

PESTICIDE USAGE SURVEY

Report Number 1

GRASSLAND AND FODDER CROPS

2003



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FOREWORD



I am very pleased to present the results of the first pesticide usage survey for grassland and fodder crops carried out in 2003 by the Department of Agriculture and Food's (DAF) Pesticide Control Service (PCS) with assistance from the Agricultural Environmental Structures (AES) Division. The survey 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 cereals, potatoes 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

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 still just one basic hectare.

NEW LEY

Grassland that is 2-4 years old. For the 2003 survey this means grassland sown in 2000, 2001 or 2002.

PERMANENT PASTURE

Grassland that is at least five years old.

ROUGH GRAZING

Hill or rough land on which hay/silage cannot be harvested and which is only suitable for grazing.

SPOT TREATMENT

Treatment of small parts of a crop area – e.g. problem weed patches, areas under electric fence wires or field boundaries - with a knapsack sprayer or similar device.

OVERALL TREATMENT

Treatment of all of a given crop area as distinct from a spot treatment which is applied to only part of a crop area.

ARABLE SILAGE

Crops of cereals and peas that were harvested and ensiled as a whole crop. These included crops of triticale, barley, wheat, oats, rye and forage peas either alone or in combination with each other and undersown with grass in some cases.

REASONS FOR USE

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

SUMMARY

This 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. The survey was based on a sample of 679 holdings, stratified by region and size and chosen to be representative of grassland and the main fodder crops (maize, fodder beet, arable silage, swedes/turnips and kale/rape). The data collected were raised to give estimates of national pesticide use.

Total usage on a national basis during 2003 was estimated to be 516 tonnes of active substances applied as overall treatments to grassland and fodder crops, on a total of 539,000 spray-hectares. A further 51 tonnes of active substances were applied as spot treatments - all on grassland.

Herbicides were the most widely used pesticide type, accounting for 95% of the weight applied and 75% of the area treated. MCPA, glyphosate and mecoprop-p were the most extensively used herbicides. Chlorothalonil was the most extensively used fungicide. In the case of insecticides, esfenvalerate was the active substance used on the greatest area while carbofuran was used in the largest quantity.

Grassland accounted for 82% of the weight of active substances applied, arable silage 9%, maize 8%, fodder beet 1%, swedes/turnips and kale/rape less than 1%. Grassland accounted for 98.9% of the total area of grassland and fodder crops in the country. Over 90% of grassland received no overall treatment although spot treatment of localized weed problems occurred on about 15% of the grassland area.

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 permit assessment of the degree of risk for consumers, spray operators and bystanders. Data on the amounts and types of product used in each region are needed to assess the risks arising for the environment and wildlife. Information on the crops treated and on the target pests controlled is required to assess 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 pesticide risks. At European level the 6th Environment Action Programme¹ 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)² 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 recently published a draft Regulation³ to give effect to these requirements.

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 current survey is 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 survey, following contacts developed at a Food Safety Promotion Board 'Plant Protection and Food Safety' symposium in 2002.⁴ Subsequently, the North/South Ministerial Council, meeting in its Agriculture Sector Format on the 15th 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 grassland and fodder crops.

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

² http://europa.eu.int/comm/environment/ppps/1st_step_com.htm

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

⁴ www.pcs.agriculture.gov.ie/news.htm#FSPBsyn

METHODS

Taking account of available resources, the number of holdings to be surveyed was set at 500 for grassland, 50 for maize, 30 each for arable silage and fodder beet, 20 for swedes/turnips and 10 for kale/rape. Holdings were grouped into broad geographical regions for each crop type, five regions for grassland and two for the other crops apart from kale/rape. Kale/rape was not grouped into regions, because of the small area grown. This regional categorization for each crop is detailed in Table 1 and Figure 1.

Table 1
Counties included in each geographical region

<i>Grassland</i>	
Region	Counties
1. South East	Waterford, Wexford, Carlow, Kilkenny & Tipperary
2. East	Laois, Offaly, Wicklow, Kildare, Dublin, Meath & Louth
3. North West	Monaghan, Cavan, Westmeath, Longford, Leitrim, Sligo & Donegal
4. West	Clare, Galway, Mayo & Roscommon
5. South West	Kerry, Limerick & Cork
<i>Maize, Fodder beet, Arable silage and Swedes/Turnips</i>	
Region	Counties
1. South	Kerry, Limerick, Cork, Waterford, Wexford, Kilkenny & Carlow
2. North	Rest of the country

Figure 1
Maps of geographical regions



Within each crop type and region, holdings were further stratified by size with roughly equal areas of the 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

	Grassland	Maize	Fodder beet	Arable silage	Swedes/Turnips	Kale/Rape
Class Size	(Hectares)	(Hectares)	(Hectares)	(Hectares)	(Hectares)	(Hectares)
1	<30	<6.5	<3	<4.5	<3.5	<3.0
2	≥30 & <50	≥6.5 & <12	≥3 & <7	≥4.5 & <8	≥3.5	≥3.0
3	≥50 & <80	≥12	≥7	≥8		
4	≥80					

Stratification by region and size ensured that holdings from all parts of the country and of all sizes were included and made allowances 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 arranged with those that had used plant protection products in 2003. Data were collected during personal interviews during which a questionnaire was completed. Interviews were carried out in the period from December 2003 to the spring of 2004. Data were collected from 679 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

Some of the 679 holdings surveyed had more than one crop type so there were 879 holding - crop combinations. Details are provided in Table 3.

Table 3
Number of holdings, crop areas and percentage of the national crop area included in the survey

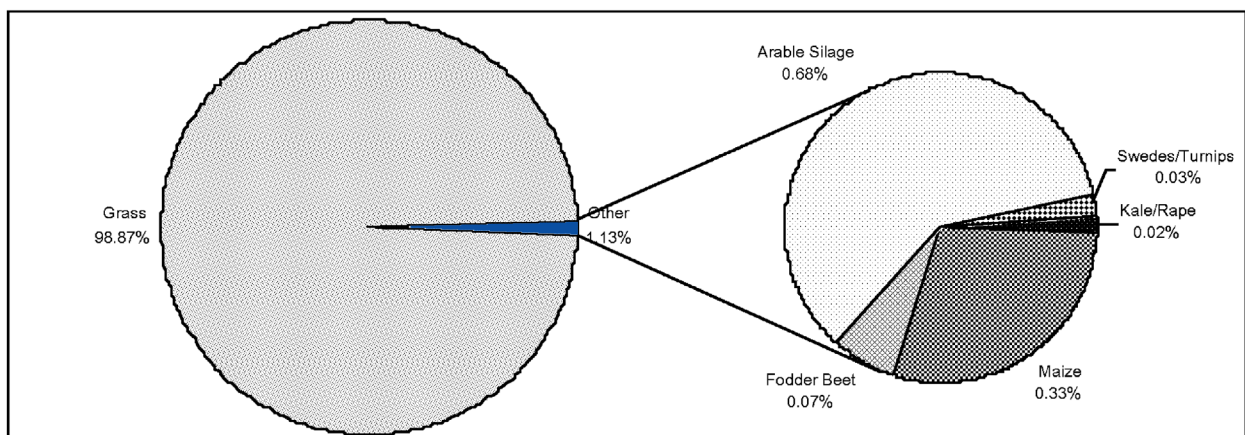
Crop	Number of holdings surveyed	Area surveyed (ha)	National crop area (ha)	Percentage of national crop area
Grass	660	37,993	4,300,032 ¹	0.9
Maize	72	735	14,541 ¹	5.1
Fodder beet	45	224	3,239 ¹	6.9
Arable silage	48	317	29,400 ²	1.1
Swedes/Turnips	32	91	1,200 ²	7.5
Kale/Rape	22	56	800 ²	7.0
All holdings	879	39,416	4,349,212	0.9

¹ Data from Integrated Administration and Control System (IACS), 2003 ² Data from Central Statistics Office Census of Agriculture, 2000

Holdings were selected for a single grass or fodder crop in the sampling procedure. However, if during the survey visit a holding was found to have additional grass or fodder crops, these crops were also included in the survey. Occasionally a holding selected for a particular crop was found not to have grown that crop. In such cases the holding was surveyed for the crop or crops actually grown and a replacement holding was selected for the missing crop. This resulted in 679 holdings being surveyed rather than the 650 originally planned.

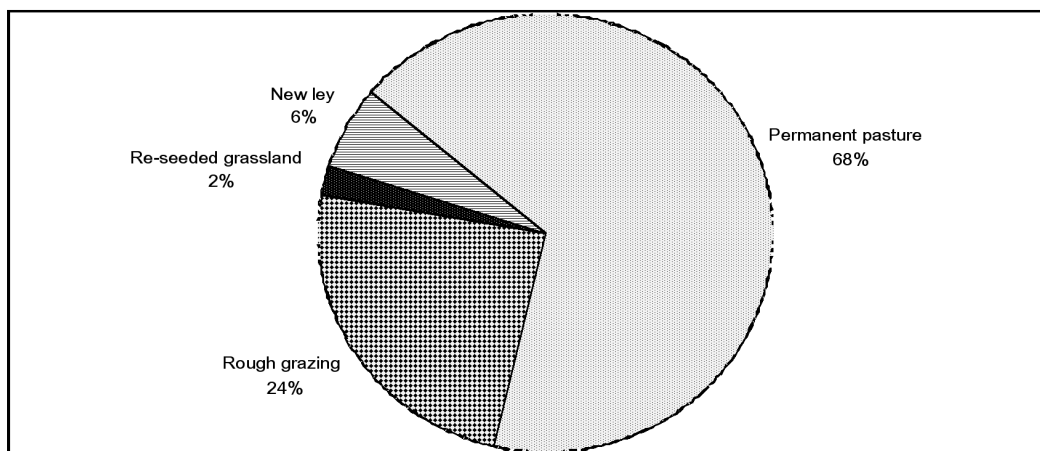
A summary of the areas of each crop surveyed is provided in Figure 2. Grassland accounted for almost 99% of the total area, which reflects the national areas of grass and fodder crops shown in Table 3. Of the other crops surveyed, arable silage had the next largest area with approximately 0.7% of the total.

Figure 2
National crop areas of grassland and fodder crops expressed as proportions



Grassland was sub-divided into four types for the purposes of the survey. The proportion of the different grassland types encountered in the survey is shown in Figure 3.

Figure 3
Proportions of each grassland type encountered in the survey



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 (ha)

Region	South East	East	North West	West	South West	Total
Grass: total holdings	17,187	14,315	30,415	37,121	25,144	124,182
surveyed	143	101	122	135	159	660
Region	South	North	-	-	-	-
Maize: total holdings	1,390	614	-	-	-	2,004
surveyed	49	23	-	-	-	72
Fodder beet: total holdings	715	250	-	-	-	965
surveyed	29	16	-	-	-	45
Arable silage: total holdings*	1,460	2,790	-	-	-	4,250
surveyed	24	24	-	-	-	48
Swedes/Turnips: total holdings*	570	590	-	-	-	1,160
surveyed	16	16	-	-	-	32
Region	Country	-	-	-	-	-
Kale/Rape: total holdings	523	-	-	-	-	523
surveyed	22					22
Overall: total holdings**	-	-	-	-	-	133,084
 surveyed**	-	-	-	-	-	879

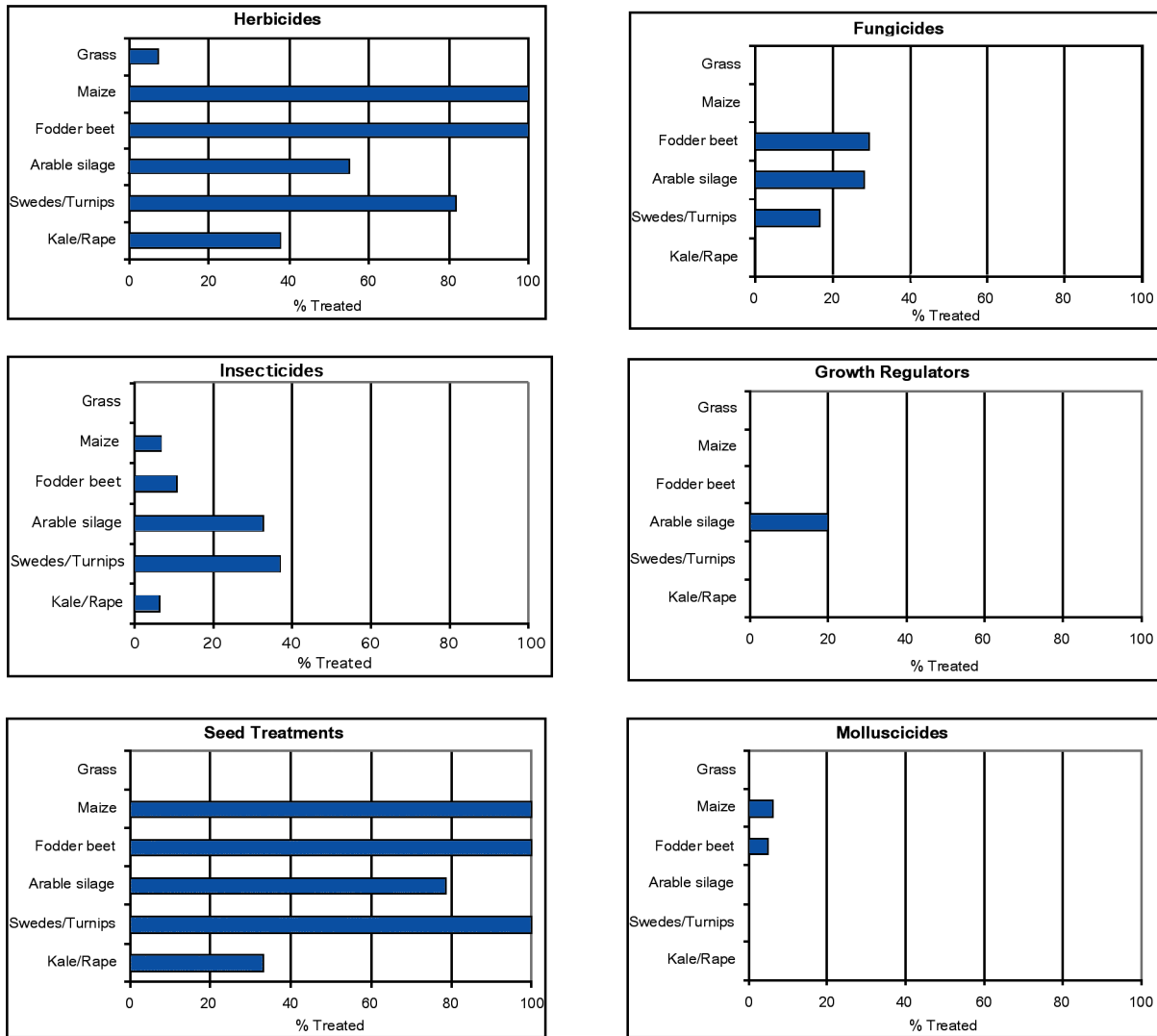
* Rounded values **Holdings with more than one crop are counted more than once

PROPORTION OF EACH CROP TREATED WITH PLANT PROTECTION PRODUCTS IN OVERALL TREATMENTS

The proportion of each crop that received an overall treatment (see definitions, page v) is shown in Figure 4. The proportions reported are the number of the basic hectares (see definitions, page v) treated divided by area of the crop actually grown.

Figure 4

Proportion of each crop treated with each type of plant protection product in overall treatments



All crop types received some herbicide treatment but only a small proportion (7.4%) of grassland was treated. Fungicide use was confined to fodder beet, arable silage and swedes/turnips. Insecticides were applied to all crop types but a relatively small proportion of the crop area was treated in most cases. For grassland the proportion treated with insecticides (0.02%) was too small to be discernable in Figure 4. Use of growth regulators was confined to arable silage crops. All crops, apart from grass, received seed treatments. Molluscicides were used on a small proportion of maize and fodder beet crops.

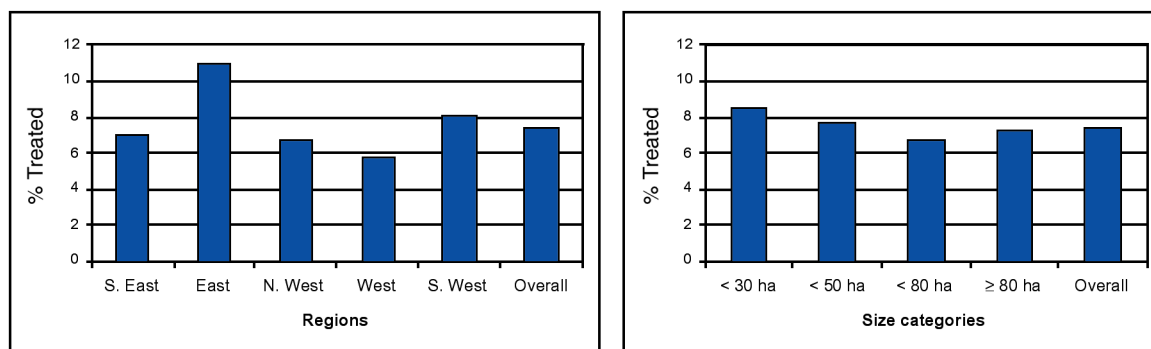
The area (in basic hectares) along with the proportion of each crop treated with each product type in overall treatments is shown in Table 5.

Table 5
Area (basic ha) and proportion of each crop treated with each
type of plant protection product in overall treatments

		Crop					
		Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape
National total crop area		4,300,032	14,541	3,239	29,400	1,200	800
Herbicides	Area treated	317,653	14,541	3,239	16,166	983	303
	% Treated	7.4%	100%	100%	55.0%	81.9%	37.9%
Fungicides	Area treated	0	0	960	8,261	202	0
	% Treated	0%	0%	29.6%	28.1%	16.8%	0
Insecticides	Area treated	993	952	346	9,636	447	49
	% Treated	0.01%	6.6%	10.7%	32.8%	37.2%	6.1%
Growth regulators	Area treated	0	0	0	5,790	0	0
	% Treated	0%	0%	0%	19.7%	0%	0%
Seed treatments	Area treated	0	14,541	3,239	23,069	1,200	264
	% Treated	0%	100%	100%	78.5%	100%	33.1%
Molluscicides	Area treated	0	878	153	0	0	0
	% Treated	0%	6.0%	4.7%	0%	0%	0%

There were some regional differences in the proportion of grassland treated as shown in Figure 5. A smaller proportion of the grassland in the north west and west was treated. Size category had little effect on the proportion treated, with the smallest holdings having a slightly higher value. Some further information on differences among regions and size categories is given in Figure 8 on page II.

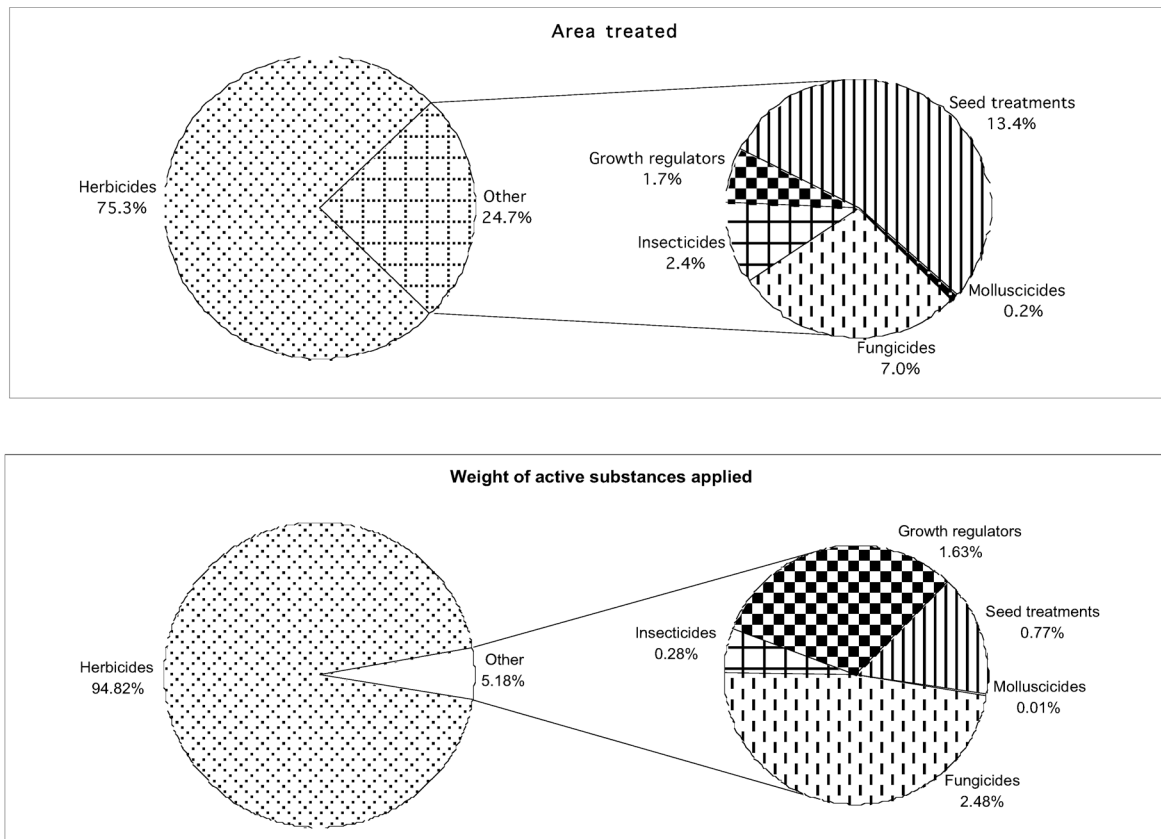
Figure 5
Proportion of grassland treated in overall treatments for each region and size category



TOTAL AREAS TREATED AND TOTAL QUANTITIES OF PLANT PROTECTION PRODUCTS APPLIED

The extent of the use of each product type in overall treatments, in terms of both total areas treated (spray hectares, see definitions, page v) and total weight of active substances is illustrated in Figure 6.

Figure 6
Proportions of each type of plant protection product used in overall treatments



Herbicides were the most heavily used product type, representing 75 % of the area treated and 95 % of the weight of active substances applied. In terms of area treated, seed treatments were the next most widely used product type, while in terms of weight of active substances applied fungicides were next. Insecticides, growth regulators and molluscicides were used at relatively low levels.

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 in overall treatments

Plant Protection Product Type	Spray hectares		Quantities applied	
	Hectares	% of total	Kilograms	% of total
Herbicides	405,469	75.3	489,521	94.8
Fungicides	37,539	7.0	12,801	2.5
Insecticides	13,066	2.4	1,454	0.3
Growth regulators	9,272	1.7	8,403	1.6
Seed treatments	72,336	13.4	3,995	0.8
Molluscicides	1,031	0.2	65	0.01
All types	538,713		516,239	

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

Table 7
Areas treated and quantities of active substances applied for each type of plant protection product and each crop in overall treatments

Plant Protection Product type		Crop					
		Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape
Herbicides	Area (spray ha)	335,732	27,675	17,188	23,337	1,233	304
	Quantity (kg)	422,418	36,843	5,786	22,578	1,419	477
Fungicides	Area (spray ha)	0	0	959	36,220	360	0
	Quantity (kg)	0	0	452	11,749	600	0
Insecticides	Area (spray ha)	993	952	346	10,206	471	98
	Quantity (kg)	235	362	92	544	171	50
Growth regulators	Area (spray ha)	0	0	0	9,272	0	0
	Quantity (kg)	0	0	0	8403	0	0
Seed treatments	Area (spray ha)	0	35,328	9,149	24,667	2,400	732
	Quantity (kg)	0	1,934	94	1,931	15	21
Molluscicides	Area (spray ha)	0	878	153	0	0	0
	Quantity (kg)	0	47	18	0	0	0
All types	Area (spray ha)	336,725	64,833	27,795	103,702	4,464	1,134
	Quantity (kg)	422,653	39,186	6,442	45,205	2,205	548

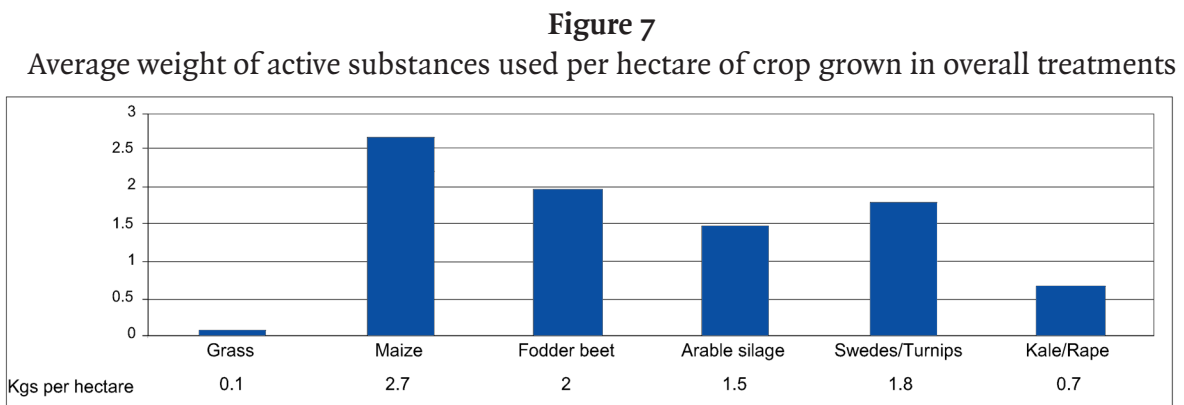
Grassland treatments accounted for 62.5% of the treated area and 82% of the weight of active substances applied.

Arable silage accounted for most of the fungicide and insecticide applications representing 19% of the area treated but only 9% of the weight of active substances applied. Other forage crops accounted for the remaining 18% of the treated area, excluding spot treatments, and 9% of the weight of active substances applied.

All crop types received herbicide and insecticide treatments. Fungicides were applied to all fodder crops, except maize. In the case of grassland, the use of insecticides was confined to re-seeded crops. Use of growth regulators was confined to arable silage crops.

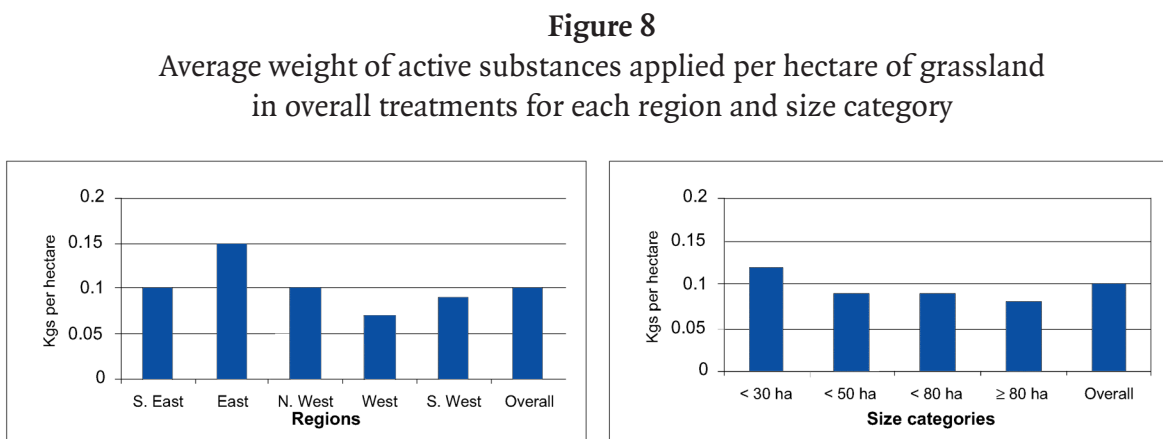
PLANT PROTECTION PRODUCTS APPLIED PER HECTARE OF CROP GROWN IN OVERALL TREATMENTS

The average weight of pesticide active substances applied in overall treatments per hectare of crop grown for each crop is provided in Figure 7. Average weights were calculated as the total weight of active substances applied divided by the total area of crop grown (whether treated or untreated).



The highest levels of use were on maize (2.7kg/ha), followed by fodder beet (2.0kg/ha) and swedes/turnips (1.8kg/ha). The value for grassland reflected the fact that less than 10% of grassland received an overall treatment.

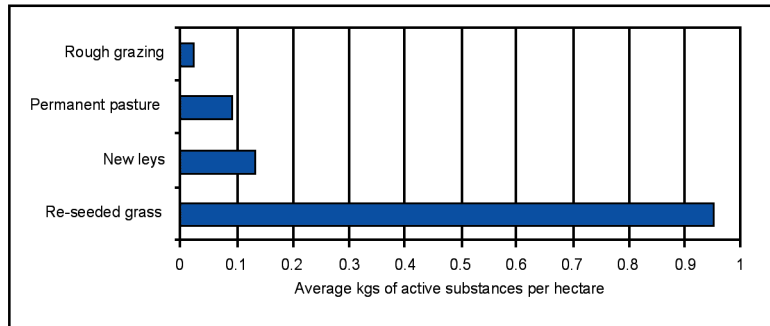
A breakdown of the grassland results by region and holding size is provided in Figure 8.



These results indicate a similar pattern to those presented in Figure 5 for the proportion of grassland treated.

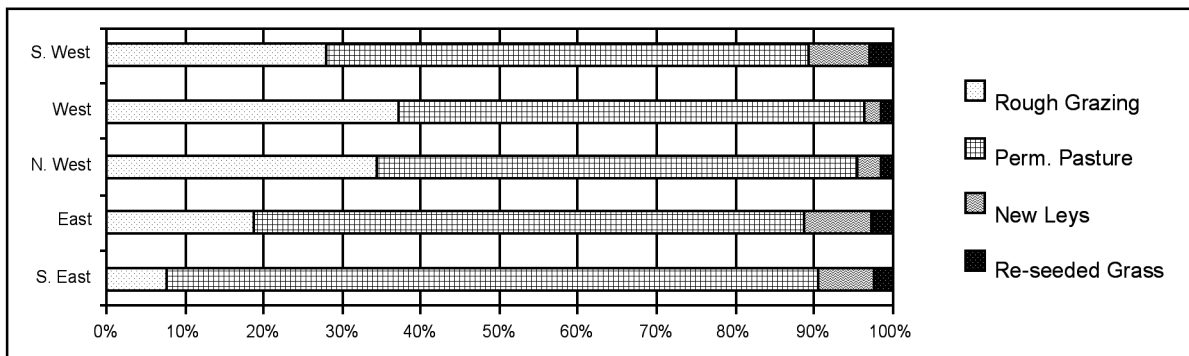
Average rates of use varied with grassland type. Rough grazing returned the lowest rate and re-seeded grassland the highest as indicated in Figure 9.

Figure 9
Average weight of active substances applied to each grassland type in overall treatments



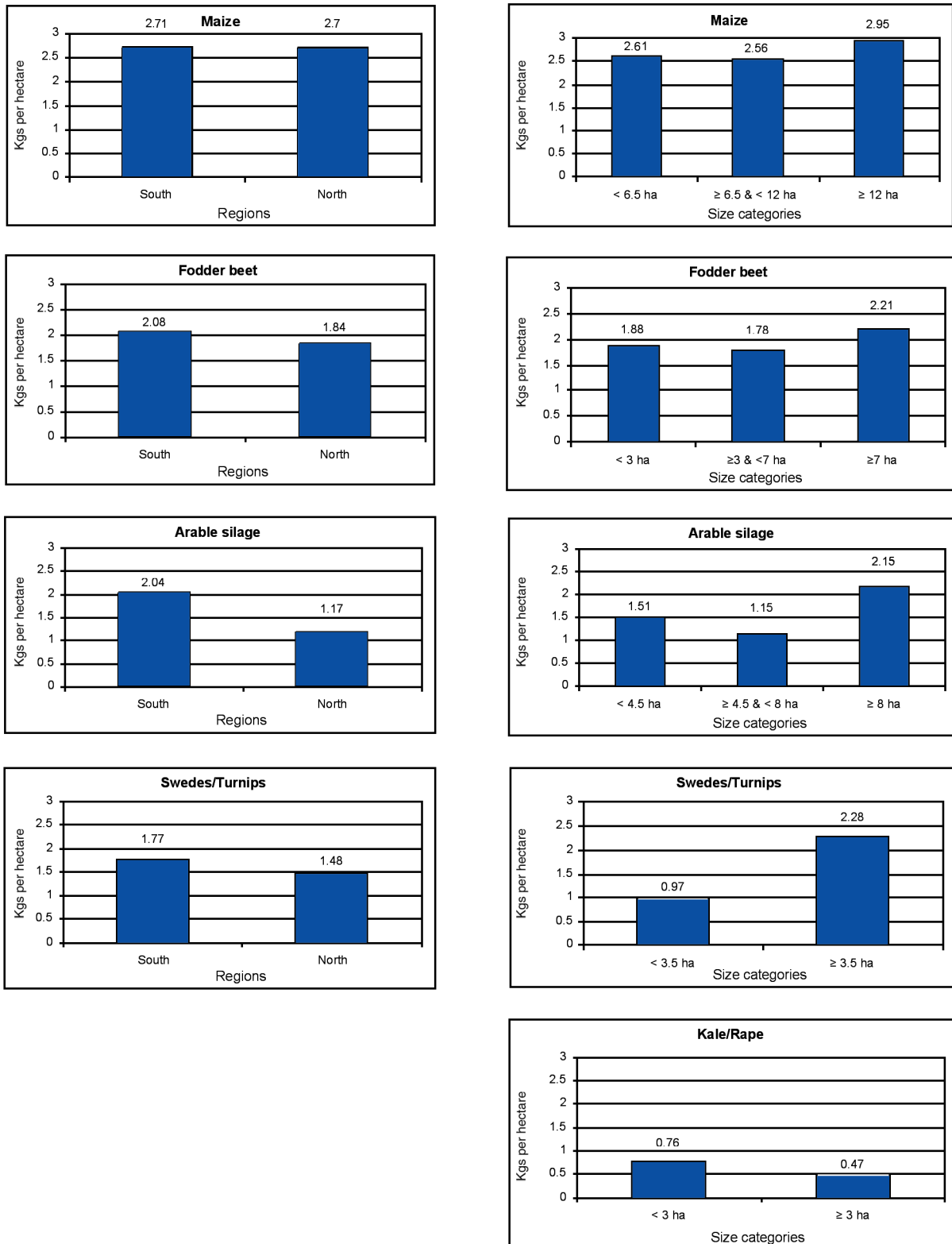
Higher rates of use of plant protection products occurred in the east of the country (Figure 8). This corresponded to a lower proportion of rough grazing and relatively higher proportion of re-seeded grassland and new leys in this region (Figure 10).

Figure 10
Proportion of each grassland type in each region



The average amounts of plant protection products used in overall treatments by region and class size for each fodder crop is provided in Figure II.

Figure II
Average weight of active substances used per hectare of fodder crops in overall treatments for each region and size category

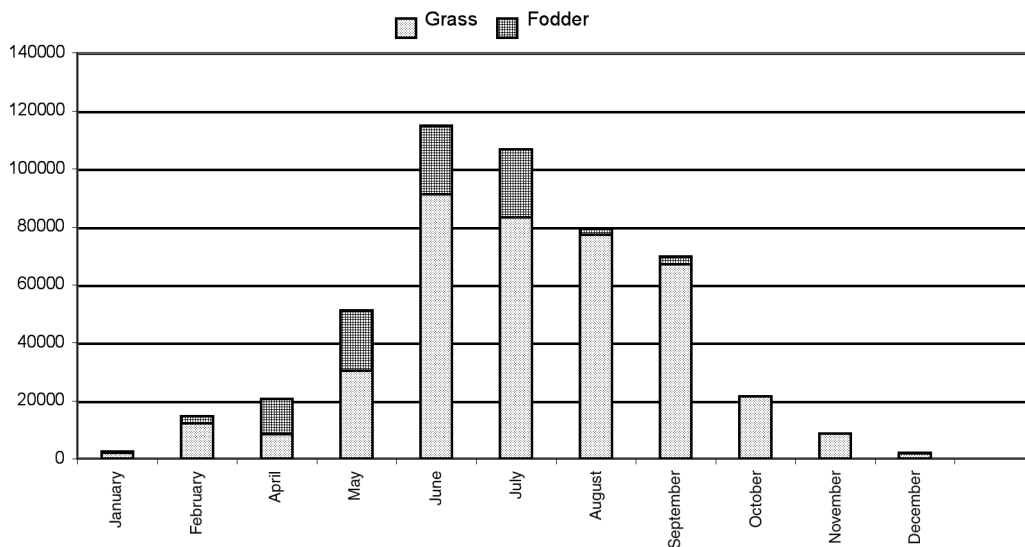


There was little difference between regions for rates of use in maize and fodder beet. However rates of use in arable silage and swedes/turnips were somewhat higher in the southern region. There were some differences in the arable silage crops grown in the two regions - e.g. no crops of triticale (a crop which had relatively high use levels) were recorded in the northern region. Rates of use in all fodder crops, except kale/rape, were highest in the largest size category. In maize, fodder beet and arable silage, use rates were lowest in the intermediate size category.

SEASONAL USE PATTERNS

The total amount of active substances (excluding seed treatments) applied to grassland and fodder crops each month is shown in Figure 12.

Figure 12
Quantities of active substances applied per month in overall treatments



The greatest use on grassland took place between May and August while use on fodder crops was highest earlier in the year - between March and June. A more detailed breakdown of monthly plant protection product use by crop is provided in Table 8.

Table 8
Kilograms of active substances applied per month in overall treatments

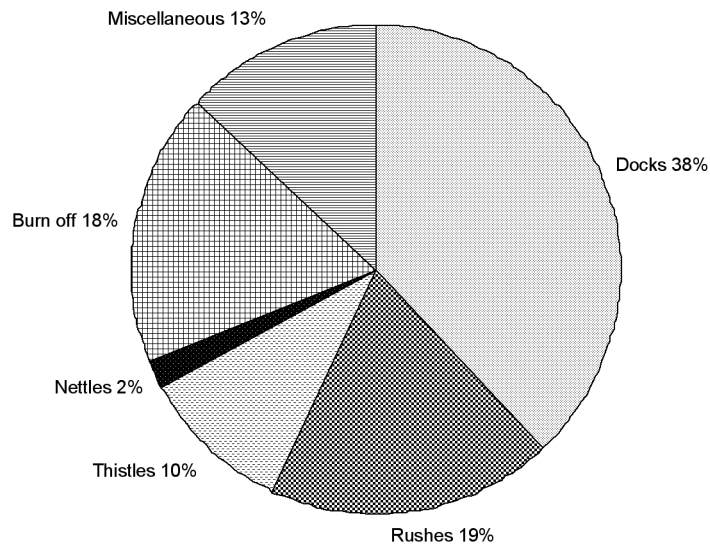
	January	February	March	April	May	June	July	August	September	October	November	December
Grass	1,919	12,351	8,373	30,283	91,254	83,330	77,382	67,089	21,546	8,751	1,730	0
Maize	502	0	2,962	12,349	12,349	8,588	192	119	0	0	0	0
Fodder beet	0	0	110	952	2,348	1,828	197	451	0	0	20	0
Arable silage	0	2,180	9,150	7,525	8,317	11,768	1,097	1,812	0	0	392	0
Swedes/Turnips	0	0	0	40	521	959	334	286	0	0	0	0
Kale/Rape	0	0	0	46	26	207	182	50	0	0	0	0
Total	2,422	14,531	20,596	51,195	114,815	106,679	79,385	69,806	21,546	8,751	2,142	0

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 5% of cases.

REASONS FOR USE

Specific pest problems were not identified in many cases. Terms such as ‘weed control’ (for herbicides) or ‘disease control’ (for fungicides) were frequently given as the reason for use of the plant protection products applied. The most detailed information on reasons for use was provided for herbicide use on grassland, where 94% of returns indicated specific reasons for use. A summary of the reasons given for herbicide use on grassland, in 491 responses, received is provided in Figure 13.

Figure 13
Reasons given for herbicide use on grassland



The main weeds identified were docks (*Rumex* spp.) (38%), rushes (*Juncus* spp.) (19%), thistles (*Cirsium* spp.) (10%) and nettles (*Urtica* spp.) (2%). The ‘miscellaneous’ category includes control of minor weeds as well as non-specific reasons. The category ‘burn off’ refers to grassland destruction in preparation for reseeded.

The only other area of pesticide use where specific pest problems were identified to any extent was herbicide use on maize. Of 180 responses received, specific weeds were identified in 36 cases - black nightshade (*Solanum nigrum*) (13), orache (*Atriplex patula*) and scutch (*Elymus repens*) (6 each), fat hen (*Chenopodium album*), cleavers (*Galium aparine*), silverweed (*Argentina* spp.) and sowthistle (*Sonchus arvensis*) (2 each), groundsel (*Senecio vulgaris*), volunteer potatoes and wild turnip (1 each).

TOTAL AMOUNTS OF EACH ACTIVE SUBSTANCE USED

The total amount of each active substance used (including spot treatments) is provided in Table 9. MCPA was the most commonly used active substance and accounted for 39% of the weight of all active substances applied. The nine most commonly used active substances were all herbicides and together accounted for 88% of the total weight of active substances. Atrazine, a herbicide that was used only in maize, was the fourth most commonly used active substance and represented 4% of the total weight of active substances applied.

Table 9
Total amounts of each active substance used – in order of weight

Rank	Active Substance	Total kgs	Rank	Active substance	Total kgs
1	MCPA	221,883	44	isoproturon	349
2	glyphosate	93,056	45	chlorpyrifos	337
3	mecoprop-P	74,598	46	ethephon	301
4	atrazine	24,152	47	thiram	293
5	2,4-D	23,458	48	simazine	269
6	mecoprop	21,761	49	carboxin	253
7	2,4-DB	18,839	50	thifensulfuron (-methyl)	238
8	triclopyr	11,450	51	tebuconazole	233
9	pendimethalin	8,253	52	metazachlor	193
10	chlormequat	7,364	53	carbendazim	191
11	asulam	7,354	54	choline chloride	143
12	dichlorprop	6,989	55	paraquat	140
13	chlorothalonil	6,903	56	kresoxim methyl	133
14	fluroxypyr	6,887	57	cyprodinil	95
15	dicamba	3,868	58	aclonifen	89
16	metamitron	2,888	59	propiconazole	82
17	methiocarb	2,007	60	cypermethrin	73
18	terbutryn	1,958	61	desmedipham	71
19	bromoxynil	1,557	62	metalaxyl	65
20	guazatine	1,359	63	triflusaluron (-methyl)	65
21	ethofumesate	1,130	64	imazalil	62
22	epoxiconazole	1,091	65	hymexazol	56
23	fenpropidin	1,079	66	carfentrazone-ethyl	47
24	clopyralid	1,007	67	linuron	45
25	pyridate	1,005	68	cyproconazole	42
26	benazolin (-ethyl)	973	69	diflufenican	35
27	azoxystrobin	937	70	propaquizafop	30
28	amidosulfuron	920	71	quizalofop-P	24
29	terbuthylazine	839	72	pirimicarb	20
30	phenmedipham	758	73	fludioxonil	19
31	trifluralin	653	74	metsulfuron (-methyl)	19
32	mepiquat	591	75	isofenphos	18
33	lenacil	571	76	fluazifop-P (-butyl)	16
34	prochloraz	566	77	esfenvalerate	16
35	bentazone	566	78	bendiocarb	14
36	MCPB	566	79	haloxyfop-R	13
37	propachlor	549	80	oxydemeton-methyl	10
38	carbofuran	508	81	iodosulfuron-methyl-	9
39	mancozeb	508	82	iprodione	7
40	fenpropimorph	482	83	imazaquin	4
41	dimethoate	458	84	tribenuron (-methyl)	4
42	glyphosate trimesium	426	85	metalaxyl-M	1
43	flusilazole	396		Total quantity	567,287

The growth regulator chlormequat was the most commonly used non-herbicide active ingredient, accounting for only 1.3% of the total active substance weight. Chlorothalonil was the most common fungicide and represented 1.2% of the total weight applied. Methiocarb, used primarily as a seed dressing but with a small amount used as a molluscicide, accounted for 0.3% of the total active substance weight. The most commonly used insecticide was dimethoate, representing 0.08% of the total weight applied.

A total of 85 different active substances were encountered in this survey.

AMOUNTS OF EACH ACTIVE SUBSTANCE OR ACTIVE SUBSTANCE COMBINATION APPLIED TO EACH CROP IN OVERALL TREATMENTS

Many of the common commercial plant protection products contain a combination of active substances - e.g. 2,4-D, dicamba and triclopyr - 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 10, while the quantities used are provided in Table 11. 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. For some crops of arable silage, swedes/turnips and kale/rape it was not possible to ascertain whether the seed used had been treated with a seed dressing or not.

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 10 and 11, is provided but in a more compact format for each individual crop in Tables 12 to 17.

The following are the main features noted for each crop.

Grassland: Only herbicides and insecticides were applied to grassland crops. The most extensively used herbicidal active substance was MCPA. It was applied mostly in formulations in which it was the sole active substance but was also applied in a number of formulations with other herbicidal active substances. Glyphosate, mecoprop, mecoprop-p and 2,4-D were also extensively used. The only insecticide applied to grassland was chlorpyrifos which was applied to newly reseeded grassland.

Maize: Herbicides, insecticides, seed treatments and molluscicides were applied to maize crops. Atrazine was the most frequently used herbicide, accounting for 51% of the herbicide-treated maize area and 66% of the quantity of herbicides applied. Pendimethalin was the second most extensively used herbicide. Carbofuran was the only insecticide and methiocarb the only molluscicide used.

Methiocarb was the most extensively used seed treatment, accounting for 95% by weight of the seed treatments applied. While fludioxonil was applied to a large proportion of maize crops it represented a relatively small part of the total weight of product applied.

Fodder beet: All plant protection product types were applied to fodder beet with the exception of growth regulators. Herbicides containing metamilon, trifluralin (methyl), a combination of desmedipham, ethofumesate and phenmedipham or a combination of ethofumesate and phenmedipham were the most extensively herbicides. Fungicide products containing carbendazim and flusilazole represented 78% of the fungicide-treated area and 96% of the quantity of fungicide applied. Hymexazol, methiocarb and thiram were the active ingredients applied as seed treatments.

Arable silage: All product types were applied to arable silage with the exception of molluscicides. Glyphosate was the most extensively used herbicide, representing 26% of the herbicide-treated arable silage area and 38% of the quantity of herbicides applied. It was used for pre-sowing ground preparation. Chlorothalonil and epoxiconazole were the most extensively used fungicides. Esfenvalerate was the most extensively used insecticide but dimethoate was applied in the largest quantities, representing 84% of the quantity of insecticide applied. Arable silage was the only crop on which growth regulators were used. Growth regulators were a very important part of the arable silage plant protection programme, representing 19% of the quantity of active substances used. Chlormequat was the most extensively used growth regulator. Products containing carboxin, guazatine, imazalil and thiram were the most extensively used seed treatment.

Swedes/Turnips: Trifluralin was the most extensively used herbicide, representing 58% of the herbicide-treated swedes/turnip area and 43% of the quantity applied. A formulation of mancozeb and metalaxyl was the most extensively used fungicide and pirimicarb the most widely used insecticide. Iprodione and thiram were the active substances used as seed treatments.

Kale/Rape: the most extensively used herbicide was glyphosate which was used for pre-sowing ground preparation. Glyphosate accounted for 22% of the treated area and 61% of the weight of active substances applied. Chlorpyrifos and cypermethrin were the only insecticides used. A greater quantity of chlorpyrifos than cypermethrin was applied (49 kg versus 1 kg), but the area treated was the same (49 ha).

Table 10
Areas (spray hectares) treated with each active substance or active substance combination in overall treatments

Active substance/combination	Crop								Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape			
Herbicides									
2,4-D	9,528								9,528
2,4-D, dicamba, triclopyr	3,388								3,388
2,4-DB, benazolin (-ethyl), MCPA	5,914								5,914
2,4-DB, linuron, MCPA	408								408
2,4-DB, MCPA	4,121			2,776					6,897
2,4-DB, mecoprop-P	1,128								1,128
acifluorfen			237						237
amidosulfuron	26,240			743					26,983
asulam	7,105								7,105
atrazine		14,166							14,166
bentazone, MCPB				666					666
bromoxynil		3,834							3,834
carfentrazone-ethyl, metsulfuron (-methyl)				2,499					2,499
clopyralid		89	824						913
clopyralid, fluroxypyr, triclopyr	2,584								2,584
clopyralid, triclopyr	27								27
desmedipham, ethofumesate, phenmedipham			3,125						3,125
dicamba, MCPA, mecoprop	5,099								5,099
dicamba, MCPA, mecoprop-P	4,978			208					5,186
dicamba, mecoprop	265								265
dicamba, mecoprop-P	5,156								5,156
dichlorprop	1,573								1,573

Table 10
Areas (spray hectares) treated with each active substance or active substance combination in overall treatments

Active substance/combination	Crop								Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape			
dichlorprop, MCPA, mecoprop-P	5,574								5,574
diflufenican, isoproturon				349					349
ethofumesate, metatriton, phenmedipham			44						44
ethofumesate, phenmedipham			2,810						2,810
fluzifop-P (-butyl)		162	139						301
fluroxypyr	2,416	270							2,686
fluroxypyr, triclopyr	25,888								25,888
glyphosate	52,856	1,760	139	5,988	142	247			61,132
glyphosate trimesium	197								1,976
haloxyfop-R			225						225
iodosulfuron-methyl-sodium				1,165					1,165
isoproturon				349					349
lenacil			2,493						2,493
MCPA	113,114			2,037					115,151
mecoprop	5,227			744					5,971
mecoprop-P	37,906			1,803					39,709
metatriton			3,654						3,654
metazachlor					300				300
metasulfuron (-methyl)	711			562					1,273
metasulfuron (-methyl), thifensulfuron (-methyl)				403					403
pendimethalin		5,684		422					6,106
propachlor								76	93
propaquizafop			239						239

Table 10
Areas (spray hectares) treated with each active substance or active substance combination in overall treatments

Active substance/combination	Crop								Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape			
pyridate		1,484							1,484
quizalofop-P			130						130
rimsulfuron		10							10
terbuthylazine, terbutryn				2,240					2,240
thifensulfuron (-methyl)	13,742								13,742
tribenuron (-methyl)				383					383
triclopyr	587								587
trifluralin					715	40			755
triflusaluron (-methyl)			3,129						3,129
unknown herbicide		216							216
Fungicides									
azoxystrobin				4,728					4,728
carbendazim, flusilazole			752	1,144					1,896
chlorothalonil				10,456					10,456
cyproconazole			80						80
cyproconazole, propiconazole				403					403
cyprodinil, propiconazole				365					365
epoxiconazole				9,695					9,695
epoxiconazole, fenpropimorph				282					282
epoxiconazole, kresoxim methyl				2,078					2,078
fenpropidin				2,901					2,901
fenpropimorph				966	43				1,009

Table 10
Areas (spray hectares) treated with each active substance or active substance combination in overall treatments

Active substance/combination	Crop							Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape		
flusilazole			127					127
mancozeb, metalaxyl					317			317
prochloraz				2,037				2,037
tebuconazole				1,165				1,165
Insecticides								
bendiocarb			50					50
carbofuran		952	137		99			1,189
carbofuran, isofenphos					67			67
chlorpyrifos	327				77	49		452
cypermethrin				2,847	32	49		2,928
deltamethrin					11			11
dimethoate				2,009				2,009
esfenvalerate			80	3,601	26			3,707
oxydemeton-methyl			79					79
pirimicarb					159			159
unknown insecticide	666			1,749				2,415
Growth regulators								
chlormequat				5,668				5,668
chlormequat, choline chloride, imazaquin				2,037				2,037
ethephon, mepiquat				1,567				1,567

Table 10
Areas (spray hectares) treated with each active substance or active substance combination in overall treatments

Active substance/combination	Crop							Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape		
Seed treatments								
carboxin, fludioxonyl, guazatine, imazalil, tebuconazole, thiram				1,975				1,975
carboxin, guazatine, imazalil, thiram				11,093				11,093
carboxin, guazatine, thiram				1,101				1,101
carboxin, thiram				917				917
fludioxonyl		11,694						11,694
fludioxonyl, guazatine				280				280
fludioxonyl, metalaxyl-M		5,474						5,474
fludioxonyl, metalaxyl, metalaxyl-M, methiocarb		1,164						1,164
guazatine				4,152				4,152
guazatine, imazalil				5,149				5,149
hymexazol			2,955			244		3,199
iprodione					1,200			1,200
metalaxyl		3,655						3,655
methiocarb		13,341	2,955			244		16,540
thiram			2,955			244		4,399
unknown seed treatment			284					284
Molluscicides								
methiocarb		878	153					1,031
All Pesticides	336,725	64,833	27,795	103,702	4,464	1,134		538,653

Table II
Quantities (kilograms) of each active substance or active substance combination applied in overall treatments

Active substance/combination	Crop							Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/Turnips	Kale/Rape		
Herbicides								
2,4-D	16,998							16,998
2,4-D, dicamba, triclopyr	4,774							4,774
2,4-DB, (-ethyl), MCPA	11,063							11,063
2,4-DB, linuron, MCPA	422							422
2,4-DB, MCPA	5,296			4,777				10,073
2,4-DB, mecoprop-P	1,466							1,466
acifluorfen			89					89
amidosulfuron	790			25				815
asulam	5,410							5,410
atrazine		24,152						24,152
bentazone MCPB				1,132				1,132
bromoxynil		1,557						1,557
carfentrazone-ethyl, metsulfuron (-methyl)				56				56
clopyralid		9	45					54
clopyralid, fluroxypyr, triclopyr	1,870							1,870
clopyralid, triclopyr	33							33
desmedipham, ethofumesate, phenmedipham			778					778
dicamba, MCPA, mecoprop	11,804							11,804
dicamba, MCPA, mecoprop-P	8,322			284				8,606
dicamba, mecoprop	125							125
dicamba, mecoprop-P	4,762							4,762
dichlorprop	1,461							1,461

Table II
Quantities (kilograms) of each active substance or active substance combination applied in overall treatments

Active substance/combination	Crop								Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape			
dichlorprop, MCPA, mecoprop-P	10,688								10,688
diflufenican, isoproturon				209					209
ethofumesate, metamitron, phenmedipham			9						9
ethofumesate, phenmedipham			1,178						1,178
fluzifop-P (-butyl)		6	11						17
fluroxypyr	423	108							531
fluroxypyr, triclopyr	11,185								11,185
glyphosate	73,939	2,379	91	8,605	167	334			85,515
glyphosate trimesium	426								426
haloxyfop-R			13						13
iodosulfuron-methyl-sodium				9					9
isoproturon				174					174
lenacil			571						571
MCPA	181,823			858					182,681
mecoprop	8,572			1,328					9,900
mecoprop-P	60,000			1,670					61,670
metamitron			2,882						2,882
metazachlor					193				193
metsulfuron (-methyl)	3			2					5
metsulfuron (-methyl), thifensulfuron (-methyl)				21					21
pendimethalin		7,627		626					8,253
propachlor					450	99			549
propaquizafop			30						30
pyridate		1,005							1,005

Table II
Quantities (kilograms) of each active substance or active substance combination applied in overall treatments

Active substance/combination	Crop							Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape		
quizalofop-P			24					24
rimsulfuron		0 ⁺						0
terbuthylazine, terbutryn				2,798				2,798
thifensulfuron (-methyl)	195							195
tribenuron (-methyl)				4				4
tricyclopyr	568							568
trifluralin					609	44		653
triflusulfuron (-methyl)			65					65
Fungicides								
azoxystrobin				937				937
carbendazim, flusilazole			433	140				573
chlorothalonil				6,903				6,903
cyproconazole			5					5
cyproconazole, propiconazole				95				95
cyprodinil, propiconazole				118				118
epoxiconazole				925				925
epoxiconazole, fenpropimorph				129				129
epoxiconazole, kresoxim methyl				267				267
fenpropidin				1,079				1,079
fenpropimorph				357	29			386
flusilazole			14					14
mancozeb, metalaxyl					571			571
prochloraz				566				566

Table II
Quantities (kilograms) of each active substance or active substance combination applied in overall treatments

Active substance/combination	Crop							Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/Turnips	Kale/Rape		
tebuconazole				233				233
Insecticides								
bendiocarb			14					14
carbofuran		362	67		43			472
carbofuran, isofenphos					55			55
chlorpyrifos	235				52	49		336
cypermethrin				71	1	1		73
deltamethrin					0 ⁺			0
dimethoate				458				458
esfenvalerate			1	15	0 ⁺			16
oxydemeton-methyl			10					10
pirimicarb					20			20
Growth regulators								
chlormequat				5,490				5,490
chlormequat, choline chloride, imazaquin				2,021				2,021
ethephon, mepiquat				892				892
Seed treatments								
carboxin, fludioxonyl, guazatine, imazalil, tebuconazole, thiram				155				155
carboxin, guazatine, imazalil, thiram				809				809
carboxin, guazatine, thiram				41				41
carboxin, thiram				96				96

Table II
Quantities (kilograms) of each active substance or active substance combination applied in overall treatments

Active substance/combination	Crop								Total
	Grass	Maize	Fodder beet	Arable silage	Swedes/ Turnips	Kale/ Rape			
fludioxonyl		13							13
fludioxonyl, guazatine				10					10
fludioxonyl, metalaxyl-M		4							4
fludioxonyl, metalaxyl, metalaxyl-M, methiocarb		83							83
guazatine				380					380
guazatine, imazalil				440					440
hymexazol			46			10			56
iprodione					7				7
metalaxyl		2							2
methiocarb		1,832	22			5			1,859
thiram			26		8	6			40
Molluscicides									
methiocarb		47	18						65
All Pesticides	422,653	39,186	6,442	45,205	2,205	548			516,239

+ Quantities less than 0.5 kg are rounded to 0

Table 12
Grass: area treated and quantity of each active substance
or active substance combination applied in overall treatments

Active substance/combination	Area (spray ha)	Quantity (kg)
Herbicides		
2,4-D	9,528	16,998
2,4-D, dicamba, triclopyr	3,388	4,774
2,4-DB, benazolin (-ethyl), MCPA	5,914	11,063
2,4-DB, linuron, MCPA	408	422
2,4-DB, MCPA	4,121	5,296
2,4-DB, mecoprop-P	1,128	1,466
amidosulfuron	26,240	790
asulam	7,105	5,410
clopyralid, fluroxypyr, triclopyr	2,584	1,870
clopyralid, triclopyr	27	33
dicamba, MCPA, mecoprop	5,099	11,804
dicamba, MCPA, mecoprop-P	4,978	8,322
dicamba, mecoprop	265	125
dicamba, mecoprop-P	5,156	4,762
dichlorprop	1,573	1,461
dichlorprop, MCPA, mecoprop-P	5,574	10,688
fluroxypyr	2,416	423
fluroxypyr, triclopyr	25,888	11,185
glyphosate	52,856	73,939
glyphosate trimesium	197	426
MCPA	113,114	181,823
mecoprop	5,227	8,572
mecoprop-P	37,906	60,000
metsulfuron (-methyl)	711	3
thifensulfuron (-methyl)	13,742	195
triclopyr	587	568
Insecticides		
chlorpyrifos	327	235
unknown insecticide	666	*
All Pesticides	336,725	422,653

* Name of product and amount used not known

Table 13
Maize: area treated and quantity of each active substance or active substance combination applied in overall treatments

Active substance/combination	Area (spray ha)	Quantity (kg)
Herbicides		
atrazine	14,166	24,152
bromoxynil	3,834	1,557
clopyralid	89	9
fluazifop-P (-butyl)	162	6
fluroxypyr	270	108
glyphosate	1,760	2,379
pendimethalin	5,684	7,627
pyridate	1,484	1,005
rimsulfuron	10	0 ⁺
unknown herbicide	216	*
Insecticides		
carbofuran	952	362
Seed treatments		
fludioxonyl	11,694	13
fludioxonyl, metalaxyl-M	5,474	4
fludioxonyl, metalaxyl, metalaxyl-M, methiocarb	1,164	83
metalaxyl	3,655	2
methiocarb	13,341	1,832
Molluscicides		
methiocarb	878	47
All Pesticides	64,833	39,186

* Name of product and amount used not known ⁺ Quantities less than 0.5 kg are rounded to 0

Table 14
Fodder beet: area treated and quantity of each active substance
or active substance combination applied in overall treatments

Active substance/combination	Area (spray ha)	Quantity (kg)
Herbicides		
aclonifen	237	89
clopyralid	824	45
desmedipham, ethofumesate, phenmedipham	3,125	778
ethofumesate, metamitron, phenmedipham	44	9
ethofumesate, phenmedipham	2,810	1,178
fluazifop-P (-butyl)	139	11
glyphosate	139	91
haloxyfop-R	225	13
lenacil	2,493	571
metamitron	3,654	2,882
propaquizafop	239	30
quizalofop-P	130	24
triflusaluron (-methyl)	3,129	65
Fungicides		
carbendazim, flusilazole	752	433
cyproconazole	80	5
flusilazole	127	14
Insecticides		
bendiocarb	50	14
carbofuran	137	67
esfenvalerate	80	1
oxydemeton-methyl	79	10
Seed treatments		
hymexazol	2,955	46
methiocarb	2,955	22
thiram	2,955	26
unknown seed treatment	284	*
Molluscicides		
methiocarb	153	18
All Pesticides	27,795	6,442

* Name of product and amount used not known

Table 15
Arable silage: area treated and quantity of each active substance
or active substance combination applied in overall treatments

Active substance/combination	Area (spray ha)	Quantity (kg)
Herbicides		
2,4-DB, MCPA	2,776	4,777
amidosulfuron	743	25
bentazone, MCPB	666	1,132
carfentrazone-ethyl, metsulfuron (-methyl)	2,499	56
dicamba, MCPA, mecoprop-P	208	284
diflufenican, isoproturon	349	209
glyphosate	5,988	8,605
iodosulfuron-methyl-sodium	1,165	9
isoproturon	349	174
MCPA	2,037	858
mecoprop	744	1,328
mecoprop-P	1,803	1,670
metsulfuron (-methyl)	562	2
metsulfuron (-methyl), thifensulfuron (-methyl)	403	21
pendimethalin	422	626
terbuthylazine, terbutryn	2,240	2,798
tribenuron (-methyl)	383	4
Fungicides		
azoxystrobin	4,728	937
carbendazim, flusilazole	1,144	140
chlorothalonil	10,456	6,903
cyproconazole, propiconazole	403	95
cyprodinil, propiconazole	365	118
epoxiconazole	9,695	925
epoxiconazole, fenpropimorph	282	129
epoxiconazole, kresoxim methyl	2,078	267
fenpropidin	2,901	1,079
fenpropimorph	966	357
prochloraz	2,037	566
tebuconazole	1,165	233
Insecticides		
cypermethrin	2,847	71
dimethoate	2,009	458
esfenvalerate	3,601	15
unknown insecticide	1749	*

Table 15 (continued)
 Arable silage: area treated and quantity of each active substance
 or active substance combination applied in overall treatments

Active substance/combination	Area (spray ha)	Quantity (kg)
Growth regulators		
chlormequat	5,668	5,490
chlormequat, choline chloride, imazaquin	2,037	2,021
ethephon, mepiquat	1,567	892
Seed treatments		
carboxin, fludioxonyl, guazatine, imazalil, tebuconazole, thiram	1,975	155
carboxin, guazatine, imazalil, thiram	11,093	809
carboxin, guazatine, thiram	1,101	41
carboxin, thiram	917	96
fludioxonyl, guazatine	280	10
guazatine	4,152	380
guazatine, imazalil	5,149	440
All Pesticides	103,702	45,205

* Name of product and amount used not known

Table 16
Swedes/Turnips: area treated and quantity of each active substance
or active substance combination applied in overall treatments

Active substance/combination	Area (spray ha)	Quantity (kg)
Herbicides		
glyphosate	142	167
metazachlor	300	193
propachlor	76	450
trifluralin	715	609
Fungicides		
fenpropimorph	43	29
mancozeb, metalaxyl	317	571
Insecticides		
carbofuran	99	43
carbofuran, isofenphos	67	55
chlorpyrifos	77	52
cypermethrin	32	1
deltamethrin	11	0 ⁺
esfenvalerate	26	0 ⁺
pirimicarb	159	20
Seed treatments		
iprodione	1,200	7
thiram	1,200	8
All Pesticides	4,464	2,206

⁺Quantities less than 0.5 kg are rounded to 0

Table 17
Kale/Rape: area treated and quantity of each active substance
or active substance combination applied in overall treatments

Active substance/combination	Area (spray ha)	Quantity (kg)
Herbicides		
glyphosate	247	334
propachlor	17	99
trifluralin	40	44
Insecticides		
chlorpyrifos	49	49
cypermethrin	49	1
Seed treatments		
hymexazol	244	10
methiocarb	244	5
thiram	244	6
All Pesticides	1,134	548

SPOT TREATMENTS

Spot treatments refer to treatment of problem weed patches using a knapsack sprayer or similar device. This treats localised areas or patches as distinct from overall treatments with e.g. a tractor-mounted sprayer. In such cases, surveyors recorded the total amount of product applied, as the area treated was not available. Spot treatments were only used for the application of herbicides to grassland but a significant quantity of herbicides was applied in this way. The quantities of herbicidal active substances used as spot treatments whether as single substances or in combinations of two or more substances are provided in Table 18.

Table 18

Quantities of active substances or active substance combinations applied as spot treatments

Active substance/combination	kg	Active substance/combination	kg
2,4-D	1,092	dichlorprop, MCPA, mecoprop-P	11
2,4-D, dicamba, triclopyr	4,618	fluroxypyr, triclopyr	125
amidosulfuron	105	glyphosate	7,540
asulam	1,944	MCPA	24,335
carfentrazone-ethyl, metsulfuron (-methyl)	3	mecoprop	3,840
clopyralid, fluroxypyr, triclopyr	234	mecoprop-P	2,815
clopyralid, triclopyr	2,392	paraquat	140
dicamba, MCPA, mecoprop	683	simazine	269
dicamba, mecoprop, triclopyr	17	thifensulfuron (-methyl)	24
dicamba, mecoprop-P	258	triclopyr	603
		Total quantity	51,048

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Department of Agriculture and Food - Form 1F
 (To be used for Maize, Fodder Beet, Arable Silage, Swedes, Turnips, Kale and Rape)

Region _____ Class Size _____ Holding No. _____ Block Number (s)* _____ Block(s) area (Ha) _____
 Crop name _____ Variety(s) _____ Date Sown _____ Drilling Method _____ (Maize – Plastic Seed Weight _____ Date Harvested _____

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

Surveyor _____ Date surveyed _____ Page _____ of _____ Comments (if comments are noted, please tick box and write on back)

Department of Agriculture and Food - Form 1G
(To be used for grassland)

Region _____ Class Size _____ Holding _____ Surveyor _____ Date surveyed _____ Survey by: Visit Phone Page _____ of _____

Grass re-seeded in 2003 Undersown Directly sown Block number(s) _____ Block(s) area (ha) _____ Date sown _____ Nurse crop _____ Drill method _____

	Treated(Y/N)	Product / A.I.	Dressing Rate	A/E	Merchant	Seeding Rate	Operator	Source
1	Seed							
	Date	Product/ A.I. Used	Application Rate	A/E	Reason for use	Area Treated	Operator	Source
1								
2								
3								
4								

Established Pasture: Total area of established pasture (New ley Permanent and Rough) _____

	*Crop Profile (age of crop)	Block Number	Date	Product/ A.I. Used	Application Rate	A/E	Reason for use	Area Treated	Operator	Source
1										
2										
3										
4										
5										
6										
7										
8										
9										

*New Ley(New): Second, Third and Fourth year Grass (Sown 2000 – 2002)

Permanent Pasture(Perm): 5th Year Grass and older (Sown Pre 2000)

Rough Grazing (Rough): Hill or rough land on which hay / silage cannot be harvested

Comments P.T.O