

# PESTICIDE USAGE SURVEY

Report Number 2

## ARABLE CROPS

## 2004



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PESTICIDE CONTROL SERVICE  
BACKWESTON CAMPUS, YOUNG 'S CROSS, CELBRIDGE, CO KILDARE, IRELAND.

## Foreword

I am very pleased to present the results of the second pesticide usage survey carried out in 2004 by the Department of Agriculture and Food's (DAF) Pesticide Control Service (PCS) with assistance from the Agricultural Environmental Structures (AES) Division. The survey involved arable crops and was aligned with a corresponding survey conducted by the Department of Agriculture & Rural Development for Northern Ireland and was initiated following a meeting of the North-South Pesticide Steering Group established in the context of the North/South Ministerial Council, Agriculture Sector. I look forward to the completion in due course of surveys for horticulture, forestry and other crops.

The data and information generated provides critical baseline information for use in assessing the impact of pesticide use on the environment and will over time provide valuable information on trends in such use. Such surveys will assist us in achieving our primary mission, which is to lead the sustainable development of a competitive consumer-focussed agri-food sector and to contribute to a vibrant rural economy and society.

I am very grateful to and wish to acknowledge the critical role played by officials from the Department of Agriculture & Rural Development for Northern Ireland in providing advice and in training staff.

**Brendan Smith TD**

Minister of State at the Department of Agriculture and Food

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**DEFINITION OF TERMS USED IN THE REPORT AND NOTES****Spray hectare**

One plant protection treatment applied to one hectare of a crop is referred to as a spray-hectare. For example, two separate applications of the same product to the same hectare of crop constitutes two spray hectares. Separate or simultaneous application of two different plant protection products to the same hectare of crop also constitutes two spray hectares. Thus the number of spray-hectares may be greater than the number of hectares of the crop actually grown. The term is used to cover all application methods – seed treatments, soil incorporation etc., as well as application by spraying equipment.

**Basic hectare**

Refers to the actual area of crop grown. One hectare of a crop that receives several pesticide treatments is one basic hectare.

**Field margin treatment**

Treatment of the area between the crop and the field boundary, generally a small narrow strip of area.

**Set-aside**

Land that is taken out of agricultural production and is managed in accordance with the set-aside requirements of the Area Aid 2004 Scheme – e.g. establishment and management of a green cover.

**Non-food crops**

Crops grown on set-aside land for the manufacture of products not primarily intended for human or animal consumption.

**Reasons for use**

These refer to the farmer's perceived reasons for use of a plant protection product and may or may not be the use or uses for which the product is recommended.

**Rounding**

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

### SUMMARY

This second national survey of pesticide use concerned use of plant protection products on arable crops harvested during the calendar year 2004. The survey was based on a sample of 236 holdings, stratified by region and size and chosen to be representative of the main arable crops (barley, wheat, oats, oilseed rape, peas, beans, potatoes, sugar beet, linseed, lupins, set-aside and non-food crops). The data collected were raised to give estimates of national pesticide use.

Total usage on a national basis during 2004 was estimated to be 1,520 tonnes of active substances applied as overall treatments to arable crops, on a total of 3,898,000 spray-hectares. A further 2 tonnes of active substances were applied to field margins of arable crops.

Herbicides and fungicides were the most widely used plant protection product types; herbicides accounting for 44% of the weight applied and 28% of the area treated, fungicides for 41% of the weight applied and 44% of the area treated. Glyphosate, mecoprop-p and isoproturon were the most extensively used herbicides. The desiccant sulphuric acid was used in large quantities but not extensively. Chlorothalonil and mancozeb were the most extensively used fungicides. In the case of insecticides, esfenvalerate was the active substance used on the greatest area while dimethoate was used in the largest quantity. Chlormequat accounted for 93% of the weight of growth regulators applied.

Cereals (barley, wheat and oats) accounted for 69% of the weight of active substances applied, potatoes 24%, sugar beet 6%, beans, peas, linseed, lupins, set-aside and non-food crops 1%. Cereals accounted for 79% of the total area of arable crops in the country, with spring barley accounting for the largest individual crop area at 42% of the total area. Set-aside accounted for 8% of the total area, while 77% of the set-aside area received no overall treatment.



## INTRODUCTION

Annual sales data provide overall information on the quantities of plant protection products placed on the market. On their own, such data are not sufficient to permit assessment of the risks and benefits arising from the use of such products. Information on the crops treated and on the amounts and types of products applied to each crop is required to facilitate assessment of the degree of risk that may arise for consumers and spray operators. Data on the amounts and types of product used in each region are needed to facilitate assessment of the risks arising for the environment and wildlife. Information on the crops treated and on the target pests controlled is required to facilitate assessment of the benefits accruing from use. Reliable information on use can only be obtained by means of regular, systematic surveys.

A number of international initiatives have been undertaken in recent years to develop standard indicators and to generate data to permit their use in monitoring risks associated with use of pesticides. At European level the 6<sup>th</sup> Environment Action Programme <sup>1</sup> aims to achieve a more sustainable use of pesticides, consistent with crop protection needs. The Commission communication *Towards a Thematic Strategy on the Sustainable Use of Pesticides* (COM (2002) 349 final) <sup>2</sup> identified the need for detailed, harmonised and up-to-date statistics on sales and use of pesticides at EU level and proposed that mandatory requirements to collect such statistics be introduced. The Commission has submitted its Proposal for such a Regulation (COM (2006) 778 final) <sup>3</sup> to Council and Parliament.

Regular pesticide usage surveys have been carried out in some Member States for a number of years – notably in the UK. Separate surveys are conducted in England/Wales, Scotland and Northern Ireland. The first national survey of pesticide use in the Republic of Ireland concerned use of plant protection products on grassland and fodder crops harvested during the calendar year 2003. That survey and this current survey are similar to those carried out in Northern Ireland and the rest of the UK. Staff of the Pesticide Survey Unit of the Department of Agriculture and Rural Development in Northern Ireland provided valuable assistance in setting up the first survey, following contacts developed at a Food Safety Promotion Board ‘Plant Protection and Food Safety’ symposium in 2002 <sup>4</sup>. The North/South Ministerial Council, meeting in its Agriculture Sector Format on the 15<sup>th</sup> April 2002, noted pesticide usage surveys as an area for ongoing co-operation.

The recorded use of active substances on crops in this survey does not infer that such active substances have or had a legal use in this country. The focus of this survey was to ascertain what active substances were actually used on arable crops.

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<sup>1</sup> <http://europa.eu.int/comm/environment/newprg/>

<sup>2</sup> [http://europa.eu.int/comm/environment/ppps/1st\\_step\\_com.htm](http://europa.eu.int/comm/environment/ppps/1st_step_com.htm)

<sup>3</sup> <http://forum.europa.eu.int/Public/irc/dsis/pip/library>

<sup>4</sup> [www.pcs.agriculture.gov.ie/news.htm#FSPBsyn](http://www.pcs.agriculture.gov.ie/news.htm#FSPBsyn)

## METHODS

Taking account of available resources, the number of holdings to be surveyed was set at 70 for spring barley, 12 for winter barley, 15 for spring wheat, 30 for winter wheat, 15 for spring oats, 8 for winter oats, 40 for potatoes, 17 for set-aside, 8 for beans, 6 each for peas and oilseed rape and 3 each for lupins, linseed and non-food crops. Holdings were grouped into broad geographical regions for the main arable crops. The minor arable crops - oilseed rape, peas, linseed, lupins and non-food crops were not grouped into regions, because of the small area grown. Sugar beet was not grouped into regions, due to a difficulty with the database of sugar beet crops grown. The regional categorization for the main arable crops is detailed in Table 1.

**Table 1**  
Counties included in each geographical region

<i>Barley, Wheat, Oats, Potatoes, Beans &amp; Set-aside</i>	
Region	Counties
1. South	Kerry, Limerick, Cork, Tipperary, Waterford, Wexford & Kilkenny
2. North	Rest of the country

Within each crop type and region, holdings were further stratified by size with roughly equal areas of crops in each size group. Holdings were selected at random within each region-size group. The number of holdings to be selected in each group was chosen to ensure that an equal percentage of the total crop area from each size group was surveyed. This approach ensured inclusion of sufficient large holdings in the survey and avoided inclusion of a very large number of small holdings.

The size classes used for the various crops are shown in Table 2.

**Table 2**  
Stratification by size class for each crop

	Barley, Winter oats & Potatoes	Winter wheat	Spring wheat	Spring oats & Beans	Oilseed rape
Class Size	(Hectares)	(Hectares)	(Hectares)	(Hectares)	(Hectares)
1	<15	<25	<12	<8	<15
2	≥15 & <35	≥25 & <80	≥12 & <24	≥8 & <18	≥15 & <30
3	≥35	≥80	≥24	≥18	≥30
	Set-aside & Non-food	Peas	Linseed	Lupins	Sugar beet
Class Size	(Hectares)	(Hectares)	(Hectares)	(Hectares)	(Hectares)
1	<6	<8	<20	<4	<9
2	≥6 & <12	≥8	≥20	≥4	≥9 & <17
3	≥12				≥17

Stratification by region and size ensured that holdings from all parts of the country and of all sizes were included and made allowance for possible regional differences in patterns of use and differences associated with holding size.

The purpose of the survey was explained to the occupiers of the selected holdings through correspondence. The occupiers of the holdings were then contacted by telephone and an appointment was arranged. Data were collected during personal interviews during which a questionnaire was completed. Interviews were carried out in the period from December 2004 to the spring of 2005. Data were collected

from 234 holdings in total. This data included the area of crops grown, the target crops, plant protection products used, area treated, rates of product applied and dates applied. The growers' perceived reasons for use were also recorded. Holdings selected for which data was not provided were replaced with similar holdings from the same region and size group.

The data collected were entered into a database, verified and analysed. Estimates of national plant protection product use were derived from the sample data using raising factors calculated from the ratio of the area of crop sampled to the national crop area within each region-size group.

### CROPS SURVEYED

Holdings were selected for a single arable crop in the sampling procedure. In a number of cases a holding selected for a particular crop was also selected for another crop. In such cases the holding was surveyed for both crops. This resulted in 234 holdings being surveyed rather than the 236 originally planned. If during the survey visit a holding was found to have additional arable crops, these crops were also included in the survey. The 234 holdings surveyed yielded 497 holding - crop combinations. Details are provided in Table 3.

Occasionally a holding selected for a particular crop was found not to have grown that crop. In such cases the holding was replaced and a replacement holding was selected for the missing crop.

**Table 3**

Number of holdings, crop areas and percentage of the national crop area included in the survey

Crop	Number of holdings surveyed	Area surveyed (ha)	National crop area (ha)	Percentage of national crop area
Spring barley	141	3,748	163,200 <sup>5</sup>	2.3
Winter barley	33	901	20,500 <sup>5</sup>	4.4
Spring wheat	39	667	31,200 <sup>5</sup>	2.1
Winter wheat	48	2,783	71,500 <sup>5</sup>	3.9
Spring oats	18	227	7,000 <sup>5</sup>	3.2
Winter oats	21	616	12,900 <sup>5</sup>	4.8
Oilseed rape	10	154	1,792 <sup>6</sup>	8.6
Peas	3	31	320 <sup>7</sup>	9.8
Beans	13	211	2,658 <sup>6</sup>	7.9
Linseed	4	83	333 <sup>6</sup>	24.8
Potatoes	47	2,014	13,224 <sup>5</sup>	15.2
Set-aside	57	534	31,135 <sup>6</sup>	1.7
Non-food	5	43	404 <sup>6</sup>	10.7
Lupins	3	19	67 <sup>6</sup>	28.2
Sugar beet	55	632	31,100 <sup>5</sup>	2.0
<b>All holdings</b>	<b>497</b>	<b>12,662</b>	<b>387,335</b>	<b>3.3</b>

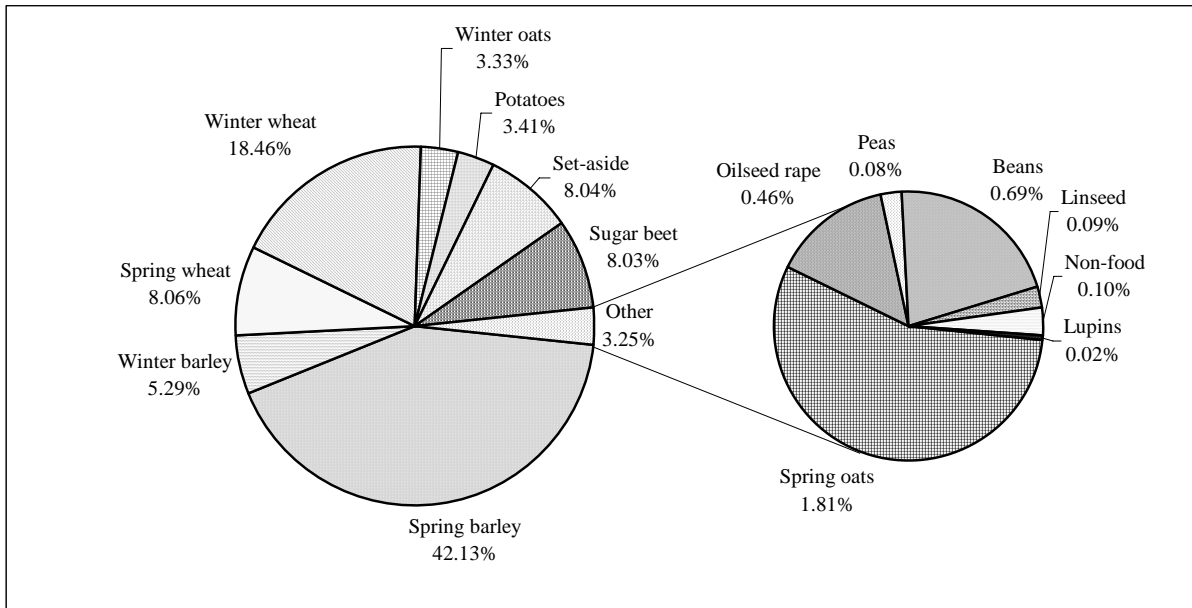
<sup>5</sup> Data from Central Statistics Office Crops and Livestock Survey, 2004

<sup>6</sup> Data from Integrated Administration and Control System (IACS), 2004

<sup>7</sup> Data from Batchelors

A summary of the areas of each crop surveyed is provided in Figure 1. Cereals accounted for 79% of the total area of arable crops in the country, of which 42% was spring barley and 18% was winter wheat. This reflects the national areas of arable crops shown in Table 3. Of the non-cereal crops surveyed, set-aside had the largest area with 8% of the total.

**Figure 1**  
National crop areas of arable crops expressed as proportions



A comparison of the total number of holdings in each survey region with the number actually surveyed is provided in Table 4.

**Table 4**  
Total holdings and number of holdings surveyed for each crop in each survey region

Crop		Region			Source
		South	North	Total	
Spring barley	Total holdings*	6,520	5,750	12,270	CSO 2000
	Surveyed	78	63	141	
Winter barley	Total holdings*	590	1,030	1,620	CSO 2000
	Surveyed	12	21	33	
Spring wheat	Total holdings*	960	650	1,610	CSO 2000
	Surveyed	21	18	39	
Winter wheat	Total holdings*	750	1,480	2,230	CSO 2000
	Surveyed	11	37	48	
Spring oats	Total holdings*	530	1,030	1,560	CSO 2000
	Surveyed	8	10	18	
Winter oats	Total holdings*	400	430	830	CSO 2000
	Surveyed	6	15	21	
Beans	Total holdings	130	145	275	IACS 2004
	Surveyed	3	10	13	
Potatoes	Total holdings	408	660	1,068	IACS 2004
	Surveyed	12	35	47	
Set-aside	Total holdings	2,889	2,517	5,406	IACS 2004
	Surveyed	26	31	57	
Crop		Country			
Oilseed rape	Total holdings	112	-	112	IACS 2004
	Surveyed	10	-	10	
Peas	Total holdings	88	-	88	IACS 2004
	Surveyed	3	-	3	
Linseed	Total holdings	34	-	34	IACS 2004
	Surveyed	4	-	4	
Non-food	Total holdings	77	-	18	IACS 2004
	Surveyed	5	-	3	
Lupins	Total holdings	18	-	77	IACS 2004
	Surveyed	3	-	5	
Sugar beet	Total holdings	2,916	-	2,916	IACS 2005
	Surveyed	55	-	55	
<b>Overall</b>	<b>Total holdings**</b>	-	-	<b>30,114</b>	
	<b>Surveyed**</b>	-	-	<b>497</b>	

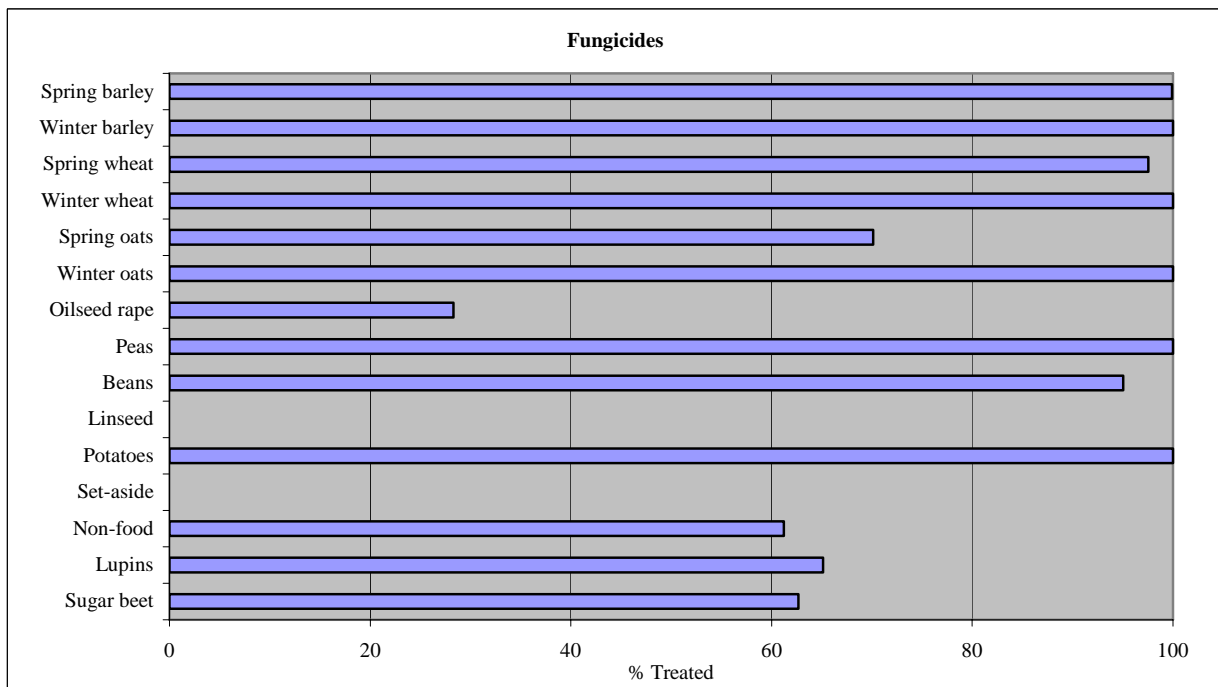
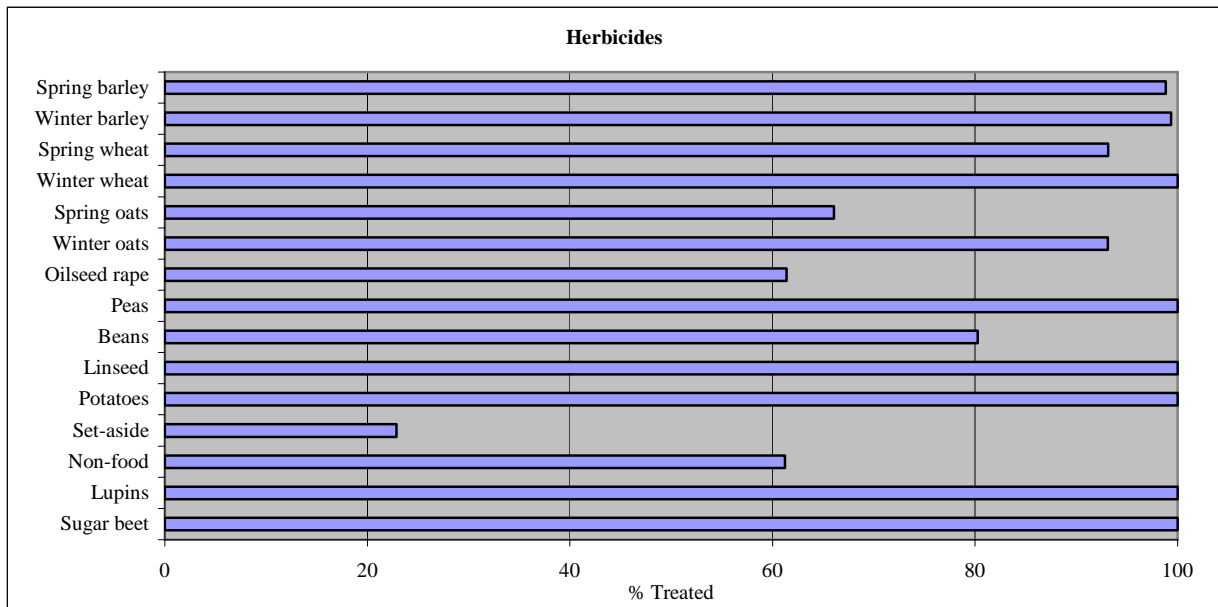
\* Rounded values

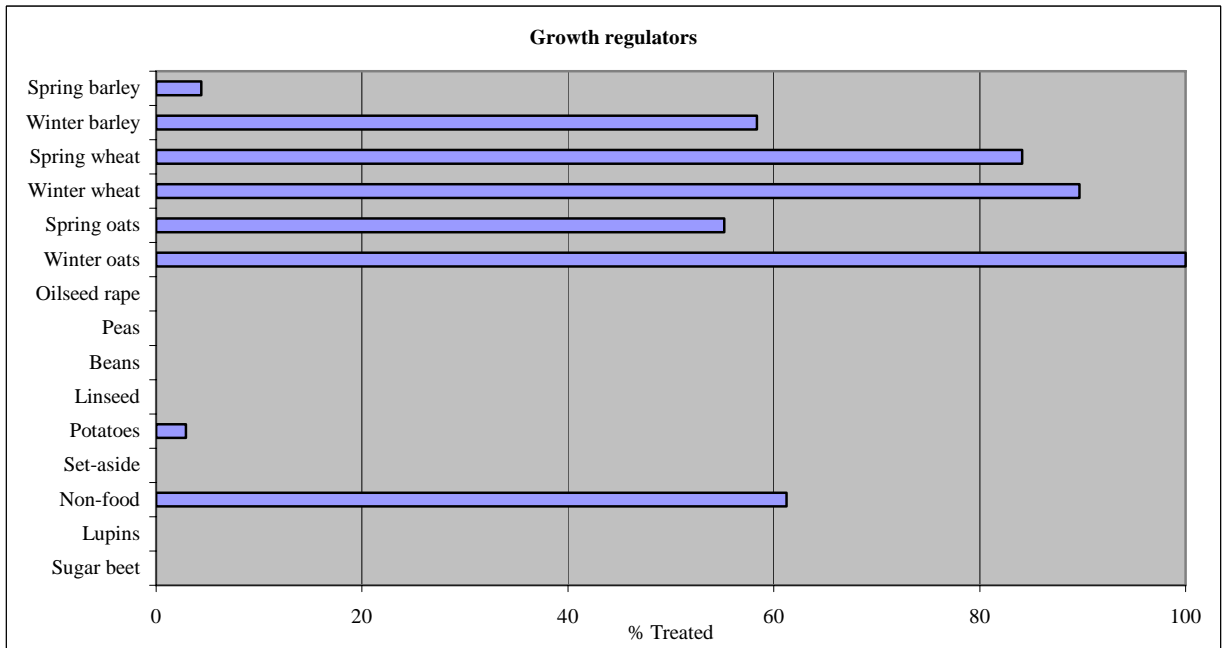
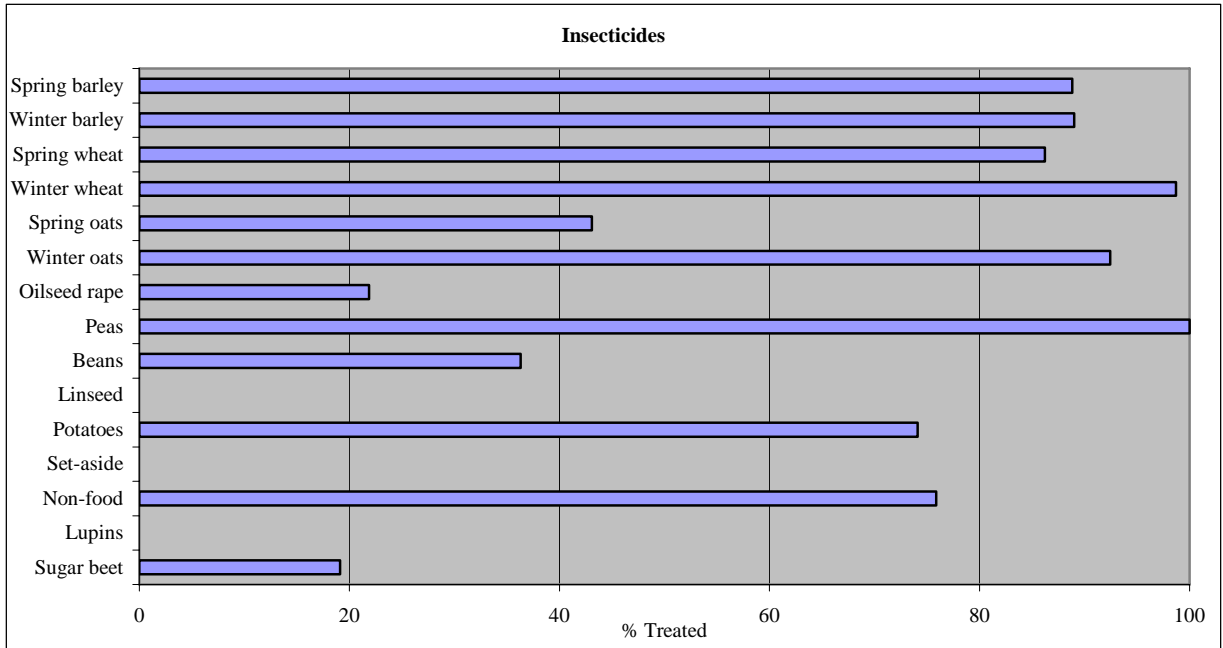
\*\* Holdings with more than one crop are counted more than once

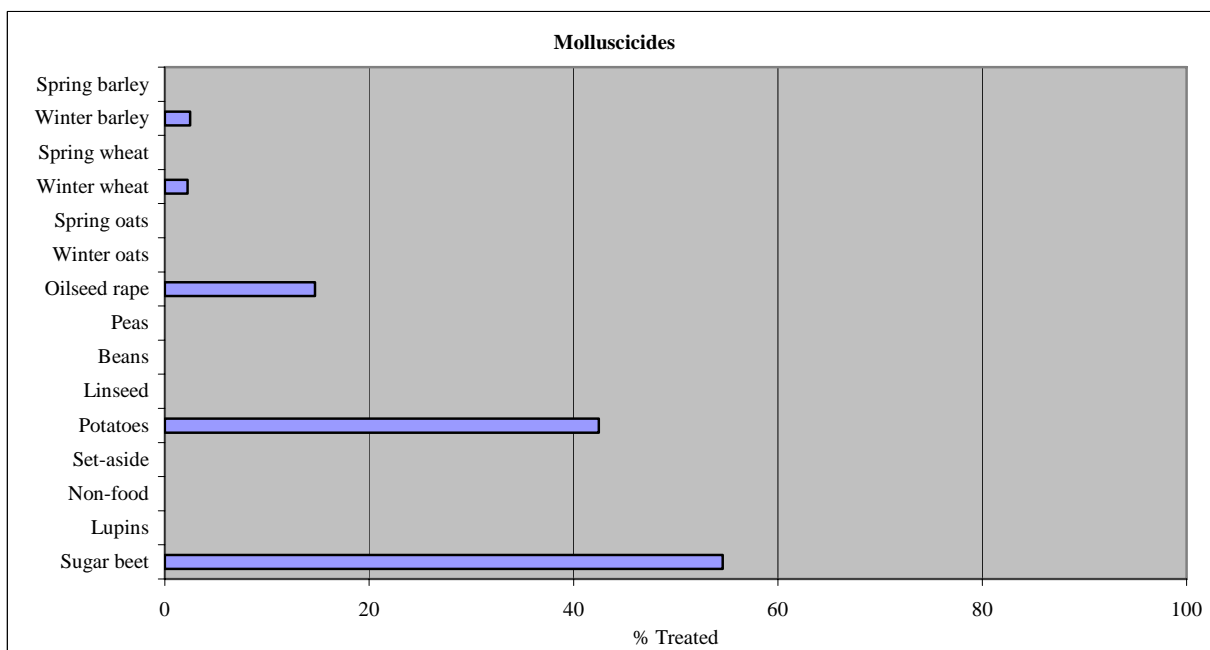
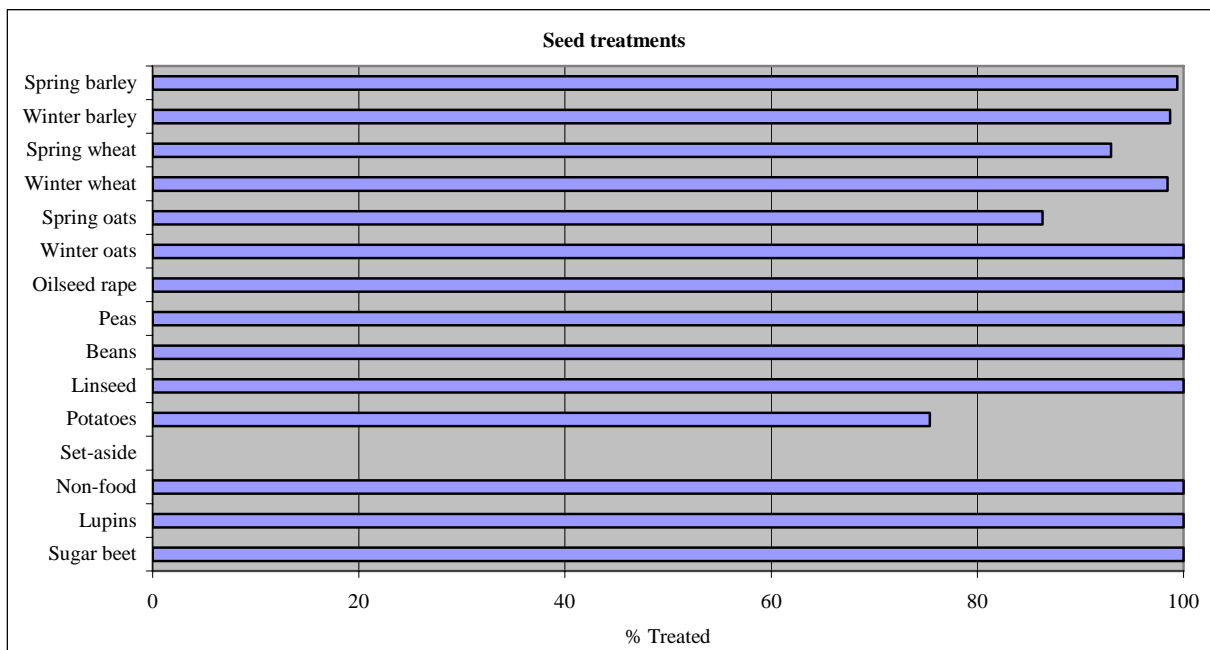
**PROPORTION OF EACH CROP TREATED WITH PLANT PROTECTION PRODUCTS**

The proportion of each crop that received a treatment is shown in Figure 2. The proportions reported are the percentage of the basic hectares (see definitions, page v) treated divided by area of the crop actually grown.

**Figure 2**  
Proportion of each crop treated with each type of plant protection product







All crop types received some herbicide treatment, with 100% of some crops such as winter wheat, peas, potatoes, linseed and sugar beet receiving herbicide treatment. Fungicides were applied to all crops with the exception of linseed and set-aside crops, with again 100% of some crops receiving fungicide treatment. Insecticides were not applied to linseed, set-aside, or lupin crops. Use of growth regulators was confined to cereal crops, a very small proportion of potatoes (2.9%) and some non-food crops. All crops, apart from set-aside, received seed treatments. Molluscicides were most widely used on sugar beet (54.6%) and potatoes (42.5%) and only on a small proportion of oilseed rape, winter barley and winter wheat crops.



**Table 5**

Area (basic ha) and proportion of each crop treated with each type of plant protection product (excluding field margin treatments)

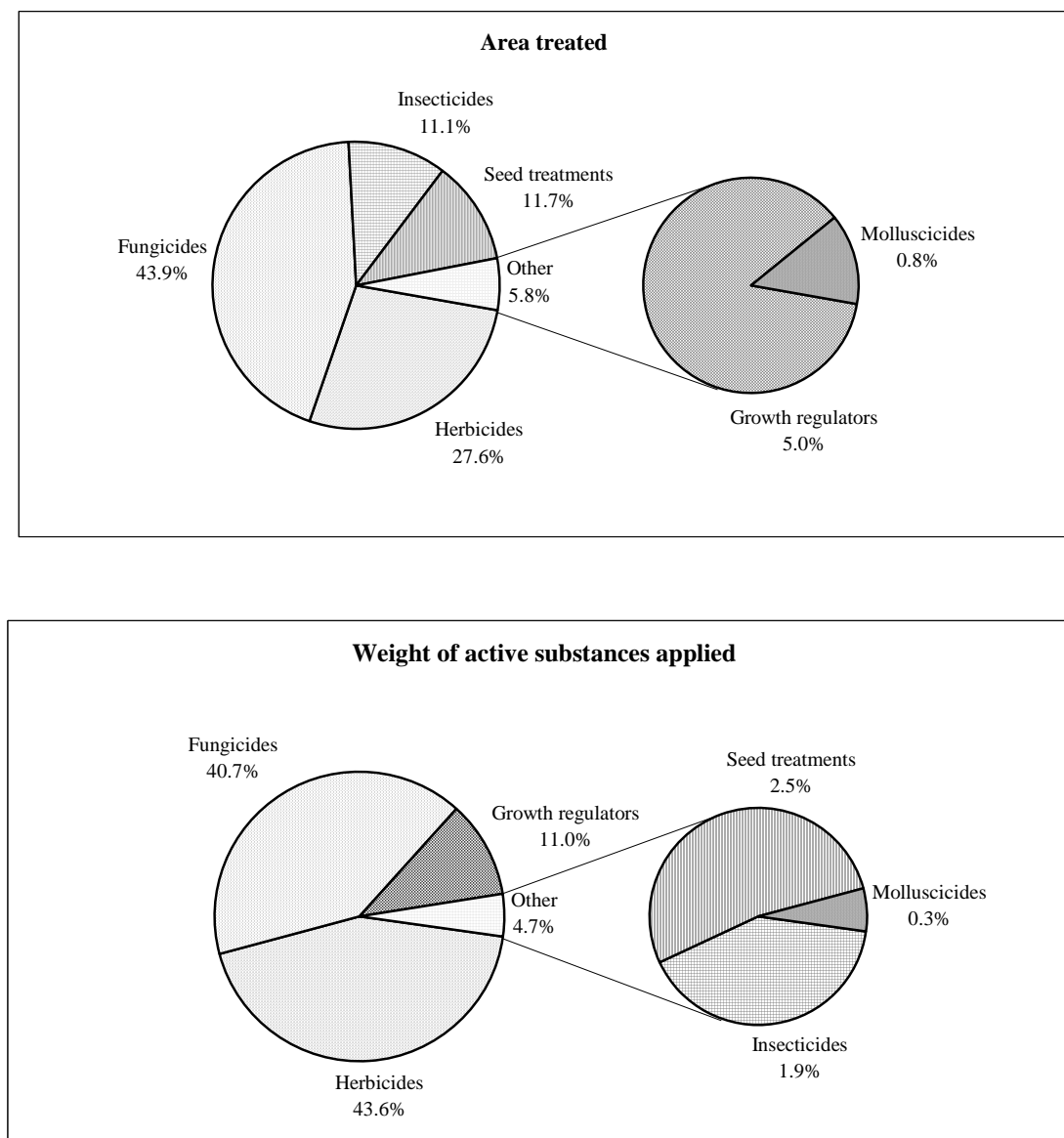
Plant Protection Product Type	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	
National total crop area	163,200	20,500	31,200	71,500	7,000	12,900	1,792	320	2,658	333	13,224	31,135	404	67	31,100	
Herbicides	Area	161,310	20,368	29,057	71,500	4,624	12,012	1,101	320	2,133	333	13,224	7,118	248	67	31,100
	%	98.8%	99.4%	93.1%	100%	66.1%	93.1%	61.4%	100%	80.3%	100%	100%	22.9%	61.2%	100%	100%
Fungicides	Area	163,055	20,500	30,432	71,500	4,908	12,900	507	320	2,527	0	13,224	0	248	44	19,488
	%	99.9%	100%	97.5%	100%	70.1%	100%	28.3%	100%	95.0%	0%	100%	0%	61.2%	65.1%	62.7%
Insecticides	Area	144,978	18,246	26,904	70,564	3,016	11,925	392	320	965	0	9,798	0	307	0	5,941
	%	88.8%	89%	86.2%	98.7%	43.1%	92.4%	21.9%	100%	36.3%	0%	74.1%	0%	75.9%	0%	19.1%
Growth regulators	Area	7,162	11,965	26,251	64,137	3,862	12,900	0	0	0	0	383	0	248	0	0
	%	4.4%	58.4%	84.1%	89.7%	55.2%	100%	0%	0%	0%	0%	2.9%	0%	61.2%	0%	0%
Seed treatments	Area	162,233	20,237	29,006	70,405	6,042	12,900	1,792	320	2,658	333	9,971	0	404	67	31,100
	%	99.4%	98.7%	93.0%	98.5%	86.3%	100%	100%	100%	100%	100%	75.4%	0%	100%	100%	100%
Molluscicides	Area	0	503	0	1,586	0	0	263	0	0	0	5,616	0	0	0	16,984
	%	0%	2.5%	0%	2.2%	0%	0%	14.7%	0%	0%	0%	42.5%	0%	0%	0%	54.6%
Miscellaneous	Area	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0.2%	0%	0%	0%	0%

The area (in basic hectares) along with the proportion of each crop treated with each product type is shown in Table 5.

**TOTAL AREAS TREATED AND TOTAL QUANTITIES OF PLANT PROTECTION PRODUCTS APPLIED**

The extent of the use of each product type, in terms of both total areas treated (spray hectares, see definitions, page v) and total weight of active substances is illustrated in Figure 3.

**Figure 3**  
Proportions of each type of plant protection product used



Herbicides were the product type used in the greatest quantity, representing 43.6% of the weight of active substances applied. Fungicides closely followed with 40.7% of the total weight of active substances applied. Growth regulators were next at 11.0% of the weight of active substances applied. Fungicides were applied to the largest area, representing 43.9% of the area treated, while herbicides followed at 27.6%. Seed treatments and insecticides were next representing 11.7% and 11.1% of the area treated respectively but represented relatively low levels of the weight of active substances applied. Molluscicides represented only 0.3% of the weight of active substances applied and were used on a relatively small area.

Further details of the areas treated and quantities applied are provided in Table 6.

**Table 6**  
Areas treated and quantities of active substances applied for each type of plant protection product (excluding field margin treatments)

Plant Protection Product type	Spray hectares		Quantities applied	
	Hectares	% of total	Kilograms	% of total
Herbicides	1,074,171	27.6	663,238	43.6
Fungicides	1,710,235	43.9	618,612	40.7
Insecticides	431,373	11.1	28,973	1.9
Growth regulators	195,847	5.0	167,435	11.0
Seed treatments	455,610	11.7	37,810	2.5
Molluscicides	30,789	0.8	4,516	0.3
Miscellaneous	47	0.0 <sup>+</sup>		
<b>All types</b>	<b>3,898,071</b>	<b>100.0</b>	<b>1,520,584</b>	<b>100.0</b>

The extent of overall use of plant protection products for each crop is shown in Table 7.

Spring barley and winter wheat treatments combined accounted for over 60% of the treated area and over 50% of the weight of active substances applied. Individually spring barley and winter wheat treatments accounted for 37.1% and 26.7% of the treated area respectively and 26.2% and 26.4% of the weight of active substances applied respectively. While potatoes also accounted for a significant proportion of the weight of active substances applied at 23.9%.

All crop types received herbicide treatment. Fungicide treatment was applied in greatest quantity to potatoes, at 30.1% of the weight applied. Spring barley and winter wheat accounted for 71.5% of the insecticide treated area. Growth regulator treatment was confined to the cereal crops, potatoes and non-food crops. Winter wheat accounted for 48.4% of the growth regulator treated area and 54.9% of the weight of growth regulator active substances applied. Seed treatments were applied to all arable crops, except set-aside. Molluscicides were most widely used on sugar beet and potatoes with 55.2% and 37.2% of the areas treated respectively and 48.3% and 44.4% of the weight applied.

<sup>+</sup> Percentages less than 0.5 are rounded to 0

**Table 7**

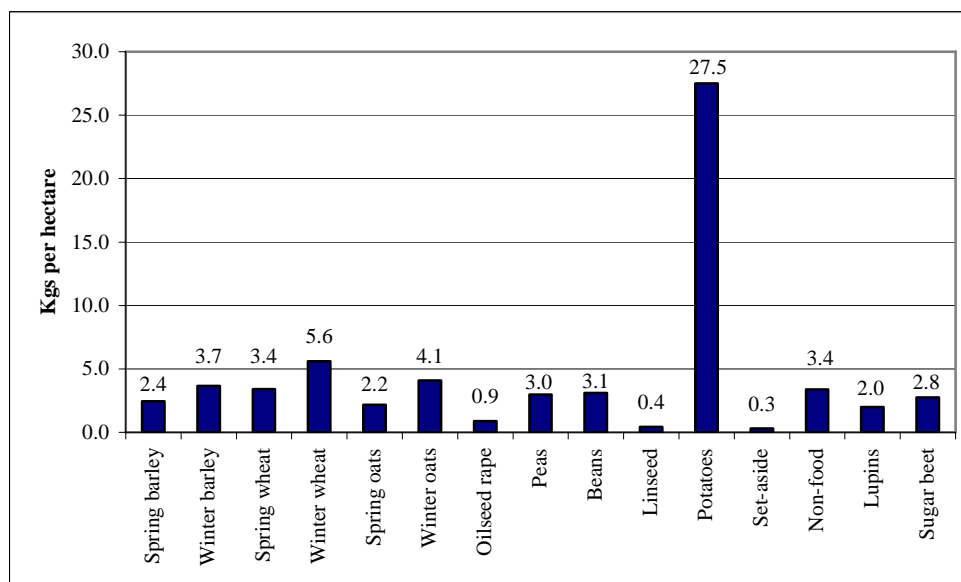
Areas treated and quantities of active substances applied for each type of plant protection product and each crop (excluding field margin treatments)

Plant Protection Product Type		Crop														
		Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet
Herbicides	Area (spray ha)	419,396	50,933	77,624	214,192	10,411	24,701	1,651	320	3,443	431	41,157	7,120	869	111	221,812
	Quantity (kg)	185,292	31,340	34,985	137,615	4,604	8,363	1,126	341	2,745	104	172,052	9,112	476	105	74,977
Fungicides	Area (spray ha)	668,303	107,329	148,178	516,008	16,160	60,661	778	805	6,999	0	163,380	0	1,602	88	19,943
	Quantity (kg)	181,939	30,207	35,775	154,420	4,940	14,868	285	530	4,708	0	186,378	0	502	18	4,041
Insecticides	Area (spray ha)	177,372	26,142	46,735	131,136	5,367	16,211	392	320	1,178	0	18,848	0	554	0	7,118
	Quantity (kg)	9,199	849	3,370	9,406	181	1,055	67	47	171	0	2,405	0	31	0	2,191
Growth regulators	Area (spray ha)	8,252	18,205	35,408	94,802	6,797	31,547	0	0	0	0	461	0	374	0	0
	Quantity (kg)	3,556	10,066	29,650	91,842	4,868	26,532	0	0	0	0	593	0	329	0	0
Seed treatments	Area (spray ha)	172,892	21,984	34,240	84,398	6,042	12,900	3,007	320	2,658	431	11,593	0	455	67	104,624
	Quantity (kg)	18,117	2,599	2,813	7,891	675	1,920	60	31	618	42	672	0	32	10	2,328
Molluscicides	Area (spray ha)	0	503	0	1,586	0	0	263	0	0	0	11,453	0	0	0	16,984
	Quantity (kg)	0	105	0	170	0	0	53	0	0	0	2,006	0	0	0	2,183
Miscellaneous	Area (spray ha)	0	0	0	0	0	0	0	0	0	0	47	0	0	0	0
<b>All types</b>	<b>Area (spray ha)</b>	<b>1,446,214</b>	<b>225,095</b>	<b>342,185</b>	<b>1,042,123</b>	<b>44,777</b>	<b>146,020</b>	<b>6,091</b>	<b>1,765</b>	<b>14,278</b>	<b>862</b>	<b>246,939</b>	<b>7,120</b>	<b>3,854</b>	<b>266</b>	<b>370,481</b>
	<b>Quantity (kg)</b>	<b>398,102</b>	<b>75,166</b>	<b>106,594</b>	<b>401,344</b>	<b>15,269</b>	<b>52,739</b>	<b>1,590</b>	<b>950</b>	<b>8,242</b>	<b>146</b>	<b>364,105</b>	<b>9,112</b>	<b>1,371</b>	<b>134</b>	<b>85,720</b>

### PLANT PROTECTION PRODUCTS APPLIED PER HECTARE OF CROP GROWN

The average weight of pesticide active substances applied per hectare of crop grown for each crop is provided in Figure 4. Average weights were calculated as the total weight of active substances applied divided by the total area of crop grown (whether treated or untreated).

**Figure 4**  
Average weight of active substances used per hectare of crop grown



The highest level of use was on potatoes (27.5kg/ha), which was much greater than on any of the other arable crops. The relatively high number of pesticide treatments, in particular fungicide treatments, applied to potato crops explains this. The winter cereal crops were next highest in level of use with winter wheat (5.6kg/ha), winter oats (4.1kg/ha) and winter barley (3.7kg/ha). The level on set-aside was the lowest (0.3kg/ha).

The average amount of plant protection products used by region and class size for each arable crop is provided in Tables 8 and 9 respectively.

There was little difference between regions in rates of use in spring barley, spring wheat, winter oats, beans and set-aside. However rates for use in winter barley, winter wheat, and spring oats were higher in the southern region. Rates for use in winter oats and in particular potatoes were higher in the northern region.

**Table 8**

Average weight (kilograms) of active substances used per hectare of crops for each region

Crop	Region <sup>∞</sup>		Country
	South	North	
Spring barley	2.30	2.62	-
Winter barley	4.85	2.95	-
Spring wheat	3.36	3.50	-
Winter wheat	6.34	5.35	-
Spring oats	2.70	1.79	-
Winter oats	3.69	4.41	-
Oilseed rape	-	-	0.89
Peas	-	-	2.97
Beans	2.86	3.25	-
Linseed	-	-	0.44
Potatoes	19.35	30.23	-
Set-aside	0.19	0.39	-
Non-food	-	-	3.39
Lupins	-	-	2.00
Sugar beet	-	-	2.76

**Table 9**

Average weight (kilograms) of active substances used per hectare of crops for each size class

Crop	Class Size <sup>∞</sup>		
	1	2	3
Spring barley	2.55	2.42	2.33
Winter barley	3.69	2.99	4.28
Spring wheat	2.61	3.26	3.85
Winter wheat	4.30	6.13	6.00
Spring oats	1.94	2.95	1.67
Winter oats	3.36	4.76	4.13
Oilseed rape	1.28	0.82	0.66
Peas	2.65	3.29	-
Beans	3.13	3.45	2.63
Linseed	0.84	0.11	-
Potatoes	34.07	26.78	22.16
Set-aside	0.19	0.13	0.53
Non-food	5.02	0.01	4.02
Lupins	2.26	1.77	-
Sugar beet	2.68	2.46	3.14

<sup>∞</sup> Refer to Table 1

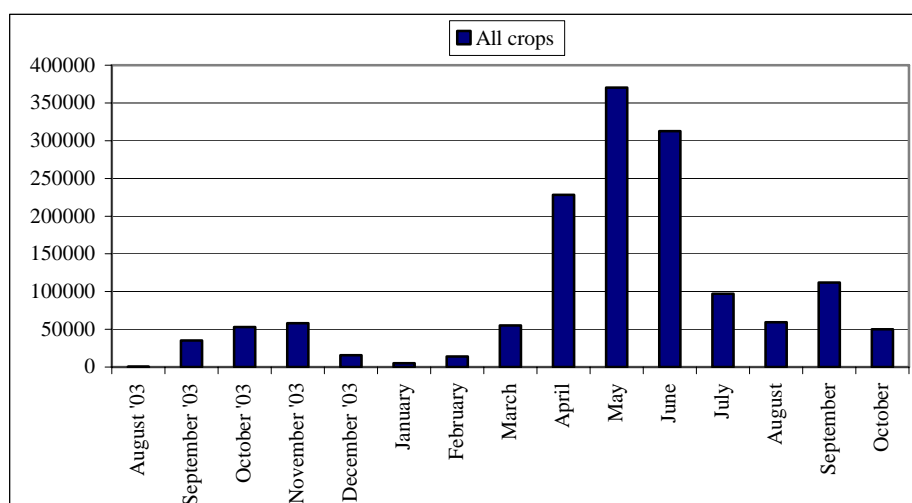
<sup>∞</sup> Refer to Table 2

Rates of use in potatoes, oilseed rape, linseed and lupins were highest in the smallest category and decreased with increased crop size. The decrease in rate of use in potatoes with increased size was particularly significant, being highest at 34.07kg/ha for the smallest category and lowest at 22.16kg/ha for the largest category. Rates of use in spring and winter wheat, spring and winter oats and peas were lowest in the smallest category. In winter barley, sugar beet, set-aside and non-food crops, rates of use were lowest in the medium size category.

### SEASONAL USE PATTERNS

The total amount of active substances (excluding seed and field margin treatments) applied to arable crops each month is shown in Figure 5.

**Figure 5**  
 Quantities of active substances applied per month



The application of plant protection products on arable crops harvested in 2004 started in August 2003 and continued until October 2004. Greatest use on arable crops took place between April and June, with significant use in July and September also. The amount applied in August 2003 was too small to be discernable in Figure 5. The quantity applied in August-October 2004 period was higher than in the August-October period 2003 for the crops harvested in 2004, this however does not imply an annual increase in the quantity applied as the application is to different crop stages. A more detailed breakdown of monthly plant protection product use by crop is provided in Table 10.

**Table 10**  
Quantities (kilograms) of active substances applied per month

	August '03	September '03	October '03	November '03	December '03	January	February	March	April	May	June	July	August	September	October
Spring barley	0	13,284	6,990	3,885	0	1,769	1,659	3,194	34,306	169,851	113,464	18,832	7,182	945	0
Winter barley	125	3,442	12,865	9,535	805	0	2,354	5,855	19,633	13,377	1,741	1,357	0	0	0
Spring wheat	0	0	323	0	0	0	1,281	564	22,065	43,325	27,581	1,872	6,397	0	0
Winter wheat	342	11,484	27,017	42,419	14,264	2,964	5,916	35,945	119,543	62,428	44,371	13,101	11,185	0	0
Spring oats	0	789	97	0	0	0	64	442	2,498	4,614	3,798	1,521	212	0	0
Winter oats	0	1,594	51	581	364	3	0	6,014	19,803	13,458	6,241	2,710	0	0	0
Oilseed rape	0	0	187	0	52	0	0	190	170	35	118	500	111	167	0
Peas	0	0	0	0	0	0	146	196	0	0	577	0	0	0	0
Beans	0	325	0	0	0	0	762	825	615	1,936	2,944	0	218	0	0
Linseed	0	0	0	0	0	0	0	0	0	1	103	0	0	0	0
Potatoes	0	0	0	110	0	212	1,823	426	3,046	26,496	80,637	54,072	30,374	110,985	49,927
Set-aside	0	0	0	0	0	0	0	0	0	4,639	3,880	592	0	0	0
Non-food	0	0	0	0	1	0	0	349	119	475	242	0	153	0	0
Lupins	0	16	0	0	0	0	12	21	29	0	18	0	28	0	0
Sugar beet	0	4,198	5,508	1,421	0	0	0	961	6,594	29,589	27,076	2,425	3,454	0	0
<b>All crops</b>	<b>467</b>	<b>35,131</b>	<b>53,038</b>	<b>57,952</b>	<b>15,484</b>	<b>4,948</b>	<b>14,018</b>	<b>54,982</b>	<b>228,420</b>	<b>370,225</b>	<b>312,794</b>	<b>96,981</b>	<b>59,312</b>	<b>112,097</b>	<b>49,927</b>

Most crops reflected the overall arable crop situation with greatest use between April and June. Potatoes though had significant use after the April to June period, with the highest level per month occurring in September 2004. The winter cereal crops had relatively high use between September and December 2003, with winter wheat having a particular high level in November 2003. The total quantity of active substances applied is slightly less than that given elsewhere, reflecting the fact that application date was not available for approximately 1% of cases.

#### TOTAL AMOUNTS OF EACH ACTIVE SUBSTANCE USED

The total amount of each active substance used (including field margin treatments) is provided in Table 11. The ten most commonly used active substances include fungicides, herbicides and a growth regulator. The fungicide chlorothalonil was the most commonly used active substance and accounted for 12.5% of the weight of all active substances applied. The second most commonly used active substance was the fungicide mancozeb, which accounted for 10.3% of the weight of all active substances applied. The growth regulator chlormequat was the third most commonly used active substance, accounting for 10.2% of the total weight of all active substance applied. The desiccant sulphuric acid was the most commonly used herbicide, it represented 9.7% of the total weight applied. The most commonly used seed treatment was guazatine, representing 1.5% of the total weight applied. The most commonly used insecticide was dimethoate, representing 1.2% of the total weight of active substance applied. Methiocarb, used primarily as a molluscicide but with a small amount used as a seed dressing, accounted for 0.3% of the total weight of active substance applied.

A total of 128 different active substances were encountered in this survey.



**Table 11**  
Total amounts of each active substance used – in order of weight

Rank	Active substance	Total kgs	Rank	Active substance	Total kgs
1	chlorothalonil	190,776	37	propiconazole	5,445
2	mancozeb	157,295	38	ethephon	5,162
3	chlormequat	155,970	39	mepiquat chloride	5,009
4	sulphuric acid	147,059	40	paraquat	4,977
5	glyphosate	116,731	41	tralkoxydim	4,976
6	mecoprop-P	112,058	42	carboxin	4,704
7	isoproturon	107,852	43	fluroxypyr	4,497
8	fenpropimorph	68,157	44	fentin hydroxide	4,458
9	metamitron	29,113	45	trifloxystrobin	4,407
10	epoxiconazole	24,888	46	methiocarb	4,235
11	guazatine	22,571	47	chlorpyrifos	3,850
12	flusilazole	21,203	48	maneb	3,200
13	azoxystrobin	20,795	49	propamocarb	3,156
14	tribenuron (-methyl)	20,485	50	cymoxanil	3,108
15	prochloraz	17,729	51	cyproconazole	2,870
16	dimethoate	17,592	52	fluquinconazole	2,803
17	pendimethalin	14,727	53	metsulfuron (-methyl)	2,277
18	ethofumesate	13,983	54	cypermethrin	2,274
19	carbendazim	12,487	55	2,4-DB	2,272
20	spiroxamine	12,426	56	oxydemeton-methyl	2,086
21	fluazinam	11,171	57	quinoxifen	1,672
22	MCPA	10,012	58	imidacloprid	1,646
23	fenpropidin	9,593	59	zoxamide	1,554
24	cyprodinil	9,159	60	ioxynil	1,533
25	tebuconazole	9,034	61	thifensulfuron (-methyl)	1,513
26	mecoprop	8,992	62	imazalil	1,467
27	diflufenican	8,505	63	flutriafol	1,414
28	phenmedipham	7,782	64	bromoxynil	1,383
29	dichlorprop	7,546	65	carbofuran	1,259
30	metribuzin	7,538	66	fenoxaprop-P (ethyl)	1,219
31	diquat (dibromide)	6,915	67	metalaxyl M	1,141
32	kresoxim methyl	6,868	68	desmedipham	1,063
33	lenacil	6,446	69	dimethomorph	1,061
34	picoxystrobin	6,063	70	triflusulfuron (-methyl)	1,050
35	simazine	5,576	71	silthiofam	910
36	thiram	5,552	72	esfenvalerate	850

Rank	Active substance	Total kgs
73	pyraclostrobin	831
74	dicamba	826
75	clopyralid	808
76	famoxodone	733
77	flamprop-M (isopropyl)	730
78	pirimicarb	674
79	clodinafop	669
80	dichlorprop-P	647
81	flurtamone	598
82	trinexapac ethyl	567
83	dimoxystrobin	522
84	cyazofamid	512
85	carfentrazone-ethyl	486
86	oxadixyl	482
87	maleic hydrazide	419
88	cycloxydim	414
89	metconazole	394
90	difenoconazole	381
91	propaquizafop	378
92	dithianon	356
93	metalaxyl	330
94	pencycuron	330
95	metaldehyde	267
96	benalaxyl	262
97	terbutryn	239
98	copper oxychloride	231
99	propyzamide	205
100	cyanazine	205
101	fluazifop-P (-butyl)	202

Rank	Active substance	Total kgs
102	linuron	190
103	fenoxaprop (ethyl)	187
104	dimethipin	174
105	lambda-cyhalothrin	131
106	amidosulfuron	127
107	deltamethrin	120
108	cholin chloride	115
109	benazolin (-ethyl)	104
110	bromuconazole	104
111	terbuthylazine	102
112	alpha-cypermethrin	89
113	thiodicarb	84
114	iodosulfuron-methyl-sodium	51
115	iprodione	46
116	beta-cyfluthrin	35
117	isofenphos	30
118	florasulam	23
119	imazaquin	20
120	haloxyfop-R	15
121	thiabendazole	14
122	triazamate	11
123	quizalofop-P	10
124	bifenthrin	8
125	rimsulfuron	5
126	fludioxonil	5
127	propachlor	5
128	sulfosulfuron	2
	<b>Total quantity</b>	<b>1,522,654</b>

### AMOUNTS OF EACH ACTIVE SUBSTANCE OR ACTIVE SUBSTANCE COMBINATION APPLIED TO EACH CROP (EXCLUDING FIELD MARGIN TREATMENTS)

Many of commercial plant protection products contain a combination of active substances – *e.g.* dicamba, MCPA and mecoprop-P – while other commercial products contain only a single active substance. In this survey all use was recorded in terms of commercial plant protection products. The results in the following tables are presented in terms of active substances or active substance combinations found in those products.

A listing of the spray hectares treated with particular active substances or combinations of active substances is provided in Table 12, while the quantities used are provided in Table 13. In a few cases, it was recorded that a crop had been treated but the name of the product used or the amounts applied were not known. In such cases, the product used is identified as ‘unknown herbicide’, ‘unknown insecticide’ *etc.* as appropriate.

Some of the active substances used in seed treatments were applied in other countries before the seed was exported to Ireland. Use of glyphosate on some fodder crops refers to use for pre-sowing ground preparation rather than use on the crop itself.

The same information as provided in Tables 12 and 13, is provided but in a more compact format for each individual crop in Tables 14 to 28.

The following are the main features noted for each crop.

**Spring barley:** Herbicides, fungicides, insecticides, growth regulators and seed treatments were applied to spring barley crops. The most extensively used herbicidal active substance was mecoprop-P. It was applied mostly in formulations in which it was the sole active substance but also applied in a number of formulations with other herbicidal active substances. Glyphosate was the next most extensively used herbicide, while metsulfuron (-methyl) was applied, as a sole active substance and in a number of formulations with other herbicidal active substances, to a large area but not in large quantities. Chlorothalonil was the most frequently used fungicide, accounting for 21% of the fungicide-treated area and 42% of the quantity of fungicides applied. Esfenvalerate and cypermethrin were the most extensively used insecticides, while dimethoate was the insecticide applied in the largest quantity. Chlormequat was the most extensively used growth regulator. The most commonly used active substance in seed treatments was guazatine. It was applied predominantly in a formulation with imazalil rather than as a sole active substance.

**Winter barley:** All plant protection product types were applied to winter barley. Isoproturon was the most extensively used herbicidal active substance. It was applied mostly in formulations with the herbicide diflufenican but also was applied in formulations with a sole active substance. Chlorothalonil was the most frequently used fungicide, accounting for 28% of the fungicide-treated area and 45% of the quantity of fungicides applied. Esfenvalerate was the most extensively used insecticide, while dimethoate was the insecticide applied in the largest quantity, accounting for 81% of the quantity of insecticides applied. The most extensively used growth regulator was chlormequat, and was applied mostly in formulations in which it was the sole active substance. Guazatine was the most commonly used active substance in seed treatments. It was applied only in a formulation with imazalil. Methiocarb was only applied to a relatively small area and it was the only molluscicide applied.

- Spring wheat: The most extensively used herbicidal active substance was mecoprop-P. It was applied mostly as a sole active substance formulation but also in formulations with dicamba and MCPA. Metsulfuron (-methyl) was the next most extensively used herbicide, but not in weight terms. Epoxiconazole was the most frequently used fungicide. Esfenvalerate was the most extensively used insecticide, accounting for 45% of the insecticide-treated area, while dimethoate was the insecticide applied in the largest quantity, accounting for 73% of the quantity of insecticides applied. Chlormequat was the most extensively used growth regulator. The most extensively used active substance in seed treatments was guazatine, which was predominantly applied as a sole active substance product.
- Winter wheat: All plant protection product types were applied to winter wheat, albeit that molluscicides were applied to a relatively very small area. Isoproturon was the most extensively used herbicidal active substance. It was applied as a sole active substance formulation and in formulations with other herbicidal active substances. Chlorothalonil, epoxiconazole and azoxystrobin were the most frequently used fungicides. Esfenvalerate was the most extensively used insecticide, while dimethoate was the insecticide applied in the largest quantity, accounting for 84% of the quantity of insecticides applied. The most extensively used growth regulator was chlormequat. Guazatine was the most commonly used active substance in seed treatments, accounting for 77% of the seed-treated area, while silthiofam accounted for 16% of the seed-treated area.
- Spring oats: Metsulfuron (-methyl) was the most extensively used herbicide, accounting for 34% of the herbicide-treated area, but because of its relatively low application rate it accounted for less than 1% of the quantity of herbicides applied. Fenpropimorph was the most frequently used fungicide and esfenvalerate was the most frequently used insecticide. Chlormequat and trinexapac ethyl accounted for both 94% of the growth regulator-treated area and the quantity of growth regulators applied.
- Winter oats: Mecoprop-P and glyphosate were the most extensively used herbicides. Fenpropimorph was the most frequently used fungicide and was applied mostly in a formulation with quinoxifen. Esfenvalerate and dimethoate were the most frequently used insecticides. Chlormequat, ethephon and trinexapac ethyl were the active substances applied as growth regulators. Carboxin, guazatine, imazalil and thiram were the known active substances applied as seed treatments.
- Oilseed rape: All plant protection product types were applied to oilseed rape with the exception of growth regulators. Glyphosate was the most extensively used herbicide, predominantly applied prior to harvest. The most extensively used fungicide was tebuconazole, accounting for 53% of the fungicide-treated area, but for only 22% of the quantity of fungicides applied. The two insecticidal active substances applied were esfenvalerate and dimethoate. Esfenvalerate was the more extensively used insecticide, while dimethoate was applied in the largest quantity. Beta-cyfluthrin, imidacloprid and thiram were the active substances applied as seed treatments.
- Peas: The only herbicide applied to peas was a formulation of terbutylazine and terbutryn. Chlorothalonil and azoxystrobin were the two fungicidal active substances applied. Pirimicarb was the most extensively applied insecticide, accounting for 50% of the insecticide-treated area. Only one formulation type was applied as a seed treatment and this contained the active substances cymoxanil, fludioxonil and metalaxyl M.

- Beans:** Simazine was the most extensively used herbicide accounting for 56% of the herbicide-treated area and 71% of the quantity of herbicides applied. Chlorothalonil and carbendazim accounted for 80% of the fungicide-treated area and 76% of the quantity of fungicides applied. The most extensively applied insecticide was dimethoate. The only active substance applied as a seed treatment was thiram.
- Linseed:** Only herbicides and seed treatments were applied to linseed crops. Mecoprop-P accounted for 23% of the herbicide-treated area but for 93% of the quantity of herbicides applied. All other herbicides applied contained metsulfuron (-methyl) as a sole active substance formulation or in formulations with carfentrazone-ethyl or thifensulfuron (-methyl). Beta-cyfluthrin, imidacloprid and prochloraz were the known active substances applied as seed treatments.
- Potatoes:** All plant protection product types were applied to potatoes. Herbicides containing diquat (dibromide), paraquat and metribuzin were the most extensively used herbicides. While diquat (dibromide) was used for weed control purposes in occasional cases, it was predominantly used as a desiccant. Sulphuric acid although only applied to a limited area, that is 2% of the herbicide-treated area, for the purpose of desiccation, was applied in relatively large quantities, such that it accounted for 85% of the quantity of herbicides applied. Fluazinam was the most extensively used fungicide, accounting for 35% of the fungicide-treated area, however mancozeb was applied in the largest quantity. It was applied as a sole active substance formulation and in a number of fungicide formulations. The most extensively used insecticide was oxydemeton-methyl, which accounted for 49% of the insecticide-treated area, while dimethoate was the insecticide applied in the largest quantity. Oxydemeton-methyl and dimethoate together accounted for 73% of the quantity of insecticides applied. A very small area received growth regulator, and the active substances used for this purpose were dimethipin and maleic hydrazide. Imazalil was the most extensively used seed treatment. It was used as a sole active substance formulation and in a formulation with pencycuron. Metaldehyde, methiocarb and thiodicarb were the active substances applied as molluscicides, methiocarb accounting for 89% of the molluscicide-treated area.
- Set-aside:** Only herbicides were applied to set-aside areas. Products containing the active substances glyphosate, MCPA and metsulfuron (-methyl) were applied, with glyphosate accounting for 81% of the treated area and 88% of the quantity applied.
- Non-food:** The non-food crop category consisted of wheat and oilseed rape crops grown for industrial purposes. Herbicides, fungicides, insecticides, growth regulators and seed treatments were applied to the non-food wheat crops, however the non-food oilseed rape crops they only received insecticide and seed treatments. The wheat crops were both winter and spring sown. Isoproturon was the most extensively used herbicidal active substance. Chlorothalonil was the most extensively used fungicidal active substance. Dimethoate, esfenvalerate and lambda-cyhalothrin were the insecticides used. Guazatine was the only active substance used in seed treatments. The oilseed rape crops were all spring sown. Esfenvalerate was the only insecticide applied to these crops and of the known seed treatments, beta-cyfluthrin, imidacloprid and thiram were the active substances used.

- Lupins: Herbicides, fungicides and seed treatments were applied to lupin crops. The most extensively used herbicide was glyphosate, which was used for pre-sowing ground preparation and pre-harvest desiccation. Fenpropimorph and propiconazole were the most extensively used fungicides, each accounting for 36% of the fungicide-treated area, however a greater quantity of fenpropimorph was applied. A formulation of thiabendazole and thiram was the only seed treatment applied.
- Sugar beet: All plant protection product types were applied to sugar beet with the exception of growth regulators. The combination of desmedipham, ethofumesate and phenmedipham was the most extensively used herbicide. However met amitron was the applied in the greatest quantity, accounting for 39% of the quantity of herbicides applied. The combination of carbendazim and flusilazole was the most extensively used fungicide, accounting for 90% of the fungicide-treated area and 96% of the quantity of fungicides applied. Carbofuran was the most extensively used insecticide. Imidacloprid, methiocarb, propamocarb and thiram were the active substances applied as seed treatments. Methiocarb was also applied as a molluscicide.

**Table 12**

Areas (spray hectares) treated with each active substance or active substance combination (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
<b>Herbicides</b>																
2,4-DB, benazolin (-ethyl), MCPA	549															549
2,4-DB, MCPA	810															810
amidosulfuron	1,058	381		3,841		1,011							126			6,417
bromoxynil, fluroxypyr, ioxynil	1,211															1,211
bromoxynil, ioxynil	4,920	185	656		514								126			6,402
carfentrazone-ethyl, metsulfuron (-methyl)	11,836	133		1,065						162						13,195
clodinafop			3,317	13,203												16,520
clopyralid															10,027	10,027
cyanazine															1,194	1,194
cycloxydim															3,050	3,050
desmedipham, ethofumesate, phenmedipham															44,445	44,445
dicamba, MCPA, mecoprop-P	5,076		357		202											5,636
dicamba, mecoprop-P	9,125	634		1,473												11,232
dichlorprop	8,265				847											9,112
dichlorprop-P, ioxynil	518															518
diflufenican, flurtamone						3,509										3,509
diflufenican, isoproturon		18,266		44,453									121			62,840
diquat (dibromide)							347				14,039				149	14,535
diquat (dibromide), paraquat											119					119
ethofumesate															4,437	4,437
ethofumesate, phenmedipham															26,758	26,758
fenoxaprop (ethyl)	2,014		913	3,225												6,152
fenoxaprop-P (ethyl)	12,823	2,166	3,718	9,166												27,874
flamprop-M (isopropyl)	2,345	568														2,913
florasulam				3,452	424	1,105										4,980
fluazifop-P (-butyl)															1,848	1,848
fluroxypyr	10,611		2,132	8,325	501	740										22,308
glyphosate	48,128	7,981	9,973	45,035	2,218	5,980	984		603		1,953	5,768	121	67	12,202	141,011
haloxyfop-R															923	923
iodosulfuron-methyl-sodium	6,448		252	1,287												7,988
isoproturon	3,222	12,874	3,256	50,244					202				248			70,045
isoproturon, pendimethalin				11,899												11,899
lenacil															31,869	31,869

**Table 12 (continued)**

Areas (spray hectares) treated with each active substance or active substance combination (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
linuron											340					340
MCPA	6,145	3,678	749	915	127							877				12,492
mecoprop	10,863		1,603		330											12,796
mecoprop-P	109,947	827	20,846	5,463	1,110	5,072				98						143,361
metamitron															39,370	39,370
metribuzin											9,637					9,637
metsulfuron (-methyl)	37,632	478	15,591	3,265	3,328	2,089				73		475				62,931
metsulfuron (-methyl), thifensulfuron (-methyl)	40,813		6,041	1,856						98			126			48,934
metsulfuron (-methyl), tribenuron (-methyl)	15,951		2,892		386	1,352										20,581
paraquat	940								707		10,300					11,946
pendimethalin				1,166										44		1,210
propachlor											25					25
propaquizafop											19				4,970	4,988
propyzamide							320									320
quizalofop-P															157	157
rimsulfuron											381					381
simazine									1,932		3,320					5,251
sulfosulfuron				940												940
sulphuric acid											952					952
terbuthylazine, terbutryn								320								320
thifensulfuron (-methyl), tribenuron (-methyl)	17,935		1,856													19,791
tralkoxydim	20,041	1,739														21,780
tribenuron (-methyl)	29,376	1,022	3,472	3,920	424	3,844										42,059
triflusaluron (-methyl)															40,413	40,413
unknown herbicide	795										74					869
<b>Fungicides</b>																
azoxystrobin	45,407	7,240	21,549	55,806	1,791	7,154		325	452				126	12		139,864
azoxystrobin, fenpropimorph	2,981	455	582	2,381		1,235							121			7,754
benalaxyl, mancozeb									111		1,423					1,534
bromuconazole	519															519
carbendazim	4,486		656	3,087					2,389							10,618
carbendazim, flusilazole	104,209	6,545	1,298	1,216	544										17,924	131,736
chlorothalonil	138,387	30,458	26,920	145,574		3,130		480	3,191		939		490	12		349,582



**Table 12 (continued)**

Areas (spray hectares) treated with each active substance or active substance combination (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
chlorothalonil, flutriafol			1,992	9,476												11,468
copper oxychloride											93					93
cyazofamid											4,663					4,663
cymoxanil											10,703					10,703
cymoxanil, famoxodone											360					360
cymoxanil, mancozeb											8,929					8,929
cymoxanil, mancozeb, oxadixyl											2,315					2,315
cyproconazole	1,209		4,044		395										455	6,102
cyproconazole, cyprodinil	1,164															1,164
cyproconazole, prochloraz				9,867									126			9,993
cyproconazole, propiconazole	8,346		2,890	10,006	745	2,779										24,766
cyproconazole, trifloxystrobin		568	1,383	8,752		5,866										16,568
cyprodinil		347		3,881												4,228
cyprodinil, propiconazole	16,212	7,660														23,872
difenoconazole	1,567		984	969											1,109	4,629
dimethomorph, mancozeb											5,820					5,820
dimoxystrobin, epoxiconazole			548	3,844												4,392
dithianon											316					316
epoxiconazole	43,877	13,819	30,285	112,938	100	1,050							121			202,190
epoxiconazole, fenpropimorph	2,432	397		4,597												7,425
epoxiconazole, fenpropimorph, kresoxim methyl	3,510				490	1,352										5,352
epoxiconazole, kresoxim methyl	50,232	5,534	7,698	9,139	1,282	5,111										78,996
epoxiconazole, kresoxim methyl, pyraclostrobin	1,667															1,667
famoxodone, flusilazole	4,735	2,680														7,415
fenpropidin	13,851		7,037	5,278	169	1,755										28,091
fenpropidin, fenpropimorph						289										289
fenpropidin, propiconazole, tebuconazole	1,157															1,157
fenpropidin, tebuconazole						566										566
fenpropimorph	117,597	8,242	18,764	21,477	4,883	5,705							126	32		176,825
fenpropimorph, flusilazole	4,140															4,140
fenpropimorph, propiconazole	1,373															1,373
fenpropimorph, quinoxifen	9,158	544	779	3,653	1,418	12,812										28,364
fentin hydroxide											6,055					6,055
fluzazinam											57,194					57,194

**Table 12 (continued)**

Areas (spray hectares) treated with each active substance or active substance combination (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
fluazinam, metalaxyl M											251					251
fluquinconazole			1,195	10,445									121			11,762
fluquinconazole, prochloraz			1,002	8,537												9,540
flusilazole	23,340	7,153	1,402													31,896
iprodione									263							263
mancozeb				915					381		40,821					42,116
mancozeb, metalaxyl							182				1,928					2,109
mancozeb, metalaxyl M											11,319					11,319
mancozeb, propamocarb											2,946					2,946
mancozeb, zoxamide											6,119					6,119
maneb											897					897
metconazole			1,297	6,337												7,635
picoxystrobin	34,815	6,895	504	619												42,833
prochloraz		3,121	1,426	24,309									121			28,977
propamocarb											292					292
propiconazole	7,669	506		8,359		380								32	455	17,401
pyraclostrobin	415	478	968	2,762												4,623
quinoxifen	2,644		1,738			1,111										5,492
spiroxamine	2,773		996			1,352										5,120
spiroxamine, tebuconazole	5,939	568	6,353	23,613	3,090	5,717	187									45,467
tebuconazole	1,237	132	3,450	13,207	1,253	3,296	409		213				126			23,323
trifloxystrobin	11,255	3,989	437	4,965									121			20,767
<b>Insecticides</b>																
alpha-cypermethrin				1,235							99					1,334
bifenthrin	1,211															1,211
carbofuran															2,970	2,970
carbofuran, isofenphos															455	455
chlorpyrifos	5,819		907	2,256											462	9,444
cypermethrin	61,774	2,186	10,588	13,055	1,407	1,847		83			1,051					91,991
deltamethrin	8,795	1,238	672	7,641							120				434	18,901
dimethoate	13,185	3,678	9,931	39,446	1,337	3,179	187	77	554		4,538		121		1,620	77,853
esfenvalerate	76,907	16,479	21,089	56,216	2,123	8,916	205		263		125		312		640	183,275
lambda-cyhalothrin	4,412	2,561		6,469	501	2,020					942		121			17,026

**Table 12 (continued)**

Areas (spray hectares) treated with each active substance or active substance combination (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
oxydemeton-methyl	4,132		3,548	4,817					250		9,223				537	22,506
pirimicarb	1,075							160	111		2,689					4,035
triazamate						249					62					310
unknown insecticide	61															61
<b>Growth regulators</b>																
chlormequat	4,737	9,148	27,827	65,346	4,655	25,306							248			137,266
chlormequat, cholin chloride, imazaquin		680	911	16,313												17,904
dimethipin											355					355
ethephon	2,179	5,264	1,727	915		359										10,444
ethephon, mepiquat chloride		1,930	4,944	9,118	424											16,416
maleic hydrazide											106					106
trinexapac ethyl	1,336	1,183		3,110	1,719	5,882							126			13,355
<b>Seed treatments</b>																
beta-cyfluthrin, imidacloprid							1,215			260			50			1,525
carboxin, thiram	43,600	5,883	2,038	3,917	501	957										56,896
cymoxanil, fludioxonil, metalaxyl M								320								320
guazatine	3,291		23,126	65,295	682	283							248			92,925
guazatine, imazalil	112,333	14,464	289		2,928	10,772										140,786
imazalil											9,897					9,897
imazalil, pencycuron											1,026					1,026
imazalil, tebuconazole	4,702															4,702
imidacloprid															23,468	23,468
iprodione											83					83
methiocarb															18,956	18,956
prochloraz										98						98
propamocarb															31,100	31,100
silthiofam		1,239	5,233	13,919												20,391
thiabendazole											586					586
thiabendazole, thiram														67		67
thiram							1,792		2,658				98		31,100	35,648
unknown seed dressing	8,966	397	3,553	1,267	1,931	888				73			59			17,134

**Table 12 (continued)**

Areas (spray hectares) treated with each active substance or active substance combination (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
<b>Molluscicides</b>																
metaldehyde											721					721
methiocarb		503		1,586			263				10,190				16,984	29,526
thiodicarb											542					542
<b>Miscellaneous</b>																
unknown											47					47
<b>All Pesticides</b>	<b>1,446,214</b>	<b>225,095</b>	<b>342,185</b>	<b>1,042,123</b>	<b>44,777</b>	<b>146,020</b>	<b>6,091</b>	<b>1,765</b>	<b>14,278</b>	<b>862</b>	<b>246,939</b>	<b>7,120</b>	<b>3,854</b>	<b>266</b>	<b>370,481</b>	<b>3,898,071</b>

**Table 13**  
Quantities (kilograms) of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
<b>Herbicides</b>																
2,4-DB, benazolin (-ethyl), MCPA	1,181															1,181
2,4-DB, MCPA	1,587															1,587
amidosulfuron	32	8		73		13							1			127
bromoxynil, fluroxypyr, ioxynil	246															246
bromoxynil, ioxynil	1,920	97	216		288								76			2,596
carfentrazone-ethyl, metsulfuron (-methyl)	596	3		7						2						607
clodinafop			395	274												669
clopyralid															808	808
cyanazine															205	205
cycloxydim															414	414
desmedipham, ethofumesate, phenmedipham															11,137	11,137
dicamba, MCPA, mecoprop-P	2,791		223		277											3,291
dicamba, mecoprop-P	4,930	111		504												5,545
dichlorprop	6,276				1,270											7,546
dichlorprop-P, ioxynil	797															797
diflufenican, flurtamone						837										837
diflufenican, isoproturon		14,491		35,012									91			49,595
diquat (dibromide)							161				6,695				30	6,886
diquat (dibromide), paraquat											71					71
ethofumesate															1,674	1,674
ethofumesate, phenmedipham															10,017	10,017
fenoxaprop (ethyl)	61		45	81												187
fenoxaprop-P (ethyl)	456	82	221	459												1,219
flamprop-M (isopropyl)	664	67														730
florasulam				14	2	7										23
fluazifop-P (-butyl)															202	202
fluroxypyr	2,621		204	1,388	60	148										4,420
glyphosate	40,733	6,084	7,834	28,596	1,720	4,236	759		542		2,458	8,012	153	56	13,481	114,664
haloxyfop-R															14	14
iodosulfuron-methyl-sodium	42		2	8												51
isoproturon	2,689	8,051	2,733	39,455					143				155			53,227
isoproturon, pendimethalin				26,592												26,592
lenacil															6,446	6,446
linuron											190					190
MCPA	3,529	1,183	528	848	48							1,097				7,232

**Table 13 (continued)**

Quantities (kilograms) of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
mecoprop	7,759		1,044		188											8,992
mecoprop-P	82,544	619	16,609	2,803	726	3,039				97						106,436
metamitron															29,113	29,113
metribuzin											7,538					7,538
metsulfuron (-methyl)	197	2	1,656	16	16	8				1		3				1,898
metsulfuron (-methyl), thifensulfuron (-methyl)	1,125		149	42						4			1			1,321
metsulfuron (-methyl), tribenuron (-methyl)	210		104		6	17										337
paraquat	423									111	4,400					4,934
pendimethalin				1,382										50		1,432
propachlor											5					5
propaquizafop											3				375	378
propyzamide							205									205
quizalofop-P															10	10
rimsulfuron											5					5
simazine									1,949		3,628					5,576
sulfosulfuron				0												0
sulphuric acid											147,059					147,059
terbuthylazine, terbutryn								341								341
thifensulfuron (-methyl), tribenuron (-methyl)	459		47													507
tralkoxydim	4,454	522														4,976
tribenuron (-methyl)	16,971	20	2,975	62	4	59										20,091
triflusaluron (-methyl)															1,050	1,050
<b>Fungicides</b>																
azoxystrobin	6,249	1,180	2,894	8,243	273	982		47	85				6	3		19,961
azoxystrobin, fenpropimorph	973	135	177	1,096		730							58			3,169
benalaxyl, mancozeb									167		2,225					2,392
bromuconazole	104															104
carbendazim	993		135	2,157					1,043							4,328
carbendazim, flusilazole	17,623	1,613	239	730	386										3,886	24,477
chlorothalonil	76,159	13,657	13,162	72,664		1,729		484	2,543		1,101		245	6		181,751
chlorothalonil, flutriafol			1,631	8,808												10,440
copper oxychloride											231					231
cyazofamid											512					512
cymoxanil											1,279					1,279
cymoxanil, famoxodone											92					92
cymoxanil, mancozeb											25,465					25,465

**Table 13 (continued)**

Quantities (kilograms) of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
cymoxanil, mancozeb, oxadixyl											4,048					4,048
cyproconazole	48		162		18										14	242
cyproconazole, cyprodinil	272															272
cyproconazole, prochloraz				3,560									46			3,607
cyproconazole, propiconazole	1,042		325	1,383	115	427										3,292
cyproconazole, trifloxystrobin		45	286	1,281		1,201										2,813
cyprodinil		104		1,320												1,424
cyprodinil, propiconazole	5,196	4,173														9,369
difenoconazole	52		101	121											107	381
dimethomorph, mancozeb											10,496					10,496
dimoxystrobin, epoxiconazole			75	644												719
dithianon											356					356
epoxiconazole	3,137	991	2,637	10,373	10	92							5			17,244
epoxiconazole, fenpropimorph	756	179		1,538												2,473
epoxiconazole, fenpropimorph, kresoxim methyl	797				69	152										1,018
epoxiconazole, kresoxim methyl	8,209	1,117	1,233	1,364	179	661										12,764
epoxiconazole, kresoxim methyl, pyraclostrobin	625															625
famoxodone, flusilazole	727	692														1,420
fenpropidin	5,454		1,820	1,255	51	764										9,345
fenpropidin, fenpropimorph						72										72
fenpropidin, propiconazole, tebuconazole	268															268
fenpropidin, tebuconazole						116										116
fenpropimorph	37,000	2,853	6,130	7,553	2,117	1,417							47	8		57,125
fenpropimorph, flusilazole	1,511															1,511
fenpropimorph, propiconazole	485															485
fenpropimorph, quinoxyfen	1,542	85	123	792	446	3,330										6,318
fentin hydroxide											4,458					4,458
fluazinam											11,121					11,121
fluazinam, metalaxyl M											75					75
fluquinconazole			161	1,251									15			1,426
fluquinconazole, prochloraz			330	5,482												5,812
flusilazole	2,591	885	224													3,700
iprodione									42							42
mancozeb				1,464					802		80,474					82,740
mancozeb, metalaxyl							170				2,802					2,972
mancozeb, metalaxyl M											18,689					18,689
mancozeb, propamocarb											5,493					5,493

**Table 13 (continued)**

Quantities (kilograms) of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Crop															
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	Total
mancozeb, zoxamide											14,041					14,041
maneb											3,200					3,200
metconazole			59	335												394
picoxystrobin	4,974	918	62	109												6,063
prochloraz		971	495	8,647									44			10,156
propamocarb											221					221
propiconazole	775	31		522		24								2	34	1,389
pyraclostrobin	43	59	120	276												498
quinoxifen	113		131			97										341
spiroxamine	883		747			380										2,009
spiroxamine, tebuconazole	1,594	115	1,880	9,073	1,068	2,187	53									15,971
tebuconazole	214	6	406	1,910	207	508	62		27				24			3,364
trifloxystrobin	1,530	397	27	470									11			2,435
<b>Insecticides</b>																
alpha-cypermethrin				37							52					89
bifenthrin	8															8
carbofuran															1,199	1,199
carbofuran, isofenphos															90	90
chlorpyrifos	2,984		109	446											311	3,850
cypermethrin	1,530	55	253	328	35	46		2			26					2,274
deltamethrin	40	6	4	43							1				27	120
dimethoate	3,865	686	2,475	7,860	134	950	65	29	144		903		29		451	17,592
esfenvalerate	395	75	109	216	9	39	1		1		1		2		2	850
lambda-cyhalothrin	11	28		20	3	13					55		1			131
oxydemeton-methyl	234		421	456					11		854				111	2,086
pirimicarb	134							16	15		509					674
triazamate						7					4					11
<b>Growth regulators</b>																
chlormequat	2,902	7,713	26,928	78,433	4,532	26,083							324			146,915
chlormequat, cholin chloride, imazaquin		226	367	8,597												9,189
dimethipin											174					174
ethephon	553	1,037	412	358		256										2,616
ethephon, mepiquat chloride		1,020	1,944	4,299	293											7,555
maleic hydrazide											419					419
trinexapac ethyl	100	71		155	43	193							5			567



**Table 13 (continued)**

Quantities (kilograms) of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Crop															Total
	Spring barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas	Beans	Linseed	Potatoes	Set-aside	Non-food	Lupins	Sugar beet	
<b>Seed treatments</b>																
beta-cyfluthrin, imidacloprid							28			40			2			70
carboxin, thiram	6,902	1,119	405	709	97	176										9,408
cymoxanil, fludioxonil, metalaxyl M								31								31
guazatine	299		2,197	6,518	90	35							28			9,166
guazatine, imazalil	10,878	1,417	29		488	1,709										14,521
imazalil											313					313
imazalil, pencycuron											346					0
imazalil, tebuconazole	38															38
imidacloprid															1,611	1,611
iprodione											4					0
methiocarb															71	71
prochloraz										1						1
propamocarb															457	457
silthiofam		64	181	665												910
thiabendazole											10					10
thiabendazole, thiram														10		10
thiram							32		618				2		190	842
<b>Molluscicides</b>																
metaldehyde											267					267
methiocarb		105		170			53				1,654				2,183	4,164
thiodicarb											84					84
<b>All Pesticides</b>	<b>398,102</b>	<b>75,166</b>	<b>106,594</b>	<b>401,344</b>	<b>15,269</b>	<b>52,739</b>	<b>1,590</b>	<b>950</b>	<b>8,242</b>	<b>146</b>	<b>363,756</b>	<b>9,112</b>	<b>1,371</b>	<b>134</b>	<b>85,720</b>	<b>1,520,584</b>

**Table 14**

**Spring barley: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)**

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
2,4-DB, benazolin (-ethyl), MCPA	549	1,181
2,4-DB, MCPA	810	1,587
amidosulfuron	1,058	32
bromoxynil, fluroxypyr, ioxynil	1,211	246
bromoxynil, ioxynil	4,920	1,920
carfentrazone-ethyl, metsulfuron (-methyl)	11,836	596
dicamba, MCPA, mecoprop-P	5,076	2,791
dicamba, mecoprop-P	9,125	4,930
dichlorprop	8,265	6,276
dichlorprop-P, ioxynil	518	797
fenoxaprop (ethyl)	2,014	61
fenoxaprop-P (ethyl)	12,823	456
flamprop-M (isopropyl)	2,345	664
fluroxypyr	10,611	2,621
glyphosate	48,128	40,733
iodosulfuron-methyl-sodium	6,448	42
isoproturon	3,222	2,689
MCPA	6,145	3,529
mecoprop	10,863	7,759
mecoprop-P	109,947	82,544
metsulfuron (-methyl)	37,632	197
metsulfuron (-methyl), thifensulfuron (-methyl)	40,813	1,125
metsulfuron (-methyl), tribenuron (-methyl)	15,951	210
paraquat	940	423
thifensulfuron (-methyl), tribenuron (-methyl)	17,935	459
tralkoxydim	20,041	4,454
tribenuron (-methyl)	29,376	16,971
unknown herbicide	795	*
<b>Fungicides</b>		
azoxystrobin	45,407	6,249
azoxystrobin, fenpropimorph	2,981	973
bromuconazole	519	104
carbendazim	4,486	993
carbendazim, flusilazole	104,209	17,623
chlorothalonil	138,387	76,159
cyproconazole	1,209	48
cyproconazole, cyprodinil	1,164	272
cyproconazole, propiconazole	8,346	1,042
cyprodinil, propiconazole	16,212	5,196
difenoconazole	1,567	52
epoxiconazole	43,877	3,137
epoxiconazole, fenpropimorph	2,432	756
epoxiconazole, fenpropimorph, kresoxim methyl	3,510	797

\* Name of product and amount used not known

**Table 14 (continued)**

Spring barley: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
epoxiconazole, kresoxim methyl	50,232	8,209
epoxiconazole, kresoxim methyl, pyraclostrobin	1,667	625
famoxodone, flusilazole	4,735	727
fenpropidin	13,851	5,454
fenpropidin, propiconazole, tebuconazole	1,157	268
fenpropimorph	117,597	37,000
fenpropimorph, flusilazole	4,140	1,511
fenpropimorph, propiconazole	1,373	485
fenpropimorph, quinoxyfen	9,158	1,542
flusilazole	23,340	2,591
picoxystrobin	34,815	4,974
propiconazole	7,669	775
pyraclostrobin	415	43
quinoxyfen	2,644	113
spiroxamine	2,773	883
spiroxamine, tebuconazole	5,939	1,594
tebuconazole	1,237	214
trifloxystrobin	11,255	1,530
<b>Insecticides</b>		
bifenthrin	1,211	8
chlorpyrifos	5,819	2,984
cypermethrin	61,774	1,530
deltamethrin	8,795	40
dimethoate	13,185	3,865
esfenvalerate	76,907	395
lambda-cyhalothrin	4,412	11
oxydemeton-methyl	4,132	234
pirimicarb	1,075	134
unknown insecticide	61	*
<b>Growth regulators</b>		
chlormequat	4,737	2,902
ethephon	2,179	553
trinexapac ethyl	1,336	100
<b>Seed treatments</b>		
carboxin, thiram	43,600	6,902
guazatine	3,291	299
guazatine, imazalil	112,333	10,878
imazalil, tebuconazole	4,702	38
unknown seed dressing	8,966	*
<b>All Pesticides</b>	<b>1,446,214</b>	<b>398,102</b>

\* Name of product and amount used not known

**Table 15**

Winter barley: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
amidosulfuron	381	8
bromoxynil, ioxynil	185	97
carfentrazone-ethyl, metsulfuron (-methyl)	133	3
dicamba, mecoprop-P	634	111
diflufenican, isoproturon	18,266	14,491
fenoxaprop-P (ethyl)	2,166	82
flamprop-M (isopropyl)	568	67
glyphosate	7,981	6,084
isoproturon	12,874	8,051
MCPA	3,678	1,183
mecoprop-P	827	619
metsulfuron (-methyl)	478	2
tralkoxydim	1,739	522
tribenuron (-methyl)	1,022	20
<b>Fungicides</b>		
azoxystrobin	7,240	1,180
azoxystrobin, fenpropimorph	455	135
carbendazim, flusilazole	6,545	1,613
chlorothalonil	30,458	13,657
cyproconazole, trifloxystrobin	568	45
cyprodinil	347	104
cyprodinil, propiconazole	7,660	4,173
epoxiconazole	13,819	991
epoxiconazole, fenpropimorph	397	179
epoxiconazole, kresoxim methyl	5,534	1,117
famoxodone, flusilazole	2,680	692
fenpropimorph	8,242	2,853
fenpropimorph, quinoxyfen	544	85
flusilazole	7,153	885
picoxystrobin	6,895	918
prochloraz	3,121	971
propiconazole	506	31
pyraclostrobin	478	59
spiroxamine, tebuconazole	568	115
tebuconazole	132	6
trifloxystrobin	3,989	397
<b>Insecticides</b>		
cypermethrin	2,186	55
deltamethrin	1,238	6
dimethoate	3,678	686
esfenvalerate	16,479	75
lambda-cyhalothrin	2,561	28

**Table 15 (continued)**

Winter barley: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Growth regulators</b>		
chlormequat	9,148	7,713
chlormequat, cholin chloride, imazaquin	680	226
ethephon	5,264	1,037
ethephon, mepiquat chloride	1,930	1,020
trinexapac ethyl	1,183	71
<b>Seed treatments</b>		
carboxin, thiram	5,883	1,119
guazatine, imazalil	14,464	1,417
silthiofam	1,239	64
unknown seed dressing	397	*
<b>Molluscicides</b>		
methiocarb	503	105
<b>All Pesticides</b>	<b>225,095</b>	<b>75,166</b>

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\* Name of product and amount used not known

**Table 16**  
**Spring wheat:** area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
bromoxynil, ioxynil	656	216
clodinafop	3,317	395
dicamba, MCPA, mecoprop-P	357	223
fenoxaprop (ethyl)	913	45
fenoxaprop-P (ethyl)	3,718	221
fluroxypyr	2,132	204
glyphosate	9,973	7,834
iodosulfuron-methyl-sodium	252	2
isoproturon	3,256	2,733
MCPA	749	528
mecoprop	1,603	1,044
mecoprop-P	20,846	16,609
metsulfuron (-methyl)	15,591	1,656
metsulfuron (-methyl), thifensulfuron (-methyl)	6,041	149
metsulfuron (-methyl), tribenuron (-methyl)	2,892	104
thifensulfuron (-methyl), tribenuron (-methyl)	1,856	47
tribenuron (-methyl)	3,472	2,975
<b>Fungicides</b>		
azoxystrobin	21,549	2,894
azoxystrobin, fenpropimorph	582	177
carbendazim	656	135
carbendazim, flusilazole	1,298	239
chlorothalonil	26,920	13,162
chlorothalonil, flutriafol	1,992	1,631
cyproconazole	4,044	162
cyproconazole, propiconazole	2,890	325
cyproconazole, trifloxystrobin	1,383	286
difenoconazole	984	101
dimoxystrobin, epoxiconazole	548	75
epoxiconazole	30,285	2,637
epoxiconazole, kresoxim methyl	7,698	1,233
fenpropidin	7,037	1,820
fenpropimorph	18,764	6,130
fenpropimorph, quinoxifen	779	123
fluquinconazole	1,195	161
fluquinconazole, prochloraz	1,002	330
flusilazole	1,402	224
metconazole	1,297	59
picoxystrobin	504	62
prochloraz	1,426	495
pyraclostrobin	968	120
quinoxifen	1,738	131
spiroxamine	996	747
spiroxamine, tebuconazole	6,353	1,880

**Table 16 (continued)**

Spring wheat: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
tebuconazole	3,450	406
trifloxystrobin	437	27
<b>Insecticides</b>		
chlorpyrifos	907	109
cypermethrin	10,588	253
deltamethrin	672	4
dimethoate	9,931	2,475
esfenvalerate	21,089	109
oxydemeton-methyl	3,548	421
<b>Growth regulators</b>		
chlormequat	27,827	26,928
chlormequat, cholin chloride, imazaquin	911	367
ethephon	1,727	412
ethephon, mepiquat chloride	4,944	1,944
<b>Seed treatments</b>		
carboxin, thiram	2,038	405
guazatine	23,126	2,197
guazatine, imazalil	289	29
silthiofam	5,233	181
unknown seed dressing	3,553	*
<b>All Pesticides</b>	<b>342,185</b>	<b>106,594</b>

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\* Name of product and amount used unknown

**Table 17**  
**Winter wheat:** area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
amidosulfuron	3,841	73
carfentrazone-ethyl, metsulfuron (-methyl)	1,065	7
clodinafop	13,203	274
dicamba, mecoprop-P	1,473	504
diflufenican, isoproturon	44,453	35,012
fenoxaprop (ethyl)	3,225	81
fenoxaprop-P (ethyl)	9,166	459
florasulam	3,452	14
fluroxypyr	8,325	1,388
glyphosate	45,035	28,596
iodosulfuron-methyl-sodium	1,287	8
isoproturon	50,244	39,455
isoproturon, pendimethalin	11,899	26,592
MCPA	915	848
mecoprop-P	5,463	2,803
metsulfuron (-methyl)	3,265	16
metsulfuron (-methyl), thifensulfuron (-methyl)	1,856	42
pendimethalin	1,166	1,382
sulfosulfuron	940	0 <sup>†</sup>
tribenuron (-methyl)	3,920	62
<b>Fungicides</b>		
azoxystrobin	55,806	8,243
azoxystrobin, fenpropimorph	2,381	1,096
carbendazim	3,087	2,157
carbendazim, flusilazole	1,216	730
chlorothalonil	145,574	72,664
chlorothalonil, flutriafol	9,476	8,808
cyproconazole, prochloraz	9,867	3,560
cyproconazole, propiconazole	10,006	1,383
cyproconazole, trifloxystrobin	8,752	1,281
cyprodinil	3,881	1,320
difenoconazole	969	121
dimoxystrobin, epoxiconazole	3,844	644
epoxiconazole	112,938	10,373
epoxiconazole, fenpropimorph	4,597	1,538
epoxiconazole, kresoxim methyl	9,139	1,364
fenpropidin	5,278	1,255
fenpropimorph	21,477	7,553
fenpropimorph, quinoxifen	3,653	792
fluquinconazole	10,445	1,251
fluquinconazole, prochloraz	8,537	5,482
mancozeb	915	1,464
metconazole	6,337	335

<sup>†</sup> Quantities less than 0.5 kg are rounded to 0



Active substance/combination	Area (spray ha)	Quantity (kg)
picoxystrobin	619	109

**Table 17 (continued)**

Winter wheat: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
prochloraz	24,309	8,647
propiconazole	8,359	522
pyraclostrobin	2,762	276
spiroxamine, tebuconazole	23,613	9,073
tebuconazole	13,207	1,910
trifloxystrobin	4,965	470
<b>Insecticides</b>		
alpha-cypermethrin	1,235	37
chlorpyrifos	2,256	446
cypermethrin	13,055	328
deltamethrin	7,641	43
dimethoate	39,446	7,860
esfenvalerate	56,216	216
lambda-cyhalothrin	6,469	20
oxydemeton-methyl	4,817	456
<b>Growth regulators</b>		
chlormequat	65,346	78,433
chlormequat, cholin chloride, imazaquin	16,313	8,597
ethephon	915	358
ethephon, mepiquat chloride	9,118	4,299
trinexapac ethyl	3,110	155
<b>Seed treatments</b>		
carboxin, thiram	3,917	709
guazatine	65,295	6,518
silthiofam	13,919	665
unknown seed dressing	1,267	*
<b>Molluscicides</b>		
methiocarb	1,586	170
<b>All Pesticides</b>	<b>1,042,123</b>	<b>401,344</b>

\* Name of product and amount used unknown

**Table 18**  
**Spring oats:** area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
bromoxynil, ioxynil	514	288
dicamba, MCPA, mecoprop-P	202	277
dichlorprop	847	1,270
florasulam	424	2
fluroxypyr	501	60
glyphosate	2,218	1,720
MCPA	127	48
mecoprop	330	188
mecoprop-P	1,110	726
metsulfuron (-methyl)	3,328	16
metsulfuron (-methyl), tribenuron (-methyl)	386	6
tribenuron (-methyl)	424	4
<b>Fungicides</b>		
azoxystrobin	1,791	273
carbendazim, flusilazole	544	386
cyproconazole	395	18
cyproconazole, propiconazole	745	115
epoxiconazole	100	10
epoxiconazole, fenpropimorph, kresoxim methyl	490	69
epoxiconazole, kresoxim methyl	1,282	179
fenpropidin	169	51
fenpropimorph	4,883	2,117
fenpropimorph, quinoxyfen	1,418	446
spiroxamine, tebuconazole	3,090	1,068
tebuconazole	1,253	207
<b>Insecticides</b>		
cypermethrin	1,407	35
dimethoate	1,337	134
esfenvalerate	2,123	9
lambda-cyhalothrin	501	3
<b>Growth regulators</b>		
chlormequat	4,655	4,532
ethephon, mepiquat chloride	424	293
trinexapac ethyl	1,719	43
<b>Seed treatments</b>		
carboxin, thiram	501	97
guazatine	682	90
guazatine, imazalil	2,928	488
unknown seed dressing	1,931	*

\* Name of product and amount used not known

<b>All Pesticides</b>	<b>44,777</b>	<b>15,269</b>
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**Table 19**

Winter oats: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
amidosulfuron	1,011	13
diflufenican, flurtamone	3,509	837
florasulam	1,105	7
fluroxypyr	740	148
glyphosate	5,980	4,236
mecoprop-P	5,072	3,039
metsulfuron (-methyl)	2,089	8
metsulfuron (-methyl), tribenuron (-methyl)	1,352	17
tribenuron (-methyl)	3,844	59
<b>Fungicides</b>		
azoxystrobin	7,154	982
azoxystrobin, fenpropimorph	1,235	730
chlorothalonil	3,130	1,729
cyproconazole, propiconazole	2,779	427
cyproconazole, trifloxystrobin	5,866	1,201
epoxiconazole	1,050	92
epoxiconazole, fenpropimorph, kresoxim methyl	1,352	152
epoxiconazole, kresoxim methyl	5,111	661
fenpropidin	1,755	764
fenpropidin, fenpropimorph	289	72
fenpropidin, tebuconazole	566	116
fenpropimorph	5,705	1,417
fenpropimorph, quinoxifen	12,812	3,330
propiconazole	380	24
quinoxifen	1,111	97
spiroxamine	1,352	380
spiroxamine, tebuconazole	5,717	2,187
tebuconazole	3,296	508
<b>Insecticides</b>		
cypermethrin	1,847	46
dimethoate	3,179	950
esfenvalerate	8,916	39
lambda-cyhalothrin	2,020	13
triazamate	249	7
<b>Growth regulators</b>		
chlormequat	25,306	26,083
ethephon	359	256
trinexapac ethyl	5,882	193
<b>Seed treatments</b>		
carboxin, thiram	957	176

guazatine	283	35
guazatine, imazalil	10,772	1,709

**Table 19 (continued)**

Winter oats: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
unknown seed dressing	888	*
<b>All Pesticides</b>	<b>146,020</b>	<b>52,739</b>

**Table 20**

Oilseed rape: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
diquat (dibromide)	347	161
glyphosate	984	759
propyzamide	320	205
<b>Fungicides</b>		
mancozeb, metalaxyl	182	170
spiroxamine, tebuconazole	187	53
tebuconazole	409	62
<b>Insecticides</b>		
dimethoate	187	65
esfenvalerate	205	1
<b>Seed treatments</b>		
beta-cyfluthrin, imidacloprid	1,215	28
thiram	1,792	32
<b>Molluscicides</b>		
methiocarb	263	53
<b>All Pesticides</b>	<b>6,091</b>	<b>1,590</b>

\* Name of product and amount used not known

**Table 21**

Peas: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
terbuthylazine, terbutryn	320	341
<b>Fungicides</b>		
azoxystrobin	325	47
chlorothalonil	480	484
<b>Insecticides</b>		
cypermethrin	83	2
dimethoate	77	29
pirimicarb	160	16
<b>Seed treatments</b>		
cymoxanil, fludioxonil, metalaxyl M	320	31
<b>All Pesticides</b>	<b>1,765</b>	<b>950</b>

**Table 22**

Beans: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
glyphosate	603	542
isoproturon	202	143
paraquat	707	111
simazine	1,932	1,949
<b>Fungicides</b>		
azoxystrobin	452	85
benalaxyl, mancozeb	111	167
carbendazim	2,389	1,043
chlorothalonil	3,191	2,543
iprodione	263	42
mancozeb	381	802
tebuconazole	213	27
<b>Insecticides</b>		
dimethoate	554	144
esfenvalerate	263	1
oxydemeton-methyl	250	11
pirimicarb	111	15
<b>Seed treatments</b>		
thiram	2,658	618
<b>All Pesticides</b>	<b>14,278</b>	<b>8,242</b>

**Table 23**

Linseed: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
carfentrazone-ethyl, metsulfuron (-methyl)	162	2
mecoprop-P	98	97
metsulfuron (-methyl)	73	1
metsulfuron (-methyl), thifensulfuron (-methyl)	98	4
<b>Seed treatments</b>		
beta-cyfluthrin, imidacloprid	260	40
prochloraz	98	1
unknown seed dressing	73	*

\* Name of product and amount used not known

<b>All Pesticides</b>	<b>862</b>	<b>146</b>

**Table 24**

Potatoes: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
diquat (dibromide)	14,039	6,695
diquat (dibromide), paraquat	119	71
glyphosate	1,953	2,458
linuron	340	190
metribuzin	9,637	7,538
paraquat	10,300	4,400
propachlor	25	5
propaquizafop	19	3
rimsulfuron	381	5
simazine	3,320	3,628
sulphuric acid	952	147,059
unknown herbicide	74	*
<b>Fungicides</b>		
benalaxyl, mancozeb	1,423	2,225
chlorothalonil	939	1,101
copper oxychloride	93	231
cyazofamid	4,663	512
cymoxanil	10,703	1,279
cymoxanil, famoxodone	360	92
cymoxanil, mancozeb	8,929	25,465
cymoxanil, mancozeb, oxadixyl	2,315	4,048
dimethomorph, mancozeb	5,820	10,496
dithianon	316	356
fentin hydroxide	6,055	4,458
fluazinam	57,194	11,121
fluazinam, metalaxyl M	251	75
mancozeb	40,821	80,474
mancozeb, metalaxyl	1,928	2,802
mancozeb, metalaxyl M	11,319	18,689
mancozeb, propamocarb	2,946	5,493
mancozeb, zoxamide	6,119	14,041
maneb	897	3,200
propamocarb	292	221
<b>Insecticides</b>		
alpha-cypermethrin	99	52
cypermethrin	1,051	26
deltamethrin	120	1
dimethoate	4,538	903
esfenvalerate	125	1
lambda-cyhalothrin	942	55

\* Name of product and amount used not known

Active substance/combination	Area (spray ha)	Quantity (kg)
oxydemeton-methyl	9,223	854
pirimicarb	2,689	509
triazamate	62	4

**Table 24 (continued)**

Potatoes: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Growth regulators</b>		
dimethipin	355	174
maleic hydrazide	106	419
<b>Seed treatments</b>		
imazalil	9,897	313
imazalil, pencycuron	1,026	346
iprodione	83	4
thiabendazole	586	10
<b>Molluscicides</b>		
metaldehyde	721	267
methiocarb	10,190	1,654
thiodicarb	542	84
<b>Miscellaneous</b>		
unknown	47	*
<b>All Pesticides</b>	<b>246,939</b>	<b>364,105</b>

**Table 25**

Set-aside: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
glyphosate	5,768	8,012
MCPA	877	1,097
metsulfuron (-methyl)	475	3
<b>All Pesticides</b>	<b>7,120</b>	<b>9,112</b>

\* Name of product and amount used unknown



**Table 26**  
Non-food: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
amidosulfuron	126	1
bromoxynil, ioxynil	126	76
diflufenican, isoproturon	121	91
glyphosate	121	153
isoproturon	248	155
metsulfuron (-methyl), thifensulfuron (-methyl)	126	1
<b>Fungicides</b>		
azoxystrobin	126	6
azoxystrobin, fenpropimorph	121	58
chlorothalonil	490	245
cyproconazole, prochloraz	126	46
epoxiconazole	121	5
fenpropimorph	126	47
fluquinconazole	121	15
prochloraz	121	44
tebuconazole	126	24
trifloxystrobin	121	11
<b>Insecticides</b>		
dimethoate	121	29
esfenvalerate	312	2
lambda-cyhalothrin	121	1
<b>Growth regulators</b>		
chlormequat	248	324
trinexapac ethyl	126	5
<b>Seed treatments</b>		
beta-cyfluthrin, imidacloprid	50	2
guazatine	248	28
thiram	98	2
unknown seed dressing	59	*
<b>All Pesticides</b>	<b>3,854</b>	<b>1,371</b>

\* Name of product and amount used unknown

**Table 27**

Lupins: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
glyphosate	67	56
pendimethalin	44	50
<b>Fungicides</b>		
azoxystrobin	12	3
chlorothalonil	12	6
fenpropimorph	32	8
propiconazole	32	2
<b>Seed treatments</b>		
thiabendazole, thiram	67	10
<b>All Pesticides</b>	<b>266</b>	<b>134</b>

**Table 28**  
Sugar beet: area treated and quantity of each active substance or active substance combination applied (excluding field margin treatments)

Active substance/combination	Area (spray ha)	Quantity (kg)
<b>Herbicides</b>		
clopyralid	10,027	808
cyanazine	1,194	205
cycloxydim	3,050	414
desmedipham, ethofumesate, phenmedipham	44,445	11,137
diquat (dibromide)	149	30
ethofumesate	4,437	1,674
ethofumesate, phenmedipham	26,758	10,017
fluazifop-P (-butyl)	1,848	202
glyphosate	12,202	13,481
haloxyfop-R	923	14
lenacil	31,869	6,446
metamitron	39,370	29,113
propaquizafop	4,970	375
quizalofop-P	157	10
triflusaluron (-methyl)	40,413	1,050
<b>Fungicides</b>		
carbendazim, flusilazole	17,924	3,886
cyproconazole	455	14
difenoconazole	1,109	107
propiconazole	455	34
<b>Insecticides</b>		
carbofuran	2,970	1,199
carbofuran, isofenphos	455	90
chlorpyrifos	462	311
deltamethrin	434	27
dimethoate	1,620	451
esfenvalerate	640	2
oxydemeton-methyl	537	111
<b>Seed treatments</b>		
imidacloprid	23,468	1,611
methiocarb	18,956	71
propamocarb	31,100	457
thiram	31,100	190
<b>Molluscicides</b>		
methiocarb	16,984	2,183
<b>All Pesticides</b>	<b>370,481</b>	<b>85,720</b>

### FIELD MARGIN TREATMENTS

Field margin treatments refer to the treatment of the area between the crop and the field boundary (see definitions, page v). These treatments were not applied to the margins of the full range of arable crops in this survey. Of these arable crops, the greatest percentage of the crop area whose margins' were treated was sugar beet at 11%. Cereal crops were next at 8.5%. The only treatments were the application of herbicides. Glyphosate was the most widely used herbicide in these cases, accounting for 94% of the quantity of active substances used. The quantities of herbicidal active substances used in field margin treatments and the percentage of crop area whose field margin received treatment are provided in Table 29.

**Table 29**  
Quantities (kilograms) of active substance applied to field margins of arable crops and overall percentage of crops receiving field margin treatments

Active substance	Cereals	Oilseed rape	Potatoes	Set-aside	Sugar beet
glyphosate	1,946	4	12	5	100
sulfosulfuron	2	0	0	0	0
haloxyfop-R	0	0	0	0	1
<b>Total quantity</b>	<b>1,948</b>	<b>4</b>	<b>12</b>	<b>5</b>	<b>101</b>
Percentage of crop areas receiving field margin treatment	8.5%	6.4%	3.0%	0.3%	11.0%

### ACKNOWLEDGEMENTS

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**DEPARTMENT OF AGRICULTURE AND FOOD -PESTICIDE SURVEY 2004 FORM 1A****(To be used for Cereals, Peas, Beans, Potatoes, Oilseed, Lupins, Set-aside etc.)**

Region \_\_\_\_\_ Class Size \_\_\_\_\_ Holding No. \_\_\_\_\_ Block Number (s)\* \_\_\_\_\_ Block(s) area (Ha) \_\_\_\_\_ Undersown (Y/N) \_\_\_\_\_

Crop name \_\_\_\_\_ Variety(s) \_\_\_\_\_ Date Sown \_\_\_\_\_ Date Harvested \_\_\_\_\_ Cultivation Method \_\_\_\_\_ Drilling Method \_\_\_\_\_

		<i>Treated (Y/N)</i>	<i>Seed Treatment</i>	<i>Dressing Rate</i>	<i>A/E</i>	<i>Sowing Rate</i>	<i>Variety</i>	<i>Merchant (if applicable)</i>	<i>Date Bought</i>	<i>Source</i>	<i>Operator</i>
	<b><u>SEED</u></b>										
	<b><u>SEED</u></b>										
	<i>Date</i>	<i>Crop Stage</i>	<i>Product/ A.I. Used</i>	<i>App.Rate</i>	<i>A/E</i>	<i>Single/Tank Mix (S/M)</i>	<i>Spray Round</i>	<i>Reason for use</i>	<i>Area Treated</i>	<i>Source</i>	<i>Operator</i>
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
		<i>Date</i>	<i>Product/ A.I. Used</i>	<i>App.Rate</i>	<i>A/E</i>	<i>Single/Tank Mix (S/M)</i>	<i>Spray Round</i>	<i>Reason for use</i>	<i>Area Treated</i>	<i>Source</i>	<i>Operator</i>
	<b><u>Field Margin</u></b>										

Surveyor \_\_\_\_\_ Date Surveyed \_\_\_\_\_ Page \_\_\_ of \_\_\_ Comments  (if comments are noted, please tick box and write on back)

	<i>Date</i>	<i>Crop Stage</i>	<i>Product/ A.I. Used</i>	<i>App.Rate</i>	<i>A/E</i>	<i>Single/Tank Mix (S/M)</i>	<i>Spray Round</i>	<i>Reason for use</i>	<i>Area Treated</i>	<i>Source</i>	<i>Operator</i>
11											
12											
13											
14											
15											
16											
17											
18											

Main pests problem(s):

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Additional Comments:

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