.

25,031 kilogrammes applied.

95.2% of the area of fodder beet received a pesticide treatment.

Figure 44: Pesticide usage (spha) on fodder beet crops in Ireland, 2013.

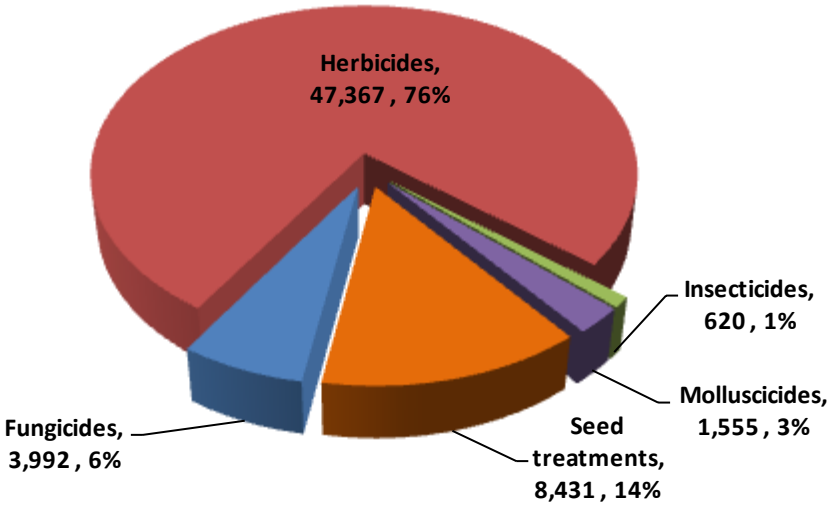


Figure 45: Weight of pesticides (kg) applied to fodder beet crops in Ireland, 2013.

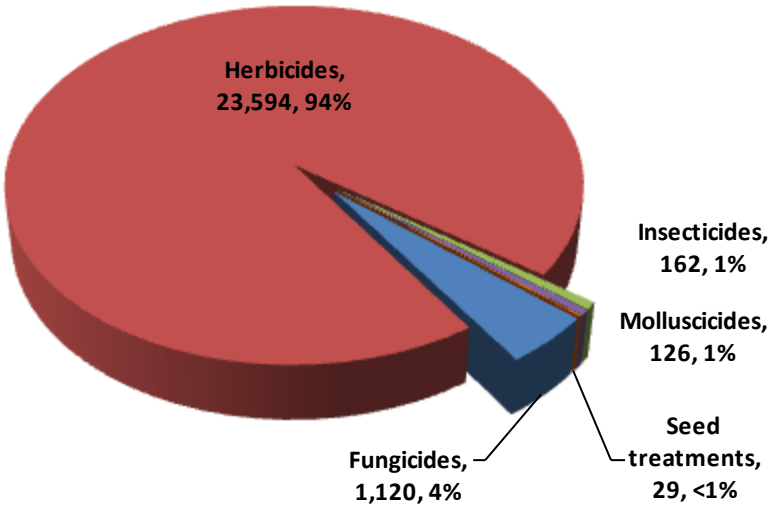


Figure 46: Proportional area of fodder beet crops treated with each pesticide group in Ireland, 2013.

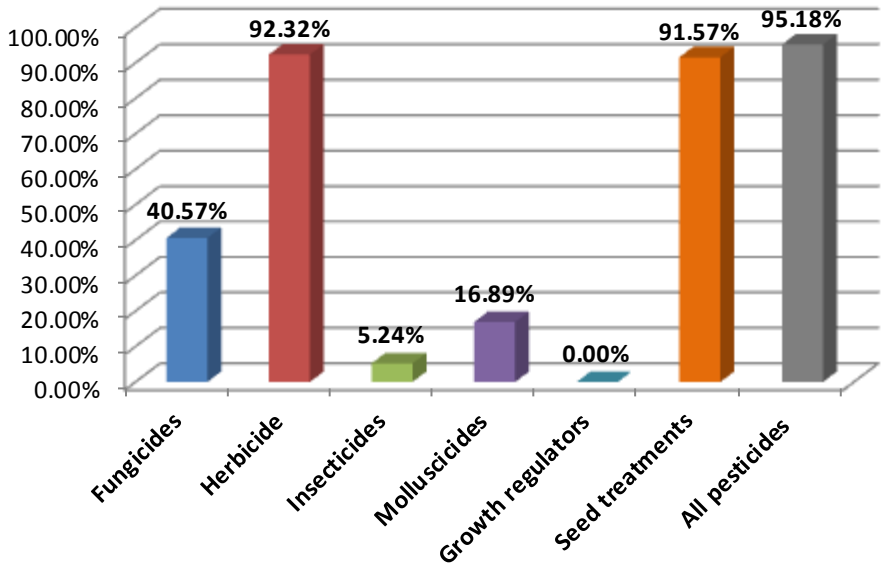


Figure 47: The top 10 active ingredients most extensively used on fodder beet in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Ethofumesate	16,841	8,669	3,302
Phenmedipham	16,679	8,669	2,394
Lenacil	12,160	6,597	2,440
Metamitron	8,330	6,504	11,624
Tefluthrin	7,947	7,947	12
Triflusulfuron-methyl	7,691	5,770	113
Desmedipham	7,435	4,913	286
Carbendazim	3,735	3,735	342
Flusilazole	3,735	3,735	683
Glyphosate	2,439	2,439	2,723

Figure 48: The top 10 active ingredients most extensively used on fodder beet in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Metamitron	11,624	8,330	6,504
Ethofumesate	3,302	16,841	8,669
Glyphosate	2,723	2,439	2,439
Lenacil	2,440	12,160	6,597
Phenmedipham	2,394	16,679	8,669
Flusilazole	683	3,735	3,735
Carbendazim	342	3,735	3,735
Desmedipham	286	7,435	4,913
Chloridazon	192	361	361
Dimethoate	162	620	483

Pesticide usage on fodder kale & fodder rape.

3,530 ha of other fodder crops grown in Ireland.

6,905 treated hectares.

3,924 kilogrammes applied.

63.6% of the area of fodder kale and fodder rape received a pesticide treatment.

Figure 49: Pesticide usage (spha) on fodder kale & fodder rape crops in Ireland, 2013.

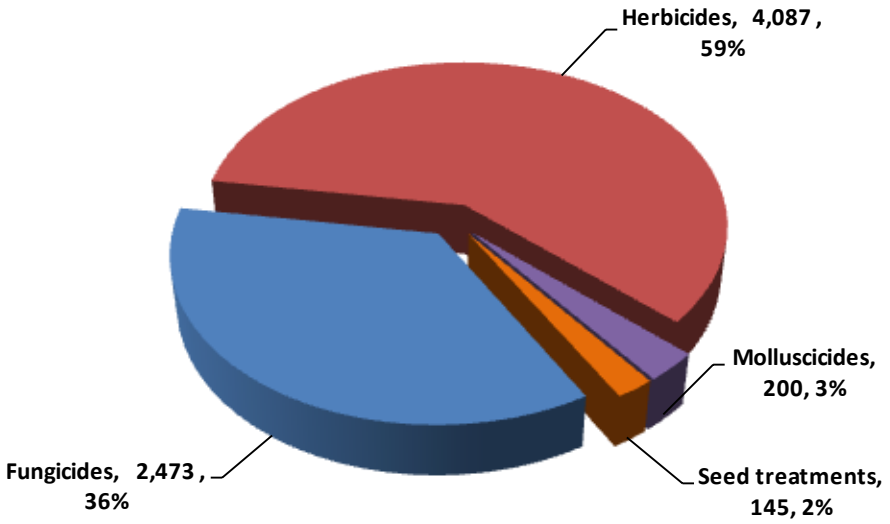


Figure 50: Weight of pesticides (kg) applied to fodder kale & fodder rape crops in Ireland, 2013.

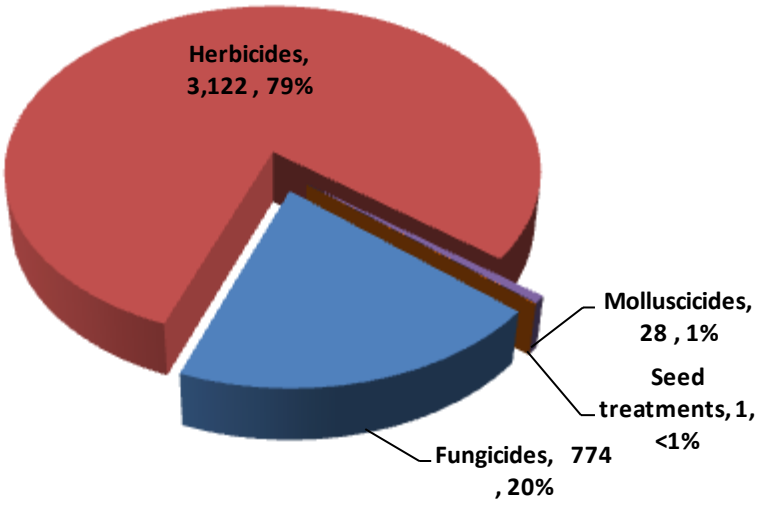


Figure 51: Proportional area of fodder kale & fodder rape crops treated with each pesticide group in Ireland, 2013.

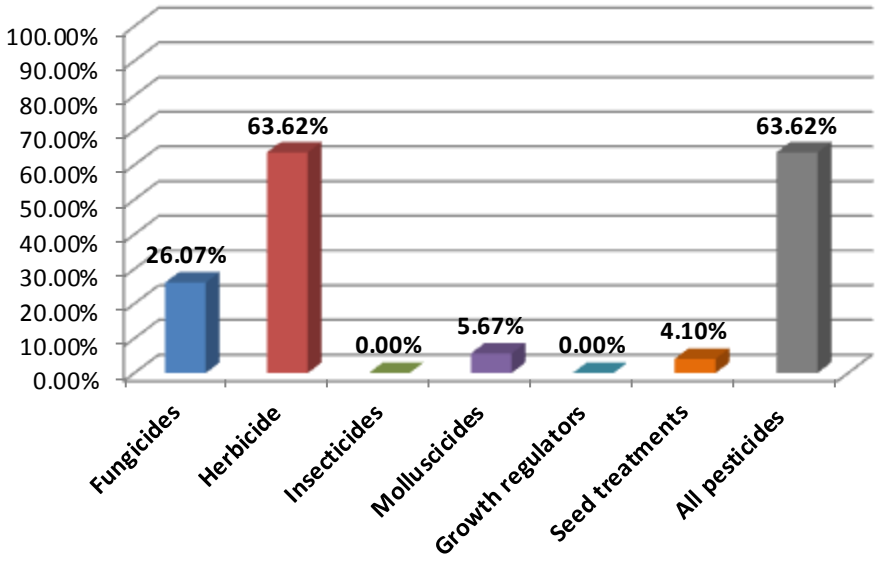


Figure 52: The top 10 active ingredients most extensively used on fodder kale & fodder rape crops in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Glyphosate	2,244	2,244	2,893
Boscalid	920	920	230
Desmedipham	634	634	16
Ethametsulfuron-methyl	634	634	12
Ethofumesate	634	634	96
Phenmedipham	634	634	48
Carbendazim	633	633	59
Flusilazole	633	633	119
Metconazole	633	633	57
Propaquizafop	575	287	57

Figure 53: The top 10 active ingredients most extensively used on fodder kale & fodder rape crops in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Glyphosate	2,893	2,244	2,244
Mancozeb	302	287	287
Boscalid	230	920	920
Flusilazole	119	633	633
Ethofumesate	96	634	634
Carbendazim	59	633	633
Propaquizafop	57	575	287
Metconazole	57	633	633
Phenmedipham	48	634	634
Metaldehyde	24	157	157

Pesticide usage on fodder turnips & fodder swedes.

645 ha of fodder turnips and fodder swedes grown in Ireland.

1,870 treated hectares.

1,284 kilogrammes applied.

92.7% of the area of fodder turnips and fodder swedes received a pesticide treatment.

Figure 54: Pesticide usage (spha) on fodder turnip & fodder swede crops in Ireland, 2013.

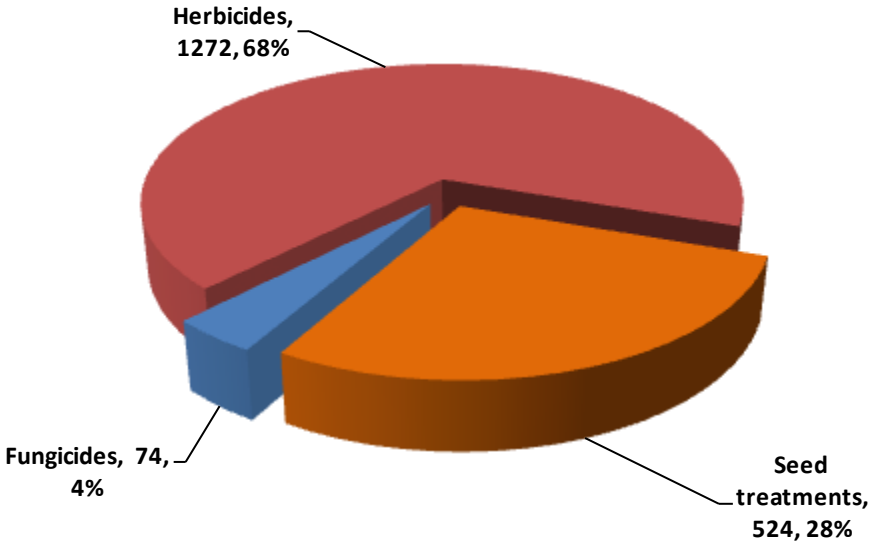


Figure 55: Weight of pesticides (kg) applied to fodder turnip & fodder swede crops in Ireland, 2013.

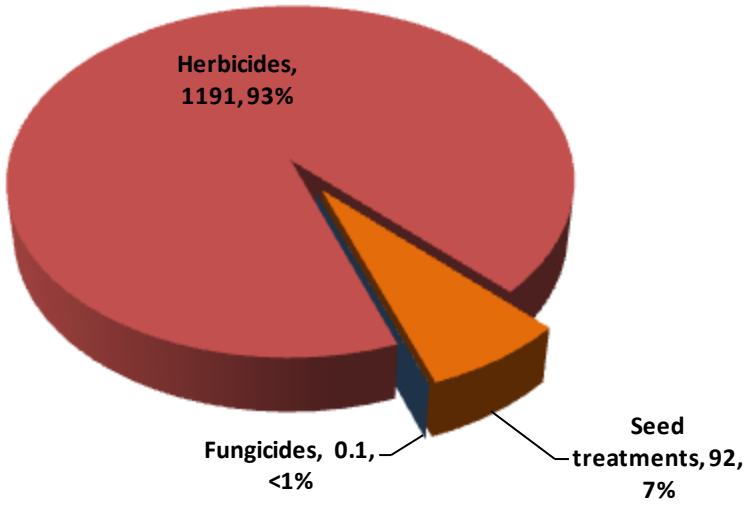


Figure 56: Proportional area of fodder turnip & fodder swede crops treated with each pesticide group in Ireland, 2013.

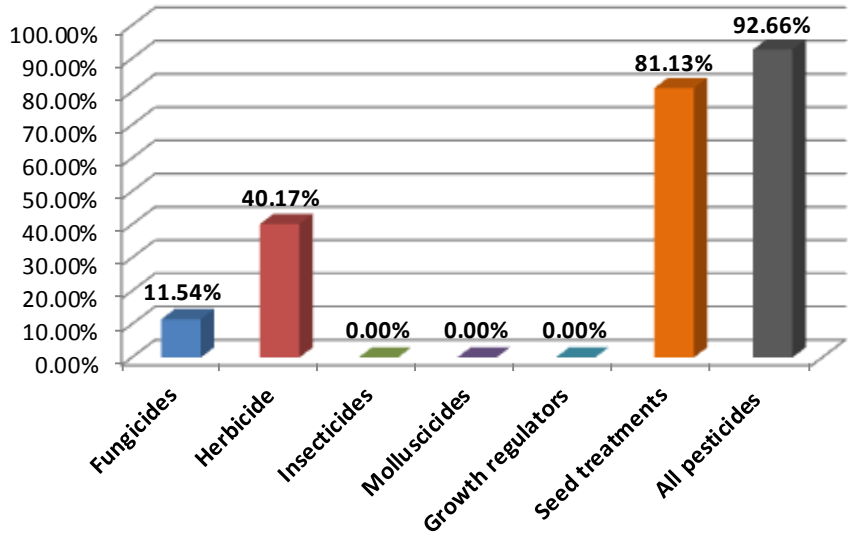


Figure 57: The top 10 active ingredients most extensively used on fodder turnip & fodder swede crops in Ireland in 2013, ranked by area treated (spray-hectares).

Active substance	Treated area (spha)	Basic area treated (ha)	Quantity applied (kg)
Thiram	453	453	1
Ethofumesate	289	145	87
Phenmedipham	289	145	69
Glyphosate	185	185	266
Cycloxydim	145	145	29
Imidacloprid	145	145	91
Lenacil	145	145	64
Metamitron	145	145	506
Propyzamide	145	145	116
Triflusulfuron-methyl	145	145	2

Figure 58: The top 10 active ingredients most extensively used on fodder turnip & fodder swede crops in Ireland in 2013, ranked by weight (kg).

Active substance	Quantity applied (kg)	Treated area (spha)	Basic area treated (ha)
Metamitron	506	145	145
Glyphosate	266	185	185
Propyzamide	116	145	145
Imidacloprid	91	145	145
Ethofumesate	87	289	145
Phenmedipham	69	289	145
Lenacil	64	145	145
Metazachlor	52	74	74
Cycloxydim	29	145	145
Triflusulfuron-methyl	2	145	145

Table 1: Estimated area (ha) of grassland & fodder crops grown regionally in Ireland, 2013.

Crop	Region East	South	North/West	Ireland
Permanent Grassland	375,254	981,315	1,531,885	2,888,454
Grass silage 1st Cut	117,971	455,927	326,778	900,676
Grass silage 2nd cut	29,489	180,419	70,368	280,275
Grass silage 3rd cut		1,502	1,665	3,166
Grass silage 4th cut		1,483		1,483
Rough grazing	313	292,944	125,443	418,700
Grass reseed	12,493	38,141	21,456	72,089
Arable silage	2,595	2,822	4,334	9,751
Fodder maize	2,852	8,482	3,080	14,414
Fodder kale & fodder rape	1,368	1,077	1,085	3,530
Fodder beet	2,075	5,368	1,764	9,207
Hay & Haylage	14,899	46,955	34,207	96,061
Fodder turnip & fodder swedes	289	316	40	645
Total	***559,598***	***2,016,750***	***2,122,103***	***4,698,451***

Table 2: Estimated area (spray-hectares) of grassland & fodder crops treated regionally with each pesticide.

Pesticide type	Region East	South	North/West	Ireland
Fungicides	5,120	6,882	2,389	14,391
Herbicides	96,686	210,787	253,682	561,155
Insecticides	641	1,742	72	2,455
Molluscicides	382	6,489	442	7,313
Growth Regulators	187	516	72	774
Seed treatments	5,145	10,229	5,296	20,669
Total	***108,161***	***236,644***	***261,952***	***606,757***

Table 3: Estimated weight (kg) applied to grassland & fodder crops regionally with each pesticide type in Ireland, 2013.

	Region			
Pesticide type	**East**	**South**	**North/West**	**Ireland**
Fungicides	1,776	2,214	773	4,764
Herbicides	79,467	197,053	310,764	587,285
Insecticides	109	269	0	378
Molluscicides	30	1,136	33	1,199
Growth Regulators	86	472	54	612
Seed treatments	728	903	618	2,249
Total	***82,197***	***202,048***	***312,242***	***596,487***

Table 4: The total area (spray hectares) and the basic area (hectares), of grassland & fodder crops in Ireland 2013 treated with each pesticide type.

	Pesticide Type														
	Fungicides		Herbicides		Insecticides		Molluscicides		Growth regulators		Seed treatments		All Pesticides		
Crop type	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(ha)	(sp ha)	(ha) treated	(ha) grown
Permanent grassland			264,129	242,105									264,129	242,105	2,888,454
Silage 1st cut			112,626	109,088									112,626	109,088	900,676
Silage 2nd cut			10,497	10,497									10,497	10,497	280,275
Silage 3rd & 4th cut *															4,649
Rough grazing			5,045	5,045									5,045	5,045	418,700
Grass reseed			79,559	66,571			516	516					80,075	66,571	72,089
Arable silage	6,785	2,768	6,159	3,715	1,835	1,486			774	609	2,846	2,846	18,400	5,241	9,751
Fodder maize	1,066	533	29,104	14,341			5,042	5,042			8,724	8,724	43,935	14,414	14,414
Fodder kale & Fodder rape	2,473	920	4,087	2,246			200	200			8,431	145	6,905	2,246	3,530
Hay & Haylage			1,309	1,309									1,309	1,309	96,061
Fodder turnip & Fodder swedes	74	74	1,272	259							668	524	1,870	598	645
Fodder beet	3,992	3,735	47,367	8,500	620	483	1,555	1,555				8,431	61,965	8,763	9,207
Total	***14,391***	***8,031***	***561,155***	***463,677***	***2,455***	***1,969***	***7,313***	***7,313***	***774***	***609***	***20,669***	***20,669***	***606,757***	***465,877***	***4,698,451***

* No applications of pesticides to 3rd and 4th cut grass silage were noted during the survey.

Table 5: The total quantities (kilograms) of each pesticide type used on grassland and fodder crops in Ireland 2013.

	Pesticide type						
Crop	Fungicides	Herbicides	Insecticides	Molluscicides	Growth regulators	Seed treatments	Total weight applied (kg)
Permanent grassland		319,156					319,156
Silage 1st cut		99,617					99,617
Silage 2nd cut		6,209					6,209
Rough grazing		8,293					8,293
Grass reseed		96,509		51			96,560
Arable silage	2,563	4,453	216		612	418	8,262
Fodder maize	306	24,407		994		1,710	27,417
Fodder kale & fodder rape	774	3,122		28		1	3,924
Hay & Haylage		733					733
Fodder turnip & fodder swedes	0	1,191				92	1,284
Fodder beet	1,120	23,594	162	126		29	25,031
All crops	***4,764***	***587,285***	***378***	***1,199***	***612***	***2,249***	***596,487***

Table 6: Estimated area (spray-hectares) of grassland & fodder crops treated with pesticide formulations in Ireland, 2013.

Pesticide type & formulation	Permanent Grassland	Grass silage 1st cut	Grass silage 2nd cut	Rough grazing	Grass reseed	Crop Arable silage	Fodder maize	Fodder kale & rape	Hay & Haylage	Fodder turnip & swedes	Fodder beet	All crops
Fungicides												
Azoxystrobin						237						237
Azoxystrobin/fenpropimorph						166						166
Benthiavalicarb-isopropyl/mancozeb								287				287
Bixafen/Prothioconazole						255						255
Boscalid								920				920
Boscalid/Epoxiconazole						139						139
Boscalid/pyraclostrobin						1,707						1,707
Carbendazim/flusilazole								633			3,735	4,368
Chlorothalonil						2,028	533					2,561
Chlorothalonil/Proquinazid						185						185
Difenoconazole/Tebuconazole						139						139
Epoxiconazole						72	533					605
Epoxiconazole/fenpropimorph/metrafenone						325						325
Epoxiconazole/fenpropimorph/pyraclostrobin											257	257
Epoxiconazole/Fluxapyroxad						114						114
Epoxiconazole/metconazole						510						510
Fenpropimorph						130						130
Fluoxastrobin/prothioconazole						114						114
Metalaxyl-M						268						268
Metconazole								633				633
Prothioconazole/tebuconazole						166						166
Tebuconazole						231						231
Thiram										74		74
All fungicides						***6,785***	***1,066***	***2,473***		***74***	***3,992***	***14,391***

Table 6 (cont.): Estimated area (spray-hectares) of grassland & fodder crops treated with pesticide formulations in Ireland, 2013.

Pesticide type & formulation	Permanent Grassland	Grass silage 1st cut	Grass silage 2nd cut	Rough grazing	Grass reseed	Crop Arable silage	Fodder maize	Fodder kale & rape	Hay & Haylage	Fodder turnip & swedes	Fodder beet	All crops
Herbicides												
2,4-D	9,465	4,124										13,589
2,4-D/Dicamba/Triclopyr	8,162	5,564	2,625		352							16,703
2,4-D/MCPA	2,624											2,624
2,4-D/Triclopyr											300	300
2,4-DB/MCPA					7,348	274						7,622
2,4-DB/Mecoprop-P					2,165	136						2,301
Amidosulfuron	10,397	13,067	3,309		168				344			27,284
Aminopyralid/fluroxypyr	113	823	1,468									2,404
Asulam	113											113
Chloridazon											361	361
Clomazone/linuron						384						384
Clopyralid											1,651	1,651
Clopyralid/fluroxypyr/triclopyr	6,144	1,815			3,495							11,454
Clopyralid/Triclopyr	20,293	9,592	415									30,299
Cycloxydim										145		145
Desmedipham/Ethofumesate/Lenacil/Phenmedipham											3,738	3,738
Desmedipham/ethofumesate/phenmedipham								634			3,697	4,331
Dicamba/MCPA/mecoprop-P	4,577	3,328			347							8,251
Dicamba/mecoprop-P	6,659	12,445	1,091		2,961	139			545			23,840
Dichlorprop-P/MCPA/mecoprop-P	5,092											5,092
Ethametsulfuron-methyl								634				634
Ethofumesate	447										162	610
Ethofumesate/phenmedipham										289	9,243	9,533
Florasulam/fluroxypyr					2,061							2,061

Table 6 (cont.): Estimated area (spray-hectares) of grassland & fodder crops treated with pesticide formulations in Ireland, 2013.

Pesticide type & formulation	Permanent Grassland	Grass silage 1st cut	Grass silage 2nd cut	Rough grazing	Grass reseed	Crop Arable silage	Fodder maize	Fodder kale & rape	Hay & Haylage	Fodder turnip & swedes	Fodder beet	All crops
Herbicides (cont.)												
Fluazifop-P-butyl											201	201
Flufenacet/isoxaflutole							1,259					1,259
Fluroxypyr	8,824	2,489				510	703					12,526
Fluroxypyr/triclopyr	21,289	27,644	1,238						393			50,564
Glyphosate	22,541	696	352	2,668	59,373	2,262	3,117	2,244		185	2,439	95,876
Imazamox/pendimethalin						616						616
Iodosulfron-methyl-sodium						114						114
Lenacil										145	7,693	7,838
Lenacil/Triflusulfuron-methyl											729	729
MCPA	124,705	28,682		2,378	264				27			156,057
Mecoprop-P	3,868	1,379			853	413						6,513
Mesotrione/Terbuthylazine							11,885					11,885
Metamitron										145	8,330	8,474
Metazachlor										74		74
Metsulfuron-methyl						185						185
Metsulfuron-methyl/tribenuron-methyl						643						643
Pendimethalin	8,815					226	12,140					21,181
Propaquizafop								574			1,309	1,884
Propyzamide										145		145
Tepraloxydim											553	553
Thifensulfuron-methyl		978										978
Thifensulfuron-methyl/tribenuron-methyl						259						259
Tribenuron-methyl					173							173
Triflusulfuron-methyl										145	6,962	7,106
All herbicides	***264,129***	***112,626***	***10,497***	***5,045***	***79,559***	***6,159***	***29,104***	***4,087***	***1,309***	***1,272***	***47,367***	***561,155***

Table 6 (cont.): Estimated area (spray-hectares) of grassland & fodder crops treated with pesticide formulations in Ireland, 2013.

Pesticide type & formulation	Permanent Grassland	Grass silage 1st cut	Grass silage 2nd cut	Rough grazing	Grass reseed	Crop Arable silage	Fodder maize	Fodder kale & rape	Hay & Haylage	Fodder turnip & swedes	Fodder beet	All crops
Insecticides												
Cypermethrin						837						837
Dimethoate						633					620	1,253
Esfenvalerate						365						365
All Insecticides						***1,835***					***620***	***2,455***
Molluscicides												
Metaldehyde								157				157
Methiocarb					516		5,042	43			1,555	7,156
All molluscicides					***516***		***5,042***	***200***			***1,555***	***7,313***
Growth regulators												
Chlormequat						424						424
Ethephon/Mepiquat chloride						350						350
All growth regulators						***774***						***774***
Seed treatments												
Carboxin/thiram						2,189						2,189
Fludioxonil/flutriafol						90						90
hymexazol											263	263
Imidacloprid										145	109	254
Iprodione											113	113
Methiocarb							8,724					8,724
Prochloraz/triticonazole						568						568
Tefluthrin											7,947	7,947
Thiram								145		379		524
All seed treatment						***2,846***	***8,724***	***145***		***524***	***8,431***	***20,669***
All pesticides	***264,129***	***112,626***	***10,497***	***5,045***	***80,075***	***18,400***	***43,935***	***6,905***	***1,309***	***1,870***	***61,965***	***606,757***

Table 7: Estimated quantities (kilograms) of pesticide formulations used on grassland and fodder crops in Ireland, 2013.

Pesticide type & formulation	Permanent Grassland	Grass silage 1st cut	Grass silage 2nd cut	Rough grazing	Grass reseed	Crop Arable silage	Fodder maize	Fodder kale & rape	Hay & Haylage	Fodder turnip & swedes	Fodder beet	All crops
Fungicides												
Azoxystrobin						50						50
Azoxystrobin/fenpropimorph						157						157
Benthiavalicarb-isopropyl/mancozeb								309				309
Bixafen/Prothioconazole						51						51
Boscalid								230				230
Boscalid/Epoxiconazole						53						53
Boscalid/pyraclostrobin						482						482
Carbendazim/flusilazole								178			1,025	1,203
Chlorothalonil						1,162	266					1,428
Chlorothalonil/Proquinazid						121						121
Difenoconazole/Tebuconazole						33						33
Epoxiconazole						6	40					46
Epoxiconazole/fenpropimorph/metrafenone						108						108
Epoxiconazole/fenpropimorph/pyraclostrobin											95	95
Epoxiconazole/Fluxapyroxad						14						14
Epoxiconazole/metconazole						36						36
Fenpropimorph						67						67
Fluoxastrobin/prothioconazole						17						17
Metalaxyl-M						125						125
Metconazole								57				57
Prothioconazole/tebuconazole						51						51
Tebuconazole						29						29
Thiram										0		0
All fungicides						***2,563***	***306***	***774***		***0***	***1,120***	***4,764***

Table 7 (cont.): Estimated quantities (kilograms) of pesticide formulations used on grassland and fodder crops in Ireland, 2013.

Pesticide type & formulation	Permanent Grassland	Grass silage 1st cut	Grass silage 2nd cut	Rough grazing	Grass reseed	Crop Arable silage	Fodder maize	Fodder kale & rape	Hay & Haylage	Fodder turnip & swedes	Fodder beet	All crops
Herbicides												
2,4-D	14,893	6,679										21,572
2,4-D/Dicamba/Triclopyr	13,502	8,687	3,675		615							26,479
2,4-D/MCPA	7,241											7,241
2,4-D/Triclopyr											206	206
2,4-DB/MCPA					10,593	224						10,817
2,4-DB/Mecoprop-P					3,444	170						3,614
Amidosulfuron	399	504	99		9				15			1,027
Aminopyralid/fluroxypyr	29	214	534									778
Asulam	317											317
Chloridazon											192	192
Clomazone/linuron						227						227
Clopyralid											126	126
Clopyralid/fluroxypyr/triclopyr	2,801	1,243			2,588							6,632
Clopyralid/Triclopyr	7,852	3,891	131									11,874
Cycloxydim										29		29
Desmedipham/Ethofumesate/Lenacil/Phenmedipham											824	824
Desmedipham/ethofumesate/phenmedipham								159			1,182	1,342
Dicamba/MCPA/mecoprop-P	2,886	4,920			591							8,397
Dicamba/mecoprop-P	5,394	11,091	927		2,025	64			464			19,965
Dichlorprop-P/MCPA/mecoprop-P	8,020											8,020
Ethametsulfuron-methyl								12				12
Ethofumesate	358										122	479
Ethofumesate/phenmedipham										156	3,960	4,116
Florasulam/fluroxypyr					317							317

Table 7 (cont.): Estimated quantities (kilograms) of pesticide formulations used on grassland and fodder crops in Ireland, 2013.

Pesticide type & formulation	Permanent Grassland	Grass silage 1st cut	Grass silage 2nd cut	Rough grazing	Grass reseed	Crop Arable silage	Fodder maize	Fodder kale & rape	Hay & Haylage	Fodder turnip & swedes	Fodder beet	All crops
Herbicides (cont.)												
Fluazifop-P-butyl											50	50
Flufenacet/isoxaflutole							520					520
Fluroxypyr	1,329	575				95	104					2,102
Fluroxypyr/triclopyr	11,713	15,003	462						196			27,375
Glyphosate	23,601	750	380	4,802	75,159	2,510	3,090	2,893		266	2,723	116,173
Imazamox/pendimethalin						657						657
Iodosulfron-methyl-sodium						1						1
Lenacil										64	2,176	2,240
Lenacil/Triflusulfuron-methyl											169	169
MCPA	200,260	43,237		3,492	330				58			247,377
Mecoprop-P	6,221	2,813			836	220						10,090
Mesotrione/Terbuthylazine							5,666					5,666
Metamitron										506	11,624	12,130
Metazachlor										52		52
Metsulfuron-methyl						1						1
Metsulfuron-methyl/tribenuron-methyl						8						8
Pendimethalin	12,341					271	15,027					27,639
Propaquizafop								57			101	159
Propyzamide										116		116
Tepraloxydim											37	37
Thifensulfuron-methyl		11										11
Thifensulfuron-methyl/tribenuron-methyl						6						6
Tribenuron-methyl					1							1
Triflusulfuron-methyl										2	101	103
All herbicides	***319,156***	***99,617***	***6,209***	***8,293***	***96,509***	***4,453***	***24,407***	***3,122***	***733***	***1,191***	***23,594***	***587,285***

Table 7 (cont.): Estimated quantities (kilograms) of pesticide formulations used on grassland and fodder crops in Ireland, 2013.

Pesticide type & formulation	Permanent Grassland	Grass silage 1st cut	Grass silage 2nd cut	Rough grazing	Grass reseed	Crop Arable silage	Fodder maize	Fodder kale & rape	Hay & Haylage	Fodder turnip & swedes	Fodder beet	All crops
Insecticides												
Cypermethrin						22						22
Dimethoate						192					162	354
Esfenvalerate						2						2
All Insecticides						***216***					***162***	***378***
Molluscicides												
Metaldehyde								24				24
Methiocarb					51		994	4			126	1,175
All molluscicides					***51***		***994***	***28***			***126***	***1,199***
Growth regulators												
Chlormequat						407						407
Ethephon/Mepiquat chloride						205						205
All growth regulators						***612***						***612***
Seed treatments												
Carboxin/thiram						402						402
Fludioxonil/flutriafol						1						1
hymexazol											3	3
Imidacloprid										91	12	103
Iprodione											1	1
Methiocarb							1,710					1,710
Prochloraz/triticonazole						14						14
Tefluthrin											12	12
Thiram								1		1		2
All seed treatment						***418***	***1,710***	***1***		***92***	***29***	***2,249***
All pesticides	***319,156***	***99,617***	***6,209***	***8,293***	***96,560***	***8,262***	***27,417***	***3,924***	***733***	***1,284***	***25,031***	***596,487***

Table 8: The fifty active ingredients most extensively used on grassland & fodder crops in Ireland in 2013, ranked by area treated (spray-hectares).

No.	Active ingredient	Treated area (sp ha)
1	MCPA	179,646
2	Triclopyr	109,320
3	Glyphosate	95,876
4	Fluroxypyr	79,009
5	Dicamba	48,794
6	Mecoprop-P	45,997
7	Clopyralid	43,404
8	2,4-D	33,215
9	Amidosulfuron	27,284
10	Pendimethalin	21,797
11	Ethofumesate	18,212
12	Phenmedipham	17,602
13	Lenacil	12,305
14	Terbuthylazine	11,885
15	Mesotrione	11,885
16	2,4-DB	9,923
17	Metamitron	8,474
18	Desmedipham	8,070
19	Triflusulfuron-methyl	7,835
20	Methiocarb	7,156
21	Dichlorprop-P	5,092
22	Carbendazim	4,368
23	Flusilazole	4,368
24	Boscalid	2,766
25	Chlorothalonil	2,745
26	Aminopyralid	2,404
27	Florasulam	2,061
28	Pyraclostrobin	1,964
29	Epoxiconazole	1,950
30	Propaquizafop	1,884
31	Flufenacet	1,259
32	Isoxaflutole	1,259
33	Dimethoate	1,253
34	Thifensulfuron-methyl	1,237
35	Metconazole	1,143
36	Tribenuron-methyl	1,074
37	Fenpropimorph	877
38	Cypermethrin	837
39	Metsulfuron-methyl	828
40	Ethametsulfuron-methyl	634
41	Imazamox	616
42	Tepraloxydim	553
43	Prothioconazole	535
44	Tebuconazole	535
45	Azoxystrobin	403
46	Linuron	384
47	Clomazone	384
48	Esfenvalerate	365
49	Chloridazon	361
50	Ethephon	350

Table 9: The fifty active ingredients most extensively used on grassland & fodder crops in Ireland in 2013, ranked by weight (kilograms).

No.	Active ingredient	Quantity (kgs)
1	MCPA	258,703
2	Glyphosate	116,173
3	2,4-D	40,421
4	Mecoprop-P	33,908
5	Triclopyr	30,663
6	Pendimethalin	28,255
7	Fluroxypyr	18,908
8	2,4-DB	12,557
9	Metamitron	12,130
10	Dicamba	9,217
11	Terbuthylazine	4,674
12	Clopyralid	4,472
13	Dichlorprop-P	3,946
14	Ethofumesate	3,842
15	Phenmedipham	2,511
16	Lenacil	2,503
17	Chlorothalonil	1,543
18	Methiocarb	1,175
19	Amidosulfuron	1,027
20	Mesotrione	992
21	Flusilazole	802
22	Boscalid	655
23	Flufenacet	430
24	Chlormequat	407
25	Carbendazim	401
26	Dimethoate	354
27	Asulam	317
28	Fenpropimorph	302
29	Mancozeb	302
30	Desmedipham	301
31	Chloridazon	192
32	Linuron	192
33	Aminopyralid	179
34	Propaquizafop	159
35	Mepiquat chloride	136
36	Pyraclostrobin	126
37	Metalaxyl-m	125
38	Epoxiconazole	119
39	Propyzamide	116
40	Triflusulfuron-methyl	115
41	Azoxystrobin	92
42	Isoxaflutole	90
43	Tebuconazole	78
44	Metconazole	72
45	Ethephon	69
46	Prothioconazole	69
47	Metazachlor	52
48	Fluazifop-P-butyl	50
49	Imazamox	41
50	Tepraloxydim	37

Table 10: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for permanent grassland, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Permanent grassland	Herbicides			
	2,4-D	26,229	20,251	20,251
	Amidosulfuron	399	10,397	10,397
	Aminopyralid	7	113	113
	Asulam	317	113	113
	Clopyralid	2,611	26,437	26,437
	Dicamba	4,063	19,398	16,794
	Dichlorprop-P	3,946	5,092	5,092
	Ethofumesate	358	447	447
	Fluroxypyr	8,142	36,370	36,370
	Glyphosate	23,601	22,541	22,541
	MCPA	207,316	136,998	134,179
	Mecoprop-P	14,355	20,196	17,592
	Pendimethalin	12,341	8,815	8,815
	Triclopyr	15,473	55,888	55,373

Table 11: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for grass silage 1st cut, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Grass silage 1st cut	Herbicides			
	2,4-D	11,643	9,688	9,688
	Amidosulfuron	504	13,067	13,067
	Aminopyralid	49	823	823
	Clopyralid	1,134	11,406	11,406
	Dicamba	3,663	21,337	21,337
	Fluroxypyr	8,655	32,770	32,770
	Glyphosate	750	696	696
	MCPA	45,552	32,010	32,010
	Mecoprop-P	14,956	17,152	17,152
	Thifensulfuron-methyl	11	978	978
	Triclopyr	12,700	44,615	44,615

Table 12: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for grass silage 2nd cut, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Grass silage 2nd cut	Herbicides			
	2,4-D	2,100	2,625	2,625
	Amidosulfuron	99	3,309	3,309
	Aminopyralid	123	1,468	1,468
	Clopyralid	26	415	415
	Dicamba	1,002	3,716	3,716
	Fluroxypyr	642	2,706	2,706
	Glyphosate	380	352	352
	Mecoprop-P	818	1,091	1,091
	Triclopyr	1,018	4,277	4,277

Table 13: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for grass reseed, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Grass reseed	Herbicides			
	2,4-D	352	352	352
	2,4-DB	12,211	9,513	9,513
	Amidosulfuron	9	168	168
	Clopyralid	575	3,495	3,495
	Dicamba	427	3,659	3,659
	Florasulam	8	2,061	2,061
	Fluroxypyr	1,172	5,557	5,557
	Glyphosate	75,159	59,373	59,373
	MCPA	2,254	7,959	7,959
	Mecoprop-P	3,077	6,326	6,326
	Tribenuron-methyl	1	173	173
	Triclopyr	1,265	3,847	3,847
	Molluscicides			
	Methiocarb	51	516	516

Table 14: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for rough grazing, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Rough Grazing	Herbicides			
	Glyphosate	4,802	2,668	2,668
	MCPA	3,492	2,378	2,378

Table 15: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for fodder beet, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Fodder Beet	Fungicides			
	Carbendazim	342	3,735	3,735
	Epoxiconazole	11	257	257
	Fenpropimorph	55	257	257
	Flusilazole	683	3,735	3,735
	Hymexazol	3	263	263
	Iprodione	1	113	113
	Pyraclostrobin	29	257	257
	Herbicides			
	2,4-D	98	300	150
	Chloridazon	192	361	361
	Clopyralid	126	1,651	1,651
	Desmedipham	286	7,435	4,913
	Ethofumesate	3,302	16,841	8,669
	Fluazifop-P-butyl	50	201	201
	Glyphosate	2,723	2,439	2,439
	Lenacil	2,440	12,160	6,597
	Metamitron	11,624	8,330	6,504
	Phenmedipham	2,394	16,679	8,669
	Propaquizafop	101	1,309	1,049
	Tepraloxydim	37	553	553
	Triclopyr	109	300	150
	Triflusulfuron-methyl	113	7,691	5,770
	Insecticides			
	Dimethoate	162	620	483
	Imidacloprid	12	109	109
	Tefluthrin	12	7,947	7,947
	Molluscicides			
	Methiocarb	126	1,555	1,555

Table 16: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for arable silage, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Arable silage	Fungicides			
	Azoxystrobin	92	403	237
	Bixafen	17	255	255
	Boscalid	425	1,846	1,702
	Carboxin	201	2,189	2,189
	Chlorothalonil	1,277	2,212	1,909
	Difenoconazole	9	139	139
	Epoxiconazole	68	1,160	696
	Fenpropimorph	247	621	621
	Fludioxonil	1	90	90
	Fluoxastrobin	9	114	114
	Flutriafol	1	90	90
	Fluxapyroxad	7	114	114
	Metalaxyl-m	125	268	268
	Metconazole	15	510	510
	Metrafenone	24	325	325
	Prochloraz	11	568	568
	Proquinazid	6	185	185
	Prothioconazole	69	535	369
	Pyraclostrobin	97	1,707	1,563
	Tebuconazole	78	535	535
	Thiram	201	2,189	2,189
	Triticonazole	4	568	568
	Herbicides			
	2,4-DB	347	410	410
	Clomazone	35	384	384
	Dicamba	8	139	139
	Fluroxypyr	95	510	510
	Glyphosate	2,510	2,262	2,117
	Imazamox	41	616	616
	Iodosulfron-methyl-Sodium	1	114	114
	Linuron	192	384	384
	MCPA	32	274	274
	Mecoprop-P	292	688	688
	Metsulfuron-methyl	4	828	828
	Pendimethalin	887	841	841
	Thifensulfuron-methyl	3	259	259
	Tribenuron-methyl	8	902	902
	Insecticides			
	Cypermethrin	22	837	837
	Dimethoate	192	633	633
	Esfenvalerate	2	365	365
	Growth regulators			
	Chloremequat	407	425	425
	Ethephon	69	350	350
	Mepiquat chloride	136	350	350

Table 17: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for fodder maize, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Fodder maize	Fungicides			
	Chlorothalonil	267	533	533
	Epoxiconazole	40	533	533
	Herbicides			
	Flufenacet	430	1,259	1,259
	Fluroxypyr	104	703	703
	Glyphosate	3,090	3,117	3,117
	Isoxaflutole	90	1,259	1,259
	Mesotrione	992	11,885	11,885
	Pendimethalin	15,027	12,140	12,140
	Terbuthylazine	4,674	11,885	11,885
	Molluscicides			
	Methiocarb	2,704	13,766	13,766

Table 18: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for hay & haylage, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Hay & haylage	Herbicides			
	Amidosulfuron	15	344	344
	Dicamba	55	545	545
	Fluroxypyr	98	393	393
	MCPA	58	27	27
	Mecoprop-P	409	545	545
	Triclopyr	98	393	393

Table 19: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for fodder kale & fodder rape crops, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Fodder kale & fodder rape	Fungicides			
	Benthiavalicarb-isopropyl	8	287	287
	Boscalid	230	920	920
	Carbendazim	59	633	633
	Flusilazole	119	633	633
	Mancozeb	302	287	287
	Metconazole	57	633	633
	Thiram	1	145	145
	Herbicides			
	Desmedipham	16	634	634
	Ethametsulfuron-methyl	12	634	634
	Ethofumesate	96	634	634
	Glyphosate	2,893	2,244	2,244
	Phenmedipham	48	634	634
	Propaquizafop	57	575	287
	Molluscicides			
	Metaldehyde	24	157	157
	Methiocarb	4	43	43

Table 20: Estimated quantity (kg), spray area (spha) and basic area (ha) of active substance for fodder turnip & fodder swede crops, 2013.

Crop	Active Substance	Quantity (kg) of Active Ingredient Total	Spray area (spha) of Active Ingredient Total	Basic area (ha) of Active Ingredient Total
Fodder turnip & fodder swedes	Fungicides			
	Thiram	1	453	453
	Herbicides			
	Cycloxydim	29	145	145
	Ethofumesate	87	289	145
	Glyphosate	266	185	185
	Lenacil	64	145	145
	Metamitron	506	145	145
	Metazachlor	52	74	74
	Phenmedipham	69	289	145
	Propyzamide	116	145	145
	Triflusulfuron-methyl	2	145	145
	Insecticides			
	Imidacloprid	91	145	145

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