PESTICIDE USAGE IN SCOTLAND

ARABLE CROPS 2006 (Revised 2009)

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Reason for Report Revision

This report has been reissued to correct inaccuracies in active ingredient application area data that were overestimated in the original report.

This issue only affects a limited number of active ingredients in relation to active ingredient application area. All formulation data and active ingredient weight data are unaffected. The tables containing amended data are:

Table 27 – Cereal fungicide active ingredients
Table 28 – Cereal herbicide and growth regulator active ingredients
Table 32 – Oilseed rape herbicide active ingredients
Table 35 – Potato fungicide active ingredients
Table 36 – Potato herbicides active ingredients
Table 39 – Legume fungicide active ingredients
Table 44 – Set aside herbicides active ingredients
Table 45 – Principal active ingredients
Tables 47-50 – Comparisons with previous years

Text relating to the data contained in these tables has also been revised.

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SUMMARY

This report presents information from a survey of pesticide usage on arable crops in Scotland during the 2005/2006 growing season. The sample data have been raised to give estimates of national pesticide usage.

Compared with the previous survey in 2004, the total area of arable crops, excluding land for set aside, declined by 9% to 466,851 hectares. There were decreases in all the main crops surveyed except oats, triticale and field beans.

Insecticide usage, when measured by the area treated with active ingredients, increased by 12% compared with the previous survey, despite the decline in area grown. The pyrethroid, lambda-cyhalothrin, applied to over 77,000 hectares, remained the most commonly used insecticide.

There was a 25% decline in molluscicide use, due mainly to decreased usage on potatoes. As in previous surveys, metaldehyde, applied to almost 27,000 hectares, remained the most widely used molluscicide.

When measured by area treated with active ingredients, overall fungicide use declined by 10% compared with 2004, in line with the decrease in area grown. Chlorothalonil, applied to over 442,000 hectares remained the most commonly used fungicide, and overall the most widely used active ingredient.

Herbicide usage, when measured by area of active ingredients, decreased by 10%, in line with the reduction of area grown. Mecoprop-P, applied to almost 218,000 hectares remained the principal herbicide.

INTRODUCTION

This is the thirteenth survey of pesticide usage on arable crops in Scotland since 1974[1-13], (survey report 74 in 1987 covered potatoes only) and is part of a continuing program of post registration surveillance of pesticides. The survey covered cereals, oilseeds, potatoes, legumes (peas, beans and lupins), and set aside land.

DEFINITIONS AND NOTES

Basic area is the planted area of crop which was treated with a given pesticide or pesticide group, irrespective of the number of times it was applied to that area. Basic areas are not presented anywhere in the report, but their values are used to calculate the percentage of crop treated with a given pesticide or pesticide group.

Area treated (or hectares treated) is the basic area of a crop treated with a given pesticide multiplied by the number of treatments that area received. These terms are synonymous with "spray area" and "spray hectare" which have appeared in previous reports. The new terms are believed to more appropriate where pelleted or granular treatments are applied.

In this report the term ‘formulation(s)’ is used to describe the pesticide active ingredient or mixture of active ingredients in a product(s).

The reasons for the uses of pesticides reported in the text are those given by growers and may sometimes be inappropriate.

It should be borne in mind that some of the herbicides may not have been applied directly to the crop itself but either as land preparation treatments prior to sowing/planting the crop or to control weeds at the field margins.

Usage of sulphur on oilseed rape has been recorded as though it were a pesticide. However, the predominant reason for its use is as a nutrient rather than to control disease.

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

Data from the 2004 survey are provided for comparison purposes in some of the tables, although it should be borne in mind that there may be minor differences in the range of crops surveyed, together with changes in areas of each of the crops grown.

METHOD

Using the June 2006 Agricultural Census[14] a sample was drawn representing the whole of Scotland and was selected from holdings growing any of the combinable crops and/or potatoes.

As in previous surveys of this type, the country was divided into 11 land-use regions[15] (Fig 1). Holdings were stratified by land-use region and by size group (based on the total area of arable crops grown, excluding set aside land). Sampling fractions within both regions and size groups were based on the areas of the relevant crops grown rather than number of holdings, so that smaller size groups would not dominate the sample.

The survey period was from the end of the 2005 harvest to the end of the 2006 harvest. As well as recording treatments applied directly to the crop, data were also collected on land preparation treatments prior to sowing/planting the crop.

With a few exceptions, each grower was visited by a surveyor, following an introductory letter and telephone call. A small number of growers in remote areas had to be interviewed by telephone, again by prior arrangement. When necessary, data were also collected from consultant agronomists, contractors and seed merchants. In all, information was obtained from 320 holdings. Details of the numbers of holdings visited and their distribution are given in Table 2 and the areas of crops surveyed are shown in Table 51.

For all crops, sample data were raised to give estimates of national pesticide usage using raising factors (Table 53). These were based on the areas growing arable crops in the 2006 Agricultural Census[14] within regions and size groups (Table 52). Adjustments (Table 54) were made for each crop, including those grown on set aside land, within each region by applying the raising factors (Table 53) to the sample area of each crop grown and comparing this with the area from the 2006 Agricultural Census. A second adjustment was made for crops where no holdings were sampled in one or more regions (Table 54). In Tables 47, 48 and 49 only, estimates of pesticide usage were further adjusted to take into account those pesticide treatments which were known to have been applied, but where the details were unspecified.

WINTER BARLEY

The area of winter barley grown in 2006 was 53,697 hectares, a 5% decline compared with the previous survey in 2004. The most popular variety encountered was Pearl, accounting for 27% of the sample surveyed.

Seed treatments (Table 5)

Pesticides were applied to 90% of the seed, similar to that recorded in 2004.

The newly approved formulation containing prothioconazole/tebuconazole/triazoxide was the most commonly used treatment applied to 34% of the winter barley seed. Tebuconazole/triazoxide, which was the most popular treatment in 2004, was used on 30% of the crop, and prochloraz/triticonazole on 12%.

Insecticides and molluscicides (Tables 6, 26)

Insecticide usage increased slightly, applied to 32% of the crop in 2006 compared with 26% in 2004. Tau-fluvalinate, used on 9% of the crop area, replaced lambda-cyhalothrin (5%) as the most commonly used insecticide. Cypermethrin (7%) and deltamethrin (5%) were also widely used. As in previous years, treatment was predominately for aphid control.

Molluscicides were recorded on 4% of the crop area, compared with only 1% in 2004. Metaldehyde was applied to 2,021 hectares and methiocarb to 233 hectares.

Fungicides (Tables 7, 27)

The entire crop received a fungicide treatment compared with 98% in 2004. Chlorothalonil applied to 58,634 hectares was the most popular active ingredient. Its usage has increased in recent years due its good activity against the ever-increasing disease *Rhynchosporium secalis*. Increased chlorothalonil usage is also partly due to a decline in sensitivity of some triazole fungicides, which are commonly used to control this disease (*Pers. Comm*. Oxley,S. 2004).

Fenpropimorph was also widely used, applied to 67% of the crop compared with 87% in the previous survey. Prothioconazole which was launched in 2005 was recorded on 69% of the crop area.

Herbicides and growth regulators (Tables 8, 28)

Nearly the entire crop (96%) was treated with a herbicide, slightly lower than in the previous survey (100%). The main reason given for the use of herbicides was general weed control. Isoproturon remained the most common herbicide, applied to 39,780 hectares, accounting for 23% of the total area treated with herbicide active ingredients (26% in 2004).

Pendimethalin, applied to 22,034 hectares and diflufenican to 21,527 hectares were also extensively used.

Eighty-eight percent of the winter barley crop area was treated with a growth regulator. The main active ingredients were very similar to that recorded in the last survey. Chlormequat (73%), trinexapac-ethyl (57%) and 2-chloroethylphosphonic acid (51%) were again widely used.

SPRING BARLEY

There were 220,408 hectares of spring barley grown in Scotland in 2006, compared with 259,329 hectares in 2004. The most popular variety encountered was Optic, accounting for 50% of the sample surveyed.

Seed treatments (Table 5)

Ninety-one percent of the seed was treated with a pesticide (94% in 2004).

In line with previous surveys tebuconazole/triazoxide remained the most frequently encountered formulation, applied to 40% of the crop area. The new formulation comprising prothioconazole/tebuconazole/triazoxide was also very popular, applied to 28% of the crop area. In comparison with 2004, usage of imazalil/triticonazole increased (9%), whilst that of fludioxonil declined from 11% to 5% of the crop.

Insecticides and molluscicides (Tables 6, 26)

Insecticides were recorded on 7% of the area of crop grown (3% in 2004). As in the previous five surveys, chlorpyrifos, applied to 4,362 hectares for leatherjacket control, was the most popular insecticide. This was closely followed by tau-fluvalinate which was applied to 3,945 hectares.

Molluscicide use on spring barley remained very low, with metaldehyde encountered on only 30 hectares.

Fungicides (Tables 7, 27)

The proportion of the crop area treated with a fungicide was 89%, similar to that recorded in 2004.

The use of chlorothalonil continued to rise due to its effectiveness against barley leaf spot diseases (*Pers. Comm*. Oxley,S), replacing fenpropimorph as the principal fungicide. The total area treated with chlorothalonil increased from 162,854 hectares (51%) in the previous survey to 173,581 hectares (67%) in 2006.

Usage of fenpropimorph (49%) and epoxiconazole (20%) decreased. However, the new active prothioconazole was widely recorded on 41% of the area grown.

Herbicides and growth regulators (Tables 8, 28)

Herbicides were applied to 95% of the spring barley crop area, mainly for general weed control, compared with 98% in 2004.

Mecoprop-P, applied to 68% of the crop area, replaced metsulfuron-methyl (52%) as the most commonly used herbicide. Thifensulfuron-methyl (57%) and tribenuron-methyl (36%) were also widely used.

The proportion of the crop area treated with a growth regulator has almost halved since 2004 with only 7% receiving a treatment in 2006. The principal active ingredients encountered were chlormequat and trinexapac-ethyl (each 3%).

WINTER WHEAT

The estimated area of winter wheat grown in 2006 was 94,231 hectares, a 5% decrease compared with the previous survey. The most popular varieties encountered were Robigus and Consort, accounting for 29% and 26 % of the sample surveyed respectively.

Seed treatments (Table 5)

The proportion of seed treated with a pesticide was 93%, slightly lower than the 94% recorded in 2004. The formulation comprising prochloraz/triticonazole applied to 22% of the crop area replaced bitertanol/fuberidazole (12%) as the most popular seed treatment. Fludioxonil (15%) and fuberidazole/triadimenol (11%) were also widely used.

Insecticides and molluscicides (Tables 6, 26)

The proportion of crop area treated with an insecticide increased slightly from 35% in the last survey to 41% in 2006.

Cypermethrin, applied to 13,692 hectares and accounting for 31% of the total area treated with insecticide active ingredients was the most popular insecticide.

Only 8% of the crop area was treated with molluscicides, compared with 5% in 2004. Metaldehyde, applied to 6,163 hectares remained the predominant active ingredient.

Fungicides (Tables 7, 27)

Nearly all (99%) of the winter wheat was treated with a fungicide, with disease precaution and control of septoria as the most commonly cited reasons for their use.

As in the previous survey, chlorothalonil was the principal active ingredient, applied to 196,007 hectares and accounted for 25% of the total area of fungicide active ingredients.

Epoxiconazole and prothioconazole applied to 102,217 and 67,252 hectares respectively were also commonly used.

Herbicides and growth regulators (Tables 8, 28)

Ninety-seven percent of the winter wheat area received a herbicide treatment, a very similar proportion to that recorded in previous surveys. Control of annual broad-leaved weeds and general weed control were the main reasons given for their use.

Isoproturon, applied to 70% of the crop area, continues to be by far the most popular herbicide. Usage of pendimethalin (49%) and picolinafen (34%) had increased since 2004, whereas usage of mecoprop-P (34%) and diflufenican (32%) had decreased.

Growth regulators were used on 96% of winter wheat, a similar proportion to that recorded in the last survey. Chlormequat, applied to 123,901 hectares remained the main growth regulator.

SPRING WHEAT

This crop is not recorded separately in the Agricultural Census, but it was estimated that 5,384 hectares were grown in Scotland in 2006, compared with only 2,535 hectares in 2004 and 842 hectares in 2002. Estimates of pesticide usage are presented in Tables 5-8 and 25-28.

WINTER OATS

The area of winter oats grown in 2006 was 6,609 hectares, a 7% increase compared with 2004.

Seed treatments (Table 5)

Eighty-one percent of winter oats received a seed treatment. Fludioxonil remains the most commonly used seed treatment, applied to 47% of the crop area, compared with 30% in the previous survey. Usage of bitertanol/fuberidazole also increased from 17% in 2004 to 28% of the 2006 crop area. However, carboxin/thiram which was recorded on 17% in 2004 was not recorded at all in 2006.

Insecticides and molluscicides (Tables 6, 26)

The proportion of the crop area treated with insecticide was 28%, slightly lower than the 31% recorded in the last survey.

Lambda-cyhalothrin, applied to 2,816 hectares, 21% of the crop area, was the most popular insecticide. Cypermethrin, which was the main insecticide used in 2004 was not encountered during the 2006 survey.

No molluscicide usage was recorded.

Fungicides (Tables 7, 27)

Nearly all (99%) of the crop area was treated with fungicides (96% in 2004), with disease precaution the main reason cited for their use.

As in previous years, fenpropimorph applied to 75% of the crop area was the most popular fungicide. Metrafenone (43%) and pyraclostrobin (35%) were also widely used, although neither were encountered in 2004.

Herbicides and growth regulators (Tables 8, 28)

Herbicides were applied to 99% of the crop area in 2006, compared with the entire crop being treated in 2004.

Metsulfuron-methyl, applied to 4,771 hectares and flupysulfuron-methyl, to 3,980 hectares, were the most commonly used herbicides.

Growth regulators were recorded on 81% of the crop, compared with 88% in 2004. As in the previous survey chlormequat (62%) and trinexapac-ethyl (42%) were the main active ingredients.

SPRING OATS

The area grown in 2006 was 16,049 hectares, very similar to that grown in 2004.

Seed treatments (Table 5)

Eighty-three percent of the seed was treated, slightly lower than the eighty-seven percent recorded in 2004.

Fludioxonil, applied to 4,939 hectares, replaced bitertanol/fuberidazole (4,296 ha) as the principal formulation.

Insecticides and molluscicides (Tables 6, 26)

Eleven percent of spring oats received an insecticide treatment mainly for aphid control, compared with only 3% in 2004.

Lambda-cyhalothrin, applied to 1,845 hectares and accounting for 82% of the total area of insecticide active ingredients, was the most popular treatment.

As in previous surveys, no molluscicide usage was recorded.

Fungicides (Tables 7, 27)

The proportion of the crop area treated with fungicide increased significantly from 61% in 2004 to 94% in 2006.

Fenpropimorph remained by far the most popular fungicide applied to 14,930 hectares. Other treatments included metrafenone (32%), quinoxyfen (21%), kresoxim-methyl and tebuconazole (both 20%).

Herbicides and growth regulators (Tables 8, 28)

Herbicides were applied to 94% of the spring oats crop area (91% in 2004).

The two most popular herbicides were again mecoprop-P, applied to 12,844 hectares, and metsulfuron-methyl, to 5,978 hectares.

Eighty-three percent of the crop area was treated with a growth regulator, compared with 49% in 2004. As in previous surveys, chlormequat, applied to 12,367 hectares was the most popular treatment.

WINTER OILSEED RAPE

Compared with the previous survey, the area grown declined by 9% to 30,931 hectares in 2006. The most popular varieties encountered were Lioness and Expert, accounting for 21% and 20% of the sample surveyed respectively.

Seed treatments (Table 9)

Ninety-six percent of the seed was treated, very similar to that recorded in 2004.

Beta-cyfluthrin/imidacloprid applied to 71% of the crop area, was the most commonly used formulation closely followed by iprodione (69%) and thiram (66%).

Insecticides and molluscicides (Tables 10, 30)

Insecticides were applied to 79% of the crop area, compared with only 60% in the last survey. The main cited reasons for use were aphid or pollen beetle control.

Lambda-cyhalothrin, applied to 33% of the crop area and tau-fluvalinate to 26%, were the most popular insecticides.

Nineteen percent of the crop area was treated with molluscicides (12% in 2004). Metaldehyde, applied to 6,173 hectares accounted for 85% of the total area treated with molluscicide active ingredients. Methiocarb was the only other molluscicide encountered.

Fungicides (Tables 11, 31)

Nearly all (99%) of the crop area received a fungicide, mainly for general disease precaution or for the control of light leaf spot.

The use of tebuconazole significantly increased from 35% of the crop area in 2004 to 66% in 2006, replacing flusilazole (59%) as the principal fungicide. Boscalid (57%) and carbendazim (50%) were also widely used.

Herbicides and growth regulators (Tables 12, 32)

Herbicide usage dropped slightly to 96% of the crop area in 2006 from 100% in the previous survey.

Metazachlor, applied to 84% of the crop area, remains by far the most commonly used herbicide, accounting for 35% of the total area treated with herbicide active ingredients. Glyphosate was used on 50% of the crop area as a pre-harvest desiccant, and propaquizafop on 42% mainly for control of volunteer cereals.

In 2006, no growth regulators were encountered. In previous surveys only very small treated areas were recorded.

SPRING OILSEED RAPE

The area grown in 2006 was 2,760 hectares, a 47% decline since the previous survey.

Seed treatments (Table 9)

The proportion of seed treated with a pesticide fell from the entire crop in 2004 to 88% in 2006.

Thiram applied to 67% of the crop remained the principal treatment. As in previous years, iprodione and the insecticide formulation comprising beta-cyfluthrin/imidacloprid (each 50%) were the only other treatments encountered.

Insecticides and molluscicides (Tables 10, 30)

Eighty-five percent of the crop area was treated with an insecticide. Control of pollen beetle was the main cited reason for their use.

Lambda-cyhalothrin and deltamethrin, applied to 1,135 and 1,043 hectares respectively were the main active ingredients.

No molluscicide usage was recorded.

Fungicides (Tables 11, 31)

Fungicides were applied to 93% of the crop area, compared with only 80% in 2004.

As in the previous survey, boscalid, applied to just over half of the crop area (1,432 hectares), was the most popular fungicide. Flusilazole (38%) and carbendazim (26%) were also widely used.

Herbicides and growth regulators (Tables 12, 32)

In 2006, the entire crop was treated with herbicides, compared with only 95% in the previous survey.

The most commonly used herbicides remain as metazachlor, applied to 2,332 hectares, and glyphosate, to 993 hectares, predominantly for pre-harvest desiccation.

No growth regulators were encountered.

SEED POTATOES

The area of seed potatoes grown in 2006 was 11,440 hectares, a 5% decline compared with the last survey.

Seed treatments (Table 13)

Eighty-seven percent of the seed was treated with a pesticide, compared with 97% in 2004.

As in the previous survey, imazalil and pencycuron, both alone and in formulation together, were the most commonly used treatments.

Insecticides and molluscicides (Tables 14, 34)

The proportion of the crop area treated with an insecticide remained very similar with 89% of the crop treated. Aphid control was the main cited reason for use.

Lambda-cyhalothrin, applied to 84% of the crop area and pirimicarb, applied to 74% were the most popular insecticides. The use of deltamethrin continued to decline with only 1% of the crop area treated in 2006, compared with 38% in 2004 and 56% in 2002.

As in the previous survey, 26% of seed potatoes received a molluscicide. Methiocarb, applied to 2,723 hectares, remained the most widely used molluscicide.

Fungicides (Tables 15, 35)

Almost the entire crop (99%) was treated with a fungicide.

Mancozeb, applied to 96% of the crop area for blight control was the most commonly used fungicide. Fluazinam (94%) and cymoxanil (91%) were also widely used.

Herbicides (Tables 16, 36)

Ninety-six percent of the crop was treated with a herbicide, compared with the whole crop in 2004.

Paraquat, applied to 96% of the crop area, and linuron, to 76%, remained the main treatments for weed control. Diquat was also widely used (68%) and replaced sulphuric acid (33%) as the most commonly used desiccant. Sulphuric acid had previously been applied to 90% of the crop area in 2004. The use of carfentrazone-ethyl as a desiccant has greatly increased from 1% of the crop area in 2004 to 21% in 2006.

EARLY POTATOES

The area grown in 2006 was 831 hectares, compared with 941 in the previous survey. Only a few crops were encountered in this survey, and detailed pesticide usage data are presented in all the relevant tables.

WARE POTATOES

There were 15,853 hectares of ware potatoes grown in Scotland in 2006, a 3% decline compared with 2004.

Seed treatments (Table 13)

Eighty-nine percent of the seed was treated with a pesticide (86% in 2004).

As in the previous survey, imazalil and pencycuron, both alone and in formulation together, were the most commonly used treatments.

Insecticides and molluscicides (Tables 14, 34)

The proportion of crop area treated with insecticide had increased slightly from 60% in the last survey to 65% in 2006, mainly for control of aphids.

Lambda-cyhalothrin, applied to 12,951 hectares remained the most commonly used insecticide, with pirimicarb, applied to 8,274 hectares also widely used.

Forty-eight percent of the crop area was treated with a molluscicide. Methiocarb, applied to 10,902 hectares was the most popular treatment.

Fungicides (Tables 15, 35)

Nearly all (99%) of the crop was treated with a fungicide, similar to that recorded in the previous survey.

Mancozeb, used on 94% of the crop area, cymoxanil (91%) and fluazinam (82%) were the most commonly used fungicides for blight control.

Herbicides and growth regulators (Tables 16, 36)

Ninety-eight percent of the ware area was treated with a herbicide. Diquat, applied to 21,347 hectares for both general weed control and pre-harvest desiccation was the most popular herbicide. Paraquat and linuron, applied to 13,795 and 7,919 hectares respectively were also widely used. The use of sulphuric acid declined from 79% of the crop area in 2004 to only 39% in 2006.

A small area (5%) was treated with the growth regulator, maleic hydrazide. No growth regulator usage was recorded in 2004.

LEGUMES

Peas for combining (Tables17-20, 37-40)

In 2006, 1,490 hectares of peas for combining were grown, a 6% decline since the last survey.

Thiram, applied to 981 hectares, was the only seed treatment encountered.

Only 5% of the crop area was treated with an insecticide. Pirimicarb, applied to 78 hectares for aphid control, was the only insecticide recorded.

Half of the crop area received a fungicide, similar to that recorded in 2004. Chlorothalonil, applied to 746 hectares remained the principal fungicide.

Herbicides were applied to 50% of the crop area, compared with 64% in the previous survey. Glyphosate, applied to 46% of the crop for both general weed control and pre-harvest desiccation, was the most popular herbicide active ingredient.

Field beans (Tables17-20, 37-40)

The area grown in 2006 was 4,523 hectares, an increase of 61% since the previous survey.

No seed treatments were encountered during the 2006 survey. In 2004, 24% of the seed had been treated with thiram.

Fifty-two percent of the crop area was treated with an insecticide, very similar to the last survey. Lamda-cyhalothrin, applied to 1,377 hectares and accounting for 46% of the total area treated with insecticide active ingredients was the most popular insecticide.

Fungicides were applied to 93% of the crop area (85% in 2004). Chlorothalonil, applied to 87% of the crop area, remained the main fungicide.

Herbicide usage remained very similar to the previous survey with 90% of the crop area being treated. Simazine was by far the most popular herbicide, applied to 61% of the crop. Glyphosate was also widely used (38%) as a desiccant.

Lupins (Tables17-20, 37-40)

The area of lupins grown in 2006 was 581 hectares, a 16% decline since 2004.

Twenty-four percent of lupins were treated with a seed treatment. The formulation comprising thiabendazole/thiram was the only treatment recorded.

Deltamethrin, applied to 16% of the crop was the only insecticide encountered. No insecticides were recorded in 2004.

Fungicides were used on 16% of the crop area, compared with 13% in the previous survey. Chlorothalonil was the only fungicide recorded.

Forty percent of the crop was treated with a herbicide, compared with the entire crop in 2004. Glyphosate, applied for desiccation and pendimethalin for general weed control (each 40%) were the only herbicides encountered.

MINOR CROPS

The areas of these crops are recorded in the Agricultural Census, but the areas grown are considered too small to warrant inclusion of data in the tables. Estimates of pesticide usage of all the active ingredients applied are used to calculate the survey's principal active ingredient.

Triticale

The area in 2006 was 1,286 hectares, similar to that in 2004.

The key active ingredients in each pesticide category are listed below:

Fungicides	: tebuconazole, azoxystrobin, prothioconazole
Herbicides	: diflufenican, isoproturon, mecoprop-P
Growth regulators	: trinexapac-ethyl, chlormequat, 2-chloroethylphosphonic acid
Insecticides	: deltamethrin
Molluscicides	: methiocarb

Linseed

The area grown in 2006 was 314 hectares, a 51% decline compared with the previous survey.

No linseed was encountered during the 2006 survey.

SET ASIDE LAND

The total area of set aside in 2006 was 67,549 hectares, a 1% decline since 2004.

Natural regeneration (Tables 21-24, 41-44)

The estimated area of set aside natural regeneration was 19,873 hectares, a 34% decline since the previous survey.

As in previous surveys, no fungicides, insecticides or molluscicides were recorded.

Glyphosate, applied to 34% of the crop area (24% in 2004), was the only herbicide active ingredient encountered.

Grass (Tables 21-24, 41-44)

The area of grass grown was estimated to be 39,968 hectares, an increase of 20% since 2004.

Insecticide usage was very low, with only a very small area of chlorpyrifos recorded on new grass for the control of leatherjackets.

The proportion of crop area treated with a herbicide was 3% compared with only 1% in 2004. Glyphosate, applied to 1,077 hectares, remained the principal treatment.

Industrial oilseed rape (Tables 21-24, 41-44)

The estimated area of set aside industrial oilseed rape was 5,001 hectares, a 50% increase compared to the previous survey.

Ninety-five percent of the seed was treated, compared with the entire crop in 2004. The insecticide formulation comprising beta-cyfluthrin/imidacloprid (81%) replaced iprodione (79%) as the most popular seed treatment.

Insecticides were applied to 69% of the crop area, compared with 66% in 2004. Cypermethrin was the principal treatment, applied to 26% of the crop area. Tau-fluvalinate (23%) and lambda-cyhalothrin (16%) were also widely used. Molluscicides were recorded on 11% of the crop area.

The proportion of crop area treated with a fungicide was 84%, very similar to that recorded in 2004. Flusilazole, applied to 4,454 hectares remained the most popular fungicide. Carbendazim and tebuconazole, applied to 3,329 and 3,207 hectares respectively were also commonly used.

Herbicide usage slightly increased from 89% in the previous survey to 92% in 2006. Metazachlor, applied to 69% of the crop area, remained the most widely used herbicide.

Other crops (Tables 21-24, 41-44)

The total area of these crops was estimated to be 2,707 hectares, compared with 1,318 hectares in 2004. This was made up of 1,633 hectares of cover crops, 245 hectares of mustard, 120 hectares of phacelia and 709 hectares of woodland.

No pesticides were encountered on phacelia or woodland. However, the insecticide lambda-cyhalothrin and herbicide fluazifop-P-butyl were recorded on mustard. Glyphosate was also encountered on both cover crops and mustard.

COMPARISON WITH PREVIOUS SURVEYS

Cereals (Table 47)

The total area of cereal crops grown in 2006 was 397,664 hectares, a 10 % fall from 2004.

The overall area treated with pesticide active ingredients decreased by 9% when compared with 2004, in line with the drop in area grown, whilst their weights fell by 14%.

Insecticide usage increased by 28% between 2004 and 2006 when measured by area of active ingredients. However, total weights applied declined by 20%. This divergence was mainly due to a reduction in use of organophosphates, which are applied at relatively high dose rates compared with pyrethroids and carbamates. As in previous surveys, pyrethroids remained by far the most commonly used insecticide type. In 2006, cypermethrin replaced lambda-cyhalothrin as the principle insecticide. Molluscicide usage, when measured by area treated and by weight, significantly increased since the previous survey, although was still much lower than in 2002.

The total area treated with fungicide active ingredients fell in line with the decline in area grown, as did the total weight. Chlorothalonil was the principal fungicide, having increased continually over recent years. The newly approved active ingredient prothioconazole was widely used, although use of other main actives such as azoxystrobin, epoxiconazole and fenpopimorph had declined.

Herbicide usage also decreased in line with the decline in area grown. As in the previous two surveys, mecoprop-P remained the most widely used herbicide. Growth regulator usage decreased by 15% compared with the last survey and chlormequat remained the most popular active ingredient.

The total area treated with seed treatment active ingredients decreased by 2% compared with 2004, whilst their weights fell by 28%. This large decline in active weight is due mainly to the decreased usage of bitertanol and that of guazatine, the latter being applied at relatively high dosage rates.

Oilseed rape (Table 48)

The total area of oilseed rape grown in Scotland in 2006 was 33,692 hectares, a 14% fall compared with the previous survey.

The total area treated with all pesticides decreased by 6% when measured by area of active ingredients, and by 5% when measured by weight.

Insecticide usage increased by 11% when measured by area of active ingredient and their weights increased by 58%, despite the reduction in area grown. This was due mainly to the increased use of pyrethroids, and also that of carbamates which had been absent from the previous two surveys and are applied at relatively high dosage rates. Lambda-cyhalothrin remained the most widely used insecticide. Compared with the last survey, the area treated with molluscicide active incredients increased by 50% and their weights by almost 2 ½ times. This was likely to be due to milder/wet weather conditions during the autumn of 2005.

Fungicide usage decreased by 14% in line with the decline in area grown. Flusilazole remained the most commonly used treatment.

The total area treated with herbicide active ingredients increased by 6%, and their weights by 3%, despite the decrease in area grown. This was partly due to the increased use of glyphosate on winter oilseed rape as a pre-harvest desiccant. Metazachlor remained the most popular herbicide.

Usage of seed treatments decreased by 10% when measured by area of active ingredients, and by 3% when measured by their weights, slightly lower than the decrease in area grown.

- ***Potatoes (Table 49)***

The area of potatoes grown decreased by 4% compared with 2004 to 28,124 hectares.

The total area treated with all pesticides fell by 14%, whilst the total weight declined by 60%.

Insecticide usage, when measured by area of active ingredients, changed very little when compared with the previous survey. However, weights more than doubled due mainly to an increased use of organophosphates and carbamates, which are applied at higher dose rates. Lambda-cyhalothrin replaced pirimicarb as the most widely used insecticide. Molluscicide usage, applied predominantly to the ware crop, decreased by 47% when measured by the area of active ingredient and by 57% when measured by weight. Methiocarb replaced metaldehyde as the principal molluscicide.

The total area treated with fungicide active ingredients fell by 13%. Weights declined by 22%, due partly to a reduction in the use of mancozeb and sulphur, both of which are applied at relatively high rates. As in previous years, mancozeb remained the most popular fungicide.

Usage of herbicides also decreased, with areas of active ingredients falling by 15% and weights more noticeably by 62%. This was principally due to the continuing decline in use of sulphuric acid as a desiccant. Diquat has replaced paraquat as the most widely used herbicide.

Reductions in the use of seed treatments were recorded, both by area treated (27%) and by weight (32%).

- ***Set aside (Table 50)***

The total area of set aside in 2006 was 67,549 hectares, very similar to that recorded in 2004. Grass remained the largest category of set aside land at 60%, with the rest comprising of, natural regeneration (29%), industrial oilseed rape (7%) and others (4%).

The total area treated with all pesticide active ingredients increased by 43%, whilst their weights fell slightly by 1%. This was partly due to a reduction in the weight of fungicides applied.

The area treated with insecticide active ingredients, applied predominately to industrial oilseed rape, increased by 59%, and by 173% in weight, compared with the previous survey. Cypermethrin replaced deltamethrin as the most widely used insecticide. Molluscicide usage, applied exclusively to industrial oilseed rape, also increased significantly.

Usage of fungicides, applied solely to oilseed rape, increased by 32% when measured by area of active ingredient. Despite this, the weight of fungicides applied actually fell by 41%. This was partly due to a reduction in the use of sulphur, which is applied at high dosage rates. Sulphur remained the principal fungicide by weight.

Overall use of herbicides increased by 40%, compared with 2004. Usage on industrial oilseed rape, natural regeneration, grass and cover crops all increased. The use of glyphosate increased, and it remained by far the most widely used herbicide.

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FIGURE 1 Land-Use Regions of Scotland

FIGURE 2 Percentage areas of arable crops grown

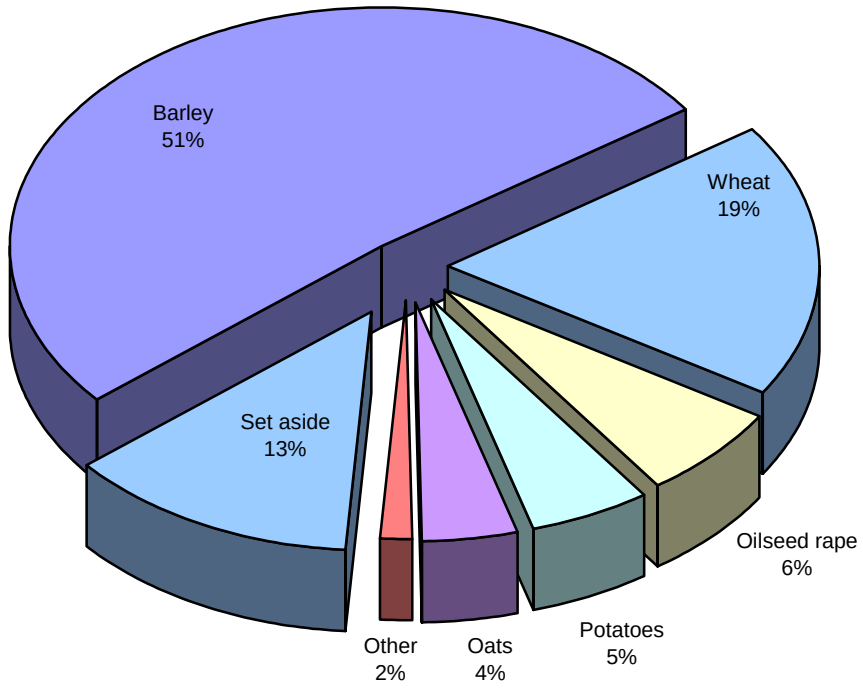


FIGURE 3 Estimated percentage areas of set aside

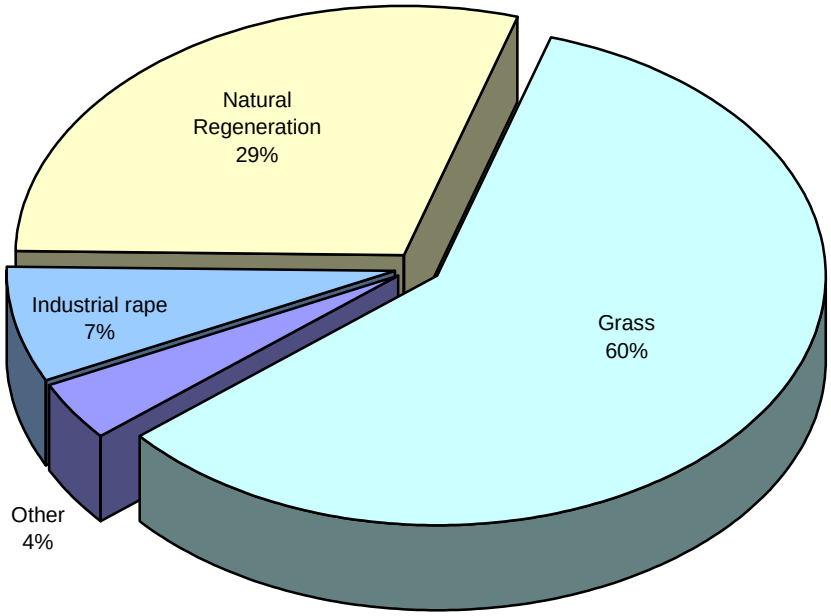
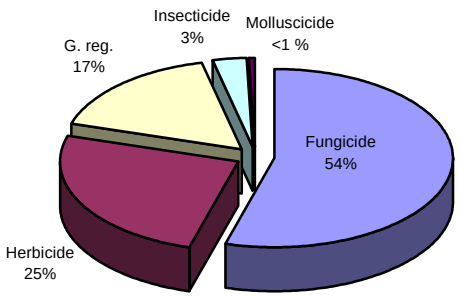


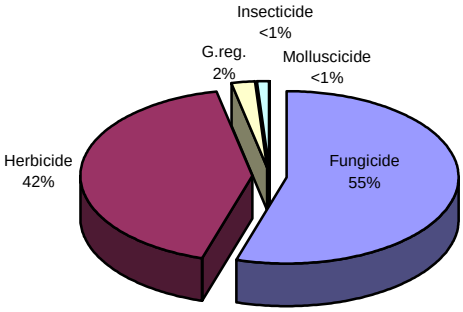
FIGURE 4 Distribution of pesticide types on crops

Treated area of active ingredients

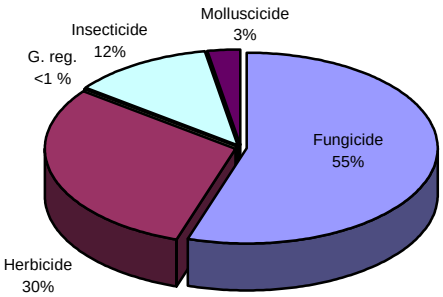
Winter cereals



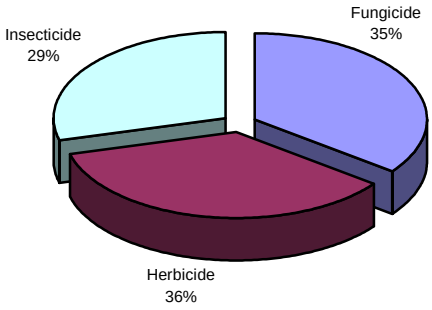
Spring cereals



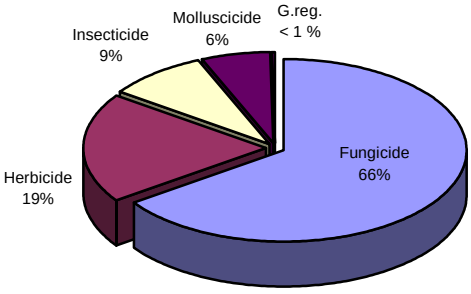
Winter oilseed rape



Spring oilseed rape



Ware potatoes



Seed potatoes

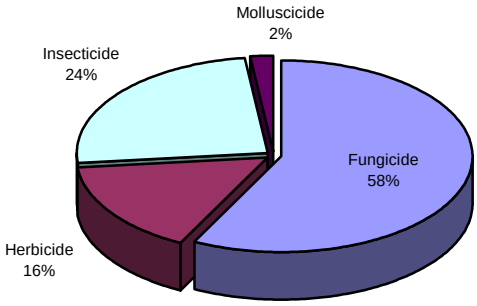


FIGURE 5 Percentage of areas of crops treated with insecticide

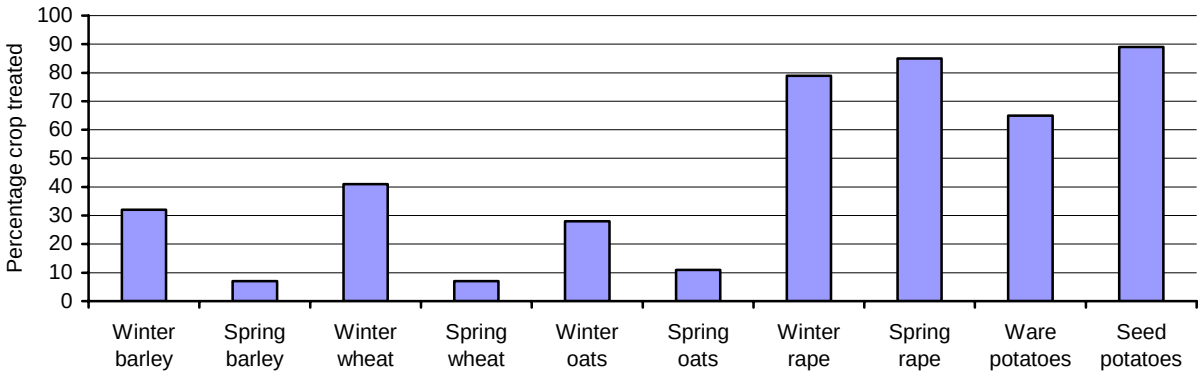


FIGURE 6 Percentage of areas of crops treated with fungicide

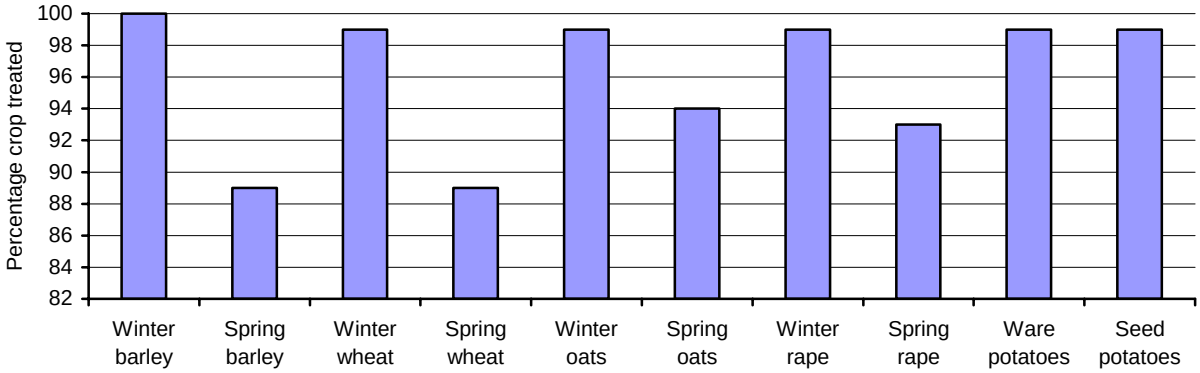


FIGURE 7 Percentage of areas of crops treated with herbicide

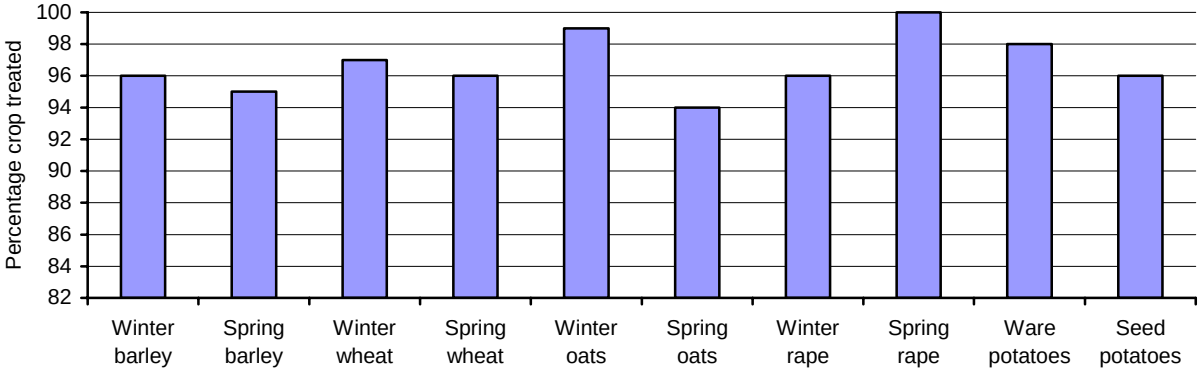
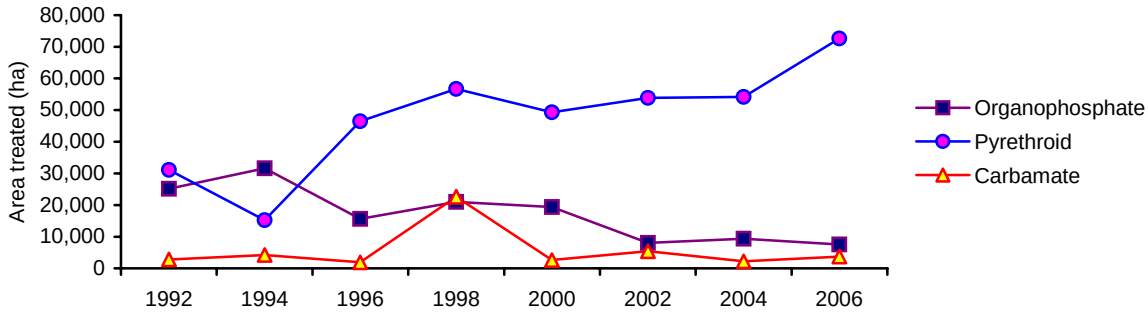


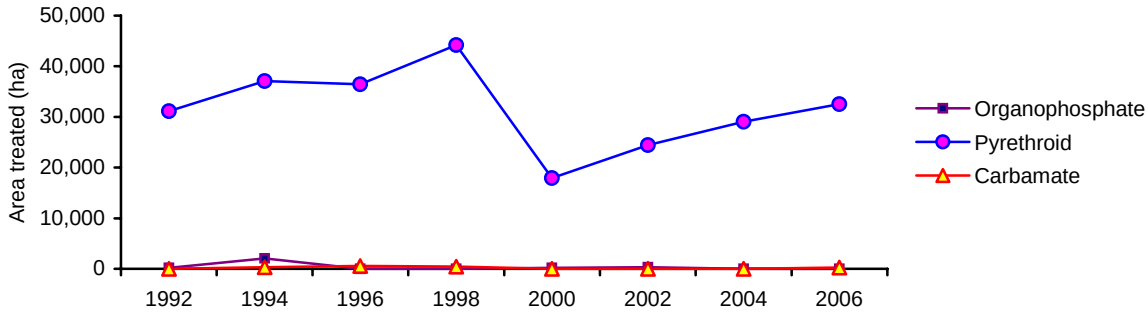
FIGURE 8 Trends in main insecticide types 1992 - 2006

Area treated with active ingredients

Cereals



Oilseed rape



Potatoes

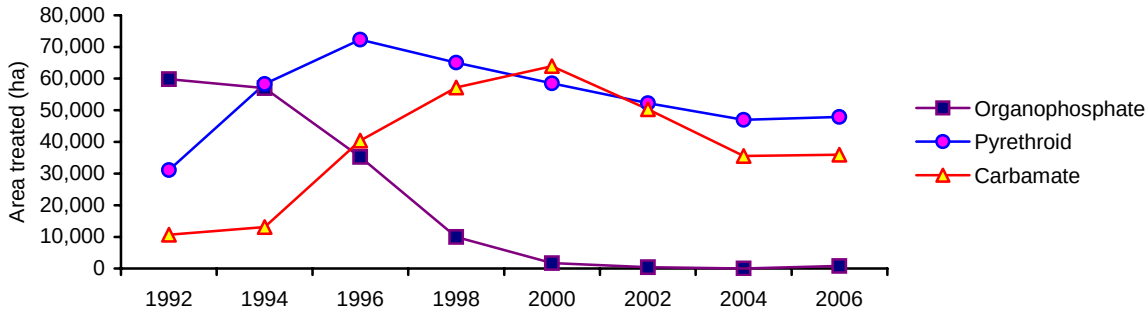


TABLE 1 Regional distribution of arable crops in 2006 (hectares)

	Highlands & Islands and Caithness & Orkney	*Moray Firth*	*Aberdeen*	*Angus*	*East Fife*	*Lothian*	*Central Lowlands*	*Tweed Valley*	*S. Uplands & Solway*	*Scotland 2006*	*Scotland 2004*	*% change*
Winter barley	632	2,576	18,627	8,502	4,395	3,734	4,860	6,237	4,135	**53,697**	56,709	-5
Spring barley	11,694	31,122	60,079	36,826	12,035	14,162	27,425	14,620	12,445	**220,408**	259,329	-15
Wheat	239	6,195	8,199	22,051	14,520	16,873	8,521	20,562	2,456	**99,615**	101,674	-2
Winter oats	85	552	448	1,321	1,025	50	1,020	1,881	227	**6,609**	6,152	7
Spring oats	1,790	1,953	2,912	3,322	795	252	2,873	1,604	548	**16,049**	15,814	1
Triticale	*	185	184	151	*	87	100	117	405	**1,286**	1,284	0
Winter oilseed rape	26	2,389	9,608	7,379	2,422	2,610	1,527	4,427	543	**30,931**	34,167	-9
Spring oilseed rape	49	288	895	408	334	159	343	209	*	**2,760**	5,178	-47
Seed potatoes	131	1,361	1,759	5,956	570	184	1,110	296	75	**11,440**	12,022	-5
Early potatoes	22	123	45	172	106	43	201	38	81	**831**	941	-12
Ware potatoes	256	578	709	6,562	2,362	1,746	1,651	1,726	263	**15,853**	16,389	-3
Combine peas	*	268	106	546	119	145	160	119	*	**1,490**	1,586	-6
Field beans	*	39	*	335	658	1,015	584	1,720	153	**4,523**	2,802	61
Linseed	*	147	43	85	*	*		*		**314**	638	-51
Lupins	25	78	91	64	*	*	133	116	*	**581**	691	-16
Set-aside	2,135	7,662	15,695	11,966	5,461	5,655	8,136	8,221	2,619	**67,549**	68,386	-1

To prevent disclosure of information about individual holdings, entries relating to fewer than 5 holdings have been replaced by a *

TABLE 2 Distribution of sample

Number of holdings surveyed in each region and size group

Size (ha)	*Highland & Islands and Caithness & Orkney*	*Moray Firth*	*Aberdeen*	*Angus*	*East Fife*	*Lothian*	*Central Lowlands*	*Tweed Valley*	*S. Uplands & Solway*	*Scotland 2006*
0.1-19.9	7	3	4	3	0	0	4	1	3	**25**
20-49.9	3	7	19	7	3	1	9	2	5	**56**
50-99.9	1	9	20	19	6	6	9	5	4	**79**
100-149.9	0	7	14	10	5	7	3	9	3	**58**
150+	0	10	18	24	8	13	7	20	2	**102**
All sizes	**11**	**36**	**75**	**63**	**22**	**27**	**32**	**37**	**17**	**320**

TABLE 3 Proportion (%) of each crop treated with pesticides (cereals)

	Winter barley	*Spring barley*	*Winter wheat*	*Spring wheat*	*Winter oats*	*Spring oats*	*Triticale*
Insecticides	32	7	41	7	28	11	16
Molluscicides	4	+	8	0	0	0	2
Fungicides	100	89	99	89	99	94	35
Herbicides	96	95	97	96	99	94	35
Growth regulators	88	7	96	72	81	83	29
Any pesticide	100	98	99	96	99	95	35

'+' = <0.5%

TABLE 4 Proportion (%) of each crop treated with pesticides (other crops)

	Winter oilseed rape	*Spring oilseed rape*	*Seed potatoes*	*Early potatoes*	*Ware potatoes*	*Combine peas*	*Field beans*	*Lupins*	*Setaside*
Insecticides	79	85	89	29	65	5	52	16	5
Molluscicides	19	0	26	0	48	0	0	0	1
Fungicides	99	93	99	61	99	50	93	16	6
Herbicides	96	100	96	84	98	50	90	40	20
Growth regulators	0	0	0	0	5	0	0	0	0
Any pesticide	100	100	99	100	99	50	94	40	20

TABLE 5 Cereal seed treatment formulations

Area (ha) and percentage of crop treated

Seed treatments	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Bitertanol/fuberidazole	0	0	0	0	11,055	12	88	2	1,878	28	4,296	27	**17,468**	42,868
Bitertanol/fuberidazole/imidacloprid	0	0	0	0	1,068	1	0	0	0	0	0	0	**1,068**	2,544
Carboxin/thiram	328	1	3,550	2	2,783	3	106	2	0	0	1,453	9	**8,221**	16,257
Clothianidin/prothioconazole	0	0	0	0	330	+	0	0	0	0	0	0	**330**	0
Fludioxonil	3,310	6	10,282	5	14,435	15	803	15	3,120	47	4,939	31	**36,889**	56,218
Fluoxastrobin/prothioconazole	0	0	0	0	5,201	6	0	0	0	0	0	0	**5,201**	0
Fluquinconazole	0	0	0	0	1,511	2	0	0	0	0	0	0	**1,511**	0
Fluquinconazole/prochloraz	0	0	0	0	3,828	4	0	0	0	0	0	0	**3,828**	5,689
Fuberidazole/imidacloprid/triadimenol	0	0	0	0	329	+	0	0	0	0	0	0	**329**	907
Fuberidazole/triadimenol	2,254	4	5,590	3	10,761	11	2,280	42	0	0	133	1	**21,017**	13,164
Guazatine	632	1	6,516	3	3,264	3	218	4	35	1	2,446	15	**13,132**	18,581
Guazatine/imazalil	0	0	484	+	0	0	0	0	0	0	0	0	**484**	0
Guazatine/triticonazole	0	0	0	0	1,562	2	0	0	0	0	0	0	**1,562**	6,399
Imazalil/triticonazole	364	1	19,544	9	0	0	0	0	0	0	0	0	**19,909**	16,800
Prochloraz/triticonazole	6,695	12	0	0	20,538	22	0	0	297	4	0	0	**27,530**	1,111
Prothioconazole	114	+	0	0	8,868	9	1,356	25	0	0	0	0	**10,339**	0
Prothioconazole/tebuconazole/ triazoxide	18,163	34	62,519	28	0	0	0	0	0	0	0	0	**80,682**	0
Silthiofam					4,461	5	0	0	0	0	0	0	**4,461**	1,412
Tebuconazole	302	1	3,815	2	0	0	0	0	0	0	0	0	**4,117**	
Tebuconazole/triazoxide	16,251	30	87,843	40	0	0	0	0	0	0	0	0	**104,094**	215,645
Tefluthrin	0	0	567	+	374	+	0	0	0	0	0	0	**941**	1,156
Unspecified seed treatment	0	0	0		24	+	0	0	0	0	0	0	**24**	10,754
Area grown	53,697	90	220,408	91	94,231	93	5,384	90	6,609	81	16,049	83	**397,664**	440,963

'*' includes triticale, '+' = <0.5%

TABLE 6 Cereals insecticide and molluscicide formulations

Area treated (ha) and percentage of crop treated

Insecticides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Alpha-cypermethrin	1,304	2	0	0	4,732	5	0	0	0	0	0	0	**6,036**	3,210
Chlorpyrifos	0	0	4,362	2	1,535	2	0	0	0	0	0	0	**5,897**	6,938
Cypermethrin	3,891	7	2,183	1	13,692	15	0	0	0	0	300	2	**20,066**	15,671
Deltamethrin	2,654	5	0	0	1,941	2	0	0	0	0	0	0	**4,798**	3,675
Dimethoate	0	0	0	0	1,678	2	0	0	0	0	0	0	**1,678**	2,479
Lambda-cyhalothrin	3,035	5	1,855	1	9,284	8	363	7	2,816	21	1,845	8	**19,199**	21,635
Pirimicarb	0	0	0	0	3,749	4	0	0	0	0	0	0	**3,749**	2,200
Tau-fluvalinate	4,780	9	3,945	2	4,735	5	24	+	301	5	0	0	**13,785**	6,271
Zeta-cypermethrin	2,135	4	3,027	1	3,316	4	0	0	124	2	96	1	**8,698**	3,712
All insecticides	**17,799**	**32**	**15,372**	**7**	**44,662**	**41**	**387**	**7**	**3,241**	**28**	**2,241**	**11**	**83,905**	**65,792**
Molluscicides														
Metaldehyde	2,021	4	30	+	6,163	6	0	0	0	0	0	0	**8,215**	3,654
Methiocarb	233	+	0	0	3,216	3	0	0	0	0	0	0	**3,470**	1,399
All molluscicides	**2,255**	**4**	**30**	**+**	**9,380**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**11,685**	**6,149**
Area grown	53,697		220,408		94,231		5,384		6,609		16,049		**397,664**	440,963

'*' includes triticale, '+' = <0.5%

TABLE 7 Cereals fungicide formulations

Area treated (ha) and percentage of crop treated

Fungicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Azoxystrobin	150	+	3,990	2	16,756	16	430	8	1,558	24	1,927	12	**24,812**	67,796
Azoxystrobin/chlorothalonil	2,007	4	4,466	2	14,907	14	0	0	0	0	0	0	**21,530**	16,833
Azoxystrobin/cyproconazole	530	1	2,835	1	1,620	2	0	0	234	4	0	0	**5,219**	2,982
Azoxystrobin/fenpropimorph	2,034	4	5,408	2	1,299	1	354	3	0	0	110	1	**9,274**	30,989
Boscalid/epoxiconazole	1,416	3	6,978	3	23,577	24	0	0	0	0	0	0	**31,971**	0
Carbendazim	585	1	10,418	5	2,452	3	0	0	0	0	0	0	**13,456**	14,704
Carbendazim/flusilazole	1,853	2	4,347	2	0	0	0	0	0	0	0	0	**6,199**	14,039
Chlorothalonil	53,194	69	151,071	59	165,895	88	4,588	65	163	2	0	0	**374,911**	351,998
Chlorothalonil/cyproconazole	0	0	1,693	1	7,673	7	0	0	0	0	0	0	**9,366**	16,432
Chlorothalonil/cyproconazole/ propiconazole	0	0	3,722	2	3,061	3	0	0	0	0	0	0	**6,783**	0
Chlorothalonil/flusilazole	861	2	1,294	1	0	0	29	1	0	0	0	0	**2,183**	0
Chlorothalonil/flutriafol	0	0	0	0	11,965	12	0	0	0	0	0	0	**11,965**	5,400
Chlorothalonil/mancozeb	0	0	0	0	420	+	0	0	0	0	0	0	**420**	1,462
Chlorothalonil/picoxystrobin	4,798	9	11,478	5	0	0	0	0	0	0	0	0	**16,276**	0
Chlorothalonil/proquinazid	630	1	1,650	1	783	1	0	0	0	0	0	0	**3,063**	0
Chlorothalonil/tetraconazole	0	0	0	0	299	+	0	0	0	0	0	0	**299**	418
Copper oxychloride	0	0	0	0	191	+	0	0	0	0	95	1	**286**	0
Cyflufenamid	951	2	592	+	6,121	5	0	0	1,026	8	419	3	**9,110**	0
Cyproconazole	87	+	1,432	1	4,958	5	0	0	1,039	10	2,832	14	**10,348**	2,597
Cyproconazole/cyprodinil	482	1	3,695	2	7,735	8	0	0	0	0	0	0	**11,912**	26,760

'*' includes triticale, '+' = <0.5%

Cont…

TABLE 7 Cereals fungicide formulations continued

Area treated (ha) and percentage of crop treated

Fungicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Cyproconazole/propiconazole	0	0	1,204	1	8,864	6	0	0	0	0	0	0	**10,068**	6,322
Cyproconazole/trifloxystrobin	785	1	1,706	1	0	0	0	0	0	0	0	0	**2,492**	8,008
Cyprodinil	12,746	20	5,216	2	7,490	8	0	0	0	0	0	0	**25,453**	88,790
Cyprodinil/picoxystrobin	4,410	8	10,795	5	0	0	0	0	0	0	0	0	**15,206**	21,535
Dimoxystrobin/epoxiconazole	0	0	0	0	8,589	9	0	0	0	0	0	0	**8,589**	21,166
Epoxiconazole	1,879	3	10,863	5	40,870	38	366	7	0	0	124	1	**54,102**	95,336
Epoxiconazole/fenpropimorph	2,283	4	12,394	5	11,160	10	1,262	23	256	4	290	2	**27,645**	58,059
Epoxiconazole/fenpropimorph/ kresoxim-methyl	749	1	7,278	3	3,437	3	785	15	505	8	1,799	11	**14,553**	67,189
Epoxiconazole/fenpropimorph/ Pyraclostrobin	1,214	2	4,038	2	3,401	4	0	0	0	0	0	0	**8,653**	0
Epoxiconazole/kresoxim-methyl	2,322	3	5,193	2	11,361	11	330	6	705	11	0	0	**19,911**	46,238
Epoxiconazole/pyraclostrobin	0	0	524	+	5,578	6	547	10	0	0	0	0	**6,649**	16,990
Famoxadone/flusilazole	5,881	10	32,064	14	14,340	14	0	0	43	1	0	0	**52,327**	88,236
Fenpropidin	0	0	0	0	5,633	6	0	0	0	0	0	0	**5,633**	5,997
Fenpropimorph	21,728	34	35,767	15	5,143	5	795	15	4,522	52	7,482	36	**75,507**	99,650
Fenpropimorph/flusilazole	10,225	18	52,124	19	845	1	0	0	0	0	0	0	**63,194**	55,536
Fenpropimorph/kresoxim-methyl	234	+	5,806	3	398	+	129	2	64	1	1,430	9	**8,062**	22,999
Fenpropimorph/pyraclostrobin	10,348	17	31,417	13	12,277	10	293	5	1,415	14	1,946	12	**57,696**	46,780
Fenpropimorph/quinoxyfen	0	0	426	+	77	+	0	0	588	9	1,873	12	**2,964**	11,249
Fluoxastrobin/prothioconazole	12,147	20	26,789	11	4,195	4	293	5	0	0	0	0	**43,424**	4,595

'*' includes triticale, '+' = <0.5%

Cont…

TABLE 7 Cereals fungicide formulations continued

Area treated (ha) and percentage of crop treated

Fungicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Fluoxastrobin/prothioconazole/ trifloxystrobin	9,162	12	18,288	7	425	+	0	0	0	0	0	0	**27,875**	0
Fluquinconazole	0	0	0	0	10,353	11	0	0	0	0	0	0	**10,353**	15,267
Flusilazole	3,632	7	10,643	5	1,146	1	0	0	0	0	0	0	**15,420**	23,378
Flutriafol	0	0	0	0	403	+	0	0	0	0	0	0	**403**	3,778
Mancozeb	0	0	0	0	9,555	7	218	4	0	0	0	0	**9,773**	9,172
Maneb	0	0	0	0	346	+	0	0	0	0	0	0	**346**	3,963
Metconazole	0	0	2,009	1	748	1	0	0	0	0	0	0	**2,756**	19,522
Metrafenone	831	2	8,890	4	18,812	19	605	9	2,825	43	5,092	32	**37,076**	43,907
Picoxystrobin	8,238	9	4,904	2	0	0	0	0	301	5	0	0	**13,443**	27,245
Prochloraz	1,504	3	1,375	1	1,605	2	0	0	0	0	0	0	**4,484**	9,575
Prochloraz/propiconazole	0	0	978	+	1,369	1	0	0	0	0	0	0	**2,347**	9,403
Prochloraz/tebuconazole	0	0	0	0	2,792	3	24	+	0	0	0	0	**2,816**	4,463
Propiconazole/tebuconazole	0	0	0	0	2,813	3	0	0	0	0	0	0	**2,813**	5,216
Proquinazid	1,935	4	10,979	5	11,141	11	146	3	2,372	27	2,855	15	**29,427**	0
Prothioconazole	20,115	25	28,230	10	32,331	28	0	0	0	0	0	0	**80,676**	0
Prothioconazole/spiroxamine	5,819	8	6,888	3	9,694	7	0	0	0	0	0	0	**22,401**	0
Prothioconazole/tebuconazole	4,648	8	14,191	6	15,056	9	88	2	0	0	0	0	**34,186**	0
Prothioconazole/trifloxystrobin	5,657	8	24,142	10	6,285	6	0	0	0	0	0	0	**36,083**	0
Pyraclostrobin	870	2	523	+	8,430	9	0	0	1,408	21	2,257	14	**13,488**	6,512
Quinoxyfen	0	0	0	0	1,917	2	121	2	301	5	1,464	9	**3,804**	32,094

'*' includes triticale, '+' = <0.5%

Cont…

TABLE 7 Cereals fungicide formulations continued

Area treated (ha) and percentage of crop treated

Fungicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Spiroxamine	2,897	5	13,930	6	7,106	8	571	11	499	8	81	1	**25,083**	37,000
Spiroxamine/tebuconazole	1,325	2	900	+	0	0	0	0	0	0	0	0	**2,225**	5,297
Sulphur	1,932	4	5,351	2	10,249	10	1,048	7	120	2	1,258	8	**19,959**	24,481
Tebuconazole	150	+	106	+	32,901	35	1,268	18	1,675	25	3,280	20	**39,451**	26,214
Tebuconazole/triadimenol	75	+	100	+	4,312	5	0	0	0	0	0	0	**4,487**	17,026
Tetraconazole	0	0	0	0	320	+	0	0	0	0	0	0	**320**	0
Trifloxystrobin	1,892	4	1,172	1	3,735	4	0	0	0	0	0	0	**6,869**	59,143
All fungicides	**227,209**	**100**	**612,271**	**89**	**607,211**	**99**	**14,289**	**89**	**21,623**	**99**	**36,615**	**94**	**1,519,871**	**1,719,351**
Area grown	53,697		220,408		94,231		5,384		6,609		16,049		**397,664**	440,963

'*' includes triticale, '+' = <0.5%

TABLE 8 Cereals herbicide and growth regulator formulations

Area treated (ha) and percentage of crop treated

Herbicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
2,4-DB/linuron/MCPA	0	0	753	+	0	0	0	0	0	0	0	0	**753**	2,868
2,4-DB/MCPA	0	0	141	+	0	0	0	0	0	0	0	0	**141**	0
Amidosulfuron/ iodosulfuron-methyl-sodium	420	1	4,477	2	0	0	0	0	0	0	0	0	**4,897**	1,379
Bentazone/MCPA/MCPB	0	0	2,718	1	211	+	1,625	30	0	0	1,252	8	**5,806**	1,515
Bromoxynil	420	1	7,007	3	734	1	0	0	187	3	0	0	**8,349**	4,890
Bromoxynil/diflufenican/ioxynil	0	0	572	+	898	1	0	0	0	0	0	0	**1,470**	608
Bromoxynil/fluroxypyr/ioxynil	39	+	654	+	0	0	0	0	0	0	0	0	**693**	2,564
Bromoxynil/ioxynil	614	1	24,129	11	3,227	3	513	10	0	0	798	5	**29,281**	34,015
Bromoxynil/ioxynil/mecoprop-P	105	+	13,951	6	423	+	0	0	0	0	53	+	**14,533**	13,164
Carfentrazone-ethyl/ flupyrsulfuron-methyl	0	0	0	0	0	0	0	0	2,288	35	0	0	**2,288**	3,063
Carfentrazone-ethyl/mecoprop-P	200	+	0	0	889	1	0	0	65	1	0	0	**1,155**	0
Carfentrazone-ethyl/ thifensulfuron-methyl	0	0	379	+	0	0	0	0	0	0	0	0	**379**	0
Chloridazon	0	0	0	0	282	+	0	0	0	0	0	0	**282**	0
Chlorotoluron	1,630	3	0	0	291	+	0	0	0	0	0	0	**1,921**	1,786
Chlorotoluron/isoproturon	366	1	0	0	563	1	0	0	0	0	0	0	**929**	4,802
Clodinafop-propargyl	0	0	0	0	1,137	1	0	0	0	0	0	0	**1,137**	2,859
Dicamba/MCPA/mecoprop-P	0	0	13,176	6	0	0	88	2	0	0	220	1	**13,484**	4,443
Dicamba/mecoprop-P	135	+	31,371	14	1,019	1	430	8	43	1	2,882	18	**35,951**	33,126

'*' includes triticale, '+' = <0.5%

Cont…

TABLE 8 Cereals herbicide and growth regulator formulations continued

Area treated (ha) and percentage of crop treated

Herbicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Dichlorprop-p	0	0	2,538	1	403	+	395	7	0	0	0	0	**3,335**	0
Diclofop-methyl/ fenoxaprop-P- ethyl	0	0	517	+	0	0	0	0	0	0	0	0	**517**	712
Diflufenican	0	0	0	0	945	1	0	0	0	0	0	0	**945**	0
Diflufenican/flufenacet	3,375	6	0	0	1,140	1	0	0	0	0	0	0	**4,536**	0
Diflufenican/flurtamone	592	1	0	0	2,350	2	0	0	0	0	0	0	**2,942**	12,470
Diflufenican/flurtamone/ isoproturon	2,637	5	0	0	5,642	6	0	0	0	0	0	0	**8,278**	8,849
Diflufenican/isoproturon	14,924	28	0	0	20,227	20	0	0	0	0	0	0	**35,374**	49,660
Diflufenican/trifluralin	0	0	0	0	637	1	0	0	0	0	0	0	**637**	6,193
Fenoxaprop-P-ethyl	0	0	0	0	1,943	2	0	0	0	0	0	0	**1,943**	4,244
Florasulam	0	0	0	0	135	+	121	2	0	0	0	0	**256**	1,138
Florasulam/fluroxypyr	1,176	2	1,490	1	6,321	6	0	0	205	3	265	2	**9,458**	6,003
Flufenacet/pendimethalin	1,604	3	0	0	1,074	1	0	0	0	0	0	0	**2,679**	0
Flupyrsulfuron-methyl/ picolinafen	0	0	0	0	3,241	3	0	0	0	0	0	0	**3,241**	0
Flupyrsulfuron-methyl/ thifensulfuron-methyl	0	0	0	0	256	+	0	0	1,692	26	0	0	**1,947**	878
Fluroxypyr	606	1	4,244	2	2,465	3	0	0	1,282	19	941	6	**9,538**	6,854
Glufosinate-ammonium	669	1	0	0	0	0	0	0	0	0	0	0	**669**	0
Glyphosate**	16,731	31	30,840	14	20,815	20	470	9	1,363	21	1,084	7	****71,303**	100,429

'*' includes triticale, '+' = <0.5%

'**' pre-harvest treatments accounted for 91% of the total area treated with glyphosate

Cont…

TABLE 8 Cereals herbicide and growth regulator formulations continued

Area treated (ha) and percentage of crop treated

Herbicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Iodosulfuron-methyl-sodium/ mesosulfuron-methyl	0	0	0	0	1,062	1	0	0	0	0	0	0	**1,062**	0
Isoproturon	31,426	58	3,653	2	50,629	54	218	4	0	0	0	0	**85,926**	90,741
Isoproturon/pendimethalin	2,911	5	0	0	631	1	0	0	0	0	0	0	**3,542**	6,615
Isoproturon/trifluralin	1,638	3	0	0	3,395	4	0	0	0	0	0	0	**5,033**	0
Linuron	0	0	13	+	0	0	0	0	0	0	0	0	**13**	1,936
Linuron/trifluralin	2,472	5	0	0	0	0	0	0	0	0	0	0	**2,472**	0
MCPA	0	0	13,313	6	0	0	1,713	32	0	0	1,252	8	**16,278**	26,491
MCPA/MCPB	0	0	4,384	2	0	0	0	0	0	0	0	0	**4,384**	478
MCPB	0	0	1,203	1	0	0	0	0	0	0	0	0	**1,203**	1,806
Mecoprop-P	10,313	18	95,345	43	33,740	32	2,325	43	3,273	50	9,689	59	**154,835**	192,026
Mecoprop-P/ metsulfuron-methyl	0	0	665	+	0	0	0	0	0	0	0	0	**665**	4,614
Metsulfuron-methyl	1,449	3	12,531	6	1,567	2	220	4	1,829	28	3,756	23	**21,351**	50,709
Metsulfuron-methyl/ thifensulfuron- methyl	4,737	9	70,488	32	10,397	11	1,373	26	547	8	0	0	**87,542**	145,456
Metsulfuron-methyl/ tribenuron-methyl	949	2	30,650	14	9,024	10	566	11	2,395	36	2,222	14	**45,957**	22,778
Pendimethalin	6,025	11	464	+	15,566	17	0	0	0	0	0	0	**22,258**	18,181
Pendimethalin/picolinafen	11,493	21	0	0	29,236	31	0	0	0	0	0	0	**40,730**	33,107
Pinoxaden	1,441	3	7,957	4	3,618	4	0	0	0	0	0	0	**13,016**	0
Sulfosulfuron	0	0	0	0	1,150	1	0	0	0	0	0	0	**1,150**	4,927

'*' includes triticale, '+' = <0.5%

Cont…

TABLE 8 Cereals herbicide and growth regulator formulations continued

Area treated (ha) and percentage of crop treated

Herbicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Thifensulfuron-methyl	440	1	21,589	10	1,229	1	507	9	0	0	0	0	**23,766**	1,504
Thifensulfuron-methyl/ tribenuron-methyl	2,412	4	33,607	15	992	1	0	0	43	1	0	0	**37,055**	36,425
Tralkoxydim	455	1	17,044	8	527	1	0	0	0	0	0	0	**18,027**	39,989
Tribenuron-methyl	2,859	5	20,379	8	2,482	3	224	4	0	0	3,296	21	**29,240**	15,531
Trifluralin	4,679	9	0	0	2,534	3	0	0	0	0	0	0	**7,213**	12,333
All herbicides	**131,944**	**96**	**472,242**	**95**	**245,050**	**97**	**10,788**	**96**	**15,214**	**99**	**27,710**	**94**	**903,767**	**1,033,235**
Growth regulators	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0
2-chloroethylphosphonic acid	10,854	20	784	+	7,781	8	0	0	0	0	0	0	**19,440**	29,296
2-chloroethylphosphonic acid/ chlormequat	13,533	25	2,059	1	15,434	16	0	0	379	6	110	1	**31,516**	31,913
2-chloroethylphosphonic acid/ chlormequat/mepiquat chloride	209	+	227	+	2,042	2	0	0	0	0	0	0	**2,477**	3,945
2-chloroethylphosphonic acid/ mepiquat chloride	2,947	5	813	+	4,956	5	0	0	0	0	0	0	**8,715**	28,149
Chlormequat	37,624	61	5,249	2	92,273	82	3,850	72	4,703	62	12,258	76	**156,362**	173,814
Chlormequat/imazaquin	0	0	0	0	15,364	13	0	0	0	0	0	0	**15,364**	21,522
Mepiquat chloride/ prohexadione-calcium	87	+	0	0	0	0	0	0	0	0	0	0	**87**	0
Trinexapac-ethyl	31,851	57	7,746	3	50,770	44	201	4	2,762	42	4,319	25	**98,003**	81,972
All growth regulators	**97,106**	**88**	**16,877**	**7**	**188,620**	**96**	**4,050**	**72**	**7,844**	**81**	**16,687**	**83**	**331,963**	**372,216**
Area grown	53,697		220,408		94,231		5,384		6,609		16,049		**397,664**	440,963

'*' includes triticale, '+' = <0.5%

TABLE 9 Oilseed rape seed treatment formulations

Area (ha) and percentage of crop treated

Seed treatments	***Winter oilseed rape***		***Spring oilseed rape***		***All oilseed rape***	***2004***
	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Beta-cyfluthrin/imidacloprid	21,933	71	1,383	50	**23,316**	18,309
Iprodione	21,224	69	1,383	50	**22,607**	32,197
Prochloraz/thiram	133	+	0	0	**133**	0
Thiram	20,565	66	1,851	67	**22,416**	31,460
Unspecified seed treatment	206	1	0	0	**206**	1,644
Area grown	30,931	96	2,760	88	**33,692**	39,345

'+' = <0.5%

TABLE 10 Oilseed rape insecticide and molluscicide formulations

Area treated (ha) and percentage of crop treated

Insecticides	***Winter oilseed rape***		***Spring oilseed rape***		***All oilseed rape***	***2004***
	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Alpha-cypermethrin	865	3	0	0	**865**	946
Cypermethrin	5,136	15	429	16	**5,564**	5,335
Deltamethrin	1,091	4	1,043	38	**2,134**	4,673
Lambda-cyhalothrin	11,702	33	1,135	24	**12,837**	12,541
Pirimicarb	268	1	0	0	**268**	0
Tau-fluvalinate	7,913	26	389	14	**8,302**	3,979
Zeta-cypermethrin	2,812	9	0	0	**2,812**	1,548
All insecticides	**29,788**	**79**	**2,996**	**85**	**32,783**	**29,441**
Molluscicides	0	0	0	0	**0**	0
Metaldehyde	6,173	15	0	0	**6,173**	2,347
Methiocarb	1,071	3	0	0	**1,071**	1,358
All molluscicides	**7,244**	**19**	**0**	**0**	**7,244**	**4,837**
Area grown	30,931		2,760		**33,692**	39,345

TABLE 11 Oilseed rape fungicide formulations

Area treated (ha) and percentage of crop treated

Fungicides	***Winter oilseed rape***		***Spring oilseed rape***		***All oilseed rape***	***2004***
	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Azoxystrobin	4,118	13	0	0	**4,118**	0
Azoxystrobin/cyproconazole	731	2	0	0	**731**	0
Boscalid	17,751	57	1,432	52	**19,183**	17,509
Carbendazim	11,273	32	718	26	**11,992**	14,105
Carbendazim/flusilazole	8,102	25	0	0	**8,102**	19,199
Chlorothalonil	1,652	4	0	0	**1,652**	1,077
Difenoconazole	384	1	0	0	**384**	1,585
Famoxadone/flusilazole	7,580	22	0	0	**7,580**	9,934
Flusilazole	11,087	33	1,043	38	**12,130**	13,901
Metconazole	10,881	33	0	0	**10,881**	9,048
Prochloraz	1,236	4	0	0	**1,236**	8,282
Prochloraz/propiconazole	235	1	0	0	**235**	743
Prochloraz/tebuconazole	2,364	7	0	0	**2,364**	250
Prothioconazole	3,710	9	0	0	**3,710**	0
Prothioconazole/tebuconazole	864	3	0	0	**864**	0
Sulphur	9,985	25	0	0	**9,985**	10,438
Tebuconazole	22,680	59	90	3	**22,770**	15,145
Vinclozolin	3,687	12	335	12	**4,022**	7,673
All fungicides	**118,319**	**99**	**3,618**	**93**	**121,937**	**132,223**
Area grown	30,931		2,760		**33,692**	39,345

TABLE 12 Oilseed rape herbicide formulations

Area treated (ha) and percentage of crop treated

Herbicides	***Winter oilseed rape***		***Spring oilseed rape***		***All oilseed rape***	***2004***
	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Carbetamide	85	+	0	0	**85**	602
Clomazone	5,158	17	0	0	**5,158**	744
Clopyralid	37	+	0	0	**37**	432
Clopyralid/picloram	411	1	0	0	**411**	83
Cyanazine	830	3	0	0	**830**	548
Cycloxydim	887	3	0	0	**887**	1,037
Diquat	91	+	0	0	**91**	711
Fluazifop-P-butyl	1,570	4	0	0	**1,570**	2,177
Glyphosate	15,692	50	993	36	**16,685**	12,416
Metazachlor	21,337	69	2,332	84	**23,669**	27,238
Metazachlor/quinmerac	5,433	18	0	0	**5,433**	4,309
Propaquizafop	14,830	42	185	7	**15,015**	9,878
Propyzamide	3,308	11	0	0	**3,308**	6,748
Quizalofop-P-ethyl	669	2	0	0	**669**	990
Trifluralin	814	3	159	6	**973**	1,052
All herbicides	**71,153**	**96**	**3,669**	**100**	**74,823**	**70,692**
Area grown	30,931		2,760		**33,692**	39,345

‘+’ = <0.5%

TABLE 13 Potato seed treatment formulations

Area (ha) and percentage of crop treated

Seed treatments	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Flutolanil	883	8	2,720	17	0	0	**3,604**	789
Imazalil	3,929	34	5,263	33	324	39	**9,515**	10,135
Imazalil/pencycuron	2,189	19	2,890	18	0	0	**5,079**	11,597
Iprodione	232	2	302	2	0	0	**534**	1,674
Pencycuron	5,280	46	5,368	34	110	13	**10,759**	9,526
Unspecified seed treatment	62	1	0	0	0	0	**62**	0
Area grown	11,440	87	15,853	89	831	52	**28,124**	29,352

TABLE 14 Potato insecticide, molluscicide and nematicide formulations

Area treated (ha) and percentage of crop treated

Insecticides	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Aldicarb	266	2	658	4	110	13	**1,034**	876
Cypermethrin	140	+	0	0	0	0	**140**	4,247
Deltamethrin/pirimicarb	379	1	0	0	0	0	**379**	11,045
Flonicamid	0	0	0	0	132	16	**132**	0
Fosthiazate	217	2	604	4	0	0	**821**	0
Lambda-cyhalothrin	22,943	76	10,556	41	0	0	**33,499**	21,569
Lambda-cyhalothrin/pirimicarb	6,887	26	2,395	12	0	0	**9,282**	9,561
Oxamyl	173	2	2,064	13	0	0	**2,237**	175
Pirimicarb	17,193	57	5,879	25	0	0	**23,072**	16,089
Pymetrozine	6,626	37	1,453	8	0	0	**8,079**	11,466
Thiacloprid	2,005	16	1,396	9	0	0	**3,401**	0
Zeta-cypermethrin	3,367	10	1,224	3	0	0	**4,591**	558
All insecticides	**60,196**	**89**	**26,231**	**65**	**243**	**29**	**86,669**	**75,586**
Molluscicides								
Ferric phosphate	309	3	0	0	0	0	**309**	0
Metaldehyde	2,618	11	9,108	24	0	0	**11,726**	27,339
Methiocarb	2,723	17	10,902	37	0	0	**13,625**	11,287
All molluscicides	**5,650**	**26**	**20,010**	**48**	**0**	**0**	**25,660**	**48,807**
Area grown	11,440		15,853		831		**28,124**	29,352

'+' = <0.5%

TABLE 15 Potato fungicide formulations

Area treated (ha) and percentage of crop treated

Fungicides	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Azoxystrobin	1,497	13	1,390	9	110	13	**2,997**	1,362
Benalaxyl/mancozeb	4,943	20	9,529	36	0	0	**14,472**	10,492
Benthiavalicarb isopropyl/mancozeb	490	4	3,104	18	0	0	**3,594**	0
Chlorothalonil	0	0	10	+	0	0	**10**	486
Chlorothalonil/mancozeb	0	0	619	3	0	0	**619**	0
Chlorothalonil/ Propamocarb hydrochloride	152	1	1,166	6	0	0	**1,318**	8,190
Copper oxychloride	480	3	90	1	0	0	**569**	0
Cyazofamid	8,356	40	11,451	38	0	0	**19,807**	24,468
Cymoxanil	8,209	36	18,324	43	0	0	**26,533**	37,987
Cymoxanil/famoxadone	462	4	1,597	7	0	0	**2,059**	9,847
Cymoxanil/mancozeb	29,188	84	24,289	62	331	13	**53,808**	73,844
Dimethomorph/mancozeb	2,607	20	4,312	18	0	0	**6,919**	17,085
Fenamidone/mancozeb	0	0	259	2	0	0	**259**	1,761
Fenamidone/propamocarb hydrochloride	2,240	14	1,624	9	0	0	**3,864**	4,733
Fluazinam	28,338	82	25,954	69	896	45	**55,187**	46,963
Fluazinam/metalaxyl-M	4,715	28	6,636	23	263	32	**11,614**	9,506
Flupicolide/propamocarb hydrochloride	1,885	16	7,665	28	0	0	**9,550**	0

'+' = <0.5%

Cont…

TABLE 15 Potato fungicide formulations continued

Area treated (ha) and percentage of crop treated

Fungicides	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Mancozeb	1,873	16	4,289	17	0	0	**6,162**	13,066
Mancozeb/metalaxyl-M	6,196	38	6,886	28	110	13	**13,193**	8,085
Mancozeb/zoxamide	2,074	14	8,467	31	0	0	**10,541**	9,864
Maneb	210	1	0	0	132	16	**343**	233
Sulphur	0	0	433	2	0	0	**433**	1,258
All fungicides	**103,914**	**99**	**138,091**	**99**	**1,843**	**61**	**243,848**	**280,954**
Area grown	11,440		15,853		831		**28,124**	29,352

TABLE 16 Potato herbicide and growth regulator formulations

Area treated (ha) and percentage of crop treated

Herbicides	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Carfentrazone-ethyl	2,544	21	3,548	22	131	16	**6,222**	1,508
Clomazone	0	0	224	1	0	0	**224**	0
Diquat	7,811	47	9,768	42	268	19	**17,848**	8,292
Diquat/paraquat	5,810	51	11,579	73	110	13	**17,499**	18,803
Glyphosate	146	1	41	+	0	0	**187**	0
Linuron	8,701	76	7,919	50	588	71	**17,208**	20,947
Metribuzin	2,744	24	6,663	41	110	13	**9,517**	8,516
Paraquat	5,116	45	2,216	14	0	0	**7,333**	9,550
Pendimethalin	0	0	667	4	0	0	**667**	1,186
Rimsulfuron	0	0	1,263	8	0	0	**1,263**	781
Sulphuric acid	5,559	33	7,950	39	0	0	**13,509**	38,778
All herbicides	**38,431**	**96**	**51,838**	**98**	**1,208**	**84**	**91,477**	**108,643**
Growth regulators								
Maleic hydrazide	0	0	730	5	0	0	**730**	0
All growth regulators	**0**	**0**	**730**	**5**	**0**	**0**	**730**	**0**
Area grown	11,440		15,853		831		**28,124**	29,352

'+' = <0.5%

TABLE 17 Legume seed treatment formulations

Area (ha) and percentage of crop treated

Seed treatments	***Combine peas***		***Field beans***		***Lupins***		***All***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Thiabendazole/thiram	0	0	0	0	142	24	**142**	31
Thiram	981	66	0	0	0	0	**981**	1,404
Area grown	1,490	66	4,523		581	24	**6,594**	5,079

TABLE 18 Legume insecticide formulations

Area treated (ha) and percentage of crop treated

Insecticides	***Combine peas***		***Field beans***		***Lupins***		***All crops***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Alpha-cypermethrin	0	0	400	9	0	0	**400**	131
Cypermethrin	0	0	533	12	0	0	**533**	160
Deltamethrin	0	0	463	10	91	16	**554**	388
Lambda-cyhalothrin	0	0	1,377	22	0	0	**1,377**	1,208
Pirimicarb	78	5	136	3	0	0	**214**	391
Zeta-cypermethrin	0	0	98	2	0	0	**98**	93
All insecticides	**78**	**5**	**3,007**	**52**	**91**	**16**	**3,176**	**2,372**
Area grown	1,490		4,523		581		**6,594**	5,079

TABLE 19 Legume fungicide formulations

Area treated (ha) and percentage of crop treated

Fungicides	***Combine peas***		***Field beans***		***Lupins***		***All crops***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Azoxystrobin	139	9	222	5	0	0	**361**	1,047
Azoxystrobin/chlorothalonil	0	0	105	2	0	0	**105**	160
Chlorothalonil	746	50	3,206	57	91	16	**4,042**	3,411
Chlorothalonil/cyproconazole	0	0	1,009	22	0	0	**1,009**	761
Chlorothalonil/metalaxyl-M	0	0	1,603	24	0	0	**1,603**	666
Cyproconazole	0	0	77	2	0	0	**77**	0
Mancozeb/metalaxyl-M	0	0	283	6	0	0	**283**	0
Metconazole	0	0	367	8	0	0	**367**	0
Sulphur	0	0	2,517	44	0	0	**2,517**	1,105
Vinclozolin	241	16	516	11	0	0	**757**	583
All fungicides	**1,126**	**50**	**9,905**	**93**	**91**	**16**	**11,122**	**8,454**
Area grown	1,490		4,523		581		**6,594**	5,079

TABLE 20 Legume herbicide formulations

Area treated (ha) percentage of crop treated

Herbicides	***Combine peas***		***Field beans***		***Lupins***		***All crops***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Bentazone/MCPB	121	4	0	0	0	0	**121**	0
Clomazone	0	0	576	13	0	0	**576**	0
Cyanazine	121	4	0	0	0	0	**121**	0
Cyanazine/pendimethalin	0	0	183	4	0	0	**183**	909
Diquat	366	25	646	14	0	0	**1,012**	638
Glyphosate	685	46	1,712	38	233	40	**2,630**	1,066
Pendimethalin	241	16	0	0	233	40	**474**	59
Propaquizafop	0	0	881	19	0	0	**881**	297
Simazine	0	0	2,781	61	0	0	**2,781**	1,511
Terbuthylazine/terbutryn	0	0	993	22	0	0	**993**	1,535
All herbicides	**1,534**	**50**	**7,772**	**90**	**465**	**40**	**9,771**	**6,459**
Area grown	1,490		4,523		581		**6,594**	5,079

TABLE 21 Set aside seed treatment formulations

Area (ha) and percentage of crop treated

Seed treatments	***Set aside oilseed rape***		***Set aside grass***		***Set aside cover crop***		***Set aside mustard***		***Set aside phacelia***		****All set aside***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Beta-cyfluthrin/imidacloprid	4,051	81	0	0	0	0	0	0	0	0	**4,051**	1,948
Iprodione	3,963	79	0	0	0	0	0	0	0	0	**3,963**	3,176
Thiram	2,744	55	0	0	0	0	0	0	0	0	**2,744**	2,445
Area grown	5,001	95	**39,968	0	1,633	0	245	0	120	0	**46,967**	37,804

'*' excluding natural regeneration and woodland
'**' not all grass in first year

TABLE 22 Set aside insecticide and molluscicide formulations

Area treated (ha) and percentage of crop treated

Insecticides	***Set aside oilseed rape***		***Set aside regeneration***		***set aside grass***		***Set aside cover crop***		***Set aside mustard***		***Set aside phacelia***		****All set aside***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Alpha-cypermethrin	1,030	12	0	0	0	0	0	0	0	0	0	0	**1,030**	71
Chlorpyrifos	0	0	0	0	52	+	0	0	0	0	0	0	**52**	0
Cypermethrin	1,493	26	0	0	0	0	0	0	0	0	0	0	**1,493**	1,038
Deltamethrin	468	9	0	0	0	0	0	0	0	0	0	0	**468**	1,412
Lambda-cyhalothrin	805	16	0	0	0	0	0	0	132	54	0	0	**937**	667
Tau-fluvalinate	1,174	23	0	0	0	0	0	0	0	0	0	0	**1,174**	149
Zeta-cypermethrin	151	3	0	0	0	0	0	0	0	0	0	0	**151**	0
All insecticides	**5,121**	**69**	**0**	**0**	**52**	**+**	**0**	**0**	**132**	**54**	**0**	**0**	**5,304**	**3,337**
Molluscicides														
Metaldehyde	638	11	0	0	0	0	0	0	0	0	0	0	**638**	209
Methiocarb	46	1	0	0	0	0	0	0	0	0	0	0	**46**	55
All molluscicides	**683**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**683**	**264**
Area grown	5,001		19,873		39,968		1,633		245		120		**66,840**	68,142

'*' excluding woodland, '+' = <0.5%

TABLE 23 Set aside fungicide formulations

Area treated (ha) and percentage of crop treated

Fungicides	***Set aside oilseed rape***		***Set aside regeneration***		***Set aside grass***		***Set aside cover crop***		***Set aside mustard***		***Set aside phacelia***		****All set aside***	****2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
Azoxystrobin	208	4	0	0	0	0	0	0	0	0	0	0	**208**	0
Azoxystrobin/cyproconazole	286	6	0	0	0	0	0	0	0	0	0	0	**286**	0
Boscalid	1,493	30	0	0	0	0	0	0	0	0	0	0	**1,493**	688
Carbendazim	2,350	42	0	0	0	0	0	0	0	0	0	0	**2,350**	1,628
Carbendazim/flusilazole	979	20	0	0	0	0	0	0	0	0	0	0	**979**	817
Cyproconazole	257	5	0	0	0	0	0	0	0	0	0	0	**257**	0
Famoxadone/flusilazole	1,537	31	0	0	0	0	0	0	0	0	0	0	**1,537**	977
Flusilazole	1,938	39	0	0	0	0	0	0	0	0	0	0	**1,938**	1,927
Metconazole	1,235	21	0	0	0	0	0	0	0	0	0	0	**1,235**	971
Prochloraz/propiconazole	93	2	0	0	0	0	0	0	0	0	0	0	**93**	0
Prochloraz/tebuconazole	598	12	0	0	0	0	0	0	0	0	0	0	**598**	0
Prothioconazole	368	7	0	0	0	0	0	0	0	0	0	0	**368**	0
Sulphur	1,446	19	0	0	0	0	0	0	0	0	0	0	**1,446**	1,655
Tebuconazole	2,609	47	0	0	0	0	0	0	0	0	0	0	**2,609**	1,114
Vinclozolin	187	4	0	0	0	0	0	0	0	0	0	0	**187**	355
All fungicides	**15,585**	**84**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**15,585**	**12,473**
Area grown	5,001		19,873		39,968		1,633		245		120		**66,840**	68,142

'*' excluding woodland

TABLE 24 Set aside herbicide formulations

Area treated (ha) percentage of crop treated

Herbicides	***Set aside oilseed rape***		***Set aside regeneration***		***Set aside grass***		***Set aside cover crop***		***Set aside mustard***		***Set aside phacelia***		****All set aside***	***2004***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(ha)
2,4-DB/linuron/MCPA	0	0	0	0	171	+	0	0	0	0	0	0	**171**	0
Amidosulfuron	0	0	0	0	63	+	0	0	0	0	0	0	**63**	0
Asulam	0	0	0	0	63	+	0	0	0	0	0	0	**63**	0
Clomazone	1,473	29	0	0	0	0	0	0	0	0	0	0	**1,473**	71
Clopyralid	11	+	0	0	0	0	0	0	0	0	0	0	**11**	0
Clopyralid/picloram	65	1	0	0	0	0	0	0	0	0	0	0	**65**	0
Fluazifop-P-butyl	0	0	0	0	0	0	0	0	132	54	0	0	**132**	416
Glyphosate	3,260	65	6,832	34	1,077	3	332	20	264	54	0	0	**11,764**	9,171
Metazachlor	2,185	42	0	0	0	0	0	0	0	0	0	0	**2,185**	1,895
Metazachlor/quinmerac	1,345	27	0	0	0	0	0	0	0	0	0	0	**1,345**	900
Propaquizafop	2,956	55	0	0	0	0	0	0	0	0	0	0	**2,956**	1,041
Propyzamide	302	6	0	0	0	0	0	0	0	0	0	0	**302**	541
Quizalofop-P-ethyl	216	4	0	0	0	0	0	0	0	0	0	0	**216**	0
Trifluralin	275	6	0	0	0	0	0	0	0	0	0	0	**275**	272
All herbicdes	**12,088**	**92**	**6,832**	**34**	**1,373**	**3**	**332**	**20**	**396**	**54**	**0**	**0**	**21,021**	**15,007**
Area grown	5,001		19,873		39,968		1,633		245		120		**66,840**	68,142

'*' excluding woodland, '+' = <0.5%

TABLE 25 Cereals seed treatment active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Seed treatments	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****All cereals***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Bitertanol	0	0	0	0	12,123	13	88	2	1,878	28	4,296	27	**18,536**	2,149
Carboxin	328	1	3,550	2	2,783	3	106	2	0	0	1,453	9	**8,221**	955
Clothianidin	0	0	0	0	330	+	0	0	0	0	0	0	**330**	35
Fludioxonil	3,310	6	10,282	5	14,435	15	803	15	3,120	47	4,939	31	**36,889**	363
Fluoxastrobin	0	0	0	0	5,201	6	0	0	0	0	0	0	**5,201**	59
Fluquinconazole	0	0	0	0	5,339	6	0	0	0	0	0	0	**5,339**	710
Fuberidazole	2,254	4	5,590	3	23,213	25	2,368	44	1,878	28	4,429	28	**39,882**	296
Guazatine	632	1	6,999	3	4,827	5	218	4	35	1	2,446	15	**15,178**	2,142
Imazalil	364	1	20,028	9	0	0	0	0	0	0	0	0	**20,392**	189
Imidacloprid	0	0	0	0	1,397	1	0	0	0	0	0	0	**1,397**	112
Prochloraz	6,695	12	0	0	24,365	26	0	0	297	4	0	0	**31,357**	731
Prothioconazole	18,277	34	62,519	28	14,400	15	1,356	25	0	0	0	0	**96,552**	1,071
Silthiofam	0	0	0	0	4,461	5	0	0	0	0	0	0	**4,461**	207
Tebuconazole	34,716	65	154,176	70	0	0	0	0	0	0	0	0	**188,892**	1,112
Tefluthrin	0	0	567	+	374	+	0	0	0	0	0	0	**941**	33
Thiram	328	1	3,550	2	2,783	3	106	2	0	0	1,453	9	**8,221**	955
Triadimenol	2,254	4	5,590	3	11,090	12	2,280	42	0	0	133	1	**21,347**	1,396
Triazoxide	34,414	64	150,361	68	0	0	0	0	0	0	0	0	**184,775**	926
Triticonazole	7,059	13	19,544	9	22,100	23	0	0	297	4	0	0	**49,001**	408
Unspecified seed treatment	0	0	0	0	24	+	0	0	0	0	0	0	**24**	0
Area grown	53,697	90	220,408	91	94,231	93	5,384	90	6,609	81	16,049	83	**397,664**	

'*' includes triticale, '+' = <0.5%

TABLE 26 Cereals insecticide and molluscicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Insecticides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****All cereals***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Pyrethroids														
Alpha-cypermethrin	1,304	2	0	0	4,732	5	0	0	0	0	0	0	**6,036**	81
Cypermethrin	3,891	7	2,183	1	13,692	15	0	0	0	0	300	2	**20,066**	438
Deltamethrin	2,654	5	0	0	1,941	2	0	0	0	0	0	0	**4,798**	21
Lambda-cyhalothrin	3,035	5	1,855	1	9,284	8	363	7	2,816	21	1,845	8	**19,199**	58
Tau-fluvalinate	4,780	9	3,945	2	4,735	5	24	+	301	5	0	0	**13,785**	384
Zeta-cypermethrin	2,135	4	3,027	1	3,316	4	0	0	124	2	96	1	**8,698**	99
All pyrethroids	**17,799**	0	**11,010**	0	**37,700**	0	**387**	0	**3,241**	0	**2,241**	0	**72,581**	**1,081**
Carbamates	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0
Pirimicarb	0	0	0	0	3,749	4	0	0	0	0	0	0	**3,749**	160
All carbamates	**0**	0	**0**	0	**3,749**	0	**0**	0	**0**	0	**0**	0	**3,749**	**160**
Organophosphates		0	0	0	0	0	0	0	0	0	0	0	**0**	0
Chlorpyrifos	0	0	4,362	2	1,535	2	0	0	0	0	0	0	**5,897**	3,889
Dimethoate	0	0	0	0	1,678	2	0	0	0	0	0	0	**1,678**	530
All organophosphates	**0**	0	**4,362**	0	**3,213**	0	**0**	0	**0**	0	**0**	0	**7,575**	**4,420**
All insecticides	**17,799**	**32**	**15,372**	**7**	**44,662**	**41**	**387**	**7**	**3,241**	**28**	**2,241**	**11**	**83,905**	**5,661**
Molluscicides														
Metaldehyde	2,021	4	30	+	6,163	6	0	0	0	0	0	0	**8,215**	2,227
Methiocarb	233	+	0	0	3,216	3	0	0	0	0	0	0	**3,470**	361
All molluscicides	**2,255**	**4**	**30**	**+**	**9,380**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**11,685**	**2,588**
Area grown	53,697		220,408		94,231		5,384		6,609		16,049		**397,664**	

'*' includes triticale, '+' = <0.5%

TABLE 27 Cereals fungicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Fungicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****All cereals***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Azoxystrobin	4,721	9	16,698	8	34,171	30	784	11	1,793	27	2,037	13	**60,423**	5,502
Boscalid	1,416	3	6,978	3	23,577	24	0	0	0	0	0	0	**31,971**	5,885
Carbendazim	2,438	3	14,765	7	2,452	3	0	0	0	0	0	0	**19,655**	3,256
Chlorothalonil	58,634	77	173,581	67	196,007	94	4,617	66	163	2	0	0	**433,153**	191,782
Copper oxychloride	0	0	0	0	191	+	0	0	0	0	95	1	**286**	49
Cyflufenamid	951	2	592	+	6,121	5	0	0	1,026	8	419	3	**9,110**	56
Cyproconazole	1,884	4	16,040	7	31,532	23	0	0	1,274	14	2,832	14	**53,561**	2,149
Cyprodinil	17,352	26	19,707	9	15,225	16	0	0	0	0	0	0	**52,284**	13,755
Dimoxystrobin	0	0	0	0	8,589	9	0	0	0	0	0	0	**8,589**	742
Epoxiconazole	9,004	13	47,267	20	102,217	70	3,290	45	1,467	18	2,089	13	**165,334**	9,169
Famoxadone	5,881	10	32,064	14	14,340	14	0	0	43	1	0	0	**52,327**	3,048
Fenpropidin	0	0	0	0	5,633	6	0	0	0	0	0	0	**5,633**	1,103
Fenpropimorph	48,426	67	151,012	49	37,188	33	3,488	43	7,351	75	14,930	78	**262,465**	49,168
Fluoxastrobin	21,308	32	45,077	18	4,620	5	293	5	0	0	0	0	**71,298**	3,690
Fluquinconazole	0	0	0	0	10,353	11	0	0	0	0	0	0	**10,353**	701
Flusilazole	22,364	32	100,471	37	16,330	15	29	1	43	1	0	0	**139,237**	9,663
Flutriafol	0	0	0	0	12,368	12	0	0	0	0	0	0	**12,368**	560
Kresoxim-methyl	3,305	4	18,277	8	15,197	15	1,244	23	1,274	19	3,229	20	**42,526**	2,319
Mancozeb	0	0	0	0	9,975	8	218	4	0	0	0	0	**10,193**	6,782

‘*’ includes triticale, , ‘+’ = < 0.5%

Cont…

TABLE 27 Cereals fungicide active ingredients continued

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Fungicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****All cereals***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Maneb	0	0	0	0	346	+	0	0	0	0	0	0	**346**	249
Metconazole	0	0	2,009	1	748	1	0	0	0	0	0	0	**2,756**	87
Metrafenone	831	2	8,890	4	18,812	19	605	9	2,825	43	5,092	32	**37,076**	2,305
Picoxystrobin	17,442	24	27,106	10	0	0	0	0	301	5	0	0	**44,848**	3,550
Prochloraz	1,504	3	2,354	1	5,766	6	24	+	0	0	0	0	**9,647**	1,756
Propiconazole	0	0	5,905	3	16,106	14	0	0	0	0	0	0	**22,011**	1,137
Proquinazid	2,566	5	12,629	6	11,647	12	146	3	2,372	27	2,855	15	**32,214**	838
Prothioconazole	57,068	69	118,346	41	67,252	49	381	7	0	0	0	0	**243,250**	18,375
Pyraclostrobin	12,432	21	36,502	16	29,686	28	840	16	2,823	35	4,203	19	**86,486**	5,671
Quinoxyfen	0	0	426	+	1,993	2	121	2	889	13	3,338	21	**6,767**	365
Spiroxamine	10,041	16	21,717	9	16,800	14	571	11	499	8	81	1	**49,709**	8,977
Sulphur	1,932	4	5,351	2	10,249	10	1,048	7	120	2	1,258	8	**19,959**	65,305
Tebuconazole	6,199	11	15,297	6	57,873	46	1,380	20	1,675	25	3,280	20	**85,977**	7,077
Tetraconazole	0	0	0	0	619	1	0	0	0	0	0	0	**619**	30
Triadimenol	75	+	100	+	4,312	5	0	0	0	0	0	0	**4,487**	224
Trifloxystrobin	17,496	24	45,308	19	10,445	11	0	0	0	0	0	0	**73,318**	3,442
All fungicides	**325,269**	**100**	**944,469**	**89**	**798,740**	**99**	**19,076**	**89**	**25,939**	**99**	**45,738**	**94**	**2,160,238**	**428,767**
Area grown	53,697		220,408		94,231		5,384		6,609		16,049		**397,664**	

'*' includes triticale, '+' = < 0.5%

TABLE 28 Cereals herbicide and growth regulator active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Herbicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****All cereals***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
2,4-DB	0	0	753	+	0	0	0	0	0	0	0	0	**753**	667
Amidosulfuron	420	1	4,477	2	0	0	0	0	0	0	0	0	**4,897**	79
Bentazone	0	0	2,718	1	211	+	1,625	30	0	0	1,252	8	**5,806**	4,345
Bromoxynil	1,178	2	46,314	21	5,282	6	513	10	187	3	851	5	**54,325**	6,947
Carfentrazone-ethyl	200	+	379	+	889	1	0	0	2,354	36	0	0	**3,822**	49
Chloridazon	0	0	0	0	282	+	0	0	0	0	0	0	**282**	24
Chlorotoluron	1,996	4	0	0	853	1	0	0	0	0	0	0	**2,850**	4,506
Clodinafop-propargyl	0	0	0	0	1,137	1	0	0	0	0	0	0	**1,137**	22
Dicamba	135	+	44,102	20	1,019	1	518	10	43	1	3,102	19	**48,989**	2,563
Dichlorprop-p	0	0	2,538	1	403	+	395	7	0	0	0	0	**3,335**	2,168
Diclofop-methyl	0	0	517	+	0	0	0	0	0	0	0	0	**517**	226
Diflufenican	21,527	40	572	+	31,765	32	0	0	0	0	0	0	**54,088**	2,839
Fenoxaprop-P-ethyl	0	0	517	+	1,943	2	0	0	0	0	0	0	**2,460**	121
Florasulam	1,176	2	1,490	1	6,456	7	121	2	205	3	265	2	**9,714**	17
Flufenacet	4,347	8	0	0	1,790	2	0	0	0	0	0	0	**6,157**	930
Flupyrsulfuron-methyl	0	0	0	0	3,497	4	0	0	3,980	60	0	0	**7,477**	56
Fluroxypyr	1,821	3	6,388	3	8,786	9	0	0	1,487	23	1,207	8	**19,689**	1,870
Flurtamone	3,228	6	0	0	7,992	8	0	0	0	0	0	0	**11,221**	1,176

‘*’ includes triticale, ‘+’ = <0.5%

Cont...

TABLE 28 Cereals herbicide and growth regulator active ingredients continued

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Herbicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****All cereals***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Glufosinate-ammonium	669	1	0	0	0	0	0	0	0	0	0	0	**669**	75
Glyphosate**	16,731	31	30,840	14	20,815	20	470	9	1,363	21	1,084	7	****71,303**	53,266
Iodosulfuron-methyl-sodium	420	1	4,477	2	1,062	1	0	0	0	0	0	0	**5,960**	12
Ioxynil	758	1	39,306	17	4,548	5	513	10	0	0	851	5	**45,976**	4,479
Isoproturon	39,780	74	3,653	2	68,034	70	218	4	0	0	0	0	**111,908**	100,442
Linuron	2,472	5	766	+	0	0	0	0	0	0	0	0	**3,238**	1,040
MCPA	0	0	27,040	12	211	+	1,713	32	0	0	1,472	9	**30,436**	30,487
MCPB	0	0	7,650	3	211	+	1,625	30	0	0	1,252	8	**10,738**	10,156
Mecoprop-P	10,754	18	152,169	68	35,674	34	2,843	53	3,382	51	12,844	75	**217,885**	98,200
Mesosulfuron-methyl	0	0	0	0	1,062	1	0	0	0	0	0	0	**1,062**	13
Metsulfuron-methyl	7,135	13	113,889	52	20,988	22	2,160	40	4,771	72	5,978	37	**155,070**	492
Pendimethalin	22,034	41	464	+	46,399	49	0	0	0	0	0	0	**69,100**	45,672
Picolinafen	11,493	21	0	0	32,477	34	0	0	0	0	0	0	**43,971**	1,304
Pinoxaden	1,441	3	7,957	4	3,618	4	0	0	0	0	0	0	**13,016**	312
Sulfosulfuron	0	0	0	0	1,150	1	0	0	0	0	0	0	**1,150**	17
Thifensulfuron-methyl	7,589	14	126,063	57	12,875	14	1,881	35	2,282	35	0	0	**150,689**	3,218

'*' includes triticale, '+' = <0.5%

'**' pre-harvest treatments accounted for 91% of the total area treated with glyphosate

Cont…

TABLE 28 Cereals herbicide and growth regulator active ingredients continued

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Herbicides	***Winter barley***		***Spring barley***		***Winter wheat***		***Spring wheat***		***Winter oats***		***Spring oats***		****All cereals***	****All cereals***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Tralkoxydim	455	1	17,044	8	527	1	0	0	0	0	0	0	**18,027**	3,198
Tribenuron-methyl	6,221	12	84,636	36	12,498	13	790	15	2,439	37	5,518	34	**112,252**	810
Trifluralin	8,789	16	0	0	6,567	7	0	0	0	0	0	0	**15,355**	9,659
All herbicides	**172,770**	**96**	**726,717**	**95**	**341,023**	**97**	**15,383**	**96**	**22,494**	**99**	**35,676**	**94**	**1,315,326**	**391,456**
Growth regulators														
2-chloroethylphosphonic acid	27,543	51	3,882	2	29,840	32	0	0	379	6	110	1	**61,775**	10,876
Chlormequat	51,366	73	7,534	3	123,901	90	3,850	72	5,082	62	12,367	76	**204,506**	155,934
Imazaquin	0	0	0	0	15,364	13	0	0	0	0	0	0	**15,364**	17
Mepiquat chloride	3,243	6	1,039	+	6,997	7	0	0	0	0	0	0	**11,279**	2,811
Prohexadione-calcium	87	+	0	0	0	0	0	0	0	0	0	0	**87**	3
Trinexapac-ethyl	31,851	57	7,746	3	50,770	44	201	4	2,762	42	4,319	25	**98,003**	3,970
All growth regulators	**114,091**	**88**	**20,202**	**7**	**226,872**	**96**	**4,050**	**72**	**8,223**	**81**	**16,796**	**83**	**391,014**	**173,611**
Area grown	53,697		220,408		94,231		5,384		6,609		16,049		**397,664**	

'*' includes triticale, '+' = <0.5%

TABLE 29 Oilseed rape seed treatment active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Seed treatment	***Winter oilseed rape***		***Spring oilseed rape***		***All oilseed rape***	***All oilseed rape***
	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Beta-cyfluthrin	21,933	71	1,383	50	**23,316**	217
Imidacloprid	21,933	71	1,383	50	**23,316**	217
Iprodione	21,224	69	1,383	50	**22,607**	265
Prochloraz	133	+	0	0	**133**	1
Thiram	20,698	67	1,851	67	**22,549**	302
Unspecified seed treatment	206	1	0	0	**206**	0
Area grown	30,931	96	2,760	88	**33,692**	

'+' = < 0.5%

TABLE 30 Oilseed rape insecticide and molluscicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Insecticides	***Winter oilseed rape***		***Spring oilseed rape***		***All oilseed rape***	***All oilseed rape***
	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Pyrethroids						
Alpha-cypermethrin	865	3	0	0	**865**	11
Cypermethrin	5,136	15	429	16	**5,564**	119
Deltamethrin	1,091	4	1,043	38	**2,134**	21
Lambda-cyhalothrin	11,702	33	1,135	24	**12,837**	74
Tau-fluvalinate	7,913	26	389	14	**8,302**	330
Zeta-cypermethrin	2,812	9	0	0	**2,812**	25
All pyrethroids	**29,520**	0	**2,996**	0	**32,515**	**579**
Carbamates	0	0	0	0	**0**	0
Pirimicarb	268	1	0	0	**268**	56
All carbamates	**268**	0	**0**	0	**268**	**56**
All insecticides	**29,788**	**79**	**2,996**	**85**	**32,783**	**636**
Molluscicides						
Metaldehyde	6,173	15	0	0	**6,173**	2,444
Methiocarb	1,071	3	0	0	**1,071**	161
All molluscicides	**7,244**	**19**	**0**	**0**	**7,244**	**2,604**
Area grown	30,931		2,760		**33,692**	

TABLE 31 Oilseed rape fungicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Fungicides	***Winter oilseed rape***		***Spring oilseed rape***		***All oilseed rape***	***All oilseed rape***
	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Azoxystrobin	4,849	16	0	0	**4,849**	665
Boscalid	17,751	57	1,432	52	**19,183**	4,190
Carbendazim	19,375	50	718	26	**20,094**	4,107
Chlorothalonil	1,652	4	0	0	**1,652**	642
Cyproconazole	731	2	0	0	**731**	44
Difenoconazole	384	1	0	0	**384**	24
Famoxadone	7,580	22	0	0	**7,580**	573
Flusilazole	26,769	59	1,043	38	**27,812**	2,816
Metconazole	10,881	33	0	0	**10,881**	419
Prochloraz	3,834	12	0	0	**3,834**	938
Propiconazole	235	1	0	0	**235**	7
Prothioconazole	4,574	11	0	0	**4,574**	390
Sulphur	9,985	25	0	0	**9,985**	48,374
Tebuconazole	25,908	66	90	3	**25,998**	3,659
Vinclozolin	3,687	12	335	12	**4,022**	1,425
All fungicides	**138,195**	**99**	**3,618**	**93**	**141,813**	**68,273**
Area grown	30,931		2,760		**33,692**	

TABLE 32 Oilseed rape herbicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Herbicides	***Winter oilseed rape***		***Spring oilseed rape***		***All oilseed rape***	***All oilseed rape***
	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Carbetamide	85	+	0	0	**85**	179
Clomazone	5,158	17	0	0	**5,158**	274
Clopyralid	448	1	0	0	**448**	40
Cyanazine	830	3	0	0	**830**	314
Cycloxydim	887	3	0	0	**887**	89
Diquat	91	+	0	0	**91**	55
Fluazifop-P-butyl	1,570	4	0	0	**1,570**	104
Glyphosate	15,692	50	993	36	**16,685**	20,420
Metazachlor	25,944	84	2,332	84	**28,276**	18,626
Picloram	411	1	0	0	**411**	9
Propaquizafop	14,830	42	185	7	**15,015**	627
Propyzamide	3,308	11	0	0	**3,308**	1,847
Quinmerac	5,433	18	0	0	**5,433**	899
Quizalofop-P-ethyl	669	2	0	0	**669**	23
Trifluralin	814	3	159	6	**973**	901
All herbicides	**76,171**	**96**	**3,669**	**100**	**79,841**	**44,408**
Area grown	30,931		2,760		**33,692**	

‘+’ = < 0.5%

TABLE 33 Potato seed treatment active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Seed treatments	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***All potatoes***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Flutolanil	883	8	2,720	17	0	0	**3,604**	899
Imazalil	5,561	49	7,240	46	324	39	**13,125**	442
Iprodione	232	2	302	2	0	0	**534**	250
Pencycuron	7,469	65	8,258	52	110	13	**15,837**	11,336
Unspecified seed treatment	62	1	0	0	0	0	**62**	0
Area grown	11,440	87	15,853	89	831	52	**28,124**	

TABLE 34 Potato insecticide, molluscicide and nematicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Insecticides	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***All potatoes***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Pyrethroids								
Cypermethrin	140	+	0	0	0	0	**140**	4
Deltamethrin	379	1	0	0	0	0	**379**	2
Lambda-cyhalothrin	29,830	84	12,951	52	0	0	**42,781**	266
Zeta-cypermethrin	3,367	10	1,224	3	0	0	**4,591**	34
All pyrethroids	**33,716**		**14,176**		**0**		**47,891**	**307**
Carbamates								
Aldicarb	266	2	658	4	110	13	**1,034**	2,548
Oxamyl	173	2	2,064	13	0	0	**2,237**	4,262
Pirimicarb	24,459	74	8,274	37	0	0	**32,734**	3,719
All carbamates	**24,898**		**10,997**		**110**		**36,005**	**10,528**
Organophosphates								
Fosthiazate	217	2	604	4	0	0	**821**	1,232
All organophosphates	**217**		**604**				**821**	**1,232**

'+' = <0.5%

Cont…

TABLE 34 Potato insecticide, molluscicide and nematicide active ingredients continued

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Insecticides	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***All potatoes***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Others								
Flonicamid	0	0	0	0	132	16	**132**	11
Pymetrozine	6,626	37	1,453	8	0	0	**8,079**	1,106
Thiacloprid	2,005	16	1,396	9	0	0	**3,401**	293
All others	**8,631**		**2,849**		**132**		**11,612**	**1,410**
All insecticides	**67,462**	**89**	**28,626**	**65**	**243**	**29**	**96,330**	**13,476**
Molluscicides								
Ferric phosphate	309	3	0	0	0	0	**309**	25
Metaldehyde	2,618	11	9,108	24	0	0	**11,726**	3,517
Methiocarb	2,723	17	10,902	37	0	0	**13,625**	1,232
All molluscicides	**5,650**	**26**	**20,010**	**48**	0	0	**25,660**	**4,774**
Area grown	11,440		15,853		831		**28,124**	

TABLE 35 Potato fungicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Fungicides	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***All potatoes***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Azoxystrobin	1,497	13	1,390	9	110	13	**2,997**	2,134
Benalaxyl	4,943	20	9,529	36	0	0	**14,472**	2,067
Benthiavalicarb isopropyl	490	4	3,104	18	0	0	**3,594**	93
Chlorothalonil	152	1	1,795	9	0	0	**1,946**	1,531
Copper oxychloride	480	3	90	1	0	0	**569**	569
Cyazofamid	8,356	40	11,451	38	0	0	**19,807**	1,585
Cymoxanil	37,859	91	44,210	91	331	13	**82,400**	6,733
Dimethomorph	2,607	20	4,312	18	0	0	**6,919**	1,022
Famoxadone	462	4	1,597	7	0	0	**2,059**	235
Fenamidone	2,240	14	1,883	9	0	0	**4,123**	618
Fluazinam	32,787	94	32,315	82	1,159	61	**66,260**	10,080
Flupicolide	1,885	16	7,665	28	0	0	**9,550**	812
Mancozeb	46,973	96	61,071	94	441	13	**108,486**	134,769
Maneb	210	1	0	0	132	16	**343**	175
Metalaxyl-M	10,911	59	13,523	50	374	45	**24,807**	1,822
Propamocarb hydrochloride	4,277	29	10,455	37	0	0	**14,732**	12,258
Sulphur	0	0	433	2	0	0	**433**	1,732
Zoxamide	2,074	14	8,467	31	0	0	**10,541**	1,420
All fungicides	**158,202**	**99**	**213,286**	**99**	**2,548**	**61**	**374,036**	**179,657**
Area grown	11,440		15,853		831		**28,124**	

TABLE 36 Potato herbicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Herbicides	***Seed potatoes***		***Ware potatoes***		***Early potatoes***		***All potatoes***	***All potatoes***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Carfentrazone-ethyl	2,544	21	3,548	22	131	16	**6,222**	360
Clomazone	0	0	224	1	0	0	**224**	12
Diquat	13,621	68	21,347	90	379	19	**35,347**	9,902
Glyphosate	146	1	41	+	0	0	**187**	118
Linuron	8,701	76	7,919	50	588	71	**17,208**	18,043
Metribuzin	2,744	24	6,663	41	110	13	**9,517**	4,891
Paraquat	10,926	96	13,795	87	110	13	**24,832**	7,802
Pendimethalin	0	0	667	4	0	0	**667**	721
Rimsulfuron	0	0	1,263	8	0	0	**1,263**	9
Sulphuric acid	5,559	33	7,950	39	0	0	**13,509**	2,012,902
All herbicides	**44,242**	**96**	**63,417**	**98**	**1,318**	**84**	**108,977**	**2,054,761**
Growth regulators								
Maleic hydrazide	0	0	730	5	0	0	**730**	2,134
All growth regulators	**0**		**730**	**5**	**0**		**730**	**2,134**
Area grown	11,440		15,853		831		**28,124**	

'+' = <0.5%

TABLE 37 Legume seed treatment active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Seed treatments	***Combine peas***		***Field beans***		***Lupins***		***All crops***	***All crops***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Thiabendazole	0	0	0	0	142	24	**142**	7
Thiram	981	66	0	0	142	24	**1,123**	133
Area grown	1,490	66	4,523	0	581	24	**6,594**	

TABLE 38 Legume insecticide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Insecticides	***Combine peas***		***Field beans***		***Lupins***		***All crops***	***All crops***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Pyrethroids								
Alpha-cypermethrin	0	0	400	9	0	0	**400**	5
Cypermethrin	0	0	533	12	0	0	**533**	12
Deltamethrin	0	0	463	10	91	16	**554**	3
Lambda-cyhalothrin	0	0	1,377	22	0	0	**1,377**	9
Zeta-cypermethrin	0	0	98	2	0	0	**98**	1
All pyrethroids	**0**		**2,872**		**91**		**2,962**	**29**
Carbamates								
Pirimicarb	78	5	136	3	0	0	**214**	26
All carbamates	**78**		**136**		**0**		**214**	**26**
All insecticides	**78**	**5**	**3,007**	**52**	**91**	**16**	**3,176**	**55**
Area grown	1,490		4,523		581		**6,594**	

TABLE 39 Legume fungicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Fungicides	***Combine peas***		***Field beans***		***Lupins***		***All crops***	***All crops***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Azoxystrobin	139	9	327	7	0	0	**466**	64
Chlorothalonil	746	50	4,647	87	91	16	**5,484**	4,827
Cyproconazole	0	0	1,086	24	0	0	**1,086**	63
Mancozeb	0	0	283	6	0	0	**283**	236
Metalaxyl-M	0	0	1,887	30	0	0	**1,887**	93
Metconazole	0	0	367	8	0	0	**367**	16
Sulphur	0	0	2,517	44	0	0	**2,517**	7,804
Vinclozolin	241	16	516	11	0	0	**757**	224
All fungicides	**1,126**	**50**	**11,630**	**93**	**91**	**16**	**12,847**	**13,328**
Area grown	1,490		4,523		581		**6,594**	

TABLE 40 Legume herbicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Herbicides	***Combine peas***		***Field beans***		***Lupins***		***All crops***	***All crops***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Bentazone	121	4	0	0	0	0	**121**	27
Clomazone	0	0	576	13	0	0	**576**	52
Cyanazine	121	4	183	4	0	0	**304**	90
Diquat	366	25	646	14	0	0	**1,012**	497
Glyphosate	685	46	1,712	38	233	40	**2,630**	2,254
MCPB	121	4	0	0	0	0	**121**	27
Pendimethalin	241	16	183	4	233	40	**657**	736
Propaquizafop	0	0	881	19	0	0	**881**	42
Simazine	0	0	2,781	61	0	0	**2,781**	2,687
Terbuthylazine	0	0	993	22	0	0	**993**	320
Terbutryn	0	0	993	22	0	0	**993**	746
All herbicides	**1,655**	**50**	**8,948**	**90**	**465**	**40**	**11,068**	**7,478**
Area grown	1,490		4,523		581		**6,594**	

TABLE 41 Set aside seed treatment active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Seed treatments	***Set aside oilseed rape***		***Set aside grass***		***Set aside cover crop***		***Set aside mustard***		***Set aside phacelia***		**** All set aside***	**** All set aside***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Beta-cyfluthrin	4,051	81	0	0	0	0	0	0	0	0	**4,051**	42
Imidacloprid	4,051	81	0	0	0	0	0	0	0	0	**4,051**	42
Iprodione	3,963	79	0	0	0	0	0	0	0	0	**3,963**	47
Thiram	2,744	55	0	0	0	0	0	0	0	0	**2,744**	40
Area grown	5,001	95	**39,968		1,633		245		120		**46,967**	

‘*’ excluding natural regeneration and woodland
‘**’ not all grass in first year

TABLE 42 Set aside insecticide and molluscicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Insecticides	***Set aside oilseed rape***		***Set aside regeneration***		***Set aside grass***		***Set aside cover crop***		***Set aside mustard***		***Set aside phacelia***		****All set aside***	****All set aside***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Pyrethroids														
Alpha cypermethrin	1,030	12	0	0	0	0	0	0	0	0	0	0	**1,030**	8
Cypermethrin	1,493	26	0	0	0	0	0	0	0	0	0	0	**1,493**	34
Deltamethrin	468	9	0	0	0	0	0	0	0	0	0	0	**468**	3
Lambda-cyhalothrin	805	16	0	0	0	0	0	0	132	54	0	0	**937**	6
Tau-fluvalinate	1,174	23	0	0	0	0	0	0	0	0	0	0	**1,174**	39
Zeta cypermethrin	151	3	0	0	0	0	0	0	0	0	0	0	**151**	2
All pyrethroids	**5,121**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**132**	**0**	**0**	**0**	**5,253**	**92**
Organophosphates														
Chlorpyrifos	0	0	0	0	52	+	0	0	0	0	0	0	**52**	31
All organophosphates	**0**		**0**		**52**		**0**		**0**		**0**		**52**	**31**
All insecticides	**5,121**	**69**			**52**	**+**			**132**	**54**	**0**		**5,304**	**123**
Molluscicides														
Metaldehyde	638	11	0	0	0	0	0	0	0	0	0	0	**638**	264
Methiocarb	46	1	0	0	0	0	0	0	0	0	0	0	**46**	2
All molluscicides	**683**	**11**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**683**	**266**
Area grown	5,001		19,873		39,968		1,633		245		120		**66,840**	

'*'excluding woodland, '+' = <0.5%

TABLE 43 Set aside fungicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Fungicides	***Set aside oilseed rape***		***Set aside regeneration***		***Set aside grass***		***Set aside cover crop***		***Set aside mustard***		***Set aside phacelia***		****All set aside***	****All set aside***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
Azoxystrobin	494	10	0	0	0	0	0	0	0	0	0	0	**494**	89
Boscalid	1,493	30	0	0	0	0	0	0	0	0	0	0	**1,493**	296
Carbendazim	3,329	55	0	0	0	0	0	0	0	0	0	0	**3,329**	863
Cyproconazole	543	11	0	0	0	0	0	0	0	0	0	0	**543**	30
Famoxadone	1,537	31	0	0	0	0	0	0	0	0	0	0	**1,537**	157
Flusilazole	4,454	58	0	0	0	0	0	0	0	0	0	0	**4,454**	499
Metconazole	1,235	21	0	0	0	0	0	0	0	0	0	0	**1,235**	39
Prochloraz	690	14	0	0	0	0	0	0	0	0	0	0	**690**	158
Propiconazole	93	2	0	0	0	0	0	0	0	0	0	0	**93**	3
Prothioconazole	368	7	0	0	0	0	0	0	0	0	0	0	**368**	26
Sulphur	1,446	19	0	0	0	0	0	0	0	0	0	0	**1,446**	4,752
Tebuconazole	3,207	59	0	0	0	0	0	0	0	0	0	0	**3,207**	456
Vinclozolin	187	4	0	0	0	0	0	0	0	0	0	0	**187**	68
All fungicides	**19,078**	**84**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**19,078**	**7,435**
Area grown	5,001		19,873		39,968		1,633		245		120		**66,840**	

'*' excluding woodland

TABLE 44 Set aside herbicide active ingredients

Area treated (ha), percentage of crop treated, and weights (kg) of active ingredients for all crops

Herbicides	***Set aside oilseed rape***		***Set aside regeneration***		***Set aside grass***		***Set aside cover crop***		***Set aside mustard***		***Set aside phacelia***		****All set aside***	****All set aside***
	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	(ha)	(%)	**(ha)**	(kg)
2,4-DB	0	0	0	0	171	+	0	0	0	0	0	0	**171**	131
Amidosulfuron	0	0	0	0	63	+	0	0	0	0	0	0	**63**	1
Asulam	0	0	0	0	63	+	0	0	0	0	0	0	**63**	44
Clomazone	1,473	29	0	0	0	0	0	0	0	0	0	0	**1,473**	95
Clopyralid	76	2	0	0	0	0	0	0	0	0	0	0	**76**	7
Fluazifop-P-butyl	0	0	0	0	0	0	0	0	132	54	0	0	**132**	10
Glyphosate	3,260	65	6,832	34	1,077	3	332	20	264	54	0	0	**11,764**	13,748
Linuron	0	0	0	0	171	+	0	0	0	0	0	0	**171**	18
MCPA	0	0	0	0	171	+	0	0	0	0	0	0	**171**	18
Metazachlor	3,522	69	0	0	0	0	0	0	0	0	0	0	**3,522**	1,867
Picloram	65	1	0	0	0	0	0	0	0	0	0	0	**65**	2
Propaquizafop	2,956	55	0	0	0	0	0	0	0	0	0	0	**2,956**	117
Propyzamide	302	6	0	0	0	0	0	0	0	0	0	0	**302**	180
Quinmerac	1,345	27	0	0	0	0	0	0	0	0	0	0	**1,345**	252
Quizalofop-P-ethyl	216	4	0	0	0	0	0	0	0	0	0	0	**216**	3
Trifluralin	275	6	0	0	0	0	0	0	0	0	0	0	**275**	264
All herbicides	**13,490**	**92**	**6,832**	**34**	**1,714**	**3**	**332**	**20**	**396**	**54**	**0**	**0**	**22,764**	**16,758**
Area grown	5,001		19,873		39,968		1,633		245		120		**66,840**	

'*' excluding woodland, '+' = <0.5%.

TABLE 45 Principal active ingredients

Area (area treated × 1000) treated with the 50 most used active ingredients, including seed treatments, on all crops surveyed

	Ai	*Type*	*2006*	*200*
1	Chlorothalonil	F	442	404
2	Prothioconazole	F/S	345	0
3	Tebuconazole	F/S	304	293
4	Fenpropimorph	F	262	369
5	Mecoprop-P	H	218	247
6	Chlormequat	G	205	230
7	Triazoxide	S	185	218
8	Flusilazole	F	172	226
9	Epoxiconazole	F	165	296
10	Metsulfuron-Methyl	H	155	223
11	Thifensulfuron-Methyl	H	151	185
12	Mancozeb	F	119	145
13	Tribenuron-Methyl	H	112	76
14	Isoproturon	H	112	137
15	Glyphosate	H	103	123
16	Trinexapac-Ethyl	G	98	82
17	Pyraclostrobin	F	86	74
18	Cymoxanil	F	82	117
19	Lambda-Cyhalothrin	I	77	67
20	Fluoxastrobin	F/S	76	0
21	Trifloxystrobin	F	73	72
22	Pendimethalin	H	70	61
23	Azoxystrobin	F	69	122
24	Fluazinam	F	66	56
25	Famoxadone	F	64	109
26	2-Chloroethylphosphonic acid	G	62	93
27	Cyproconazole	F	56	63
28	Bromoxynil	H	54	56
29	Diflufenican	H	54	78
30	Boscalid	F	53	18
31	Cyprodinil	F	52	137
32	Spiroxamine	F	50	42
33	Triticonazole	S	49	24
34	Dicamba	H	49	38
35	Ioxynil	H	46	51
36	Prochloraz	F/S	46	49
37	Picoxystrobin	F	45	49
38	Picolinafen	H	44	33
39	Carbendazim	F	43	67
40	Kresoxim-Methyl	F	43	140
41	Fuberidazole	S	40	59
42	Metrafenone	F	37	44
43	Pirimicarb	I	37	39
44	Fludioxonil	S	37	56
45	Diquat	H	36	29
46	Thiram	S	35	52
47	Sulphur	F	34	39
48	Imazalil	S	34	37
49	Proquinazid	F	32	0
50	Metazachlor	H	32	33

TABLE 46 Principal active ingredients

Quantity (tonnes) of the 50 most used active ingredients, including seed treatments, on all crops surveyed

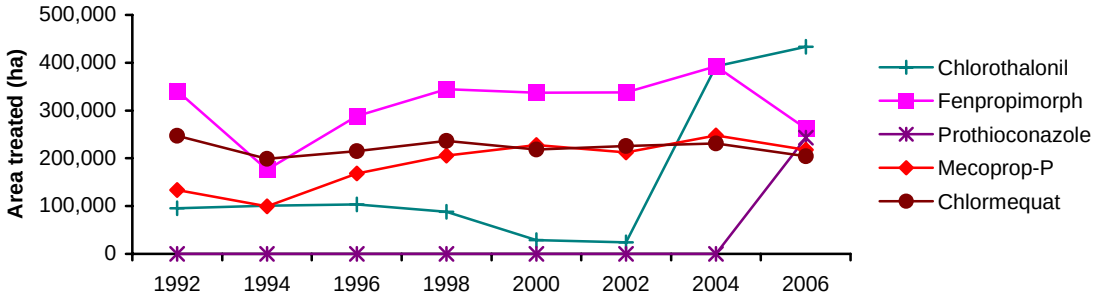
	Ai	*Type*	*2006*	*2004*
1	Sulphuric acid	H	2,013	5,445
2	Chlorothalonil	F	199	197
3	Chlormequat	G	156	173
4	Mancozeb	F	142	188
5	Sulphur	F	128	147
6	Isoproturon	H	100	121
7	Mecoprop-P	H	98	130
8	Glyphosate	H	90	98
9	Fenpropimorph	F	49	70
10	Pendimethalin	H	47	43
11	MCPA	H	31	25
12	Metazachlor	H	20	22
13	Prothioconazole	F/S	20	0
14	Linuron	H	19	22
15	Cyprodinil	F	14	41
16	Flusilazole	F	13	17
17	Tebuconazole	F/S	12	9
18	Propamocarb hydrochloride	F	12	11
19	Pencycuron	S	11	13
20	2-chloroethylphosphonic acid	G	11	16
21	Trifluralin	H	11	15
22	Diquat	H	10	8
23	Boscalid	F	10	4
24	MCPB	H	10	5
25	Fluazinam	F	10	8
26	Epoxiconazole	F	9	17
27	Spiroxamine	F	9	9
28	Azoxystrobin	F	8	13
29	Metaldehyde	M	8	11
30	Carbendazim	F	8	9
31	Paraquat	H	8	10
32	Bromoxynil	H	7	6
33	Cymoxanil	F	7	11
34	Pyraclostrobin	F	6	5
35	Metribuzin	H	5	5
36	Chlorotoluron	H	5	5
37	Ioxynil	H	4	5
38	Bentazone	H	4	2
39	Oxamyl	I	4	0.3
40	Famoxadone	F	4	7
41	Trinexapac-ethyl	G	4	4
42	Pirimicarb	I	4	4
43	Chlorpyrifos	I	4	5
44	Fluoxastrobin	F/S	4	0
45	Prochloraz	F/S	4	9
46	Picoxystrobin	F	4	5
47	Trifloxystrobin	F	3	6
48	Thifensulfuron-methyl	H	3	4
49	Tralkoxydim	H	3	7
50	Diflufenican	H	3	4

For table 45 and table 46 the pesticide type is shown (H: Herbicide, F: Fungicide, I: Insecticide, S: seed treatment & G: growth regulator, M: molluscicide)

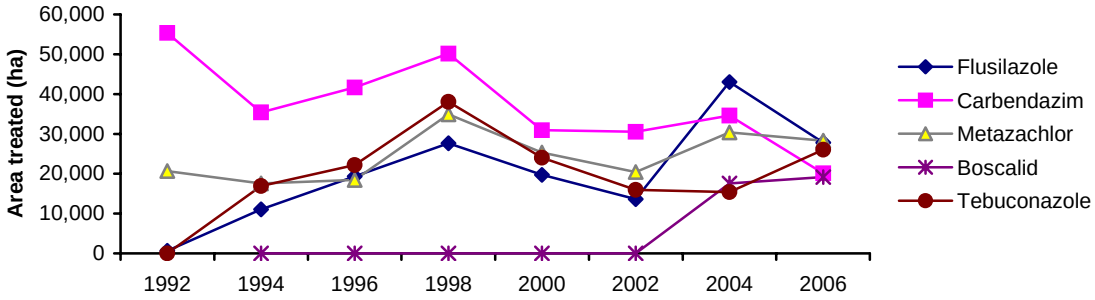
FIGURE 9 Top 5 active ingredients in 2006: trends in usage 1992 - 2006

Treated area (hectares) of active ingredients

Cereals



Oilseed rape



Potatoes

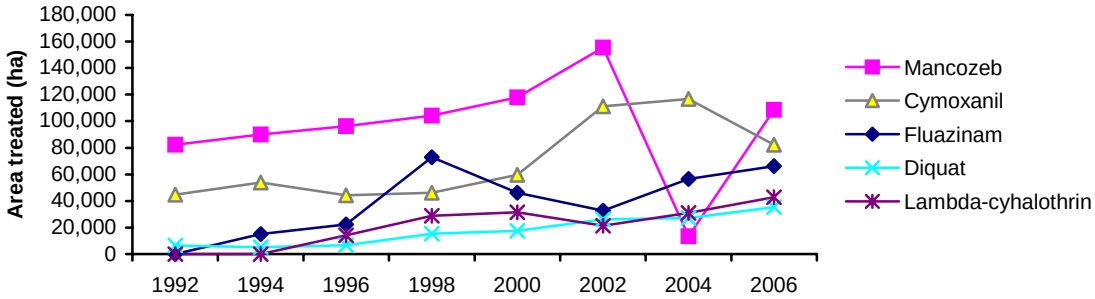


TABLE 47 Cereals, comparison with previous years

Pesticide usage in 2002, 2004 and 2006, area treated with formulations and active ingredients (a.i.) and the quantities applied

	2002			2004			2006		
	Formulations (ha)	***a.i. (ha)***	***kg***	***Formulations (ha)***	***a.i. (ha)***	***kg***	***Formulations (ha)***	***a.i. (ha)***	***kg***
Insecticides									
Pyrethroids	53,809	53,809	709	54,174	54,174	707	72,581	72,581	1,081
Organophosphates	8,130	8,130	5,269	9,418	9,418	6,217	7,575	7,575	4,420
Carbamates	5,430	5,430	504	2,200	2,200	164	3,749	3,749	160
All insecticides	67,368	67,368	6,482	65,792	65,792	7,088	83,905	83,905	5,661
Molluscicides	35,265	35,265	8,192	6,149	6,149	1,470	11,685	11,685	2,588
Fungicides	1,393,453	1,976,211	349,509	1,719,351	2,390,726	496,420	1,519,871	2,160,238	428,767
Herbicides	951,323	1,387,061	376,639	1,033,235	1,481,070	455,947	903,767	1,315,326	391,456
Growth regulators	338,350	426,160	186,017	372,216	459,750	201,670	331,963	391,014	173,611
Seed treatments	420,887	729,187	27,859	411,795	750,033	19,105	363,136	736,953	13,849
All pesticides	**3,206,646**	**4,621,252**	**954,698**	**3,608,538**	**5,153,519**	**1,181,700**	**3,214,327**	**4,699,121**	**1,015,932**
Area planted (ha)	445,512			440,963			397,664		

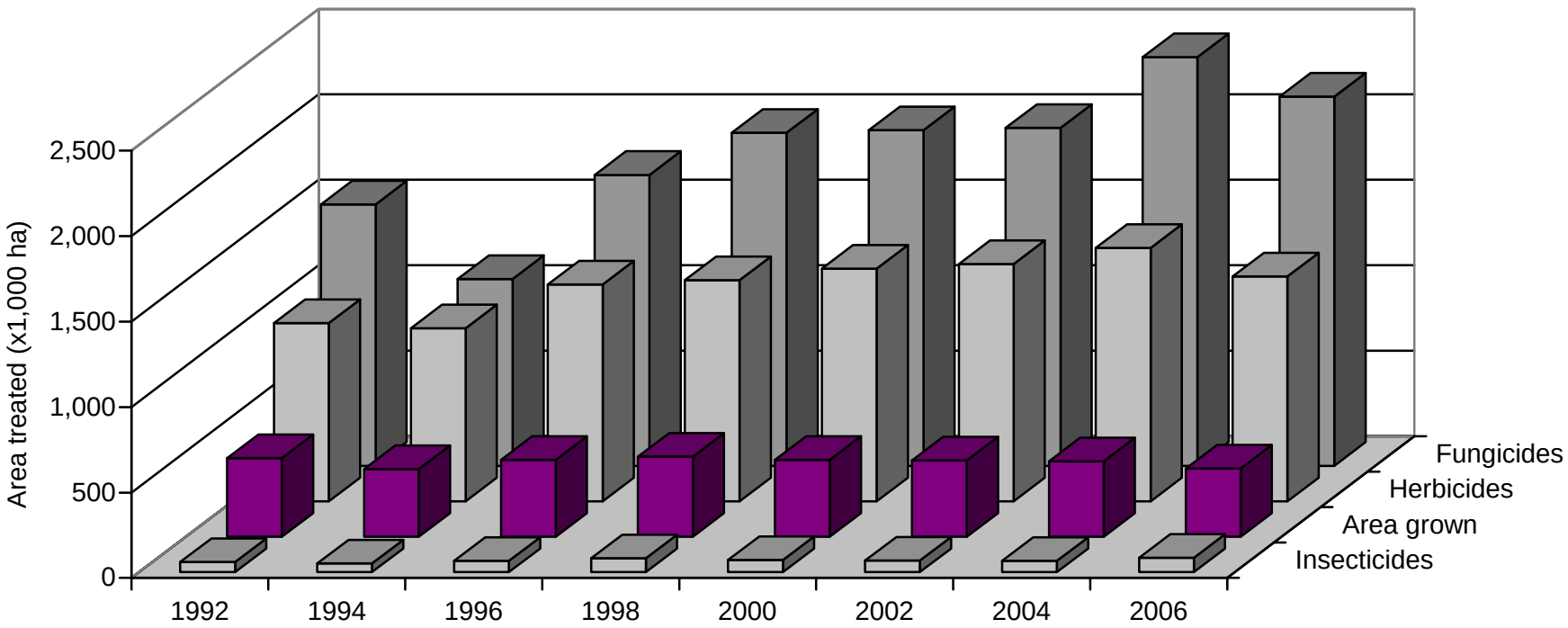


FIGURE 10 Cereals, comparison with previous years

Treated area of active ingredients of main pesticide types 1992 – 2006

TABLE 48 Oilseed rape, comparison with previous years

Pesticide usage in 2002, 2004 and 2006, area treated with formulations and active ingredients (a.i.) and the quantities applied

	2002			2004			2006		
	Formulations (ha)	***a.i. (ha)***	***kg***	***Formulations (ha)***	***a.i. (ha)***	***kg***	***Formulations (ha)***	***a.i. (ha)***	***kg***
Insecticides									
Pyrethroids	24,461	24,461	338	29,022	29,022	375	32,515	32,515	579
Organophosphates	305	305	76	0	0	0	0	0	0
Carbamates	0	0	0	0	0	0	268	268	56
Mixed formulations or others	468	468	44	419	419	26	0	0	0
All insecticides	25,234	25,234	458	29,441	29,441	401	32,783	32,783	635
Molluscicides	11,063	11,063	2,419	4,837	4,837	1,055	7,244	7,244	2,604
Fungicides	89,272	111,718	41,797	132,223	164,640	77,284	121,937	141,813	68,273
Herbicides/desiccants	50,041	56,930	30,218	70,692	75,298	42,958	74,823	79,841	44,408
Growth regulators	36	36	51	180	180	143	0	0	0
Seed treatments	37,439	42,764	732	83,610	102,282	1,111	68,678	92,450	1,079
All pesticides	**213,085**	**247,745**	**75,675**	**320,983**	**376,678**	**122,952**	**305,465**	**354,131**	**116,999**
Area planted (ha)	30,902			39,345			33,692		

FIGURE 11 Oilseed rape, comparison with previous years

Treated area of active ingredients of main pesticide types 1992 - 2006

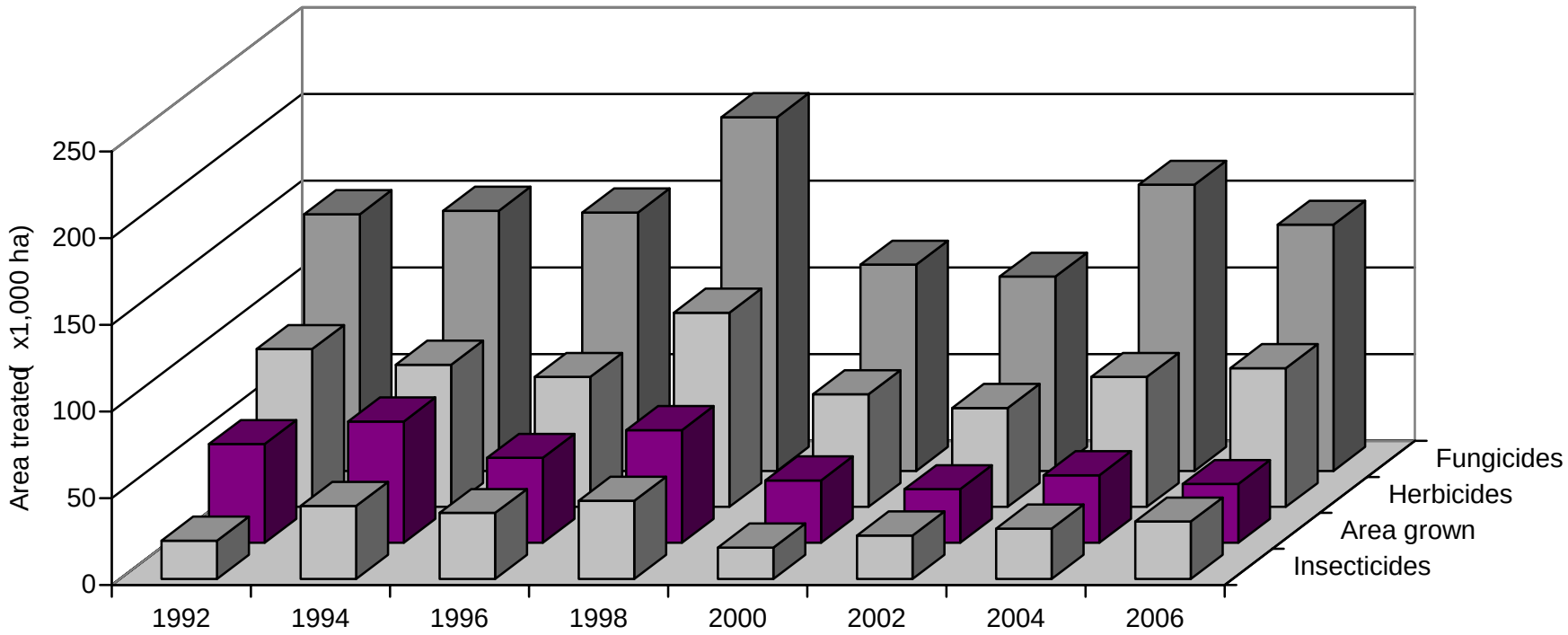


TABLE 49 Potatoes, comparison with previous years

Pesticide usage in 2002, 2004 and 2006, area treated with formulations and active ingredients (a.i.) and the quantities applied

	2002			2004			2006		
	Formulations (ha)	***a.i. (ha)***	***kg***	***Formulations (ha)***	***a.i. (ha)***	***kg***	***Formulations (ha)***	***a.i. (ha)***	***kg***
Insecticides & nematicides									
Pyrethroids	18,362	52,186	386	26,374	46,980	337	38,230	47,891	307
Organophosphates	376	376	30	0	0	0	821	821	1,232
Carbamates	16,493	50,317	7,061	16,965	37,571	4,583	26,344	36,005	10,528
Mixed formulations or others	43,131	9,307	753	32,247	11,641	1,675	21,273	11,612	1,410
All insecticides & nematicides	78,362	112,187	8,229	75,586	96,193	6,595	86,668	96,329	13,477
Molluscicides	30,546	30,546	5,376	48,807	48,807	11,109	25,660	25,660	4,774
Fungicides	268,617	437,881	266,805	280,954	428,357	230,562	243,848	374,036	179,657
Herbicides/desiccants	113,073	132,712	6,362,964	108,643	127,671	5,473,250	91,477	108,977	2,054,761
Growth regulators	1,333	1,333	4,000	0	0	0	730	730	2,134
Seed treatments	29,222	43,290	16,178	34,982	45,168	18,975	29,553	33,170	12,961
All pesticides	**521,153**	**757,949**	**6,663,552**	**548,972**	**746,197**	**5,740,491**	**477,936**	**638,902**	**2,267,764**
Area planted (ha)	30,203			29,352			28,124		

FIGURE 12 Potatoes, comparison with previous years

Treated area of active ingredients of main pesticide types 1992 - 2006

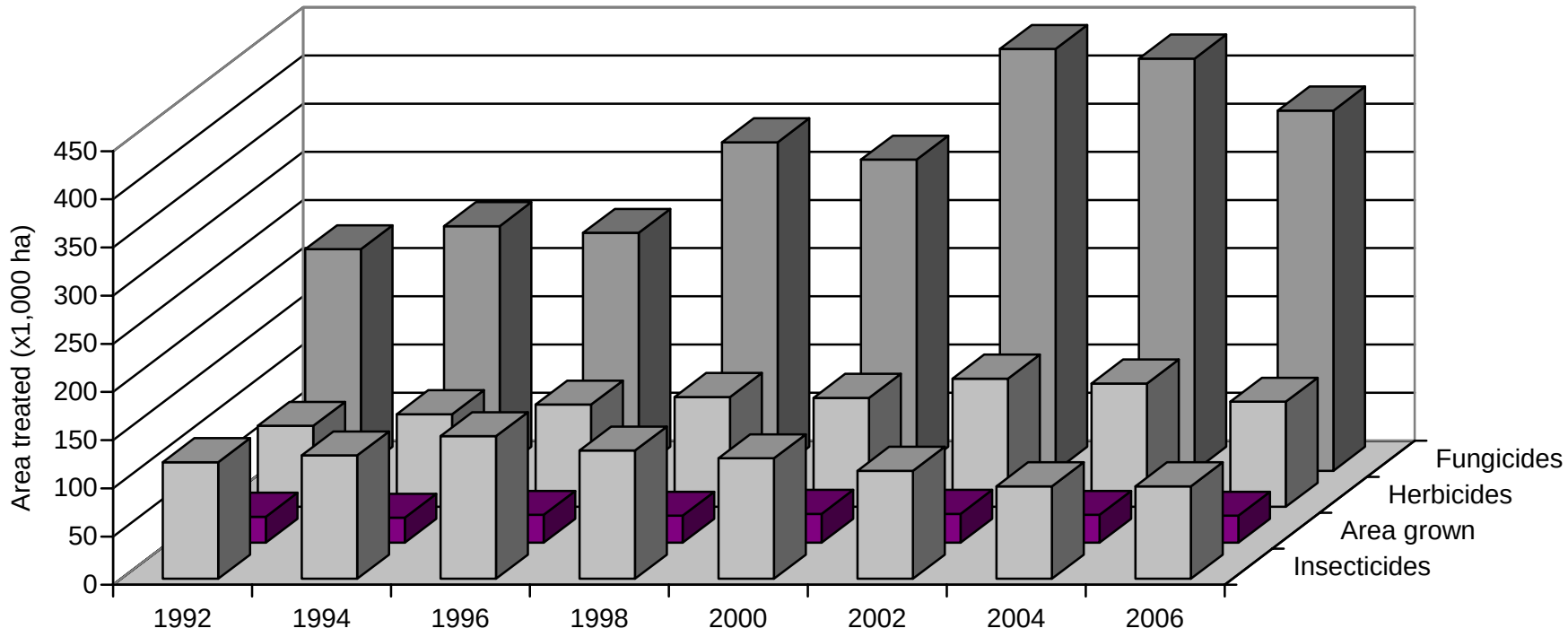


TABLE 50 Set aside, comparison with previous years

Pesticide usage in 2002, 2004 and 2006, area treated with formulations and active ingredients (a.i.) and the quantities applied

	2002			2004			2006		
	Formulations (ha)	***a.i. (ha)***	***kg***	***Formulations (ha)***	***a.i. (ha)***	***kg***	***Formulations (ha)***	***a.i. (ha)***	***kg***
Insecticides									
Pyrethroids	2,244	2,244	26	3,337	3,337	45	5,253	5,253	92
Organophosphates	0	0	0	0	0	0	52	52	31
All insecticides	2,244	2,244	26	3,337	3,337	45	5,305	5,305	123
Molluscicides	466	467	267	264	264	27	683	683	266
Fungicides	5,370	6,322	6,667	12,473	14,444	12,597	15,585	19,078	7,435
Herbicides	20,663	21,620	20,223	15,007	16,305	12,261	21,021	22,764	16,758
Seed treatments	4,648	5,708	100	7,569	9,517	112	10,758	14,809	171
All pesticides	**33,391**	**36,361**	**27,283**	**38,650**	**43,867**	**25,042**	**53,352**	**62,639**	**24,753**
Area (ha)	85,580			68,142			67,549		

FIGURE 13 Set aside, comparison with previous years

Treated area of active ingredients of main pesticide types 1994 - 2006

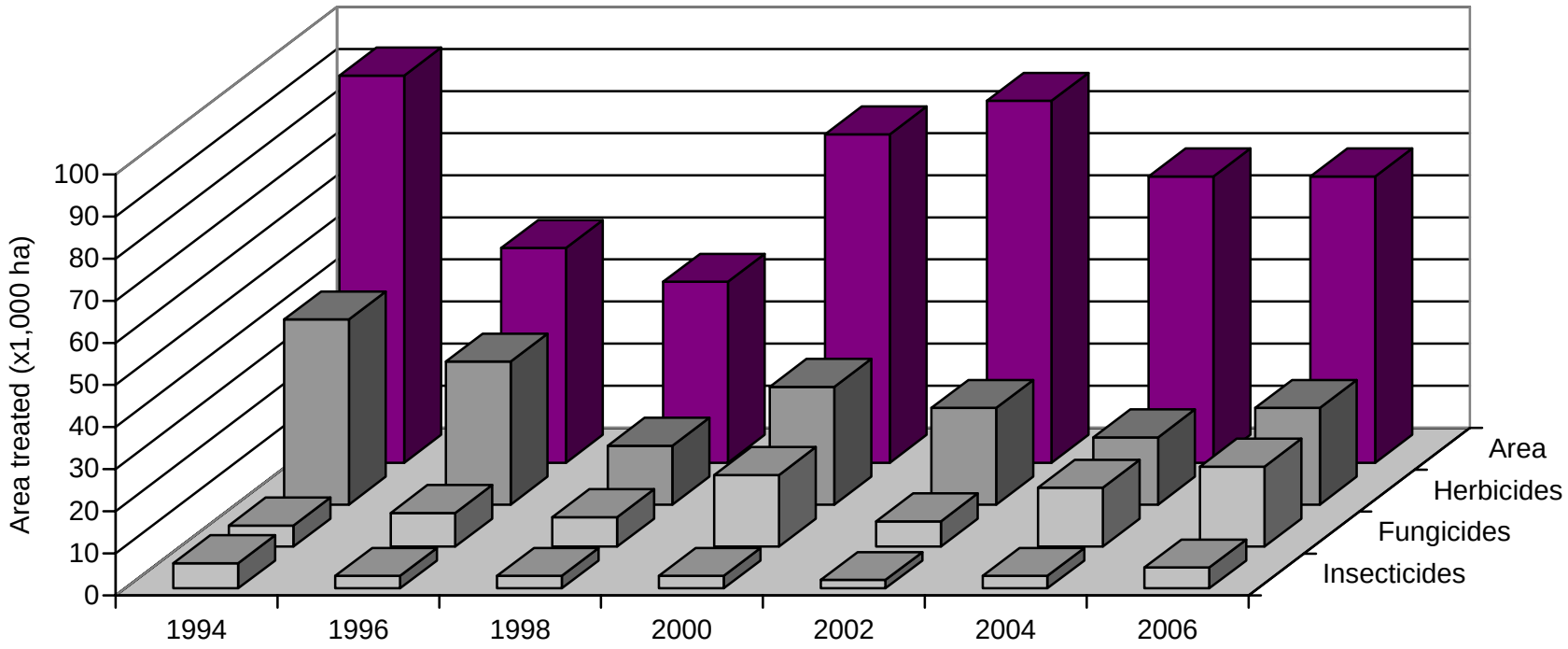


TABLE 51 Sampled area

Size (ha)	*Highland & Islands*	*Caithness & Orkney*	*Moray Firth*	*Aberdeen*	*Angus*	*East Fife*	*Lothian*	*Central Lowlands*	*Tweed Valley*	*S. Uplands*	*Solway*
0.1-19.9	3	5	20	51	20	0	0	42	16	4	32
20-49.9	24	75	275	670	261	121	24	275	85	30	142
50-99.9	69	0	586	1,409	1,325	430	449	593	438	54	173
100-149.9	0	0	906	1,718	1,215	577	870	374	1,136	110	220
150+	0	0	2,547	4,977	5,608	2,079	2,566	1,645	5,300	151	183
All sizes	**96**	**80**	**4,334**	**8,824**	**8,429**	**3,207**	**3,908**	**2,930**	**6,976**	**349**	**750**

TABLE 52 Census area

Size (ha)	*Highland & Islands*	*Caithness & Orkney*	*Moray Firth*	*Aberdeen*	*Angus*	*East Fife*	*Lothian*	*Central Lowlands*	*Tweed Valley*	*S. Uplands*	*Solway*
0.1-19.9	2,345	4,050	3,719	9,776	2,966	989	980	6,824	1,238	1,270	3,950
20-49.9	1,546	3,006	8,981	23,830	11,821	4,037	2,820	13,153	3,810	1,415	5,235
50-99.9	1,381	1,734	11,918	28,566	26,105	11,356	7,985	14,679	9,534	1,575	3,428
100-149.9	331	503	9,532	18,072	16,807	8,255	10,792	7,067	12,810	520	1,064
150+	193	0	13,739	23,617	36,045	14,776	18,507	8,792	26,354	1,541	1,513
All sizes	**5,797**	**9,293**	**47,889**	**103,860**	**93,745**	**39,413**	**41,085**	**50,515**	**53,746**	**6,320**	**15,190**

TABLE 53 Raising factors

Size (ha)	*Highland & Islands*	*Caithness & Orkney*	*Moray Firth*	*Aberdeen*	*Angus*	*East Fife*	*Lothian*	*Central Lowlands*	*Tweed Valley*	*S. Uplands*	*Solway*
0.1-19.9	739.67	768.55	187.16	190.56	147.19	NA	NA	162.17	75.08	348.85	123.27
20-49.9	65.44	39.97	32.65	35.59	45.90	33.38	117.05	47.77	44.95	46.55	36.88
50-99.9	20.09	NA	20.34	20.28	19.81	26.42	17.80	24.76	21.77	29.00	19.83
100-149.9	NA	NA	10.53	10.52	13.83	14.30	12.41	18.90	11.27	4.72	4.83
150+	NA	NA	5.39	4.74	6.43	7.11	7.21	5.34	4.97	10.21	8.29

'NA' not applicable, no data to raise

TABLE 54 First and second adjustment factors

	Highlands & Islands	*Caithness & Orkney*	*Moray Firth*	*Aberdeen*	*Angus*	*East Fife*	*Lothian*	*Central Lowlands*	*Tweed Valley*	*Southern Uplands*	*Solway*	*Second adjustment factor*
Winter barley	NA	NA	0.75	0.88	1.04	1.25	1.57	1.81	2.07	2.71	1.02	**1.01**
Spring barley	0.95	1.28	1.01	0.95	0.93	1.01	0.90	0.83	0.86	0.73	0.93	**1.00**
Wheat	0.56	NA	0.88	0.87	0.94	0.96	1.01	1.02	0.95	1.48	1.19	**1.00**
Winter oats	2.98	NA	1.95	0.51	0.75	0.60	NA	1.83	0.63	NA	NA	**1.05**
Spring oats	6.75	0.90	1.29	1.99	1.52	0.66	2.01	2.46	0.73	NA	NA	**1.04**
Triticale	NA	NA	NA	NA	0.55	NA	1.21	NA	4.03	NA	0.57	**1.73**
Winter oilseed	NA	NA	1.35	1.38	1.06	1.58	1.47	1.28	1.26	NA	0.66	**1.01**
Spring oilseed	NA	NA	0.67	7.09	2.30	2.77	1.44	NA	1.19	NA	0.68	**1.17**
Seed potatoes	NA	NA	0.91	6.75	0.86	0.94	NA	4.25	0.85	NA	NA	**1.04**
Early potatoes	NA	NA	NA	0.29	NA	NA	NA	0.27	0.52	NA	NA	**2.93**
Ware potatoes	1.18	NA	1.21	2.90	1.61	2.15	0.84	0.81	1.46	NA	3.26	**1.00**
Combine peas	NA	NA	0.61	0.92	NA	NA	NA	2.13	0.59	NA	NA	**2.28**
Field beans	NA	NA	0.34	0.16	1.50	0.42	0.98	1.88	1.29	NA	NA	**1.04**
Lupins	NA	NA	0.68	NA	NA	NA	0.27	NA	NA	NA	0.13	**4.48**
All set-aside	6.95	1.61	1.06	1.39	1.05	0.98	1.47	1.98	1.14	1.35	1.64	**1.00**

'NA' not applicable no data to adjust

PESTICIDE USAGE IN SCOTLAND

POTATO STORES 2006

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SUMMARY

This is the twelfth survey on the use of pesticides on stored potatoes in Scotland, covering the crop harvested in 2006.

The overall quantity of potatoes stored remained similar to that reported in 2004 at 1,095,543 tonnes. The storage of seed potatoes increased by 5% to 320,345 tonnes, while ware potatoes decreased by 2% to 775,198 tonnes.

The proportion of seed potatoes treated in store was 46%, a 6% increase from 2004, whereas the proportion of ware potatoes treated was 8% compared with 9% in 2004.

As in previous surveys imazalil was the principal active ingredient used on all potatoes, being applied to almost 146,000 tonnes of seed, and almost 41,500 tonnes of ware.

INTRODUCTION

This is the twelfth survey of the use of pesticides on stored potatoes in Scotland. A list of previous surveys can be found in the references[1-9].

Both the methodology employed in this survey and the presentation of data in the report is similar to those employed in the previous survey.

DEFINITIONS AND NOTES

Pesticide information recorded in this survey relates to post-harvest applications, including those carried out in the field prior to entry to the store. Pre-planting treatments with a fungicide intended to control disease post planting e.g. black scurf was not included, even if the fungicides had been applied in store. Usage of pesticides in the latter situation is recorded in the Arable Crop reports.

Basic tonnage is the quantity of potatoes treated with a pesticide, irrespective of the number of times they were treated or the number of pesticides used. This figure is used to calculate the percentage of potatoes treated with a chemical or groups of chemicals.

Treated tonnage is the basic tonnage multiplied by the number of treatments those potatoes received.

Seed potatoes are those intended for marketing or planting as seed, after dressing and removal of the ware fraction.

Ware potatoes include those grown for the ware market plus the portion of potatoes originally planted for seed but later sold as ware. The quantity of stored potatoes following the harvest recorded in this report will include soil, wastage, and those potatoes downgraded to animal feed.

Farm store data include information obtained from grower-dealers, i.e. those farmers who grow and trade in potatoes.

For the purpose of this survey, potato merchants do not own agricultural land and are therefore not in the Agricultural Census. As in the previous report, merchants have been subdivided into those that grow potatoes on rented land and store potatoes, and those who only store.

Due to rounding, there may be slight differences in totals between tables.

METHOD

For this survey, the sample of farms selected was the same as that for the Arable Crops 2006[10] and was drawn from the 2006 Agricultural Census[11]. In addition, a number of grower-dealers and potato merchants who grew potatoes were identified during the survey fieldwork. All the known merchants in Scotland who did not grow potatoes were surveyed.

The country was divided into 11 land-use regions[12] (Fig.1), and the farm store sample was selected from the arable sample. The sample was stratified by land-use region and size of holding. Sampling fractions within region and size group related to area of crops grown rather than number of farms, so that smaller size groups did not dominate the sample. A number of regions were amalgamated, due to the low number of stores sampled. These regions were Highlands and Islands with Moray Firth and Aberdeen, East Fife and Central Lowlands with Lothian and Tweed Valley with Solway and Southern Uplands.

The data were obtained by personal interview and details recorded including the areas of seed and ware grown, quantities of potatoes stored, the storage environment, methods of storage and chemicals applied into or during storage. Fungicidal seed treatments applied prior to planting are included in the Arable Crops report and are therefore not recorded in this report.

The data from merchants that grew potatoes on rented land were merged with the farm sample. National estimates of storage chemical usage were produced from the sample data by applying raising factors based on the areas of potatoes grown in 2006[11] (Table 64). An adjustment was made to the ware fraction to allow for the potatoes grown for seed that were then designated as ware (Table 65). A second adjustment (Table 66) was made to the survey estimates of stored potatoes to bring them into line with the figures provided by the British Potato Council.

Information from merchants that did not grow potatoes was recorded separately, as this data was not raised. The two data sets were then merged in the final tables to provide total national usage figures.

DISTRIBUTION OF STORES

Information was obtained from a total of 84 stores. The distribution of these stores throughout Scotland is shown in Table 55.

SEED POTATOES

The quantity of seed potatoes stored in 2006 was 320,345 tonnes. A five percent increase compared with the previous survey.

Storage methods (Tables 56, 57)

An estimated 59% of seed potatoes was held in refrigerated storage compared with 46% in 2004. Of the remainder, 37% was in ventilated storage and the remaining 4% in unventilated storage. This compares with 43% in ventilated and 11% in unventilated in 2004.

All seed potatoes are stored in boxes.

Use of pesticides (Tables 57, 58)

The proportion of seed potatoes treated in store was 46%, compared with the 40% treated in 2004.

Imazalil remained the most widely used chemical, with 46% being treated compared with 39% in 2004. Usage of 2-aminobutane remained at 1%, the same as the previous survey, while less than 0.5% was treated with thiabendazole compared with 3% previously.

WARE POTATOES

The quantity of ware potatoes stored in Scotland was 775,198 tonnes, only a 2% drop compared to previous survey.

Storage methods (Tables 56, 57)

Sixty percent of ware potatoes was held in refrigerated stores and thirty two percent in ventilated storage, compared with 65% and 27% respectively in 2004. The remaining 8% was held in unventilated storage, the same as 2004.

Ninety-nine percent of ware was stored in boxes, with the remainder in bulk storage.

Use of pesticides (Tables 57, 58)

The proportion of ware potatoes treated in store was 8% similar to the 9% in 2004. Imazalil and chlorpropham were the principal chemicals used on 5% and 4% of the stored tonnage respectively. Use of thiabendazole was not recorded in this survey, although 1% was treated in 2004.

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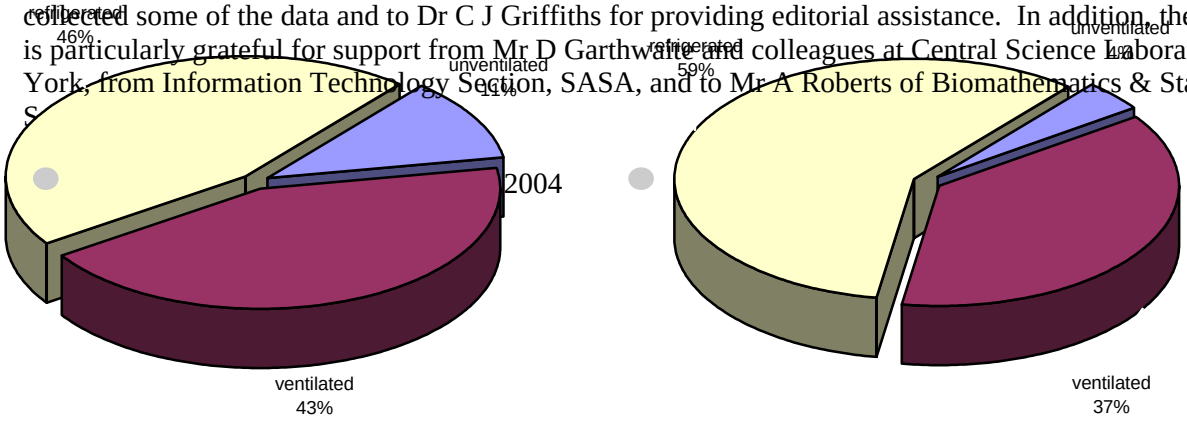

Figure 16 Storage of ware potatoes 2004

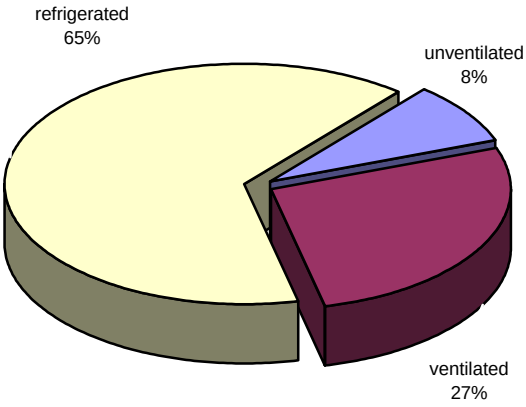

Figure 17 Storage of ware potatoes 2006

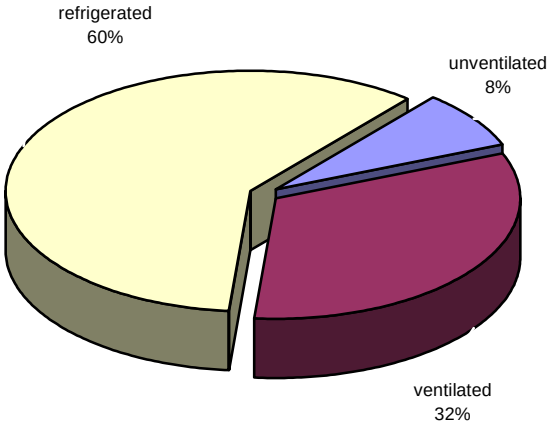

TABLE 55 Distribution of sampled stores

Region	*Number of stores*
Highlands & Islands, Moray Firth and Aberdeen	17
Angus	34
East Fife, Central Lowlands and Lothian	25
Tweed Valley, Southern Uplands and Solway	8
Scotland	**84**

TABLE 56 Stored potatoes

Storage type and method

	Store type				Storage method		
	Unventilated	***Ventilated***	***Refrigerated***	***Total***	***Bulk***	***Boxed***	***Total***
Seed							
Tonnes stored	12,929	119,603	187,813	**320,345**		320,345	**320,345**
% type and method	4%	37%	59%	**100%**		100%	**100%**
Basic tonnage treated		72,320	73,915	**146,235**		146,235	**146,235**
% treated		60%	39%	**46%**			
Ware							
Tonnes stored	60,720	250,592	463,886	**775,198**	6,103	769,095	**775,198**
% type and method	8%	32%	60%	**100%**	1%	99%	**100%**
Basic tonnage treated		39,970	21,330	**61,300**		61,300	**61,300**
% treated		16%	5%	**8%**			

TABLE 57 Stored potatoes

Pesticides used by store type and method (tonnes treated)

	Store type				Storage method		
	Unventilated	*Ventilated*	*Refrigerated*	*Total*	*Bulk*	*Boxed*	*Total*
Seed							
2-Aminobutane		150	2,203	**2,353**		2,353	**2,353**
Imazalil		71,970	73,915	**145,885**		145,885	**145,885**
Thiabendazole		800		**800**		800	**800**
All formulations		**72,920**	**76,118**	**149,038**		**149,038**	**149,038**
Not treated	12,929	47,283	113,899	**174,111**		174,111	**174,111**
Ware							
Chlorpropham		33,168	1,379	**34,547**		34,547	**34,547**
Imazalil		21,463	19,950	**41,413**		41,413	**41,413**
All formulations		**54,631**	**21,329**	**75,960**		**75,960**	**75,960**
Not treated	60,720	210,622	442,556	**713,898**	6,100	707,798	**713,898**

TABLE 58 Stored potatoes

Pesticides used (tonnes treated) and percentage treated

Seed	***Tonnes treated***	***% treated 2006***	***% treated 2004***
2-Aminobutane	**2,353**	1	1
Imazalil	**145,885**	46	39
Thiabendazole	**800**	+	3
All formulations	**149,038**	**46**	**40**
Tonnes stored		320,345	304,212
Ware			
Chlorpropham	**34,547**	4	3
Imazalil	**41,413**	5	6
All formulations	**75,961**	**8**	**9**
Tonnes stored		775,198	792,548

'+' = <0.5%

TABLE 59 Active ingredients

Tonnes treated and quantities (kg) used

Seed	***Tonnes treated***	***Kg***
2-Aminobutane	2,353	474
Imazalil	145,886	1,376
Thiabendazole	800	24
All actives	**149,039**	**1,874**
Ware		
Chlorpropham	34,547	526
Imazalil	41,413	387
All actives	**75,961**	**913**

TABLE 60 Stored potatoes

Comparison of pesticide usage 2002-2006, tonnes stored, tonnes treated and quantities (kg) used

	2002			2004			2006		
	Tonnes stored	Tonnes treated	Kg	Tonnes stored	Tonnes treated	Kg	Tonnes stored	Tonnes treated	Kg
Seed	385,934	182,180	4,159	304,212	133,153	2,079	320,345	149,039	1,874
Ware	848,257	53,358	586	792,548	79,592	1,127	775,198	75,961	913
All potatoes	**1,234,191**	**235,538**	**4,745**	**1,096,760**	**212,745**	**3,206**	**1,095,543**	**225,000**	**2,788**

TABLE 61 Stored potatoes

Comparison of active ingredient usage 2002-2006, tonnes treated and quantities (kg) used

	2002		2004		2006	
Seed	Tonnes treated	Kg	Tonnes treated	Kg	Tonnes treated	Kg
2-Aminobutane	12,372	2,493	3,655	707	2,353	474
Imazalil	169,808	1,666	119,917	1,027	145,886	1,376
Thiabendazole			9,581	345	800	24
All actives	**182,180**	**4,159**	**133,153**	**2,079**	**149,039**	**1,874**
Ware						
Chlorpropham	4,935	104	28,178	542	34,548	526
Imazalil	48,423	482	46,740	422	41,413	387
Thiabendazole			4,674	163		
All actives	**53,358**	**586**	**79,592**	**1,127**	**75,961**	**913**

TABLE 62 Stored potatoes

Comparison of potatoes 1998-2006 tonnes stored and area grown (ha)

	1998	*2000*	*2002*	*2004*	*2006*
All potatoes (tonnes)	1,099,932	1,155,075	1,234,191	1,096,760	1,095,543
All potatoes (ha)	28,761	29,691	30,203	29,352	28,124

TABLE 63 Percentage treated

Comparison of pesticide usage 1998-2006, percentage (%) treated

	1998	*2000*	*2002*	*2004*	*2006*
Seed	37	22	47	40	46
Ware	12	9	6	9	8
All potatoes	**21**	**14**	**19**	**18**	**19**

TABLE 64 Raising factors

Region	*Seed*	*Ware*
Highlands & Islands, Moray Firth and Aberdeen	7.8808	11.5813
Angus	1.9940	4.2402
East Fife, Central Lowlands and Lothian	4.3225	4.6051
Tweed Valley, Southern Uplands and Solway	7.9896	5.8943

TABLE 65 First adjustment factors for ware potatoes

Region	*Ware*
Highlands & Islands, Moray Firth and Aberdeen	0.9534
Angus	0.8653
East Fife, Central Lowlands and Lothian	0.9998
Tweed Valley, Southern Uplands and Solway	1.0000

TABLE 66 Second adjustment factors

Seed	0.8822
Ware	0.8357