

PESTICIDE USAGE IN NORTHERN IRELAND
SURVEY REPORT 238

NORTHERN IRELAND GRASSLAND AND FODDER CROPS 2009



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PESTICIDE USAGE SURVEY REPORT 238

NORTHERN IRELAND

GRASSLAND & FODDER CROPS

2009

J.A Withers, S. Jess,
D. Matthews and T. Kelly.

Pesticide Usage Survey Group
Agri-Food and Biosciences Institute
Newforge Lane
Belfast BT9 5PX

Tel: 028 90255283
Fax: 028 90255380
email: stephen.jess@afbni.gov.uk

Department of Agriculture & Rural Development for Northern Ireland

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The County Regions of Northern Ireland



SUMMARY

This is the sixth survey examining pesticide usage practices on grassland and fodder crops in Northern Ireland, providing data comparative to that obtained from previous surveys in 1989 (Jess et al., 1992), 1993 (Jess et al., 1995), 1997 (Jess et al., 2000), 2003 (Withers et al., 2005) and 2005 (Withers et al., 2007). In this survey, information on all aspects of pesticide usage was collected from 324 enclosed grazing, 36 arable silage, 33 fodder maize and 20 other fodder crop holdings throughout the Province, representing 2.9% of the total area of grassland and fodder crops grown. Quantitative data obtained were adjusted to provide estimates of total pesticide usage.

Overall, the area of grassland and fodder crops grown in 2009, 1,145,386 ha, increased by 2% when compared to 2005. The area of established grassland crops also increased by 3% throughout this period. The area of fodder crops grown in Northern Ireland in 2009 increased by 45% compared to that recorded in 2005. This was principally due to the increase in fodder maize production. A fourth cut of silage was recorded for the first time in 2005 and this recurred in 2009.

The area of grassland and fodder crops receiving pesticide treatment, decreased by 21% when compared to that recorded in 2005. Both the pesticide-treated area and the weight of pesticides applied were the lowest recorded in any survey. A total of 75 tonnes of pesticides was applied to 101,998 spray hectares of grassland and fodder crops during 2009. This represented a 12% reduction in the weight of pesticides applied compared to 2005. Herbicides accounted for 78% of the pesticide-treated area, representing 96% of the weight of pesticides applied. Seed treatments accounted for a further 12% of the treated area. The weight of active ingredients applied as seed treatments represented less than 1% of the total active ingredients. Fungicides, insecticides and growth regulators collectively accounted for the remainder of the total pesticide usage. No molluscicide use was recorded during this survey.

The areas of enclosed grazing and grass silage treated with pesticides decreased by 38% when compared to the 2005 survey, returning to a level similar to that recorded in 1989. Correspondingly, the weight of pesticide applied to enclosed grazing and grass silage decreased by 38%. Pesticide usage on sown grassland crops increased by 25% when compared with 2005 and the weight applied increased two-fold. This was due mainly to increased applications of herbicides to grass reseeds. The increase in the area of fodder crops when compared to 2005 was mainly attributed to a 43% increase in the area of fodder maize. The pesticide-treated area of the maize crop increased by more than two-fold from 5,993 spray hectares (spha) to 13,751 spha. However, the weight of pesticides applied increased by only 10%. This was due to the withdrawal of atrazine and the application of the formulations bromoxynil/terbutylazine and flufenacet/isoxaflutole. The formulation mesotrione/terbutylazine was also frequently applied.

Herbicides remained the most extensively used pesticide type on grassland and fodder crops. The use of herbicides decreased by 21% between 2003 and 2005. This continued between 2005 and 2009 showing a 32% reduction. The trend for reduced weight of herbicide applied since 1989 also continued. The formulation of fluroxypyr/triclopyr was the most frequently-used herbicide, principally applied to the first-cut of grass silage to control docks (*Rumex* spp.).

A total of 112 products comprising 70 active ingredients were recorded in use in this survey.

DEFINITIONS AND NOTES

‘Basic area’. This refers to the actual planted area of crop which was treated with a given pesticide.

‘Treated area’. This refers to the total area treated with a pesticide, which includes all repeated applications to the basic area. This is measured in ‘spray-hectares’ (spha).

‘Reasons for use’. This refers to the perceived reasons reported by the farmer for the use of a particular pesticide. These reasons may sometimes be inappropriate.

‘Rounding’. Due to rounding of figures there may be slight differences in totals both within and between tables.

‘Spray applications’. This refers to the number of treatments of any pesticide type applied to the treated areas.

‘General weed control’. This refers to post emergence weed control.

‘Ground preparation’. This refers to treatments applied before or during seed bed preparation.

‘Sealer’. This refers to the application of herbicides to the crop, usually during sowing, to kill weed seedlings as they emerge.

‘Grass silage’. Prior to 1997, the survey areas of grass silage from multiple cuts were reported as a single crop. However, in keeping with 1997, 2003 and 2005 the 2009 survey areas and pesticide treatments on individual cuts of silage were recorded separately.

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

‘Enclosed grazing’. Is defined as land which has been improved by management practices such as liming, top dressing and fencing etc., where there is not a significant presence of sensitive plant species, and which could be cultivated for other purposes.

‘Arable silage’. Is defined as arable crops, particularly cereals, which has been ensiled whole and has not been combined for grain.

‘Arable silage (undersown)’. Is defined as an arable crop grown as a nurse crop for a green cover crop, such as ryegrass, and which has been ensiled rather than combined for grain.

‘Cereals (undersown)’. Are defined as cereal crops which have been grown as a nurse crop for a green cover crop, such as ryegrass, and which has been combined for grain.

‘Other fodder crops’ comprised fodder beet, fodder kale, fodder rape, fodder swede and fodder turnip. These were grouped together for statistical purposes.

INTRODUCTION

As a participant of the UK Working Party on Pesticide Usage Surveys, and on behalf of the Department of Agriculture and Rural Development (DARD), the Agri-food and Biosciences Institute conducts a cyclical programme of surveys to examine pesticide usage in all sectors of the agricultural and horticultural industries. Principally, the data collected provides information for consideration by the Advisory Committee on Pesticides. However, pesticide usage data may also be used by those involved in residue testing, for public information, for provision of data for research and for evaluation of trends in pesticide usage.

This is the sixth survey of pesticide usage on grassland and fodder crops in Northern Ireland. The previous surveys of this sector were conducted in 1989 (Jess et al., 1992), 1993 (Jess et al., 1995), 1997 (Jess et al., 2000), 2003 (Withers et al., 2005) and 2005 (Withers et al., 2007), data from which are included in this report for comparative purposes.

A list of published Northern Ireland Pesticide Usage Survey reports is shown in Appendix 1.

METHODS

The sample of holdings to be surveyed was selected from each of the six counties on the basis of the total area of enclosed grassland grown. To ensure adequate coverage of different fodder crops and to accurately assess total usage for fodder crops, separate samples were selected for farms that grew arable silage, fodder maize and other fodder crops. The Northern Ireland Agricultural Census, June 2008 (Anon., 2009) was used for this purpose.

In each region the sample holdings were stratified into six size groups according to the total area of enclosed grassland. Holdings were selected at random from within each of the size groups, the number of holdings selected being proportional to the total area of enclosed grassland in the group as a whole. Samples of holdings for arable silage, fodder maize and other fodder crops were selected from their own defined Northern Ireland populations using separate area size groups, with the number of holdings selected being proportional to the total area of that fodder crop.

The purpose of the survey was explained to the occupiers of the selected holdings in preliminary correspondence. A total of 324 enclosed grazing, 36 arable silage, 33 fodder maize and 20 other fodder crop holdings were surveyed by telephone interview from January 2010 - April 2010. The data collected included the area of crops grown, area treated, the target crop, pesticides used and the number of treatments applied. The growers' given reasons for pesticide use, including inappropriate usage, were also recorded. Holdings selected in the original sample which proved unable to provide data were replaced with those from the same

county and size group held on a reserve list. During analysis, the sample data were raised to the total population level using raising factors calculated from the ratio of the number of farms sampled to the number of farms in the population within each region and size group. A further adjustment factor corrected the data in accordance with the areas of grassland and fodder crops published in the Northern Ireland Agricultural Census, June 2009 (Anon., 2010). The total number of farms in each size group and the number of farms sampled are shown in Tables 1a, b, c and d.

The collected data were entered using Oracle, a relational database programme. Validated data were downloaded for analysis using SPSS software.

Crops:

Information was collected for enclosed grazing, grass silage, hay, rough grazing, sown crops and fodder crops. Data on pesticide usage on these crops were collected from 1,327 crops surveyed on 327 holdings. This accounted for 2.93% of crops (table 2).

Figure 1: Regional distribution of grassland and fodder crops grown in Northern Ireland (ha), 2009.

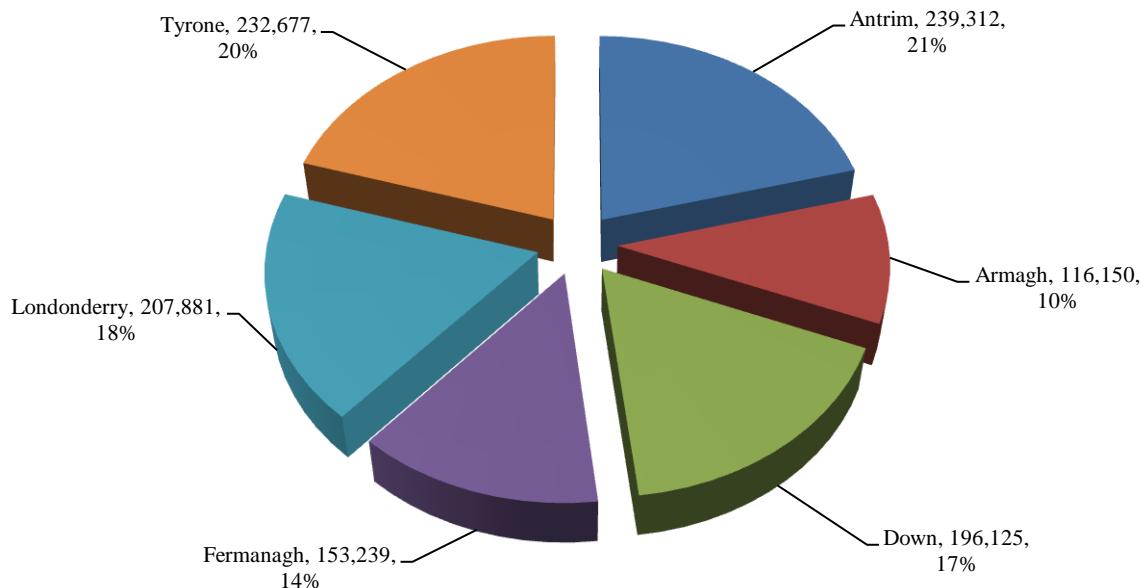


Figure 2: Regional distribution of individual grassland and fodder crops grown in Northern Ireland (ha), 2009.

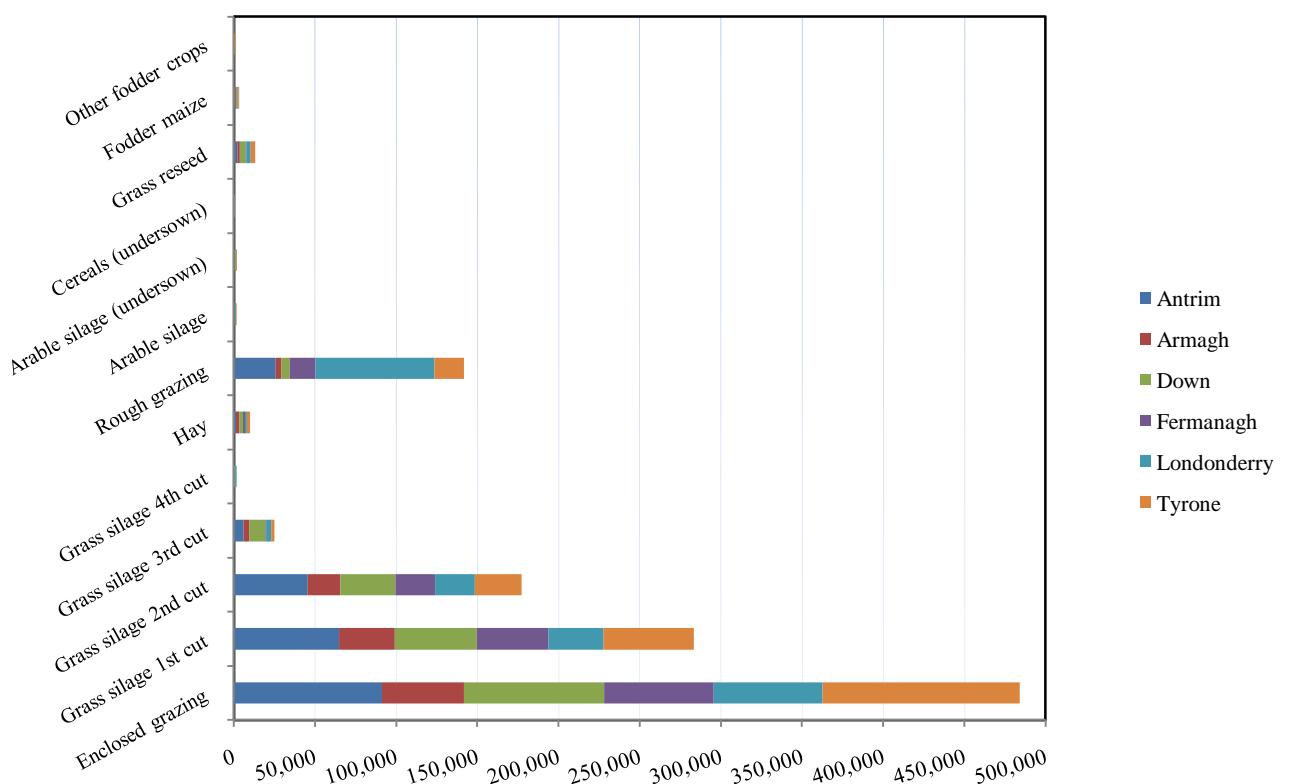


Figure 3: Regional distribution of area (ha) of grassland crops grown in Northern Ireland, 2009.

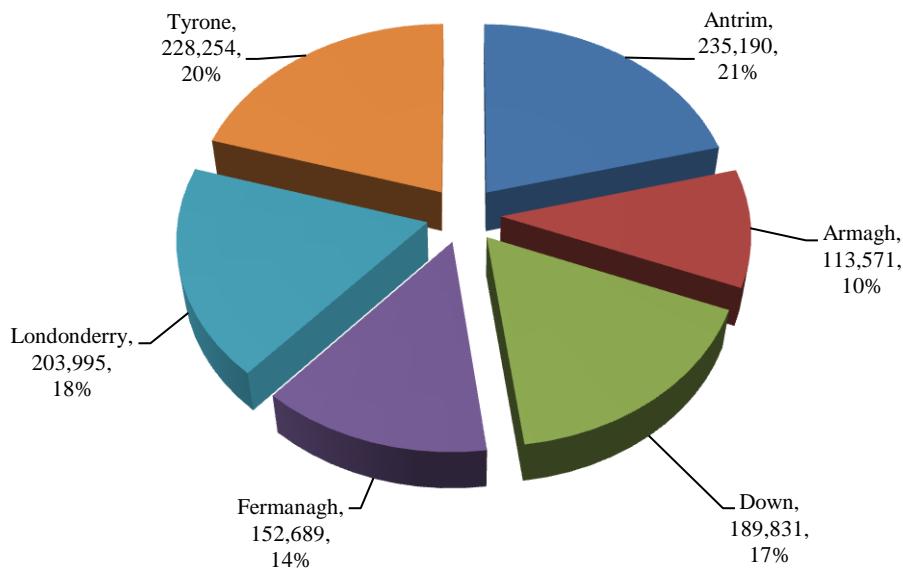


Figure 4: Regional distribution of area (ha) of sown crops grown in Northern Ireland, 2009.

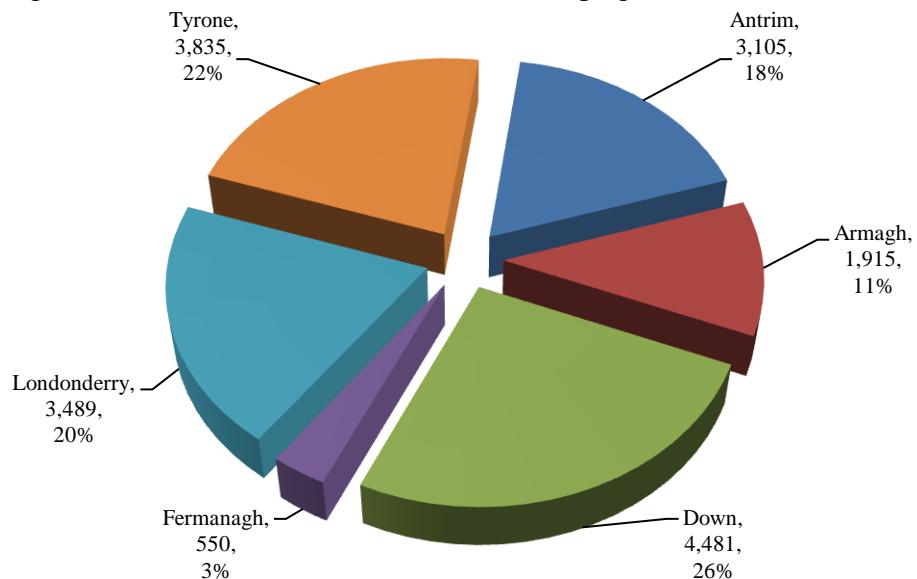
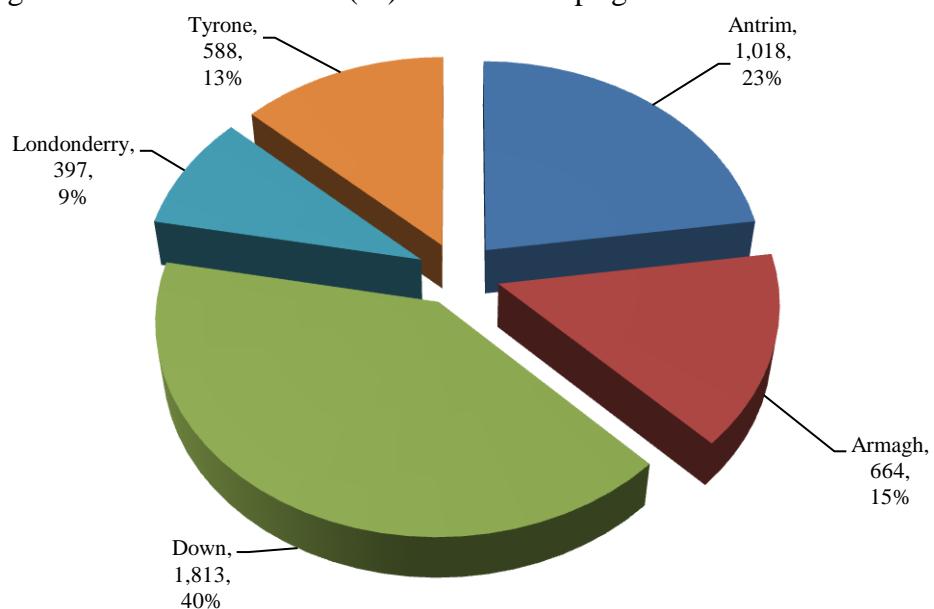


Figure 5: Regional distribution of area (ha) of fodder crops grown in Northern Ireland, 2009.



Pesticide usage:

Figure 6: Pesticide usage (spha) on grassland & fodder crops in Northern Ireland, 2009.

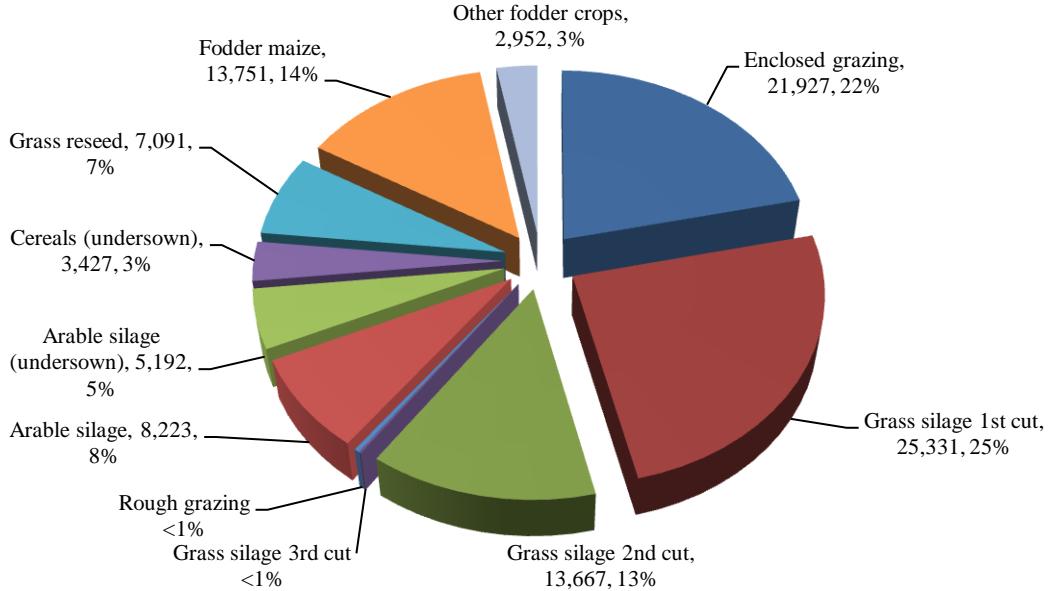


Figure 7: Weight (kg) of pesticide applied to grassland & fodder crops in Northern Ireland, 2009.

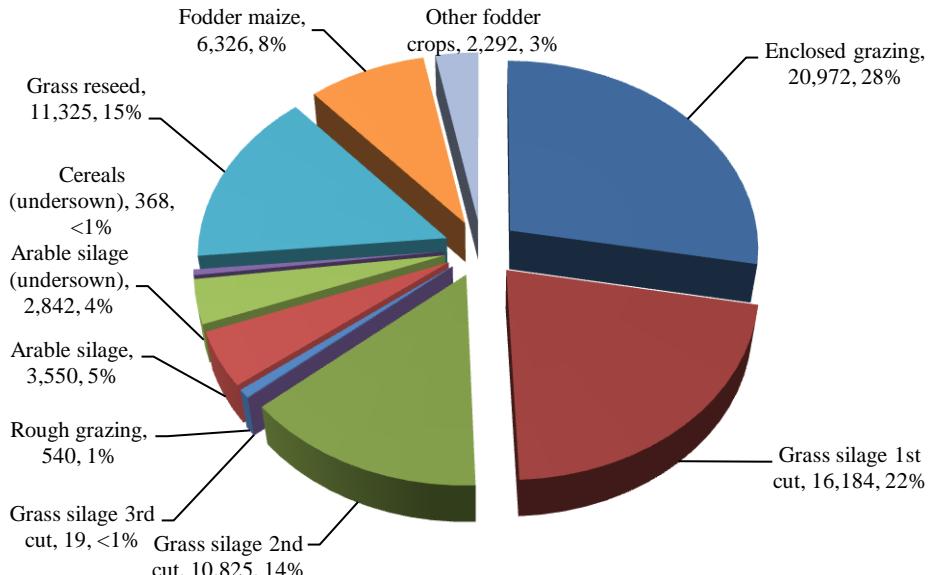


Figure 8: Area (spha) of grassland & fodder crops treated regionally with each pesticide type in Northern Ireland, 2009.

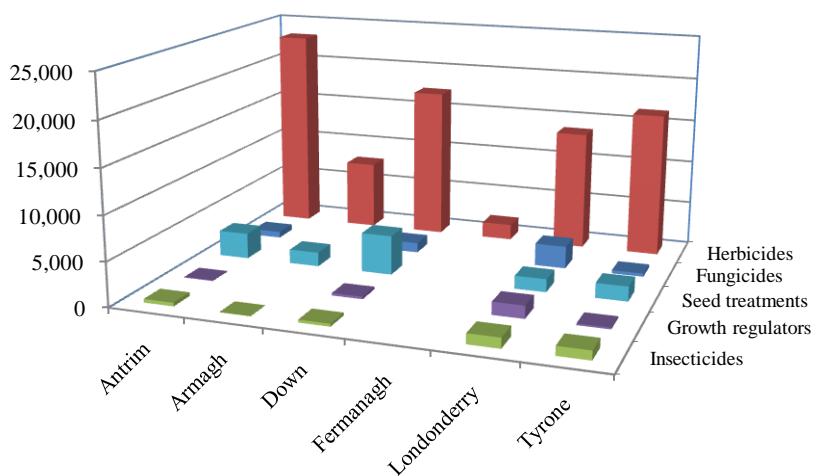


Figure 9: Weight (kg) of each pesticide type applied regionally to grassland & fodder crops in Northern Ireland, 2009.

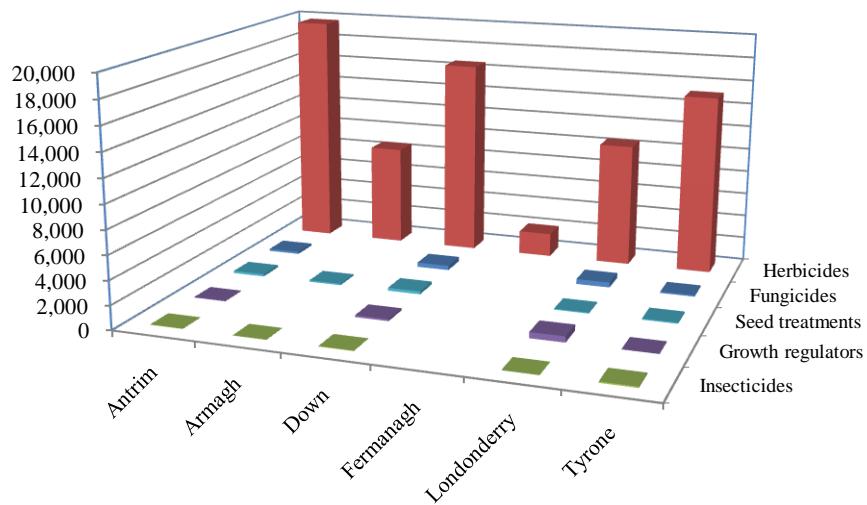


Figure 10: Pesticide usage (spha) on grassland and fodder crops in Northern Ireland, 2009.

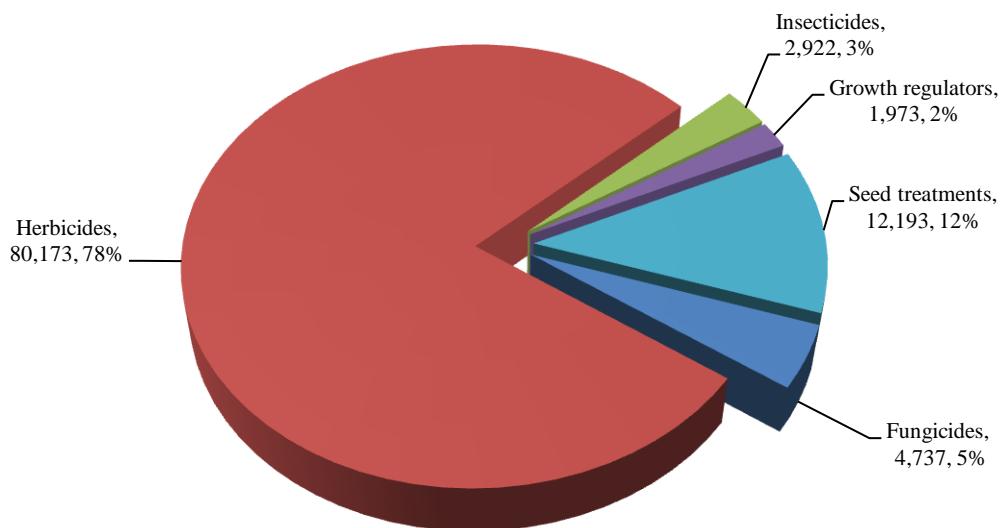


Figure 11: Weight (kg) of pesticide applied to grassland and fodder crops in Northern Ireland, 2009

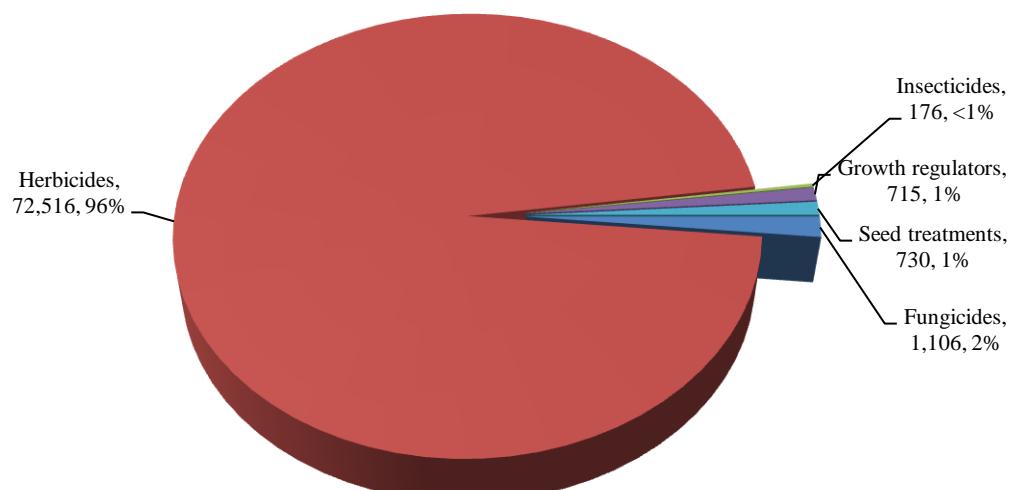


Figure 12: Pesticide usage (spha) on established grassland crops in Northern Ireland, 2009.

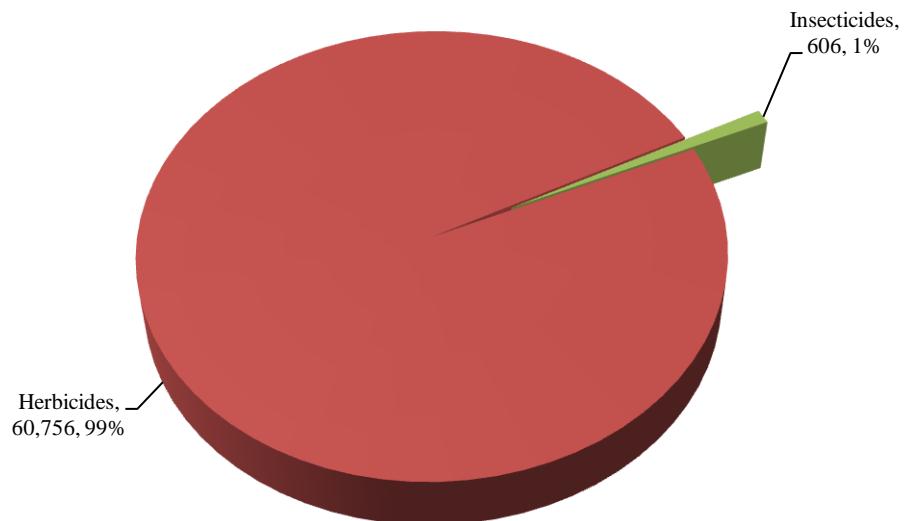


Figure 13: Weight (kg) of pesticide applied to established grassland crops in Northern Ireland, 2009.

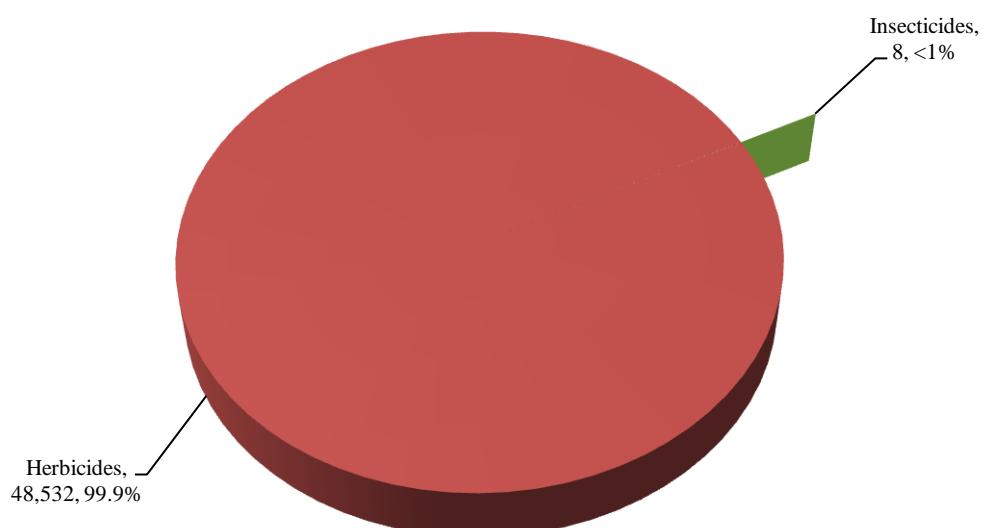


Figure 14: Pesticide usage (spha) on sown crops in Northern Ireland, 2009.

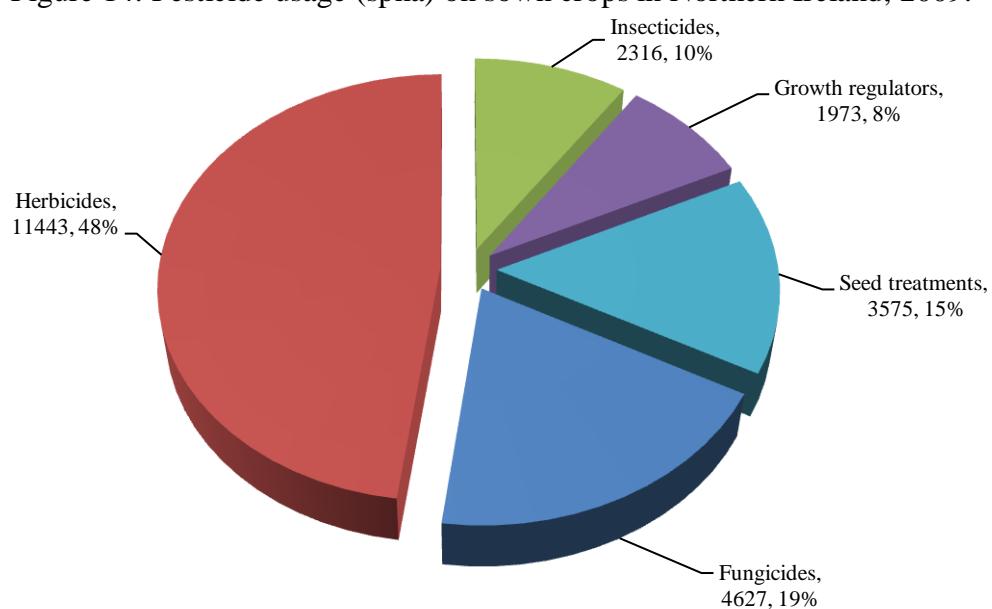


Figure 15: Weight (kg) of pesticide applied to sown crops in Northern Ireland, 2009.

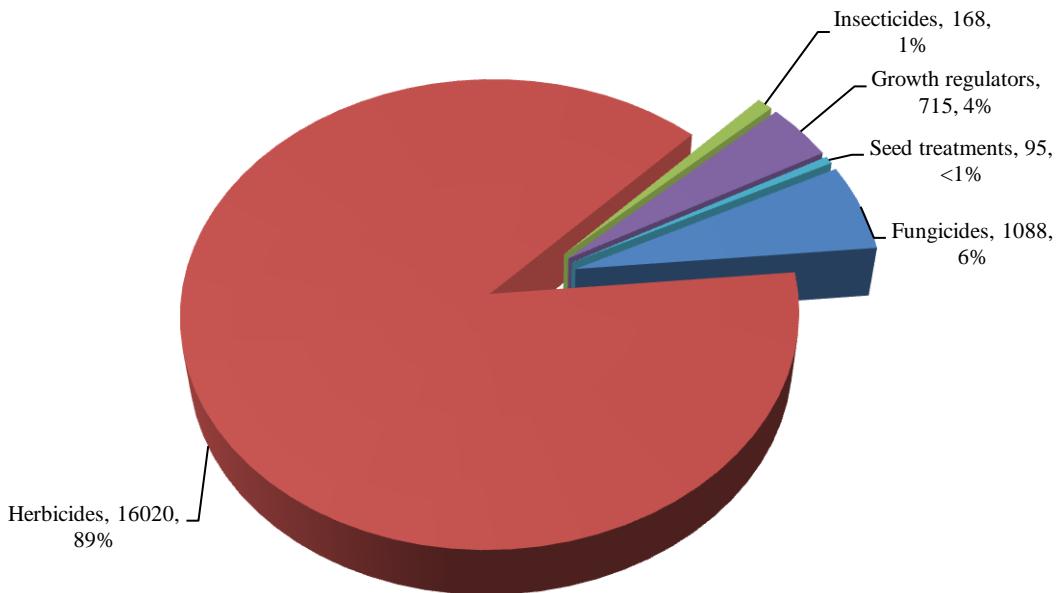


Figure 16: Pesticide usage (spha) on fodder crops in Northern Ireland, 2009.

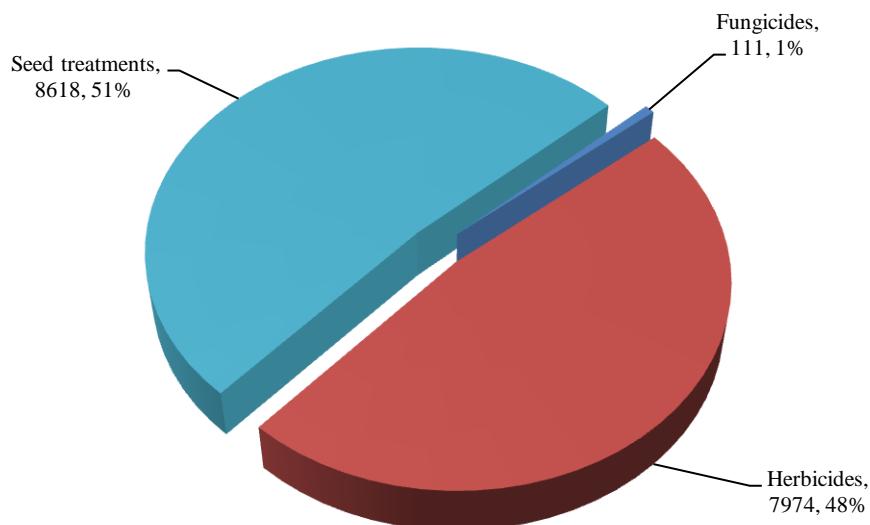
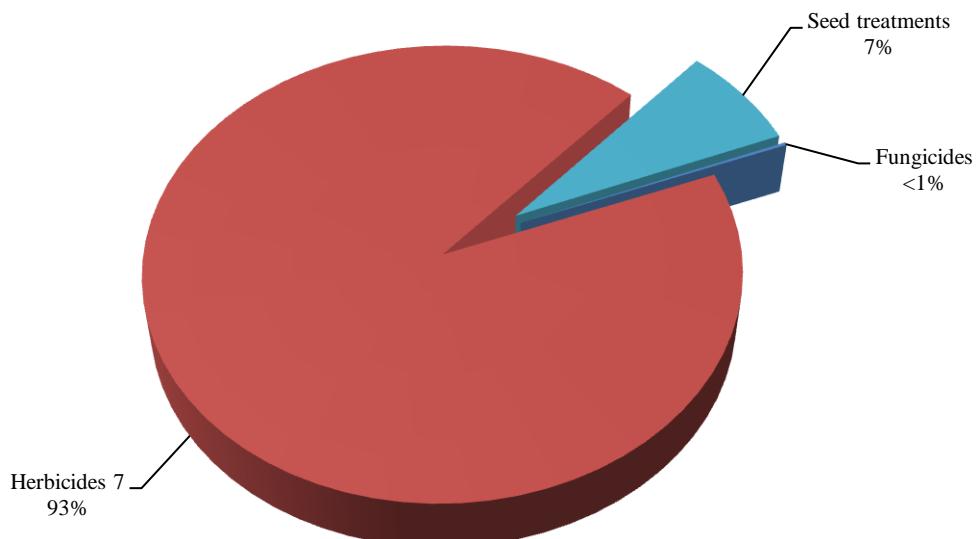


Figure 17: Weight (kg) of pesticide applied to fodder crops in Northern Ireland, 2009.



Pesticide usage on grassland:

Enclosed grassland

Tables: 3, 6, 7, 8, 9, 10, 13

- 484,223 hectares of enclosed grassland grown in Northern Ireland.
- 21,927 treated ‘spray hectares’.
- 20,972 kg of active substances applied.
- Herbicides and insecticides were applied.
- 606 ha (0.1%) were treated with cypermethrin to control leatherjackets.
- 4% of the enclosed grassland area received treatments.

Figure 18: Enclosed grazing: pesticide-treated area (spha) of herbicide active substances, 2009.

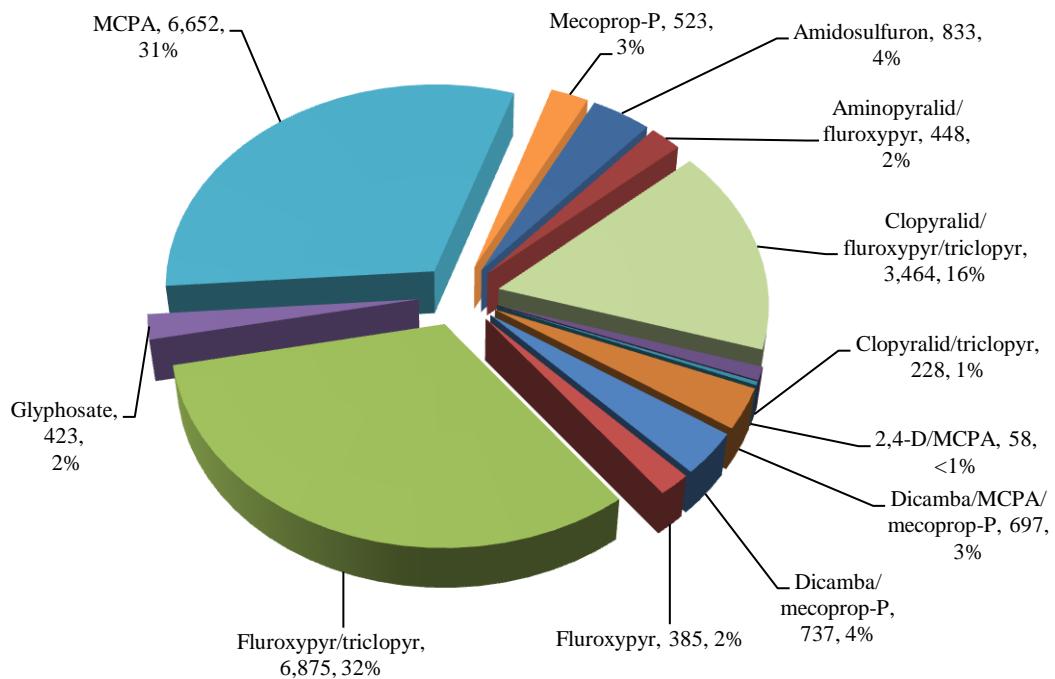


Figure 19: Enclosed grazing: weight (kg) of herbicide active substances applied, 2009.

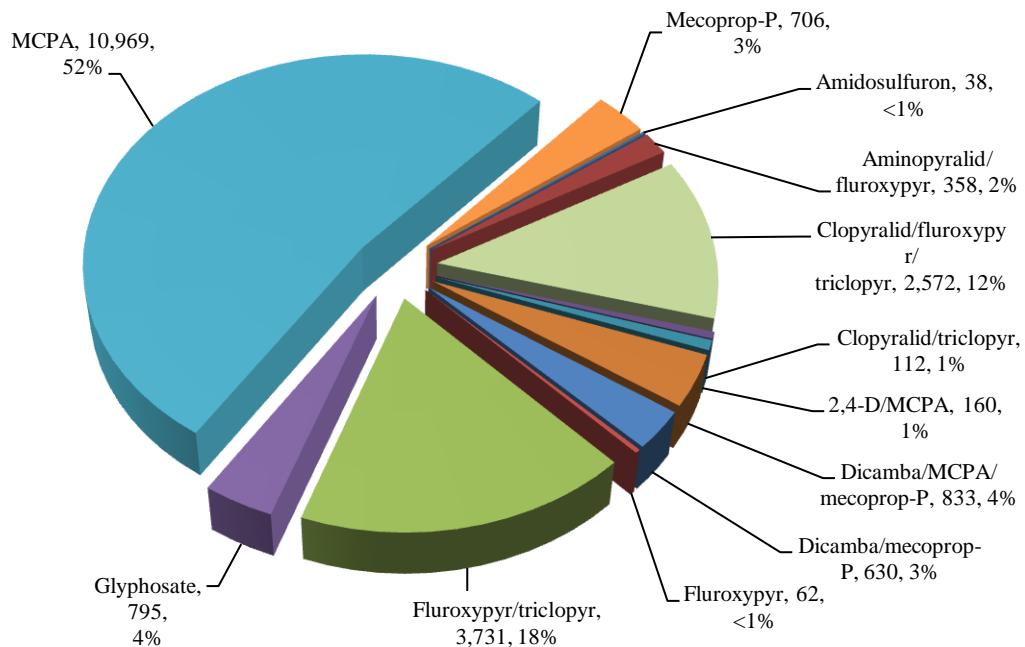
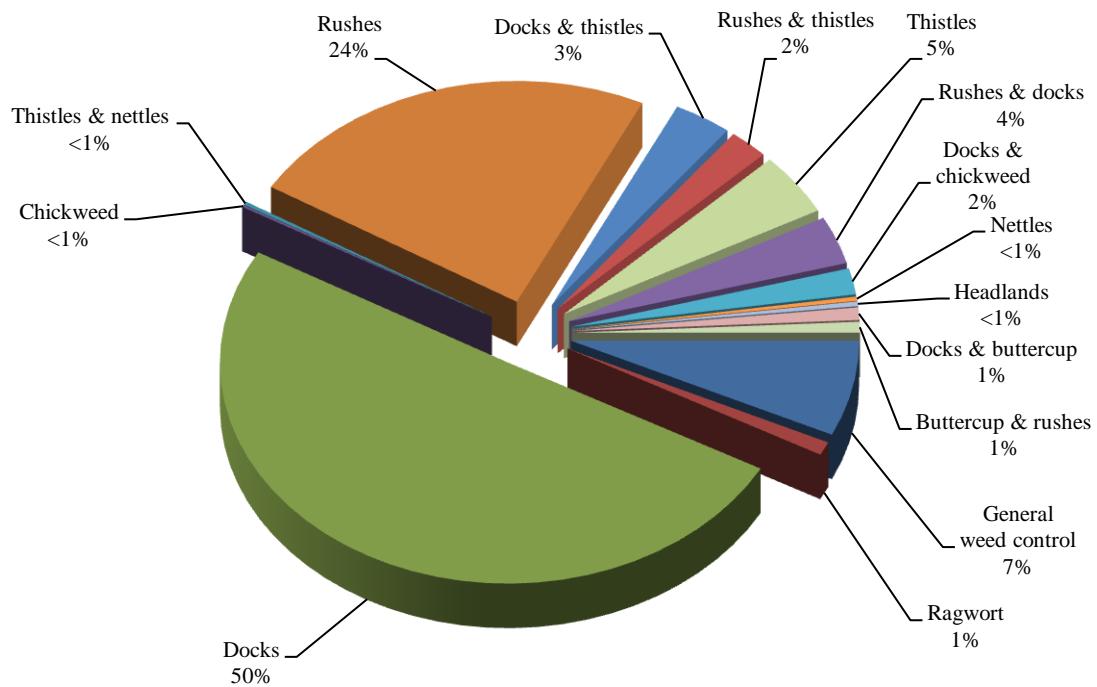


Figure 20: Enclosed grazing: reasons for herbicide use (spha), 2009.



Grass silage 1st cut

Tables: 3, 6, 7, 8, 9, 10, 14

- 283,389 hectares of 1st cut grass silage grown in Northern Ireland.
- 25,331 treated ‘spray hectares’.
- 16,184 kg of active substances applied.
- Herbicides were the only active substances applied.
- 8.5% of the 1st cut grass silage area received treatments.

Figure 21: Grass silage 1st cut: pesticide-treated area (spha) of herbicide active substances, 2009.

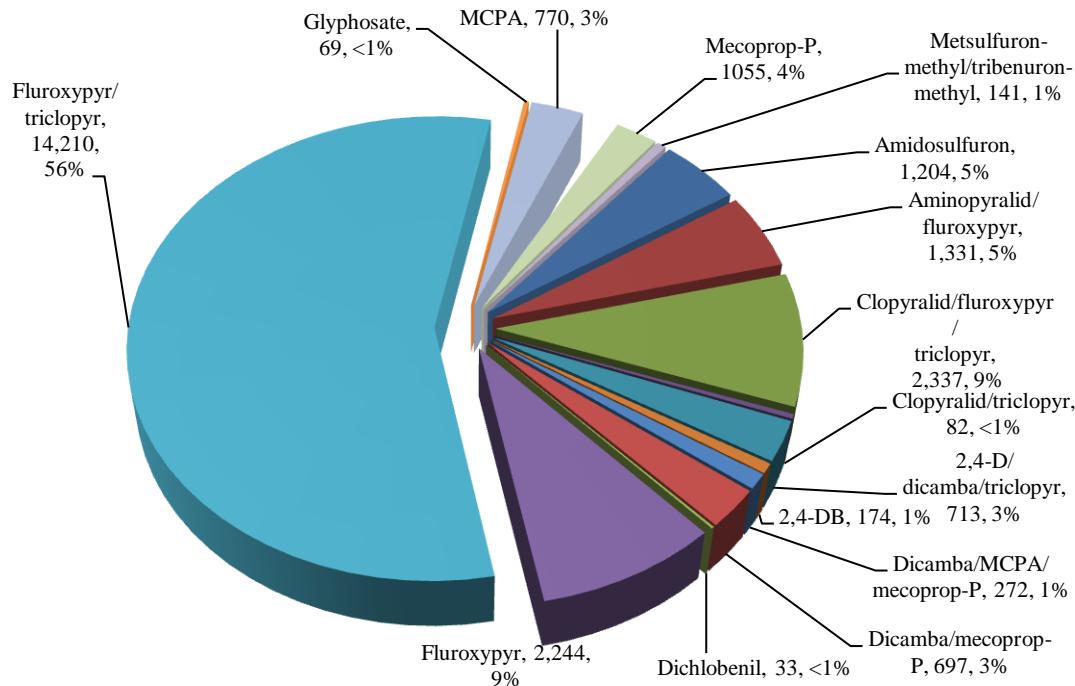


Figure 22: Grass silage 1st cut: weight (kg) of herbicide active substances applied, 2009.

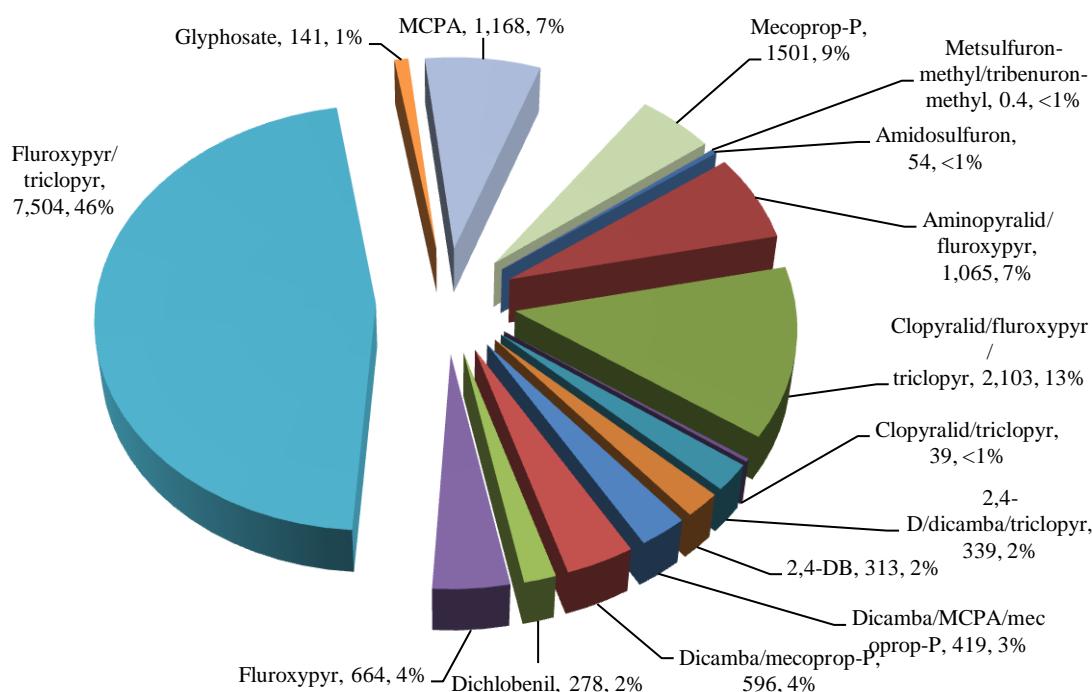
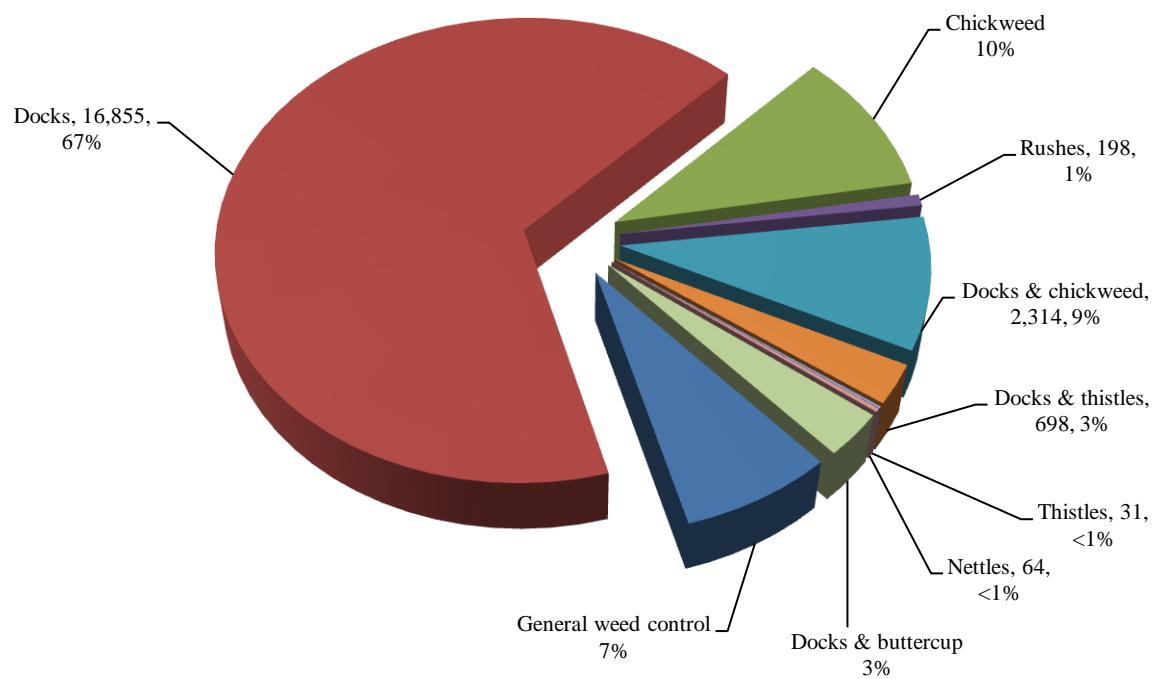


Figure 23: Grass silage 1st cut: reasons for herbicide use (spha), 2009.



Grass silage 2nd cut

Tables: 3, 6, 7, 8, 9, 10, 15

- 117,202 hectares of 2st cut grass silage grown in Northern Ireland.
- 13,667 treated ‘spray hectares’.
- 10,825 tonnes of active substances applied.
- Herbicides were the only active substances applied.
- 7.4% of the 2nd cut grass silage area received treatments.

Figure 24: Grass silage 2nd cut: pesticide-treated area (spha) of herbicide active substances, 2009.

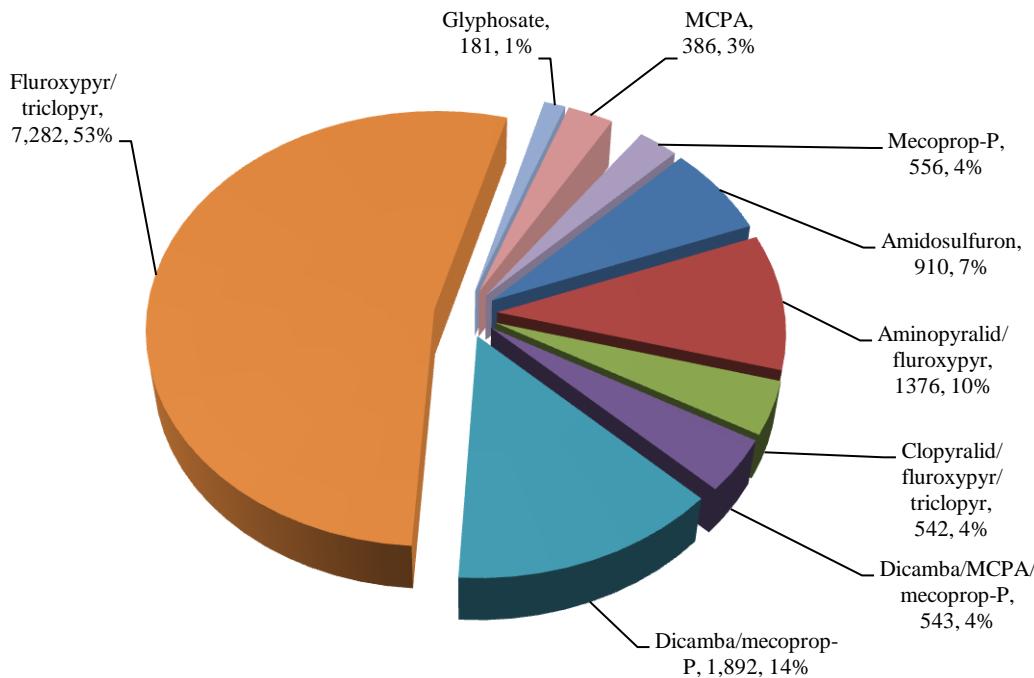


Figure 25: Grass silage 2nd cut: weight (kg) of herbicide active substances applied, 2009.

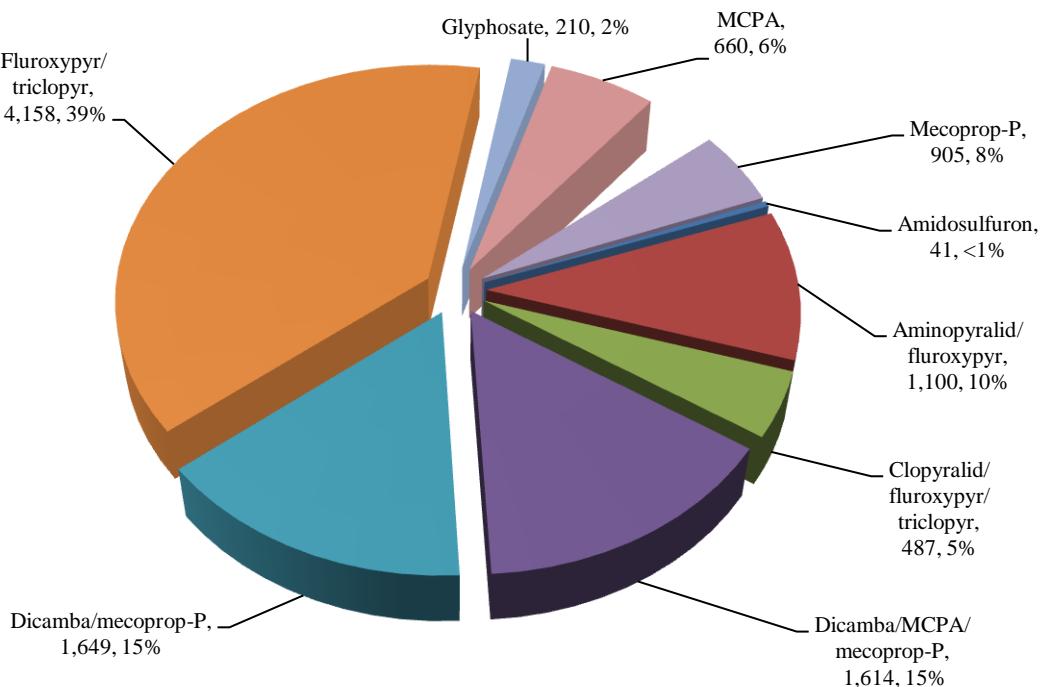
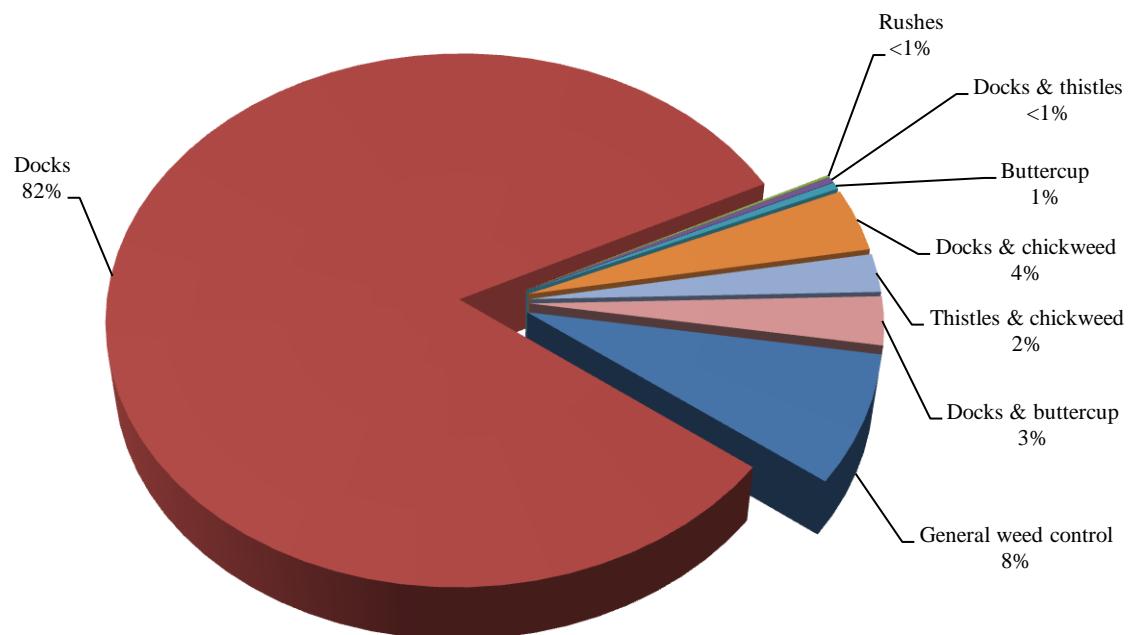


Figure 26: Grass silage 2nd cut: reasons for herbicide use (spha), 2009.



Grass silage 3rd cut

Tables: 3, 6, 7, 8, 9, 10, 16

- 25,144 hectares of 3rd cut grass silage grown in Northern Ireland.
- 130 treated ‘spray hectares’.
- 19 kilograms of active substances applied.
- The herbicide fluroxypyr was the only active substance applied.
- This was applied to treat docks and chickweed.
- 0.5% of the 3rd cut silage area received treatments.

Grass silage 4th cut

Tables: 3, 6, 7, 8, 9, 10

- 1,806 hectares of 4th cut grass silage grown in Northern Ireland.
- No treatments were applied.

Hay

Tables: 3, 6, 7, 8, 9, 10

- 9,861 hectares of hay grown in Northern Ireland.
- No treatments were applied.

Rough grazing

Tables: 3, 6, 7, 8, 9, 10, 17

- 141,926 hectares of rough grazing in Northern Ireland.
- 308 treated ‘spray hectares’.
- 540 kilograms of active substances applied.
- Herbicides were the only active substances applied.
- 0.2% of the rough grazing area received treatments.

Figure 27: Rough grazing: pesticide-treated area (spha) of herbicide active substances, 2009.

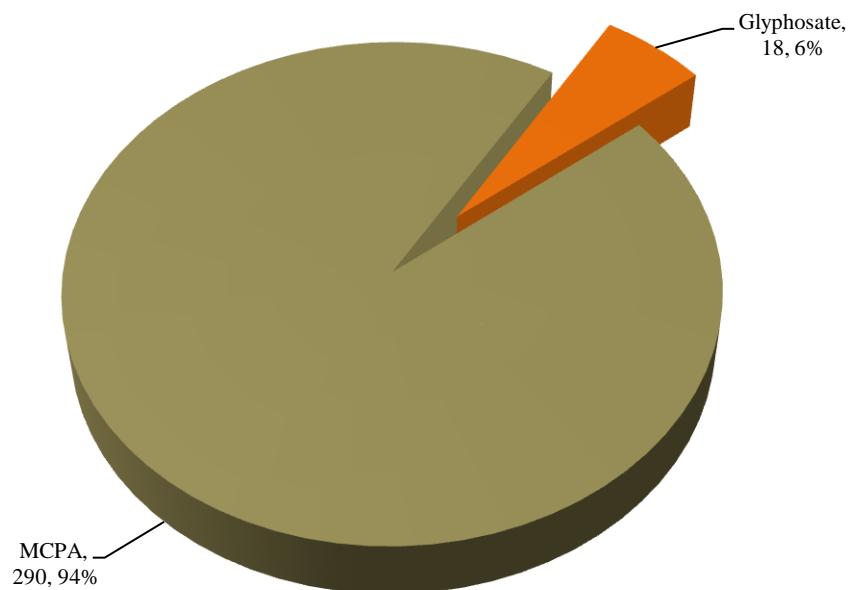


Figure 28: Rough grazing: weight (kg) of herbicide active substances applied, 2009.

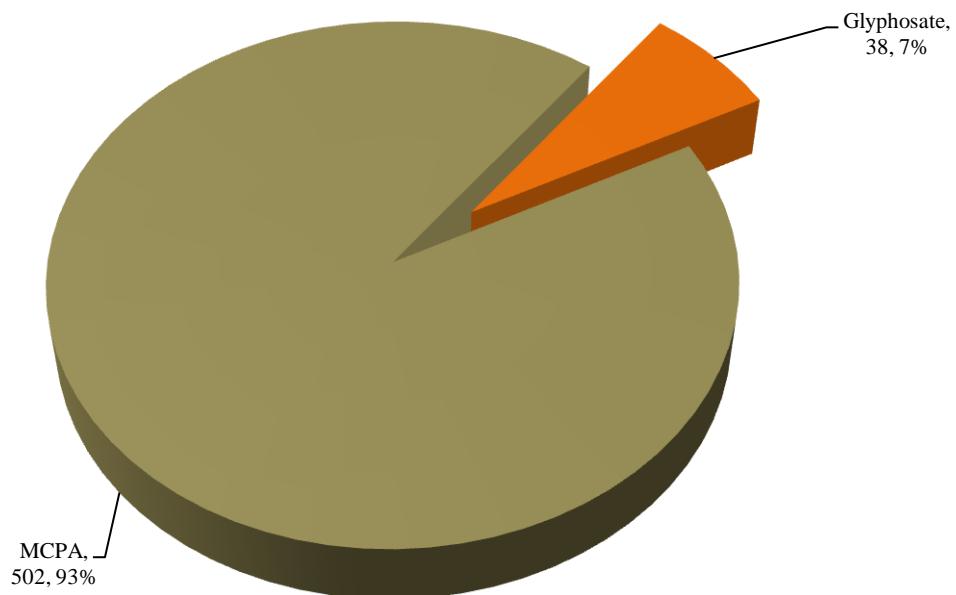
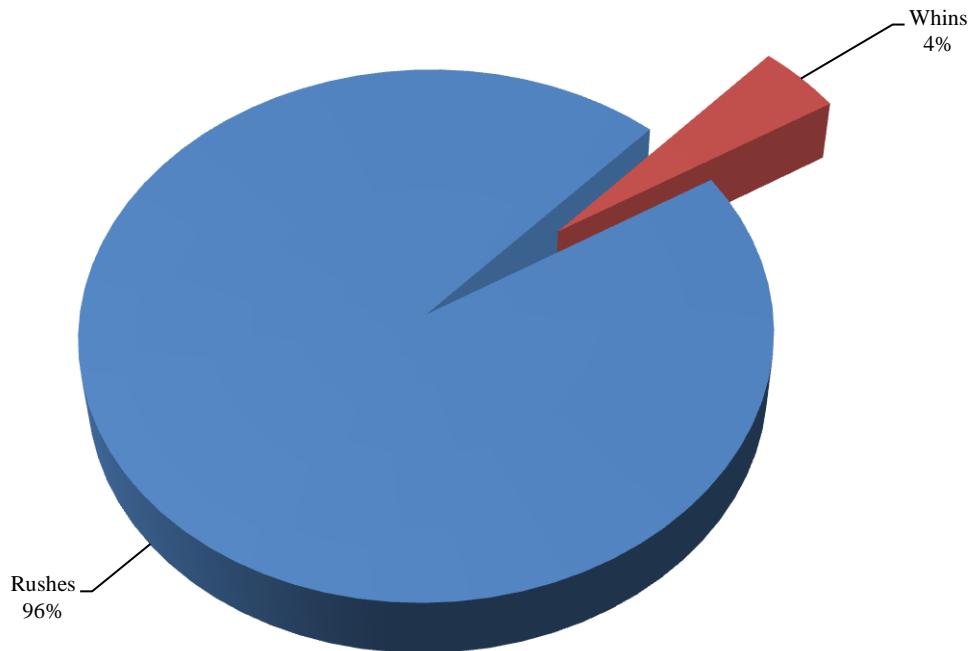


Figure 29: Rough grazing: reasons for herbicide use (spha), 2009.



Arable silage

Tables: 3, 6, 7, 8, 9, 10, 18

- 1,638 hectares of arable silage in Northern Ireland.
- 8,223 treated ‘spray hectares’.
- 3,550 kilograms of active substances applied.
- Fungicides, herbicides, insecticides, growth regulators and seed treatments were all applied.
- 88.9% of the arable silage area received treatments.

Figure 30: Arable silage: Area (spha) of pesticide groups applied, 2009.

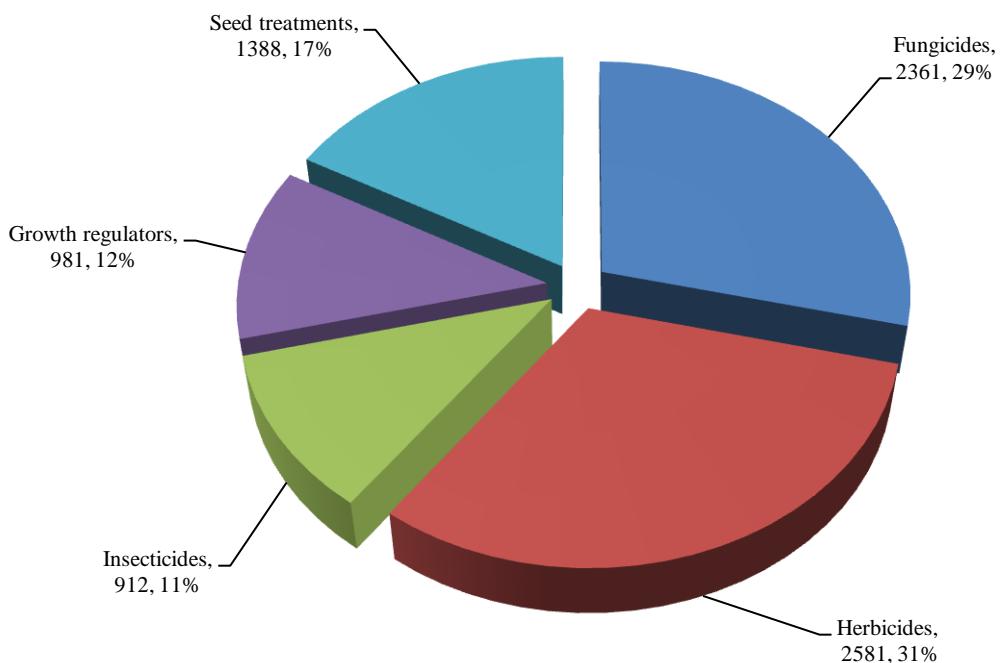


Figure 31: Arable silage: Weight (kg) of pesticide groups applied, 2009.

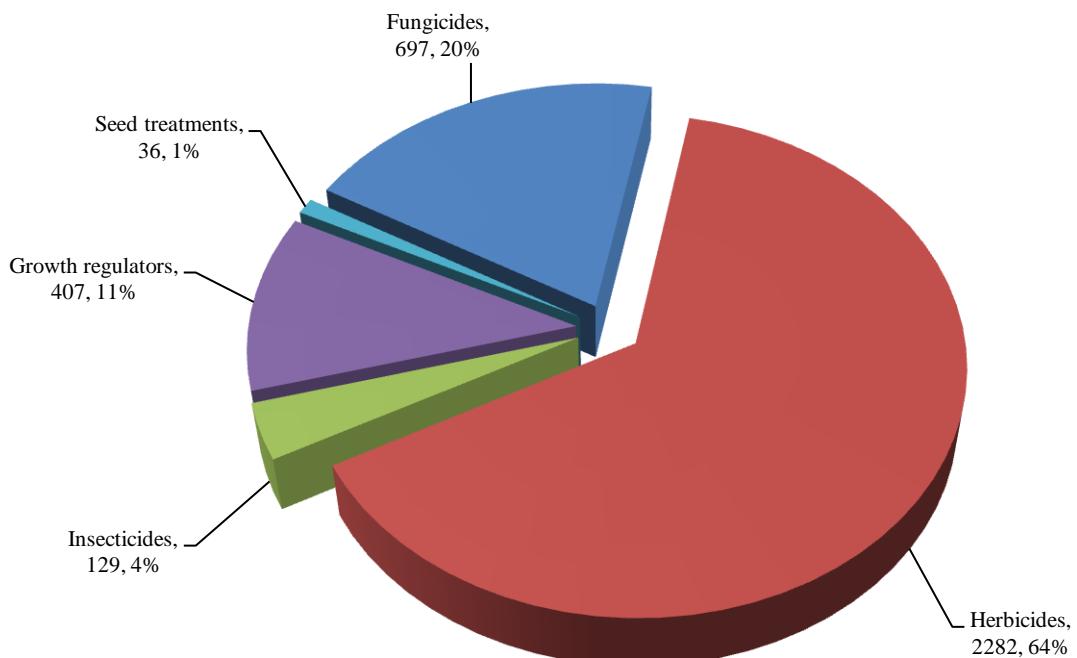


Figure 32: Arable silage: pesticide-treated area (spha) of fungicide active substances, 2009.

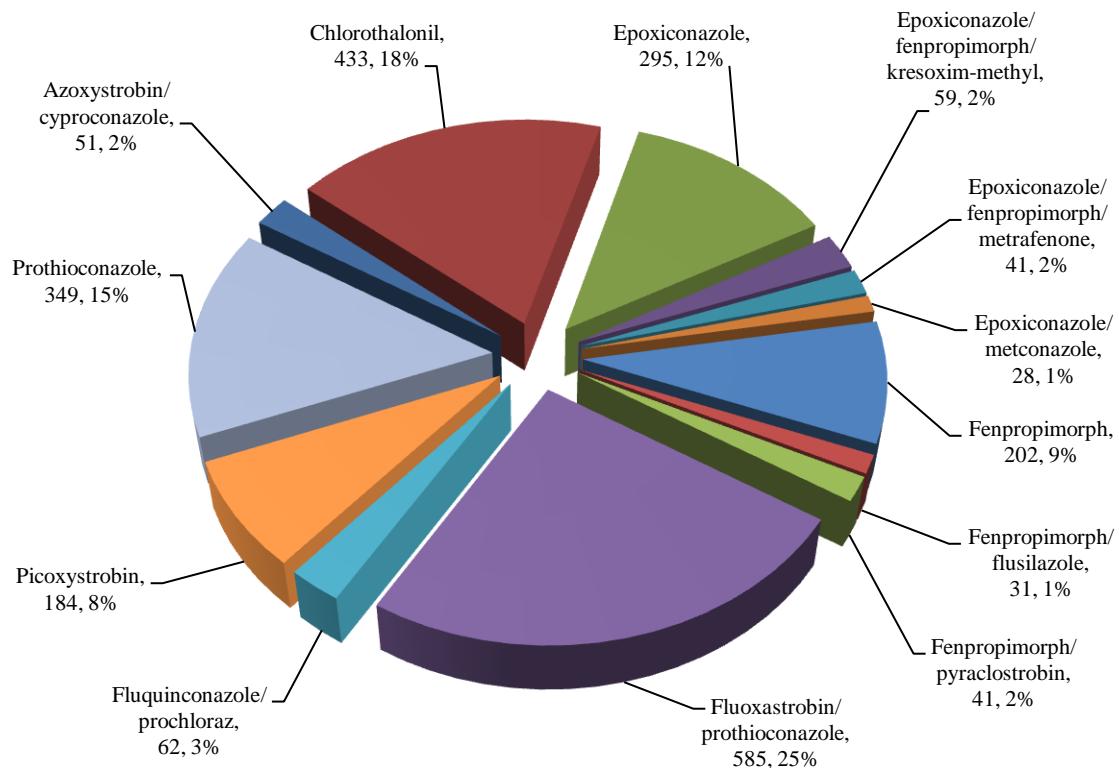


Figure 33: Arable silage: weight (kg) of fungicide active substances applied, 2009.

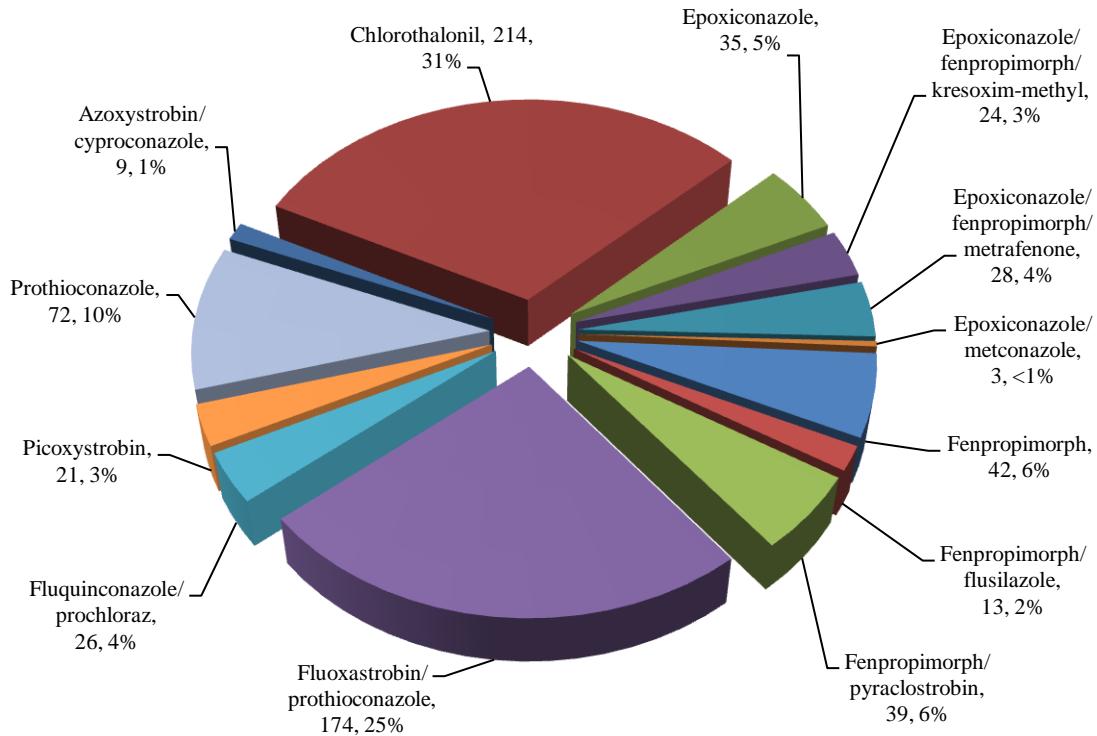


Figure 34: Arable silage: pesticide-treated area (spha) of herbicide active substances, 2009.

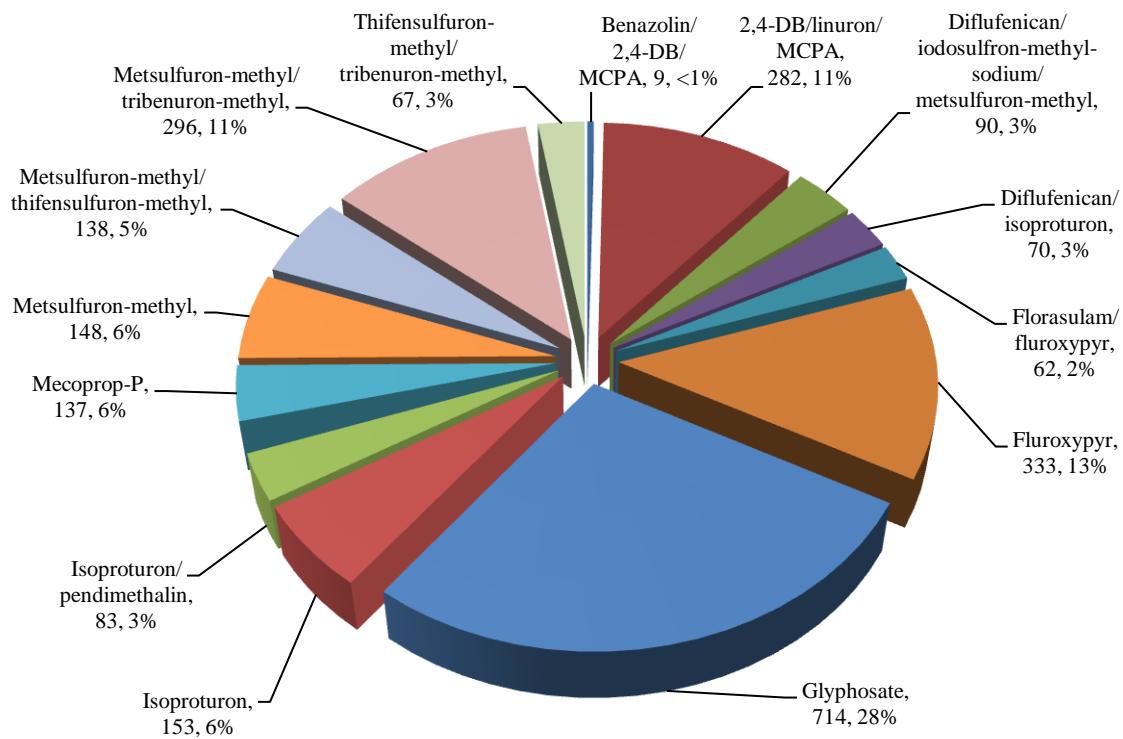


Figure 35: Arable silage: weight (kg) of herbicide active substances applied, 2009.

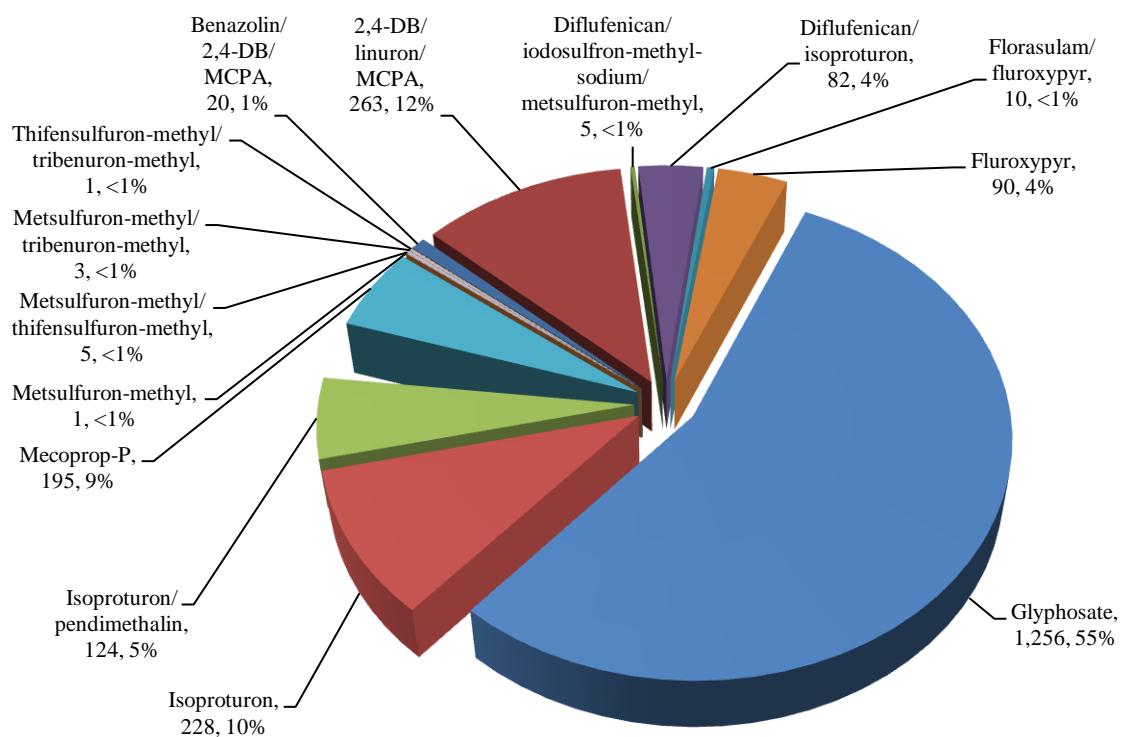


Figure 36: Arable silage: pesticide-treated area (spha) of insecticide active substances, 2009.

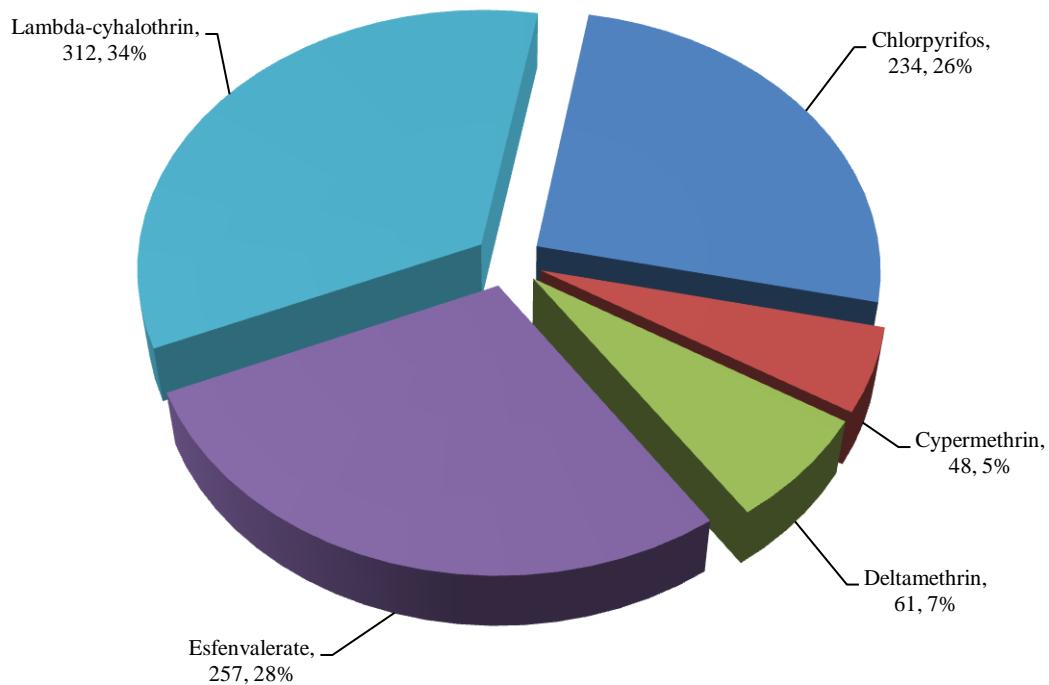


Figure 37: Arable silage: weight (kg) of insecticide active substances applied, 2009.

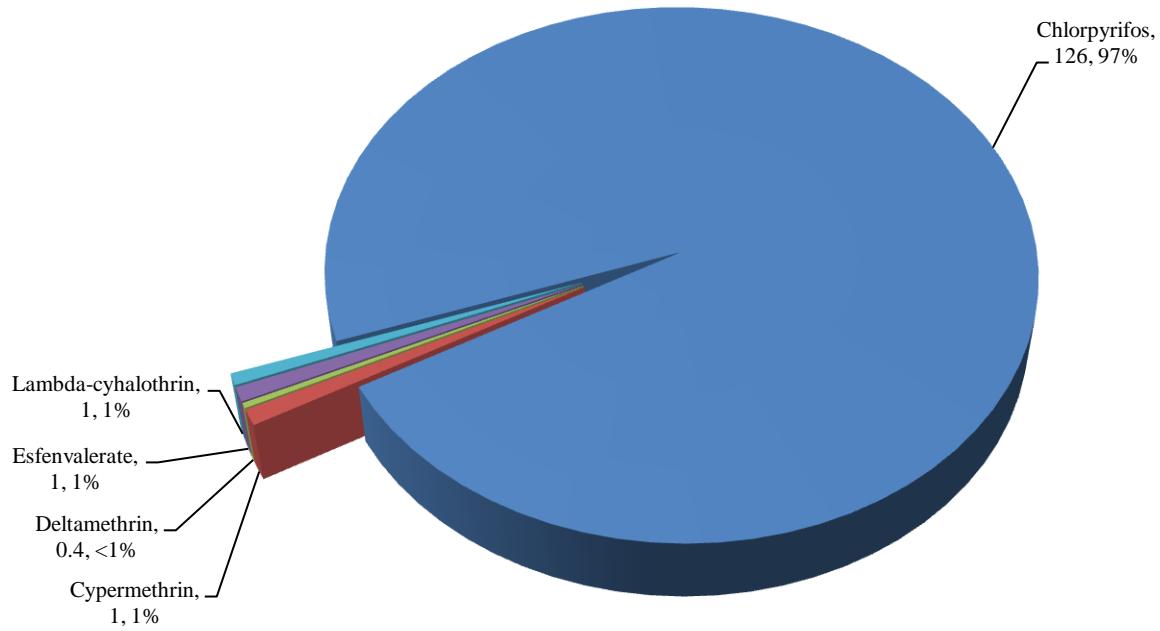


Figure 38: Arable silage: pesticide-treated area (spha) of growth regulator active substances, 2009.

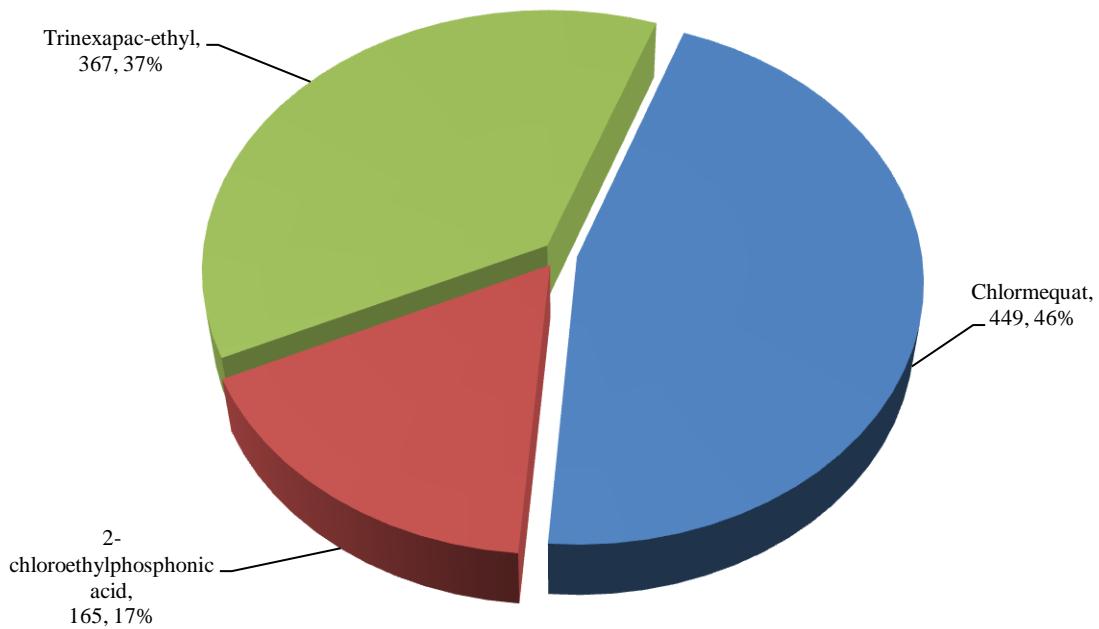


Figure 39: Arable silage: weight (kg) of growth regulator active substances applied, 2009.

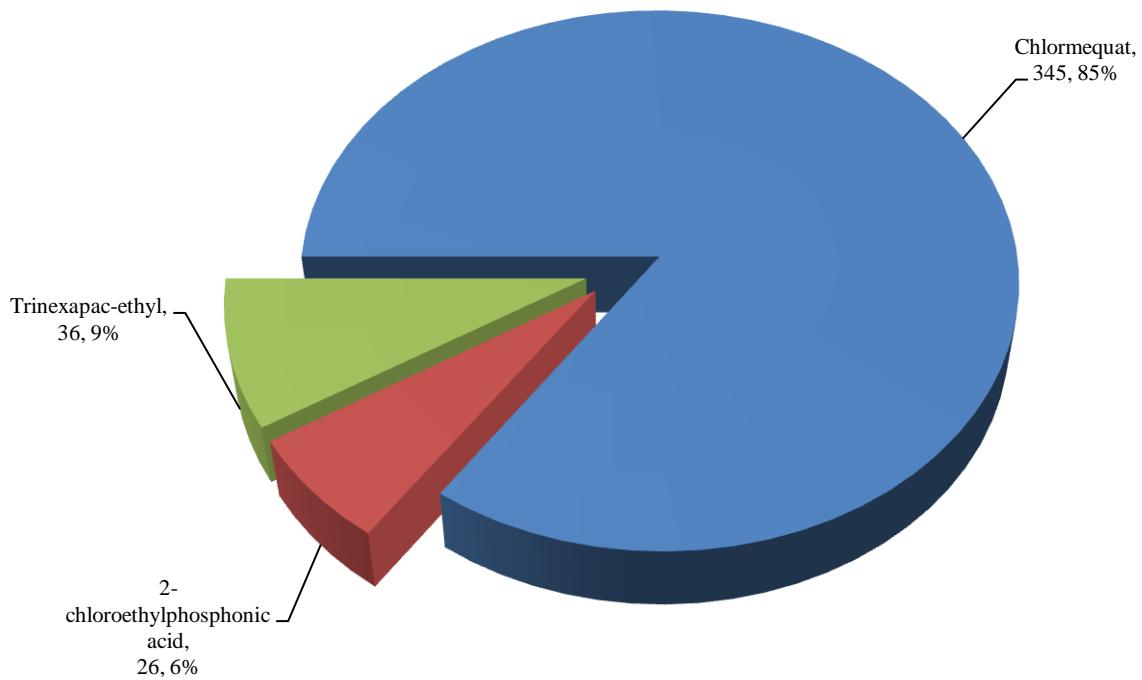


Figure 40: Arable silage: pesticide-treated area (ha) of seed treatment active substances, 2009.

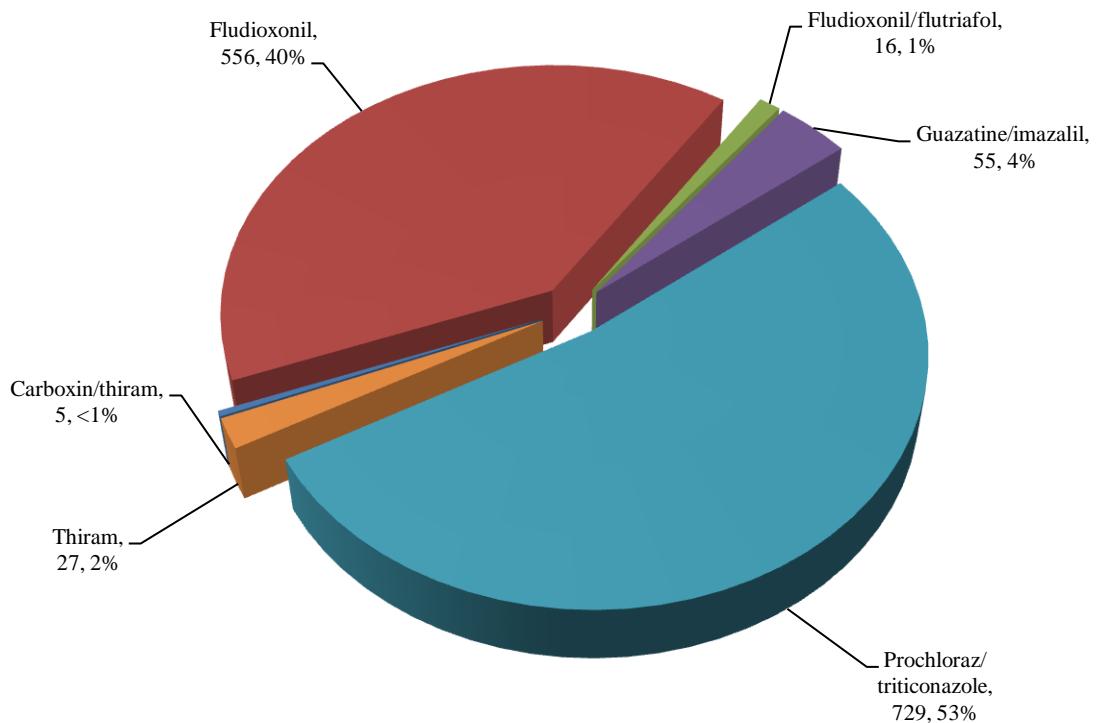


Figure 41: Arable silage: weight (kg) of seed treatment active substances applied, 2009.

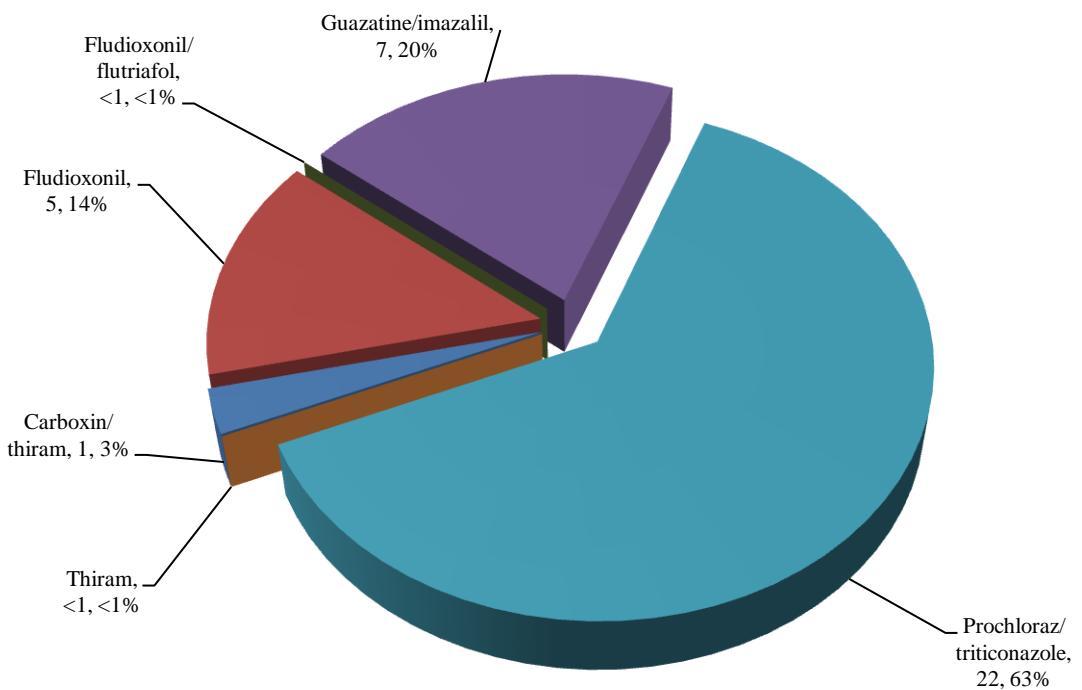
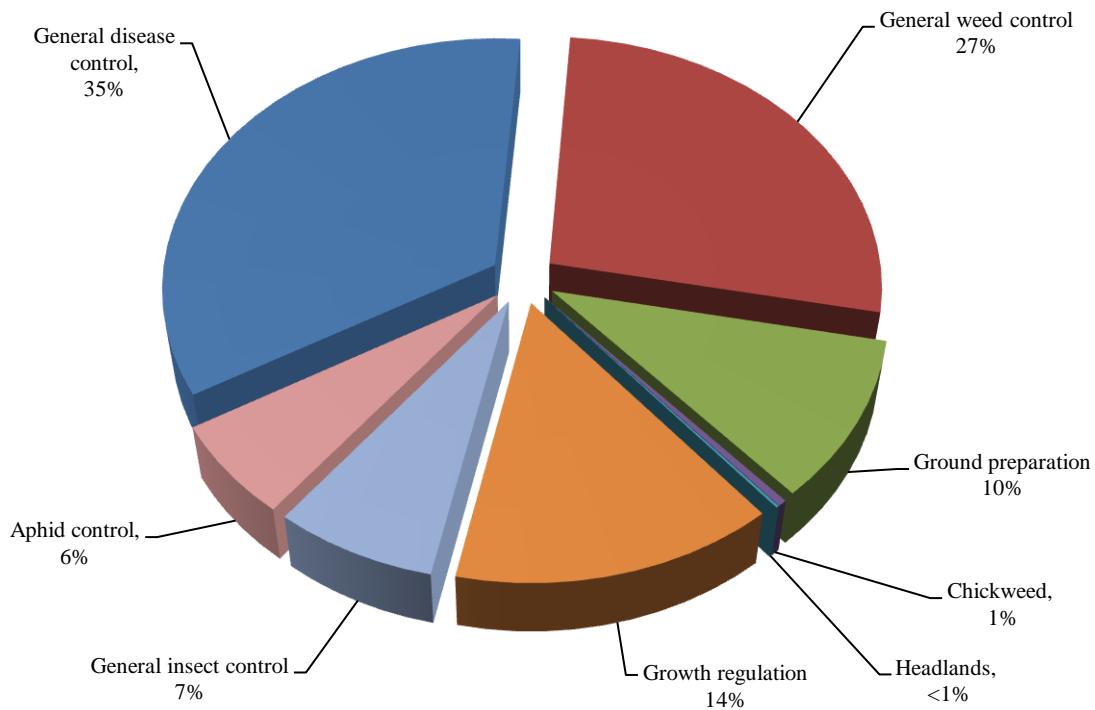


Figure 42: Arable silage: reasons for pesticide use (spha), 2009.



Arable silage (undersown)

Tables: 3, 6, 7, 8, 9, 10, 19

- 1,937 hectares of arable silage (undersown) grown in Northern Ireland.
- 5,192 treated ‘spray hectares’.
- 2,842 kilograms of active substances applied.
- Fungicides, herbicides, insecticides, growth regulators and seed treatments were all applied.
- Chlormequat was the only growth regulator applied.
- 87.6% of the undersown arable silage area received treatments.

Figure 43: Arable silage (undersown): Area (spha) of pesticide groups applied, 2009.

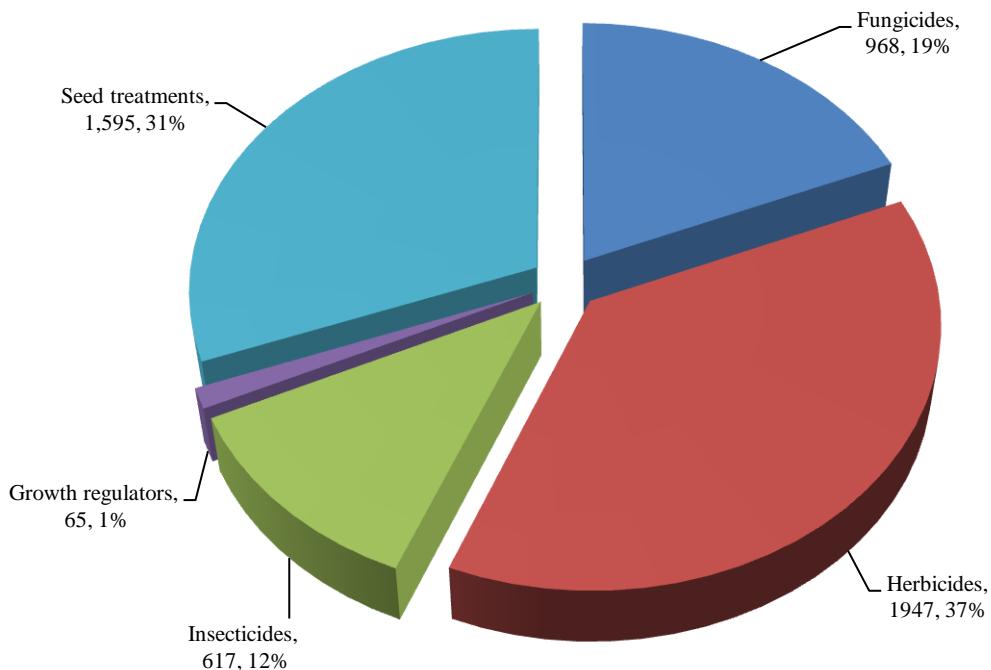


Figure 44: Arable silage (undersown): Weight (kg) of pesticide groups applied, 2009.

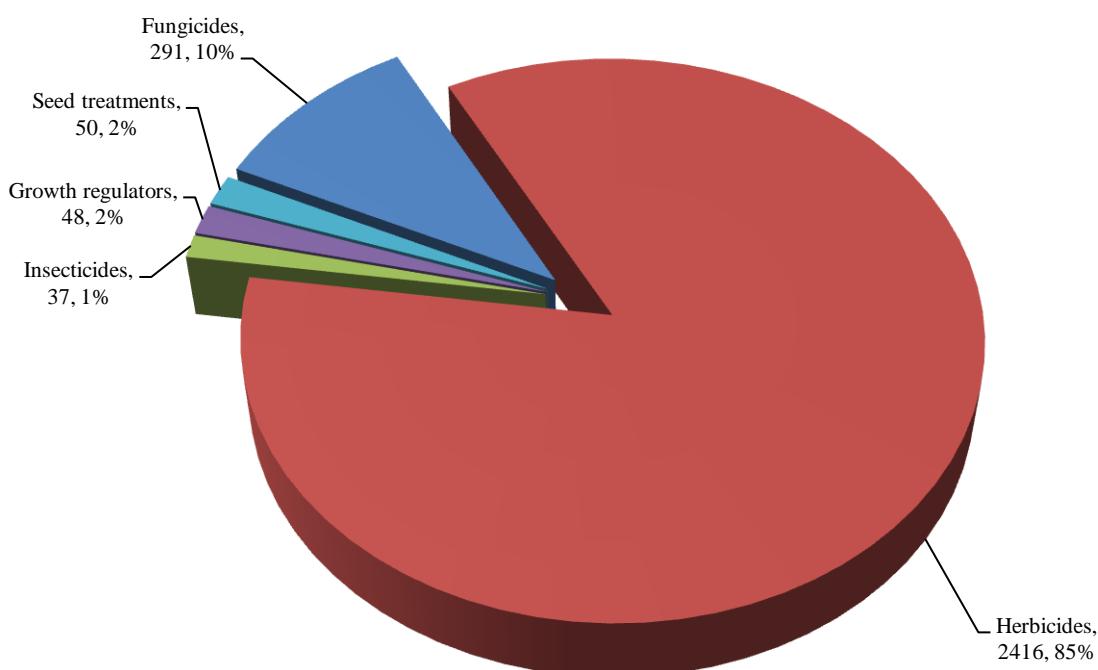


Figure 45: Arable silage (undersown): pesticide-treated area (spha) of fungicide active substances, 2009.

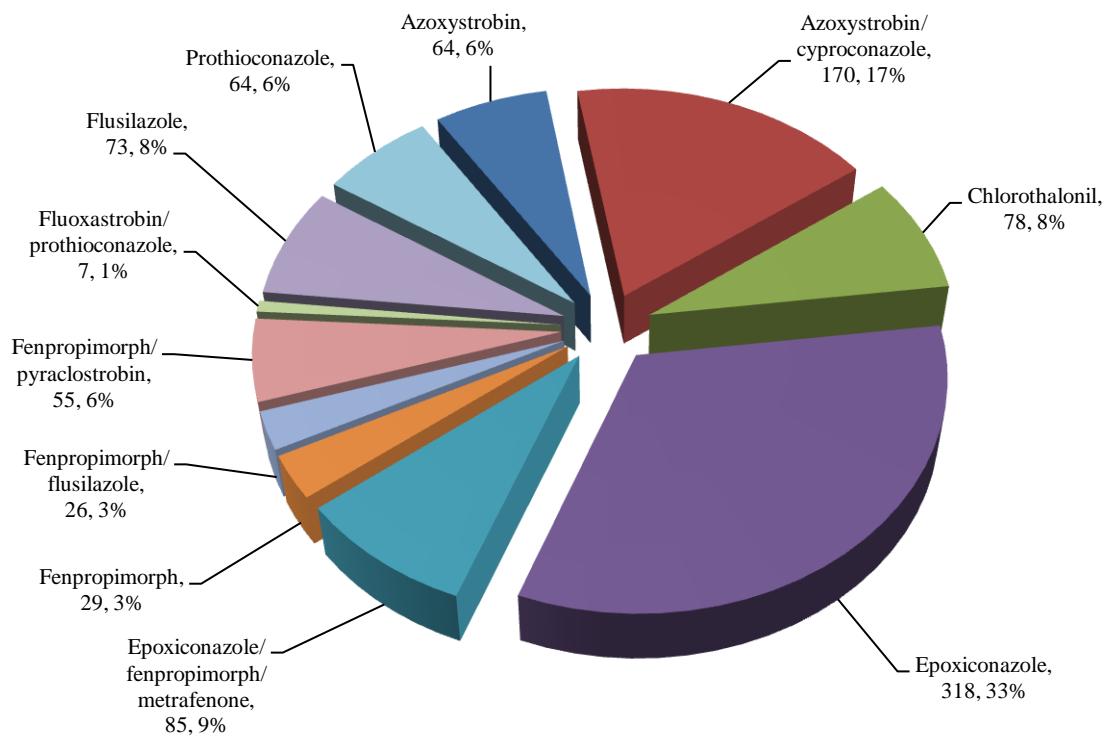


Figure 46: Arable silage (undersown): weight (kg) of fungicide active substances applied, 2009.

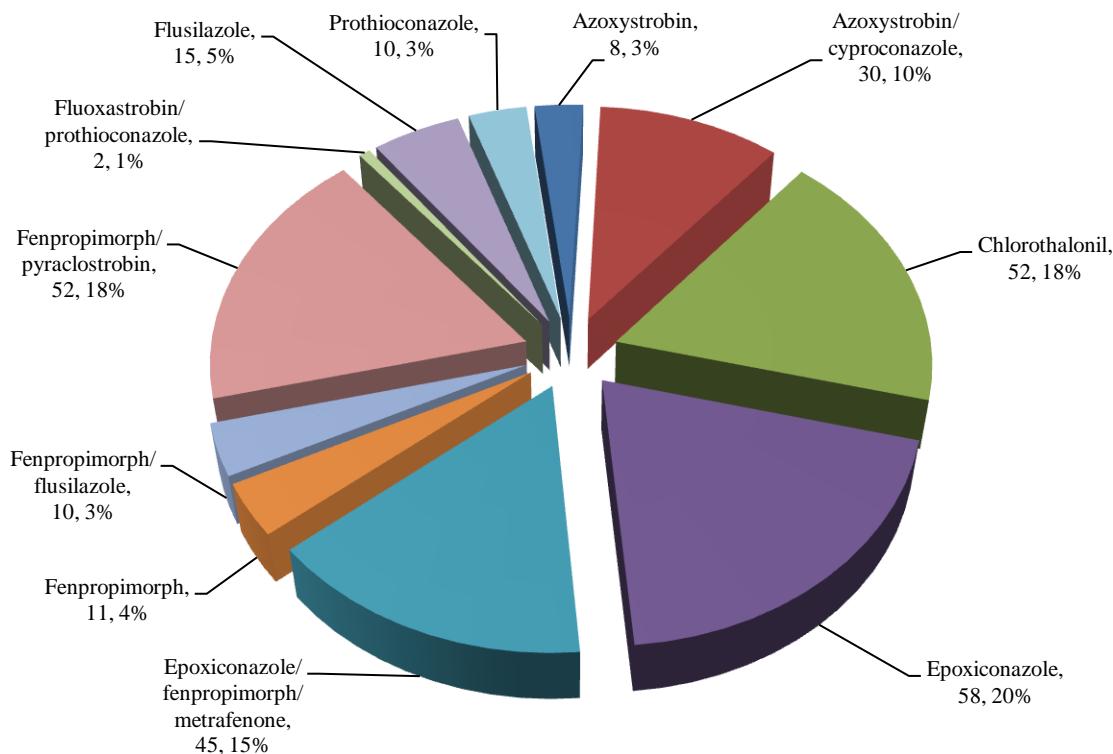


Figure 47: Arable silage (undersown): pesticide-treated area (spha) of herbicide active substances, 2009.

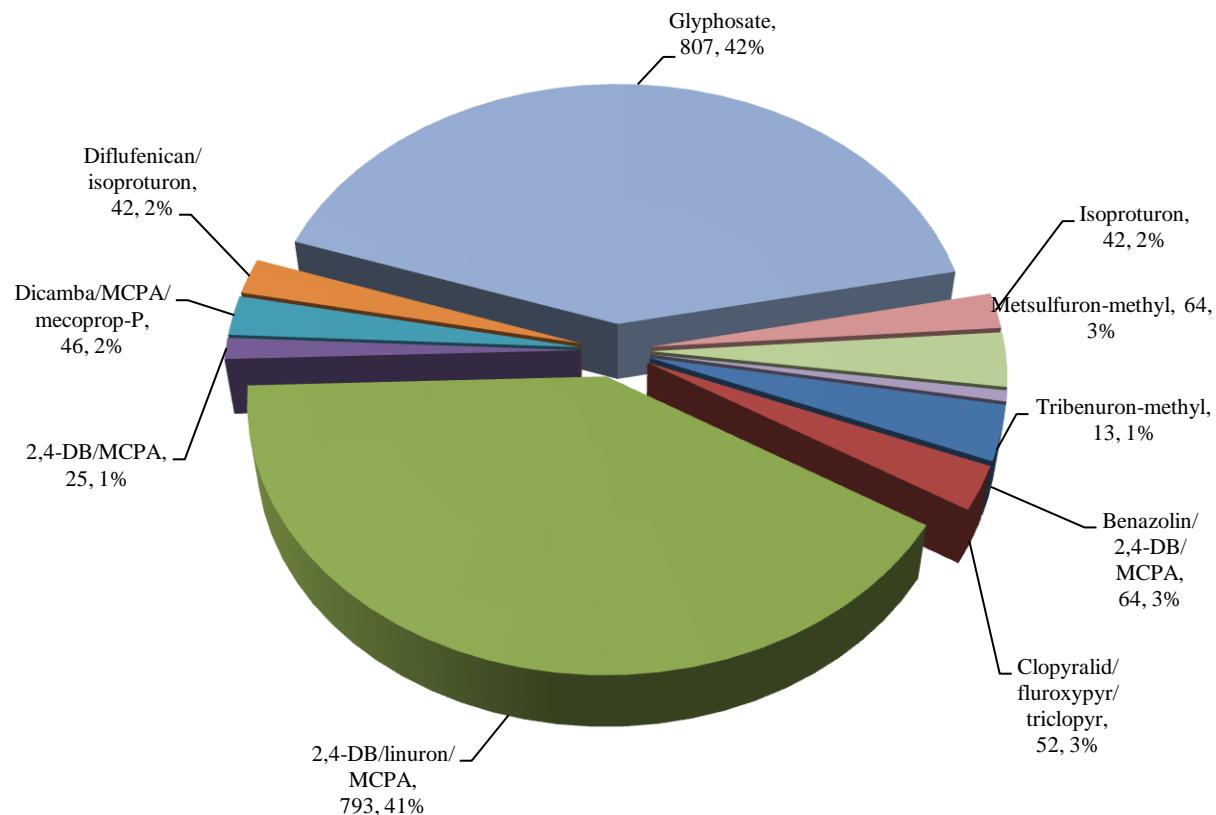


Figure 48: Arable silage (undersown): weight (kg) of herbicide active substances applied, 2009.

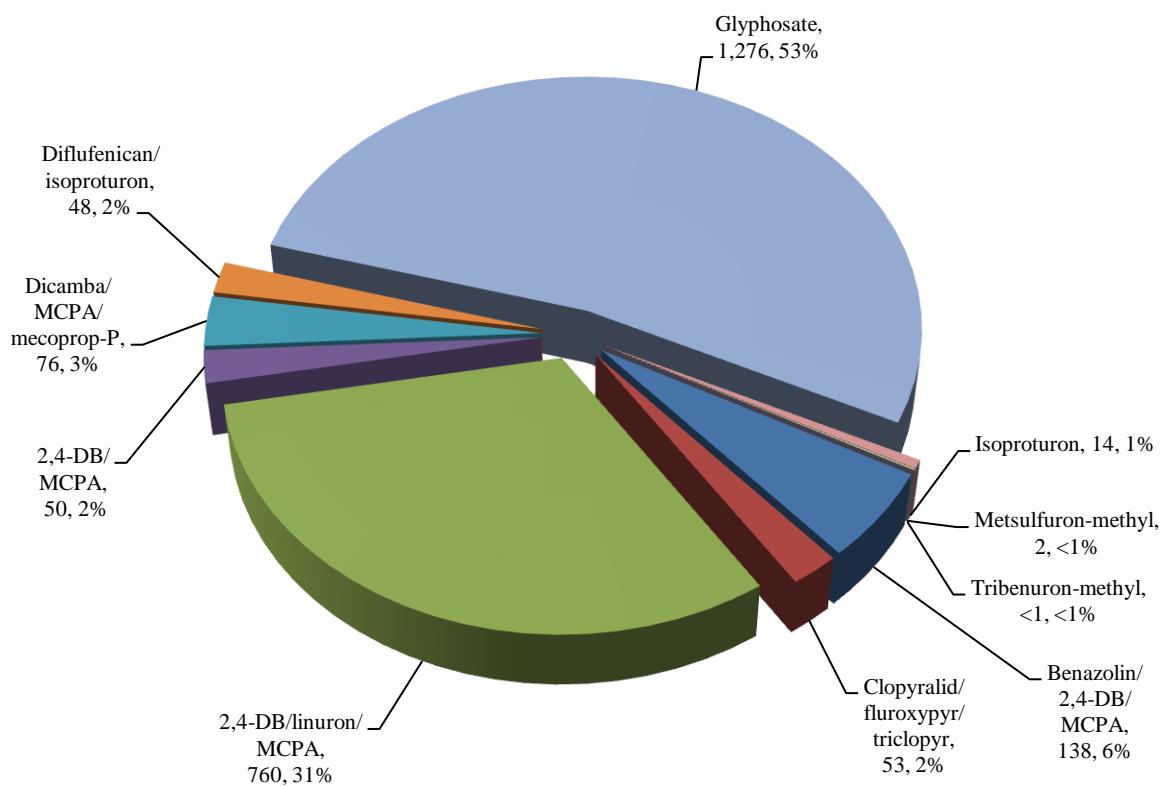


Figure 49: Arable silage (undersown): pesticide-treated area (spha) of insecticide active substances, 2009.

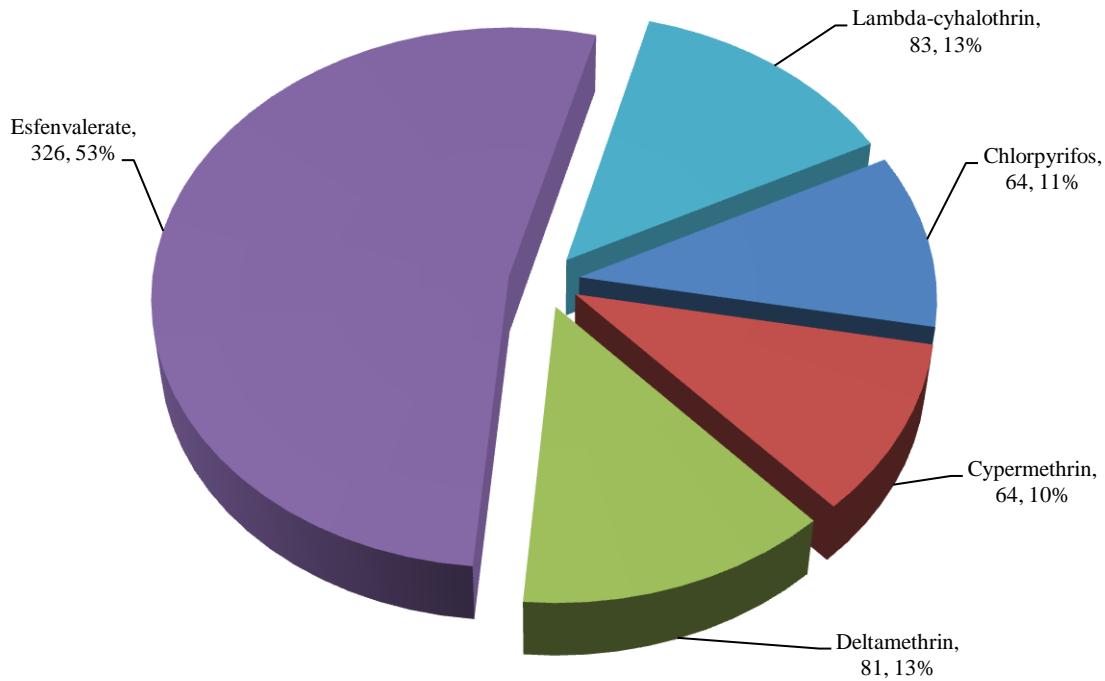


Figure 50: Arable silage (undersown): weight (kg) of insecticide active substances applied, 2009.

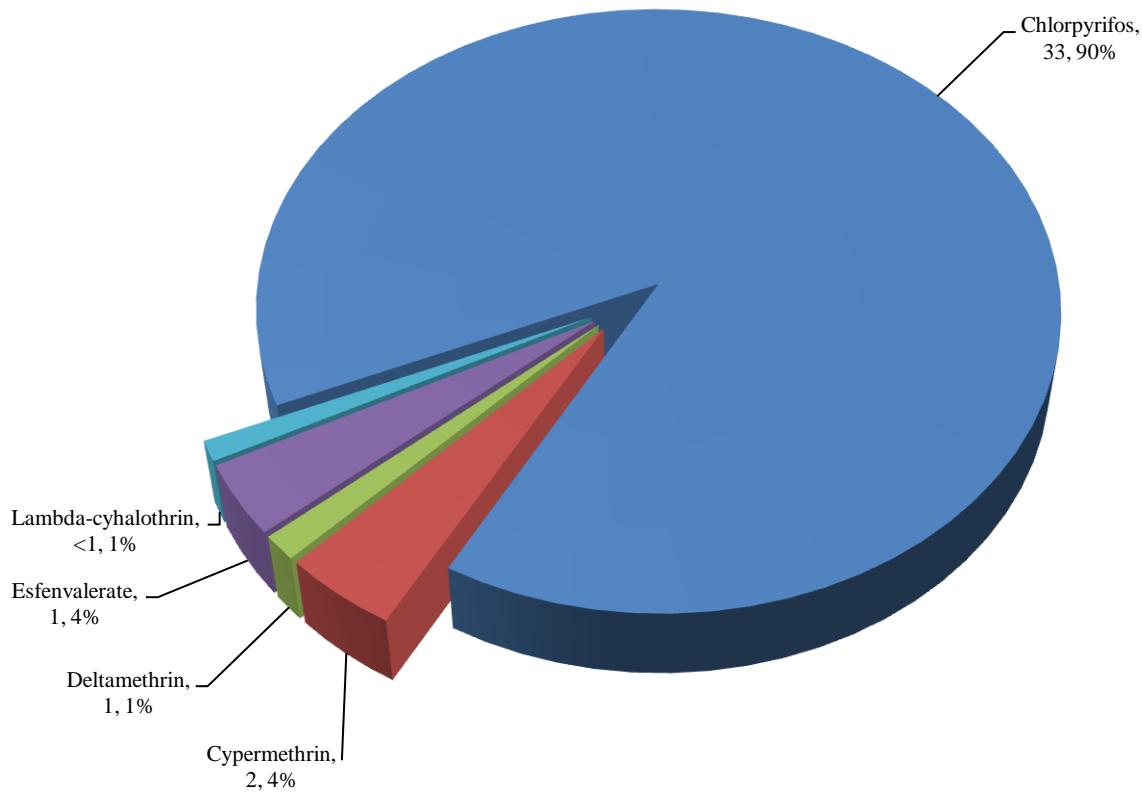


Figure 51: Arable silage (undersown): pesticide-treated area (ha) of seed treatment active substances, 2009.

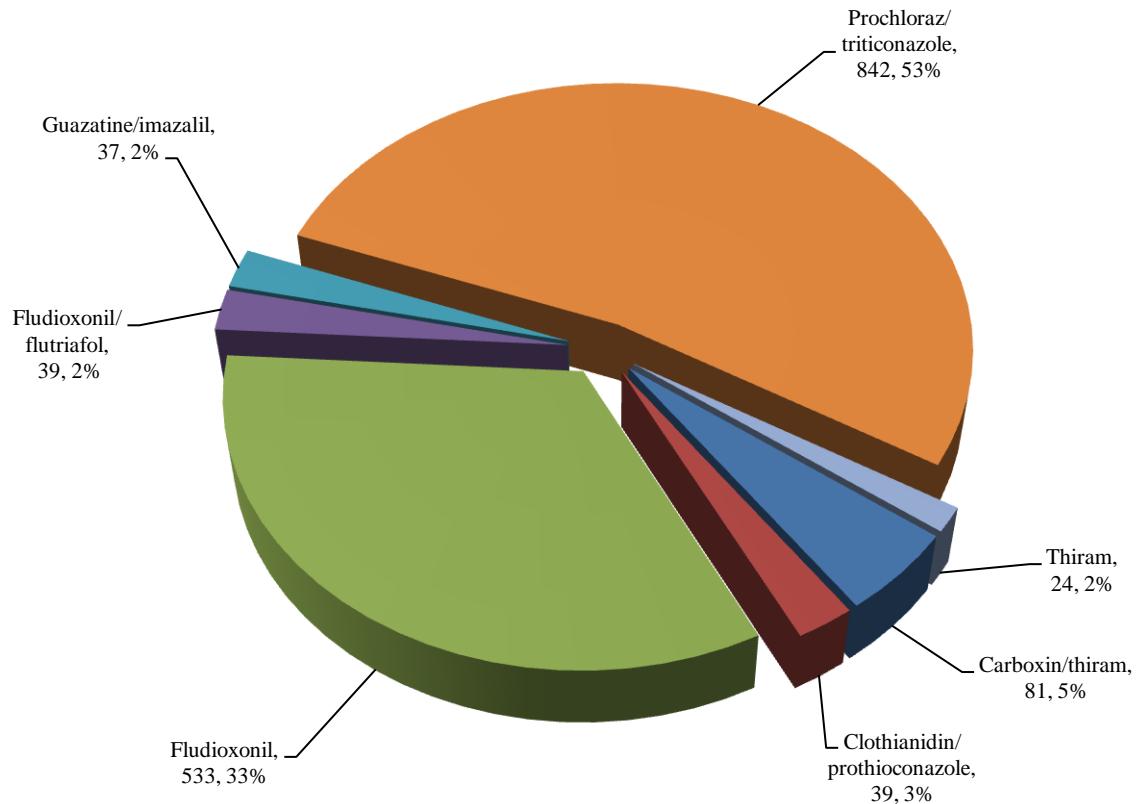


Figure 52: Arable silage (undersown): weight (kg) of seed treatment active substances applied, 2009.

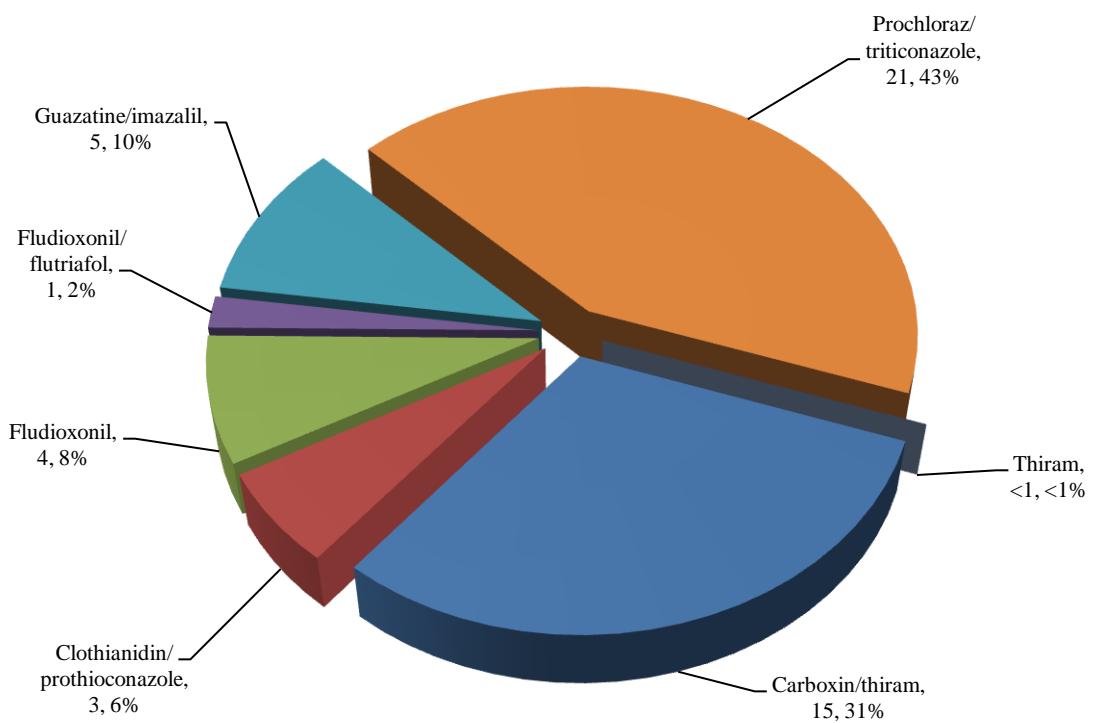
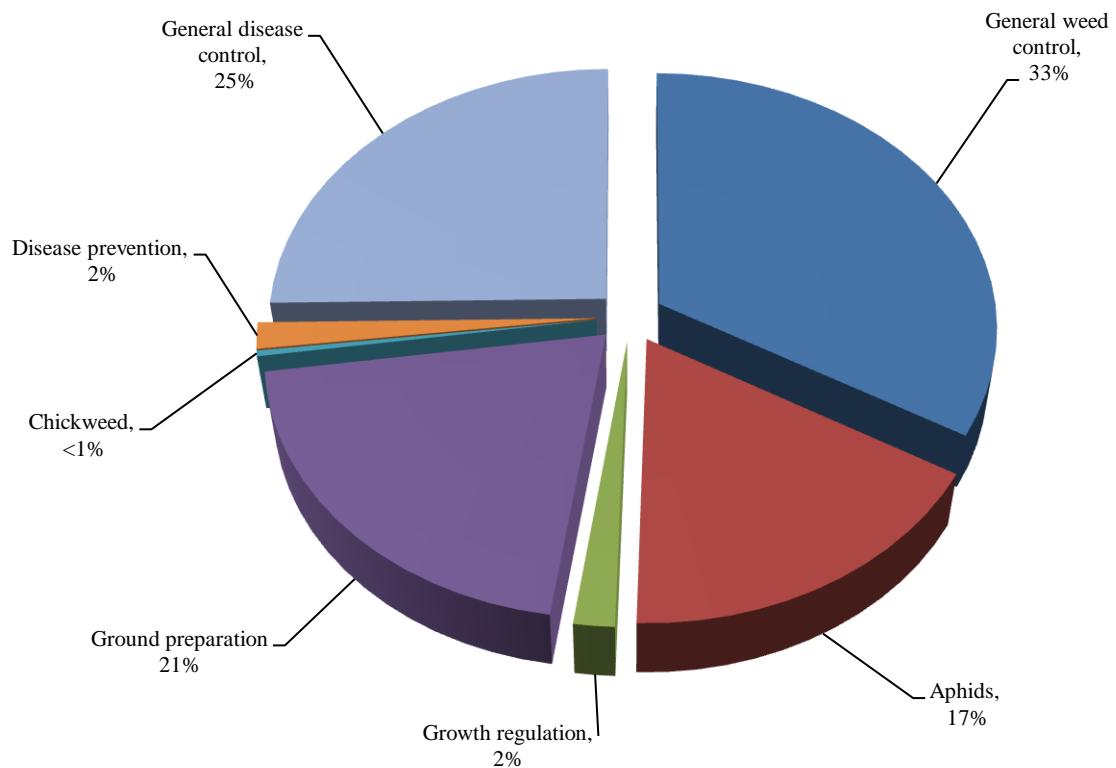


Figure 53: Arable silage (undersown): reasons for pesticide use (spha), 2009.



Cereals (undersown)

Tables: 3, 6, 7, 8, 9, 10, 20

- 573 hectares of arable silage (undersown) grown in Northern Ireland.
- 3,427 treated ‘spray hectares’.
- 368 kilograms of active substances applied.
- Fungicides, insecticides, growth regulators and seed treatments were all applied.
- 72.7% of the undersown cereal area received treatments.

Figure 54: Cereals (undersown): Area (spha) of pesticide groups applied, 2009.

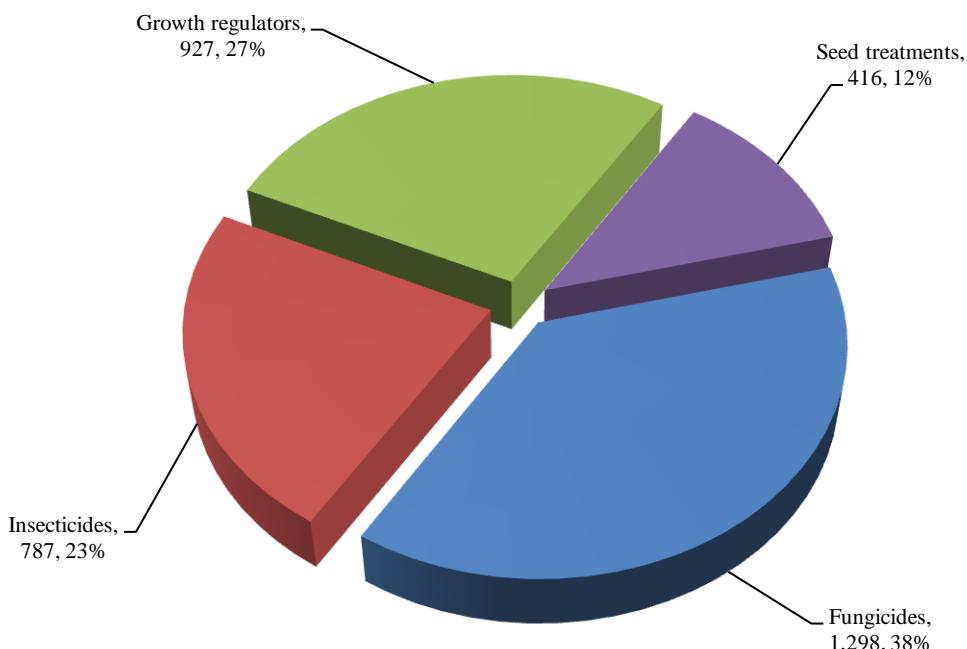


Figure 55: Cereals (undersown): Weight (kg) of pesticide groups applied, 2009.

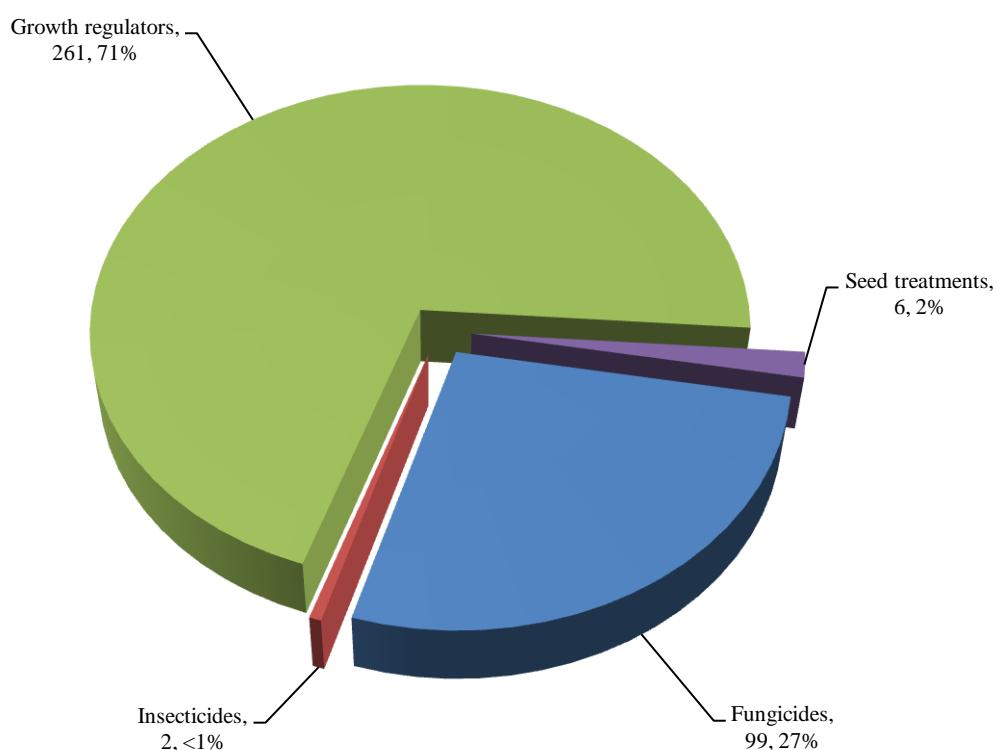


Figure 56: Cereals (undersown): pesticide-treated area (spha) of fungicide active substances, 2009.

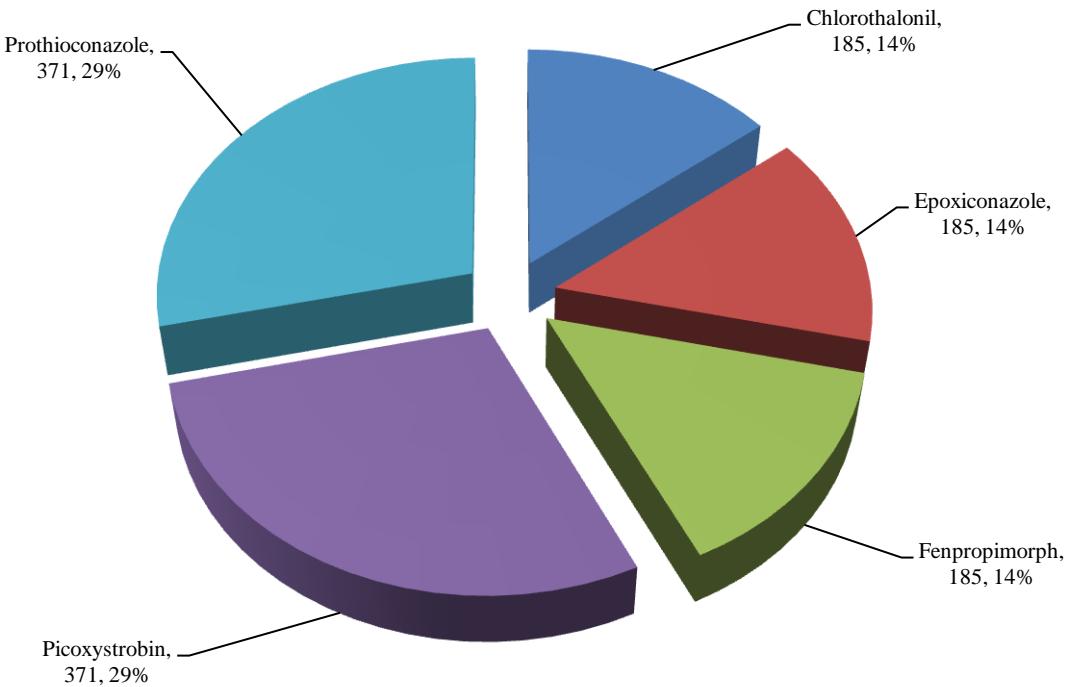


Figure 57: Cereals (undersown): weight (kg) of fungicide active substances applied, 2009.

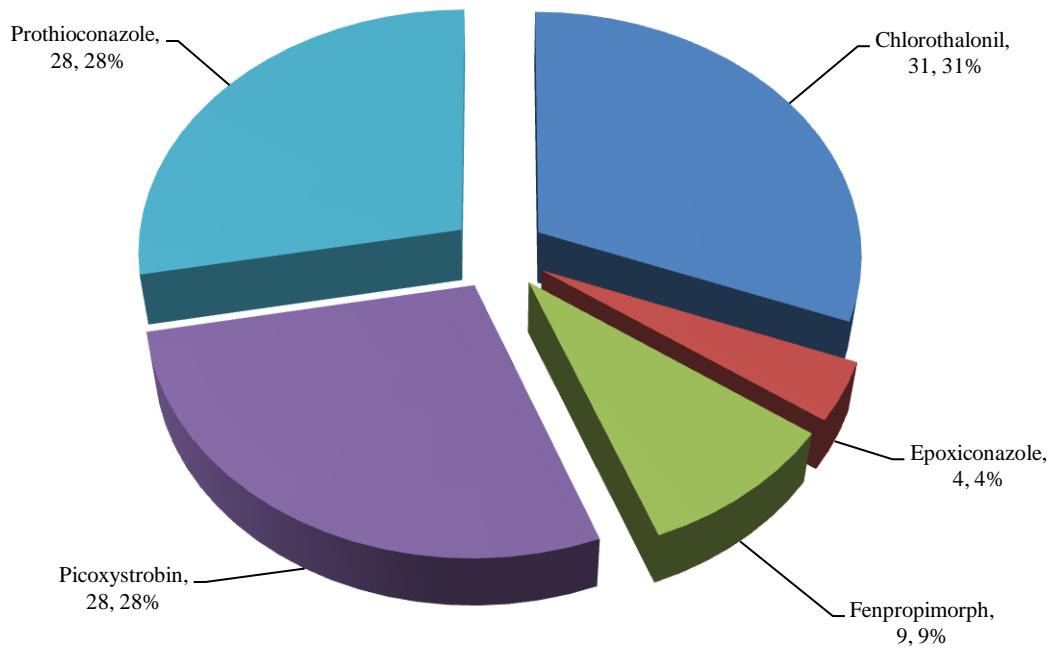


Figure 58: Cereals (undersown): pesticide-treated area (spha) of insecticide active substances, 2009.

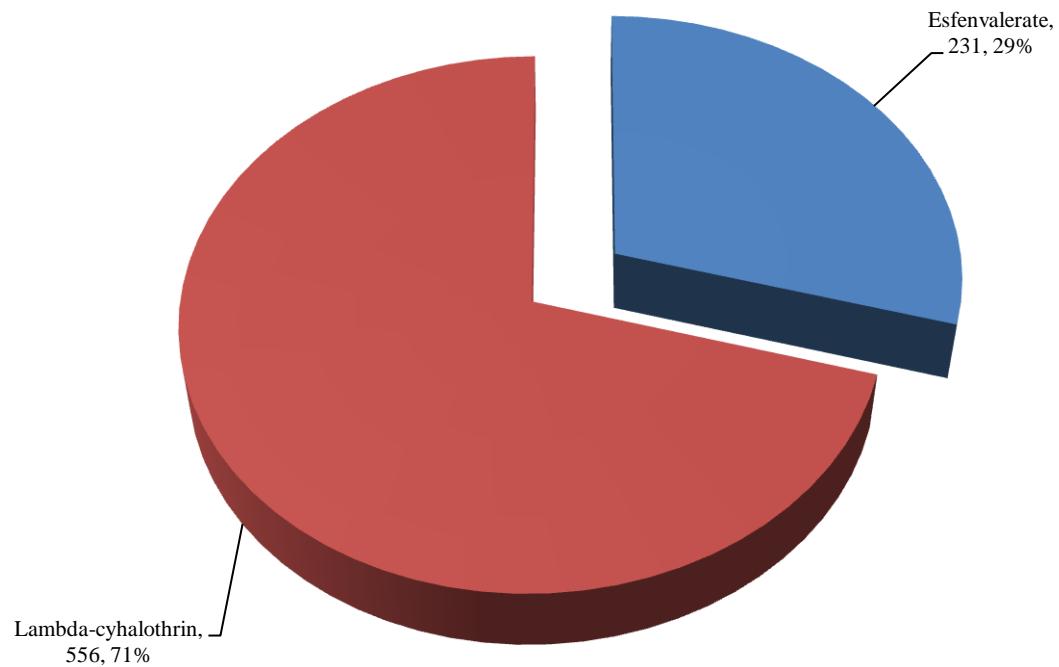
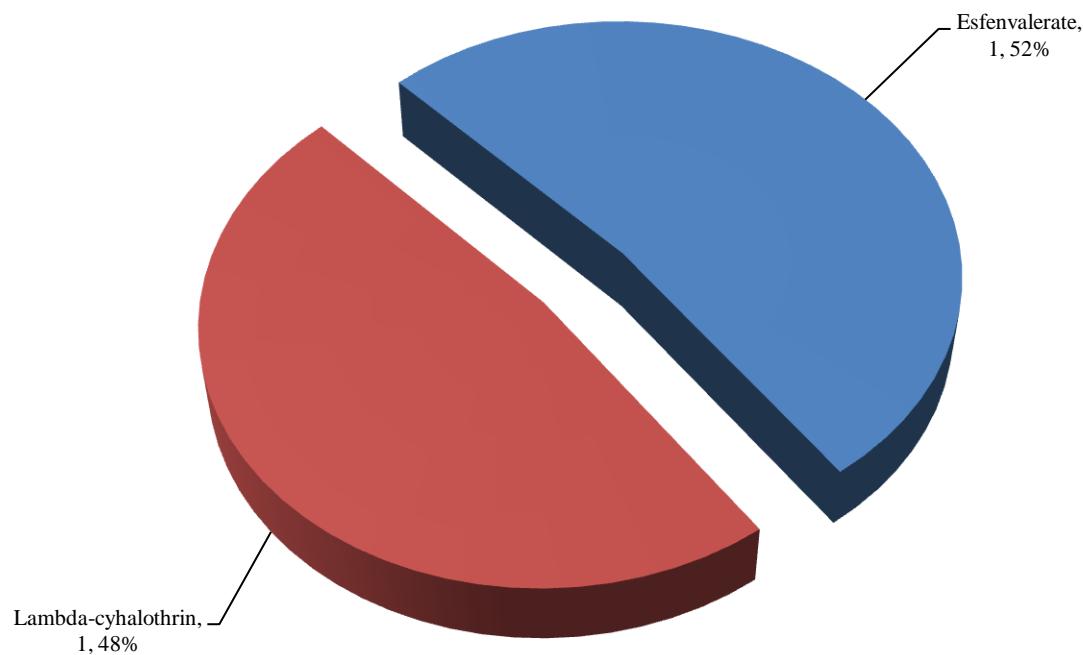


Figure 59: Cereals (undersown): weight (kg) of insecticide active substances applied, 2009.



. Figure 60: Cereals (undersown): pesticide-treated area (spha) of growth regulator active substances, 2009.

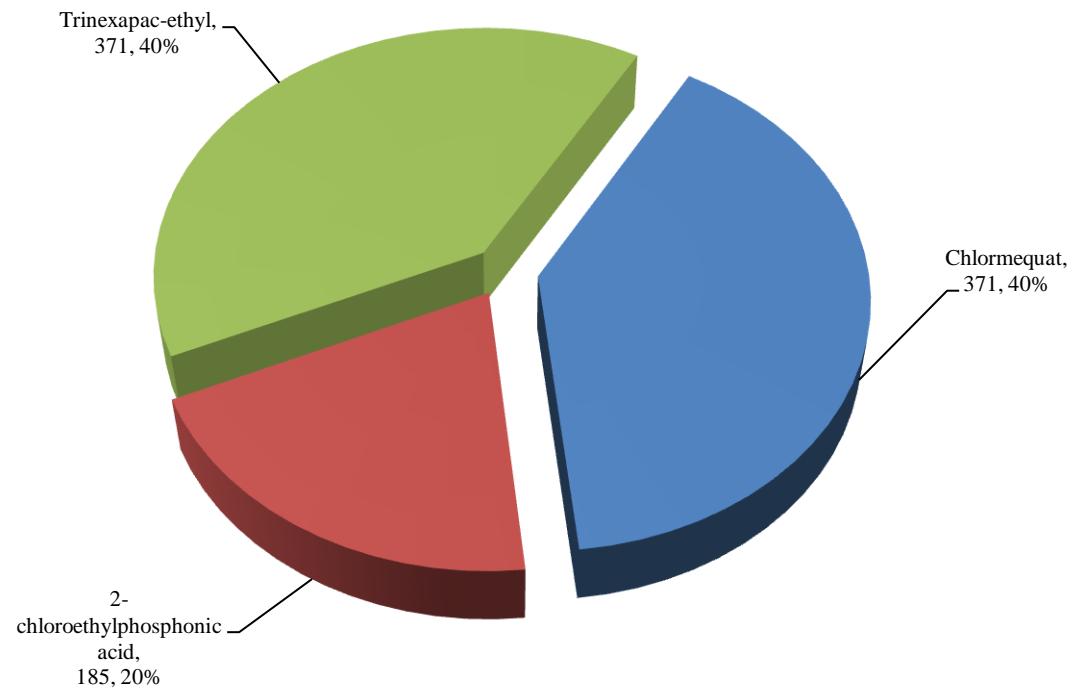


Figure 61: Cereals (undersown): weight (kg) of growth regulator active substances applied, 2009.

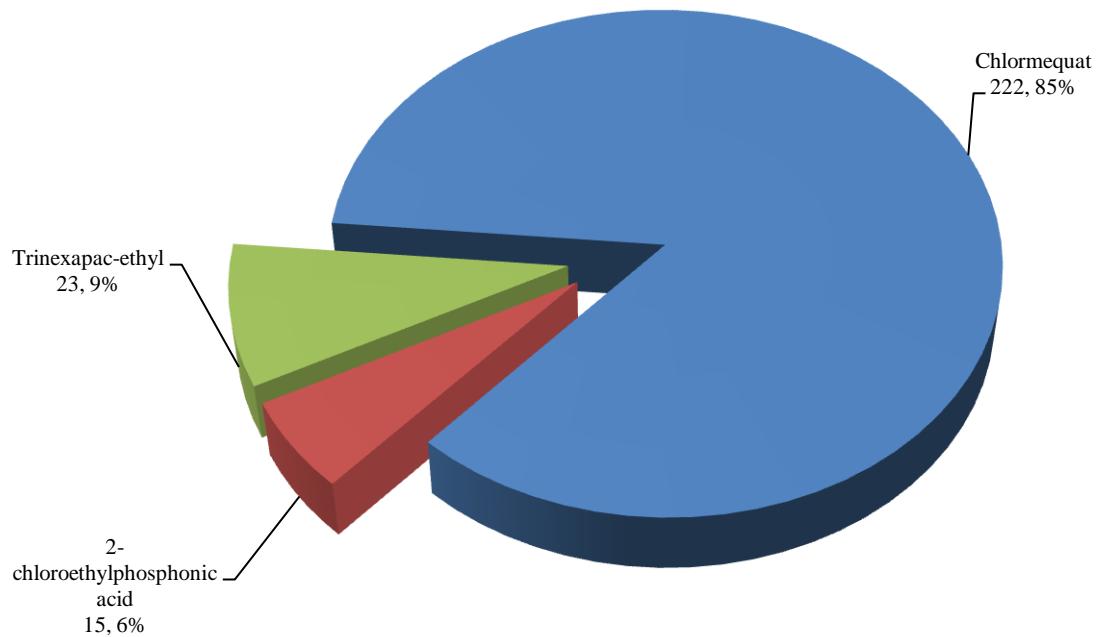


Figure 62: Cereals (undersown): pesticide-treated area (ha) of seed treatment active substances, 2009.

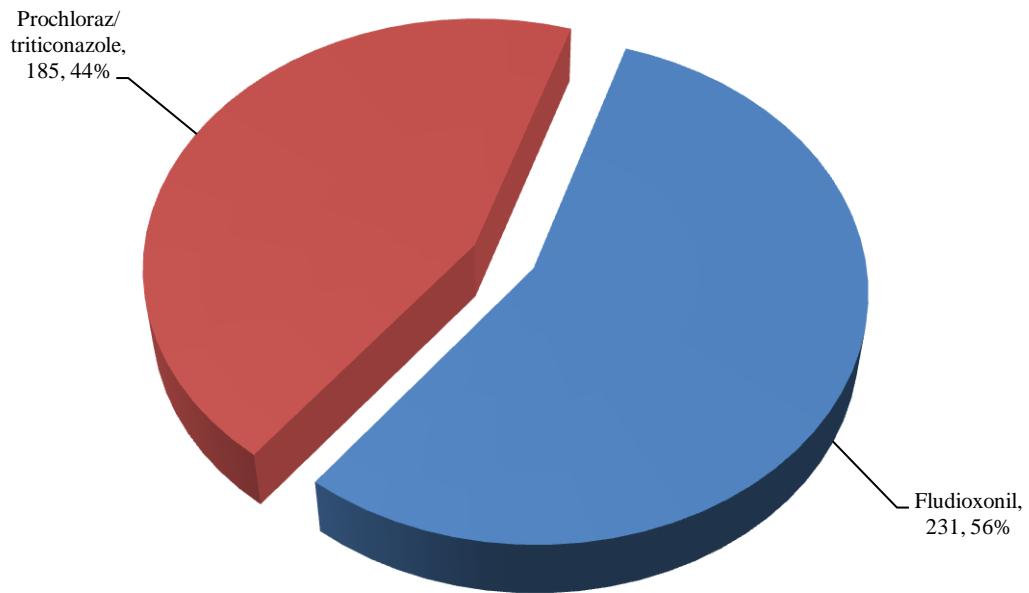


Figure 63: Cereals (undersown): weight (kg) of seed treatment active substances applied, 2009.

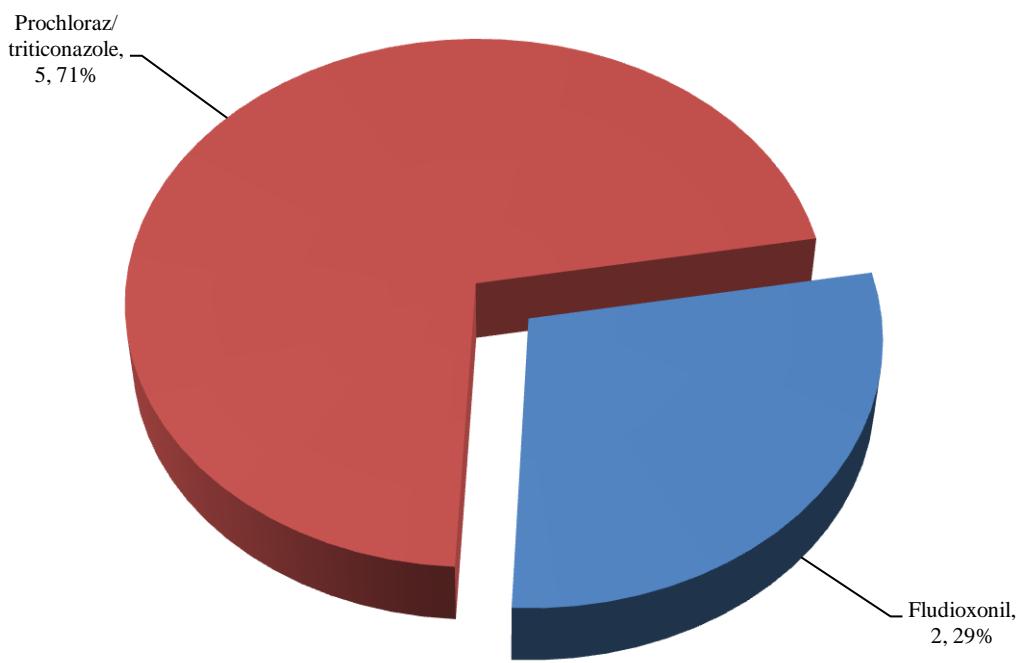
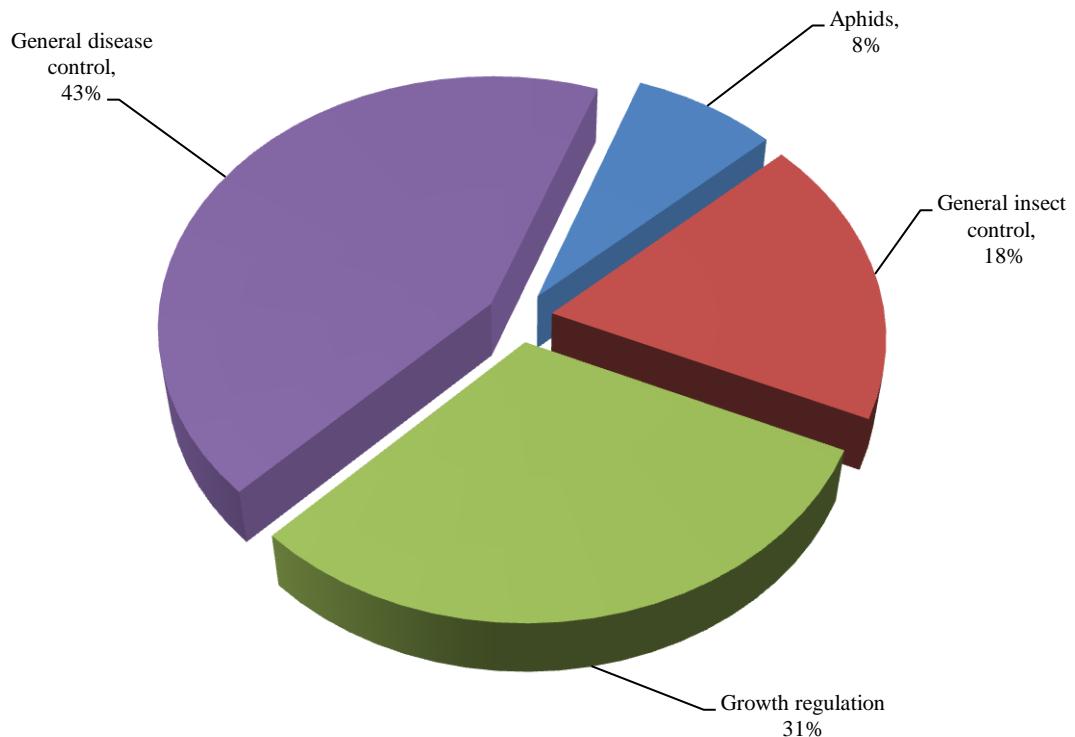


Figure 64: Cereals (undersown): reasons for pesticide use (spha), 2009.



Grass reseed

Tables: 3, 6, 7, 8, 9, 10, 21

- 13,229 hectares of grass reseeds were sown in Northern Ireland.
- 7,091 treated ‘spray hectares’.
- 11,325 kilograms of active substances applied.
- Herbicides and seed treatments were the only pesticide active ingredients applied.
- Bacillus subtilis was the only seed treatment applied.
- 44.1% of the grass reseed area received treatments.

Figure 65: Grass reseeds: Area (spha) of pesticide groups applied, 2009.

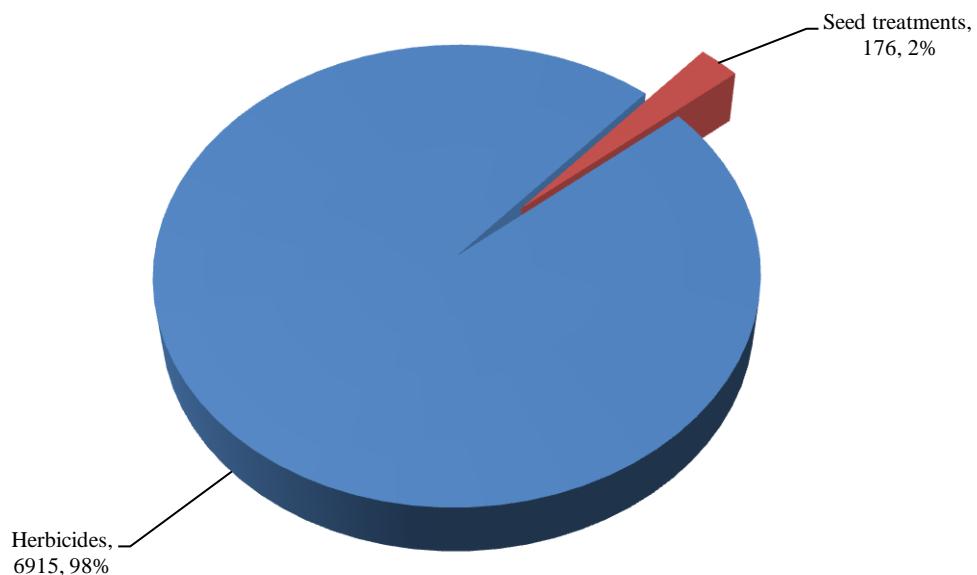


Figure 66: Grass reseeds: Weight (kg) of pesticide groups applied, 2009.

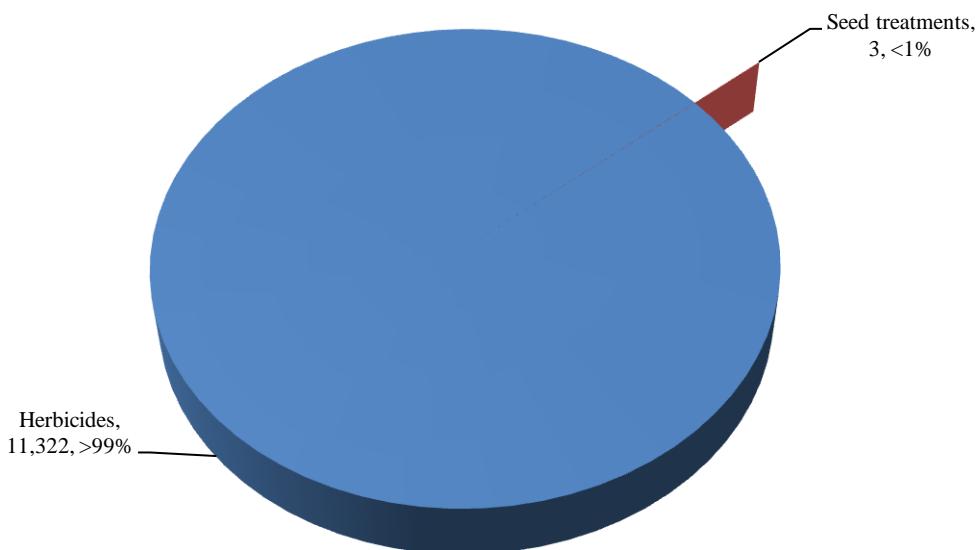


Figure 67: Grass reseeds: pesticide-treated area (spha) of herbicide active substances, 2009

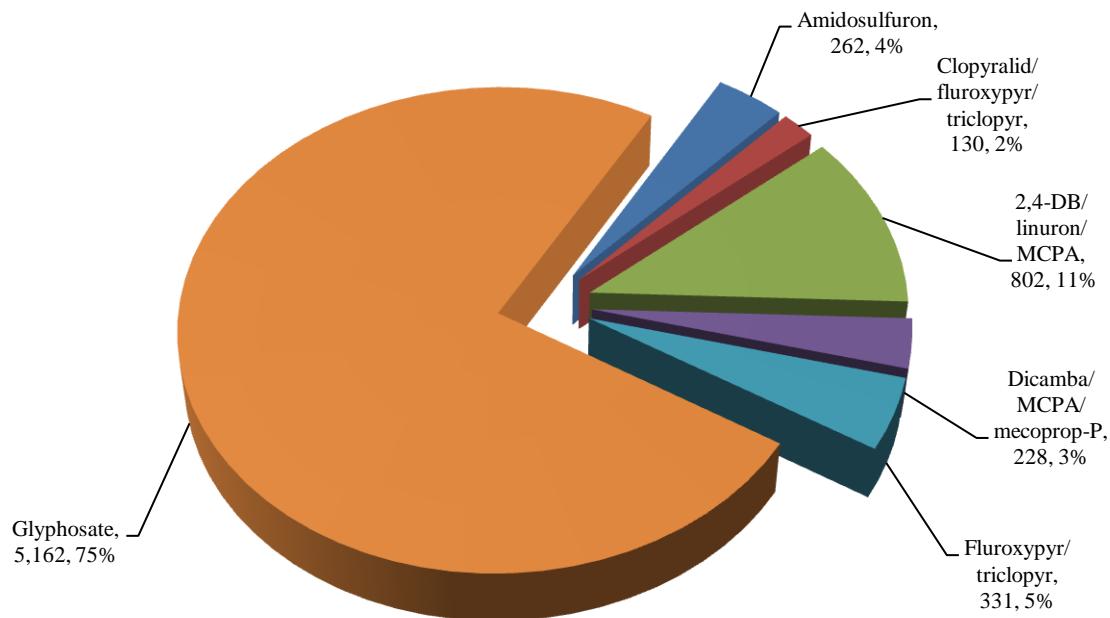


Figure 68: Grass reseeds: weight (kg) of herbicide active substances applied, 2009.

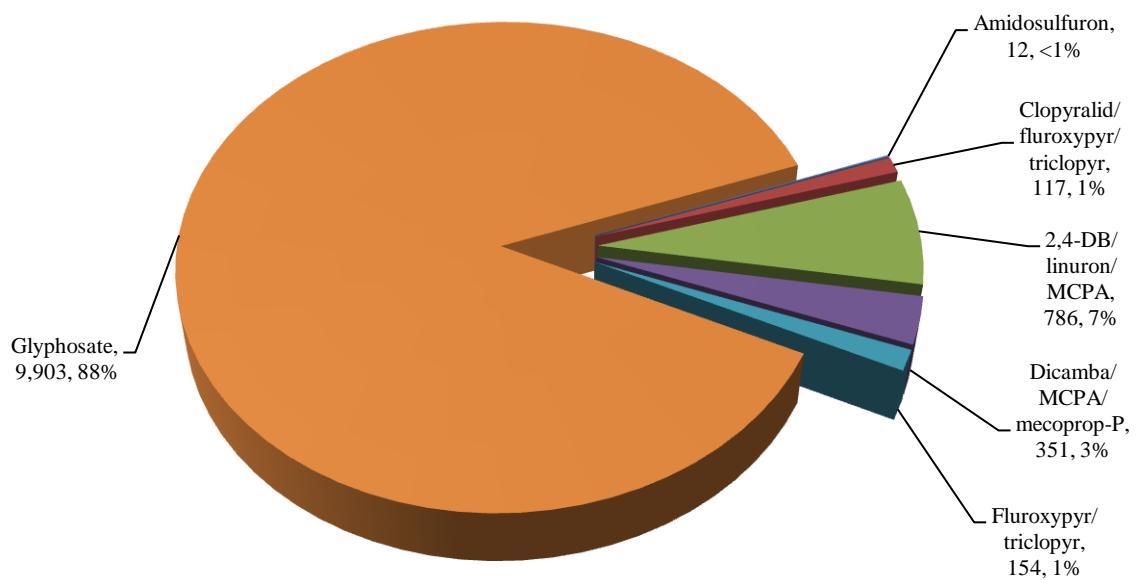
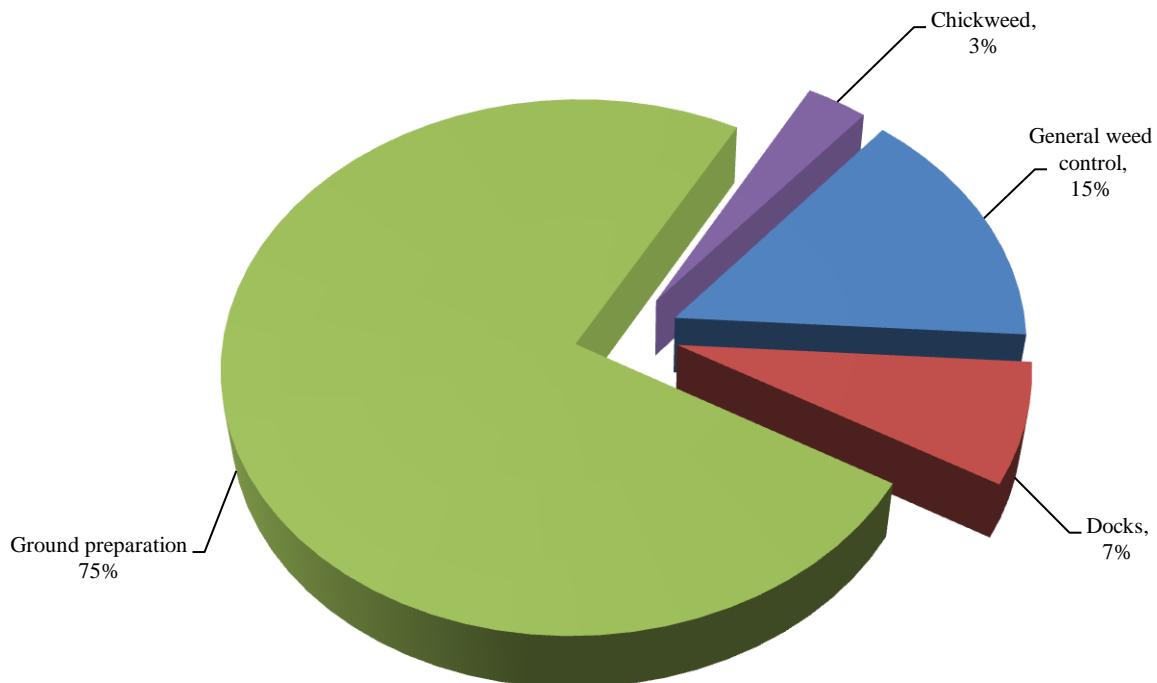


Figure 69: Grass reseeds: reasons for herbicide use (spha), 2009.



Fodder maize

Tables: 3, 6, 7, 8, 9, 10, 22

- 3,455 hectares of fodder maize were sown in Northern Ireland.
- 13,751 treated ‘spray hectares’.
- 6,326 kilograms of active substances applied.
- Herbicides and seed treatments were the only pesticide active ingredients applied.
- 100% of the fodder maize area received treatments.

Figure 70: Fodder maize: Area (spha) of pesticide groups applied, 2009.

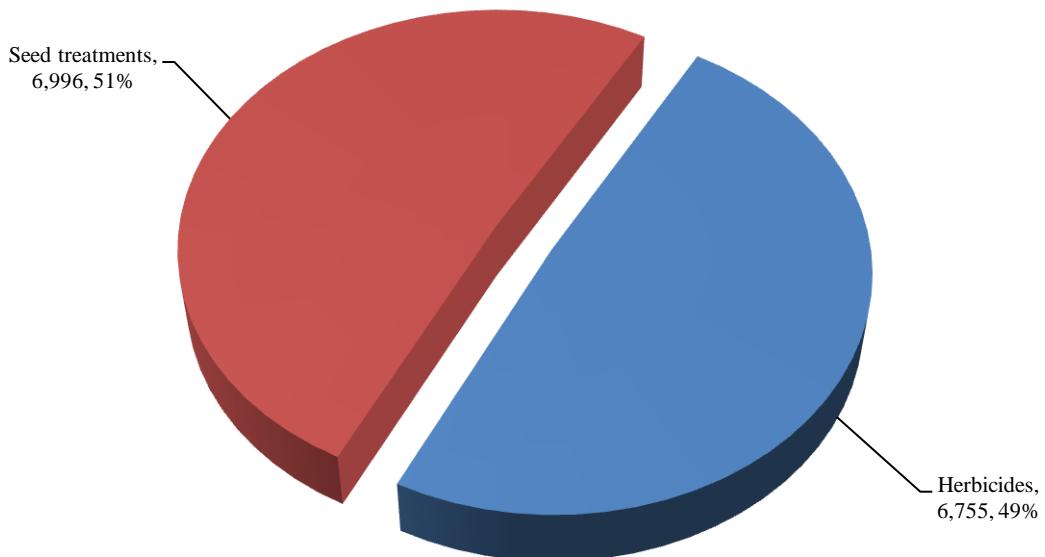


Figure 71: Fodder maize: Weight (kg) of pesticide groups applied, 2009.

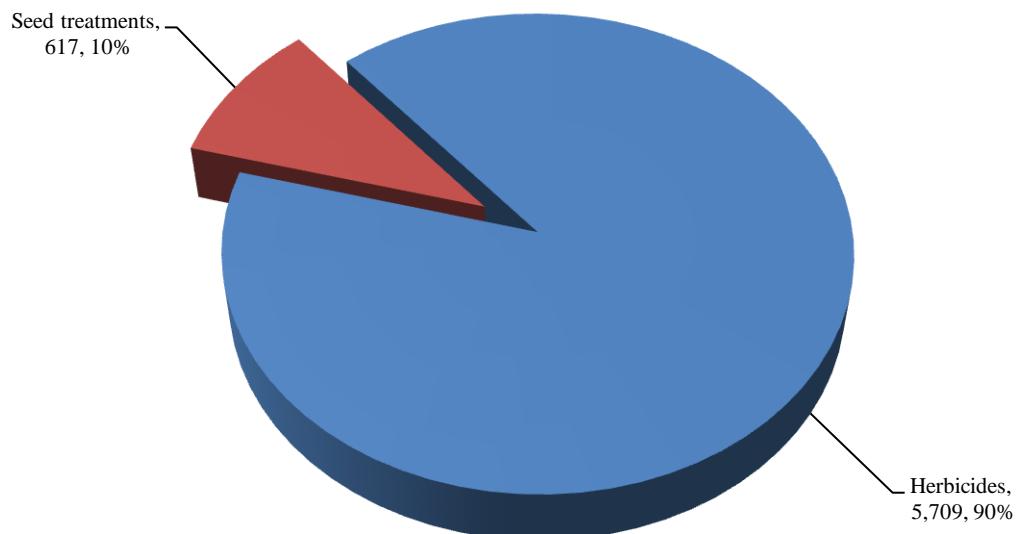


Figure 72: Fodder Maize: pesticide-treated area (spha) of herbicide active substances, 2009.

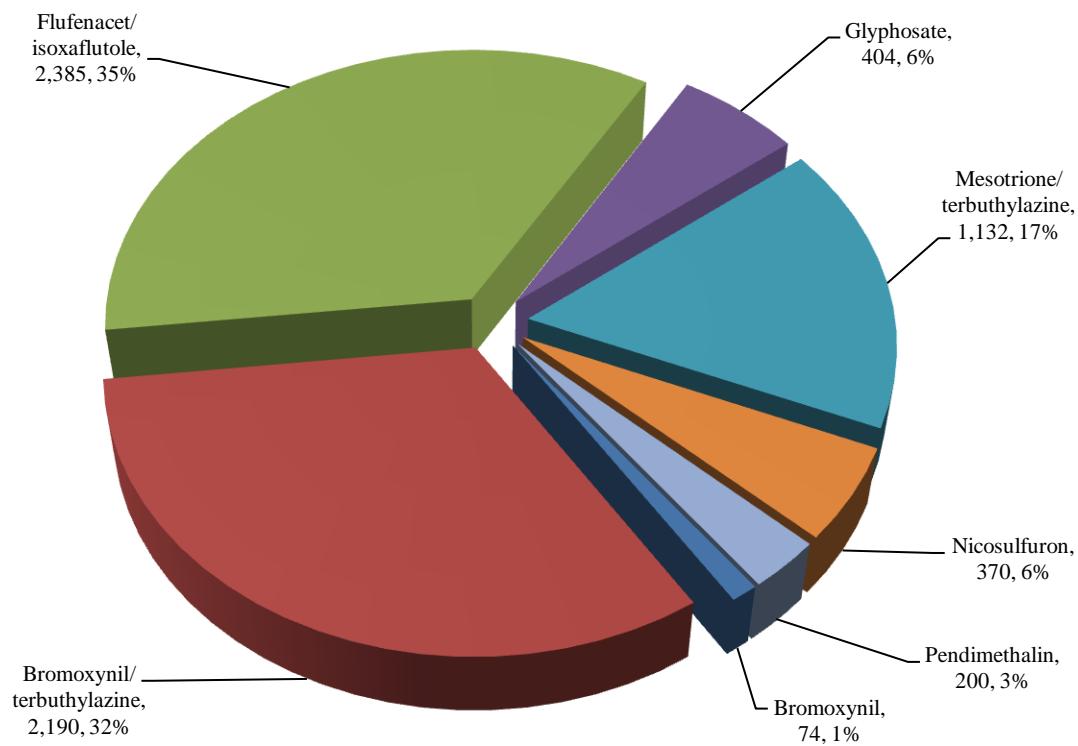


Figure 73: Fodder maize: weight (kg) of herbicide active substances applied, 2009.

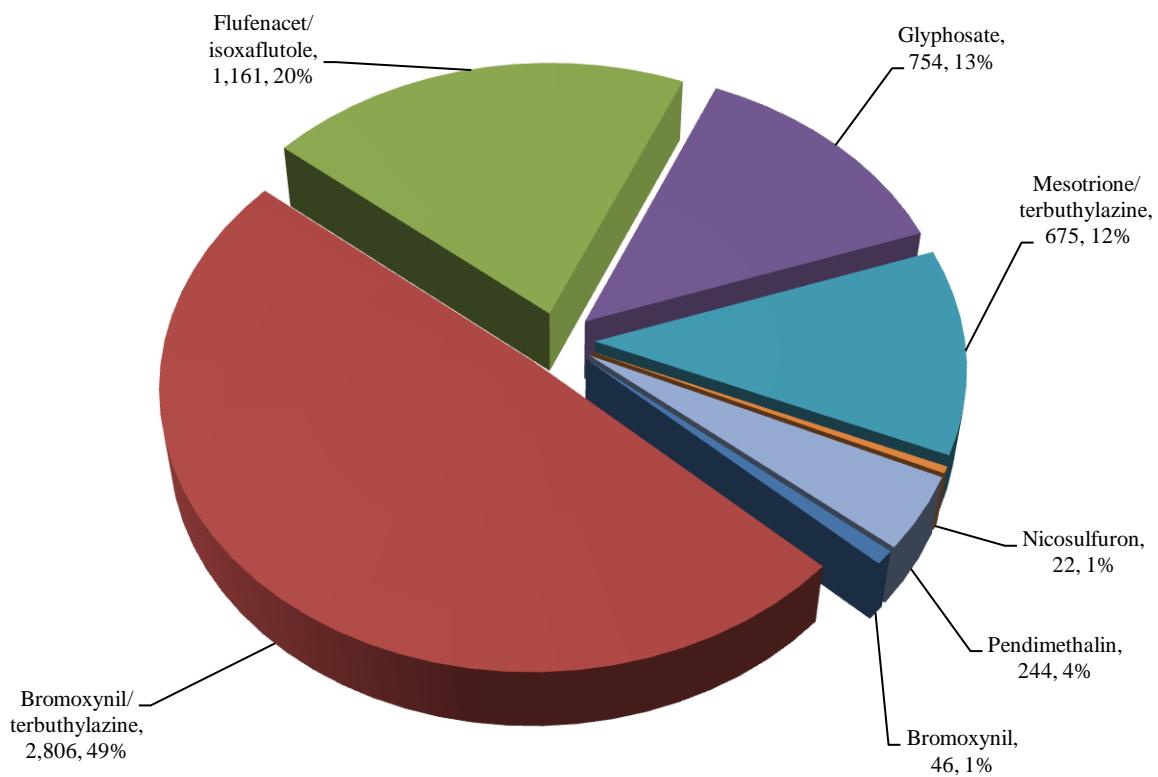


Figure 74: Fodder maize: pesticide-treated area (ha) of seed treatment active substances, 2009.

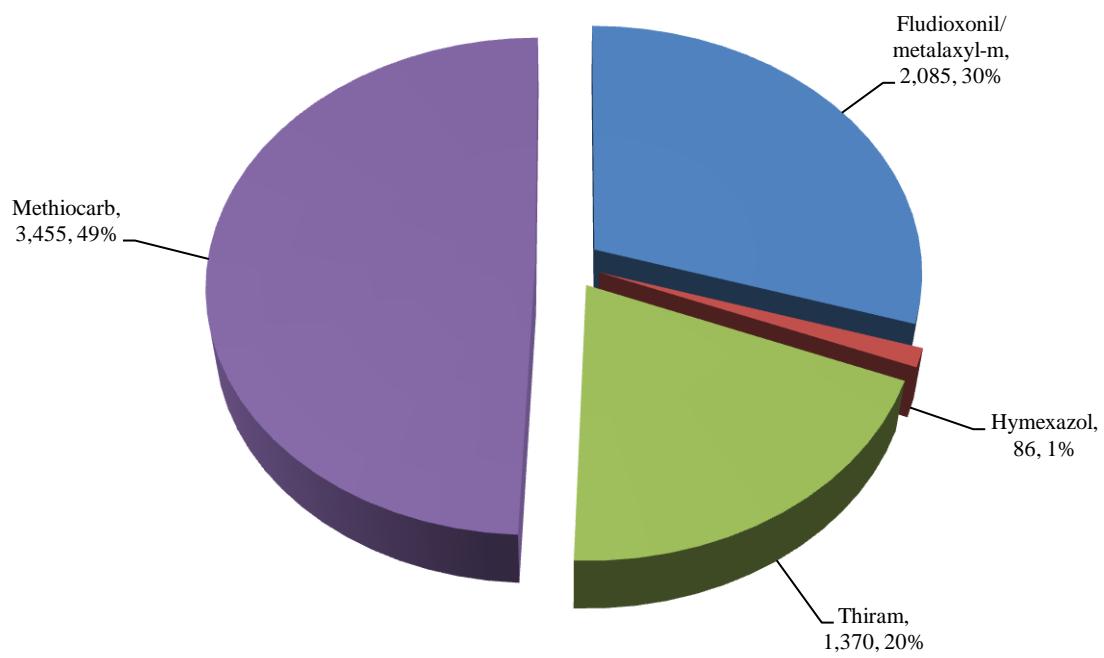


Figure 75: Fodder maize: weight (kg) of seed treatment active substances applied, 2009.

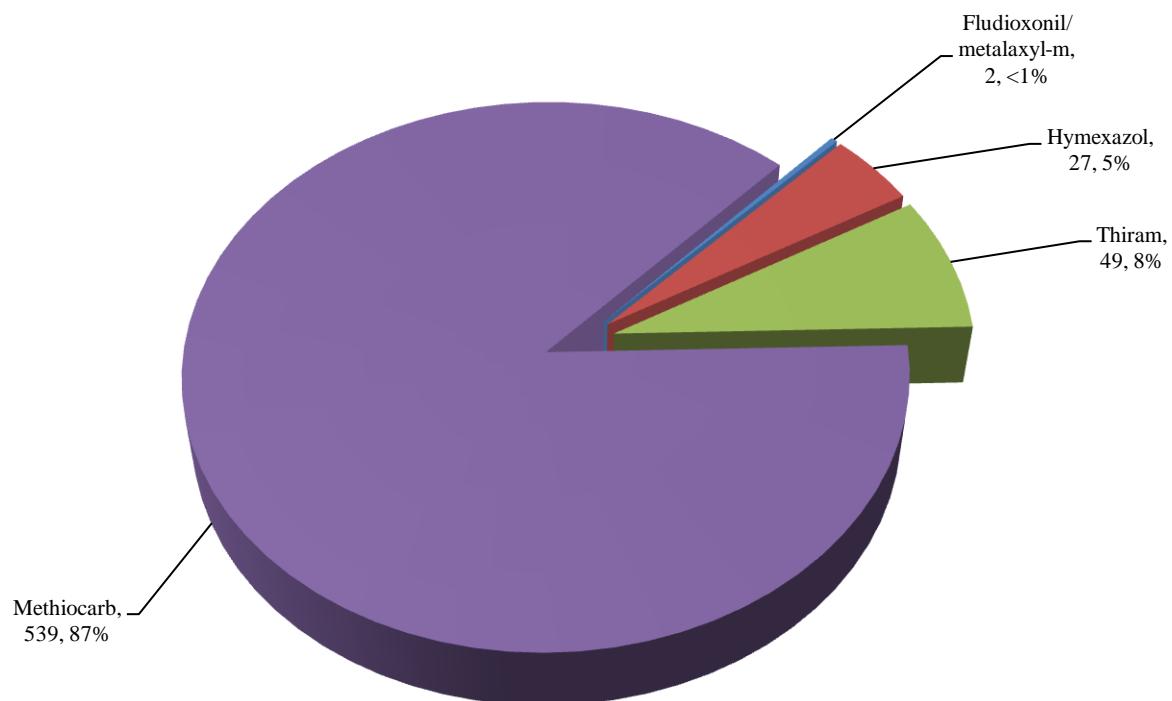
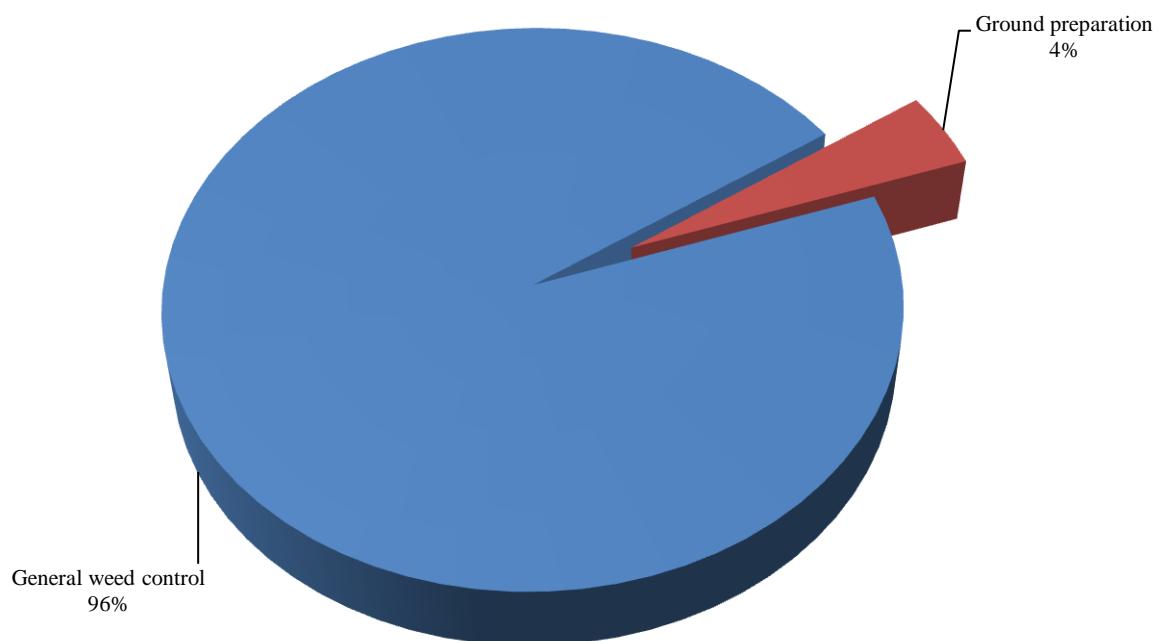


Figure 76: Fodder maize: reasons for herbicide use (spha), 2009.



Other fodder crops

Tables: 3, 6, 7, 8, 9, 10, 23

- 1,024 hectares of other fodder crops were sown in Northern Ireland.
- 2,952 treated ‘spray hectares’.
- 18 kilograms of active substances applied.
- Fungicides, herbicides and seed treatments were applied.
- The formulation prothioconazole/trifloxystrobin was the only fungicide applied.
- This was applied for general fungal control.
- 80.9% of the other fodder crops area received treatments.

Figure 77: Other fodder crops: Area (spha) of pesticide groups applied, 2009.

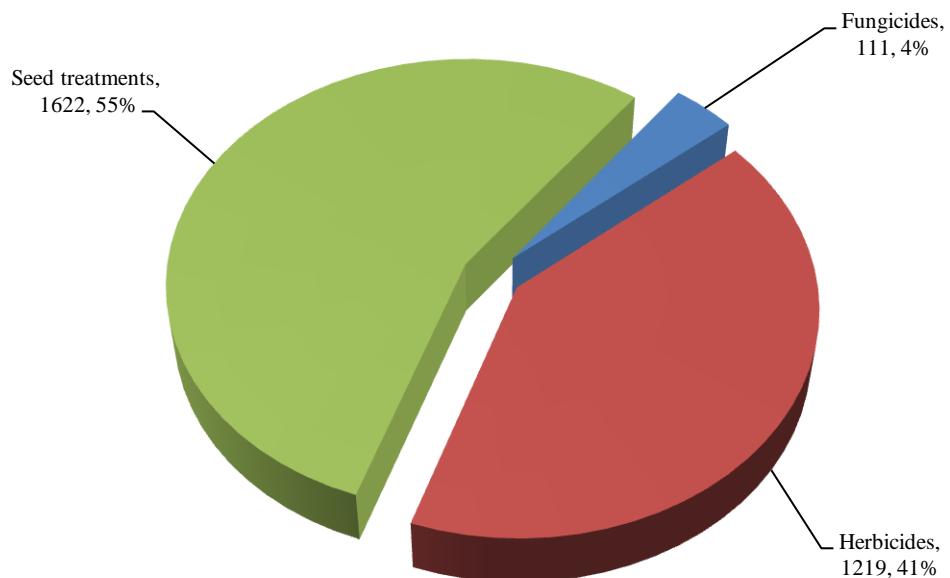


Figure 78: Other fodder crops: Weight (kg) of pesticide groups applied, 2009.

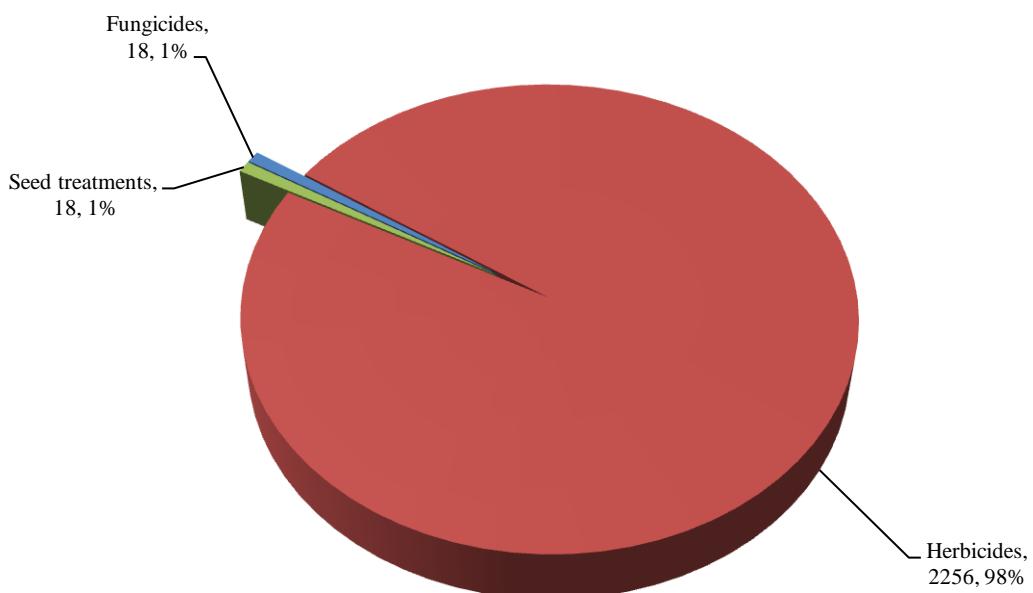


Figure 79: Other fodder crops: pesticide-treated area (spha) of herbicide active substances, 2009.

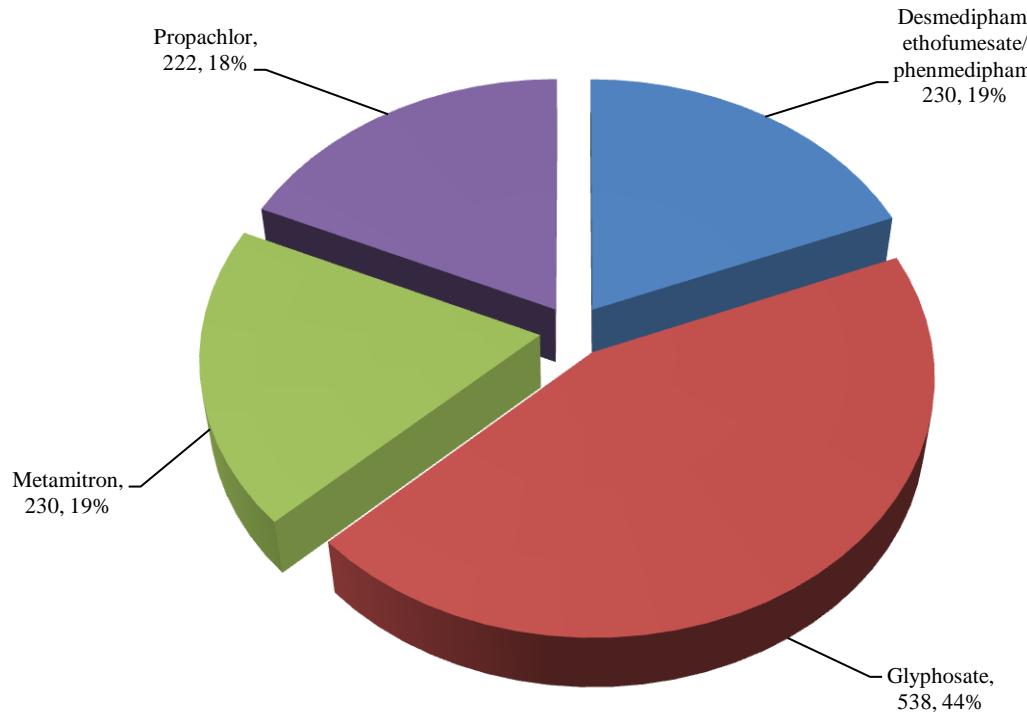


Figure 80: Other fodder crops: weight (kg) of herbicide active substances applied, 2009.

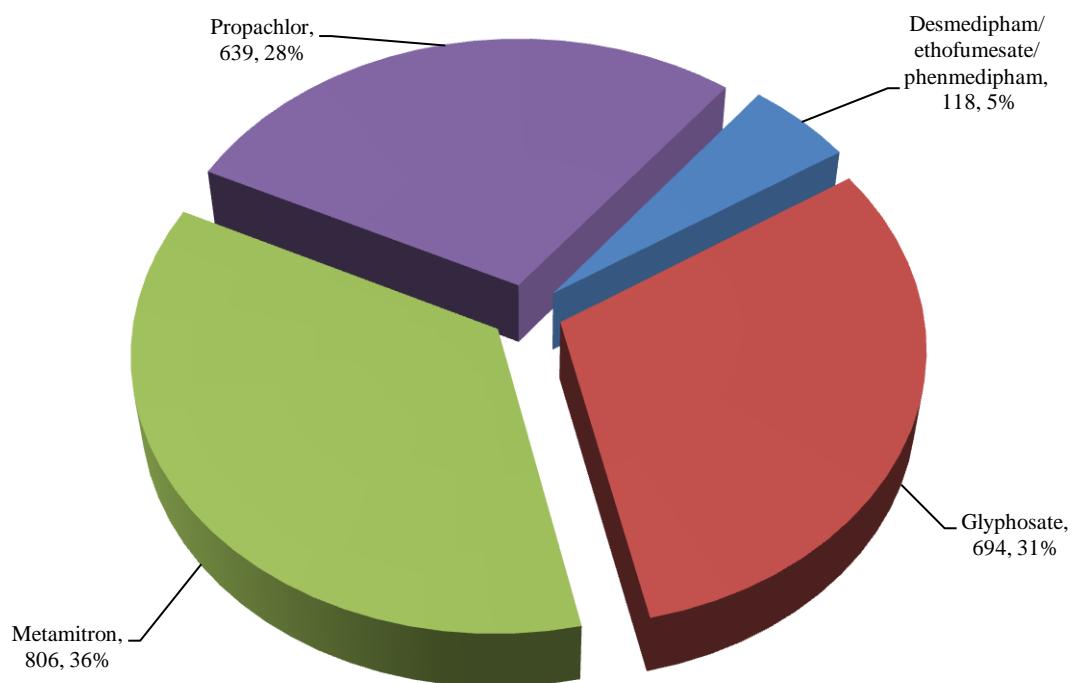


Figure 81: Other fodder crops: pesticide-treated area (ha) of seed treatment active substances, 2009.

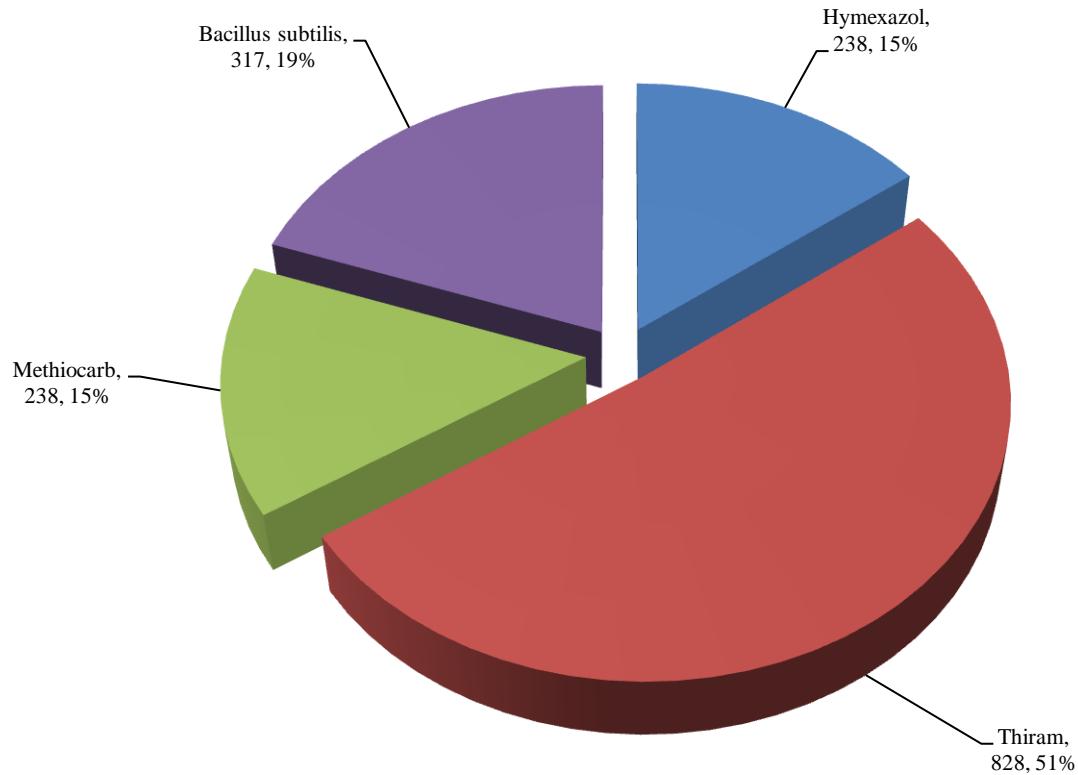


Figure 82: Other fodder crops: weight (kg) of seed treatment active substances applied, 2009.

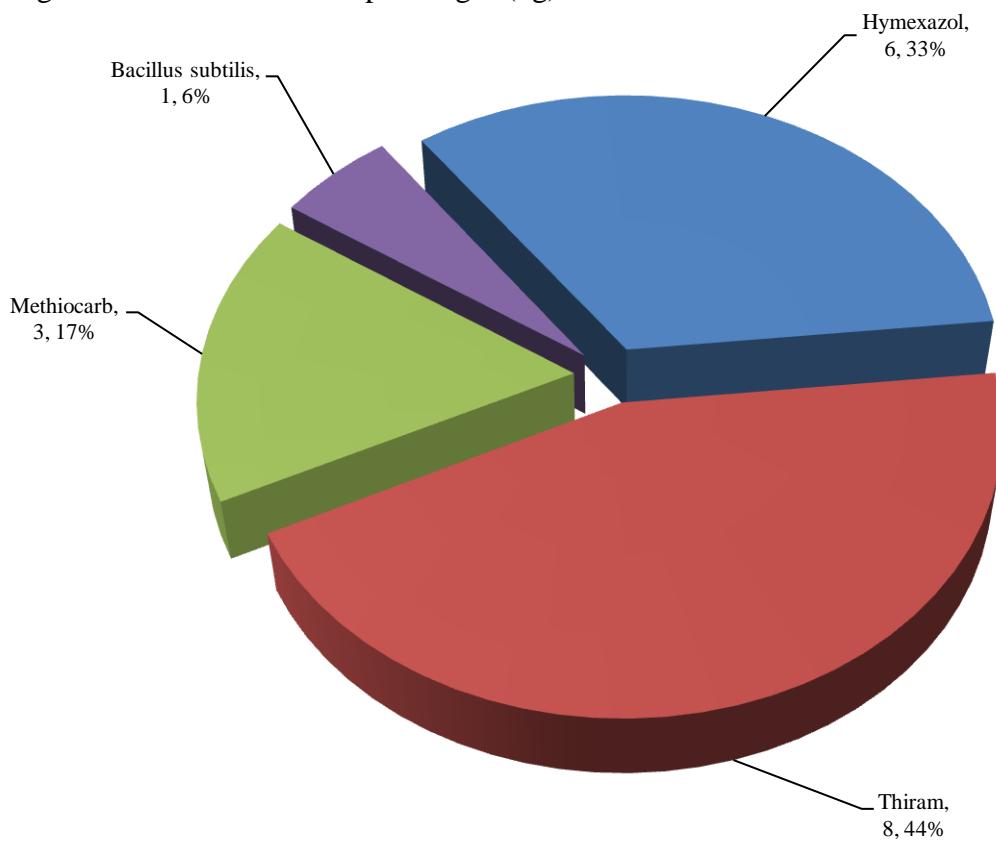
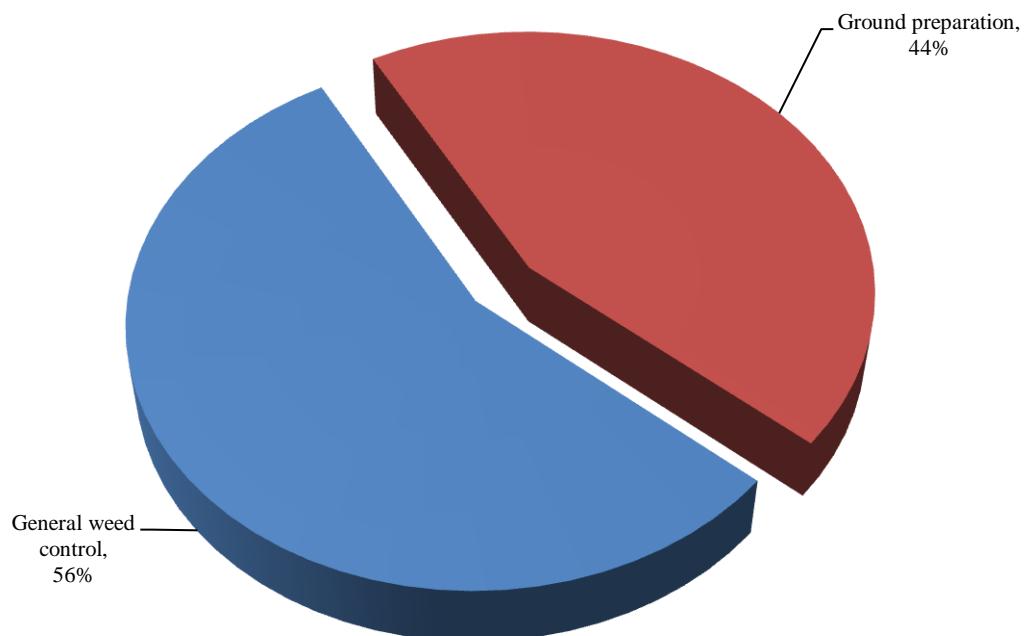


Figure 83: Other fodder crops: reasons for herbicide use (spha), 2009.



Trends:

Figure 84a: Area (ha) of grassland and fodder crops grown, 1989-2009.

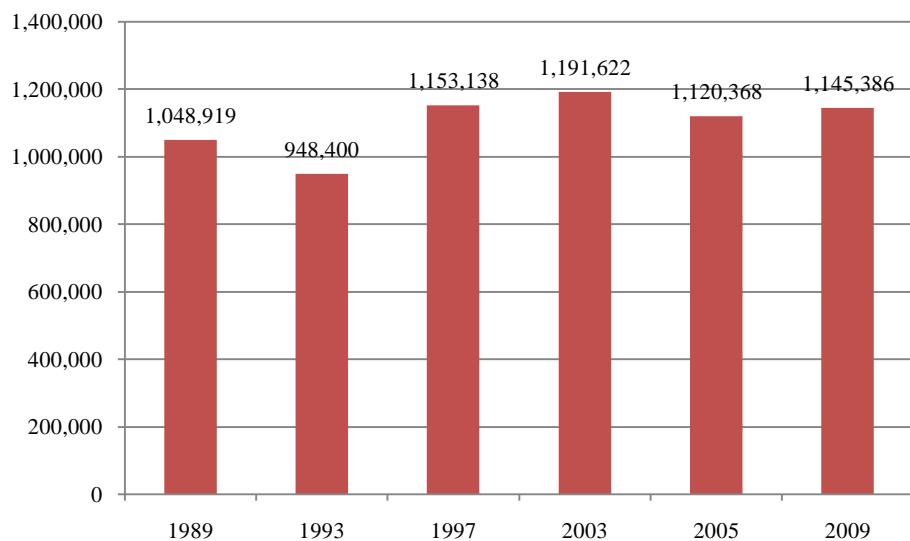


Figure 84b: Pesticide-treated area (spha) of grassland and fodder crops, 1989-2009.

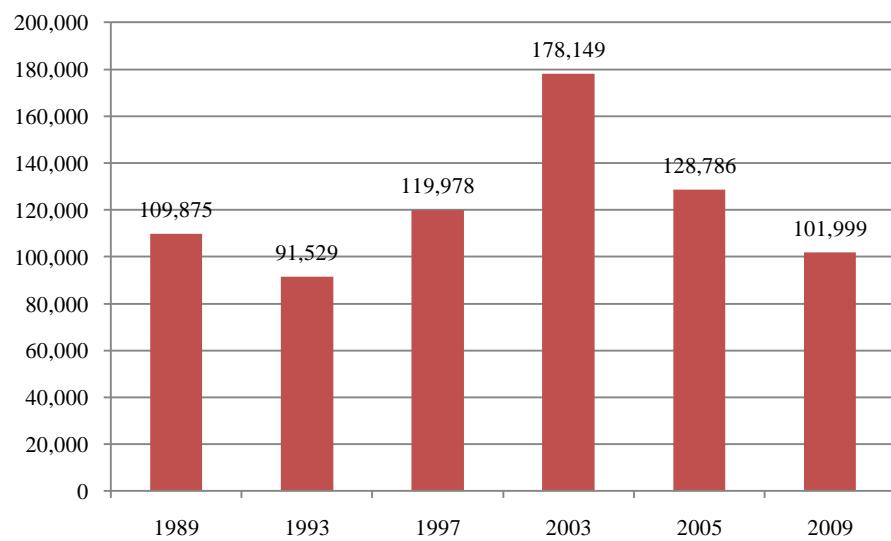


Figure 84c: Weight (t) of pesticides applied to grassland and fodder crops, 1989-2009.

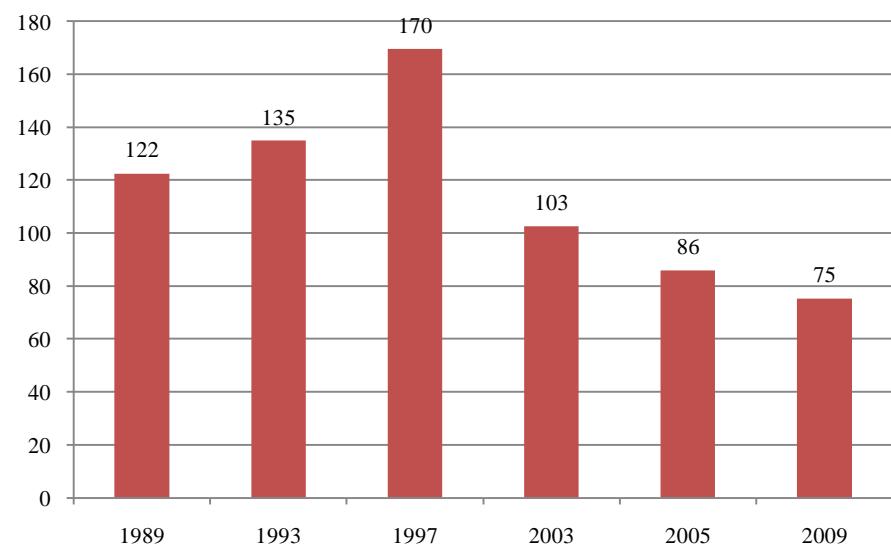


Figure 85a: Area (ha) of established grassland grown, 1989-2009.

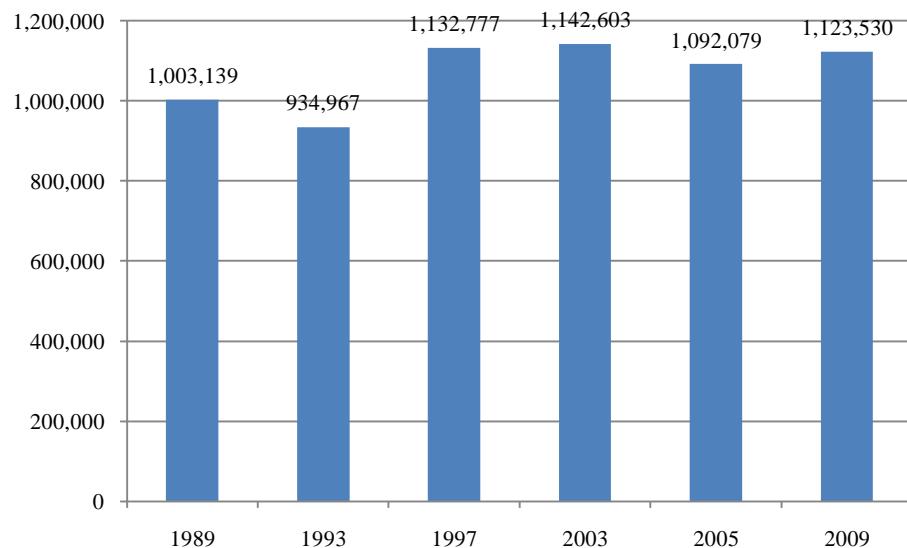


Figure 85b: Pesticide-treated area (spha) of established grassland, 1989-2009.

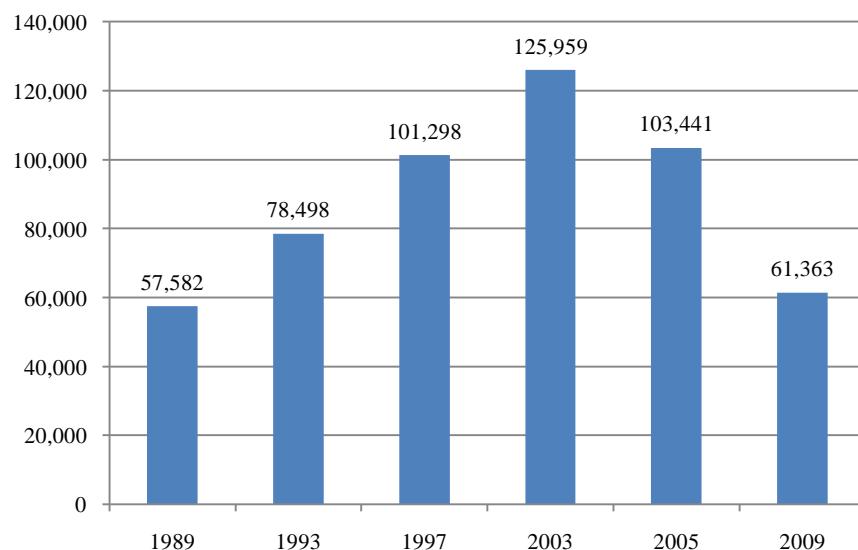


Figure 85c: Weight (t) of pesticides applied to established grassland, 1989-2009.

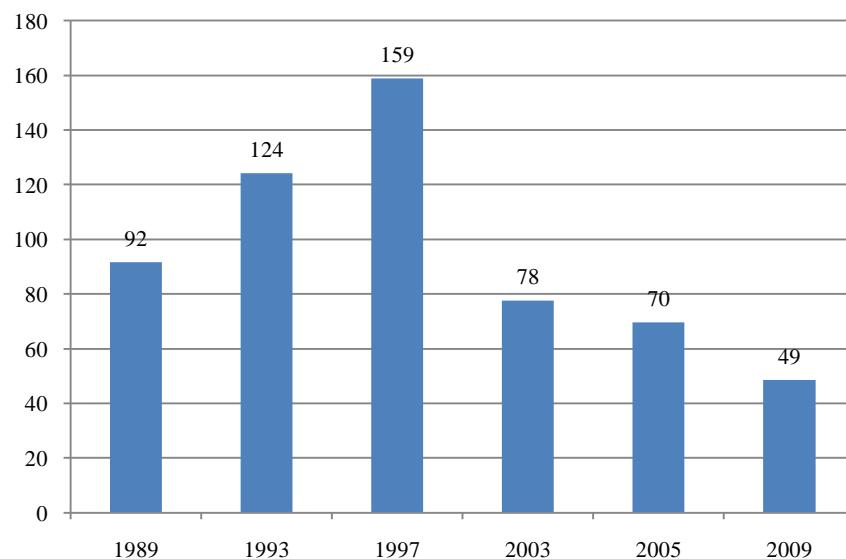


Figure 86a: Area (ha) of enclosed grassland grown (ha), 1989-2009.

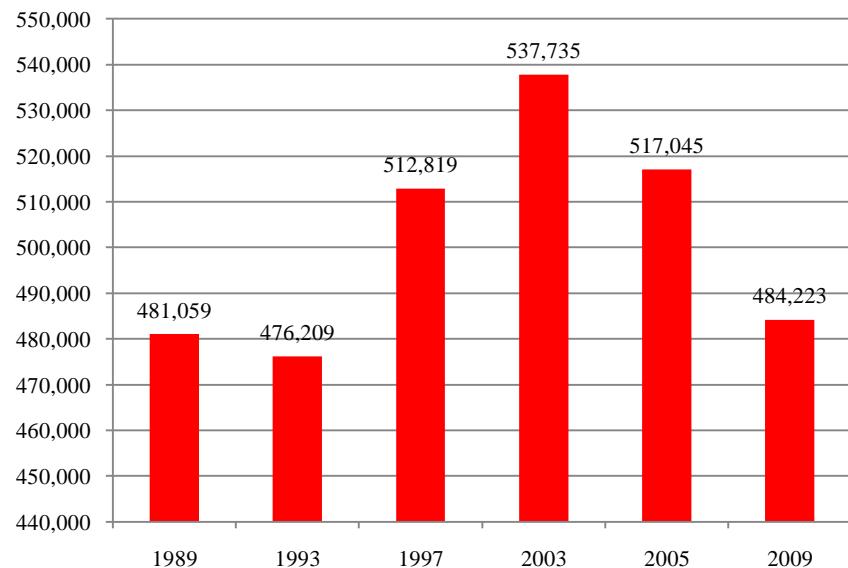


Figure 86b: Pesticide-treated area (spha) of enclosed grassland, 1989-2009.

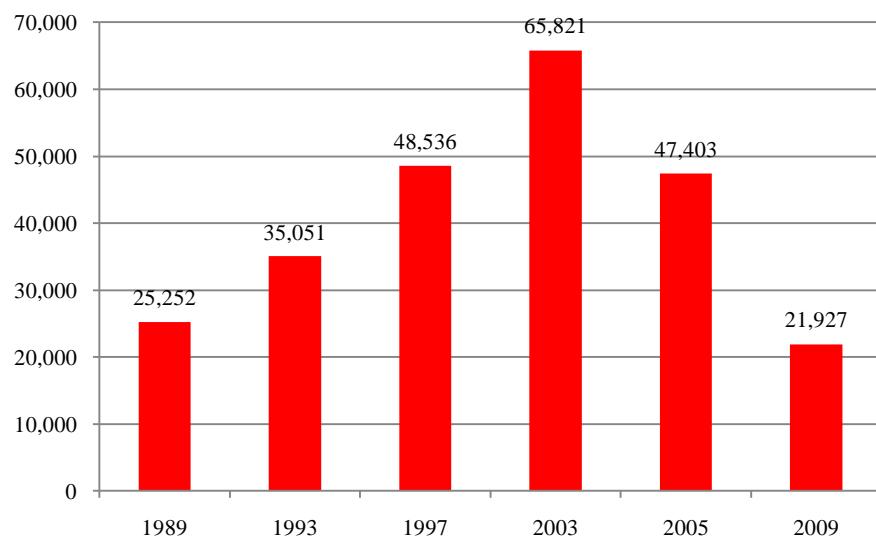


Figure 86c: Weight (t) of pesticides applied to enclosed grassland, 1989-2009.

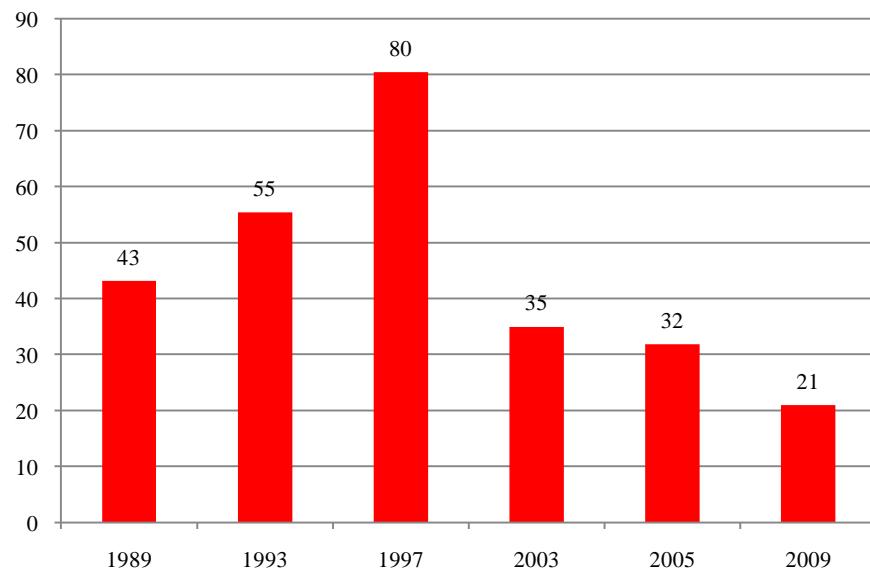


Figure 87a: Area (ha) of grass silage grown, 1989-2009.

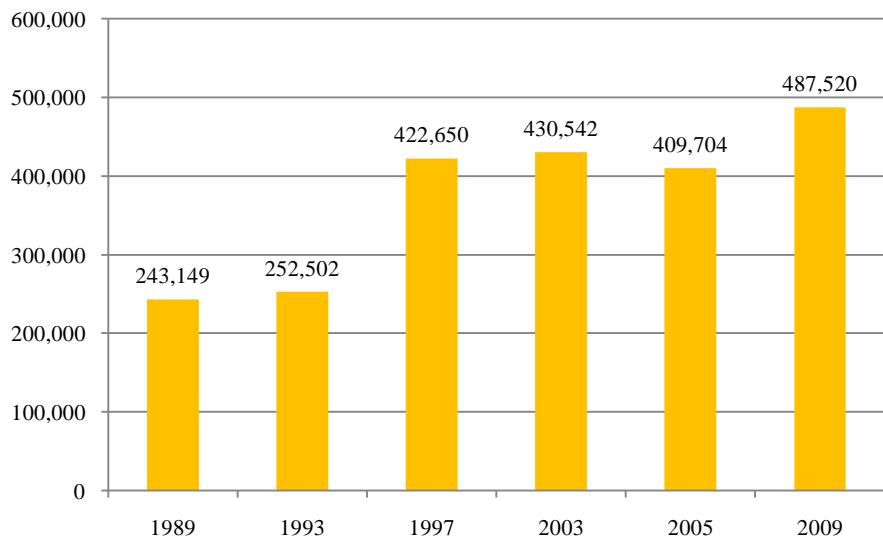


Figure 87b: Pesticide-treated area (spha) of grass silage, 1989-2009.

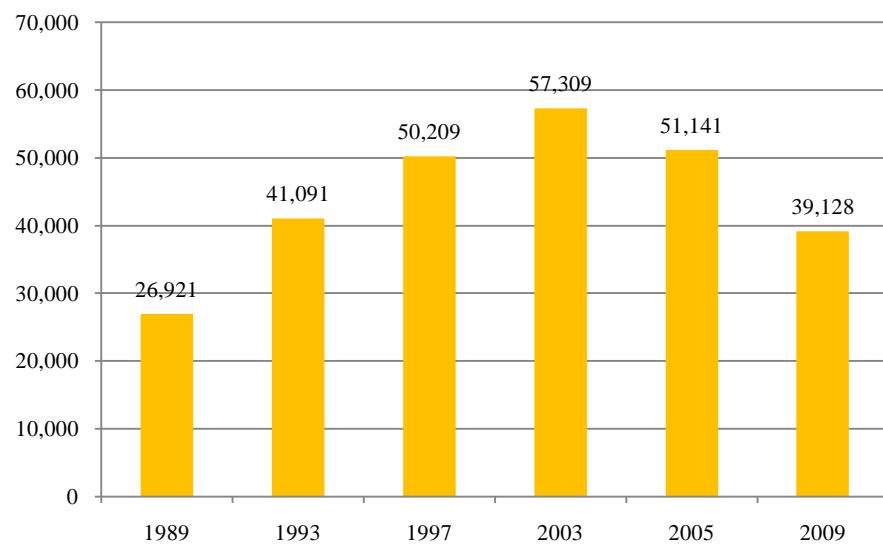


Figure 87c: Weight (t) of pesticides applied to grass silage, 1989-2009.

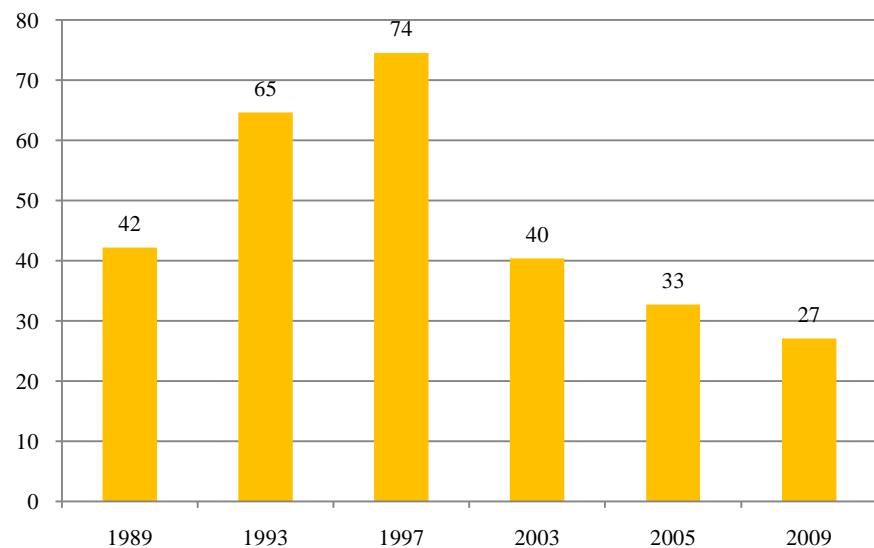


Figure 88a: Area (ha) of hay grown, 1989-2009.

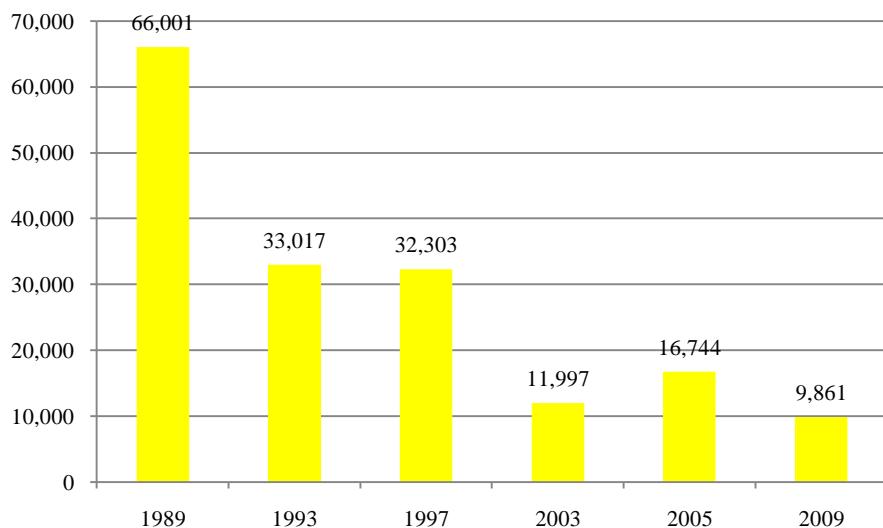


Figure 88b: Pesticide-treated area (spha) of hay, 1989-2009.

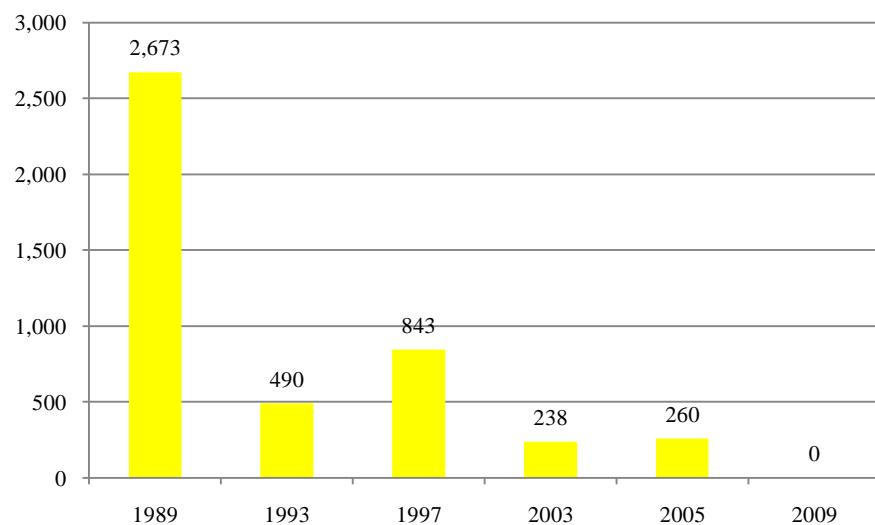


Figure 88c: Weight (t) of pesticides applied to hay, 1989-2009.

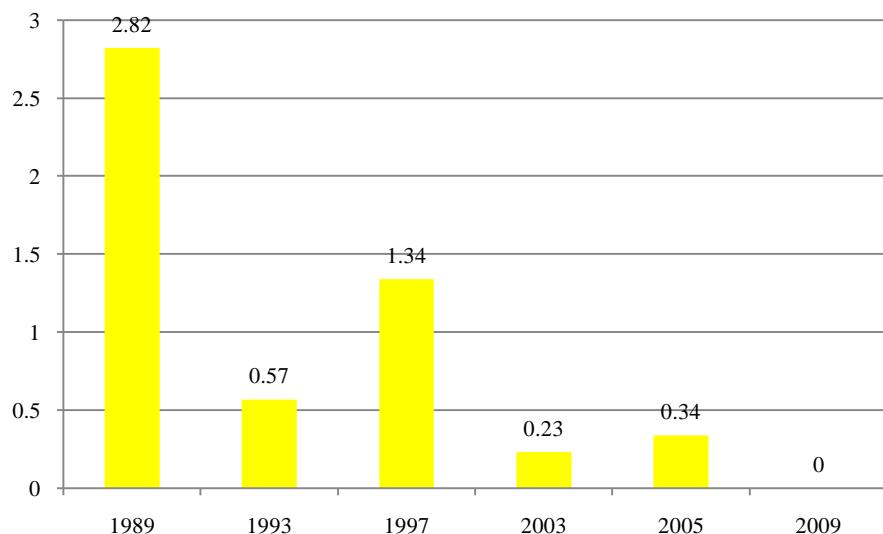


Figure 89a: Area (ha) of rough grazing, 1989-2009.

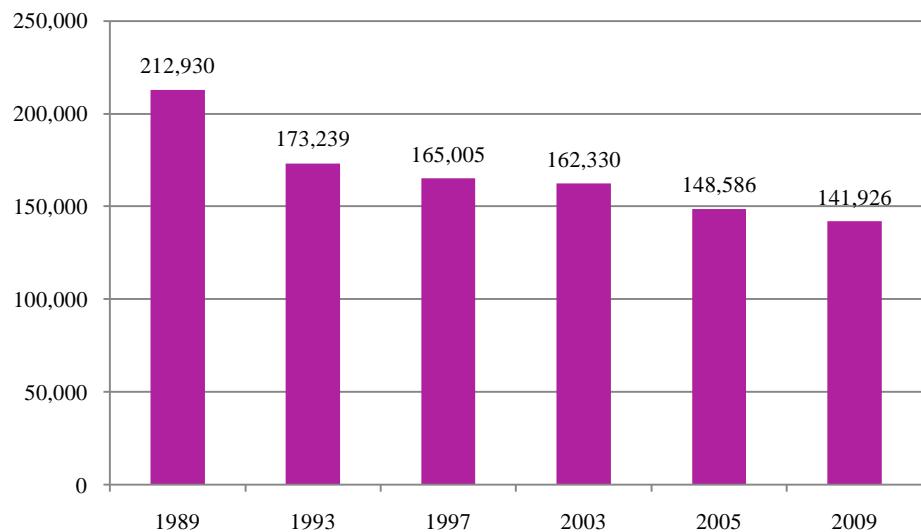


Figure 89b: Pesticide-treated area (spha) of rough grazing, 1989-2009.

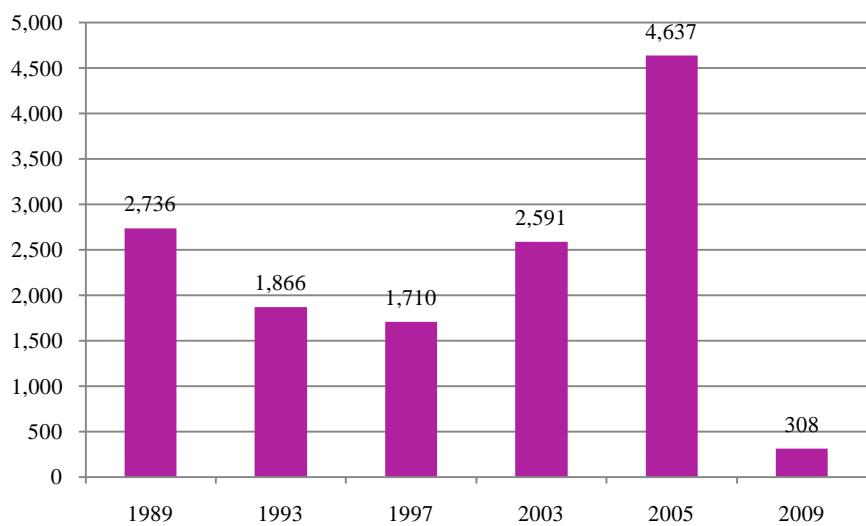


Figure 89c: Weight (t) of pesticides applied to rough grazing, 1989-2009.

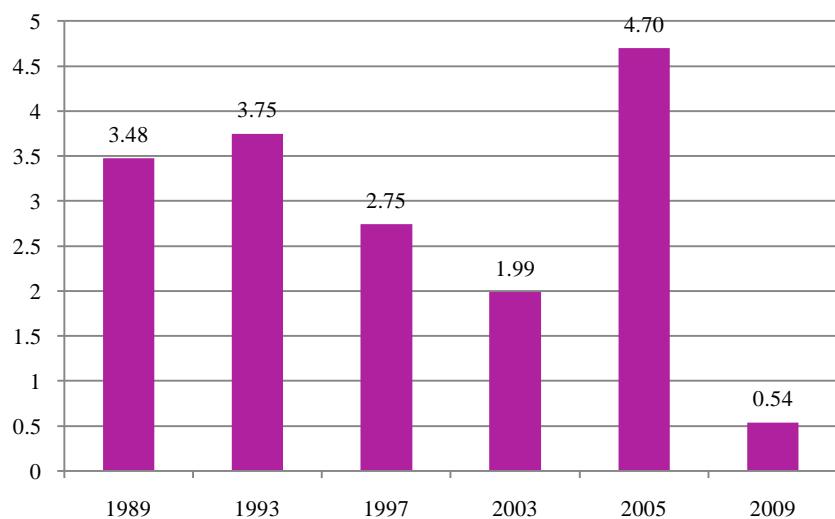


Figure 90a: Area (ha) of sown crops grown, 1989-2009.

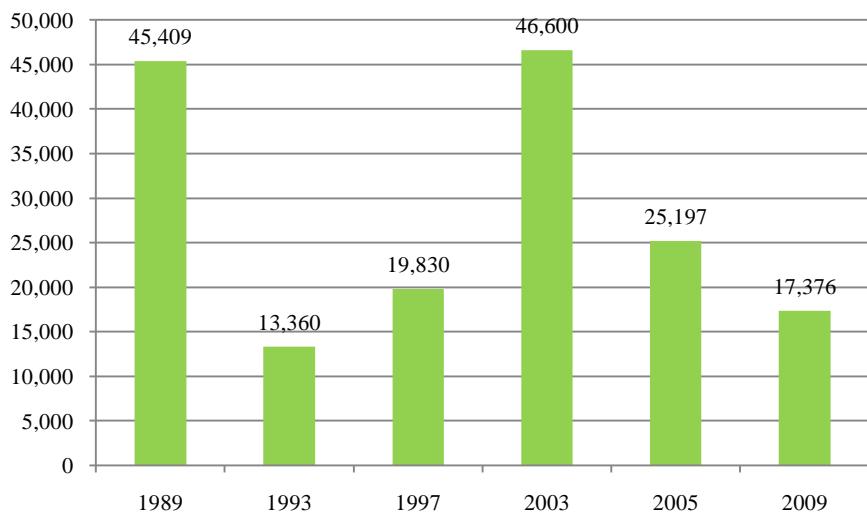


Figure 90b: Pesticide-treated area (spha) of sown crops, 1989-2009.

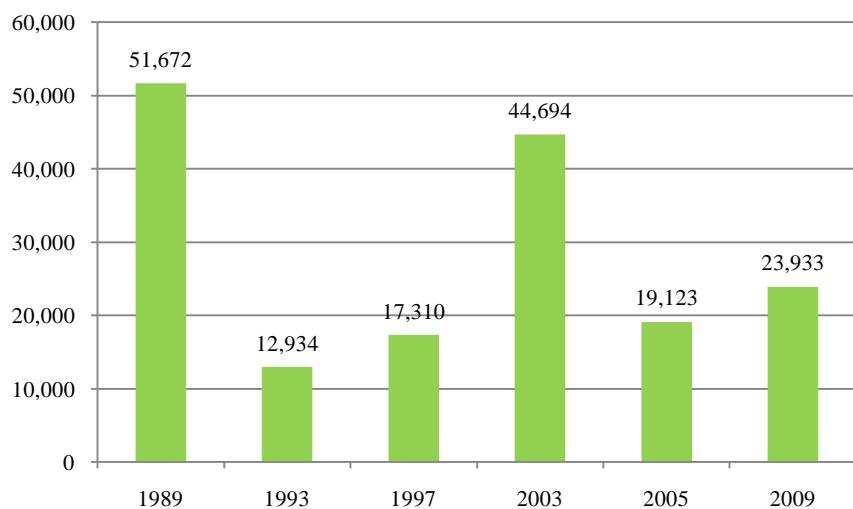


Figure 90c: Weight (t) of pesticides applied to sown crops, 1989-2009.

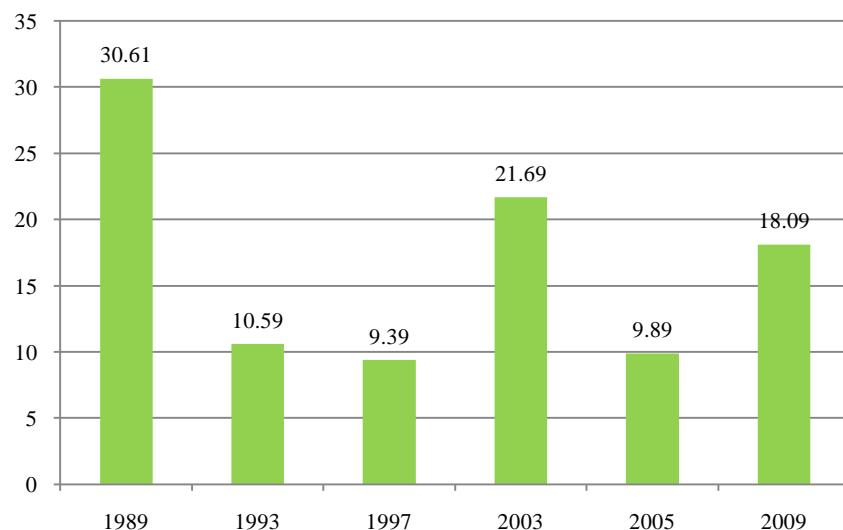


Figure 91a: Area (ha) of arable silage, 1989-2009.

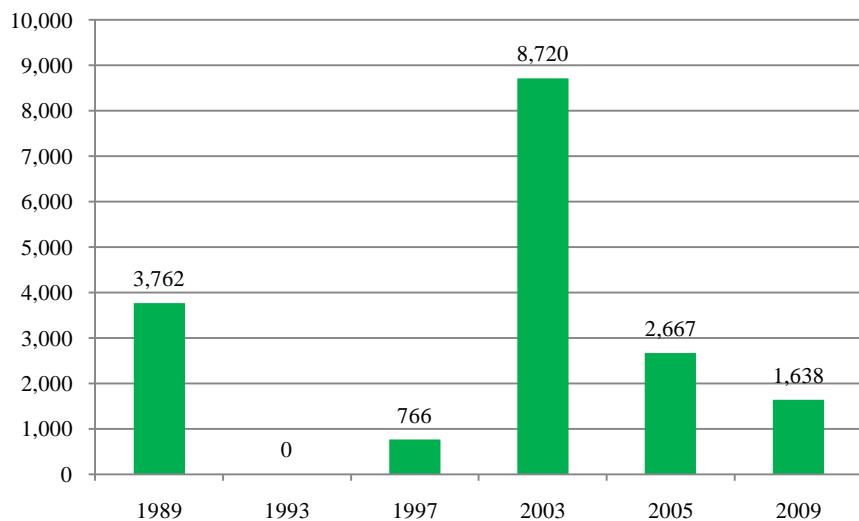


Figure 91b: Pesticide-treated area (spha) of arable silage, 1989-2009.

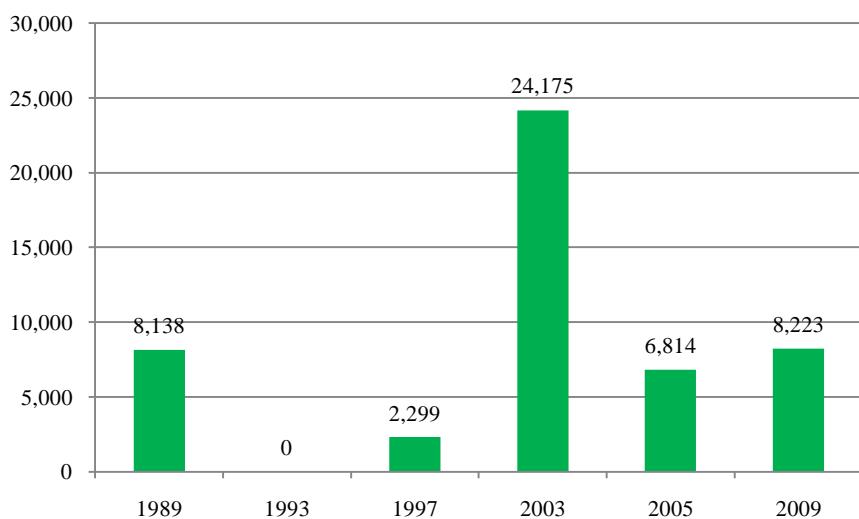


Figure 91c: Weight (t) of pesticides applied to arable silage, 1989-2009.

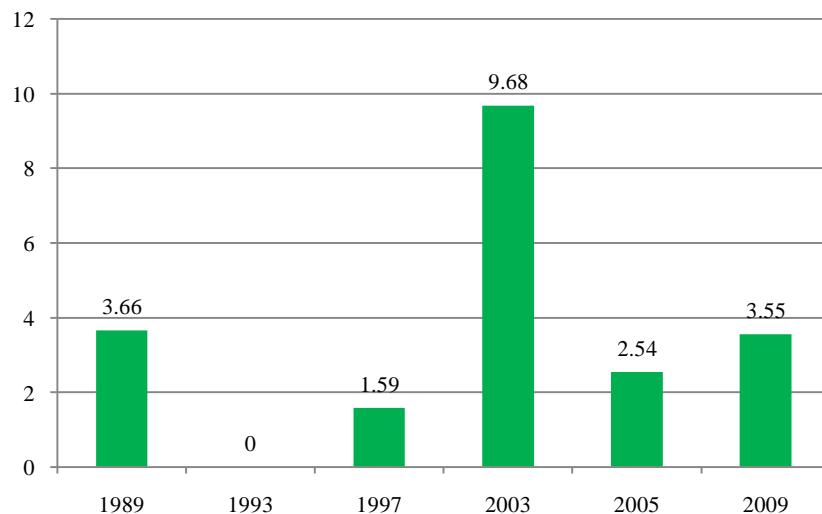


Figure 92a: Area (ha) of arable silage (undersown), 1989-2009.

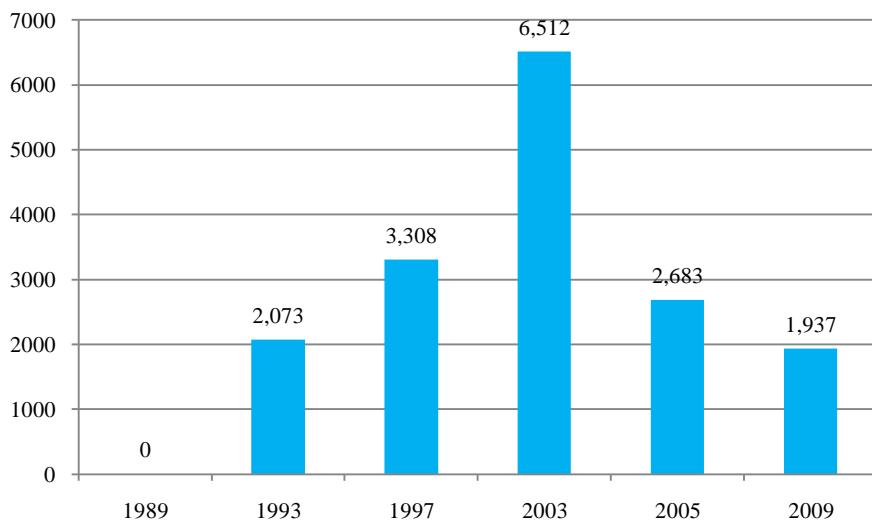


Figure 92b: Pesticide-treated area (spha) of arable silage (undersown), 1989-2009.

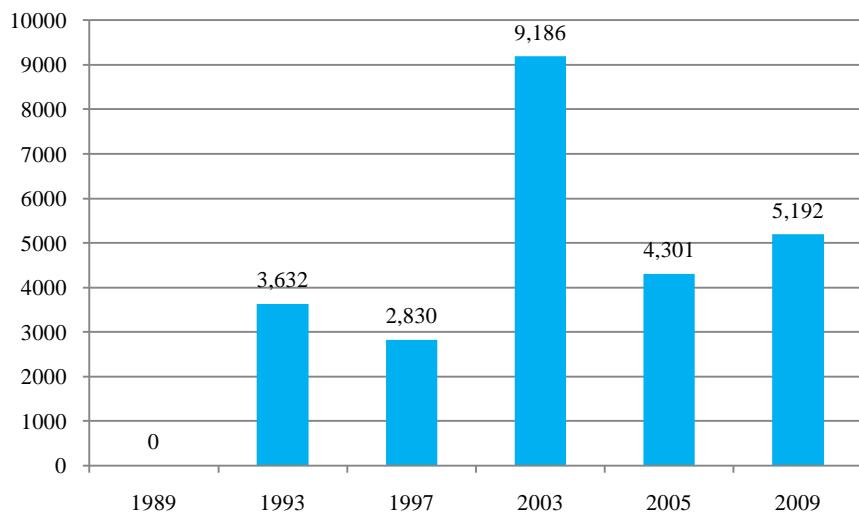


Figure 92c: Weight (t) of pesticides applied to arable silage (undersown), 1989-2009.

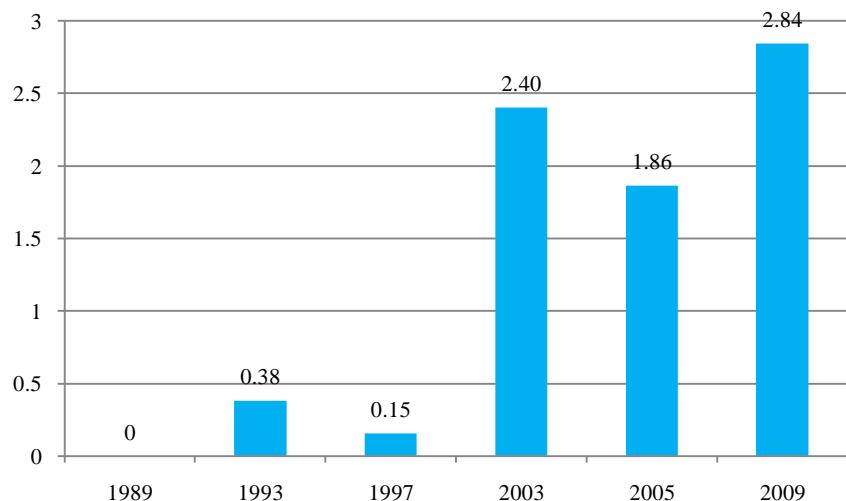


Figure 93a: Area (ha) of cereals (undersown), 1989-2009.

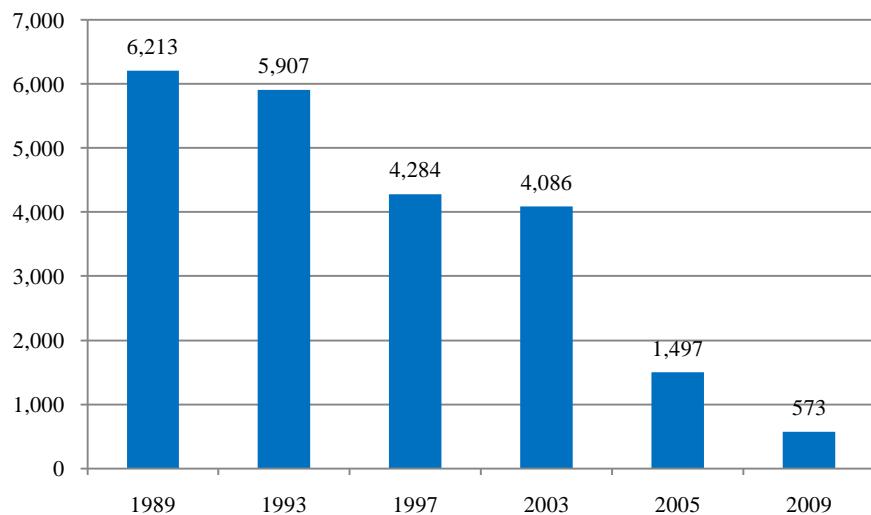


Figure 93b: Pesticide-treated area (spha) of cereals (undersown), 1989-2009.

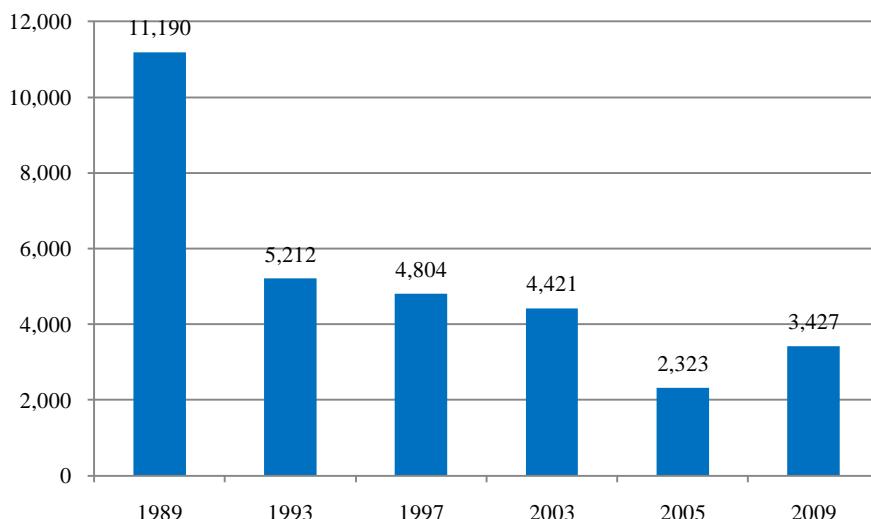


Figure 93c: Weight (t) of pesticides applied to cereals (undersown), 1989-2009.

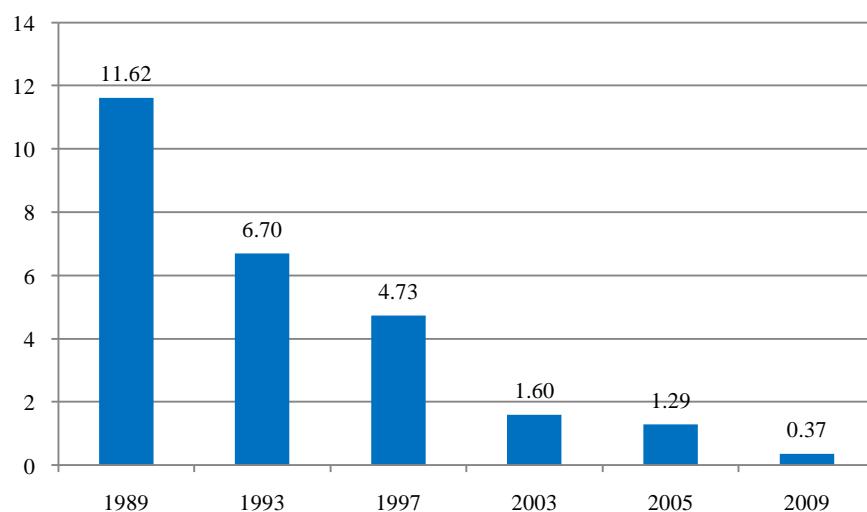


Figure 94a: Area (ha) of grass reseeds sown, 1989-2009.

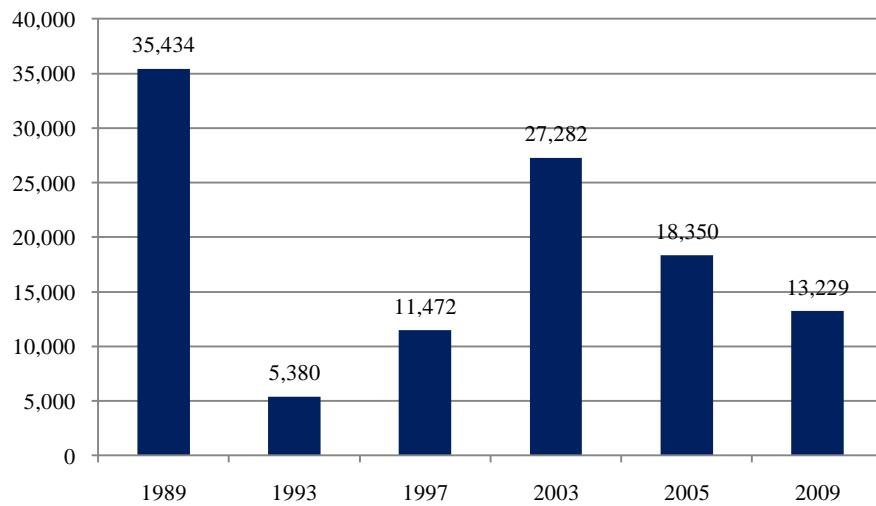


Figure 94b: Pesticide-treated area (spha) of grass reseeds, 1989-2009.

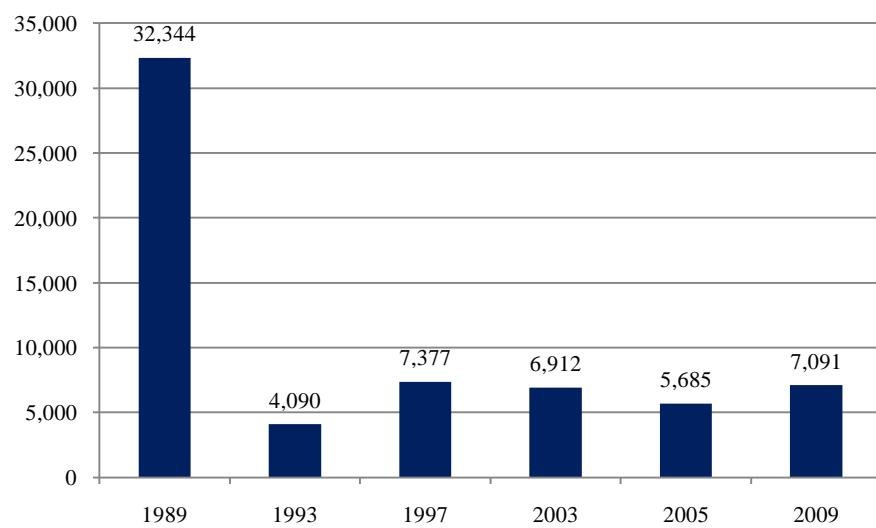


Figure 94c: Weight (t) of pesticides applied to grass reseeds, 1989-2009.

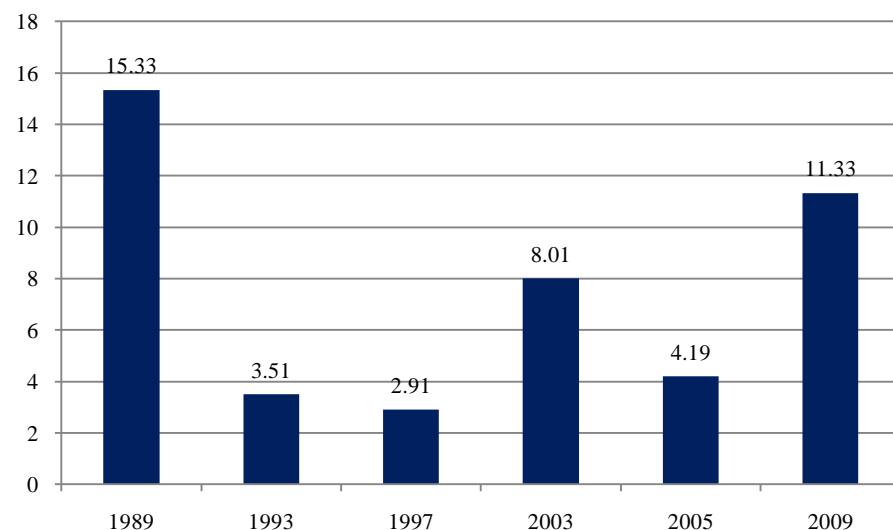


Figure 95a: Area (ha) of fodder crops sown, 1989-2009.

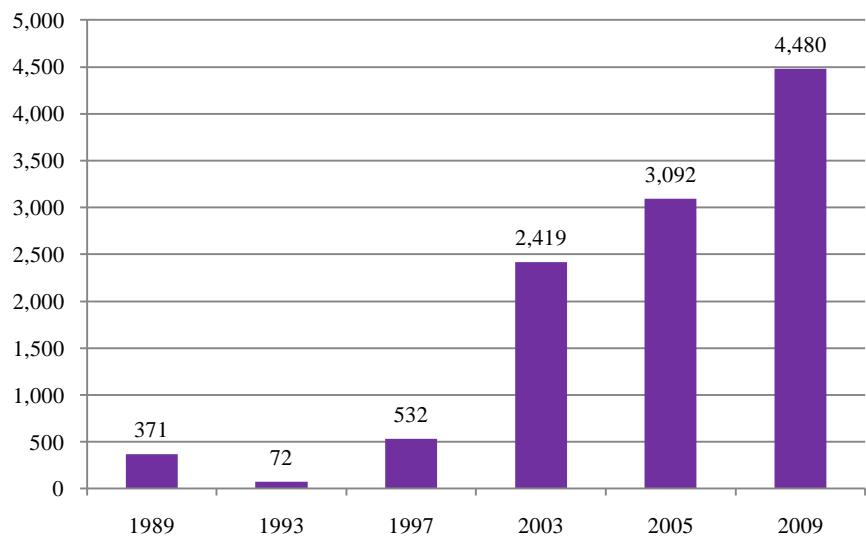


Figure 95b: Pesticide-treated area (spha) of fodder crops, 1989-2009.

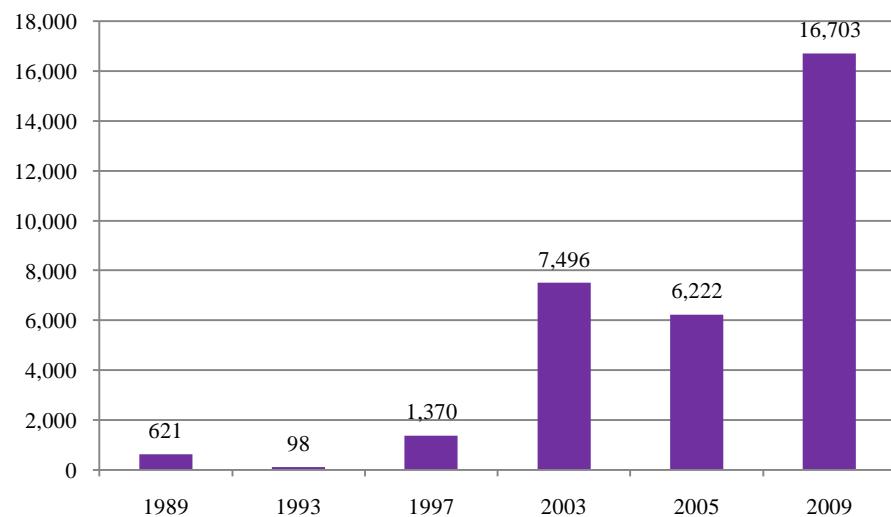


Figure 95c: Weight (t) of pesticides applied to fodder crops, 1989-2009.

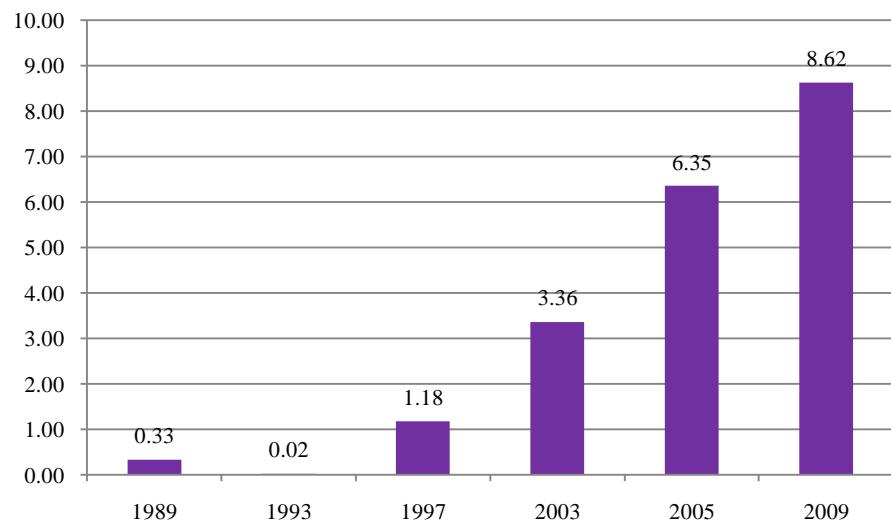


Figure 96: Area (ha) of fodder maize sown, 1989-2009.

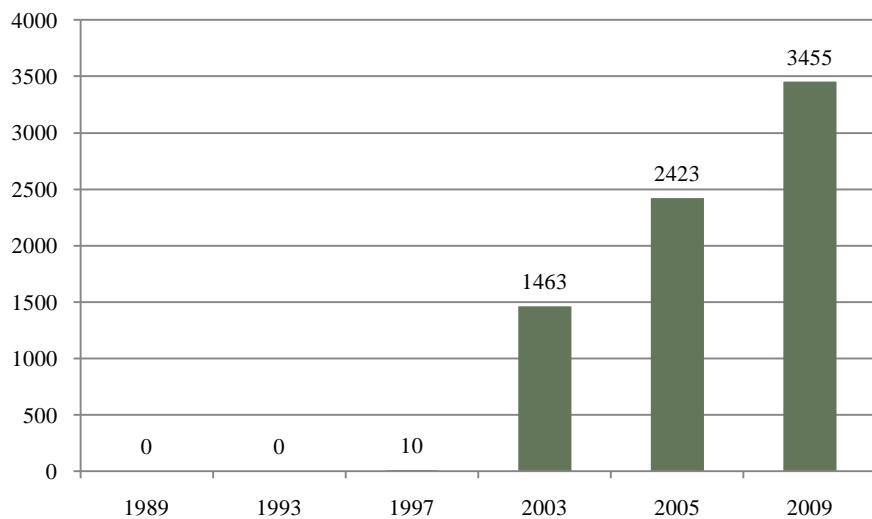


Figure 96b: Pesticide-treated area (spha) of fodder maize crops, 1989-2009.

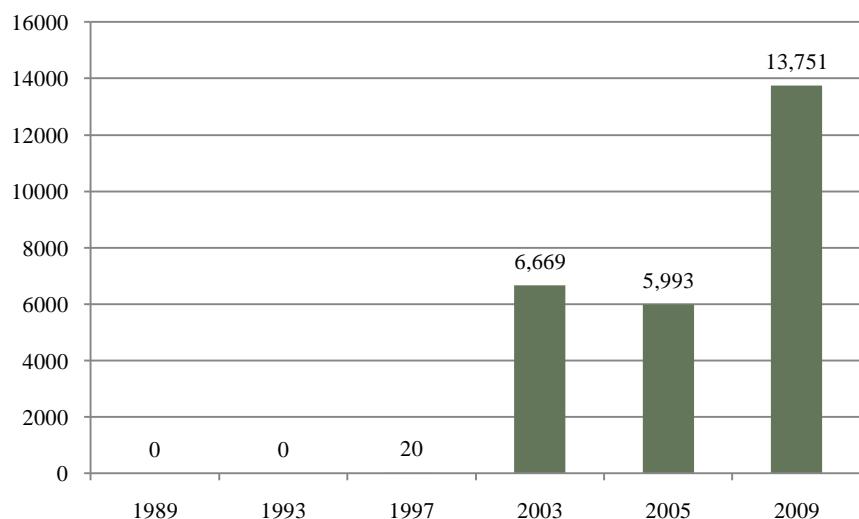


Figure 96c: Weight (t) of pesticides applied to fodder maize crops, 1989-2009.

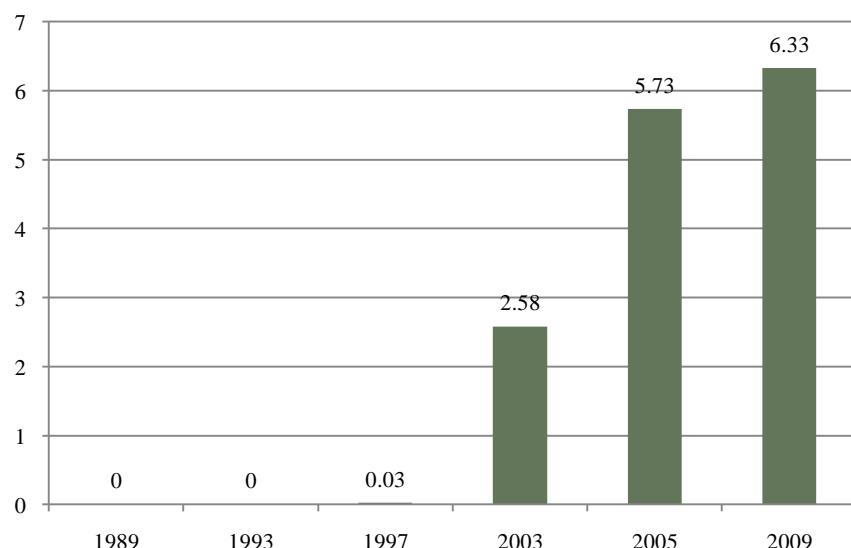


Figure 97a: Area (ha) of other fodder crops sown, 1989-2009.

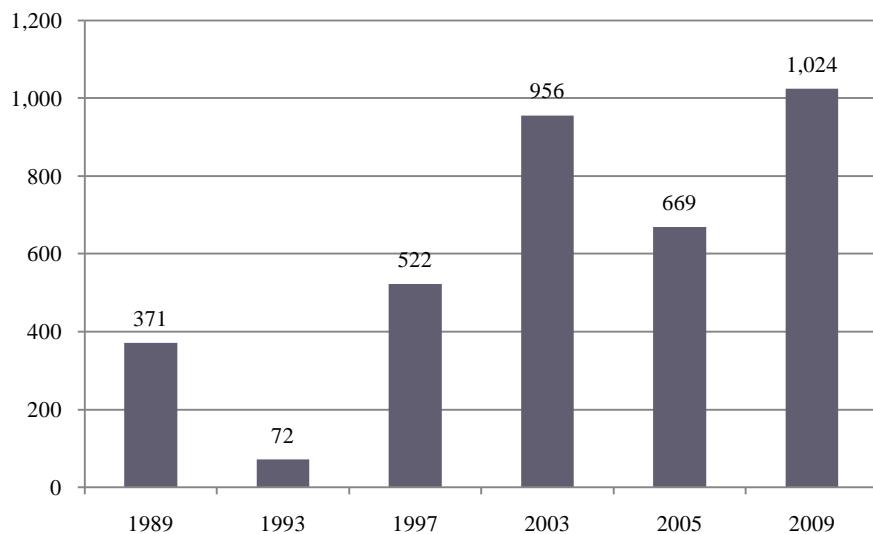


Figure 97b: Pesticide-treated area (spha) of other fodder crops, 1989-2009.

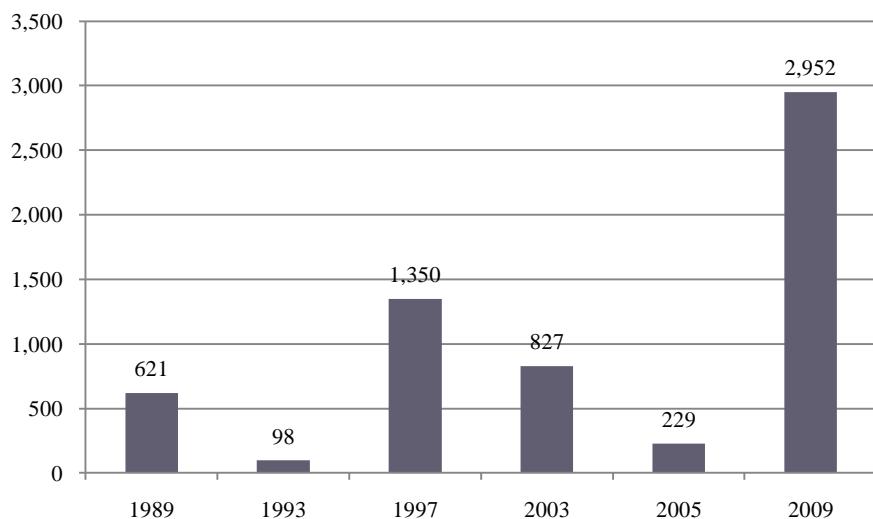


Figure 97c: Weight (t) of pesticides applied to other fodder crops, 1989-2009.

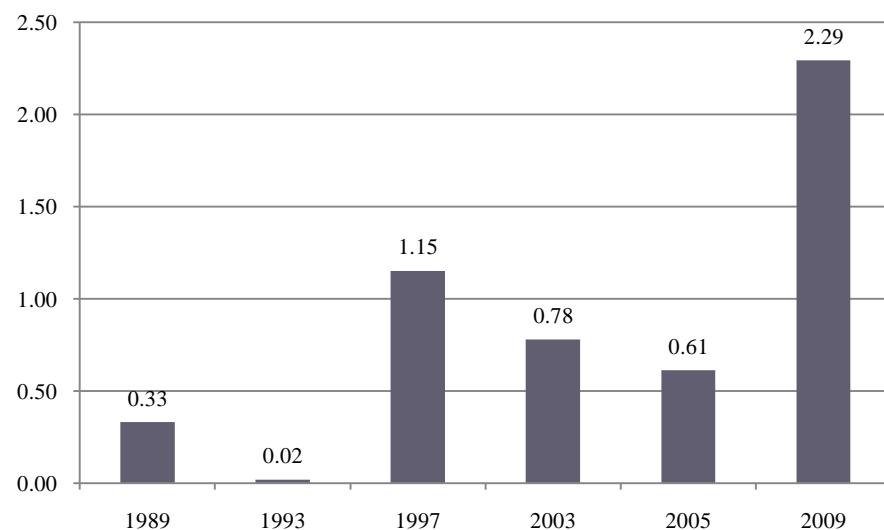


Table 1a Number of farms in each size class with enclosed grassland in the Northern Ireland June 2009 census and the number of samples from each class.

County	Size group (hectares)														Total
	< 10		10 < 20		20 < 30		30 < 50		50 < 100		100+				
	Holdings in strata	Holdings sampled	Holdings in strata												
Antrim	882	5	851	4	624	6	795	10	806	31	278	17	4,236	73	
Armagh	944	4	969	5	562	5	522	6	333	9	60	6	3,390	35	
Down	1,251	6	1,111	6	690	9	763	13	612	17	184	17	4,611	68	
Fermanagh	473	3	713	4	559	7	599	9	482	6	148	5	2,974	34	
Londonderry	655	1	778	4	500	1	603	9	534	21	146	6	3,216	44	
Tyrone	1,120	4	1,494	10	1,076	7	1,147	15	858	21	228	16	5,923	73	
Northern Ireland	5,325	23	5,916	35	4,011	35	4,429	62	3,625	105	1,044	67	24,350	327	

Table 1b Number of farms in each size class with arable crop silage in the Northern Ireland June 2009 census and the number of samples from each class.

	Size group (hectares)								Total	
	< 5		5 < 10		10+					
	Holdings in strata	Holdings sampled								
Northern Ireland	178	21	128	20	127	28	433	69		

Table 1c Number of farms in each size class with maize in the Northern Ireland June 2009 census and the number of samples from each class.

	Size group (hectares)							
	< 8		8 < 12		12+		Total	
	Holdings in strata	Holdings sampled						
Northern Ireland	130	6	77	10	100	17	307	33

Table 1d Number of farms in each size class with other fodder crops in the Northern Ireland June 2009 census and the number of samples from each class.

	Size group (hectares)							
	< 3		3 < 5		5+		Total	
	Holdings in strata	Holdings sampled						
Northern Ireland	132	1	63	3	73	4	268	8

Table 2 The total number and area (hectares) of crops sampled, and the proportion (%) of the total area of grassland and fodder crops surveyed in Northern Ireland, 2009.

Crop	Number of crops surveyed	Survey area (ha)	Proportion of crops surveyed (%)
<i>Established grassland crops</i>			
Enclosed grazing	320	12,687	3%
Grass silage 1st cut	304	8,113	3%
Grass silage 2nd cut	230	5,583	3%
Grass silage 3rd cut	51	1,044	4%
Grass silage 4th cut	3	53	3%
Hay	57	185	2%
Rough grazing	157	4,216	3%
<i>Sown crops</i>			
Arable silage	36	322	20%
Arable silage (undersown)	45	362	19%
Cereals (undersown)	3	27	5%
Grass reseed	79	525	4%
<i>Fodder crops</i>			
Fodder maize	33	464	13%
Other fodder crops	9	47	2%
All crops	1,327	33,626	2.93%

Table 3 Estimated area (hectares) of grassland and fodder crops grown regionally in Northern Ireland, 2009.

Crop	County						Northern Ireland
	Antrim	Armagh	Down	Fermanagh	Londonderry	Tyrone	
<i>Established grassland crops</i>							
Enclosed grazing	91,417	50,207	86,649	67,261	67,025	121,664	484,223
Grass silage 1st cut	64,944	34,080	50,706	44,032	34,029	55,577	283,369
Grass silage 2nd cut	45,564	20,048	33,868	24,423	24,577	28,721	177,202
Grass silage 3rd cut	6,072	3,678	9,848	191	3,294	2,062	25,144
Grass silage 4th cut	.	.	1,151	.	654	.	1,806
Hay	1,457	1,764	2,493	1,180	1,114	1,853	9,861
Rough grazing	25,735	3,794	5,117	15,601	73,302	18,377	141,926
<i>Sown crops</i>							
Arable silage	490	91	377	.	426	254	1,638
Arable silage (undersown)	663	41	676	.	141	416	1,937
Cereals (undersown)	.	.	.	.	185	387	573
Grass reseed	1,952	1,784	3,429	550	2,737	2,777	13,229
<i>Fodder crops</i>							
Fodder maize	1,018	664	936	.	397	441	3,455
Other fodder crops	.	.	876	.	.	148	1,024
All crops	239,312	116,150	196,125	153,239	207,881	232,677	1,145,386

Table 4 Estimated area (spray hectares) of grassland and fodder crops treated regionally with each pesticide type in Northern Ireland, 2009.

Pesticide type	County					Northern Ireland	
	Antrim	Armagh	Down	Fermanagh	Londonderry		
Fungicides	692	.	1,126	.	2,552	367	4,737
Herbicides	23,153	7,806	17,293	1,797	13,634	16,490	80,173
Insecticides	408	34	313	.	1,147	1,020	2,922
Growth regulators	73	.	275	.	1,440	184	1,973
Seed treatments	2,951	1,612	4,478	.	1,477	1,676	12,193
Total	27,277	9,451	23,485	1,797	20,250	19,737	101,998

Table 5 Estimated weight (kilograms) of pesticides applied to grassland and fodder crops regionally in Northern Ireland, 2009.

Pesticide type	County					Northern Ireland	
	Antrim	Armagh	Down	Fermanagh	Londonderry		
Fungicides	185	.	383	.	427	110	1,106
Herbicides	19,697	8,561	16,590	2,010	10,476	15,182	72,516
Insecticides	29	0.2	40	.	3	104	176
Growth regulators	44	.	157	.	496	18	715
Seed treatments	190	124	246	.	78	92	730
Total	20,144	8,685	17,416	2,010	11,482	15,506	75,243

Table 6 The total area (spray hectares) and the basic area (hectares), (in parentheses), of grassland and fodder crops treated, in Northern Ireland 2009, with each pesticide type.

Crop	Pesticide type											
	Fungicides		Herbicides		Insecticides		Growth regulators		Seed treatments		All pesticides	
	sp ha	(ha)	sp ha	(ha)	sp ha	(ha)	sp ha	(ha)	sp ha	(ha)	sp ha	(ha)
<i>Established grassland crops</i>												
Enclosed grazing	.	.	21,321	(17,544)	606	(606)	.	.	.	.	21,927	(17,544)
Grass silage 1st cut	.	.	25,331	(23,609)	.	.	.	.	.	.	25,331	(23,609)
Grass silage 2nd cut	.	.	13,667	(12,325)	.	.	.	.	.	.	13,667	(12,325)
Grass silage 3rd cut	.	.	130	(130)	.	.	.	.	.	.	130	(130)
Grass silage 4th cut	.	.	.	.	.	.	.	.	.	.	.	.
Hay	.	.	.	.	.	.	.	.	.	.	.	.
Rough grazing	.	.	308	(308)	.	.	.	.	.	.	308	(308)
<i>Sown crops</i>												
Arable silage	2,361	(1,106)	2,581	(1,348)	912	(636)	981	(568)	1,388	(1,360)	8,223	(1,374)
Arable silage (undersown)	968	(649)	1,947	(1,246)	617	(617)	65	(65)	1,595	(1,547)	5,192	(1,629)
Cereals (undersown)	1,298	(185)	.	.	787	(416)	927	(185)	416	(416)	3,427	(416)
Grass reseed	.	.	6,915	(5,833)	.	.	.	.	176	(176)	7,091	(5,833)
<i>Fodder crops</i>												
Fodder maize	.	.	6,755	(3,324)	.	.	.	.	6,996	(3,455)	13,751	(3,324)
Other fodder crops	111	(111)	1,219	(563)	.	.	.	.	1,622	(828)	2,952	(828)
All crops	4,737	(2,052)	80,173	(66,231)	2,922	(2,275)	1,973	(818)	12,193	(7,783)	101,998	(67,321)

Table 7 Total weight (kilograms) of each pesticide type applied to grassland and fodder crops in Northern Ireland, 2009.

Crop	Fungicides	Herbicides	Insecticides	Growth regulators	Seed treatments	Total
<i>Established grassland crops</i>						
Enclosed grazing	.	20,964	8	.	.	20,972
Grass silage 1st cut	.	16,184	.	.	.	16,184
Grass silage 2nd cut	.	10,825	.	.	.	10,825
Grass silage 3rd cut	.	19	.	.	.	19
Grass silage 4th cut	.	.	.	.	.	.
Hay	.	.	.	.	.	.
Rough grazing	.	540	.	.	.	540
<i>Sown crops</i>						
Arable silage	697	2,282	129	407	36	3,550
Arable silage (undersown)	291	2,416	37	48	50	2,842
Cereals (undersown)	99	.	2	261	6	368
Grass reseed	.	11,322	.	.	3	11,325
<i>Fodder crops</i>						
Fodder maize	.	5,709	.	.	617	6,326
Other fodder crops	18	2,256	.	.	18	2,292
All crops	1,106	72,516	176	715	730	75,243

Table 8 The proportional area (%) of each crop treated with pesticides and the number of spray applications (in parentheses) in Northern Ireland, 2009.

Crop	Fungicides		Herbicides		Insecticides		Growth regulators		Seed treatments %	All pesticides	
	%	sp apps	%	sp apps	%	sp apps	%	sp apps		%	sp apps
<i>Established grassland crops</i>											
Enclosed grazing	.	.	3.6%	(1.0)	0.1%	(1.0)	.	.	.	3.6%	(1.0)
Grass silage 1st cut	.	.	8.3%	(1.0)	.	.	.	.	.	8.3%	(1.0)
Grass silage 2nd cut	.	.	7.0%	(1.0)	.	.	.	.	.	7.0%	(1.0)
Grass silage 3rd cut	.	.	0.5%	(1.0)	.	.	.	.	.	0.5%	(1.0)
Grass silage 4th cut	.	.	.	.	.	.	.	.	.	.	.
Hay	.	.	.	.	.	.	.	.	.	.	.
Rough grazing	.	.	0.2%	(1.0)	.	.	.	.	.	0.2%	(1.0)
<i>Sown crops</i>											
Arable silage	67.6%	(1.9)	82.3%	(1.9)	38.8%	(1.1)	34.7%	(1.6)	83.1%	83.9%	(1.6)
Arable silage (undersown)	33.5%	(1.6)	64.3%	(1.4)	31.9%	(1.0)	3.3%	(1.0)	79.9%	84.1%	(1.3)
Cereals (undersown)	32.4%	(7.0)	.	.	72.7%	(2.3)	32.4%	(5.0)	72.7%	72.7%	(3.3)
Grass reseed	.	.	44.1%	(1.1)	.	.	.	.	1.3%	44.1%	(1.1)
<i>Fodder crops</i>											
Fodder maize	.	.	96.2%	(1.9)	.	.	.	.	100.0%	100.0%	(1.9)
Other fodder crops	10.8%	(1.0)	55.0%	(2.3)	.	.	.	.	80.9%	80.9%	(2.1)
All crops	0.2%	(2.3)	5.8%	(1.1)	0.2%	(1.2)	0.1%	(2.5)	0.7%	5.9%	(1.2)

Table 9 Estimated area (spray hectares) of grassland and fodder crops treated with pesticide formulations in Northern Ireland in 2009

Pesticide type & formulation	Enclosed grazing	Silage 1st cut	Silage 2nd cut	Silage 3rd cut	Rough grazing	Arable silage	Arable silage (undersown)	Cereals (undersown)	Grass reseed	Fodder maize	Fodder crops	All crops
Fungicides												
Azoxystrobin	64	.	.	.	.	.	64
Azoxystrobin/cyproconazole	51	170	.	.	.	.	.	221
Chlorothalonil	433	78	185	.	.	.	.	696
Epoxiconazole	295	318	185	.	.	.	.	798
Epoxiconazole/fenpropimorph/kresoxim-methyl	59	.	.	.	.	.	.	59
Epoxiconazole/fenpropimorph/metrafenone	41	85	.	.	.	.	.	126
Epoxiconazole/metconazole	27	.	.	.	.	.	.	27
Fenpropimorph	202	29	185	.	.	.	.	417
Fenpropimorph/flusilazole	31	26	.	.	.	.	.	57
Fenpropimorph/pyraclostrobin	41	55	.	.	.	.	.	96
Fluoxastrobin/prothioconazole	585	7	.	.	.	.	.	592
Fluquinconazole/prochloraz	62	.	.	.	.	.	.	62
Flusilazole	73	.	.	.	.	.	73
Picoxystrobin	184	.	371	.	.	.	.	554
Prothioconazole	349	64	371	.	.	.	.	783
Prothioconazole/trifloxystrobin	111	111
All fungicides	2,361	968	1,298	.	.	111	4,737
Herbicides												
Amidosulfuron	833	1,204	910	.	.	.	.	.	262	.	.	3,209
Aminopyralid/fluroxypyr	448	1,331	1,375	.	.	.	.	.	.	.	.	3,154
Benazolin/2,4-DB/MCPA	9	64	.	.	.	.	.	73
Bromoxynil	74	.	74
Bromoxynil/terbutylazine	2,190	.	2,190
Clopyralid/fluroxypyr/triclopyr	3,464	2,337	542	.	.	52	.	130	.	.	.	6,524
Clopyralid/triclopyr	227	82	.	.	.	.	.	.	.	.	.	309
2,4-D/dicamba/triclopyr	.	713	.	.	.	.	.	.	.	.	.	713
2,4-D/MCPA	58	.	.	.	.	.	.	.	.	.	.	58
2,4-DB	.	174	.	.	.	.	.	.	.	.	.	174
2,4-DB/linuron/MCPA	282	793	.	802	.	.	.	1,876
2,4-DB/MCPA	25	.	.	.	.	.	25
Desmedipham/ethofumesate/phenmedipham	230	230

Table 9 cont. Estimated area (spray hectares) of grassland and fodder crops treated with pesticide formulations in Northern Ireland in 2009

Pesticide type & formulation	Enclosed grazing	Silage 1st cut	Silage 2nd cut	Silage 3rd cut	Rough grazing	Arable silage	Arable silage (undersown)	Cereals (undersown)	Grass reseed	Fodder maize	Fodder crops	All crops
Dicamba/MCPA/mecoprop-P	697	272	543	.	.	.	46	.	228	.	.	1,786
Dicamba/mecoprop-P	737	697	1,892	.	.	.	.	.	.	.	.	3,326
Dichlobenil	.	33	.	.	.	.	.	.	.	.	.	33
Diflufenican/iodosulfron-methyl-sodium/metsulfuron-methyl	.	.	.	.	.	90	.	.	.	.	.	90
Diflufenican/isoproturon	.	.	.	.	.	70	41	.	.	.	.	112
Florasulam/fluroxypyr	.	.	.	.	.	62	.	.	.	.	.	62
Flufenacet/oxaflutole	.	.	.	.	.	.	.	.	.	2,385	.	2,385
Fluroxypyr	385	2,244	.	130	.	333	.	.	.	.	.	3,091
Fluroxypyr/triclopyr	6,875	14,210	7,282	.	.	.	.	.	331	.	.	28,699
Glyphosate	423	69	181	.	18	714	807	.	5,162	403	538	8,316
Isoproturon	.	.	.	.	.	153	41	.	.	.	.	194
Isoproturon/pendimethalin	.	.	.	.	.	83	.	.	.	.	.	83
MCPA	6,652	770	386	.	290	.	.	.	.	.	.	8,098
Mecoprop-P	523	1,055	556	.	.	137	.	.	.	.	.	2,270
Mesotrione/terbutylazine	.	.	.	.	.	.	.	.	.	1,132	.	1,132
Metamitron	.	.	.	.	.	.	.	.	.	.	230	230
Metsulfuron-methyl	.	.	.	.	.	148	64	.	.	.	.	211
Metsulfuron-methyl/thifensulfuron-methyl	.	.	.	.	.	138	.	.	.	.	.	138
Metsulfuron-methyl/tribenuron-methyl	.	141	.	.	.	296	.	.	.	.	.	437
Nicosulfuron	.	.	.	.	.	.	.	.	370	.	.	370
Pendimethalin	.	.	.	.	.	.	.	.	200	.	.	200
Propachlor	.	.	.	.	.	.	.	.	.	.	222	222
Thifensulfuron-methyl/tribenuron-methyl	.	.	.	.	.	67	.	.	.	.	.	67
Tribenuron-methyl	.	.	.	.	.	.	13	.	.	.	.	13
All herbicides	21,321	25,331	13,667	130	308	2,581	1,947	.	6,915	6,755	1,219	80,173
Insecticides												
Chlorpyrifos	.	.	.	.	.	234	64	.	.	.	.	298
Cypermethrin	606	.	.	.	.	48	64	.	.	.	.	717
Deltamethrin	.	.	.	.	.	61	81	.	.	.	.	143
Esfenvalerate	.	.	.	.	.	257	326	231	.	.	.	813
Lambda-cyhalothrin	.	.	.	.	.	312	83	556	.	.	.	950

Table 9 cont. Estimated area (spray hectares) of grassland and fodder crops treated with pesticide formulations in Northern Ireland in 2009

Pesticide type & formulation	Enclosed grazing	Silage 1st cut	Silage 2nd cut	Silage 3rd cut	Rough grazing	Arable silage	Arable silage (undersown)	Cereals (undersown)	Grass reseed	Fodder maize	Fodder crops	All crops
All insecticides	606	.	.	.	.	912	617	787	.	.	.	2,922
Growth regulators												
Chlormequat	449	65	371	.	.	.	884
2-chloroethylphosphonic acid	165	.	185	.	.	.	351
Trinexapac-ethyl	367	.	371	.	.	.	738
All growth regulators	981	65	927	.	.	.	1,973
Seed treatments												
Carboxin/thiram	5	81	.	.	.	.	86
Clothianidin/prothioconazole	39	.	.	.	.	39
Fludioxonil	556	533	231	.	.	.	1,320
Fludioxonil/flutriafol	16	39	.	.	.	.	54
Fludioxonil/metalaxyl-M	2,085	.	2,085
Guazatine/imazalil	55	37	.	.	.	.	92
Hymexazol	86	238	324	
Prochloraz/triticonazole	729	842	185	.	.	.	1,756
Thiram	27	24	.	.	1,370	828	2,250
Methiocarb	3,455	238	3,693
Bacillus subtilis	176	.	317	493
All seed treatments	1,388	1,595	416	176	6,996	1,622	12,193
All pesticides	21,927	25,331	13,667	130	308	8,223	5,192	3,427	7,091	13,751	2,952	101,998

Table 10 Estimated weight (kilograms) of pesticides applied to grassland and fodder crops in Northern Ireland in 2009

Pesticide type & formulation	Enclosed grazing	Silage 1st cut	Silage 2nd cut	Silage 3rd cut	Rough grazing	Arable silage	Arable silage (undersown)	Cereals (undersown)	Grass reseed	Fodder maize	Fodder crops	All crops
Fungicides												
Azoxystrobin	8	.	.	.	.	8
Azoxystrobin/cyproconazole	9	30	.	.	.	.	39
Chlorothalonil	214	52	31	.	.	.	297
Epoxiconazole	35	58	4	.	.	.	96
Epoxiconazole/fenpropimorph/kresoxim-methyl	24	.	.	.	.	.	24
Epoxiconazole/fenpropimorph/metrafenone	28	45	.	.	.	.	73
Epoxiconazole/metconazole	3	.	.	.	.	.	3
Fenpropimorph	42	11	9	.	.	.	61
Fenpropimorph/flusilazole	13	10	.	.	.	.	23
Fenpropimorph/pyraclostrobin	39	52	.	.	.	.	91
Fluoxastrobin/prothioconazole	174	2	.	.	.	.	176
Fluquinconazole/prochloraz	26	.	.	.	.	.	26
Flusilazole	15	.	.	.	.	15
Picoxystrobin	21	.	28	.	.	.	48
Prothioconazole	72	10	28	.	.	.	109
Prothioconazole/trifloxystrobin	18
All fungicides	697	291	99	.	.	18	1,106
Herbicides												
Amidosulfuron	37	54	41	.	.	.	.	.	12	.	.	144
Aminopyralid/fluroxypyr	358	1,065	1,100	.	.	.	.	.	.	.	.	2,523
Benazolin/2,4-DB/MCPA	19	138	.	.	.	.	158
Bromoxynil	46	.	46
Bromoxynil/terbutylazine	2,806	.	2,806
Clopyralid/fluroxypyr/triclopyr	2,572	2,103	487	.	.	.	52	.	117	.	.	5,332
Clopyralid/triclopyr	112	38	.	.	.	.	.	.	.	.	.	150
2,4-D/dicamba/triclopyr	.	339	.	.	.	.	.	.	.	.	.	339
2,4-D/MCPA	160	.	.	.	.	.	.	.	.	.	.	160
2,4-DB	.	313	.	.	.	.	.	.	.	.	.	313
2,4-DB/linuron/MCPA	263	760	.	786	.	.	1,808

Table 10 cont. Estimated weight (kilograms) of pesticides applied to grassland and fodder crops in Northern Ireland in 2009

Pesticide type & formulation	Enclosed grazing	Silage 1st cut	Silage 2nd cut	Silage 3rd cut	Rough grazing	Arable silage	Arable silage (undersown)	Cereals (undersown)	Grass reseed	Fodder maize	Fodder crops	All crops
2,4-DB/MCPA	.	.	.	.	.	.	50	.	.	.	.	50
Desmedipham/ethofumesate/phenmedipham	.	.	.	.	.	.	.	.	.	.	118	118
Dicamba/MCPA/mecoprop-P	833	419	1,614	.	.	.	76	.	351	.	.	3,293
Dicamba/mecoprop-P	630	596	1,649	.	.	.	.	.	.	.	.	2,875
Dichlobenil	.	278	.	.	.	.	.	.	.	.	.	278
Diflufenican/iodosulphon-methyl-sodium/metsulfuron-methyl	.	.	.	.	.	5	.	.	.	.	.	5
Diflufenican/isoproturon	.	.	.	.	.	82	48	.	.	.	.	130
Florasulam/fluroxypyr	.	.	.	.	.	10	.	.	.	.	.	10
Flufenacet/oxaflutole	.	.	.	.	.	.	.	.	.	1,161	.	1,161
Fluroxypyr	61	664	.	19	.	90	.	.	.	.	.	834
Fluroxypyr/triclopyr	3,731	7,504	4,158	.	.	.	.	.	154	.	.	15,547
Glyphosate	795	141	210	.	38	1,256	1,276	.	9,903	754	694	15,068
Isoproturon	.	.	.	.	.	227	13	.	.	.	.	241
Isoproturon/pendimethalin	.	.	.	.	.	124	.	.	.	.	.	124
MCPA	10,969	1,168	660	.	501	.	.	.	.	.	.	13,298
Mecoprop-P	706	1,501	905	.	.	195	.	.	.	.	.	3,306
Mesotrione/terbutylazine	.	.	.	.	.	.	.	.	.	675	.	675
Metamitron	.	.	.	.	.	.	.	.	.	.	806	806
Metsulfuron-methyl	.	.	.	.	.	1	2	.	.	.	.	3
Metsulfuron-methyl/thifensulfuron-methyl	.	.	.	.	.	5	.	.	.	.	.	5
Metsulfuron-methyl/tribenuron-methyl	.	0	.	.	.	3	.	.	.	.	.	4
Nicosulfuron	.	.	.	.	.	.	.	.	.	22	.	22
Pendimethalin	.	.	.	.	.	.	.	.	.	244	.	244
Propachlor	.	.	.	.	.	.	.	.	.	.	639	639
Thifensulfuron-methyl/tribenuron-methyl	.	.	.	.	.	1	.	.	.	.	.	1
Tribenuron-methyl	.	.	.	.	.	.	0	.	.	.	.	0
All herbicides	20,964	16,184	10,825	19	540	2,282	2,416	.	11,322	5,709	2,256	72,516
Insecticides												
Chlorpyrifos	.	.	.	.	.	125	33	.	.	.	.	159
Cypermethrin	8	.	.	.	.	1	2	.	.	.	.	10
Deltamethrin	.	.	.	.	.	0	0	.	.	.	.	1

Table 10 cont. Estimated weight (kilograms) of pesticides applied to grassland and fodder crops in Northern Ireland in 2009

Pesticide type & formulation	Enclosed grazing	Silage 1st cut	Silage 2nd cut	Silage 3rd cut	Rough grazing	Arable silage	Arable silage (undersown)	Cereals (undersown)	Grass reseed	Fodder maize	Fodder crops	All crops
Esfenvalerate	1	1	1	.	.	.	4
Lambda-cyhalothrin	1	0	1	.	.	.	2
All insecticides	8	.	.	.	.	129	37	2	.	.	.	176
Growth regulators												
Chlormequat	345	48	222	.	.	.	615
2-chloroethylphosphonic acid	26	.	15	.	.	.	41
Trinexapac-ethyl	36	.	23	.	.	.	59
All growth regulators	407	48	261	.	.	.	715
Seed treatments												
Carboxin/thiram	1	15	.	.	.	.	16
Clothianidin/prothioconazole	3	.	.	.	.	3
Fludioxonil	5	4	2	.	.	.	11
Fludioxonil/flutriafol	0	1	.	.	.	.	1
Fludioxonil/metalaxy-M	2	.	2
Guazatine/imazalil	7	5	.	.	.	.	12
Hymexazol	27	6	33
Prochloraz/triticonazole	22	21	5	.	.	.	48
Thiram	0	0	.	49	8	58	
Methiocarb	539	3	542	
Bacillus subtilis	3	.	1	4
All seed treatments	36	50	6	3	617	18	730
All pesticides	20,972	16,184	10,825	19	540	3,550	2,842	368	11,325	6,326	2,292	75,243

Table 11 The thirty active ingredients used most extensively on grassland and fodder crops in Northern Ireland in 2009, ranked by area treated (spray hectares) .

	Active ingredient	Treated area (spha)
1	Fluroxypyr	41,530
2	Triclopyr	36,244
3	MCPA	11,916
4	Glyphosate	8,316
5	Mecoprop-P	7,382
6	Clopyralid	6,833
7	Dicamba	5,824
8	Terbuthylazine	3,322
9	Amidosulfuron	3,209
10	Aminopyralid	3,154
11	Flufenacet	2,385
12	Isoxaflutole	2,385
13	Bromoxynil	2,263
14	2,4-DB	2,149
15	Linuron	1,876
16	Prothioconazole	1,486
17	Mesotrione	1,132
18	Epoxiconazole	1,010
19	Lambda-cyhalothrin	950
20	Chlormequat	884
21	Metsulfuron-methyl	876
22	Esfenvalerate	813
23	2,4-D	771
24	Fenpropimorph	754
25	Trinexapac-ethyl	738
26	Cypermethrin	717
27	Chlorothalonil	696
28	Fluxostrobin	592
29	Picoxystrobin	554
30	Tribenuron-methyl	517

Table 12 The thirty active ingredients used most extensively on grassland and fodder crops in Northern Ireland in 2009, ranked by weight applied (kilograms) .

	Active ingredient	Weight (kg)
1	MCPA	15,708
2	Glyphosate	15,068
3	Fluroxypyr	11,025
4	Triclopyr	10,293
5	Mecoprop-P	6,823
6	Terbuthylazine	2,241
7	2,4-DB	1,898
8	Aminopyralid	1,892
9	Clopyralid	1,248
10	Bromoxynil	1,169
11	Flufenacet	961
12	Metamitron	806
13	Propachlor	639
14	Dicamba	628
15	Chlormequat	615
16	Isoproturon	398
17	Pendimethalin	326
18	Chlorothalonil	297
19	Dichlobenil	278
20	2,4-D	273
21	Prothioconazole	207
22	Fenpropimorph	201
23	Isoxaflutole	200
24	Linuron	194
25	Chlorpyrifos	159
26	Amidosulfuron	144
27	Epoxiconazole	119
28	Mesotrione	118
29	Fluoxastrobin	88
30	Ethofumesate	66

Table 13 Enclosed grazing: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control		Thistles & nettles		Docks & Rushes thistles		Rushes & docks		Docks & chickweed		Docks & Nettles		Buttercup Headlands		Basic area (ha)		Quantity (kgs)	
	Ragwort	Docks	Docks	Chickweed	nettles	Rushes	thistles	Rushes	docks	chickweed	Nettles	Headlands	buttercup	rushes	All reasons	of treatment		
Herbicides																		
Amidosulfuron	.	.	799	34	.	.	.	.	.	.	.	.	.	.	833	833	38
Aminopyralid/fluroxypyr	80	.	368	.	.	.	.	.	.	.	.	.	.	.	448	448	358
Clopyralid/fluroxypyr/triclopyr	476	.	2,194	.	25	.	698	.	.	.	.	.	72	.	3,464	3,464	2,572
Clopyralid/triclopyr	75	.	.	.	5	.	.	.	134	.	.	13	.	.	228	228	112	
2,4-D/MCPA	.	58	.	.	.	.	.	.	.	.	.	.	.	.	58	58	160
Dicamba/MCPA/mecoprop-P	156	.	156	.	.	.	.	.	386	.	.	.	.	.	697	697	833
Dicamba/mecoprop-P	286	.	257	.	.	.	.	.	.	.	.	.	194	.	737	737	630
Fluroxypyr	75	.	310	.	.	.	.	.	.	.	.	.	.	.	385	385	62
Fluroxypyr/triclopyr	129	.	6,319	.	21	.	.	.	.	407	.	.	.	.	6,875	6,875	3,731
Glyphosate	.	.	.	.	.	423	.	.	.	.	.	.	.	.	423	423	795
MCPA	58	152	230	.	.	4,369	.	474	837	363	169	6,652	6,362	10,969
Mecoprop-P	156	.	101	.	.	215	.	.	.	.	52	.	.	.	523	523	706
All herbicides	1,489	210	10,733	34	51	5,006	698	474	971	748	407	65	72	194	169	21,321	17,544	20,964

	Leatherjackets	Basic area (ha)		Quantity (kgs)
		All reasons	of treatment	
Insecticides				
Cypermethrin	606	606	606	8
All insecticides	606	606	606	8

Table 14 Grass silage 1st cut: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Docks	Chickweed	Rushes	Docks & chickweed	Docks & thistles	Thistles	Nettles	Docks & buttercup	All reasons	Basic area (ha) of treatment	Quantity (kgs)
	Docks	Chickweed	Rushes	Docks & chickweed	Thistles	Thistles	Nettles	Docks & buttercup	All reasons	Basic area (ha) of treatment	Quantity (kgs)	
<i>Herbicides</i>												
Amidosulfuron	1,007	197	.	.	.	.	.	.	.	1,204	1,204	54
Aminopyralid/fluroxypyr	.	586	356	.	.	.	.	.	389	1,331	1,331	1,065
Clopyralid/fluroxypyr/triclopyr	488	1,151	.	.	.	698	.	.	.	2,337	2,337	2,103
Clopyralid/triclopyr	75	.	.	.	.	.	7	.	.	82	82	39
2,4-D/dicamba/triclopyr	.	713	.	.	.	.	.	.	.	713	713	339
2,4-DB	174	.	.	.	.	.	.	.	.	174	174	313
Dicamba/MCPA/mecoprop-P	.	78	.	.	194	.	.	.	.	272	272	419
Dicamba/mecoprop-P	.	309	.	.	.	.	.	.	389	697	697	596
Dichlobenil	.	.	.	.	.	.	.	33	.	33	33	278
Fluroxypyr	75	.	2,169	.	.	.	.	.	.	2,244	2,244	664
Fluroxypyr/triclopyr	.	12,585	.	.	1,625	.	.	.	.	14,210	14,210	7,504
Glyphosate	.	.	.	69	.	.	.	.	.	69	69	141
MCPA	51	566	.	130	.	.	23	.	.	770	770	1,168
Mecoprop-P	.	530	.	.	494	.	.	31	.	1055	1055	1,501
Metsulfuron-methyl/tribenuron-methyl	.	141	.	.	.	.	.	.	.	141	141	0.4
All herbicides	1,869	16,855	2,526	198	2,314	698	31	64	777	25,331	23,609	16,184

Table 15 Grass silage 2nd cut: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Docks	Rushes	Docks & thistles	Buttercup	Docks & chickweed	Thistles & chickweed	Docks & buttercup	All reasons	Basic area (ha) of treatment	Quantity (kgs)
<i>Herbicides</i>											
Amidosulfuron	.	910	.	.	.	.	.	.	910	910	41
Aminopyralid/fluroxypyr	904	471	.	.	.	.	.	.	1,376	1,376	1,100
Clopyralid/fluroxypyr/triclopyr	.	542	.	.	.	.	.	.	542	542	487
Dicamba/MCPA/mecoprop-P	.	.	.	.	.	.	317	226	543	543	1,614
Dicamba/mecoprop-P	.	1,892	.	.	.	.	.	.	1,892	1,575	1,649
Fluroxypyr/triclopyr	.	6,833	.	.	.	449	.	.	7,282	7,061	4,158
Glyphosate	162	.	20	.	.	.	.	.	181	181	210
MCPA	.	107	.	47	56	.	.	176	386	386	660
Mecoprop-P	.	486	.	.	.	70	.	.	556	556	905
All herbicides	1,066	11,241	20	47	56	519	317	401	13,667	12,325	10,825

Table 16 Grass silage 3rd cut: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	Docks & chickweed	All reasons	Basic area (ha) of treatment	Weight (kg)
<i>Herbicides</i>				
Fluroxypyr	130	130	130	19
All herbicides	130	130	130	19

Table 17 Rough grazing: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	Rushes	Whins	All reasons	Basic area (ha) of treatment	Quantity (kgs)
<i>Herbicides</i>					
Glyphosate	4	14	18	18	38
MCPA	290	.	290	290	502
All herbicides	295	14	308	308	540

Table 18 Arable silage: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General					General	General			Basic
	weed control	Aphids	Growth regulation	Ground preparation	Chickweed	insect control	disease control	All Headlands	of reasons treatment	area (ha) Quantity (kgs)
Fungicides										
Azoxystrobin/cyproconazole	.	.	.	.	.	.	51	.	51	51 9
Chlorothalonil	.	.	.	.	.	.	433	.	433	418 214
Epoxiconazole	.	.	.	.	.	.	295	.	295	295 35
Epoxiconazole/fenpropimorph/kresoxim-methyl	.	.	.	.	.	.	59	.	59	59 24
Epoxiconazole/fenpropimorph/metrafenone	.	.	.	.	.	.	41	.	41	41 28
Epoxiconazole/metconazole	.	.	.	.	.	.	28	.	28	28 3
Fenpropimorph	.	.	.	.	.	.	202	.	202	202 42
Fenpropimorph/flusilazole	.	.	.	.	.	.	31	.	31	31 13
Fenpropimorph/pyraclostrobin	.	.	.	.	.	.	41	.	41	41 39
Fluoxastrobin/prothioconazole	.	.	.	.	.	.	585	.	585	401 174
Fluquinconazole/prochloraz	.	.	.	.	.	.	62	.	62	62 26
Picoxystrobin	.	.	.	.	.	.	184	.	184	92 21
Prothioconazole	.	.	.	.	.	.	349	.	349	257 72
All fungicides	.	.	.	.	.	.	2,361	.	2,361	1,106 697
Herbicides										
Benazolin/2,4-DB/MCPA	9	.	.	.	.	.	.	.	9	9 20
2,4-DB/linuron/MCPA	254	.	.	.	.	28	.	.	282	282 263
Diflufenican/iodosulfuron-methyl-sodium/metsulfuron-methyl	90	.	.	.	.	.	.	.	90	90 5
Diflufenican/isoproturon	70	.	.	.	.	.	.	.	70	70 82
Florasulam/fluroxypyr	62	.	.	.	.	.	.	.	62	62 10
Fluroxypyr	333	.	.	.	.	.	.	.	333	333 90
Glyphosate	.	.	.	705	.	.	9	714	714	1,256
Isoproturon	153	.	.	.	.	.	.	.	153	153 228
Isoproturon/pendimethalin	83	.	.	.	.	.	.	.	83	83 124
Mecoprop-P	137	.	.	.	.	.	.	.	137	137 195
Metsulfuron-methyl	148	.	.	.	.	.	.	.	148	148 1
Metsulfuron-methyl/thifensulfuron-methyl	138	.	.	.	.	.	.	.	138	138 5

Table 18 cont. Arable silage: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Aphids	Growth regulation	Ground preparation	Chickweed	General insect control	General disease control	Headlands	All reasons	of treatment	Basic area (ha)	Quantity (kgs)
Metsulfuron-methyl/tribenuron-methyl	296	.	.	.	.	.	.	.	296	296	3	
Thifensulfuron-methyl/tribenuron-methyl	67	.	.	.	.	.	.	.	67	67	1	
All herbicides	1,840	.	.	705	28	.	.	9	2,581	1,348	2,282	
<i>Insecticides</i>												
Chlorpyrifos	.	50	.	.	.	184	.	.	234	234	126	
Cypermethrin	.	48	.	.	.	.	.	.	48	48	1	
Deltamethrin	.	61	.	.	.	.	.	.	61	61	0	
Esfenvalerate	.	257	.	.	.	.	.	.	257	257	1	
Lambda-cyhalothrin	.	.	.	.	.	312	.	.	312	64	1	
All insecticides	.	416	.	.	.	495	.	.	912	636	129	
<i>Growth regulators</i>												
Chlormequat	.	.	449	.	.	.	.	.	449	357	345	
2-chloroethylphosphonic acid	.	.	165	.	.	.	.	.	165	165	26	
Trinexapac-ethyl	.	.	367	.	.	.	.	.	367	276	36	
All growth regulators	.	.	981	.	.	.	.	.	981	568	407	

Table 19 Arable silage (undersown): pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Aphids	Growth regulation	Ground preparation	Chickweed	Disease prevention	General disease control	All reasons	Basic area (ha) of treatment	Quantity (kgs)
Fungicides										
Azoxystrobin	.	.	.	.	.	.	64	64	64	8
Azoxystrobin/cyproconazole	.	.	.	.	.	60	110	170	170	30
Chlorothalonil	.	.	.	.	.	.	78	78	39	52
Epoxiconazole	.	.	.	.	.	.	318	318	318	58
Epoxiconazole/fenpropimorph/metrafenone	.	.	.	.	.	.	85	85	85	45
Fenpropimorph	.	.	.	.	.	.	29	29	29	11
Fenpropimorph/flusilazole	.	.	.	.	.	.	26	26	26	10
Fenpropimorph/pyraclostrobin	.	.	.	.	.	.	55	55	55	52
Fluoxastrobin/prothioconazole	.	.	.	.	.	.	7	7	7	2
Flusilazole	.	.	.	.	.	.	73	73	73	15
Prothioconazole	.	.	.	.	.	.	64	64	64	10
All fungicides	.	.	.	.	.	60	908	968	649	291
Herbicides										
Benazolin/2,4-DB/MCPA	64	.	.	.	.	.	.	64	64	138
Clopyralid/fluroxypyr/triclopyr	52	.	.	.	.	.	.	52	52	53
2,4-DB/linuron/MCPA	793	.	.	.	.	.	.	793	793	760
2,4-DB/MCPA	12	.	.	.	13	.	.	25	25	50
Dicamba/MCPA/mecoprop-P	46	.	.	.	.	.	.	46	46	76
Diflufenican/isoproturon	42	.	.	.	.	.	.	42	42	48
Glyphosate	72	.	.	735	.	.	.	807	807	1,276
Isoproturon	42	.	.	.	.	.	.	42	42	14
Metsulfuron-methyl	64	.	.	.	.	.	.	64	64	2
Tribenuron-methyl	13	.	.	.	.	.	.	13	13	0
All herbicides	1,199	.	.	735	13	.	.	1,947	1,246	2,416
Insecticides										
Chlorpyrifos	.	64	.	.	.	.	.	64	64	33
Cypermethrin	.	64	.	.	.	.	.	64	64	2
Deltamethrin	.	81	.	.	.	.	.	81	81	1

Table 19 cont. Arable silage (undersown): pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Aphids	Growth regulation	Ground preparation	Chickweed	Disease prevention	General disease control	All reasons	Basic area (ha) of treatment	Quantity (kgs)
Esfenvalerate	.	326	.	.	.	.	.	.	326	326
Lambda-cyhalothrin	.	83	.	.	.	.	.	.	83	83
All insecticides	.	617	.	.	.	.	.	617	617	37
<i>Growth Regulators</i>										
Chlormequat	.	.	65	.	.	.	.	.	65	65
All growth regulators	.	.	65	.	.	.	.	65	65	48

Table 20 Cereals (undersown): pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	Aphids	Growth regulation	General insect control	General disease control	All reasons	Basic area (ha) of treatment	Quantity (kgs)
Fungicides							
Chlorothalonil	.	.	.	185	185	185	31
Epoxiconazole	.	.	.	185	185	185	4
Fenpropimorph	.	.	.	185	185	185	9
Picoxystrobin	.	.	.	371	371	185	28
Prothioconazole	.	.	.	371	371	185	28
All fungicides	.	.	.	1,298	1,298	185	99
Insecticides							
Esfenvalerate	231	.	.	.	231	231	1
Lambda-cyhalothrin	.	.	556	.	556	185	1
All insecticides	231	.	556	.	787	416	2
Growth regulators							
Chlormequat	.	371	.	.	371	185	222
2-chloroethylphosphonic acid	.	185	.	.	185	185	15
Trinexapac-ethyl	.	371	.	.	371	185	23
All growth regulators	.	927	.	.	927	185	261

Table 21 Grass reseed: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Docks	Ground preparation	Chickweed	All reasons	Basic area (ha) of treatment	Quantity (kgs)
Herbicides							
Amidosulfuron	.	262	.	.	262	262	12
Clopyralid/fluroxypyr/triclopyr	.	.	.	130	130	130	117
2,4-DB/linuron/MCPA	802	.	.	.	802	802	786
Dicamba/MCPA/mecoprop-P	228	.	.	.	228	228	351
Fluroxypyr/triclopyr	.	245	.	86	331	331	154
Glyphosate	.	.	5,162	.	5,162	5,162	9,903
All herbicides	1,030	508	5,162	215	6,915	5,833	11,322

Table 22 Fodder maize: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Ground preparation	All reasons	Basic area (ha) of treatment	Quantity (kgs)
<i>Herbicides</i>					
Bromoxynil	74	.	74	74	46
Bromoxynil/terbutylazine	2,190	.	2,190	2,190	2,806
Flufenacet/isoxaflutole	2,385	.	2,385	2,385	1,161
Glyphosate	112	292	404	404	754
Mesotrione/terbutylazine	1,132	.	1,132	1,132	675
Nicosulfuron	370	.	370	370	22
Pendimethalin	200	.	200	200	244
All herbicides	6,463	292	6,755	3,324	5,709

Table 23 Other fodder crops: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Ground preparation	General disease control	All reasons	Basic area (ha) of treatment	Quantity (kgs)
<i>Fungicides</i>						
Prothioconazole/trifloxystrobin	.	.	111	111	111	18
All fungicides	.	.	111	111	111	18
<i>Herbicides</i>						
Desmedipham/ethofumesate/phenmedipham	230	.	.	230	128	118
Glyphosate	222	316	.	538	538	694
Metamitron	230	.	.	230	128	806
Propachlor	.	222	.	222	222	639
All herbicides	681	538	.	1,219	563	2,256

Table 24 Comparison of the area (hectares) of grassland and fodder crops grown in Northern Ireland, 1989-2009.

Crop	Survey year					
	1989	1993	1997	2003	2005	2009
	Area grown (ha)	Area grown (ha)	Area grown (ha)	Area grown (ha)	Area grown (ha)	Area grown (ha)
<i>Established grassland crops</i>						
Enclosed grazing	481,059	476,209	512,819	537,735	517,045	484,223
Grass silage	243,149	252,502	422,650	430,542	409,704	487,520
Hay	66,001	33,017	32,303	11,997	16,744	9,861
Rough grazing	212,930	173,239	165,005	162,330	148,586	141,926
All established grassland crops	1,003,139	934,967	1,132,777	1,142,603	1,092,079	1,123,530
<i>Sown crops</i>						
Arable silage	3,762	.	766	8,720	2,667	1,638
Arable silage (undersown)	.	2,073	3,308	6,512	2,683	1,937
Cereals (undersown)	6,213	5,907	4,284	4,086	1,497	573
Grass reseed	35,434	5,380	11,472	27,282	18,350	13,229
All sown crops	45,409	13,360	19,830	46,600	25,197	17,376
<i>Fodder crops</i>						
Fodder beet	.	.	70	.	85	.
Fodder kale	.	72	45	335	17	.
Fodder kale (undersown)	.	.	58	.	.	.
Fodder maize	.	.	10	1,463	2,423	3,455
Fodder rape	.	.	99	157	192	.
Fodder turnip	371	.	250	464	375	.
All fodder (excluding maize)	371	72	522	956	669	1,024
All fodder crops	371	72	532	2,419	3,092	4,480
All crops	1,048,919	948,400	1,153,138	1,191,622	1,120,368	1,145,386

Table 25 Comparison of pesticide usage on grassland & fodder crops in Northern Ireland 1989-2009, area treated (spray hectares) and weight applied (tonnes).

Crop	Survey Year											
	1989		1993		1997		2003		2005		2009	
	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)
Established grassland crops												
Enclosed grazing	25,252	43.11	35,051	55.38	48,536	80.41	65,821	34.96	47,403	31.83	21,927	20.97
Grass silage	26,921	42.17	41,091	64.57	50,209	74.49	57,309	40.38	51,141	32.74	39,128	27.03
Hay	2,673	2.82	490	0.57	843	1.34	238	0.23	260	0.34	.	.
Rough grazing	2,736	3.48	1,866	3.75	1,710	2.75	2,591	1.99	4,637	4.70	308	0.54
All established grassland crops	57,582	91.58	78,498	124.27	101,298	158.99	125,959	77.56	103,441	69.61	61,363	48.54
Sown crops												
Arable silage	8,138	3.66	.	.	2,299	1.59	24,175	9.68	6,814	2.54	8,223	3.55
Arable silage (undersown)	.	.	3,632	0.38	2,830	0.15	9,186	2.40	4,301	1.86	5,192	2.84
Cereals (undersown)	11,190	11.62	5,212	6.70	4,804	4.73	4,421	1.60	2,323	1.29	3,427	0.37
Grass reseed	32,344	15.33	4,090	3.51	7,377	2.91	6,912	8.01	5,685	4.19	7,091	11.33
All sown crops	51,672	30.61	12,934	10.59	17,310	9.39	44,694	21.69	19,123	9.89	23,933	18.09
Fodder crops												
Fodder beet	.	.	.	.	227	0.09	.	.	170	0.61	.	.
Fodder kale	.	.	98	0.02	105	0.21	670	0.78	.	.	.	.
Fodder kale (undersown)	.	.	.	.	203	0.25	.	.	.	.	.	.
Fodder maize	.	.	.	.	20	0.03	6,669	2.58	5,993	5.73	13,751	6.33
Fodder rape	.	.	.	.	164	0.25	157	0.00	59	0.00	.	.
Fodder turnip	621	0.33	.	.	651	0.35	.	.	.	.	.	.
All fodder (excluding maize)	621	0.33	98	0.02	1,370	1.18	7,496	3.36	6,222	6.35	16,703	8.62
All fodder crops	621	0.33	98	0.02	1,370	1.18	7,496	3.36	6,222	6.35	16,703	8.62
All crops	109,875	122.47	91,529	134.87	119,978	169.55	178,149	102.61	128,786	86	101,999	75

Table 26 Comparison of pesticide usage on grassland and fodder crops in Northern Ireland 1989-2009, area treated (spray hectares), weight applied (kilograms) and the area grown (hectares).

Pesticide type	Survey Year											
	1989		1993		1997		2003		2005		2009	
	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)
Fungicides	251	235	180	59	421	161	7,933	2,417	1,776	502	4,737	1,106
Herbicides	73,637	120,551	85,151	134,680	109,253	168,545	149,630	97,976	118,499	84,221	80,173	72,516
Insecticides												
<i>Carbamates</i>	.	.	.	.	.	.	.	.	.	.	.	.
<i>Organochlorines</i>	.	.	.	.	8	4	.	.	.	.	.	.
<i>Organophosphates</i>	91	51	.	.	.	.	415	379	1,268	647	298	159
<i>Pyrethroids</i>	258	4	.	.	.	.	558	14	960	21	2,623	16
<i>Unknown insecticides</i>	.	.	.	.	.	.	.	.	.	269	.	.
All insecticides	349	55	.	.	8	4	974	393	2,498	667	2,922	176
Growth regulators	.	.	.	.	176	42	1,870	1,369	486	159	1,973	715
Seed treatments	35,635	1,624	6,199	129	10,121	793	17,741	458	5,527	304	12,193	730
All pesticides	109,874	122,465	91,529	134,869	119,978	169,545	178,148	102,613	128,786	85,854	101,998	75,243
<i>Area grown (ha)</i>	1,048,919		948,400		1,153,138		1,191,622		1,120,368		1,145,386	

Table 27 The proportional differences (%) of pesticide usage on grassland and fodder crops in Northern Ireland during 2009 compared to 1989, 1993, 1997, 2003 & 2005.

Pesticide type	1989 cf 2009		1993 cf 2009		1997 cf 2009		2003 cf 2009		2005 cf 2009	
	Area	Weight	Area	Weight	Area	Weight	Area	Weight	Area	Weight
Fungicides	1787	371	2532	1774	1025	587	-40.285196	-54	167	120
Herbicides	9	-40	-6	-46	-27	-57	-46	-26	-32	-14
Insecticides	737	220	.	.	36420	4301	200	-55	17	-74
Growth regulators	.	.	.	.	1021	1603	5	-48	306	350
Seed treatments	-66	-55	97	466	20	-8	-31	59	121	140
All pesticides	-7	-39	11	-44	-15	-56	-43	-27	-21	-12
Area grown (ha)	9%		21%		-1%		-4%		2%	

ACKNOWLEDGEMENTS

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105	Arable Crops 1990	1-855 27 130 3
106	Soft Fruit Crops 1990	1-855 27 149 4
109	Vegetable Crops 1991	1-855 27 137 0
110	Protected Crops 1991 (edible & ornamental)	1-855 27 283 0
111	Mushroom Crops 1991	1-855 27 150 8
117	Arable Crops 1992	1-855 27 193 1
118	Top Fruit Crops 1992	1-855 27 194 X
124	Grassland & Fodder crops 1993	1-855 27 221 0
131	Forestry 1993	1-855 27 282 2
132	Arable Crops 1994	1-855 27 314 4
139	Vegetable Crops 1995	1-855 27 346 2
140	Mushroom Crops 1995	1-855 27 347 0
146	Arable Crops 1996	1-855 27 469 8
147	Top fruit 1996	1-855 27 470 1
156	Grassland and Fodder Crops 1997	1-855 27 506 6
157	Sheep Treatments 1997	1-855 27 425 6
167	Soft Fruit 1998	1-855 27 540 6
168	Arable Crops 1998	1-855 27 536 8
169	Vegetable Crops 1999	1-855 27 561 9
170	Mushroom Crops 1999	1-855 27 549 X
177	Arable Crops 2000	1-855 27 670 4

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178	Top Fruit Crops 2002	1-855 27 618 6
194	Arable Crops 2002	1-855 27 674 7
198	Grassland & Fodder Crops 2003	1-855 27 797 2
199	Hardy Nursery Stock Crops 2003	1-855 27 789 1
201	Protected Ornamental Crops 2003	1-855 27 739 5
206	Arable Crops 2004	1-855 27 833 2
207	Vegetable crops 2004	1-855 27 869 3
208	Grassland and Fodder Crops	1-855 27 998 8
209	Sheep Treatments 2005	1-855 27 999 5
216	Arable Crops 2006	1-848 07 035 6
217	Top Fruit Crops 2006	1-848 07 019 6
218	Soft Fruit Crops 2006	1-848 07 036 3
222	Vegetable Crops 2007	1-848 07 062 2
223	Mushroom Crops 2007	1-848 07 061 5
230	Arable Crops 2008	1-848 07 135 3
231	Top Fruit Crops 2008	1-848 07 134 6
239	Hardy Nursery Stock Crops 2009	1-848 07 187 2

ISBN 978-1-848 07 186 5

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Table 22 Fodder maize: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Ground preparation	All reasons	Basic area (ha) of treatment	Quantity (kgs)
<i>Herbicides</i>					
Bromoxynil	74	.	74	74	46
Bromoxynil/terbutylazine	2,190	.	2,190	2,190	2,806
Flufenacet/isoxaflutole	2,385	.	2,385	2,385	1,161
Glyphosate	112	292	404	404	754
Mesotrione/terbutylazine	1,132	.	1,132	1,132	675
Nicosulfuron	370	.	370	370	22
Pendimethalin	200	.	200	200	244
All herbicides	6,463	292	6,755	3,324	5,709

Table 23 Other fodder crops: pesticide-treated area (spray-hectares), weight of pesticide applied (kilograms) and reason for use.

Pesticide type & formulation	General weed control	Ground preparation	General disease control	All reasons	Basic area (ha) of treatment	Quantity (kgs)
<i>Fungicides</i>						
Prothioconazole/trifloxystrobin	.	.	111	111	111	18
All fungicides	.	.	111	111	111	18
<i>Herbicides</i>						
Desmedipham/ethofumesate/phenmedipham	230	.	.	230	128	118
Glyphosate	222	316	.	538	538	694
Metamitron	230	.	.	230	128	806
Propachlor	.	222	.	222	222	639
All herbicides	681	538	.	1,219	563	2,256

Table 24 Comparison of the area (hectares) of grassland and fodder crops grown in Northern Ireland, 1989-2009.

Crop	Survey year					
	1989	1993	1997	2003	2005	2009
	Area grown (ha)	Area grown (ha)	Area grown (ha)	Area grown (ha)	Area grown (ha)	Area grown (ha)
<i>Established grassland crops</i>						
Enclosed grazing	481,059	476,209	512,819	537,735	517,045	484,223
Grass silage	243,149	252,502	422,650	430,542	409,704	487,520
Hay	66,001	33,017	32,303	11,997	16,744	9,861
Rough grazing	212,930	173,239	165,005	162,330	148,586	141,926
All established grassland crops	1,003,139	934,967	1,132,777	1,142,603	1,092,079	1,123,530
<i>Sown crops</i>						
Arable silage	3,762	.	766	8,720	2,667	1,638
Arable silage (undersown)	.	2,073	3,308	6,512	2,683	1,937
Cereals (undersown)	6,213	5,907	4,284	4,086	1,497	573
Grass reseed	35,434	5,380	11,472	27,282	18,350	13,229
All sown crops	45,409	13,360	19,830	46,600	25,197	17,376
<i>Fodder crops</i>						
Fodder beet	.	.	70	.	85	.
Fodder kale	.	72	45	335	17	.
Fodder kale (undersown)	.	.	58	.	.	.
Fodder maize	.	.	10	1,463	2,423	3,455
Fodder rape	.	.	99	157	192	.
Fodder turnip	371	.	250	464	375	.
All fodder (excluding maize)	371	72	522	956	669	1,024
All fodder crops	371	72	532	2,419	3,092	4,480
All crops	1,048,919	948,400	1,153,138	1,191,622	1,120,368	1,145,386

Table 25 Comparison of pesticide usage on grassland & fodder crops in Northern Ireland 1989-2009, area treated (spray hectares) and weight applied (tonnes).

Crop	Survey Year											
	1989		1993		1997		2003		2005		2009	
	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)	Area (sp ha)	Weight (t)
Established grassland crops												
Enclosed grazing	25,252	43.11	35,051	55.38	48,536	80.41	65,821	34.96	47,403	31.83	21,927	20.97
Grass silage	26,921	42.17	41,091	64.57	50,209	74.49	57,309	40.38	51,141	32.74	39,128	27.03
Hay	2,673	2.82	490	0.57	843	1.34	238	0.23	260	0.34	.	.
Rough grazing	2,736	3.48	1,866	3.75	1,710	2.75	2,591	1.99	4,637	4.70	308	0.54
All established grassland crops	57,582	91.58	78,498	124.27	101,298	158.99	125,959	77.56	103,441	69.61	61,363	48.54
Sown crops												
Arable silage	8,138	3.66	.	.	2,299	1.59	24,175	9.68	6,814	2.54	8,223	3.55
Arable silage (undersown)	.	.	3,632	0.38	2,830	0.15	9,186	2.40	4,301	1.86	5,192	2.84
Cereals (undersown)	11,190	11.62	5,212	6.70	4,804	4.73	4,421	1.60	2,323	1.29	3,427	0.37
Grass reseed	32,344	15.33	4,090	3.51	7,377	2.91	6,912	8.01	5,685	4.19	7,091	11.33
All sown crops	51,672	30.61	12,934	10.59	17,310	9.39	44,694	21.69	19,123	9.89	23,933	18.09
Fodder crops												
Fodder beet	.	.	.	.	227	0.09	.	.	170	0.61	.	.
Fodder kale	.	.	98	0.02	105	0.21	670	0.78	.	.	.	.
Fodder kale (undersown)	.	.	.	.	203	0.25	.	.	.	.	.	.
Fodder maize	.	.	.	.	20	0.03	6,669	2.58	5,993	5.73	13,751	6.33
Fodder rape	.	.	.	.	164	0.25	157	0.00	59	0.00	.	.
Fodder turnip	621	0.33	.	.	651	0.35	.	.	.	.	.	.
All fodder (excluding maize)	621	0.33	98	0.02	1350	1.15	827	0.78	229	0.61	2,952	2
All fodder crops	621	0.33	98	0.02	1,370	1.18	7,496	3.36	6,222	6.35	16,703	8.62
All crops	109,875	122.47	91,529	134.87	119,978	169.55	178,149	102.61	128,786	86	101,999	75

Table 26 Comparison of pesticide usage on grassland and fodder crops in Northern Ireland 1989-2009, area treated (spray hectares), weight applied (kilograms) and the area grown (hectares).

Pesticide type	Survey Year											
	1989		1993		1997		2003		2005		2009	
	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)	Area (sp ha)	Weight (kg)
Fungicides	251	235	180	59	421	161	7,933	2,417	1,776	502	4,737	1,106
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Pesticide type	Area	Weight								
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All pesticides	-7	-39	11	-44	-15	-56	-43	-27	-21	-12
Area grown (ha)	9%		21%		-1%		-4%		2%	

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