

PESTICIDE USAGE IN SCOTLAND

ARABLE CROPS 1998
(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 amended tables are:

- Table 51 – Cereal fungicide active ingredients
- Table 52 – Cereal herbicide and growth regulator active ingredients
- Table 54 – Oilseed rape fungicide active ingredients
- Table 57 – Potato fungicide active ingredients
- Table 58 – Potato herbicide active ingredients
- Table 59 – Principal active ingredients
- Tables 61-63 – Comparisons with previous years

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

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This report presents information from a survey of pesticide usage on arable crops in Scotland during the 1997/98 growing season. The data have been raised to give estimates of national pesticide usage.

The total area of arable crops increased by 6% compared with the previous survey in 1996 to 566,462 hectares in 1998. Changes in cropping included increases in all crops except spring barley and seed potatoes which fell by 2% and 10% respectively.

Overall usage of insecticides, compared with fungicides and herbicides, remained low. As in 1994 and 1996, pyrethroids were the dominant insecticide group with increased usage recorded on cereals and potatoes. Cypermethrin replaced deltamethrin as the principal insecticide active ingredient recorded, due mainly to reduced usage on potatoes. Use of molluscicides, applied mainly to winter wheat, oilseed rape and potatoes, increased over 4-fold compared with 1996, due mainly to the damp weather conditions.

There was an increase in fungicide use, as measured by the spray area of active ingredients, due to a large and continuing increase on cereals. Fenpropimorph, used solely on cereals, remained the principal fungicide.

When the changes in areas grown are taken into account, there were increases in the use of herbicides on potatoes and oilseed rape. As in 1996, the combined spray hectareage of mecoprop and mecoprop-P, used on cereals only, was the most commonly used herbicide.

INTRODUCTION

This is the ninth survey of pesticide usage on arable crops in Scotland, the previous surveys being in 1974, 1977, 1982, 1988, 1990, 1992, 1994 and 1996 (References 1 to 9). The survey covered cereals, oilseeds, peas, beans, potatoes and set aside land.

DEFINITIONS AND NOTES

Basic area (or basic ha) is the planted area of crop which was treated with a given pesticide, irrespective of the number of times it was applied to that area.

Spray area (or spray hectare; sp ha) is the basic area of a crop treated with a given pesticide multiplied by the number of treatments that area received.

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

When viewing the pesticide tables for the individual crops 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 1996 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.

Using the June 1997 Agricultural Census (Reference 10) 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 (Fig 1, Reference 11). 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 1997 harvest to the end of the 1998 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 332 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 64.

For all crops, sample data were raised to give estimates of national pesticide usage using raising factors (Table 66). These were based on the areas growing arable crops in the 1998 Agricultural Census (Reference 12) within regions and size groups (Table 65). Land-use regions 1 and 2 were amalgamated, as were regions 10 and 11. Adjustments (Table 67) were made for each crop, including those grown on set aside land, within each region by applying the raising factors (Table 66) to the sample area of each crop grown and comparing this with the area from the 1998 Agricultural Census. A second adjustment was made for crops where no holdings were sampled in one or more regions (Table 68).

The area grown had increased by 22% since 1996 to 77,704 hectares.

● *Insecticides and molluscicides (Tables 4, 50)*

The proportion of crop treated with insecticide was 34%, only slightly higher than the 30% recorded in 1996.

As in 1996, cypermethrin was the most popular insecticide, applied to 21% of the crop, predominantly for BYDV control through aphid control.

Molluscicide usage was again low, only 3% of the crop treated. Methiocarb and metaldehyde were the main active ingredients employed.

● *Fungicides (Tables 5, 51)*

Fungicide usage was similar to that recorded in 1996, with 97% of the crop being treated. As in the previous survey, mildew was the main specified reason for use of fungicide.

Fenpropimorph was again the principal active used, accounting for 23% of the total area of fungicide active ingredients; flusilazole (17%), carbendazim (9%) and tridemorph (8%) were also widely used.

● *Herbicides and growth regulators (Tables 6, 52)*

The proportion of winter barley receiving herbicide was 97%, the same as that recorded in 1996.

As in the previous survey, annual broad-leaved weed control was the main reason given for herbicide usage.

Isoproturon, applied to over 62,000 spray hectares, was by far the most widely used herbicide, and accounted for 33% of the total herbicide active ingredients. It was widely used in formulations notably with diflufenican where it was applied to over half the crop area, and also alone, applied to 47% of the crop area. The proportion of the crop area treated with growth regulators was 80%, similar to that recorded in 1996.

● *Seed treatments (Table 39)*

Ninety-seven percent of the seed was treated. The formulations tebuconazole/triazoxide (on 45%), and guazatine (on 18%) were the most commonly used seed treatments. The formulation ethirimol/flutriafol/thiabendazole, which had been popular in 1996, was applied to only 6% of the seed in 1998.



The area of spring barley, the principal cereal crop in Scotland, was 255,822 hectares, slightly down on the 1996 figure of 260,726 hectares.

● *Insecticides and molluscicides (Tables 7, 50)*

Only 2% of the crop was treated with insecticide, similar to usage in 1996.

As in 1996, leatherjacket control was the most common reason for insecticide use, and chlorpyrifos was the principal insecticide recorded.

Very small areas were treated with the molluscicides, metaldehyde and methiocarb; none had been recorded in the previous survey.

● *Fungicides (Tables 8, 51)*

The proportion of crop treated with fungicide increased slightly from 81% in the previous survey to 84% in 1998.

As in 1996, mildew was the main specified reason for fungicide use. Fenpropimorph remained the principal fungicide, accounting for 22% of the total spray area of fungicide active ingredients, followed by flusilazole (19%) and carbendazim (14%).

● *Herbicides and growth regulators (Tables 9, 52)*

As in the previous two surveys, nearly all (99%) of the crop received herbicide. Annual broad-leaved weed control was again the main specified reason for herbicide use.

Mecoprop and mecoprop-P (combined usage) and metsulfuron-methyl were again the most commonly applied herbicides, accounting for 22 and 21% of the total spray area of herbicide active ingredients respectively. Thifensulfuron-methyl (11%) was also widely used.

In line with the previous arable crop survey, growth regulators were applied to around 9% of the crop area. 2-chloroethylphosphonic acid, accounting for 44% of total area of growth regulator active ingredients, replaced chlormequat (25%) as the most commonly used.

● *Seed treatments (Table 39)*

As in 1996, nearly all the seed was treated.

The formulation containing tebuconazole/triazoxide, applied to 62% of the seed, was by far the most popular seed treatment used; guazatine alone (13%) and in formulation with imazalil (6%) were also popular.

WINTER WHEAT

The area of winter wheat grown in 1998 increased by 7% to 110,780 hectares, compared with 103,389 hectares recorded in 1996.

● *Insecticides and molluscicides (Tables 10, 50)*

Usage of insecticides was similar to that recorded in 1996, with 34% of the crop area being treated. In common with the 1996 survey, BYDV control through aphid control was the main specified reason for use of insecticides.

As in the previous survey, cypermethrin, applied to 12% of the crop area was the principal insecticide. Dimethoate, applied to 9%, was also widely used. Usage of deltamethrin, which had been used on 10% of the crop area in 1996, was much reduced in the present survey, to approximately 1% of the crop.

Usage of molluscicides increased from 8% of the crop area treated in 1996 to 18% in 1998. As before, metaldehyde was the main molluscicide employed.

● *Fungicides (Tables 11, 51)*

As in the previous survey, the entire crop received fungicide. Only a relatively small proportion of the treated areas was assigned specific reasons for use.

Fenpropidin, applied to 75,558 hectares was the principal fungicide, accounting for 9% of the total spray area of fungicide active ingredients. Epoxiconazole and fenpropimorph applied to 74,838 ha and 73,357 ha respectively were also widely used. The area of crop treated with carbendazim, which had been widely used in the previous survey, had almost halved. The newly introduced strobilurins were extensively used: kresoxim-methyl and azoxystrobin were each applied to around 50,000 spray hectares. 1998 was their first season on the market and they were the only strobilurins available.

● *Herbicides and growth regulators (Tables 12, 52)*

As in 1996, nearly all the crop area received herbicide.

In common with previous surveys, the control of annual broad-leaved weeds was the main specified reason for herbicide use. Isoproturon, accounting for 25% of the total spray area of herbicide active ingredients, was the principal herbicide used followed by the combined usage of mecoprop and mecoprop-P (18%) and diflufenican (16%).

Use of growth regulators was slightly greater than in the previous survey, 95% being treated compared with 92% in 1996. Chlormequat remained the principal growth regulator, accounting for 60% of the total spray area of active ingredients.

● *Seed treatments (Table 39)*

In line with the previous survey, nearly all of the seed was treated.

As in 1996, the main formulation used was guazatine (on 34%). The formulation bitertanol/fuberidazole was also widely used, on 30% of the seed. Usage of fuberidazole/triadimenol, applied to 13%, had declined since 1996 from 23% of the sown area.

● ***SPRING WHEAT***

This crop is not recorded in the Agricultural Census, but it is estimated that only 392 hectares were grown in 1998, compared with almost 600 hectares in the previous survey. Because of the small numbers of holdings providing data, individual tables for this crop are not presented in the report. Estimates of pesticide usage are, however, presented in all the Summary Tables (Tables 39-43, 50-52).

● ***WINTER OATS***

The area of crop grown in 1998 was 7,650 hectares, a 24% increase since 1996.

● ***Insecticides and molluscicides (Tables 13, 50)***

Nineteen percent of the crop was treated with insecticides, compared with 12% in 1996. Cypermethrin, applied to 17% of the crop for BYDV control through aphid control, was the principal insecticide employed. In 1996, the only insecticide recorded had been esfenvalerate.

As in the previous survey, no molluscicides were recorded.

● ***Fungicides (Tables 14, 51)***

Nearly all (99%) of the crop treated was treated with fungicide, compared with 92% in 1996. As then, mildew was the only specified reason for disease control.

Fenpropimorph, accounting for 36% of the total spray area of fungicide active ingredients, was the most popular fungicide, followed by propiconazole (17%) and tridemorph (14%).

● ***Herbicides and growth regulators (Tables 15, 52)***

The proportion of the crop treated with herbicides was 91%, slightly higher than the 86% reported in the previous survey. In common with the previous survey, the control of annual broad-leaved weeds was the main reason given for herbicide use. The combined usage of mecoprop and mecoprop-P and metsulfuron-methyl were again the principal herbicides, accounting for 34% and 26% of the total spray area of herbicide active ingredients respectively. Carfentrazone-ethyl (9%), not available in 1996, was also widely used.

Eighty-five percent of the crop area was treated with a growth regulator, compared with 74% in 1996. Chlormequat remained the most commonly used growth regulator.

● ***Seed treatments (Table 39)***

All the seed was treated, compared with 94% in 1996.

The principal seed treatment recorded was bitertanol/fuberidazole, used on 40% of seed and which had not been approved for use on oats in 1996. Guazatine and guazatine/imazalil were each used on 21% of seed.

There was a slight increase of 3% in the area of spring oats grown to 14,134 hectares.

● ***Insecticides and molluscicides (Tables 16, 50)***

Nine percent of the crop received insecticide, compared with only 2% in 1996.

Cypermethrin and chlorpyrifos, each applied to 4% of the crop area, were the main insecticides recorded, for the control of aphids and leatherjackets respectively.

As in previous surveys, no molluscicides were recorded.

● ***Fungicides (Tables 17, 51)***

Usage of fungicides was similar to that recorded in the previous survey, at around 59% of the crop area treated.

As in 1996, mildew was the main specified reason for fungicide use.

Fenpropimorph remained the principal fungicide, accounting for 40% of the total spray area of fungicide active ingredients, followed by tridemorph at 20%.

● ***Herbicides and growth regulators (Tables 18, 52)***

The proportion of the crop receiving herbicide increased from 83% in 1996 to 98% in the present survey.

As before, nearly all herbicide use was for the control of annual broad-leaved weeds.

Mecoprop and mecoprop-P (combined spray hectareage) and metsulfuron-methyl were the most commonly used herbicide active ingredients, accounting for 23% and 22% of the total spray area of herbicide active ingredients respectively.

Growth regulators were applied to 43% of the crop, similar to usage in 1996. As in the previous survey, chlormequat was by far the most popular chemical used.

● ***Seed treatments (Table 39)***

Ninety-three percent of the seed was treated, compared with 75% in the previous survey.

The principal seed treatment recorded was bitertanol/fuberidazole, used on 25% of seed and which had not been approved for use on oats in 1996. Guazatine (22%), fludioxonil (16%) and guazatine/imazalil (14%) were also widely used.

There was a 38% increase in the area of winter oilseed rape grown since 1996 to 42,001 hectares in the present survey.

● ***Insecticides and molluscicides (Tables 19, 53)***

Half the area of the crop was treated with insecticide compared with 67% in 1996.

Control of pollen beetle and seed weevil were the main reasons for insecticide use. Alpha-cypermethrin, applied to 18% of the crop, and lambda-cyhalothrin, mainly alone, but also in formulation with pirimicarb, to 15%, were the main insecticides recorded. Usage of cypermethrin, which had been the most commonly used in 1996, was used on only 9% of the crop area in 1998.

Molluscicide usage increased from around 10% of the crop treated in the previous survey to 26% in 1998. Metaldehyde (14%) and methiocarb (10%) were the most commonly used molluscicides.

● ***Fungicides (Tables 20, 54)***

As in the previous surveys, nearly all the crop received fungicide.

The main reason given for fungicide use was, as in previous surveys, for light leaf spot control. As recorded in 1996, carbendazim, alone and in a number of mixed formulations, accounting for 24% of the total spray area of fungicide active ingredients, was the principal fungicide used. Tebuconazole (20%) and flusilazole (14%) were also widely used.

● ***Herbicides and growth regulators (Tables 21, 55)***

The proportion of crop area treated with herbicides rose slightly from 95% in 1996 to 99% in the present survey.

As before, the control of annual broad-leaved weeds was the main reason specified for herbicide use. In common with the previous three surveys, metazachlor was the principal herbicide used for weed control, applied to almost 30,000 spray hectares or 70% of the crop area, followed by propyzamide (21%) and benazolin/clopyralid (14%). Herbicide usage for desiccation increased from 20% of the crop area treated in 1996 to 32% in the present survey; glyphosate, applied to 23% of the crop area, was the most commonly used herbicide for this purpose.

Chlormequat, as in 1996, was the only growth regulator recorded, applied to 15% of the crop area.

● ***Seed treatments (Table 39)***

As in 1996, nearly all (96%) of the seed was treated. The formulation containing fenpropimorph/gamma-HCH/ thiram remained the principal treatment and was applied to 53% of the seed. Usage of the formulation containing carboxin/gamma-HCH/thiram increased compared with the previous survey, and was applied to 20% of the seed.

● **SPRING OILSEED RAPE**

The area of spring oilseed rape increased by 23% to 23,115 hectares, compared with that in 1996.

● ***Insecticides and molluscicides (Tables 22, 53)***

Insecticide usage decreased from 83% of the treated crop area in the previous survey to 75% in 1998.

As before, pollen beetle control was the main reason for insecticide use. Cypermethrin, applied to 32% of the crop area, was the most commonly used insecticide, followed by alpha-cypermethrin and lambda-cyhalothrin (each applied to 19% of the crop area).

No molluscicide usage was recorded in this survey. Small areas had been treated in 1996 with metaldehyde.

● ***Fungicides (Tables 23, 54)***

Use of fungicide increased from 21% of the crop area treated in the previous survey to 35% in 1998.

As in 1994 and 1996, sulphur, accounting for 49% of the total area of fungicide active ingredients, was the principal fungicide recorded although used mainly for use as a foliar feed.

Carbendazim and vinclozolin were the main fungicide active ingredient for disease control in 1998.

● ***Herbicides and growth regulators (Tables 24, 55)***

The proportion of crop receiving herbicide increased from 59% in 1996 to 84% in the present survey.

Desiccation of the crop remained the main reason for herbicide use. As in 1996, glyphosate was the main active ingredient used, applied to 40% of the crop area, predominantly as a desiccant. As before, trifluralin, applied to over 8,600 hectares or 37% of the crop area, was the main herbicide used for weed control.

No usage of growth regulators was recorded in this survey. Small areas had been treated with chlormequat in 1996.

● ***Seed treatments (Table 39)***

As in 1996, all the seed was treated. The formulation containing carboxin/gamma-HCH/thiram, applied to 55% of the seed, replaced the iprodione (applied to only 16%) as the most commonly used seed treatment.



The area of seed potatoes decreased by 10% from 15,718 hectares in 1996 to 14,105 hectares in 1998.

● *Insecticides and molluscicides (Tables 25, 56)*

As in the previous survey, nearly all (96%) of the crop area was treated with insecticide.

All insecticide use was for aphid control. Pirimicarb, both alone and in mixed formulations, accounted for 42% of the total area of insecticide active ingredients. Lambda-cyhalothrin (22%) and deltamethrin (20%) were also commonly used. Deltamethrin had been the principal insecticide used in 1996.

Molluscicide usage increased from 8% of the crop area treated in 1996 to 24% in 1998. Metaldehyde (14%) and methiocarb (9%) were the main molluscicides recorded.

● *Fungicides (Tables 26, 57)*

The entire area of the crop was treated with fungicide, compared with 97% in 1996.

The most popular formulation recorded was fluazinam, applied to 89% of the area of the crop, followed by fentin hydroxide (68%). The formulation, cymoxanil/mancozeb, which had been the most widely used in the previous survey, was applied to 49% of the crop area in 1998. In terms of active ingredients, mancozeb and fluazinam were the principal fungicides, accounting for 31% and 20% of the total spray area of fungicide active ingredients respectively.

● *Herbicides and desiccants (Tables 27, 58)*

The entire crop received herbicide in 1998, as was the case in the previous survey.

As in 1996, paraquat, alone and in formulation with diquat, was the principal herbicide for weed control, applied to 92% of the crop area, followed by linuron to 77%.

Nearly all (97%) the crop was desiccated with sulphuric acid (92%) and with diquat (5%).

● *Seed treatments (Table 39)*

The proportion of the seed treated with a pre-planting fungicide fell from 81% in 1996 to 69% in the present survey.

As in the previous survey, imazalil was the most commonly used treatment, applied to 24% of the seed. Pencycuron (18%), iprodione (17%) and the formulation containing imazalil/pencycuron (17%) were also widely used.



WARE POTATOES

The area of potatoes grown mainly for ware increased by 8% from 13,579 hectares in 1996 to 14,656 hectares.

● *Insecticides and molluscicides (Tables 28, 56)*

The proportion of crop receiving insecticide fell slightly from 75% in 1996 to 66% in the present survey.

Pirimicarb was the principal insecticide active ingredient, used for aphid control, accounting for 39% of the total spray area of insecticide active ingredients, followed by lambda-cyhalothrin (22%) and deltamethrin (13%).

Molluscicide usage increased considerably from only 11% of the crop treated in the previous survey to 56% in 1998. Methiocarb (33%) and metaldehyde (22%) were the main molluscicides recorded.

● *Fungicides (Tables 29, 57)*

The proportion of crop treated with fungicide increased from 89% in the previous survey to 97% in 1998. As in 1996, the principal formulation was fluazinam, applied to 93% of the crop, followed by fentin hydroxide (69%). In terms of individual active ingredients, mancozeb was again the most commonly applied, accounting for 27% of the total spray area of fungicide active ingredients, in line with its use in previous surveys.

● *Herbicides and growth regulators (Tables 30, 58)*

Herbicide usage was similar to that recorded in 1996, at around 96% of the crop treated.

Paraquat, alone and in formulation with diquat, remained the principal herbicide, applied to 89% of the crop area. Linuron (43%) was also widely used.

Sulphuric acid was the most popular desiccant, applied to 77% of the crop area.

The growth regulator maleic hydrazide was used on 5% of the crop. No growth regulators had been recorded in the previous survey.

● *Seed treatments (Table 39)*

Seventy-seven percent of the seed was treated with a pre-planting fungicide, similar to that recorded in 1996.

As in 1996, the formulation containing imazalil/pencycuron (applied to 35% of the seed) and imazalil alone (to 28%) were the most commonly used treatments.



The area grown in Scotland rose by 44% since 1996 to over 2,000 hectares.

● ***Insecticides and molluscicides (Table 31)***

Insecticide usage increased from 26% of the crop area treated in 1996 to 45% in the present survey. As in 1996, the only specified reason for insecticide use was for aphid control. Cypermethrin, applied to 23% of the crop, and lambda-cyhalothrin, to 22%, were the only insecticides recorded.

● ***Fungicides (Table 32)***

Usage of fungicides rose from 75% of the crop treated in 1996 to 91% in the present survey.

As in the previous survey, carbendazim and chlorothalonil were the principal fungicides, each accounting for 31% of the total spray area of fungicide active ingredients.

● ***Herbicides (Table 33)***

Nearly all (96%) the crop area was treated with herbicide. Cyanazine, alone (applied to 33% of the crop) and in formulation with pendimethalin (to 44%) was the principal herbicide for weed control.

Only 78% of the crop was desiccated, compared with the entire crop in 1996. Diquat, applied to 46% of the crop and glyphosate, applied to 32% of the crop area, were the only herbicides used for this purpose.

● ***Seed treatments (Table 39)***

All the seed was treated compared with 86% in 1996.

Thiram was the principal seed treatment, applied to 68% of the seed.

● *Field beans*

The area grown increased from around 350 hectares in 1996 to over 500 hectares in 1998. Because only a few crops were encountered in the survey, no attempt has been made to raise the data. Pesticides recorded were as follows:

Fungicides : carbendazim, chlorothalonil, iprodione/thiophanate-methyl.
Herbicides : diquat, simazine, terbutryn/trietazine.

● *Linseed*

The area of this crop increased 6-fold from only 229 hectares in 1996 to almost 1,400 hectares in 1998. No attempt has been made to raise the data which was recorded on a small number of holdings only. Pesticides recorded were as follows:

Fungicides : carbendazim, chlorothalonil.
Herbicides : diquat, metsulfuron-methyl, propaquizafop, trifluralin.

● *Triticale*

The area increased by 54% from 1,082 hectares in 1996 to 1,671 in 1998. Only a few crops were sampled in the survey; the data have been raised to national level and are included in the comparison tables (nos. 41-43, 50-52). Pesticides recorded were as follows:

Insecticides : deltamethrin.
Fungicides : bromuconazole, carbendazim/flusilazole, chlorothalonil, cyproconazole, cyproconazole/prochloraz, propiconazole, tebuconazole.
Herbicides : fluroxypyr, isoxaben/methabenzthiazuron, mecoprop-P, metsulfuron-methyl, pendimethalin.
Growth regulators : 2-chloroethylphosphonic acid, 2-chloroethylphosphonic acid/chlormequat, chlormequat.

The area of set aside land fell by 38% from around 70,000 hectares in 1996 to 43,300 hectares in 1998. Areas assigned to the individual categories of set aside land have been estimated from the raw data collected in the survey.

● ***Natural regeneration (Table 34)***

This category of set aside land was no longer the largest, and the estimated area decreased to 17,104 hectares from an estimated 39,544 hectares in 1996.

Herbicide usage was less than that recorded in the previous two surveys. Only 28% of the area was treated with herbicide, mainly against general weeds and couch. Glyphosate was by far the most common herbicide, applied to 26% of the land.

● ***Grass (Table 35)***

As in the previous survey, there was a relative increase in the area grown, estimated at over 21,000 hectares, the largest category of set-aside land in Scotland. The proportion of the area treated with herbicide, 9%, was similar to that recorded in 1996. MCPA and MCPB, alone and in formulations, were the most popular herbicides used and each accounted for 31% of the total spray area of herbicide active ingredients.

● ***Industrial oilseed rape (Tables 36 - 38)***

An estimated 3,359 hectares was grown in 1998, similar to that recorded in 1996. Insecticides were applied to 60% of the crop, mainly for the control of pollen beetle. Cypermethrin and lambda-cyhalothrin were the most common insecticides recorded, applied to 44% and 17% of the crop respectively. Alpha-cypermethrin, which had been the principal insecticide in 1996, was not recorded in the present survey. Molluscicides were applied to 10% of the crop area; metaldehyde (7%) was the most commonly used.

The proportion of the crop receiving fungicide, 61%, was similar to that recorded in 1996. As then, carbendazim, alone and in mixed formulations, was the principal fungicide active ingredient, accounting for 31% of the total spray area of fungicide active ingredients.

Nearly all (91%) of the crop received herbicide. As in 1996, metazachlor was the principal herbicide used and was applied to 32% of the crop.

● ***Other crops***

These crops, totalling 1,785 hectares, included game cover crops and woodland. The insecticide, deltamethrin, was used on a small area of cover crop, whilst the herbicides, glyphosate and propyzamide, were used on woodland.

COMPARISONS WITH PREVIOUS SURVEYS

● *Cereals (Table 61)*

Compared with 1996, there was a small increase (4%) in the area of cereal crops grown in Scotland to 468,153 hectares.

Overall, pesticide usage on cereals, when measured by the total spray area of all active ingredients, increased by 72% compared with 1996, almost double the increase in area grown.

There was a 26% increase in insecticide use compared with 1996 as measured by the spray area of active ingredients. Cypermethrin, used mainly on winter cereals, remained the principal insecticide. The overall weight of insecticide applied increased by 44% due mainly to the use of the organochlorine, gamma-HCH, on spring barley and winter wheat, which had not been recorded in either of the two previous surveys and which is applied at relatively high dosage rates. Compared with 1996, molluscicide usage increased 3-fold, applied predominantly to winter wheat.

Fungicide usage, as measured by the area of active ingredients, rose by 15%; by weight applied, there was a 5% increase, similar to the rise in area grown. As in the four previous surveys, fenpropimorph was the principal fungicide active ingredient. Flusilazole and carbendazim were again widely used.

As measured by the spray area of active ingredients, herbicide usage increased by 2%, although the weight applied fell by 4%. This was due mainly to the reduction of certain herbicides, such as glyphosate, mecoprop and MCPA, all of which are applied at relatively high dosage rates. As in the previous survey, the combined usage of mecoprop and mecoprop-P was the most commonly recorded, followed by metsulfuron-methyl. There was, again, an increased usage of isoproturon, used predominantly on the winter cereals. Also of note was the increase in the usage of growth regulators, the area of these active ingredients increasing by 8% and their weight by 12%; this was despite the fact that choline chloride is no longer recorded in survey reports as it is not a registered pesticide.

● *Oilseed rape (Table 62)*

Compared with that recorded in 1996, the total area of oilseed rape grown increased by 32% to 65,116 hectares, similar to that in 1994.

When measured by the spray area of active ingredients, the total usage of pesticides rose by 44%, a real increase when the change in area grown is taken into account.

There was a 17% increase in the spray area of insecticide active ingredients compared with 1996, although this represents a reduction in usage when the increase in area grown is taken into account. As in the previous survey, cypermethrin and alpha-cypermethrin were the principal insecticides recorded. The 13% reduction in the total weight of insecticide applied was due mainly to the reduction in use of organochlorines, which fell to one third of the area treated in 1996, and which are applied at relatively high dose rates. There was a 4-fold increase in the use of molluscicides, as measured by both area treated and quantities used, due mainly to the damp conditions which are favourable to slugs.

The increase in usage of fungicides, as measured by the area of active ingredients, rose in line with the area grown, whilst the weight applied increased by only 7%. The mean application rate of sulphur, which is used predominantly as a foliar feed and which is applied at relatively high dosage rates, was lower than that recorded in the previous survey; when this active is removed from the analysis, the weight of the remaining fungicides increased in line with the increase in area grown. Carbendazim, alone and in several formulations with other active ingredients remained the principal fungicide.

Usage of herbicides and desiccants increased by 49%, representing a real increase when the rise in area grown is taken into account, compared with 1996. The weight applied almost doubled, mainly due to the increased use of a number of herbicides which are applied at relatively high dosage rates. Metazachlor remained the principal herbicide.

● *Potatoes (Table 63)*

The area of potatoes grown in 1998 was slightly less (2%) than in 1996.

Overall usage of pesticides, as measured by the spray area of active ingredients, increased by 21%.

There was a 10% decrease in the total spray area of insecticide active ingredients compared with 1996. This was due mainly to the fact that the area grown of seed potatoes decreased by 10%, and there is traditionally more insecticide usage on this category compared with those grown for ware. The weight of insecticide increased marginally due mainly to the increased use of carbamates which are applied at higher dose rates than pyrethroids, which showed a decrease. Pirimicarb replaced deltamethrin as the principal insecticide active ingredient. Molluscicide usage increased 6-fold compared with 1996.

Compared with usage in 1996, the spray area of fungicide active ingredients increased by 38%. Significant changes were the increased usage on the ware crop. The quantity of fungicide applied rose by only 19%, due partly to the increased use of fluazinam which is applied at relatively low dosage rates.

The combined usage of herbicides and desiccants increased by 8% as measured by the total area of active ingredients, but by only 1% by weight applied. If the desiccants sulphuric acid and sodium chlorate, which are applied at extremely high dose rates, are discounted, the spray area increased by 11%, whilst the weight fell by 5%. As in the previous survey, paraquat and linuron, were the principal herbicides recorded.

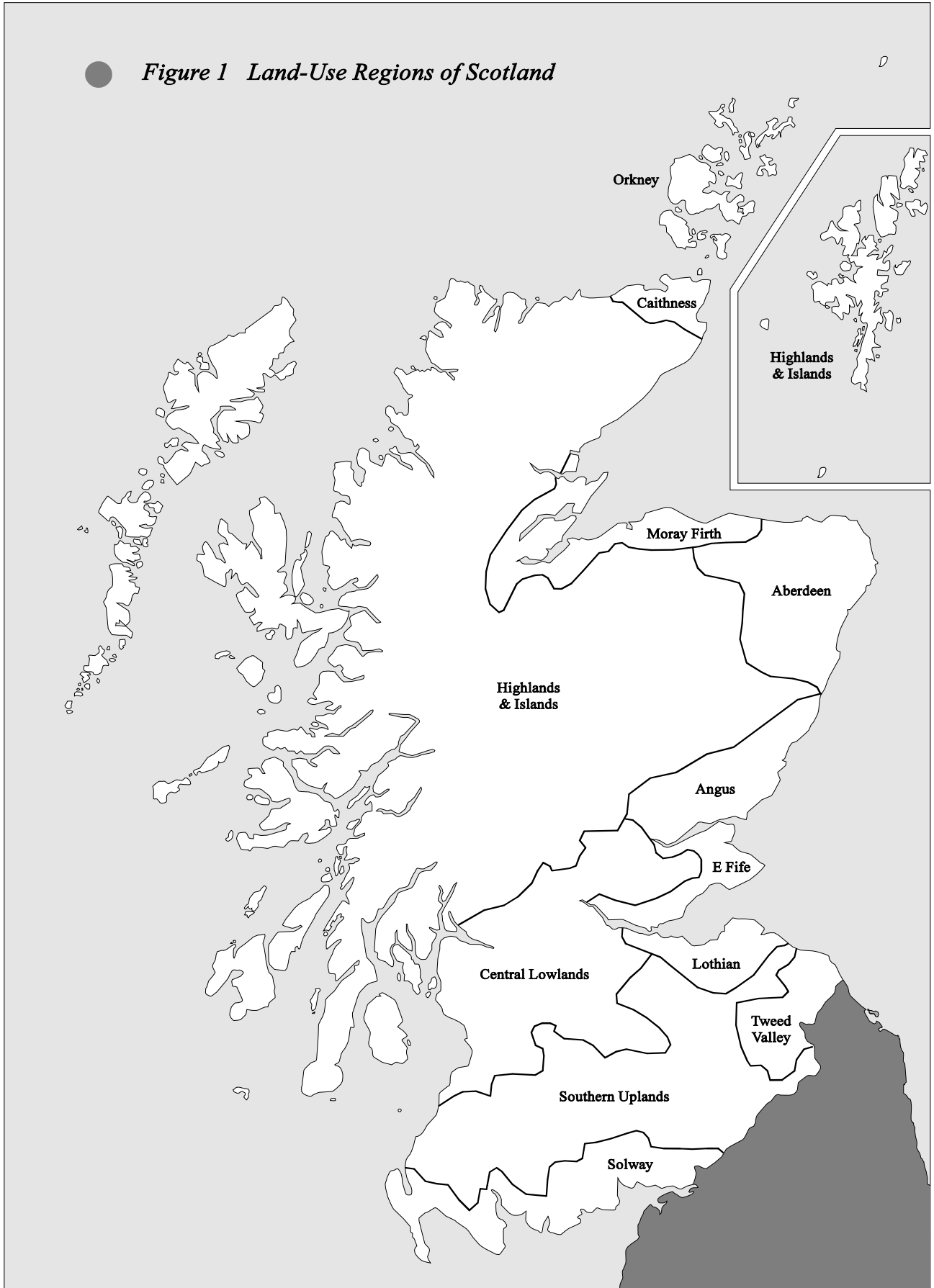
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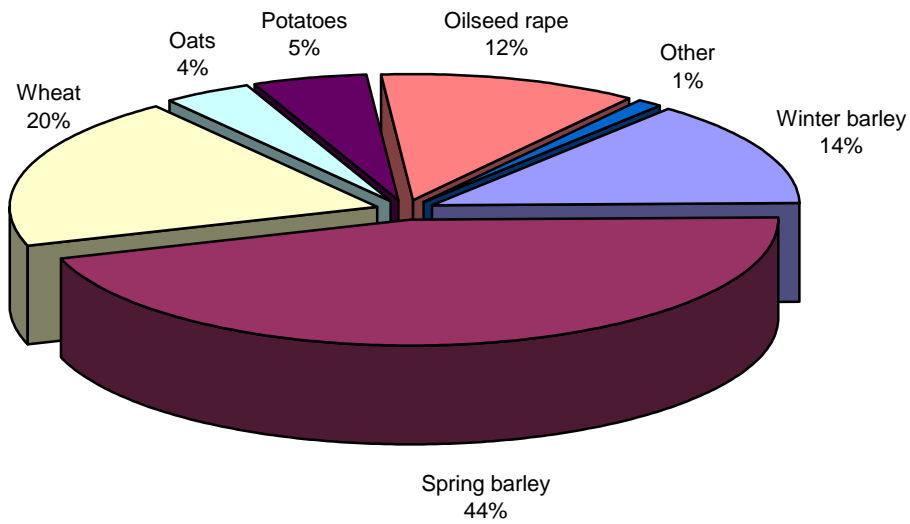
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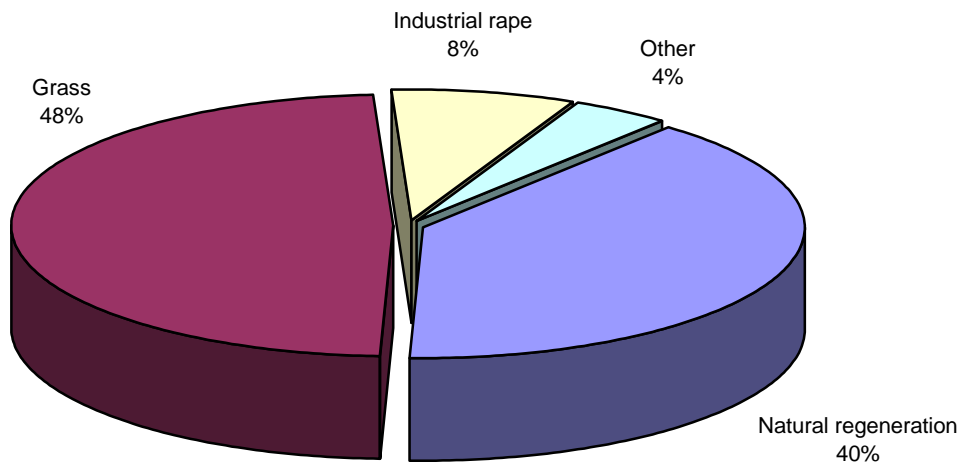
● **Figure 1 Land-Use Regions of Scotland**



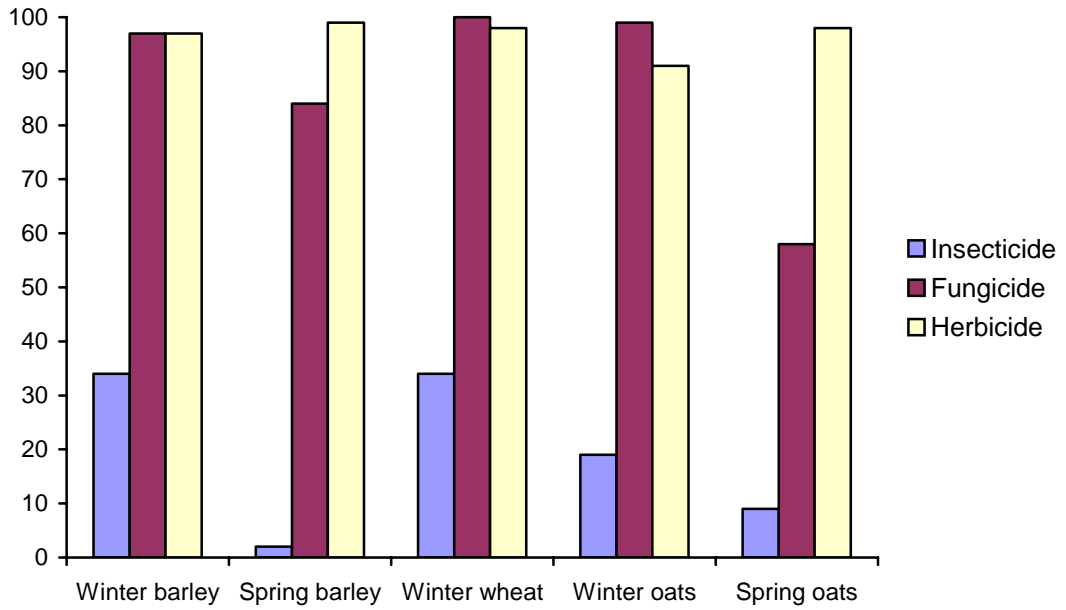
● *Figure 2 Percentage of arable crop areas*



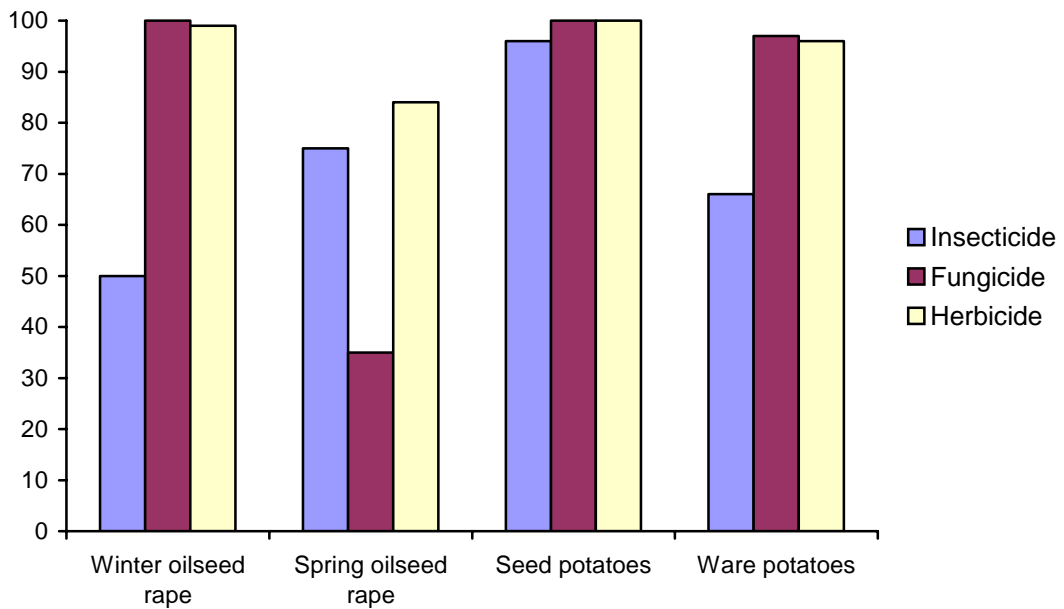
● *Figure 3 Estimated percentages of areas of set aside land*



● **Figure 4 Percentages of cereals treated with pesticides**



● **Figure 5 Percentages of oilseed rape and potatoes treated with pesticides**



● **TABLE 1 Regional distribution of arable crops in 1998 (hectares)**

<i>Crop/Region</i>	<i>Highlands & Islands and Caithness & Orkney</i>	<i>Moray Firth</i>	<i>Aberdeen</i>	<i>Angus</i>	<i>East Fife</i>	<i>Lothian</i>	<i>Central Lowlands</i>	<i>Tweed Valley</i>	<i>S Uplands & Solway</i>	<i>Scotland 1998</i>	<i>Scotland 1996</i>	<i>% change</i>
Winter barley	544	3,262	18,419	13,635	8,243	6,277	10,145	10,718	6,462	77,704	63,566	22
Spring barley	13,944	36,996	70,846	43,017	12,607	14,688	31,799	17,966	13,959	255,822	260,726	-2
Wheat	213	6,356	10,605	22,135	15,679	18,822	11,859	22,342	3,161	111,172	103,974	7
Winter oats	94	731	966	1,175	574	191	1,629	1,756	535	7,650	6,161	24
Spring oats	2,371	2,532	3,648	2,172	277	265	1,533	729	608	14,134	13,789	3
Triticale	*	502	176	198	150	*	121	160	267	1,671	1,082	54
Winter oilseed rape	119	2,097	11,913	9,959	4,354	3,937	2,895	6,419	309	42,001	30,521	38
Spring oilseed rape	622	2,681	7,687	3,979	1,609	1,101	2,992	2,038	406	23,115	18,769	23
Seed potatoes	226	1,454	2,766	6,624	739	217	1,354	559	167	14,105	15,718	-10
Ware potatoes	372	583	997	5,095	1,972	1,887	1,901	1,616	234	14,656	13,579	8
Combine peas	14	248	65	496	179	537	174	384	0	2,097	1,458	44
Field beans	0	*	*	217	80	*	45	103	*	507	343	48
Linseed	*	207	323	130	*	56	316	270	*	1,388	229	506
Set aside	1,104	5,970	11,215	7,218	3,244	2,991	5,672	4,384	1,502	43,300	69,443	-38

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

● **TABLE 2** *Distribution of sample*

<i>Size (ha)</i>	<i>Highlands & Islands and Caithness & Orkney</i>	<i>Moray Firth</i>	<i>Aberdeen</i>	<i>Angus</i>	<i>East Fife</i>	<i>Lothian</i>	<i>Central Lowlands</i>	<i>Tweed Valley</i>	<i>S Uplands & Solway</i>	<i>Scotland</i>
1-19.9	9	3	4	2	1	1	4	1	3	28
20-49.9	3	6	18	8	4	2	9	3	7	60
50-99.9	1	10	24	18	8	7	11	7	4	90
100- 149.9	0	6	14	12	8	6	4	9	1	60
150+	1	7	17	21	9	15	5	17	2	94
<i>All sizes</i>	14	32	77	61	30	31	33	37	17	332

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

	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Winter oilseed rape</i>	<i>Spring oilseed rape</i>	<i>Seed potatoes</i>	<i>Ware potatoes</i>	<i>Combine peas</i>
Insecticides	34	2	34	75	19	9	14	50	75	96	66	45
Molluscicides	3	0	18	7	0	0	0	26	0	24	56	0
Fungicides	97	84	100	100	99	58	45	100	35	100	97	91
Herbicides/desiccants	97	99	98	100	91	98	90	99	84	100	96	96
Growth regulators	80	9	95	100	85	43	100	15	0	0	5	0
Any pesticide	99	99	100	100	94	98	100	100	95	100	97	96

● **TABLE 4 Winter barley**
Insecticides and molluscicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Insecticides</i>	<i>Aphids</i>	<i>No reason given</i>	<i>Slugs</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Chlorpyrifos	0	121	0	121	+
Cypermethrin	17,038	611	0	17,649	21
Deltamethrin	1,405	0	0	1,405	2
Dimethoate	753	895	0	1,647	2
Esfenvalerate	3,462	0	0	3,462	4
Fenvalerate	186	0	0	186	+
Lambda-cyhalothrin	3,556	0	0	3,556	5
Zeta-cypermethrin	830	0	0	830	1
<i>All insecticides</i>	27,230	1,627	0	28,857	34
<i>Molluscicides</i>					
Metaldehyde	0	0	957	957	1
Methiocarb	0	0	2,022	2,022	2
Thiodicarb	0	0	335	335	+
<i>All molluscicides</i>	0	0	3,315	3,315	3
Area planted (ha)					77,704

‘+’ = <0.5%

TABLE 5 Winter barley
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Rhyncho- sporium</i>	<i>Net blotch</i>	<i>Mildew & rhyncho- sporium</i>	<i>Mildew & net blotch</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Azoxystrobin	34	0	0	0	363	124	0	0	0	4,882	5,402	7
Azoxystrobin/fenpropimorph	0	0	0	640	0	0	0	0	0	0	640	+
Bromuconazole	525	0	0	0	0	0	0	0	0	1,715	2,240	3
Carbendazim	475	2,324	0	1,314	0	617	0	0	0	3,553	8,284	11
Carbendazim/chlorothalonil	0	0	0	0	0	0	0	0	0	174	174	+
Carbendazim/flusilazole	2,056	3,446	1,524	3,387	784	146	0	0	1,590	12,898	25,832	25
Carbendazim/mancozeb	0	0	0	0	0	0	0	0	0	289	289	+
Carbendazim/maneb/tridemorph	0	0	0	0	279	0	0	0	0	0	279	+
Carbendazim/prochloraz	0	0	0	215	0	0	0	0	0	0	215	+
Carbendazim/propiconazole	143	0	96	1,158	843	0	0	0	0	4,449	6,689	8
Chlorothalonil	0	0	0	0	0	0	0	0	427	2,518	2,945	4
Copper oxychloride	0	0	0	0	0	0	876	0	0	0	876	1
Cyproconazole	0	0	0	0	0	0	0	0	0	1,227	1,227	2
Cyproconazole/prochloraz	0	0	0	0	0	0	0	0	0	11,686	11,686	8
Cyprodinil	0	504	122	1,040	0	252	0	0	56	9,168	11,142	12
Epoxiconazole	290	423	447	1,552	89	302	0	0	543	6,212	9,856	12
Epoxiconazole/fenpropimorph	0	1,275	0	525	0	213	0	0	0	719	2,731	4
Epoxiconazole/fenpropimorph/ kresoxim-methyl	0	0	0	0	0	0	0	0	0	1,908	1,908	2
Epoxiconazole/kresoxim-methyl	0	0	0	0	186	0	0	0	186	3,073	3,445	4
Epoxiconazole/tridemorph	0	0	0	0	0	0	0	0	0	1,090	1,090	1

cont...

TABLE 5 Winter barley (continued)
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Rhyncho- sporium</i>	<i>Net blotch</i>	<i>Mildew & rhyncho- sporium</i>	<i>Mildew & net blotch</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Fenpropidin	548	0	0		0	0	0	0	303	2,177	3,028	4
Fenpropidin/fenpropimorph	5,116	0	736	0	227	0	0	0	0	6,601	12,680	10
Fenpropidin/prochloraz	0	0	0	0	0	0	0	0	0	1,674	1,674	2
Fenpropidin/propiconazole	621	0	0	0	0	0	0	0	1,287	1,644	3,552	4
Fenpropidin/propiconazole/ tebuconazole	0	0	0	0	0	0	0	0	0	1,688	1,688	2
Fenpropimorph	12,773	1,244	0	8,231		973	0	0	124	34,872	58,216	46
Fenpropimorph/flusilazole	0	201	0	252	279		0	0	0	1,489	2,220	3
Fenpropimorph/flusilazole/ Tridemorph	0	0	0	193		193	0	0	0	3,113	3,498	4
Fenpropimorph/kresoxim-methyl	0	0	0	0	0	0	0	0	0	3,327	3,327	4
Fenpropimorph/prochloraz	1,504	0	0	0	0	0	0	0	0	612	2,117	3
Fenpropimorph/propiconazole	446	0	0	0	0	252	0	0	437	3,339	4,474	5
Fenpropimorph/quinoxifen	249	0	0	0	0		0	0	0	396	645	1
Fenpropimorph/tridemorph	4,641	0	0	203	0	0	0	0	0	7,837	12,681	13
Flusilazole	6,972	1,975	238	2,324	1,271	888	0	0	2,010	24,114	39,793	30
Flusilazole/tridemorph	1,250	0	0	0	0	0	0	0	0	4,517	5,767	4
Flutriafol	0	0	0	0	0	0	0	0	0	293	293	+

cont...

TABLE 5 Winter barley (continued)
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Rhyncho- sporium</i>	<i>Net blotch</i>	<i>Mildew & rhyncho- sporium</i>	<i>Mildew & net blotch</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Mancozeb	244	0	0	0	0	0	0	0	0	1,610	1,853	2
Maneb	0	225	557	0	0	349	0	0	318	5,432	6,881	5
Prochloraz	249	0	0	0	88	0	0	0	0	1,003	1,340	2
Propiconazole	716	437	706	154	0	0	0	0	773	6,329	9,114	8
Propiconazole/tebuconazole	0	0	0	0	0	0	0	0	0	510	510	1
Propiconazole/tridemorph	0	0	0	181	0	0	0	0	0	798	979	1
Quinoxifen	2,890	0	0	0	0	0	0	0	0	5,109	7,999	9
Spiroxamine	2,484	1,360	0	1,265	0	0	0	0	244	9,981	15,333	15
Spiroxamine/tebuconazole	0	0	0	0	0	0	0	0	0	94	94	+
Sulphur	0	0	0	0	0	0	3,405	4,008	0	1,349	8,762	9
Tebuconazole	0	0	0	0	0	87	0	0	0	2,553	2,640	3
Tebuconazole/triadimenol	0	0	0	0	0	0	0	0	0	2,240	2,240	3
Triadimenol/tridemorph	1,538	0	0	0	0	0	0	0	0	6,502	8,040	8
Tridemorph	2,484	0	0	0	0	167	0	0	0	3,991	6,642	7
All fungicides	48,246	13,414	3,690	23,369	4,181	4,790	4,281	4,008	8,299	210,751	325,029	97
Area planted (ha)												77,704

‘+’ = <0.5%

● **TABLE 6 Winter barley**

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual bl & grass weeds</i>	<i>Annual bl, grass & wild oats</i>	<i>Annual bl weeds & docks</i>	<i>Couch & volunteer cereals</i>	<i>Annual grass & wild oats</i>	<i>Volunteer rape</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
2,4-DB/linuron/MCPA	0	0	0	0	0	0	0	0	226	0	226	+
Amidosulfuron	338	0	0	0	0	0	0	0	484	0	822	1
Bromoxynil/ioxynil	912	0	0	0	0	0	0	0	505	0	1,416	2
Bromoxynil/ioxynil/triasulfuron	1,154	0	0	0	0	0	0	0	1,662	0	2,815	4
Carfentrazone-ethyl/isoproturon	0	0	0	0	0	0	0	0	625	0	625	1
Chlorotoluron	571	0	0	0	0	0	0	0	0	0	571	1
Cyanazine/terbuthylazine	0	0	0	0	0	0	0	0	623	0	623	1
Dicamba/mecoprop-P	156	0	0	0	0	0	0	0	144	0	301	+
Difenzoquat	0	0	0	0	0	0	0	0	207	0	207	+
Diflufenican/isoproturon	7,513	5,475	0	0	0	137	0	0	27,241	0	40,365	52
Diflufenican/terbuthylazine	823	524	0	0	0	0	0	0	847	0	2,193	3
Diflufenican/trifluralin	0	0	0	0	0	0	0	0	1,197	0	1,197	2
Diquat	0	0	0	0	0	0	0	88	0	0	88	+
Flamprop-M-isopropyl	0	0	0	0	0	452	0	0	0	0	452	1
Fluroglycofen-ethyl/isoproturon	0	0	0	0	0	0	0	0	933	0	933	1
Fluroxypyr	99	0	0	0	0	0	0	0	1,262	0	1,361	2
Glyphosate	0	0	0	0	1,100	0	0	1,451	703	0	3,255	4
Isoproturon	2,820	4,985	323	0	0	514	0	0	28,544	0	37,186	47
Isoproturon/pendimethalin	900	852	429	0	0	0	0	0	2,304	0	4,483	6

cont...

● **TABLE 6 Winter barley (continued)**

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual bl & grass weeds</i>	<i>Annual bl, grass & wild oats</i>	<i>Annual bl weeds & docks</i>	<i>Couch & volunteer cereals</i>	<i>Annual grass & wild oats</i>	<i>Volunteer rape</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
MCPA	0	0	0	0	0	0	0	0	226		226	+
Mecoprop	636	0	0	0	0	0	262	0	1,416		2,314	3
Mecoprop-P	4,756	0	0	0	0	0	1,510	0	16,788		23,054	28
Metsulfuron-methyl	2,451	0	0	1,287	0	0	89	0	6,008		9,835	13
Metsulfuron-methyl/ thifensulfuron-methyl	526	0	0	0	0	0	0	0	364		889	1
Pendimethalin	1,155	377	0	0	0	0	0	0	3,834		5,365	7
Propaquizafop	0	0	0	0	0	0	0	0	1		1	+
Tralkoxydim	0	0	0	0	0	1,838	0	0	144		1,982	3
Tri-allate	0	0	0	0	0	0	0	0	1		1	+
Tribenuron-methyl	2,113	0	0	0	0	0	0	0	1,466		3,579	5
Trifluralin	124	278	0	0	0	0	0	0	2,504		2,906	4
Unspecified herbicide	0	0	0	0	0	0	0	0	314		314	+
All herbicides	27,046	12,491	752	1,287	1,100	2,940	1,860	1,539	100,569		149,586	97

cont....

TABLE 6 Winter barley (continued)

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Growth regulators</i>	<i>Annual bl weeds</i>	<i>Annual bl & grass weeds</i>	<i>Annual bl, grass & wild oats</i>	<i>Annual bl weeds & docks</i>	<i>Couch & volunteer cereals</i>	<i>Annual grass & wild oats</i>	<i>Volunteer rape</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
2-chloroethylphosphonic acid	0	0	0	0	0	0	0	0	0	15,851	15,851	20
2-chloroethylphosphonic acid/ chlormequat	0	0	0	0	0	0	0	0	0	13,019	13,019	16
2-chloroethylphosphonic acid/ chlormequat/imazaquin	0	0	0	0	0	0	0	0	0	891	891	1
2-chloroethylphosphonic acid/ chlormequat/mepiquat chloride	0	0	0	0	0	0	0	0	0	111	111	+
2-chloroethylphosphonic acid/ mepiquat chloride	0	0	0	0	0	0	0	0	0	12,510	12,510	16
Chlormequat	0	0	0	0	0	0	0	0	0	49,953	49,953	57
Trinexapac-ethyl	0	0	0	0	0	0	0	0	0	7,940	7,940	9
All growth regulators	0	0	0	0	0	0	0	0	0	100,275	100,275	80
Area planted (ha)												77,704

'+' = <0.5%

TABLE 7 Spring barley
Insecticides and molluscicides, the reasons for their use (spray hectares of formulations) and the percentage crop treated

<i>Insecticides</i>	<i>Aphids</i>	<i>Leather-jackets</i>	<i>No reason given</i>	<i>Slugs</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Chlorpyrifos	0	2,396	282	0	2,678	1
Cypermethrin	1,113	0	0	0	1,113	+
Gamma-HCH	0	697	0	0	697	+
All insecticides	1,113	3,093	282	0	4,487	2
Molluscicides	0	0	0	0	0	0
Metaldehyde	0	0	0	379	379	+
Methiocarb	0	0	0	288	288	+
All molluscicides	0	0	0	666	666	+
Area planted (ha)						255,822

'+' = <0.5%

TABLE 8 Spring barley
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Rhynchosporium</i>	<i>Mildew & rhynchosporium</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Azoxystrobin	0	0	0	0	0	0	0	866	866	+
Azoxystrobin/fenpropimorph	0	191	0	0	0	0	635	1,047	1,872	1
Bromuconazole	0	550	0	0	0	0	0	3,883	4,433	2
Carbendazim	913	2,589	616	0	0	0	0	11,143	15,260	6
Carbendazim/chlorothalonil	139	3,932	0	287	0	0	0	4,645	9,003	4
Carbendazim/flusilazole	4,055	16,434	1,605	652	0	0	755	30,350	53,851	18
Carbendazim/maneb	0	448	0	496	0	0	0	0	944	+
Carbendazim/prochloraz	1,033	0	0	0	0	0	0	1,381	2,415	1
Carbendazim/propiconazole	912	1,813	604	0	0	0	332	5,462	9,122	3
Carbendazim/tebuconazole	691	0	0	0	0	0	0	0	691	+
Chlorothalonil	0	1,038	0	0	0	0	0	3,559	4,597	2
Copper oxychloride	0	0	0	0	8,297	0	0	0	8,297	3
Cyproconazole	665	41	0	0	0	0	0	0	705	+
Cyproconazole/prochloraz	0	33	0	0	0	0	0	0	33	+
Cyprodinil	3,739	5,487	383	0	0	0	1,582	10,072	21,263	8

cont...

TABLE 8 Spring barley (continued)

Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Rhyncho- sporium</i>	<i>Mildew & rhyncho- sporium</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Epoxiconazole	2,427	0	0	0	0	0	434	7,042	9,903	4
Epoxiconazole/fenpropimorph	0	255	0	0	0	0	0	185	440	+
Epoxiconazole/kresoxim-methyl	0	0	500	0	0	0	0	726	1,226	+
Fenpropidin	3,137	0	0	0	0	0	0	1,737	4,874	1
Fenpropidin/fenpropimorph	6,876	3,602	3,295	665	0	0	0	4,466	18,904	6
Fenpropidin/prochloraz	0	0	1,234	0	0	0	0	1,203	2,437	1
Fenpropidin/propiconazole	0	0	1,917	0	0	0	0	553	2,470	1
Fenpropidin/propiconazole/ tebuconazole	0	0	0	0	0	0	0	350	350	+
Fenpropidin/tebuconazole	1,752	0	0	0	0	0	0		1,752	1
Fenpropimorph	34,951	2,135	2,022	129	0	0	585	37,802	77,623	25
Fenpropimorph/flusilazole	718	0	0	0	0	0	0	1,338	2,055	1
Fenpropimorph/flusilazole/tridemorph	1,665	0	742	302	0	0	0	4,038	6,747	2
Fenpropimorph/kresoxim-methyl	1,234	0	0	0	0	0	0	2,499	3,733	1
Fenpropimorph/prochloraz	1,139	0	1,446	0	0	0	0	1,147	3,732	1
Fenpropimorph/propiconazole	2,544	0	766	0	0	0	814	4,355	8,480	3

cont...

TABLE 8 Spring barley (continued)
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Rhynchosporium</i>	<i>Mildew & rhynchosporium</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Fenpropimorph/quinoxifen	2,648	0	0	0	0	0	0	3,908	6,555	3
Fenpropimorph/tridemorph	6,710	0	0	0	0	0	0	6,168	12,878	5
Flusilazole	9,518	7,105	6,266	0	0	0	0	31,733	54,622	18
Flusilazole/tridemorph	3,072	0	0	0	0	0	0	1,690	4,763	2
Flutriafol	0	0	0	0	0	0	0	124	124	+
Mancozeb	0	1,061	0	0	0	0	0	1,672	2,733	1
Maneb	2,003	0	0	0	0	0	0	3,335	5,339	1
Prochloraz/propiconazole	0	0	0	0	0	0	0	554	554	+
Propiconazole	6,833	5,200	1,655	287	0	0	679	16,798	31,452	11
Propiconazole/tebuconazole	601	0	0	0	0	0	0	1,057	1,657	1
Propiconazole/tridemorph	0	0	1,487	0	0	0	0	50	1,537	1
Quinoxifen	8,049	0	0	0	0	0	0	12,186	20,234	7
Spiroxamine	2,387	0	1,386	0	0	0	0	5,013	8,786	3
Spiroxamine/tebuconazole	321	744	0	0	0	0	0		1,065	+
Sulphur	0	0	0	0	7,693	8,929	0	3,130	19,752	6
Tebuconazole	0	0	0	0	0	0	0	476	476	+
Tebuconazole/tridemorph	0	0	0	0	0	0	0	697	697	+
Triadimenol/tridemorph	1,914	0	0	0	0	0	0	5,338	7,251	3
Tridemorph	5,795	186	0	0	0	0	0	3,547	9,529	4
All fungicides	118,438	52,844	25,922	2,817	15,990	8,929	5,817	237,322	468,079	84
Area planted (ha)										255,822

‘+’ = <0.5%

TABLE 9 Spring barley

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual bl weeds & volunteer rape</i>	<i>Annual grass weeds</i>	<i>Couch</i>	<i>Wild oats</i>	<i>Volunteer potatoes</i>	<i>Volunteer rape</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
2,4-DB/benazolin/MCPA	10,636	0	0	0	0	0	0	0	3,437	0	14,073	6
2,4-DB/linuron/MCPA	1,619	0	0	0	0	0	0	0	1,246	0	2,865	1
2,4-DB/MCPA	544	0	0	0	0	0	0	0	1,341	0	1,885	1
Benazolin/bromoxynil/ioxynil	641	0	0	0	0	0	0	0	0	0	641	+
Bentazone/MCPA/MCPB	1,823	0	0	0	0	0	0	0	824	0	2,647	1
Bromoxynil/diflufenican/ioxynil	0	531	0	0	0	0	0	0	4,716	0	5,247	2
Bromoxynil/fluroxypyr	287	0	0	0	0	0	0	0	1,389	0	1,676	1
Bromoxynil/ioxynil	13,861	0	0	0	0	0	0	0	7,005	0	20,865	8
Bromoxynil/ioxynil/isoproturon	0	0	0	0	0	0	0	0	672	0	672	+
Bromoxynil/ioxynil/mecoprop	3,564	0	0	0	0	0	0	0	3,288	0	6,852	3
Bromoxynil/ioxynil/mecoprop-P	5,544	0	0	0	0	0	0	0	6,075	0	11,619	5
Bromoxynil/ioxynil/triasulfuron	8,423	0	0	0	0	0	0	0	13,225	0	21,648	8
Carfentrazone-ethyl/mecoprop-P	719	0	0	0	0	0	0	0	0	0	719	+
Carfentrazone-ethyl/metsulfuron-methyl	4,308	0	0	0	0	0	0	0	718	0	5,026	2
Dicamba/MCPA/mecoprop	4,003	201	0	0	0	0	0	0	1,138	0	5,341	2
Dicamba/MCPA/mecoprop-P	685	0	0	0	0	0	0	0	0	0	685	+
Dicamba/mecoprop	1,505	0	0	0	0	0	0	0	1,650	0	3,155	1
Dicamba/mecoprop-P	6,132	0	0	0	0	0	0	0	9,140	0	15,272	6

cont...

● **TABLE 9 Spring barley (continued)**

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual bl weeds & volunteer rape</i>	<i>Annual grass weeds</i>	<i>Couch</i>	<i>Wild oats</i>	<i>Volunteer potatoes</i>	<i>Volunteer rape</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Dichlorprop/MCPA	497	0	0	0	0	0	0	0	0	0	497	+
Diclofop-methyl/fenoxaprop-P-ethyl	0	0	0	0	875	0	0	0	0	0	875	+
Difenzoquat	0	0	0	0	41	0	0	0	0	0	41	+
Diflufenican/isoproturon	0	0	0	0	0	0	0	0	802	0	802	+
Flamprop-M-isopropyl	0	0	0	0	827	0	0	0	0	0	827	+
Fluroxypyr	215	0	0	0	0	99	0	0	689	0	1,003	+
Glyphosate	0	0	0	6,098	0	285	0	6,850	528	0	13,760	5
Isoproturon	0	0	510	0	0	0	0	0	612	0	1,122	+
MCPA	15,196	0	0	0	0	0	0	0	17,299	0	32,494	13
MCPA/MCPB	180	0	0	0	0	0	0	0	1,422	0	1,602	1
Mecoprop	12,149	0	0	0	0	0	0	0	11,630	0	23,779	9
Mecoprop-P	47,337	478	0	0	0	0	595	0	48,650	0	97,060	38
Metsulfuron-methyl	49,136	148	0	0	0	0	0	0	39,834	0	89,118	35
Metsulfuron-methyl/ thifensulfuron-methyl	42,464	0	0	0	0	78	0	0	24,459	0	67,001	26
Pendimethalin	0	0	0	0	0	0	0	0	86	0	86	+
Propaquizafop	0	0	0	0	0	0	0	0	3	0	3	+

cont...

● **TABLE 9 Spring barley (continued)**

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual bl weeds & volunteer rape</i>	<i>Annual grass weeds</i>	<i>Couch</i>	<i>Wild oats</i>	<i>Volunteer potatoes</i>	<i>Volunteer rape</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Thifensulfuron-methyl/ tribenuron-methyl	7,249	0	0	0	0	0	0	0	6,376	0	13,624	5
Tralkoxydim	0	0	0	0	14,707	0	0	0	45	0	14,753	6
Triasulfuron	0	0	0	0	0	0	0	0	575	0	575	+
Tribenuron-methyl	4,748	0	0	0	0	0	0	0	3,670	0	8,418	3
Unspecified herbicide	0	0	0	369	0	0	0	0	0	0	369	+
All herbicides	243,464	1,358	510	6,467	16,450	462	595	6,850	212,541	0	488,697	99
Growth regulators												
2-chloroethylphosphonic acid	0	0	0	0	0	0	0	0	0	8,149	8,149	3
2-chloroethylphosphonic acid/ chlormequat	0	0	0	0	0	0	0	0	0	342	342	+
2-chloroethylphosphonic acid/ chlormequat/imazaquin	0	0	0	0	0	0	0	0	0	413	413	+
2-chloroethylphosphonic acid/ chlormequat/mepiquat chloride	0	0	0	0	0	0	0	0	0	41	41	+
2-chloroethylphosphonic acid/ mepiquat chloride	0	0	0	0	0	0	0	0	0	3,571	3,571	1
Chlormequat	0	0	0	0	0	0	0	0	0	6,365	6,365	2
Trinexapac-ethyl	0	0	0	0	0	0	0	0	0	4,914	4,914	2
All growth regulators	0	0	0	0	0	0	0	0	0	23,794	23,794	9
Area planted (ha)												255,822

‘+’ = <0.5%

TABLE 10 Winter wheat
Insecticides and molluscicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Insecticides</i>	<i>Aphids</i>	<i>Wheat bulb fly</i>	<i>Leather-jackets</i>	<i>No reason given</i>	<i>Slugs</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Alpha-cypermethrin	379	0	0	0	0	379	+
Chlorfenvinphos	0	365	0	0	0	365	+
Chlorpyrifos	429	2,096	860	584	0	3,969	4
Cypermethrin	13,182	0	0	1,002	0	14,184	12
Deltamethrin	691	0	0	0	0	691	1
Demeton-S-methyl	469	0	0	0	0	469	+
Dimethoate	8,081	1,637	0	1,292	0	11,010	9
Esfenvalerate	1,260	0	0	0	0	1,260	1
Gamma-HCH	0	0	0	460	0	460	+
Lambda-cyhalothrin	6,844	0	0	478	0	7,321	5
Lambda-cyhalothrin/pirimicarb	906	0	0	0	0	906	1
Pirimicarb	1,672	0	0	72	0	1,744	2
Tau-fluvalinate	0	0	0	1,105	0	1,105	1
All insecticides	34,374	4,099	860	4,532	0	43,864	34
Molluscicides							
Metaldehyde	0	0	0	0	17,449	17,449	12
Methiocarb	0	0	0	0	6,827	6,827	5
Thiodicarb	0	0	0	0	2,289	2,289	2
Unspecified molluscicide	0	0	0	0	11	11	+
All molluscicides	0	0	0	0	26,576	26,576	18
Area planted (ha)							110,780

‘+’ = < 0.5%

TABLE 11 Winter wheat
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Septoria</i>	<i>Mildew & septoria</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Anilazine	0	1,091	0	663	0	0	0	1,602	3,357	3
Azoxystrobin	3,849	2,035	1,293	14,527	0	0	0	25,565	47,268	38
Azoxystrobin/fenpropimorph	0	0	0	302	0	0	0	1,585	1,888	2
Bromuconazole	0	0	0	0	0	0	0	198	198	+
Carbendazim	0	0	0	5,137	0	0	0	3,363	8,500	8
Carbendazim/chlorothalonil	0	403	0	0	0	0	0	728	1,131	1
Carbendazim/flusilazole	665	764	0	508	0	0	138	7,484	9,559	8
Carbendazim/flutriafol	0	0	1,240	0	0	0	0	1,584	2,824	3
Carbendazim/mancozeb	0	0	885	1,837	0	0	0	1,739	4,461	4
Carbendazim/maneb	0	0	0	936	0	0	0	459	1,395	1
Carbendazim/prochloraz	0	0	113	0	0	0	0	0	113	+
Carbendazim/propiconazole	0	0	0	0	0	0	0	512	512	+
Chlorothalonil	1,861	12,078	962	5,093	0	0	0	44,783	64,776	46
Chlorothalonil/flutriafol	2,080	762	113	0	0	0	0	1,340	4,296	4
Chlorothalonil/mancozeb	0	0	0	692	0	0	0	0	692	1
Copper oxychloride	0	0	0	0	1,711	0	0	0	1,711	1
Cyproconazole	0	2,007	1,462	526	0	0	199	12,368	16,562	14
Cyproconazole/prochloraz	710	3,004	3,266	0	0	0	1,877	23,506	32,364	26
Cyproconazole/tridemorph	0	0	0	0	0	0	0	193	193	+
Cyprodinil	683	0	0	0	0	0	1,105	6,265	8,052	7

cont....

● **TABLE 11 Winter wheat (continued)**

Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Septoria</i>	<i>Mildew & septoria</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Difenoconazole	0	0	0	7,618	0	0	496	4,416	12,531	11
Epoxiconazole	1,396	4,098	1,785	0	0	0	1,569	24,067	32,915	27
Epoxiconazole/fenpropimorph	2,834	942	0	0	0	0	0	3,682	7,458	7
Epoxiconazole/fenpropimorph/ kresoxim-methyl	0	570	938	0	0	0	0	5,352	6,860	6
Epoxiconazole/kresoxim-methyl	579	2,875	2,945	285	0	0	348	19,891	26,924	17
Epoxiconazole/tridemorph	398	0	0	0	0	0	0	1,346	1,744	1
Fenbuconazole	0	0	0	346	0	0	0	2,640	2,986	2
Fenbuconazole/prochloraz	0	319	0	0	0	0	0	3,377	3,696	3
Fenbuconazole/propiconazole	0	0	0	0	0	0	0	941	941	1
Fenpropidin	7,330	0	4,448	3,511	0	0	929	22,709	38,927	23
Fenpropidin/fenpropimorph	7,074	306	113	0	0	0	0	15,240	22,733	17
Fenpropidin/prochloraz	0	352	632	0	0	0	625	8,557	10,166	9
Fenpropidin/propiconazole	0	93	0	0	0	0	0	221	314	+
Fenpropidin/propiconazole/ tebuconazole	0	0	885	0	0	0	0	1,194	2,079	2
Fenpropidin/tebuconazole	0	0	255	0	0	0	0	1,084	1,339	1

cont....

TABLE 11 Winter wheat (continued)

Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Septoria</i>	<i>Mildew & septoria</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Fenpropimorph	3,798	0	113	117	0	0	0	9,106	13,134	11
Fenpropimorph/flusilazole	0	0	0	0	0	0	0	704	704	1
Fenpropimorph/flusilazole/tridemorph	0	0	0	0	0	0	0	991	991	1
Fenpropimorph/kresoxim-methyl	654	535	2,034	0	0	0	0	14,621	17,845	13
Fenpropimorph/prochloraz	868	0	0	0	0	0	0	1,434	2,302	2
Fenpropimorph/propiconazole	0	0	0	0	0	0	0	497	497	+
Fenpropimorph/quinoxifen	612	0	0	0	0	0	0	2,354	2,967	2
Fenpropimorph/tridemorph	160	0	0	0	0	0	0	969	1,129	1
Flusilazole	775	606	1,524	0	0	0	0	14,087	16,992	13
Flutriafol	1,463	316	481	758	0	0	0	12,798	15,816	9
Flutriafol/iprodione	0	0	0	0	0	0	0	214	214	+
Mancozeb	0	607	0	1,799	0	0	0	3,377	5,783	5
Maneb	0	783	0	467	0	0	0	6,466	7,715	6
Prochloraz	0	0	0	0	0	0	0	4,151	4,151	4
Prochloraz/propiconazole	0	1,049	0	0	0	0	0	1,340	2,388	1
Prochloraz/tebuconazole	0	0	0	634	0	0	0	0	634	1
Propiconazole	753	0	1,872	0	0	0	0	1,929	4,554	4
Propiconazole/tebuconazole	496	588	255	155	0	0	0	4,596	6,091	4
Propiconazole/tridemorph	0	0	0	0	0	0	0	259	259	+
Quinoxifen	1,359	0	0	0	0	0	0	4,642	6,000	5

cont....

TABLE 11 Winter wheat (continued)
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Septoria</i>	<i>Mildew & septoria</i>	<i>Head spray</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Spiroxamine	3,230	0	0	404	0	0	0	6,765	10,398	7
Spiroxamine/tebuconazole	612	0	0	0	0	0	0	0	612	1
Sulphur	0	0	0	568	15,805	13,636	0	8,569	38,578	25
Tebuconazole	1,847	3,223	817	7,265	0	0	578	11,369	25,100	19
Tebuconazole/triadimenol	608	4,179	1,613	6,797	0	0	0	13,218	26,415	19
Triadimenol/tridemorph	1,080	318	0	0	0	0	0	3,994	5,392	4
Tridemorph	0	0	0	0	0	0	0	114	114	+
All fungicides	47,776	43,902	30,047	60,945	17,516	13,636	7,864	376,553	598,239	100
Area planted (ha)										110,780

‘+’ = < 0.5%

TABLE 12 Winter wheat

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual grass weeds</i>	<i>Annual bl & grass weeds</i>	<i>Wild oats</i>	<i>Couch</i>	<i>Volunteer crops</i>	<i>Mixed and other weeds</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Amidosulfuron	1,056	0	0	0	0	0	0	0	852	0	1,908	2
Bromoxynil/diflufenican/ioxynil	0	0	0	0	0	0	0	0	124	0	124	+
Bromoxynil/fluroxypyr/ioxynil	0	0	0	0	0	0	0	0	47	0	47	+
Bromoxynil/ioxynil	1,879	0	0	0	0	0	0	0	989	0	2,868	3
Bromoxynil/ioxynil/mecoprop	1,330	0	0	0	0	0	0	0	970	0	2,299	2
Bromoxynil/ioxynil/mecoprop-P	878	0	0	0	0	0	0	0	412	0	1,290	1
Bromoxynil/ioxynil/triasulfuron	0	0	0	0	0	0	0	0	276	0	276	+
Carfentrazone-ethyl/ flupyrsulfuron-methyl	128	0	0	0	0	0	0	0	280	0	408	+
Carfentrazone-ethyl/isoproturon	0	0	0	0	0	0	0	0	885	0	885	1
Carfentrazone-ethyl/mecoprop-P	880	0	0	0	0	0	0	0	0	0	880	1
Carfentrazone-ethyl/ metsulfuron-methyl	643	0	0	0	0	0	0	0	192	0	835	1
Clodinafop-propargyl	0	0	0	102	0	0	0	0	0	0	102	+
Cyanazine	0	0	0	0	0	0	109	0	259	0	368	+
Cyanazine/terbuthylazine	0	0	0	0	0	0	0	0	716	0	716	1
Dicamba/mecoprop-P	124	0	0	0	0	0	531	0	1,835	0	2,490	2
Diflufenican/flurtamone/isoproturon	0	0	0	0	0	0	0	0	282	0	282	+
Diflufenican/isoproturon	6,395	0	5,305	0	0	0	0	0	33,589	0	45,289	40
Diflufenican/terbuthylazine	1,124	179	0	0	0	0	0	0	1,709	0	3,012	3
Diflufenican/trifluralin	0	0	0	0	0	0	0	0	1,264	0	1,264	1

cont....

● **TABLE 12 Winter wheat (continued)**

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual grass weeds</i>	<i>Annual bl & grass weeds</i>	<i>Wild oats</i>	<i>Couch</i>	<i>Volunteer crops</i>	<i>Mixed and other weeds</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Fenoxaprop-P-ethyl	0	0	0	2,517	0	0	0	0	0	0	2,517	2
Flamprop-M-isopropyl	0	0	0	261	0	0	0	0	0	0	261	+
Fluoroglycofen-ethyl/isoproturon	0	0	0	0	0	0	0	0	691	0	691	1
Flupyr-sulfuron-methyl/ metsulfuron-methyl	398	0	0	0	0	0	0	0	0	0	398	+
Fluroxypyr	1,291	0	0	0	0	391	484	0	2,792	0	4,958	4
Fluroxypyr/metosulam	868	0	0	0	0	0	0	0	0	0	868	1
Glyphosate	0	0	0	0	1,712	194	784	1,663	1,286	0	5,638	5
Isoproturon	3,941	2,813	3,398	220	0	0	866	0	37,698	0	48,935	43
Isoproturon/pendimethalin	649	0	1,381	0	0	0	588	0	3,261	0	5,878	5
Isoxaben/methabenzthiazuron	0	0	0	0	0	0	0	0	186	0	186	+
MCPA	0	0	0	0	0	0	0	0	432	0	432	+
Mecoprop	0	0	0	0	0	1,263	9	0	4,314	0	5,586	4
Mecoprop-P	12,371	0	0	0	0	969	1,095	0	27,118	0	41,554	36
Metsulfuron-methyl	6,718	0	0	0	0	0	669	0	13,060	0	20,447	18
Metsulfuron-methyl/ thifensulfuron-methyl	6,268	0	0	0	0	0	0	0	8,609	0	14,877	13
Pendimethalin	2,105	0	364	0	0	0	0	0	5,641	0	8,110	7
Pendimethalin/simazine	405	0	0	0	0	0	0	0	291	0	696	1
Propaquizafop	0	0	0	0	0	0	9	0	0	0	9	+

'+' = < 0.5%

cont....

● **TABLE 12 Winter wheat (continued)**

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual grass weeds</i>	<i>Annual bl & grass weeds</i>	<i>Wild oats</i>	<i>Couch</i>	<i>Volunteer crops</i>	<i>Mixed and other weeds</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Tralkoxydim	0	0	0	1,775	0	0	0	0	0	0	1,775	2
Tri-allate	0	0	0	0	0	0	9	0	0	0	9	+
Tribenuron-methyl	3,914	0	0	0	0	0	0	0	1,251	0	5,165	4
Trifluralin	0	316	597	0	0	0	0	0	3,762	0	4,675	4
Unspecified herbicide	0	0	0	0	0	0	0	0	703	0	703	1
All herbicides	53,366	3,308	11,045	4,874	1,712	2,816	5,153	1,663	155,775	0	239,713	98
Growth regulators												
2-chloroethylphosphonic acid	0	0	0	0	0	0	0	0	0	18,081	18,081	16
2-chloroethylphosphonic acid/ chlormequat	0	0	0	0	0	0	0	0	0	11,934	11,934	10
2-chloroethylphosphonic acid/ chlormequat/imazaquin	0	0	0	0	0	0	0	0	0	1,641	1,641	1
2-chloroethylphosphonic acid/ mepiquat chloride	0	0	0	0	0	0	0	0	0	11,097	11,097	10
Chlormequat	0	0	0	0	0	0	0	0	0	112,596	112,596	80
Chlormequat/imazaquin	0	0	0	0	0	0	0	0	0	22,461	22,461	16
Trinexapac-ethyl	0	0	0	0	0	0	0	0	0	18,787	18,787	13
All growth regulators	0	0	0	0	0	0	0	0	0	196,597	196,597	95
Area planted (ha)												110,780

'+' = < 0.5%

● **TABLE 13 Winter oats**
Insecticides and molluscicides, the reasons for their use
(spray hectares of formulations) and the percentage of crop treated

<i>Insecticides</i>	<i>Aphids</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Cypermethrin	1,277	1,277	17
Lambda-cyhalothrin	202	202	3
<i>All insecticides</i>	1,479	1,479	19
Area planted (ha)			7,650
<i>Molluscicides</i>			
None recorded			

TABLE 14 Winter oats
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Foliar feed</i>	<i>Foliar feed & mildew</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Carbendazim/propiconazole	467	0	0	0	467	6
Copper oxychloride	0	520	0	0	520	6
Cyproconazole	469	0	0	623	1,092	13
Fenpropidin	134	0	0	466	600	5
Fenpropidin/fenpropimorph	306	0	0	0	306	3
Fenpropimorph	4,008	0	0	4,258	8,266	70
Fenpropimorph/prochloraz	0	0	0	672	672	9
Fenpropimorph/tridemorph	765	0	0	273	1,038	9
Flusilazole	0	0	0	233	233	3
Maneb	262	0	0	0	262	2
Propiconazole	1,859	0	0	2,441	4,300	48
Quinoxifen	1,095	0	0	496	1,591	12
Sulphur	0	372	931	1,083	2,386	18
Triadimenol	104	0	0	267	370	5
Triadimenol/tridemorph	133	0	0	466	599	5
Tridemorph	2,271	0	0	0	2,271	22
All fungicides	11,873	892	931	11,278	24,974	99
Area planted (ha)						7,650

● **TABLE 16 Spring oats**
Insecticides and molluscicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Insecticides</i>	<i>Aphids</i>	<i>Leather-jackets</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Chlorpyrifos	0	608	608	4
Cypermethrin	627	0	627	4
Dimethoate	95	0	95	1
<i>All insecticides</i>	723	608	1,331	9
Area planted (ha)				14,134
<i>Molluscicides</i>				
None recorded				

TABLE 17 Spring oats
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Mildew</i>	<i>Foliar feed</i>	<i>Mildew & foliar feed</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Bromuconazole	0	0	0	155	155	1
Carbendazim/flusilazole	29	0	0	0	29	+
Copper oxychloride	0	1,145	0	0	1,145	8
Fenpropidin/fenpropimorph	0	0	0	265	265	2
Fenpropimorph	3,635	0	0	2,906	6,542	39
Fenpropimorph/tridemorph	287	0	0	59	346	2
Flusilazole	45	0	0	0	45	+
Flusilazole/tridemorph	295	0	0	0	295	2
Maneb	0	0	0	95	95	1
Propiconazole	507	0	0	278	786	5
Quinoxifen	627	0	0	555	1,182	8
Spiroxamine	0	0	0	27	27	+
Sulphur	0	569	461	0	1,030	6
Triadimenol	63	0	0	0	63	+
Triadimenol/tridemorph	0	0	0	1,928	1,928	11
Tridemorph	879	0	0	59	939	7
All fungicides	6,367	1,714	461	6,329	14,872	59
Area planted (ha)						14,134

‘+’ = < 0.5%

● **TABLE 18 Spring oats**

Herbicides and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

Herbicides	Annual bl weeds	Wild oats	Couch	No reason given	Growth regulation	Total spray area	% of crop treated
2,4-DB/benazolin/MCPA	287	0	0	155	0	443	3
Benazolin/bromoxynil/ioxynil	574	0	0	0	0	574	4
Bromoxynil/ioxynil	0	0	0	60	0	60	+
Bromoxynil/ioxynil/mecoprop-P	689	0	0	277	0	966	7
Bromoxynil/ioxynil/triasulfuron	1,533	0	0	0	0	1,533	11
Dicamba/MCPA/mecoprop	0	0	0	608	0	608	4
Dicamba/mecoprop-P	696	0	0	0	0	696	5
Glyphosate	0	0	183	139	0	322	2
MCPA	1,276	0	0	1,049	0	2,325	16
MCPA/MCPB	401	0	0	0	0	401	3
Mecoprop	499	0	0	943	0	1,442	10
Mecoprop-P	2,366	0	0	1,012	0	3,378	24
Metsulfuron-methyl	4,733	0	0	2,122	0	6,855	49
Tralkoxydim	0	502	0	0	0	502	4
Tribenuron-methyl	421	0	0	0	0	421	3
Unspecified herbicide	0	0	0	1,166	0	1,166	8
All herbicides	13,474	502	183	7,532	0	21,692	98
Growth regulators							
2-chloroethylphosphonic acid/ mepiquat chloride	0	0	0	0	295	295	2
Chlormequat	0	0	0	0	6,044	6,044	43
All growth regulators	0	0	0	0	6,339	6,339	43
Area planted (ha)							14,134

‘+’ = < 0.5%

TABLE 20 Winter oilseed rape

Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Light leaf spot</i>	<i>Sclerotinia</i>	<i>Alternaria</i>	<i>Alternaria & sclerotinia</i>	<i>Botrytis</i>	<i>Downy mildew</i>	<i>Mainly foliar feed</i>	<i>Mixed & other diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Carbendazim	2,832	475	0	465	3,485	0	0	43	5,043	12,344	28
Carbendazim/flusilazole	13,974	0	0	0	0	0	0	243	4,187	18,404	30
Carbendazim/iprodione	0	0	0	381	0	0	0	221	766	1,368	3
Carbendazim/prochloraz	1,353	0	0	0	0	0	0	0	764	2,118	3
Carbendazim/tebuconazole	4,135	0	0	0	0	0	0	0	556	4,691	6
Carbendazim/vinclozolin	281	1,692	0	1,132	0	0	0	821	4,275	8,200	20
Chlorothalonil	0	0	0	0	0	0	0	319	475	795	2
Chlorothalonil/metalaxyl	0	0	0	0	0	0	0	0	111	111	+
Cyproconazole	0	0	0	0	0	0	0	0	173	173	+
Difenoconazole	2,121	0	62	0	0	0	0	0	154	2,338	6
Flusilazole	5,505	0	0	0	0	0	0	0	2,401	7,907	13
Iprodione/thiophanate-methyl	433	1,500	2,018	369	319	0	0	1,450	4,615	10,705	25
Mancozeb	378	0	0	0	0	0	0	0	165	542	1
Mancozeb/metalaxyl	0	0	0	0	0	1,756	0	0	107	1,863	4
Prochloraz	4,542	0	0	0	0	0	0	0	794	5,335	10
Sulphur	0	0	0	0	0	0	23,219	71	2,367	25,657	43
Tebuconazole	20,455	164	0	216	0	0	0	403	11,583	32,821	52
Vinclozolin	0	2,648	0	196	1,615	0	0	1,313	3,081	8,853	+
Unspecified fungicide	0	0	0	0	0	0	0	0	153	153	21
All fungicides	56,009	6,479	2,080	2,760	5,419	1,756	23,219	4,884	41,771	144,378	100
Area planted (ha)											42,001

‘+’ = < 0.5%

TABLE 21 Winter oilseed rape

Herbicides, desiccants and growth regulators, the reason for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual grass weeds</i>	<i>Annual bl & grass weeds</i>	<i>Annual weeds & vol. cereals</i>	<i>Volunteer cereals</i>	<i>Other weeds</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Benazolin	292	0	0	0	0	0	0	724	0	1,016	2
Benazolin/clopyralid	3,249	0	0	0	0	0	0	2,781	0	6,030	14
Carbetamide	0	0	0	0	0	0	0	441	0	441	1
Clopyralid	878	0	0	0	0	0	0	0	0	878	2
Cyanazine	358	0	0	0	0	0	0	418	0	776	2
Cycloxydim	0	0	0	0	291	0	0	822	0	1,113	3
Diquat	0	0	0	0	0	0	3,442	0	0	3,442	8
Fluazifop-P-butyl	0	321	0	232	810	174	0	1,064	0	2,601	6
Fluroxypyr	3	0	0	0	0	0	0	0	0	3	+
Glufosinate-ammonium	0	0	0	0	0	0	358	0	0	358	1
Glyphosate	0	0	0	0	0	0	9,691	0	0	9,691	23
Mecoprop	0	0	0	0	0	3	0	0	0	3	+
Metazachlor	6,147	0	1,151	433	0	0	0	21,902	0	29,632	70
Metsulfuron-methyl/thifensulfuron-methyl	3	0	0	0	0	0	0	0	0	3	+
Paraquat	0	0	0	0	130	0	0	0	0	130	+
Propaquizafop	0	2,710	0	28	1,513	52	0	2,032	0	6,334	15
Propyzamide	1,296	1,382	0	1,424	291	0	0	4,229	0	8,621	21
Quizalofop-ethyl	0	0	0	0	366	0	0	0	0	366	1
Quizalofop-P-ethyl	0	0	0	0	885	0	0	191	0	1,076	3
Trifluralin	476	0	0	0	0	0	0	4,675	0	5,151	12
All herbicides/desiccants	12,701	4,413	1,151	2,116	4,285	228	13,491	39,279	0	77,664	99
Growth regulators											
Chlormequat	0	0	0	0	0	0	0	0	6,228	6,228	15
Area planted (ha)											42,001

'+' = < 0.5%

● **TABLE 22 Spring oilseed rape**

Insecticides and molluscicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Insecticides</i>	<i>Pollen beetle</i>	<i>Aphids</i>	<i>Aphids & pollen beetle</i>	<i>Flea beetle</i>	<i>Seed weevil</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Alpha-cypermethrin	2,890	1,332	0	0	0	349	4,571	19
Cypermethrin	6,971	334	55	1,340	1,038	936	10,673	32
Deltamethrin	1,195	0	0	0	0	0	1,195	5
Lambda-cyhalothrin	3,128	560	172	0	0	436	4,296	19
Zeta-cypermethrin	1,098	0	0	0	0	0	1,098	5
<i>All insecticides</i>	15,282	2,226	226	1,340	1,038	1,721	21,833	75
<i>Molluscicides</i>								
None recorded								
Area planted (ha)								23,115

TABLE 23 Spring oilseed rape
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Light leaf spot</i>	<i>Botrytis</i>	<i>Sclerotinia</i>	<i>Mildew</i>	<i>Foliar feed</i>	<i>Mildew & foliar feed</i>	<i>Mixed diseases</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Carbendazim	864	321	156	0	0	0	0	734	2,075	9
Carbendazim/flusilazole	631	0	0	0	0	0	0	0	631	3
Carbendazim/vinclozolin	0	0	0	0	0	0	0	307	307	1
Flusilazole	542	0	0	177	0	0	0	0	718	3
Maneb	0	0	0	0	0	0	0	92	92	+
Sulphur	0	0	0	0	5,401	351	0	854	6,606	24
Tebuconazole	0	0	0	0	0	0	0	506	506	2
Vinclozolin	0	304	156	0	0	0	137	1,143	1,739	8
All fungicides	2,036	624	312	177	5,401	351	137	3,637	12,675	35
Area planted (ha)										23,115

'+' = < 0.5%

● **TABLE 24 Spring oilseed rape**

Herbicides, desiccants and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides/desiccants</i>	<i>Annual bl weeds</i>	<i>Wild oats</i>	<i>Couch</i>	<i>Volunteer cereals</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Benazolin/clopyralid	404	0	0	0	0	0	404	2
Cycloxydim	0	984	157	0	0	0	1,140	5
Diquat	0	0	0	0	1,112	0	1,112	4
Fluazifop-P-butyl	0	509	0	0	0	0	509	2
Glufosinate-ammonium	0	0	0	0	137	0	137	1
Glyphosate	0	0	77	0	8,801	436	9,314	40
Metazachlor	2,390	0	0	0	0	2,915	5,305	23
Propaquizafop	0	1,111	91	167	0	0	1,369	6
Quizalofop-P-ethyl	0	0	0	0	0	436	436	2
Trifluralin	2,486	0	0	0	0	6,164	8,649	37
<i>All herbicides/desiccants</i>	5,280	2,604	324	167	10,049	9,951	28,375	84
<i>Growth regulators</i>								
None recorded								
Area planted (ha)								23,115

TABLE 25 Seed potatoes
Insecticides and molluscicides, the reasons for their use (spray hectares of formulations)
and the percentage of crop treated

<i>Insecticides</i>	<i>Aphids</i>	<i>Slugs</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Cypermethrin	8,489	0	8,489	22
Deltamethrin	87	0	87	1
Deltamethrin/heptenophos	5,622	0	5,622	19
Deltamethrin/pirimicarb	13,180	0	13,180	37
Demeton-S-methyl	492	0	492	3
Dimethoate	1,618	0	1,618	8
Lambda-cyhalothrin	15,158	0	15,158	38
Lambda-cyhalothrin/pirimicarb	5,638	0	5,638	17
Pirimicarb	21,308	0	21,308	55
Unspecified insecticide	219	0	219	1
<i>All insecticides</i>	71,811	0	71,811	96
<i>Molluscicides</i>				
Metaldehyde	0	3,000	3,000	14
Methiocarb	0	1,992	1,992	9
Thiodicarb	0	364	364	3
<i>All molluscicides</i>	0	5,356	5,356	24
Area planted (ha)				14,105

TABLE 26 *Seed potatoes*
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Blight</i>	<i>Tuber disease</i>	<i>Foliar feed</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Benalaxyl/mancozeb	4,570	0	0	4,570	16
Chlorothalonil	312	0	0	312	1
Chlorothalonil/mancozeb	592	0	0	592	1
Chlorothalonil/propamocarb hydrochloride	2,377	0	0	2,377	13
Cymoxanil/mancozeb	15,946	0	0	15,946	49
Cymoxanil/mancozeb/oxadixyl	5,130	0	0	5,130	24
Dimethomorph/mancozeb	6,139	0	0	6,139	31
Fentin acetate/maneb	2,994	0	0	2,994	15
Fentin hydroxide	18,309	0	0	18,309	68
Fluazinam	31,285	77	0	31,362	89
Mancozeb	11,731	0	0	11,731	41
Mancozeb/metalaxyl	5,594	0	0	5,594	17
Mancozeb/metalaxyl-M	1,558	0	0	1,558	6
Mancozeb/ofurace	354	0	0	354	3
Mancozeb/oxadixyl	274	0	0	274	1
Maneb	585	0	0	585	4
Sulphur	0	0	150	150	1
All fungicides	107,747	77	150	107,974	100
Area planted (ha)					14,105

● **TABLE 27 Seed potatoes**

Herbicides and desiccants, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides/desiccants</i>	<i>Annual bl weeds</i>	<i>No reason given</i>	<i>Volunteer rape</i>	<i>Desiccation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Diquat	0	0	0	674	674	5
Diquat/paraquat	0	2,151	0	0	2,151	15
Linuron	1,479	9,386	0	0	10,865	77
Metribuzin	0	2,262	313	0	2,575	18
Paraquat	1,468	9,380	0	0	10,848	77
Sulphuric acid	0	0	0	24,209	24,209	92
Terbutryn/trietazine	0	168	0	0	168	1
All herbicides/desiccants	2,947	23,347	313	24,883	51,490	100
Area planted (ha)						14,105

TABLE 28 Ware potatoes
Insecticides and molluscicides, the reasons for their use (spray hectares of formulations)
and the percentage of crop treated

<i>Insecticides</i>	<i>Aphids</i>	<i>Nematodes</i>	<i>Silver Y moth</i>	<i>No reason given</i>	<i>Slugs</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Aldicarb	0	2,545	0	161	0	2,706	18
Cypermethrin	3,905	0	0	0	0	3,905	8
Deltamethrin/heptenophos	920	0	0	0	0	920	4
Deltamethrin/pirimicarb	3,927	0	0	0	0	3,927	17
Demeton-S-methyl	850	0	0	0	0	850	4
Dimethoate	529	0	0	0	0	529	3
Lambda-cyhalothrin	3,379	0	544	0	0	3,923	19
Lambda-cyhalothrin/pirimicarb	4,190	0	0	0	0	4,190	9
Pirimicarb	6,244	0	0	0	0	6,244	17
Unspecified insecticide	206	0	0	0	0	206	1
<i>All insecticides</i>	24,151	2,545	544	161	0	27,401	66
<i>Molluscicides</i>							
Metaldehyde	0	0	0	0	5,479	5,479	22
Methiocarb	0	0	0	0	11,855	11,855	33
Thiodicarb	0	0	0	0	6,002	6,002	18
<i>All molluscicides</i>	0	0	0	0	23,335	23,335	56
Area planted (ha)							14,656

TABLE 29 Ware potatoes
Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Blight</i>	<i>Foliar feed & scab</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Benalaxyl/mancozeb	4,637	0	4,637	15
Chlorothalonil	1,030	0	1,030	6
Chlorothalonil/propamocarb hydrochloride	2,988	0	2,988	7
Cymoxanil/mancozeb	15,253	0	15,253	48
Cymoxanil/mancozeb/oxadixyl	9,821	0	9,821	39
Dimethomorph/mancozeb	5,784	0	5,784	23
Fentin acetate/maneb	1,019	0	1,019	4
Fentin hydroxide	25,780	0	25,780	69
Fluazinam	41,601	0	41,601	93
Mancozeb	6,190	0	6,190	24
Mancozeb/metalaxyl	8,173	0	8,173	27
Mancozeb/metalaxyl-M	566	0	566	4
Mancozeb/ofurace	483	0	483	1
Mancozeb/oxadixyl	322	0	322	2
Mancozeb/propamocarb hydrochloride	1,059	0	1,059	4
Maneb	1,947	0	1,947	9
Manganese zinc ethylene-bisdithiocarbam./ofurace	725	0	725	2
Sulphur	0	1,056	1,056	2
All fungicides	127,377	1,056	128,433	97
Area planted (ha)				14,656

TABLE 30 Ware potatoes

Herbicides, desiccants and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides & desiccants</i>	<i>Annual bl weeds</i>	<i>Annual grass & perennial bl weeds</i>	<i>Volunteer rape</i>	<i>Desiccation</i>	<i>Desiccation & blight</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Cyanazine/pendimethalin	0	0	0	0	0	523	0	523	4
Diquat	0	0	0	2,902	0	303	0	3,205	19
Diquat/paraquat	187	181	0	0	0	8,924	0	9,292	62
Linuron	1,480	0	0	0	0	4,883	0	6,363	43
Metribuzin	0	0	203	0	0	4,939	0	5,141	35
Paraquat	1,293	0	0	0	0	2,431	0	3,724	25
Rimsulfuron	0	0	309	0	0	263	0	571	4
Sulphuric acid	0	0	0	19,017	0	0	0	19,017	77
Terbutylazine/terbutryn	0	0	0	0	0	242	0	242	2
Terbutryn/trietazine	0	0	0	0	0	1,012	0	1,012	7
Unspecified herbicide	0	0	0	0	0	131	0	131	1
<i>All herbicides & desiccants</i>	2,959	181	511	21,919	0	23,651	0	49,222	96
<i>Mixed formulations</i>									
Fentin hydroxide/metoxuron	0	0	0	0	47	0	0	47	+
<i>Growth regulators</i>									
Maleic hydrazide	0	0	0	0	0	0	688		5
Area planted (ha)									14,656

'+' = < 0.5%

● **TABLE 31 Combine peas**

Insecticides and molluscicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Insecticides</i>	<i>Aphids</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Cypermethrin	486	0	486	23
Lambda-cyhalothrin	0	907	907	22
<i>All insecticides</i>	486	907	1,393	45
Area planted (ha)				2,097
<i>Molluscicides</i>				
None recorded				

● **TABLE 32 Combine peas**

Fungicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Fungicides</i>	<i>Botrytis</i>	<i>Botrytis & mildew</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Carbendazim	971	0	0	971	23
Carbendazim/chlorothalonil	363	0	0	363	17
Carbendazim/iprodione	0	0	454	454	22
Chlorothalonil	227	971	221	1,419	44
Iprodione	154	0	0	154	7
Iprodione/thiophanate-methyl	227	0	0	227	11
Sulphur	0	0	939	939	45
Vinclozolin	0	0	221	221	11
<i>All fungicides</i>	1,943	971	1,834	4,748	91
Area planted (ha)					2,097

● **TABLE 33 Combine peas**

Herbicides and desiccants, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Couch & desiccation</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Wild oats</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Cyanazine	517	0	0	179	0	696	33
Cyanazine/pendimethalin	0	0	0	933	0	933	44
Cycloxydim	0	0	0	454	227	681	32
Diquat	0	0	959	0	0	959	46
Glyphosate	0	227	454	0	0	681	32
MCPA/MCPB	363	0	0	0	0	363	17
Terbutylazine/terbutryn	111	0	0	0	0	111	5
Terbutryn/trietazine	0	0	0	454	0	454	22
Trifluralin	0	0	0	179	0	179	9
<i>All herbicides</i>	991	227	959	2,651	227	5,056	96
Area planted (ha)							2,097

TABLE 34 Set aside natural regeneration

Herbicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Couch</i>	<i>Thistles</i>	<i>Couch & thistles</i>	<i>Annual & perennial bl weeds</i>	<i>Ragwort</i>	<i>Mixed weeds</i>	<i>No reason given</i>	<i>Total spray area</i>	<i>% of crop treated</i>
2,4-D	0	0	0	0	187	0	0	187	1
Glyphosate	913	0	354	224	0	264	2,888	4,643	26
MCPA	0	110	0	0	0	0	0	110	1
Paraquat	0	0	0	0	0	0	87	87	1
All herbicides	913	110	354	224	187	264	2,975	5,028	28
Area planted (ha)									17,104

TABLE 35 Set aside grass

Herbicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Couch</i>	<i>Docks & thistles</i>	<i>General weed control</i>	<i>No reason given</i>	<i>Thistles</i>	<i>Volunteer potatoes</i>	<i>Total spray area</i>	<i>% of crop treated</i>
2,4-D	0	0	0	0	0	6	0	6	+
2,4-DB/benazolin/MCPA	389	0	0	0	0	0	0	389	2
Bentazone/MCPA/MCPB	390	0	0	0	0	0	0	390	2
Fluroxypyr	0	0	0	0	0	0	99	99	+
Glyphosate	0	306	0	0	0	0	0	306	1
MCPA	156	0	390	0	0	0	0	546	3
MCPA/MCPB	491	0	0	210	0	0	0	701	3
MCPB	0	0	0	0	166	0	0	166	1
All herbicides	1,426	306	390	210	166	6	99	2,602	9
Area planted (ha)									21,050

‘+’ = < 0.5%

TABLE 36 Set aside oilseed rape

Insecticides and molluscicides, the reasons for their use (spray hectares of formulations) and the percentage of crop treated

<i>Insecticides</i>	<i>Pollen beetle</i>	<i>Seed weevil</i>	<i>Pollen beetle & seed weevil</i>	<i>Aphids</i>	<i>No reason given</i>	<i>Slugs</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Cypermethrin	1,487	114	485	108	0	0	2,194	44
Deltamethrin	0	0	0	0	50	0	50	1
Lambda-cyhalothrin	476	0	0	0	109	0	586	17
Zeta-cypermethrin	0	0	0	0	111	0	111	3
<i>All insecticides</i>	1,964	114	485	108	271	0	2,941	60
<i>Molluscicides</i>								
Metaldehyde	0	0	0	0	0	245	245	7
Methiocarb	0	0	0	0	0	24	24	1
Thiodicarb	0	0	0	0	0	76	76	2
<i>All molluscicides</i>	0	0	0	0	0	345	345	10
Area planted (ha)								3,359

TABLE 38 Set aside oilseed rape

Herbicides, desiccants and growth regulators, the reasons for their use (spray hectares of formulations) and the percentage crop treated

<i>Herbicides</i>	<i>Annual bl weeds</i>	<i>Annual grass weeds</i>	<i>Annual bl & grass weeds</i>	<i>Annual grass & volunteer cereals</i>	<i>Volunteer cereals</i>	<i>Wild oats</i>	<i>Desiccation</i>	<i>No reason given</i>	<i>Growth regulation</i>	<i>Total spray area</i>	<i>% of crop treated</i>
Benazolin	0	0	0	0	0	0	0	111	0	111	3
Benazolin/clopyralid	0	0	0	0	0	0	0	76	0	76	2
Cyanazine	151	0	0	0	0	0	0	42	0	193	6
Cycloxydim	0	0	0	0	111	0	0	0	0	111	3
Diquat	0	0	0	0	0	0	489	0	0	489	15
Fluazifop-P-butyl	0	0	0	109	0	0	0	0	0	109	3
Glyphosate	0	0	0	0	0	0	732	0	0	732	22
Metazachlor	263	0	116	0	0	0	0	679	0	1,059	32
Propaquizafop	0	256	0	0	76	114	0	42	0	487	14
Propyzamide	151	0	0	0	0	0	0	76	0	227	7
Trifluralin	193	0	0	0	0	0	0	898	0	1,091	32
All herbicides	758	256	116	109	187	114	1,220	1,924	0	4,683	91
Growth regulators											
Chlormequat	0	0	0	0	0	0	0	0	109		3
Area planted (ha)											2,036

TABLE 39 Seed treatments
Areas (ha) and percentages of arable crop areas treated

	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Winter oilseed rape</i>	<i>Spring oilseed rape</i>	<i>*Seed potatoes</i>	<i>*Ware potatoes</i>	<i>Combine peas</i>	<i>**All crops</i>
Bitertanol/fuberidazole	0	86 (+)	33,709 (30)	56 (14)	3,064 (40)	3,505 (25)	0	0	0	0	0	40,761
Carboxin/gamma-HCH/ thiram	0	0	0	0	0	0	8,336 (20)	2,804 (55)	0	0	0	21,140
Carboxin/imazalil/ thiabendazole	0	999 (+)	0	0	0	0	0	0	0	0	0	999
Carboxin/thiabendazole	0	0	2,593 (2)	0	0	0	0	0	0	0	0	2,593
Carboxin/thiram	1,664 (2)	6,466 (3)	2,339 (2)	0	292 (4)	1,166 (8)	0	0	0	0	0	11,928
Chlorfenvinphos	0	0	702 (1)	0	0	0	0	0	0	0	0	702
Ethirimol/flutriafol/ thiabendazole	4,970 (6)	13,418 (5)	0	0	0	100 (1)	0	0	0	0	0	18,488
Fenpiclonil	530 (1)	1,341 (1)	588 (1)	0	0	0	0	0	0	47 (+)	0	2,507
Fenpropimorph/gamma-HCH/ thiram	0	0	0	0	0	0	22,281 (53)	3,664 (16)	0	0	0	25,945
Fludioxonil	6,367 (8)	8,233 (3)	13,711 (12)	0	392 (5)	2,293 (16)	0	0	0	0	0	30,995
Fonofos	0	0	915 (1)	0	0	0	0	0	0	0	0	915
Fuberidazole/triadimenol	2,819 (4)	2,462 (1)	14,123 (13)	29 (7)	0	0	0	0	0	0	0	19,433
Gamma-HCH	489 (1)	2,383 (1)	512 (+)	0	278 (4)	347 (2)	0	0	0	0	0	4,009
Gamma-HCH/thiram	0	0	0	0	0	0	1,460 (3)	1,924 (8)	0	0	0	3,384
Guazatine	13,821 (18)	33,717 (13)	37,835 (34)	307 (78)	1,635 (21)	3,094 (22)	0	0	0	0	0	90,410
Guazatine/imazalil	8,000 (10)	15,415 (6)	0	0	1,577 (21)	2,023 (14)	0	0	0	0	0	27,014

cont....

TABLE 39 Seed treatments (continued)
Areas (ha) and percentages of arable crop areas treated

	Winter barley	Spring barley	Winter wheat	Spring wheat	Winter oats	Spring oats	Winter oilseed rape	Spring oilseed rape	*Seed potatoes	*Ware potatoes	Combine peas	**All crops
Imazalil	0	0	0	0	0	0	0	0	3,452 (24)	4,124 (28)	0	7,576
Imazalil/pencycuron	0	0	0	0	0	0	0	0	2,389 (17)	5,098 (35)	0	7,487
Iprodione	0	0	0	0	0	0	5,008 (12)	3,618 (16)	2,438 (17)	211 (1)	0	11,275
Metalaxyl	0	0	0	0	0	0	281 (1)	0	0	0	0	281
Metalaxyl/thiabendazole/ thiram	0	0	0	0	0	0	0	0	0	0	82 (4)	82
Pencycuron	0	0	0	0	0	0	0	0	2,608 (18)	2,299 (16)	0	4,907
Tebuconazole	0	0	557 (1)	0	0	0	0	0	0	0	0	557
Tebuconazole/triazoxide	35,131 (45)	158,416 (62)	0	0	0	0	0	0	0	0	0	193,548
Thiabendazole	0	0	0	0	0	0	0	0	228 (2)	404 (3)	0	632
Thiram	0	0	0	0	0	0	0	0	0	0	1,431 (68)	1,431
Tolclofos-methyl	0	0	0	0	0	0	0	0	222 (2)	246 (2)	0	469
Unspecified seed treatment	1,838 (2)	11,859 (5)	3,584 (3)	29 (7)	690 (9)	841 (6)	3,624 (9)	2,795 (12)	0	0	584 (28)	26,945
No treatment information	448	0	906	0	0	95	1,209	233	88	0	0	2,979
No seed treatment	2,430 (3)	3,490 (1)	992 (1)	0	0	1,018 (7)	1,540 (4)	0	4,316 (31)	3,324 (23)	0	17,338

⁺ = < 0.5%

* Seed treatments on potatoes refer to pre-planting fungicides only and exclude storage chemicals applied following the 1997 harvest.

** Includes triticale

TABLE 40 Seed treatments
Quantities (kg) of active ingredients used

	Winter barley	Spring barley	Winter wheat	Spring wheat	Winter oats	Spring oats	Winter oilseed rape	Spring oilseed rape	*Seed potatoes	*Ware potatoes	Combine peas	**All crops
Bitertanol	0	9	4,478	7	365	459	0	0	0	0	0	5,348
Carboxin	224	937	963	0	30	164	41	73	0	0	0	2,431
Chlorfenvinphos	0	0	155	0	0	0	0	0	0	0	0	155
Ethirimol	1,825	4,416	0	0	0	45	0	0	0	0	0	6,287
Fenpiclonil	27	60	30	0	0	0	0	0	0	8	0	124
Fenpropimorph	0	0	0	0	0	0	110	21	0	0	0	132
Fludioxonil	74	88	151	0	4	25	0	0	0	0	0	342
Flutriafol	137	331	0	0	0	3	0	0	0	0	0	472
Fonofos	0	0	216	0	0	0	0	0	0	0	0	216
Fuberidazole	30	21	418	1	22	28	0	0	0	0	0	522
Gamma-HCH	23	113	24	0	13	16	2,061	1,401	0	0	0	3,651
Guazatine	3,179	6,800	5,275	37	589	1,027	0	0	0	0	0	16,907
Imazalil	94	184	0	0	26	33	0	0	211	220	0	768
Iprodione	0	0	0	0	0	0	68	58	1,001	70	0	1,196
Metalaxyl	0	0	0	0	0	0	1	0	0	0	14	15
Pencycuron	0	0	0	0	0	0	0	0	3,216	3,388	0	6,604
Tebuconazole	242	1,052	4	0	0	0	0	0	0	0	0	1,298
Thiabendazole	46	121	37	0	0	1	0	0	30	37	7	280
Thiram	224	805	348	0	30	164	295	211	0	0	217	2,295
Tolclofos-methyl	0	0	0	0	0	0	0	0	140	93	0	232
Triadimenol	251	168	1,195	2	0	0	0	0	0	0	0	1,616
Triazoxide	242	1,052	0	0	0	0	0	0	0	0	0	1,294

* Seed treatments on potatoes refer to pre-planting fungicides only and exclude storage chemicals applied following the 1997 harvest.

** Includes triticale

TABLE 41 Cereals

Usage of insecticides and molluscicides (spray hectares of formulations)

<i>Insecticides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Alpha-cypermethrin	0	0	379	0	0	0	0	379	0
Chlorfenvinphos	0	0	365	0	0	0	0	365	0
Chlorpyrifos	121	2,678	3,969	29	0	608	0	7,405	6,757
Cypermethrin	17,649	1,113	14,184	0	1,277	627	0	34,850	26,031
Deltamethrin	1,405	0	691	0	0	0	228	2,324	12,718
Demeton-S-methyl	0	0	469	0	0	0	0	469	368
Dimethoate	1,647	0	11,010	0	0	95	0	12,753	8,476
Esfenvalerate	3,462	0	1,260	0	0	0	0	4,722	4,263
Fenvalerate	186	0	0	0	0	0	0	186	0
Gamma-HCH	0	697	460	0	0	0	0	1,157	0
Lambda-cyhalothrin	3,556	0	7,321	265	202	0	0	11,345	2,410
Lambda-cyhalothrin/pirimicarb	0	0	906	0	0	0	0	906	0
Pirimicarb	0	0	1,744	0	0	0	0	1,744	1,962
Tau-fluvalinate	0	0	1,105	0	0	0	0	1,105	0
Zeta-cypermethrin	830	0	0	0	0	0	0	830	0
<i>All insecticides</i>	28,857	4,487	43,864	294	1,479	1,331	228	80,541	
<i>Molluscicides</i>									
Metaldehyde	957	379	17,449	29	0	0	0	18,814	4,183
Methiocarb	2,022	288	6,827	0	0	0	0	9,137	2,410
Thiodicarb	335	0	2,289	0	0	0	0	2,624	2,248
Unspecified molluscicide	0	0	11	0	0	0	0	11	0
<i>All molluscicides</i>	3,315	666	26,576	29	0	0	0	30,586	

TABLE 42 Cereals
Usage of fungicides (spray hectares of formulations)

<i>Fungicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Anilazine	0	0	3,357	0	0	0	0	3,357	666
Azoxystrobin	5,402	866	47,268	42	0	0	0	53,578	0
Azoxystrobin/fenpropimorph	640	1,872	1,888	0	0	0	0	4,399	0
Bromuconazole	2,240	4,433	198	0	0	155	359	7,385	0
Carbendazim	8,284	15,260	8,500	122	0	0	0	32,166	49,967
Carbendazim/chlorothalonil	174	9,003	1,131	0	0	0	0	10,309	5,834
Carbendazim/flusilazole	25,832	53,851	9,559	122	0	29	180	89,572	75,306
Carbendazim/flutriafol	0	0	2,824	0	0	0	0	2,824	6,293
Carbendazim/mancozeb	289	0	4,461	0	0	0	0	4,750	1,185
Carbendazim/maneb	0	944	1,395	0	0	0	0	2,339	2,966
Carbendazim/maneb/tridemorph	279	0	0	0	0	0	0	279	649
Carbendazim/prochloraz	215	2,415	113	0	0	0	0	2,743	2,289
Carbendazim/propiconazole	6,689	9,122	512	0	467	0	0	16,790	48,168
Carbendazim/tebuconazole	0	691	0	0	0	0	0	691	0
Chlorothalonil	2,945	4,597	64,776	219	0	0	404	72,941	63,248
Chlorothalonil/flutriafol	0	0	4,296	0	0	0	0	4,296	23,969
Chlorothalonil/mancozeb	0	0	692	0	0	0	0	692	0
Copper oxychloride	876	8,297	1,711	0	520	1,145	0	12,550	2,283

cont....

TABLE 42 Cereals (continued)
Usage of fungicides (spray hectares of formulations)

<i>Fungicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Cyproconazole	1,227	705	16,562	122	1,092	0	224	19,933	22,073
Cyproconazole/prochloraz	11,686	33	32,364	56	0	0	228	44,367	41,223
Cyproconazole/tridemorph	0	0	193	0	0	0	0	193	0
Cyprodinil	11,142	21,263	8,053	0	0	0	0	40,458	0
Difenoconazole	0	0	12,531	29	0	0	0	12,560	25,999
Epoxiconazole	9,856	9,903	32,915	0	0	0	0	52,674	32,277
Epoxiconazole/fenpropimorph	2,731	440	7,458	0	0	0	0	10,630	6,678
Epoxiconazole/fenpropimorph/ kresoxim-methyl	1,908	0	6,860	0	0	0	0	8,768	0
Epoxiconazole/kresoxim-methyl	3,445	1,226	26,924	0	0	0	0	31,595	0
Epoxiconazole/tridemorph	1,090	0	1,744	0	0	0	0	2,834	2,293
Fenbuconazole	0	0	2,986	0	0	0	0	2,986	0
Fenbuconazole/prochloraz	0	0	3,696	0	0	0	0	3,696	333
Fenbuconazole/propiconazole	0	0	941	0	0	0	0	941	1,946
Fenpropidin	3,028	4,874	38,927	29	600	0	0	47,458	97,902
Fenpropidin/fenpropimorph	12,680	18,904	22,733	287	306	265	0	55,175	10,407
Fenpropidin/prochloraz	1,674	2,437	10,166	122	0	0	0	14,399	7,807
Fenpropidin/propiconazole	3,552	2,470	314	287	0	0	0	6,622	10,975
Fenpropidin/propiconazole/ tebuconazole	1,688	350	2,079	0	0	0	0	4,116	0
Fenpropidin/tebuconazole	0	1,752	1,339	0	0	0	0	3,091	422

cont....

TABLE 42 Cereals (continued)
Usage of fungicides (spray hectares of formulations)

<i>Fungicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Fenpropimorph	58,216	77,623	13,134	0	8,266	6,542	0	163,781	171,261
Fenpropimorph/flusilazole	2,220	2,055	704	0	0	0	0	4,979	1,490
Fenpropimorph/flusilazole/tridemorph	3,498	6,747	991	0	0	0	0	11,236	14,124
Fenpropimorph/kresoxim-methyl	3,327	3,733	17,845	56	0	0	0	24,960	0
Fenpropimorph/prochloraz	2,117	3,732	2,302	0	672	0	0	8,823	12,750
Fenpropimorph/propiconazole	4,474	8,480	497	0	0	0	0	13,451	10,627
Fenpropimorph/quinoxifen	645	6,555	2,967	0	0	0	0	10,167	0
Fenpropimorph/tridemorph	12,681	12,878	1,129	0	1,038	346	0	28,071	53,088
Flusilazole	39,793	54,622	16,992	0	233	45	0	111,685	111,186
Flusilazole/tridemorph	5,767	4,763	0	0	0	295	0	10,824	9,081
Flutriafol	293	124	15,816	0	0	0	0	16,233	16,240
Flutriafol/iprodione	0	0	214	0	0	0	0	214	2,718
Mancozeb	1,853	2,733	5,783	0	0	0	0	10,369	14,669
Maneb	6,881	5,339	7,715	0	262	95	0	20,292	24,844
Prochloraz	1,340	0	4,151	0	0	0	0	5,491	8,831
Prochloraz/propiconazole	0	554	2,388	0	0	0	0	2,942	0
Prochloraz/tebuconazole	0	0	634	0	0	0	0	634	0
Propiconazole	9,114	31,452	4,554	0	4,300	786	117	50,322	57,924
Propiconazole/tebuconazole	510	1,657	6,091	0	0	0	0	8,259	761
Propiconazole/tridemorph	979	1,537	259	0	0	0	0	2,775	8,605

cont....

● **TABLE 42 Cereals (continued)**
Usage of fungicides (spray hectares of formulations)

<i>Fungicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Quinoxifen	7,999	20,234	6,000	0	1,591	1,182	0	37,005	0
Spiroxamine	15,333	8,786	10,398	0	0	27	0	34,545	0
Spiroxamine/tebuconazole	94	1,065	612	0	0	0	0	1,771	0
Sulphur	8,762	19,752	38,578	311	2,386	1,030	0	70,818	53,359
Tebuconazole	2,640	476	25,100	0	0	0	224	28,440	19,985
Tebuconazole/triadimenol	2,240	0	26,415	199	0	0	0	28,854	27,636
Tebuconazole/tridemorph	0	697	0	0	0	0	0	697	0
Triadimenol	0	0	0	0	370	63	0	433	8,210
Triadimenol/tridemorph	8,040	7,251	5,392	0	599	1,928	0	23,210	41,632
Tridemorph	6,642	9,529	114	0	2,271	939	0	19,494	23,828
<i>All fungicides</i>	325,029	468,079	598,239	2,001	24,974	14,872	1,736	1,434,932	

TABLE 43 Cereals
Usage of herbicides and growth regulators (spray hectares of formulations)

<i>Herbicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
2,4-DB/benazolin/MCPA	0	14,073	0	0	0	443	0	14,516	6,530
2,4-DB/linuron/MCPA	226	2,865	0	0	0	0	0	3,091	6,556
2,4-DB/MCPA	0	1,885	0	0	0	0	0	1,885	233
Amidosulfuron	822	0	1,908	0	0	0	0	2,730	359
Benazolin/bromoxynil/ioxynil	0	641	0	0	0	574	0	1,215	4,585
Bentazone/MCPA/MCPB	0	2,647	0	0	0	0	0	2,647	3,132
Bromoxynil/diflufenican/ioxynil	0	5,247	124	0	0	0	0	5,371	2,358
Bromoxynil/fluroxypyr	0	1,676	0	0	0	0	0	1,676	3,953
Bromoxynil/fluroxypyr/ioxynil	0	0	47	0	0	0	0	47	1,295
Bromoxynil/ioxynil	1,416	20,865	2,868	0	0	60	0	25,210	38,067
Bromoxynil/ioxynil/isoproturon	0	672	0	0	0	0	0	672	0
Bromoxynil/ioxynil/mecoprop	0	6,852	2,299	0	0	0	0	9,151	23,831
Bromoxynil/ioxynil/mecoprop-P	0	11,619	1,290	0	0	966	0	13,874	0
Bromoxynil/ioxynil/triasulfuron	2,815	21,648	276	0	0	1,533	0	26,272	13,697
Carfentrazone-ethyl/ flupyrsulfuron-methyl	0	0	408	0	993	0	0	1,401	0
Carfentrazone-ethyl/isoproturon	625	0	885	0	0	0	0	1,510	0
Carfentrazone-ethyl/mecoprop-P	0	719	880	0	0	0	0	1,599	0
Carfentrazone-ethyl/ metsulfuron-methyl	0	5,026	835	0	302	0	0	6,164	0

cont....

TABLE 43 Cereals (continued)
Usage of herbicides and growth regulators (spray hectares of formulations)

<i>Herbicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Chlorotoluron	571	0	0	0	0	0	0	571	0
Clodinafop-propargyl	0	0	102	0	0	0	0	102	0
Cyanazine	0	0	368	0	0	0	0	368	227
Cyanazine/terbuthylazine	623	0	716	0	0	0	0	1,339	3,398
Dicamba/MCPA/mecoprop	0	5,341	0	0	0	608	0	5,950	6,560
Dicamba/MCPA/mecoprop-P	0	685	0	0	0	0	0	685	0
Dicamba/mecoprop	0	3,155	0	0	0	0	0	3,155	3,837
Dicamba/mecoprop-P	301	15,272	2,490	143	193	696	0	19,095	28,473
Dichlorprop/MCPA	0	497	0	0	0	0	0	497	136
Diclofop-methyl/fenoxaprop-P-ethyl	0	875	0	0	0	0	0	875	2,355
Difenzoquat	207	41	0	0	0	0	0	248	5,509
Diflufenican/flurtamone/isoproturon	0	0	282	0	0	0	0	282	0
Diflufenican/isoproturon	40,365	802	45,289	0	392	0	0	86,848	71,588
Diflufenican/terbuthylazine	2,193	0	3,012	0	467	0	0	5,673	251
Diflufenican/trifluralin	1,197	0	1,264	0	0	0	0	2,461	4,551
Diquat	88	0	0	0	0	0	0	88	0
Fenoxaprop-P-ethyl	0	0	2,517	0	0	0	0	2,517	3,832
Flamprop-M-isopropyl	452	827	261	0	0	0	0	1,540	4,406

cont....

TABLE 43 Cereals (continued)
Usage of herbicides and growth regulators (spray hectares of formulations)

<i>Herbicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Fluroglycofen-ethyl/isoproturon	933	0	691	0	0	0	0	1,624	1,754
Flupyr-sulfuron-methyl/ metsulfuron-methyl	0	0	398	0	0	0	0	398	0
Fluroxypyr	1,361	1,003	4,958	0	253	0	23	7,597	6,726
Fluroxypyr/metosulam	0	0	868	0	0	0	0	868	0
Glyphosate	3,255	13,760	5,638	0	0	322	0	22,976	27,004
Isoproturon	37,186	1,122	48,935	0	0	0	0	87,243	46,923
Isoproturon/pendimethalin	4,483	0	5,878	0	0	0	0	10,361	12,316
Isoxaben/methabenzthiazuron	0	0	186	0	0	0	180	365	0
MCPA	226	32,494	432	0	0	2,325	0	35,478	49,125
MCPA/MCPB	0	1,602	0	0	0	401	0	2,003	2,333
Mecoprop	2,313	23,779	5,586	56	277	1,442	0	33,453	47,762
Mecoprop-P	23,054	97,060	41,554	151	4,217	3,378	404	169,818	139,021
Metsulfuron-methyl	9,835	89,118	20,447	122	3,311	6,855	521	130,208	138,732
Metsulfuron-methyl/ thifensulfuron-methyl	889	67,001	14,877	270	0	0	0	83,037	80,323
Pendimethalin	5,365	86	8,110	0	0	0	979	14,541	14,061
Pendimethalin/simazine	0	0	696	0	0	0	0	696	2,277
Propaquizafop	1	3	9	0	0	0	0	13	0
Terbutryn	0	0	0	0	977	0	0	977	795

cont....

TABLE 43 Cereals (continued)
Usage of herbicides and growth regulators (spray hectares of formulations)

<i>Herbicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Thifensulfuron-methyl/ tribenuron-methyl	0	13,624	0	0	0	0	0	13,624	23,449
Tralkoxydim	1,982	14,753	1,775	143	0	502	0	19,155	13,753
Tri-allate	1	0	9	0	0	0	0	10	
Triasulfuron	0	575	0	0	0	0	0	575	8,956
Tribenuron-methyl	3,579	8,418	5,165	0	134	421	0	17,715	12,507
Trifluralin	2,906	0	4,675	0	0	0	0	7,582	12,577
Unspecified herbicide	314	369	703	0	0	1,166	0	2,552	641
All herbicides	149,586	488,697	239,713	885	11,517	21,692	2,106	914,194	
Growth regulators									
2-chloroethylphosphonic acid	15,850	8,149	18,081	0	195	0	404	42,680	32,780
2-chloroethylphosphonic acid/ chlormequat	13,019	342	11,934	143	95	0	1,151	26,684	19,776
2-chloroethylphosphonic acid/ chlormequat/imazaquin	891	413	1,641	0	0	0	0	2,945	
2-chloroethylphosphonic acid/ chlormequat/mepiquat chloride	111	41	0	0	0	0	0	151	
2-chloroethylphosphonic acid/ mepiquat chloride	12,510	3,571	11,097	0	1,032	295	0	28,505	29,549
Chlormequat	49,953	6,365	112,596	249	6,971	6,044	1,661	183,838	184,838
Chlormequat/imazaquin	0	0	22,461	0	0	0	0	22,461	10,614
Trinexapac-ethyl	7,940	4,914	18,787	0	0	0	0	31,640	4,195
All growth regulators	100,275	23,794	196,597	392	8,293	6,339	3,215	338,905	

TABLE 44 Oilseed rape
Usage of insecticides and molluscicides (spray hectares of formulations)

<i>Insecticides</i>	<i>Winter oilseed rape</i>	<i>Spring oilseed rape</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Alpha-cypermethrin	7,980	4,571	12,551	14,603
Cypermethrin	4,637	10,673	15,310	17,744
Deltamethrin	2,424	1,195	3,619	514
Fenvalerate	220	0	220	0
Gamma-HCH	323	0	323	936
Lambda-cyhalothrin	5,999	4,296	10,295	3,542
Lambda-cyhalothrin/pirimicarb	232	0	232	0
Pirimicarb	237	0	237	560
Zeta-cypermethrin	896	1,098	1,994	0
All insecticides	22,947	21,833	44,780	
<i>Molluscicides</i>				
Metaldehyde	7,884	0	7,884	1,318
Methiocarb	4,095	0	4,095	1,864
Thiodicarb	1,698	0	1,698	0
All molluscicides	13,676	0	13,676	

TABLE 45 Oilseed rape
Usage of fungicides (spray hectares of formulations)

<i>Fungicides</i>	<i>Winter oilseed rape</i>	<i>Spring oilseed rape</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Carbendazim	12,344	2,075	14,418	7,682
Carbendazim/flusilazole	18,404	631	19,035	14,194
Carbendazim/iprodione	1,368	0	1,368	1,185
Carbendazim/prochloraz	2,118	0	2,118	5,151
Carbendazim/tebuconazole	4,691	0	4,691	0
Carbendazim/vinclozolin	8,200	307	8,507	13,126
Chlorothalonil	795	0	795	0
Chlorothalonil/metalaxyl	111	0	111	0
Cyproconazole	173	0	173	0
Difenoconazole	2,338	0	2,338	0
Flusilazole	7,907	718	8,625	5,100
Iprodione/thiophanate-methyl	10,705	0	10,705	3,664
Mancozeb	542	0	542	721
Mancozeb/metalaxyl	1,863	0	1,863	0
Maneb		92	92	562
Prochloraz	5,335	0	5,335	6,869
Sulphur	25,657	6,606	32,263	26,261
Tebuconazole	32,821	506	33,327	22,190
Vinclozolin	8,853	1,739	10,593	5,001
Unspecified fungicide	153	0	153	531
All fungicides	144,378	12,675	157,053	

TABLE 46 Oilseed rape
Usage of herbicides, desiccants and growth regulators (spray hectares of formulations)

<i>Herbicides/desiccants</i>	<i>Winter oilseed rape</i>	<i>Spring oilseed rape</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Benazolin	1,016	0	1,016	0
Benazolin/clopyralid	6,030	404	6,434	9,495
Carbetamide	441	0	441	452
Clopyralid	878	0	878	544
Cyanazine	776	0	776	442
Cycloxydim	1,113	1,140	2,254	2,158
Diquat	3,442	1,112	4,553	2,530
Fluazifop-P-butyl	2,601	509	3,110	1,046
Fluroxypyr	3	0	3	0
Glufosinate-ammonium	358	137	495	1,526
Glyphosate	9,691	9,314	19,005	8,578
Mecoprop	3	0	3	
Metazachlor	29,632	5,305	34,936	18,406
Metsulfuron-methyl/ thifensulfuron-methyl	3	0	3	0
Paraquat	130	0	130	0
Propaquizafop	6,334	1,369	7,703	3,809
Propyzamide	8,621	0	8,621	11,380
Quizalofop-ethyl	366	0	366	692
Quizalofop-P-ethyl	1,076	436	1,512	0
Trifluralin	5,151	8,649	13,801	4,723
All herbicides/desiccants	77,664	28,375	106,039	
Growth regulators				
Chlormequat	6,228	0	6,228	2,902

TABLE 47 Potatoes
Usage of insecticides and molluscicides (spray hectares of formulations)

<i>Insecticides</i>	<i>Seed potatoes</i>	<i>Ware potatoes</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Aldicarb	0	2,706	2,706	680
Cypermethrin	8,489	3,905	12,394	12,790
Deltamethrin	87	0	87	0
Deltamethrin/heptenophos	5,622	920	6,542	22,048
Deltamethrin/pirimicarb	13,180	3,927	17,107	23,032
Demeton-S-methyl	492	850	1,342	9,532
Dimethoate	1,618	529	2,146	2,583
Lambda-cyhalothrin	15,158	3,923	19,080	14,220
Lambda-cyhalothrin/pirimicarb	5,638	4,190	9,829	0
Pirimicarb	21,308	6,244	27,552	16,676
Unspecified insecticide	219	206	426	0
All insecticides	71,811	27,401	99,212	
Molluscicides				
Metaldehyde	3,000	5,479	8,478	1,834
Methiocarb	1,992	11,855	13,847	3,010
Thiodicarb	364	6,002	6,366	0
All molluscicides	5,356	23,335	28,691	

TABLE 48 Potatoes
Usage of fungicides (spray hectares of formulations)

<i>Fungicides</i>	<i>Seed potatoes</i>	<i>Ware potatoes</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Benalaxyl/mancozeb	4,570	4,637	9,207	4,864
Chlorothalonil	312	1,030	1,341	283
Chlorothalonil/mancozeb	592	0	592	0
Chlorothalonil/ propamocarb hydrochloride	2,377	2,988	5,365	106
Cymoxanil/mancozeb	15,946	15,253	31,199	23,392
Cymoxanil/mancozeb/oxadixyl	5,130	9,821	14,950	19,841
Dimethomorph/mancozeb	6,139	5,784	11,923	5,215
Fentin Acetate/maneb	2,994	1,019	4,013	3,500
Fentin hydroxide	18,309	25,780	44,088	10,994
Fluazinam	31,362	41,601	72,963	22,474
Mancozeb	11,731	6,190	17,921	22,481
Mancozeb/metalaxyl	5,594	8,173	13,767	10,407
Mancozeb/metalaxyl-M	1,558	566	2,123	0
Mancozeb/ofurace	354	483	837	0
Mancozeb/oxadixyl	274	322	596	5,108
Mancozeb/ propamocarb hydrochloride		1,059	1,059	4,883
Maneb	585	1,947	2,532	12,569
Manganese zinc ethylenebisdithiocarbam./ofurace	0	725	725	1,164
Sulphur	150	1,056	1,206	0
All fungicides	107,974	128,433	236,408	

TABLE 49 Potatoes
Usage of herbicides and desiccants (spray hectares of formulations)

<i>Herbicides/desiccants</i>	<i>Seed potatoes</i>	<i>Ware potatoes</i>	<i>Total spray area</i>	<i>Spray area 1996</i>
Cyanazine/pendimethalin	0	523	523	0
Diquat	674	3,205	3,879	1,419
Diquat/paraquat	2,151	9,292	11,443	5,315
Linuron	10,865	6,363	17,228	18,041
Metribuzin	2,575	5,141	7,716	8,357
Paraquat	10,848	3,724	14,572	21,648
Rimsulfuron	0	571	571	0
Sulphuric acid	24,209	19,017	43,226	41,528
Terbutylazine/terbutryn	0	242	242	829
Terbutryn/trietazine	168	1,012	1,180	953
Unspecified herbicide	0	131	131	
All herbicides	51,490	49,222	100,712	98,090
Mixed formulations				
Fentin hydroxide/metoxuron	0	47	47	0
Growth regulators				
Maleic hydrazide	0	688	688	0

TABLE 50 Cereals*Usage of insecticides and molluscicides (spray hectares of active ingredients) and total weights applied (kg)*

<i>Insecticides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Total kg</i>
<i>Pyrethroids</i>	0	0	0	0	0	0	0	0	0
Alpha-cypermethrin	0	0	379	0	0	0	0	379	4
Cypermethrin	17,649	1,113	14,184	0	1,277	627	0	34,850	747
Deltamethrin	1,405	0	691	0	0	0	228	2,324	12
Esfenvalerate	3,462	0	1,260	0	0	0	0	4,722	15
Fenvalerate	186	0	0	0	0	0	0	186	2
Lambda-cyhalothrin	3,556	0	8,227	265	202	0	0	12,251	44
Tau-fluvalinate	0	0	1,105	0	0	0	0	1,105	27
Zeta-cypermethrin	830	0	0	0	0	0	0	830	9
<i>Carbamates</i>	0	0	0	0	0	0	0	0	0
Pirimicarb	0	0	2,650	0	0	0	0	2,650	229
<i>Organophosphates</i>	0	0	0	0	0	0	0	0	0
Chlorfenvinphos	0	0	365	0	0	0	0	365	245
Chlorpyrifos	121	2,678	3,969	29	0	608	0	7,405	4,777
Demeton-S-methyl	0	0	469	0	0	0	0	469	68
Dimethoate	1,647	0	11,010	0	0	95	0	12,753	3,385
<i>Organochlorines</i>	0	0	0	0	0	0	0	0	0
Gamma-HCH	0	697	460	0	0	0	0	1,157	1,020
<i>All insecticides</i>	28,857	4,487	44,770	294	1,479	1,331	228	81,447	10,584
<i>Molluscicides</i>									
Metaldehyde	957	379	17,449	29	0	0	0	18,814	6,550
Methiocarb	2,022	288	6,827	0	0	0	0	9,137	1,286
Thiodicarb	335	0	2,289	0	0	0	0	2,624	297
Unspecified molluscicide	0	0	11	0	0	0	0	11	0
<i>All molluscicides</i>	3,315	666	26,576	29	0	0	0	30,586	8,133

● **TABLE 51 Cereals**

Usage of fungicides (spray hectares of active ingredients) and the total weights applied (kg)

Fungicides	Winter barley	Spring barley	Winter wheat	Spring wheat	Winter oats	Spring oats	Triticale	Total spray area	Total kg
Anilazine	0	0	3,357	0	0	0	0	3,357	1,742
Azoxystrobin	6,042	2,738	49,156	42	0	0	0	57,978	5,517
Bromuconazole	2,240	4,433	198	0	0	155	359	7,385	902
Carbendazim	41,431	89,396	28,494	122	467	29	180	160,119	12,604
Chlorothalonil	3,119	13,600	70,843	219	0	0	404	88,186	33,404
Copper oxychloride	876	8,297	1,711	0	520	1,145	0	12,550	3,848
Cyproconazole	12,913	738	48,881	177	1,092	0	453	64,255	2,911
Cyprodinil	11,142	21,263	8,053	0	0	0	0	40,458	11,795
Difenoconazole	0	0	12,531	29	0	0	0	12,560	637
Epoxiconazole	19,031	11,569	74,838	0	0	0	0	105,438	6,069
Fenbuconazole	0	0	7,623	0	0	0	0	7,623	339
Fenpropidin	21,884	30,786	75,558	581	906	265	0	129,981	22,043
Fenpropimorph	104,945	138,694	73,357	342	10,110	7,153	0	334,601	76,164
Flusilazole	77,110	120,488	28,245	122	233	369	180	226,746	16,970
Flutriafol	293	124	23,150	0	0	0	0	23,566	1,326

cont....

● **TABLE 51 Cereals (continued)**
Usage of fungicides (spray hectares of active ingredients) and the total weights applied (kg)

<i>Fungicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Total kg</i>
Iprodione	0	0	214	0	0	0	0	214	6
Kresoxim-methyl	8,680	4,959	50,882	56	0	0	0	64,576	3,811
Mancozeb	2,142	2,733	10,936	0	0	0	0	15,811	11,908
Maneb	7,160	6,283	9,110	0	262	95	0	22,910	22,699
Prochloraz	17,032	9,170	55,816	177	672	0	228	83,095	20,947
Propiconazole	26,713	55,621	17,123	287	4,767	786	117	105,413	7,373
Quinoxifen	8,644	26,789	8,967	0	1,591	1,182	0	47,173	2,395
Spiroxamine	15,427	9,851	11,011	0	0	27	0	36,316	7,808
Sulphur	8,762	19,752	38,578	311	2,386	1,030	0	70,818	211,431
Tebuconazole	7,171	6,687	61,925	199	0	0	224	76,207	7,348
Triadimenol	10,280	7,251	31,808	199	969	1,991	0	52,498	3,077
Tridemorph	37,885	42,711	9,822	0	3,907	3,448	0	97,773	13,340
<i>All fungicides</i>	450,921	633,934	812,182	2,863	27,884	17,676	2,144	1,947,605	508,414

TABLE 52 Cereals

Usage of herbicides and growth regulators (spray hectares of active ingredients) and the total weights applied (kg)

<i>Herbicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Total kg</i>
2,4-DB	226	18,150	0	0	0	443	0	18,819	21,658
Amidosulfuron	822	0	1,908	0	0	0	0	2,730	56
Benazolin	0	14,715	0	0	0	1,016	0	15,731	2,556
Bentazone	0	2,647	0	0	0	0	0	2,647	2,162
Bromoxynil	4,232	69,046	6,904	0	0	3,132	0	83,314	8,723
Carfentrazone-ethyl	625	5,745	3,009	0	1,295	0	0	10,674	133
Chlorotoluron	571	0	0	0	0	0	0	571	286
Clodinafop-propargyl	0	0	102	0	0	0	0	102	3
Cyanazine	623	0	1,084	0	0	0	0	1,707	653
Dicamba	301	24,453	2,490	143	193	1,304	0	28,884	1,465
Dichlorprop	0	497	0	0	0	0	0	497	608
Diclofop-methyl	0	875	0	0	0	0	0	875	579
Difenzoquat	207	41	0	0	0	0	0	248	108
Diflufenican	43,756	6,049	49,971	0	859	0	0	100,635	6,317
Diquat	88	0	0	0	0	0	0	88	53
Fenoxaprop-P-ethyl	0	875	2,517	0	0	0	0	3,392	152
Flamprop-M-isopropyl	452	827	261	0	0	0	0	1,540	707
Fluoroglyphofen-ethyl	933	0	691	0	0	0	0	1,624	29
Flupyr-sulfuron-methyl	0	0	807	0	993	0	0	1,800	13
Fluroxypyr	1,361	2,679	5,874	0	253	0	23	10,188	1,139
Flurtamone	0	0	282	0	0	0	0	282	33
Glyphosate	3,255	13,760	5,638	0	0	322	0	22,976	19,819

cont....

● **TABLE 52 Cereals (continued)**

Usage of herbicides and growth regulators (spray hectares of active ingredients) and the total weights applied (kg)

<i>Herbicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Total kg</i>
Ioxynil	4,232	67,370	6,904	0	0	3,132	0	81,638	7,898
Isoproturon	62,062	2,596	76,892	0	392	0	0	141,942	115,112
Isoxaben	0	0	186	0	0	0	180	365	23
Linuron	226	2,865	0	0	0	0	0	3,091	259
MCPA	226	49,408	432	0	0	3,334	0	53,400	37,253
MCPB	0	4,250	0	0	0	401	0	4,651	3,812
Mecoprop	2,313	39,127	7,885	56	277	2,050	0	51,708	36,360
Mecoprop-P	23,354	125,354	46,214	294	4,410	5,040	404	205,071	99,718
Metosulam	0	0	868	0	0	0	0	868	7
Methabenzthiazuron	0	0	186	0	0	0	180	365	464
Metsulfuron-methyl	10,724	161,114	36,558	392	3,613	6,855	521	219,776	684
Pendimethalin	9,849	86	14,684	0	0	0	979	25,597	18,033
Propaquizafop	1	3	9	0	0	0	0	13	1
Simazine	0	0	696	0	0	0	0	696	129

cont....

● **TABLE 52 Cereals (continued)**

Usage of herbicides and growth regulators (spray hectares of active ingredients) and the total weights applied (kg)

<i>Herbicides</i>	<i>Winter barley</i>	<i>Spring barley</i>	<i>Winter wheat</i>	<i>Spring wheat</i>	<i>Winter oats</i>	<i>Spring oats</i>	<i>Triticale</i>	<i>Total spray area</i>	<i>Total kg</i>
Terbutylazine	2,816	0	3,729	0	467	0	0	7,012	831
Terbutryn	0	0	0	0	977	0	0	977	1,422
Thifensulfuron-methyl	889	80,625	14,877	270	0	0	0	96,661	2,226
Tralkoxydim	1,982	14,753	1,775	143	0	502	0	19,155	3,623
Tri-allate	1	0	9	0	0	0	0	10	17
Triasulfuron	2,815	22,223	276	0	0	1,533	0	26,847	139
Tribenuron-methyl	3,579	22,042	5,165	0	134	421	0	31,340	262
Trifluralin	4,104	0	5,939	0	0	0	0	10,042	7,894
Unspecified herbicide	314	369	703	0	0	1,166	0	2,552	0
All herbicides	186,938	752,544	305,523	1,298	13,864	30,652	2,285	1,293,104	403,419
Growth regulators									
2-chloroethylphosphonic acid	42,382	12,515	42,753	143	1,322	295	1,555	100,966	18,741
Chlormequat	63,757	7,160	147,607	392	7,066	6,044	2,811	234,838	216,258
Imazaquin	891	413	24,102	0	0	0	0	25,406	26
Mepiquat chloride	12,621	3,611	11,097	0	1,032	295	0	28,657	8,944
Trinexapac-ethyl	7,940	4,914	18,787	0	0	0	0	31,640	1,248
All growth regulators	127,590	28,613	244,347	535	9,421	6,634	4,366	421,506	245,217

TABLE 53 Oilseed rape

Usage of insecticides and molluscicides (spray hectares of active ingredients) and the total weights applied (kg)

<i>Insecticides</i>	<i>Winter oilseed rape</i>	<i>Spring oilseed rape</i>	<i>Total spray area</i>	<i>Total kg</i>
<i>Pyrethroids</i>				
Alpha-cypermethrin	7,980	4,571	12,551	190
Cypermethrin	4,637	10,673	15,310	388
Deltamethrin	2,424	1,195	3,619	23
Fenvalerate	220	0	220	5
Lambda-cyhalothrin	6,231	4,296	10,527	72
Zeta-cypermethrin	896	1,098	1,994	20
<i>Carbamates</i>				
Pirimicarb	469	0	469	61
<i>Organochlorines</i>				
Gamma-HCH	323	0	323	90
<i>All insecticides</i>	23,180	21,833	45,013	849
<i>Molluscicides</i>				
Metaldehyde	7,884	0	7,884	2,510
Methiocarb	4,095	0	4,095	717
Thiodicarb	1,698	0	1,698	169
<i>All molluscicides</i>	13,676	0	13,676	3,396

● **TABLE 54 Oilseed rape**

Usage of fungicides (spray hectares of active ingredients) and total weights applied (kg)

Fungicides	Winter oilseed rape	Spring oilseed rape	Total spray area	Total kg
Carbendazim	45,359	3,012	48,371	7,615
Chlorothalonil	906	0	906	373
Cyproconazole	173	0	173	6
Difenoconazole	2,338	0	2,338	144
Flusilazole	26,311	1,349	27,660	2,580
Iprodione	12,073	0	12,073	4,083
Mancozeb	2,406	0	2,406	1,433
Maneb	0	92	92	83
Metalaxyl	1,975	0	1,975	174
Prochloraz	7,453	0	7,453	1,626
Sulphur	25,657	6,606	32,263	131,751
Tebuconazole	37,512	506	38,019	4,197
Thiophanate-methyl	10,705	0	10,705	3,573
Vinclozolin	17,053	2,046	19,099	6,803
Unspecified fungicide	153	0	153	0
All fungicides	190,073	13,613	203,685	164,441

TABLE 55 Oilseed rape
*Usage of herbicides, desiccants and growth regulators (spray hectares of active ingredients)
 and total weights applied (kg)*

<i>Herbicides/desiccants</i>	<i>Winter oilseed rape</i>	<i>Spring oilseed rape</i>	<i>Total spray area</i>	<i>Total kg</i>
Benazolin	7,046	404	7,450	1,741
Carbetamide	441	0	441	842
Clopyralid	6,908	404	7,312	294
Cyanazine	776	0	776	318
Cycloxydim	1,113	1,140	2,254	308
Diquat	3,442	1,112	4,553	2,786
Fluazifop-P-butyl	2,601	509	3,110	478
Fluroxypyr	3	0	3	1
Glufosinate-ammonium	358	137	495	223
Glyphosate	9,691	9,314	19,005	20,261
Mecoprop	3	0	3	3
Metazachlor	29,632	5,305	34,936	22,554
Metsulfuron-methyl	3	0	3	+
Paraquat	130	0	130	26
Propaquizafop	6,334	1,369	7,703	317
Propyzamide	8,621	0	8,621	4,332
Quizalofop-ethyl	366	0	366	3
Quizalofop-P-ethyl	1,076	436	1,512	37
Thifensulfuron-methyl	3	0	3	+
Trifluralin	5,151	8,649	13,801	13,532
All herbicides/desiccants	83,697	28,779	112,476	68,056
Growth regulators				
Chlormequat	6,228	0	6,228	8,106

'+' = < 0.5kg

TABLE 56 Potatoes

Usage of insecticides and molluscicides (spray hectares of active ingredients) and the total weights applied (kg)

<i>Insecticides</i>	<i>Seed potatoes</i>	<i>Ware potatoes</i>	<i>Total spray area</i>	<i>Total kg</i>
<i>Pyrethroids</i>				
Cypermethrin	8,489	3,905	12,394	299
Deltamethrin	18,889	4,848	23,737	153
Lambda-cyhalothrin	20,796	8,113	28,909	163
<i>Carbamates</i>				
Aldicarb	0	2,706	2,706	3,628
Pirimicarb	40,126	14,362	54,488	5,212
<i>Organophosphates</i>				
Demeton-S-methyl	492	850	1,342	248
Dimethoate	1,618	529	2,146	503
Heptenophos	5,622	920	6,542	767
<i>Unspecified</i>				
Unspecified insecticide	219	206	426	
<i>All insecticides</i>	96,251	36,439	132,690	10,973
<i>Molluscicides</i>				
Metaldehyde	3,000	5,479	8,478	3,888
Methiocarb	1,992	11,855	13,847	1,611
Thiodicarb	364	6,002	6,366	772
<i>All molluscicides</i>	5,356	23,335	28,691	6,271

TABLE 57 Potatoes
Usage of fungicides (spray hectares of active ingredients) and total weights applied (kg)

<i>Fungicides</i>	<i>Seed Potatoes</i>	<i>Ware Potatoes</i>	<i>Total spray area</i>	<i>Total kg</i>
Benalaxyl	4,570	4,637	9,207	1,460
Chlorothalonil	3,280	4,018	7,298	5,988
Cymoxanil	21,075	25,074	46,149	3,808
Dimethomorph	6,139	5,784	11,923	1,719
Fentin acetate	2,994	1,019	4,013	1,002
Fentin hydroxide	18,309	25,827	44,135	9,500
Fluazinam	31,362	41,601	72,963	9,850
Mancozeb	47,268	50,283	97,551	130,371
Maneb	3,579	2,966	6,545	3,617
Manganese zinc ethylenebisdithiocarbam.		725	725	972
Metalaxyl	5,594	8,173	13,767	1,942
Metalaxyl-M	1,558	566	2,123	163
Ofurace	354	1,208	1,562	184
Oxadixyl	5,403	10,142	15,546	3,057
Propamocarb hydrochloride	2,377	4,047	6,424	5,921
Sulphur	150	1,056	1,206	5,726
All fungicides	154,012	187,127	341,139	185,280

TABLE 58 Potatoes
Usage of herbicides, desiccants and growth regulators (spray hectares of active ingredients) and total weights applied (kg)

<i>Herbicides/desiccants</i>	<i>Seed potatoes</i>	<i>Ware potatoes</i>	<i>Total spray area</i>	<i>Total kg</i>
Cyanazine	0	523	523	318
Diquat	2,825	12,497	15,322	4,667
Linuron	10,865	6,363	17,228	17,146
Metoxuron	0	47	47	95
Metribuzin	2,575	5,141	7,716	4,429
Paraquat	12,999	12,855	25,854	9,773
Pendimethalin	0	523	523	560
Rimsulfuron	0	571	571	5
Sulphuric acid	24,209	19,017	43,226	6,122,350
Terbutylazine	0	242	242	115
Terbutryn	168	1,254	1,422	1,287
Trietazine	168	1,012	1,180	1,018
Unspecified herbicide	0	131	131	
All herbicides/desiccants	53,809	60,177	113,986	6,161,763
Growth regulators				
Maleic hydrazide	0	688	688	2,762

● **TABLE 59 Principal active ingredients**

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

	<i>Ai</i>	1998	1996
1	Fenpropimorph	362	304
2	Tebuconazole	310	186
3	Flusilazole	255	230
4	Chlormequat	241	218
5	Metsulfuron-Methyl	221	219
6	Carbendazim	214	231
7	Mecoprop-P	205	168
8	Triazoxide	194	115
9	Isoproturon	142	106
10	Fenpropidin	130	127
11	Guazatine	117	122
12	Mancozeb	116	112
13	Sulphur	106	80
14	Epoxiconazole	105	41
15	Propiconazole	105	140
16	2-Chloroethylphosphonic Acid	101	82
17	Diflufenican	101	78
18	Chlorothalonil	100	106
19	Tridemorph	98	153
20	Thifensulfuron-Methyl	97	104
21	Prochloraz	91	84
22	Bromoxynil	83	87
23	Ioxynil	82	83
24	Fluazinam	73	22
25	Triadimenol	72	117
26	Thiram	67	30
27	Cypermethrin	65	57
28	Kresoxim-Methyl	65	0
29	Cyproconazole	65	65
30	Fuberidazole	60	62
31	Gamma-HCH	59	32
32	Azoxystrobin	58	0
33	Pirimicarb	58	42
34	MCPA	55	59
35	Lambda-Cyhalothrin	53	20
36	Mecoprop	52	82
37	Glyphosate	49	36
38	Quinoxifen	47	0
39	Cymoxanil	46	44
40	Fentin Hydroxide	44	11
41	Sulphuric Acid	43	42
42	Imazalil	43	108
43	Flutriafol	42	94
44	Bitertanol	41	21
45	Cyprodinil	40	0
46	Carboxin	37	37
47	Spiroxamine	36	0
48	Metazachlor	36	18
49	Metaldehyde	35	7
50	Trinexapac-Ethyl	32	4

● **TABLE 60 Principal active ingredients**

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

	<i>Ai</i>	1998	1996
1	Sulphuric acid	6,122	6,083
2	Sulphur	354	335
3	Chlormequat	225	193
4	Mancozeb	144	128
5	Isoproturon	115	85
6	Mecoprop-P	100	86
7	Fenpropimorph	76	73
8	Glyphosate	47	33
9	Chlorothalonil	42	38
10	MCPA	38	53
11	Mecoprop	36	65
12	Maneb	26	42
13	Trifluralin	24	20
14	Metazachlor	23	11
15	Prochloraz	23	19
16	Fenpropidin	22	33
17	2,4-DB	22	16
18	Carbendazim	22	23
19	Pendimethalin	20	20
20	Flusilazole	20	18
21	2-chloroethylphosphonic acid	19	15
22	Linuron	17	20
23	Guazatine	17	18
24	Tridemorph	13	22
25	Metaldehyde	13	2
26	Tebuconazole	13	8
27	Cyprodinil	12	0
28	Fluazinam	10	3
29	Paraquat	10	12
30	Diquat	10	4
31	Fentin hydroxide	10	3
32	Mepiquat chloride	9	9
33	Bromoxynil	9	10
34	Ioxynil	8	9
35	Spiroxamine	8	0
36	Propiconazole	7	9
37	Vinclozolin	7	7
38	Pencycuron	7	5
39	Diflufenican	6	5
40	Ethirimol	6	16
41	Epoxiconazole	6	2
42	Propamocarb hydrochloride	6	4
43	Iprodione	6	4
44	Azoxystrobin	6	0
45	Pirimicarb	6	4
46	MCPB	5	6
47	Bitertanol	5	3
48	Gamma-HCH	5	3
49	Chlorpyrifos	5	5
50	Triadimenol	5	0

● **TABLE 61 Cereals**

Comparison of pesticide usage in 1994, 1996 and 1998, spray hectares of formulations, spray hectares of active ingredients and quantities (kg of a.i.'s) used

	1994			1996			1998		
	<i>sp. ha. of formulations</i>	<i>sp. ha. of a.i.'s</i>	<i>kg</i>	<i>sp. ha. of formulations</i>	<i>sp. ha. of a.i.'s</i>	<i>kg</i>	<i>sp. ha. of formulations</i>	<i>sp. ha. of a.i.'s</i>	<i>kg</i>
<i>Insecticides</i>									
Pyrethroids	14,671	15,210	242	46,456	46,456	704	55,742	56,648	858
Organophosphates	31,069	31,609	9,296	15,656	15,656	6,485	20,993	20,993	8,476
Organochlorines	0	0	0	0	0	0	1,157	1,157	1,020
Carbamates	4,192	4,192	223	1,962	1,962	142	1,744	2,650	229
Unspecified or mixed formulation	539			427	427		906		
<i>All insecticides</i>	50,471	51,010	9,761	64,501	64,501	7,330	80,542	81,448	10,583
<i>Molluscicides</i>	17,025	17,025	4,890	8,841	8,841	2,066	30,586	30,586	8,133
<i>Fungicides</i>	834,948	1,115,883	339,074	1,255,647	1,700,558	483,125	1,434,932	1,947,605	508,416
<i>Herbicides</i>	717,607	1,011,474	373,400	889,865	1,267,714	418,465	914,194	1,293,104	403,419
<i>Growth regulators</i>	239,827	295,233	193,445	282,491	388,787	216,191	338,905	421,506	245,218
<i>Seed treatments</i>	381,686	779,010	112,472	435,566	830,133	51,793	464,754	799,005	39,192
<i>All pesticides</i>	2,241,564	3,269,635	1,033,042	2,936,911	4,260,534	1,178,970	3,263,913	4,573,254	1,214,960
Area planted (ha)	395,286			449,298			468,153		

● **TABLE 62 Oilseed rape**

Comparison of pesticide usage in 1994, 1996 and 1998, spray hectares of formulations, spray hectares of active ingredients and quantities (kg of a.i.'s) used

	1994			1996			1998		
	<i>sp. ha. of formulations</i>	<i>sp. ha. of a.i.'s</i>	<i>kg</i>	<i>sp. ha. of formulations</i>	<i>sp. ha. of a.i.'s</i>	<i>kg</i>	<i>sp. ha. of formulations</i>	<i>sp. ha. of a.i.'s</i>	<i>Kg</i>
<i>Insecticides</i>									
Pyrethroids	37,085	37,085	711	36,403	36,403	661	43,988	44,220	698
Organophosphates	2,069	2,069	1,074	0	0	0	0	0	0
Organochlorines	2,547	2,547	742	936	936	262	323	323	90
Carbamates	341	341	72	560	560	56	237	469	61
Unspecified or mixed formulation	183	183		582	582		232		
<i>All insecticides</i>	42,225	42,225	2,599	38,481	38,481	980	44,780	45,012	850
<i>Molluscicides</i>	4,955	4,955	1,089	3,412	3,412	834	13,676	13,676	3,396
<i>Fungicides</i>	127,666	150,073	183,213	112,571	149,224	153,780	157,053	203,685	164,443
<i>Herbicides/desiccants</i>	69,733	81,842	38,846	65,782	75,277	35,601	106,039	112,476	68,058
<i>Growth regulators</i>	3,578	3,578	3,801	2,902	5,286	3,663	6,228	6,228	8,106
<i>Seed treatments</i>	73,945	178,967	17,777	53,991	105,847	2,963	65,796	163,350	4,339
<i>All pesticides</i>	322,102	461,640	247,325	277,139	377,527	197,821	393,572	544,427	249,192
Area planted (ha)	69,619			49,290			65,116		

● **TABLE 63 Potatoes**

Comparison of pesticide usage in 1994, 1996 and 1998, spray hectares of formulations, spray hectares of active ingredients and quantities (kg of a.i.'s) used

	1994			1996			1998		
	<i>sp. ha. of formulations</i>	<i>sp. ha. of a.i.'s</i>	<i>kg</i>	<i>sp. ha. of formulations</i>	<i>sp. ha. of a.i.'s</i>	<i>kg</i>	<i>sp. ha of formulations</i>	<i>sp. ha. of a.i.'s</i>	<i>Kg</i>
<i>Insecticides</i>									
Pyrethroids	30,796	58,278	892	27,273	72,037	680	31,561	65,040	615
Organophosphates	29,470	56,953	9,459	13,204	35,252	5,519	3,488	10,030	1,518
Carbamates	13,140	13,140	1,592	17,356	40,388	4,693	30,258	57,194	8,839
Unspecified or mixed formulation	27,482			45,080			33,904	426	
<i>All insecticides</i>	100,888	128,371	11,943	102,913	147,678	10,893	99,211	132,690	10,972
<i>Molluscicides</i>	2,764	2,764	460	4,844	4,844	967	28,691	28,691	6,271
<i>Fungicides</i>	145,958	254,259	156,888	148,469	246,660	155,634	236,408	341,139	185,280
<i>Soil sterilants</i>	231	231	56,872	0	0	0	0	0	0
<i>Herbicides/desiccants</i>	88,372	96,269	5,406,592	98,647	105,745	6,084,000	100,712	113,986	6,161,765
<i>Mixed herbicide/fungicide</i>	0	0	0	0	0	0	47		
<i>Growth regulators</i>	427	427	1,707	0	0	0	687	687	2,762
<i>Seed treatments</i>	22,885	24,599	10,417	27,303	31,962	10,586	23,766	31,254	8,413
<i>All pesticides</i>	361,525	506,920	5,644,879	382,176	536,889	6,262,080	489,522	648,447	6,375,463
Area planted (ha)	26,411			29,297			28,761		

● **TABLE 64 Sampled areas**
Area (ha) of arable crops grown in sample

<i>Size (ha)</i>	<i>Highlands & Islands and Caithness & Orkney</i>	<i>Moray Firth</i>	<i>Aberdeen</i>	<i>Angus</i>	<i>East Fife</i>	<i>Lothian</i>	<i>Central Lowlands</i>	<i>Tweed Valley</i>	<i>S Uplands & Solway</i>	<i>Scotland</i>
1-19.9	45	26	41	20	2	11	38	17	35	235
20-49.9	98	230	600	272	157	50	288	94	241	2,029
50-99.9	84	635	1,729	1,370	636	528	820	513	257	6,572
100-149.9	0	712	1,726	1,466	921	752	512	1,116	145	7,351
150+	165	1,678	3,386	4,143	2,067	2,979	1,011	3,707	412	19,547
All sizes	392	3,281	7,482	7,271	3,782	4,320	2,669	5,447	1,090	35,734

● **TABLE 65 Census areas**
Area (ha) of arable crops grown in Scotland

<i>Size (ha)</i>	<i>Highland & Islands and Caithness & Orkney</i>	<i>Moray Firth</i>	<i>Aberdeen</i>	<i>Angus</i>	<i>East Fife</i>	<i>Lothian</i>	<i>Central Lowlands</i>	<i>Tweed Valley</i>	<i>S Uplands & Solway</i>	<i>Scotland</i>
1-19.9	8,560	4,986	12,909	3,747	1,040	1,127	9,774	1,390	6,526	50,059
20-49.9	4,504	11,150	27,477	13,117	4,668	3,031	16,899	4,354	9,056	94,255
50-99.9	3,614	13,723	38,040	29,460	13,466	9,019	19,825	11,380	5,795	144,323
100-149.9	813	11,810	20,595	22,284	12,198	11,248	9,621	14,205	2,094	104,868
150+	1,291	16,010	29,427	40,252	15,129	23,671	10,711	33,742	2,726	172,959
All sizes	29,800	57,678	128,448	108,860	46,501	48,096	66,831	65,071	26,196	566,463

● **TABLE 66 Raising factors**

<i>Size (ha)</i>	<i>Highland & Islands and Caithness & Orkney</i>	<i>Moray Firth</i>	<i>Aberdeen</i>	<i>Angus</i>	<i>East Fife</i>	<i>Lothian</i>	<i>Central Lowlands</i>	<i>Tweed Valley</i>	<i>S Uplands & Solway</i>
.1-19.9	189.9	195.4	311.7	184.5	520.0	103.6	258.6	81.8	188.9
20-49.9	45.8	48.5	45.8	48.3	29.8	61.0	58.6	46.4	37.6
50-99.9	43.2	21.6	22.0	21.5	21.2	17.1	24.2	22.2	22.5
100-149.9	NA	16.6	11.9	15.2	13.3	15.0	18.8	12.7	14.4
150+	7.8	9.5	8.7	9.7	7.3	7.9	10.6	9.1	6.6

● **TABLE 67 First adjustment factors**

<i>Crop</i>	<i>Highland & Islands and Caithness & Orkney</i>	<i>Moray Firth</i>	<i>Aberdeen</i>	<i>Angus</i>	<i>East Fife</i>	<i>Lothian</i>	<i>Central Lowlands</i>	<i>Tweed Valley</i>	<i>S Uplands & Solway</i>
Winter barley	0.40	0.85	1.08	0.74	1.04	0.90	1.07	0.87	1.17
Spring barley	0.93	0.96	0.99	1.05	0.91	0.80	0.98	0.98	1.02
Wheat	0.78	1.26	0.84	1.08	0.96	1.13	0.96	1.08	0.71
Winter oats	NA	0.45	1.15	3.33	1.30	NA	0.53	0.59	1.08
Spring oats	1.74	0.72	0.62	2.61	1.55	0.46	0.89	1.42	15.54
Winter oilseed rape	NA	0.95	1.17	0.89	0.93	1.22	1.22	0.87	0.89
Spring oilseed rape	NA	1.76	1.11	0.98	1.28	4.07	1.45	1.22	2.05
Seed potatoes	NA	1.76	2.04	0.87	3.82	1.44	0.76	2.11	NA
Ware potatoes	13.98	4.38	0.62	1.22	1.41	1.18	1.70	2.19	1.03
Combine peas	NA	NA	0.65	1.13	NA	1.55	0.85	3.51	NA
Triticale	NA	1.27	NA	1.08	2.41	NA	NA	NA	0.23
Set aside	1.65	1.35	1.90	1.09	1.23	1.06	1.44	1.38	0.61

● **TABLE 68** *Second adjustment factors*

<i>Crop</i>	
Winter barley	1.00
Spring barley	1.00
Wheat	1.00
Winter oats	1.04
Spring oats	1.00
Winter oilseed rape	1.00
Spring oilseed rape	1.03
Seed potatoes	1.03
Ware potatoes	1.00
Combine peas	1.27
Triticale	1.50
Set aside	1.00