Department of
Agriculture and
Rural Development
www.dardni.gov.uk

PESTICIDE USAGE IN NORTHERN IRELAND

SURVEY REPORT 206

Arable Crops

2004

Agriculture, Fishing & Forestry

A National Statistics Publication

PESTICIDE USAGE SURVEY REPORT 206

NORTHERN IRELAND ARABLE CROPS

2004

J.A Withers, S. Jess, C.A.Kearns,
D. Matthews and T. Moreland.

Pesticide Usage Survey Group
Agriculture and Food Science Centre
Newforge Lane
Belfast BT9 5PX

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

INVESTOR IN PEOPLE

Department of Agriculture & Rural Development
ISBN 1 85527 833 2

A NATIONAL STATISTICS PUBLICATION

National Statistics are produced to high professional standards set out in the National Statistics Code of Practice. They undergo regular quality assurance reviews to ensure that they meet customers needs. They are free from any political interference.

For general enquires about National Statistics, contact the National Statistics Public Enquiry Service on 020 75335888 or www.statistics.gov.uk.

A list of published reports can be found on:
www.afbini.gov.uk

The Agri-Food and Biosciences Institute (AFBI) was created on 1st April 2006 as the amalgamation of DARD Science Service and the Agricultural Research Institute of Northern Ireland.

Click on red button to go straight to page

CONTENTS

The County Regions of Northern Ireland

SUMMARY

This is the eighth survey of pesticide usage practices on arable crops in Northern Ireland, providing comparative data to that obtained in the previous surveys in 1990, (Jess et al., 1992), 1992 (Jess et al., 1995), 1994 (Jess et al., 1997), 1996 (Jess et al., 2000), 1998 (Jess et al., 2002), 2000 (Withers et al., 2004) and 2002 (Withers et al., 2004).

Information on all aspects of pesticide usage was collected from 293 holdings throughout the Province, representing 24% of the total area of arable crops grown. Quantitative data has been adjusted to provide estimates of total pesticide usage.

The total area of arable crops grown in Northern Ireland in 2004 was 48,541 hectares, an increase of less than 1% compared to that recorded in 2002. Approximately 44% of the arable cropping area was in County Down, 23% in County Londonderry, 16% in County Antrim, 8% in County Tyrone and 9% in County Armagh. There was no significant area of arable cropping in County Fermanagh.

During the period 2002 to 2004, the area of arable crops treated with pesticides increased by 13%, to 325,299 spray-hectares. The most notable increase was recorded in the use of insecticides (57%) which was mainly due to increased applications of the pyrethroid insecticides, principally lambda-cyhalothrin, esfenvalerate, deltamethrin and cypermethrin, along with the organophosphate, chlorpyrifos. Applications of fungicides (9%) and herbicides/desiccants (21%) also increased since 2002. However, the weight applied of these pesticide groups decreased by 17% and 35% respectively. This reflects the relatively low dose rates of current pesticide applications. Molluscicide applications reduced by 82% for both treated area and weight applied. This was the result of fewer applications principally to potatoes but also to cereals. Growth regulators were applied primarily to spring barley, winter barley and, most frequently, to winter wheat. The use of growth regulators on cereal crops reduced by 5% when compared with 2002. The principal growth regulator used in 2004 was chlormequat, which is consistent with previous surveys in 1998, 2000 and 2002. The total weight of pesticides applied to arable crops in 2004 decreased to 341 tonnes of active ingredients, a reduction of 31% compared with 2002. The single active ingredients fludioxonil and imazalil, were the most commonly used seed treatments applied to cereals and potatoes, respectively.

During 2004, regional pesticide usage was related to the area of arable crops grown in each county. Pesticides were applied to 82% of the total area of arable crops grown in Northern Ireland in 2004 with a range of 1.0 - 8.6 applications per crop.

Fungicides were applied to 43% of the pesticide-treated area, accounting for 21% of the total weight of pesticides used. Herbicides and desiccants were applied to 32% of the pesticide-treated area, representing 75% of the total weight of pesticides used. Insecticides accounted for 10% of the pesticide-treated area of arable crops, representing less than 1% of the weight of

pesticides used. Molluscicide treatments represented less than 1% of both area of application and weight of pesticides applied. Growth regulator usage accounted for 5% of the pesticide-treated area and 3% of the weight of active ingredients applied. Seed treatments were applied to 10% of the area of arable crops grown in 2004, representing less than 1% of the weight of active ingredients applied.

Potato crops comprised 13% of the area of arable crops grown in Northern Ireland in 2004, while accounting for 25% of the total pesticide-treated area. However, the weight of pesticides applied to potato crops represented 77% of the total weight of pesticides used on all arable crops. The total area of potatoes grown comprised 74% maincrop, 19% seed and 7% early potatoes. Potato crops accounted for 37% of the area of arable crops treated with fungicides and received 72% of the total weight of fungicides applied. Furthermore, applications of herbicides and desiccants to potato crops represented 19% and 83% of the area treated and weight applied of this pesticide group, respectively. The most commonly recorded fungicide was mancozeb, applied to arable crops as a single active ingredient and in formulation with other compounds. Mancozeb was used on 21% of the fungicide-treated area and accounted for 54% of the weight of fungicide active ingredients applied. Mancozeb was used primarily in maincrop potatoes to control blight *Phytophthora infestans*. Spring and winter barley crops accounted for 54% of the herbicide and desiccant-treated area, but only 10% of the weight applied of active ingredients from this pesticide group. The most commonly applied herbicide, used almost exclusively on cereal crops, principally spring barley, was metsulfuron-methyl. Owing to the low application rate of this active ingredient, the weight applied represented less than 1% of the total weight of herbicides and desiccants used.

This was the fourth survey where the cultivation of pea and bean crops was recorded .

A total of 221 products, comprising 119 active ingredients, was recorded in use on field crops in the survey.

In addition to information concerning field applications of pesticides to crops, data relating to post-harvest/storage treatments applied to farm stored potatoes were collected. It was estimated that 155,669 tonnes of potatoes were stored on-farm following the 2004 growing season. This represented a 158% increase compared with 1998. Ware potatoes accounted for 79% of the total quantity of stored potatoes, with seed potatoes accounting for the remainder. County Down and County Antrim accounted for 40% and 34% of all potatoes stored respectively. An estimated 78% of all potatoes receiving treatments in storage were held in County Down and treatments to these potatoes accounted for 95% of the weight of pesticides applied. Overall, 2% of stored potatoes received pesticide treatment. Two active ingredients were recorded as applied, with an estimated 154kg of pesticide active ingredients applied to 3,772 tonnes of stored potatoes in Northern Ireland in 2004. Approximately 42% of all potatoes in 2004 were stored in barn stores. Overall, 63% of potatoes were stored on-farm in boxes, while 23% were stored in bulk.

DEFINITIONS AND NOTES

- 'Basic area' refers to the actual planted area of crop, which was treated with a given pesticide.

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

- 'Reasons for use' refers to the perceived reasons given by the farmer for the use of a particular pesticide. These reasons may sometimes be inappropriate.

- 'Rounding'; due to rounding of figures there may be slight differences in totals both within and between tables.

- 'Spray applications' refers to the number of treatments by any pesticide type to the treated areas.

- 'Comparison tables'; due to restrictions imposed by the foot and mouth outbreak in February 2001 and the inability to complete farm visits, the 2000 report sample size was reduced by over one third. Due to this reduced sample size, data collected on the use of pesticide on potatoes, both grown and stored, was unreliable and had to be omitted from the report. Therefore, when comparisons are made between this, 2004 report, and previous reports, no comparisons can be made with the 2000 report in relation to total treatment of arable crops and both field and storage treatments of early, seed and maincrop potatoes.

INTRODUCTION

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

This is the eighth survey of pesticide usage on arable crops grown in Northern Ireland. Previous surveys reported on pesticide usage on arable crops grown in 1990 (Jess et al., 1992), 1992 (Jess *et al*., 1995), 1994 (Jess *et al.*, 1997), 1996 (Jess *et al.*, 2000), 1998 (Jess *et al.*, 2002), 2000 (Withers *et al.*, 2004) and 2002 (Withers *et al.*, 2004). Data from previous surveys are included in the report for comparative purposes.

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

METHODS

The sample of holdings to be surveyed was selected from each of the six counties on the basis of the total area of arable crops grown, using data from the Northern Ireland Agricultural Census, June 2003 (Anon., 2004). However, due to sampling procedures and the distribution of arable crops in Northern Ireland, no holdings were visited in County Fermanagh. The arable crops grown comprised the following; barley, wheat, oats, oilseed rape, peas and beans, triticale and potatoes.

The sample was stratified into six size groups, according to the total area of arable crops grown in each region. Holdings were selected at random within each of the size groups, the number of holdings being proportional to the total area of arable crops grown.

The purpose of the survey was explained to the occupiers of selected holdings in preliminary correspondence. A total of 293 holdings were visited during November 2004 to April 2005. A majority of data was collected by personal interview and the remainder by telephone interview. The data collected included; the area of crops grown, area treated, target crop, pesticides used and number of treatments applied. The growers' perceived reasons for pesticide use were also included but may not always seem appropriate. Holdings selected in the original sample that

were unable to provide data were replaced with those from the same county and size group held on a reserve list. During analysis, the sample data were raised to the total population level using raising factors calculated from the ratio of the number of farms sampled to the number of farms in the population within each region and size group. A further adjustment factor corrected the data in accordance with the areas of arable crops published in the Northern Ireland Agricultural Census, June 2004 (Anon., 2005). The total number of farms in each size group and the number of farms sampled are shown in Table 1.

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

RESULTS AND DISCUSSION

CROPS

The number and area of arable crops surveyed, together with the proportion of the crop area surveyed, are shown in Table 2. Data from 293 farms provided information on 1,076 examples in 16 crop types. The total area of crops sampled in the survey represented 24% of the area of arable crops grown in Northern Ireland in 2004. Areas of arable crops grown in the six counties were estimated from survey data (Table 3, Figure 1) using raising factors discussed previously. Approximately 44% of the area of arable crops was grown in County Down, 23% in County Londonderry, 16% in County Antrim, 8% in County Tyrone and 9% in County Armagh. There was no significant area of arable cropping in County Fermanagh.

Barley crops, including spring barley (45%), undersown barley (1%) and winter barley (9%) were grown on 55% of the total arable area. Potato crops, comprising maincrop (9%), seed (2%) and early potatoes (1%) collectively accounted for 12% of the total arable crop area (Table 3, Figure 2). A further 18% of the arable area comprised spring and winter wheat crops, while minor crops, including oats, oilseed rape etc. accounted for the remaining 15% of the total arable area.

REGIONAL PESTICIDE USAGE

Overall, regional pesticide usage closely approximated to the areas of arable crops grown in each county (Table 4, Figure 3). County Down accounted for 45%, County Londonderry 21%, County Antrim 15%, County Armagh 10% and County Tyrone 8% of the total pesticide-treated area. Counties Down and Londonderry accounted for 73% of both molluscicide and insecticide usage.

PESTICIDE USAGE ON CROPS

The basic area of individual crops treated with pesticides approximated to the areas grown (Tables 3 & 5). Collectively, barley crops accounted for 44% of the total pesticide-treated area and 13% of the total weight of pesticides applied (Tables 5 & 6). Barley crops also accounted for 51% of the insecticide-treated area of arable crops and 69% of the total weight of insecticide active ingredients applied. In addition, applications of herbicides and desiccants to barley crops accounted for 55% of the herbicide and desiccant-treated area of arable crops but only 11% of the weight of this pesticide group applied. Fungicide application to barley crops, accounted for 31% of the total area of arable crops treated with this pesticide group and 13% of the weight of fungicide active ingredients applied. Application of growth regulators to barley crops accounted for 47% of the total area of arable crops treated with this pesticide group and 42% of the weight of growth regulator active ingredients applied. Furthermore, barley crops accounted for 61% of the area of seed treatment applications and 43% of the weight of seed treatment active ingredients applied.

Wheat crops accounted for 29% of arable crops treated with insecticides. Application of growth regulators to wheat crops accounted for 45% of the total area of arable crops treated with this pesticide group and 48% of the weight of growth regulator active ingredients applied. These crops also represented 28% of the arable area treated with fungicides and 20% of the arable area treated with herbicides/desiccants. Applications of molluscicides to wheat crops accounted for 43% of the arable area treated with this pesticide group and 55% of the weight applied.

Potato crops were grown on 13% of the total area of arable crops, representing 37% of the area of arable crops receiving fungicide application, comprising 72% of the weight of fungicide active ingredients applied. The area of potato crops receiving herbicide and desiccant treatments was 19% of the total herbicide/desiccant-treated area. However, owing to the use of sulphuric acid as a haulm desiccant, the weight of herbicides and desiccants applied to potato crops was equivalent to 83% of the weight of this pesticide group applied to arable crops. Application of molluscicide treatments to maincrop potatoes accounted for 34% of the total area of arable crops treated with this pesticide group and 30% of the weight of molluscicide active ingredients.

PROPORTION OF CROPS TREATED

The proportional areas of crops treated with different pesticide groups, together with the number of spray applications are shown in Table 7. Pesticides were applied to 82% of the total area of arable crops grown, and all crop types received a minimum of one application from one of the pesticide groups. There were more than eight fungicide spray applications to maincrop and seed potatoes.

Herbicides and desiccants were applied to 82% of arable crops grown. All crop types received herbicide and/or desiccant treatment, with 100% of early potatoes being treated with this pesticide group.

Fungicides were applied to 69% of the area of arable crops grown in 2004, with 96%, 90% and 89% of maincrop, early and seed potato crops being treated, respectively. Approximately 90% of winter wheat crops received fungicide treatment, whereas 57% of spring wheat was treated with this pesticide group. Fungicides were applied to 88% of all winter barley crops

Pre-planting seed treatments were applied to 67% of all arable crops. Over 80% of undersown barley, winter barley, winter wheat and winter oat crops were sown with treated seed. With regard to potatoes, 93% of seed, 53% of early and 48% of maincrop potatoes received seed treatments.

Molluscicides, which are only available as single active ingredients, were applied to 1% of arable crops. Other pesticide groups are available both as single active ingredients and in formulations. Winter barley (2%), winter wheat (2%) and maincrop potatoes (3%) were the only arable crops to receive a single application of this pesticide group. Insecticide treatments were applied to 45% of the area of arable crops grown. Approximately 73% of winter wheat and 71% of winter barley crops were treated with insecticides. While 48% of seed potatoes were treated with insecticides, 30% of maincrop and 16% of early crops received insecticide treatments.

Growth regulators were applied to 26% of the total area of arable crops. More than 74% of winter wheat crops and 52% of winter barley received applications of growth regulators on at least one occasion. The majority of cereal crop types received growth regulator treatments, the exceptions being undersown oats and undersown barley.

TOTAL PESTICIDE USAGE

Approximately 341 tonnes of pesticide active ingredients were applied to 325,299 spray-hectares in 2004.

Fungicides were applied to 43% of the pesticide-treated area accounting for 21% of the total weight of pesticides used (Tables 8 & 9). Potato crops, including seed, early and maincrop varieties, received 72% of the weight of fungicide active ingredients representing 37% of the area treated with fungicides. Cereal crops received 27% of the weight of fungicide active ingredients accounting for 62% of the area treated with fungicides. Epoxiconazole, used exclusively on cereals and in particular winter wheat and spring barley, was the most extensively used fungicide applied as a single active ingredient, representing 12% (16,251sp ha) of the fungicide-treated area but only 1% of the weight of fungicide active ingredients applied. However, in formulation with dimoxystrobin, fenpropimorph, kresoxim-methyl and pyraclostrobin, epoxiconazole was applied to a further 15% of the fungicide-treated area and accounted for another 3% of the weight of fungicides applied. Fluazinam, which was used exclusively on potatoes, accounted for 12% (16,138sp ha) of the fungicide treated area and 3% of the weight of fungicide active ingredients applied. Mancozeb, applied as a single active ingredient and in formulation with other compounds, was applied to 21% of the fungicide-treated area and accounted for 54% of the weight of fungicide active ingredients applied. Azoxystrobin, applied as a single active ingredient, was the most commonly used fungicide on spring barley, used on 7% of the fungicide-treated area but accounting for less than 3% of the weight of fungicide active ingredients applied. Resistance of *Septoria tritici* blotch to strobilurin fungicides has not so far been reflected in their use on cereals in Northern Ireland.

Herbicides and desiccants were applied to 32% of the pesticide-treated area accounting for 75% of the total weight of pesticides used. Sulphuric acid, used as a potato haulm desiccant, accounted for 79% of the weight of herbicide and desiccant active ingredients applied. However, owing to the high concentration of the acid in product formulation, the area treated with this active ingredient represented only 1% of the total herbicide/desiccant-treated area. Cereals accounted for 79% of the area treated with herbicides and desiccants, while the weight of herbicide and desiccant active ingredients applied to cereal crops, represented 17% of the total weight of herbicides and desiccants used. Treatments to spring barley crops accounted for 44% of the herbicide and desiccant-treated area, representing 7% of the weight of herbicide and desiccant active ingredients applied. The sulfonylurea herbicide, metsulfuron-methyl, applied as a single active ingredient, and the non-selective phosphonic acid herbicide, glyphosate, were the most extensively used herbicides on cereal crops, particularly spring

barley, each accounting for 18% of the herbicide and desiccant-treated area of cereal crops. Owing to the low application rate of metsulfuron-methyl, the weight of this active ingredient applied represented less than 1% of the total weight of herbicides and desiccants used, whereas glyphosate accounted for 6%. Isoproturon, applied as a single active ingredient or in formulation with diflufenican, pendimethalin or trifluralin, was applied to 39% of the herbicide and desiccant-treated area of winter barley and winter wheat crops.

Insecticides were used on 10% of the pesticide-treated area of arable crops, accounting for less than 1% of the weight of pesticides used. Pyrethroid active ingredients accounted for 86% the insecticide-treated area but only 13% of the weight of insecticides used. The pyrethroid lambda-cyhalothrin was the most commonly used active ingredient, applied to most arable crops but primarily spring barley, winter barley and winter wheat, accounting for 36% of the insecticide-treated arable area.

Methiocarb and metaldehyde, were the only molluscicide active ingredients recorded and accounted for less than 1% of pesticide use in both area of application and weight of pesticides applied. These active ingredients were applied to winter barley, winter wheat and maincrop potatoes principally for slug control.

Growth regulators were used on 5% of the pesticide-treated area and accounted for 3% of the weight of active ingredients used. Growth regulators were applied primarily to spring barley, winter barley and most frequently, winter wheat. Chlormequat was the most commonly used growth regulator active ingredient, accounting for 67% of the area treated with growth regulators and 87% of the weight of growth regulators applied. Formulations of 2-chloroethylphosphonic acid with mepiquat chloride and the single active ingredient trinexapac-ethyl were also used on cereal crops.

Seed treatments applied to arable crops, accounted for 10% of the pesticide-treated area, with the seed dressing accounting for less than 1% of the weight of active ingredients applied. Overall, 86% of cereal crops and 90% of potato crops were grown from treated seed. The single active ingredients fludioxonil and imazalil were the most commonly used seed treatments and were applied to cereals and potatoes, respectively.

The areas of each crop treated with pesticide formulations, and the quantities of pesticide active ingredients applied to each crop type, are shown in Tables 8 and 9, respectively. The fifty most commonly used active ingredients, prioritised by area treated and weight applied, are shown in Tables 10 and 11, respectively.

PESTICIDE USAGE ON CEREALS

Spring barley (Table 12)

Overall, 87% of spring barley crops received pesticide treatments (Table 7). Applications of herbicides and desiccants to spring barley accounted for 42% of the pesticide-treated area (62% of the weight of pesticides applied), fungicides 27% (22%), seed treatments 15% (2%), insecticides 11% (3%) and growth regulators 4% (11%). Molluscicides were not used on spring barley crops during 2004 (Tables 5 & 6).

The fungicide single active ingredient epoxiconazole, primarily applied for general disease control, accounted for 18% of the fungicide-treated area and was the most extensively-used fungicide active ingredient. The formulation carbendazim/flusilazole and azoxystrobin, applied as a single active ingredient, accounted for 12% and 11% of the fungicide-treated area of spring barley, respectively. More than 96% of fungicide applications were for general disease control, while 3% were specifically to control Rhynchosporium and 1% mildew (*Blumeria graminis f.sp. hordei).*

The most extensively used herbicide was metsulfuron-methyl, applied generally as a single active ingredient, but also in formulations with thifensulfuron-methyl or tribenuron-methyl. This was used primarily for ‘general weed control’. Because of its low application rate per hectare, the weight of metsulfuron-methyl used represented only 3% of the herbicide active ingredients applied to spring barley, while accounting for 39% of the herbicide-treated area. Metsulfuron-methyl continued to be the preferred sulfonylurea herbicide for spring barley crops in 2004. Glyphosate, commonly used for ‘general weed control’, ‘ground preparation’ and ‘desiccation’ represented 25% of the herbicide-treated area and 49% of the weight applied.

The primary targets for insecticide application to spring barley were ‘aphids’, with more than 77% of applications being used for this purpose. Pyrethroids, primarily esfenvalerate, lambda-cyhalothrin and deltamethrin, represented 85% of insecticide applications to spring barley crops and 10% of weight applied. However, the organophosphate chlorpyrifos, generally applied to control leatherjackets (*Tipula* spp.), accounted for 14% of the insecticide-treated area and 89% of the weight of insecticide active ingredients applied.

Approximately 17% of the area of spring barley grown was treated with growth regulators (Table 7). Chlormequat, applied as a single active ingredient, accounted for 60% of the growth regulator treated area. The single active ingredients, trinexapac-ethyl and 2-chloroethylphosphonic acid or the formulations 2-chloroethylphosphonic acid with mepiquat chloride or chlormequat, were used on the remaining 40% of this treated area.

Approximately 73% of spring barley was treated with a single seed dressing (Table 7). Almost 54% of this area was grown from seed treated with the single active ingredient fludioxonil, representing 11% of the weight of seed treatments used (Tables 8 & 9). The formulation carboxin/thiram was used on a further 11% of the area of spring barley grown with treated seed and accounted for 50% of the weight of seed treatment active ingredients used.

Undersown barley (Table 13)

Approximately 93% (557 hectares) of undersown barley crops were treated with a pesticide (Table 7). Herbicides and desiccants accounted for 54% of the pesticide-treated area of undersown barley (93% of the weight of pesticides applied) and seed treatments represented the remaining 46% (7%). Fungicides, insecticides, growth regulators and molluscicides were not recorded in use on undersown barley crops in 2004 (Tables 5 & 6).

Formulations comprising 2,4-DB and MCPA with either benazolin or linuron were the most frequently used herbicides. Collectively, these formulations accounted for 93% of the herbicide and desiccant-treated area and 96% of the weight applied. The reason given for over 97% of herbicide applications was ‘general weed control’ with the remaining 3% being attributed to ‘ground preparation’.

The single active ingredient fludioxonil, used on over 44% of the area sown with treated seed, accounted for 4% of the weight of seed treatment active ingredients applied to undersown barley crops. The formulation carboxin/thiram accounted for 32% of the area sown with treated seed and 78% of the weight of seed treatment active ingredients applied (Tables 8 & 9).

Winter barley (Table 14)

Fungicides were used on 39% of the area of winter barley treated with pesticides, herbicides and desiccants 30%, insecticides 12%, seed treatments 10% and growth regulators 9%. However, herbicides and desiccants accounted for 62% of the total weight of pesticide active ingredients applied, fungicides 22%, growth regulators 17%, seed treatments 2% and insecticides 2%. Molluscicides accounted for less than 1% of both area of application and weight of pesticides applied (Tables 5 & 6).

Epoxiconazole, applied as a single active ingredient or in formulations with fenpropimorph and kresoxim-methyl, accounted for 17% and 10% of the fungicide-treated area and weight of fungicide applied, respectively. Azoxystrobin, as a single active ingredient or in formulation with fenpropimorph, was also frequently used. ‘General disease control’ was the primary reason given for 96% of fungicide applications.

Twenty five herbicide/desiccant single active ingredients or formulations were applied to winter barley crops in 2004. Isoproturon, as a single active ingredient or in formulation with pendimethalin, was the most commonly used herbicide, accounting for 29% of the herbicide and desiccant-treated area and 44% of the weight of herbicide and desiccant active ingredients applied. Glyphosate accounted for 22% of the area of application and 21% of weight applied. 'General weed control' was the reason given for 67% of herbicide applications to winter barley crops.

Pyrethroid insecticide active ingredients collectively accounted for 91% of the insecticide-treated area with the single active ingredients lambda-cyhalothrin and esfenvalerate representing 65% of this. Chlorpyrifos was applied to 403 spray-hectares of winter barley, primarily for the control of 'leatherjackets' (*Tipula* spp.). 'Aphid control' continued to be the main reason for the use of insecticides.

Metaldehyde and methiocarb were recorded as used for 'slug control' on 78 hectares of winter barley grown in 2004.

Chlormequat, applied as a single active ingredient, accounting 47% of the area treated with growth regulators and 75% of the weight of growth regulators applied. The growth regulator 2-chloroethylphosphonic acid, used as a single active ingredient or in formulation with mepiquat chloride, accounted for 28% of the area treated, with the remainder being treated by trinexapac-ethyl (22%) and the formulation chlormequat/2-chloroethylphosphonic acid (3%).

Approximately 81% of the area of winter barley was sown with treated seed (Table 7). The most extensively-used seed dressing was the single active ingredient fludioxonil, which accounted for 46% of the area of winter barley sown with treated seed and 7% of the weight of seed treatments used. The formulation carboxin/thiram, represented 14% of the area sown with treated seed and 47% of the weight applied (Tables 8 & 9).

Spring wheat (Table 15)

Fungicides accounted for 37% of the pesticide-treated area and 33% of the weight applied, while herbicide and desiccant applications represented 33% of the treated area and 45% of the weight used. Growth regulators were used on 7% of the pesticide-treated area and accounted for 20% of the weight of active ingredients used. While seed treatments accounted for 12% of the pesticide-treated area of spring wheat, the weight of active ingredients represented 2% of the pesticides applied to this crop. Insecticides were used on 10% of the pesticide-treated area and accounted for less than 1% of the total weight of pesticides used (Tables 5 & 6).

‘General disease control’ was the main reason attributed to the fungicide-treated area of spring wheat crops (84%). Fenpropimorph, applied as a single active ingredient and also in formulation with epoxiconazole, kresoxim-methyl, pyraclostrobin, flusilazole or, principally, quinoxyfen, accounted for 27% of the fungicide-treated area and 30% of the weight of fungicide active ingredients applied to this crop. The single active ingredient azoxystrobin was used on 12% of the fungicide-treated area and accounted for 8% of the weight of fungicide active ingredients applied. The formulation fluquinconazole/prochloraz accounted for 19% of the weight of fungicide active ingredients applied and 16% of the fungicide-treated area.

‘General weed control’ was the principal reason (72%) given for herbicide and desiccant usage. Glyphosate, used as a single active ingredient for ‘desiccation’ and ‘ground preparation’, accounted for 26% of the herbicide and desiccant-treated area and 45% of the weight applied to spring wheat crops. Metsulfuron-methyl, applied as a single active ingredient and also in formulation with thifensulfuron-methyl and tribenuron-methyl, represented 35% of the herbicide and desiccant-treated area and less than 1% of the weight applied.

Esfenvalerate accounted for 54% of the area treated with insecticides and was applied principally for ‘general insect control’.

Chlormequat was the only growth regulator recorded as applied to spring wheat in 2004.

Approximately 78% of spring wheat crops were sown with treated seed (Table 7). The single active ingredient fludioxonil was most frequently used, accounting for 59% of the area treated within this pesticide group.

No undersown spring wheat was recorded grown in 2004.

Winter wheat (Table 16)

A total of 7,111 hectares of winter wheat were grown in Northern Ireland in 2004, approximately 60% of which was grown in Co Down (Table 3). This represented a 22% increase compared with 2002. Fungicides accounted for 48% of the pesticide-treated area of winter wheat crops and 32% of the weight of pesticides used, while herbicides and desiccants represented 24% of the pesticide treated area and 47% of the weight of pesticides applied. Growth regulators accounted for 9% of the pesticide-treated area and 20% of the weight applied. Seed treatments represented 8% of the pesticide-treated area and less than 1% of the weight of pesticides applied. Insecticide treatments accounted for 11% of the pesticide-treated

area and less than 1% of the weight used. Molluscicides represented less than 1% in both area of application and weight of pesticides applied (Tables 5 & 6).

'General disease control' was the reason given for 96% of the fungicide applications to winter wheat. Epoxiconazole, used as a single active ingredient or in formulation with cyproconazole, fenpropimorph, kresoxim-methyl and/or pyraclostrobin, was the most extensively-used fungicide active ingredient, accounting for 27% of the fungicide-treated area. Chlorothalonil and azoxystrobin appled as single active ingredients were also frequently used.

The most extensively-used herbicide and desiccant, applied as a single active ingredient or in formulation, was isoproturon. Applications of this active ingredient accounted for 39% of the winter wheat area treated with this pesticide group and 58% of the weight applied. Approximately 75% of herbicide and desiccant applications were for 'general weed control'.

Insecticides, principally to control 'aphids', were applied as single active ingredients. The pyrethroid insecticides represented over 99% of the insecticide-treated area of winter wheat crops, while accounting for 79% of the weight of insecticides applied. Lambda-cyhalothrin was the most extensively-used insecticide representing 42% of the insecticide-treated area and 30% of the weight applied. Esfenvalerate was also frequently used. The only organophosphate insecticide used was chlorpyrifos, which was applied to less than 1% of the insecticide-treated area of winter wheat crops, accounting for 21% of the weight of insecticides applied. The main reasons for insecticide applications were to 'control aphids' and 'general insect control'.

The molluscicides metaldehyde and methiocarb, were applied to 145 hectares of winter wheat to control 'slugs'.

The growth regulator chlormequat, primarily used as a single active ingredient but also in formulation with 2-chloroethylphosphonic acid, accounted for 79% of the growth regulator-treated area of winter wheat and 95% of the weight of growth regulators applied.

Spring oats (Table 17)

Herbicides and desiccants accounted for 51% of the pesticide-treated area of spring oats, and 64% of the weight applied. While fungicides accounted for 25% of the pesticide-treated area of spring oats, the weight applied represented 18% of the total weight of pesticides used. The area sown with treated seed represented 13% of the pesticide-treated area and seed dressings accounted for 3% of the weight of pesticides applied. Growth regulators accounted for 7% and 14% of the pesticide-treated area and weight applied, respectively. Insecticides accounted for 5% and less than 1% of the pesticide-treated area and weight applied, respectively (Tables 5 & 6).

The principal reason given for fungicide usage was ‘general disease control’. Azoxystrobin accounted for 24% of the fungicide-treated area. Metrafenone accounted for a further 16%.

Metsulfuron-methyl, generally applied as a single active ingredient, was used on 46% of the herbicide-treated area of spring oats for, ‘general weed control’. However, this represented less than 1% of the weight of herbicides applied. Applications of glyphosate, used as single active ingredient for ‘desiccation’ and ‘ground preparation’, accounted for 71% of the weight applied and yet only 27% of the herbicide-treated area. Amidosulfuron was also frequently applied

Pyrethroid insecticide applications applied to spring oats, were used to ‘control aphids’. The organophosphate insecticide, chlorpyrifos, was applied to 9 hectares to control leatherjackets (*Tipula* spp.).

The single active ingredients 2-chloroethylphosphonic acid, chlormequat and trinexapac-ethyl were applied to 190 hectares of spring oats with 2-chloroethylphosphonic acid accounting for 50% of the area treated with growth regulators and chlormequat representing 85% of the weight applied.

Approximately 40% of the area of spring oats was sown with treated seed (Table 7). The single active ingredient fludioxonil represented 56% of the treated area (Table 8).

Winter oats (Table 18)

Herbicide and desiccant applications represented 32% of the pesticide-treated area and 36% of the weight of pesticides applied. Fungicides accounted for 30% and 25% of the pesticide-treated area of winter oats and the weight applied, respectively. While seed treatments accounted for 15% of the pesticide-treated area, the weight of active ingredients represented 2% of the pesticides applied to this crop. Insecticide treatments accounted for 12% of the pesticide-treated area and less than 1% of the weight of pesticides used. Growth regulator usage represented 11% of the pesticide-treated area and 37% of the weight of pesticides used (Tables 8 & 9).

Fenpropimorph, applied a single active ingredient and in formulation with quinoxyfen and azoxystrobin, was the most extensively used fungicide, accounting for 41% of the fungicide-treated area and 67% of the weight applied. The principal reason for the use of fungicides on winter oats was ‘general disease control’.

The principal reason for herbicide and desiccant applications (75%) was ‘general weed control’. Amidosulfuron, applied as a single active ingredient, accounted for 26% of the

herbicide-treated area but less than 2% of the weight applied. Metsulfuron-methyl and glyphosate, used as single active ingredients, and the formulation bromoxynil/ioxynil accounted for 18%, 16% and 15% of the herbicide-treated area, respectively.

Pyrethroid insecticide active ingredients accounted for 99% of the insecticide-treated area of this crop. Lambda-cyhalothrin & deltamethrin were the most extensively used insecticide active ingredients, collectively accounting for 79% of the treated area. The organophosphate chlorpyrifos was the only non-pyrethroid insecticide to be used.

The single active ingredients chlormequat and trinexapac-ethyl were the only growth regulators used on 771 hectares of winter oats.

Approximately 87% of the area of winter oats grown in Northern Ireland in 2004, was sown with treated seed (Table 7). The single active ingredient fludioxonil was the most extensively-used seed dressing, accounting for 74% of the treated area and 16% of the weight applied. The formulation guazatine/imazalil was used on 20% of the treated area and accounted for 67% of the weight applied.

Undersown oats (Table 19)

In 2004, 234 hectares of undersown oats were grown. This represented a ten-fold increase compared to 2002. Herbicides (52%) and seed treatments (48%) were the only pesticides applied (Tables 8 & 9).

PESTICIDE USAGE ON POTATOES

Potato crops represented 13% of the area of arable crops grown in Northern Ireland in 2004, while accounting for 25% of the total pesticide-treated area. However, the weight of pesticides applied to potato crops represented 77% of the total weight of pesticides used. The total area of potatoes grown comprised 74% maincrop, 19% seed and 7% early potatoes. Maincrop potatoes accounted for 73% of the total area of potatoes treated with pesticides, and 74% of the total weight of pesticides applied. Seed potatoes accounted for 22% of the area treated and 16% of the weight applied. Early potatoes represented 4% of the area treated and 10% of the weight applied. (Tables 3, 5 & 6).

Seed potatoes (Table 20)

Fungicides accounted for 57% of the area of seed potatoes treated with pesticides, while representing 21% of the weight of pesticides applied. Conversely, herbicides and desiccants represented 27% of the pesticide treated area and 77% of the weight applied. Approximately 93% of the area of seed potatoes grown was planted with treated seed. This area represented 7% of the treated area of this crop and 1% of the weight applied. Insecticides accounted for 9% of the treated area and less than 1% of the weight of pesticides applied to seed potato crops (Tables 5 & 6). Molluscicides were not applied to seed potato crops in Northern Ireland in 2004.

Mancozeb, used as a single active ingredient or in formulation, continued to be the fungicide active ingredient most extensively used, accounting for 86% of the weight of fungicides applied. However, fluazinam, applied as a single active ingredient or in formulation with metalaxyl-M, was also frequently used. Approximately 81% of fungicide applications were for ‘blight control’ *(Phytophthora infestans).*

Diquat, used for ‘desiccation’, accounted for 47% of the area of seed potatoes treated with herbicides and desiccants. Applications of sulphuric acid represented 4% of the herbicide and desiccant-treated area, but accounted for 94% of the weight of active ingredients used from this pesticide group. Approximately 54% of this group of pesticides were used for ‘desiccation’.

Approximately 1,589 spray hectares of seed potatoes were treated with insecticides in 2004. The formulation deltamethrin/pirimicarb, along with the single active ingredients lambda-cyhalothrin, dimethoate and pirimicarb were all used, entirely for ‘aphid control’.

No molluscicides were applied.

Imazalil, applied as a single active ingredient or in formulation with pencycuron, accounted for 99% of both the area planted with treated seed and the weight of seed treatments used.

Early potatoes (Table 21)

Early potato varieties accounted for approximately 7% of the area of potatoes grown and 4% of the pesticide treated area (10% of the weight applied). Fungicides accounted for 62% of the pesticide-treated area (9%), herbicides and desiccants 24% (91%), insecticides 8% (<1%) and seed treatments 6% (<1%). Molluscicides were not recorded as applied to early potato crops in Northern Ireland in 2004 (Tables 5 & 6).

The dithiocarbamate fungicide mancozeb, applied as a single active ingredient or in formulations accounted for 82% of the weight of fungicide used. Fluazinam, applied as a single active ingredient, was used on 32% of the fungicide-treated area for early potatoes. Approximately 91% of fungicide applications were to control 'blight' (*Phytophthora infestans).*

Paraquat, applied as a single active ingredient, was the principal herbicide and was used on 39% of early potato crops for 'general weed control'. Both diquat and sulphuric acid were applied as 'haulm desiccants' and 59% of herbicides applied to the treated area were for 'broad-spectrum weed control'.

The pyrethroid, lambda-cyhalothrin, was the main insecticide used, accounting for 56% of the area treated and representing less than 1% of the weight of insecticide applied. The carbamate, pirimicarb, and the novel azomethine insecticide, pymetrozine, were also used. Applications were solely for the control of 'aphids'.

No molluscicides were recorded in use on this crop.

The area of early varieties of potatoes planted with treated seed represented 53% of the total area of early potatoes grown. Imazalil applied as a single active ingredient or in formulation with pencycuron were the only seed treatments applied.

Maincrop potatoes (Table 22)

Fungicides accounted for 68% of the area of maincrop potatoes treated with pesticides (20% of the weight of pesticides applied), herbicides and desiccants 24% (79%) and insecticides 4% (less than 1%). Seed treatments accounted for 4% of the pesticide-treated area and less than 1% of pesticides in terms of weight applied. Molluscicides represented less than 1% of both the pesticide-treated area and weight applied. No growth regulators or mixed formulations were applied to maincrop potatoes in 2004. (Tables 5 & 6).

An estimated 96% of the area of maincrop potatoes received a fungicide application (Table 7). Applications of mancozeb, as a single active ingredient and in formulation, accounted for 55% of the fungicide-treated area and 71% of the weight applied. Fluazinam, applied as a single active ingredient, was also frequently used. Approximately 69% of fungicide applications to maincrop potatoes were for the 'control of blight' (*P. infestans)*.

'General weed control' and 'desiccation' accounted for 84% of all herbicide and desiccant applications. Paraquat and diquat, applied as single active ingredients and in formulation together, were the most extensively used herbicide and desiccants, comprising 58% of the area treated. Because of the high concentration and rate of application, sulphuric acid, used on only 6% of the herbicide and desiccant-treated area, accounted for 95% of the weight of active ingredients used from this pesticide group. Metribuzin was also frequently used.

The insecticide lambda-cyhalothrin, applied as a single active ingredient, accounted for 65% of the insecticide-treated area. The azomethine insecticide pymetrozine was applied to 24% of the treated area but represented 75% of the weight of insecticides applied. Approximately 96% of insecticide applications to maincrop potatoes were to control aphids.

The molluscicides methiocarb or metaldehyde were applied to 114 hectares of maincrop potatoes for 'slug control'.

Seed treatments were applied to approximately 48% of the area planted with maincrop potatoes (Table 7). Imazalil, applied as a single active ingredient or in formulations with pencycuron, accounted for 95% of the area sown and 76% of the weight applied within this group. The single active ingredients thiabendazole and flutolanil were also used (Tables 8 & 9).

PESTICIDE USAGE ON MINOR CROPS:

Oilseed rape (Table 23)

Approximately 255 hectares of oilseed rape were grown in Northern Ireland in 2004. Herbicides and desiccants were applied to 53% of the pesticide-treated area (accounting for 89% of the weight of pesticides applied), fungicides 28% (10%), seed treatments 13% (<1%), and insecticides 6% (<1%). No molluscicides were applied in 2004 (Tables 5 & 6).
All fungicides were applied for 'general disease control'. Difenoconazole was the main single active ingredient used, accounting for 40% of the treated area.

An estimated 67% of herbicide applications were for 'general weed control' with the remainder for 'desiccation'. Metazachlor was applied to 33% of the herbicide and desiccant-

treated area and represented 61% of the weight of herbicides and desiccants applied. Diquat and glyphosate were used solely as ‘desiccants’. All five herbicides and desiccants were applied as single active ingredients.

The only insecticide recorded was the pyrethroid lambda-cyhalothrin, which was applied to control ‘aphids’.

Molluscicides were not applied to oilseed rape in 2004

Approximately 41% of the area of oilseed rape crops grown was sown with treated seed ((Table 7). Thiram, as a single active ingredient, was the only known seed treatment recorded (Tables 8 & 9).

Peas & Beans (Table 24)

Peas and beans have been recorded in Northern Ireland since 1998. Approximately 740kg of pesticides were used on a total of 212 hectares in 2004, 57% of which were grown in County Down and 43% in Armagh (Table 3 & 6).

Fungicides accounted for 56% of the area treated with pesticides (73% of the weight of pesticides applied), herbicides and desiccants 27% (27%), insecticides 16% (<1%) and seed treatments 1% (<1%) (Tables 5 & 6).

Chlorothalonil was the main fungicide active ingredient used. ‘General disease control’ was the only reason for application recorded.

Bentazone, cycloxydim and simazine, applied as a single active ingredients, accounted for 85% of the herbicide and desiccant-treated area and 71% of the weight applied. Glyphosate was applied to 24 hectares for ‘desiccation’.

The pyrethroids lambda-cyhalothrin, deltamethrin and cypermethrin were the only insecticides applied and ‘general insect control’ was the principal reason given for their use.

No molluscicides were applied.

Triticale (Table 25)

An estimated 182 hectares of triticale were grown in Northern Ireland in 2004 (Table 3). Herbicide and desiccant applications were used on 44% of the pesticide-treated area and accounted for 57% of the weight applied. Fungicides accounted for 28% and 22% of the

pesticide-treated area of triticale and the weight applied, respectively. Insecticide treatments accounted for 6% of the pesticide-treated area and less than 1% of the weight applied. Growth regulators were used on 10% of the pesticide-treated area and accounted for 17% of the weight of pesticides applied to triticale (Tables 5 & 6). Approximately 49% of the area grown was sown with treated seed (Table 7). This area represented 11% of the treated area of this crop and seed dressings accounted for 5% of the weight of pesticides applied.

The sole reason for fungicide applications was 'general disease control'. Collectively, applications of the single active ingredient chlorothalonil and the formulation epoxiconazole/kresoxim-methyl accounted for 72% of the fungicide-treated area and 91% of the weight of fungicides applied.

Generally, herbicides were applied for 'general weed control'. However, glyphosate was also applied for 'dessication' and 'ground preparation' purposes and represented 30% of the herbicide-treated area and 41% of the weight applied.

The single active ingredients, 2-chloroethylphosphonic acid, chlormequat and trinexapac-ethyl, along with the formulation 2-chloroethylphosphonic acid/mepiquat chloride were collectively applied to 84 hectares of triticale.

Lambda-cyhalothrin was the only insecticide used and was applied to 54 hectares of triticale to control 'aphids'.

Lupins (Table 26)

Lupins were recorded for the first time in 2002 and the area grown was approximately 67 hectares. However, in 2004 the area of lupins grown had reduced to 10 hectares, all in County Down (Table 3).

Herbicides were the only pesticides applied to this crop. Pendimethalin was applied to this area for 'general weed control' and glyphosate for 'dessication'.

PESTICIDE USAGE ON SET-ASIDE (Table 27)

Set-aside was recorded for the third time in 2004, at an estimated 3,394 hectares.

Two herbicides were used on 657 hectares of set-aside. The single active ingredient glyphosate accounted for 98% of the herbicide-treated area and the weight of active ingredients applied.

COMPARISON WITH PREVIOUS SURVEYS OF PESTICIDE USAGE ON THE AREAS OF ARABLE CROPS GROWN. (Table 28)

The total area of arable crops grown in Northern Ireland in 2004 remained approximately the same as that recorded in the 2002 survey. However, this represented a 21% and 16% reduction in the area of arable crops grown when compared to that recorded in 1990 and 1992, respectively.

Overall, the area of cereal production remained unchanged when compared to that recorded in 2002. However, the area of most cereal crops increased, with exceptions being spring and undersown barley crops which decreased by 3% and 68%, respectively. The area of undersown oat crops grown showed a ten-fold increase, to 234 hectares, when compared to 2002.

The area of potato crops planted in 2004 was 10% lower than that recorded in 2002 and 19% lower than the area in 1998. The area of seed potato crops has reduced by 69% since 1992. A similar trend is applicable to maincrop potatoes, with the area grown in 2004 having reduced by 5% and 18% when compared with 2002 and 1998, respectively. The area of early potato crops decreased by 45% compared with 2002 and was similar to the area grown in 1998.

The area of oilseed rape grown increased more than two-fold when compared to 2002.

Triticale crops, which were first recorded in 1990, were again recorded in 2004. Having recurred in 1998, the crop area has increased almost four-fold from 2002.

The area of peas and beans has increased by 7% when compared to 2002.

Lupins were recorded for the first time in 2002 and have again been recorded. However, the area grown has reduced by 85% to 10 hectares, all grown in County Down.

TRENDS IN PESTICIDE USAGE

Comparison with previous surveys

ARABLE (Tables 29 & 30)

Overall, a 1% increase in the area of arable crops grown was recorded between 2002 and 2004. During this period the total area of pesticide application to arable crops has increased by 13%. However, the weight of pesticides applied decreased by 31%.

There was an 82% decrease in the area treated and weight of molluscicides applied when compared with 2002.

The area treated with insecticides and the weight of insecticides applied, increased by 57% and 77%, respectively, during the period 2002 to 2004. The principal reason for this was that the area treated with organophosphates had increased by 91% and the weight applied by 88%. This was mainly attributable the application of chlorpyrifos to spring barley for the control of 'leatherjackets' (Tipula spp.). Applications of pyrethroids increased by 49% with a 3% reduction in the weight applied.

The area of fungicide application increased by 9%. However, the weight applied represented a 17% reduction.

The area of application of growth regulators reduced by 5%, although the weight applied remained similar to 2002 levels.

The area of arable crops sown or planted with treated seed in 2004, and the weight of seed treatment applied, decreased by 5% and 19% respectively in comparison with the 2002 survey.

CEREALS (Tables 31& 32)

The total area of cereal crops to which pesticides were applied increased by 22%, with the weight of pesticides applied also increasing by 17% when compared with 2002.

There was a 43% increase in the area treated with fungicides compared with 2002 and a corresponding increase of 26% in the weight of fungicides applied. The weight of fungicides applied was similar to the level recorded in 1992 but the area of fungicide application has increased over two-fold since then.

The area treated with insecticides and the weight of insecticides applied to cereal crops both increased by 47% when compared with 2002.

A reduction in both weight (38%) and area (27%) of molluscicide application to cereals was recorded when compared to 2002.

In comparison with 2002, the weight of herbicides and desiccants applied to cereals and area treated increased by 19%, with the weight applied being similar to levels recorded in 2000.

The area treated with growth regulators decreased by 5% compared to 2002 and the weight applied remained similar to that recorded then.

OILSEED RAPE (Tables 33& 34)

The area of oilseed rape grown had more than doubled when compared with 2002, which is reflected in increases in insecticide, fungicide, herbicide/desiccant and seed treatment usage. However, while the weight of insecticide, fungicide, herbicide/desiccant also increased, the weight of seed treatments applied decreased by 85%.

Growth regulators and molluscicides were not applied to oilseed rape in 2004.

PEAS AND BEANS (Tables 35 & 36)

The area of peas and beans grown has increased by 7% since 2002.

The area treated increased by 51%, mainly due to increased usage of insecticides, fungicides and herbicides/desiccants. The total weight of pesticide applied approximately doubled when compared to the level recorded in 2002. This was principally due to a five-fold increase in the weight of fungicides applied, as the quantities of both herbicides/desiccants and insecticides applied reduced by 23% and 69%, respectively.

Seed treatment applications and quantities applied reduced by over 80% when compared to 2002.

SET-ASIDE (Tables 37& 38)

The area of set-aside increased by 13% since 2002 to 3,394 hectares with herbicides being the only pesticide type applied. The area treated and weight applied have decreased by 53% and 47%, respectively.

POTATOES (Tables 39-46)

The total area of potatoes grown in 2004 decreased by 10% (6,068 hectares) when compared with 2002. This is the smallest area of potatoes grown since surveys began. Maincrop and seed potatoes showed moderate decreases in area grown of 5% and 7%, respectively. However, the area of early potatoes grown decreased significantly by 45% to 403 hectares, which was similar to that grown in 1998.

The overall usage of pesticides on potato crops, measured by application area of active ingredients, decreased by 9% compared with 2002. This was a reflection of the reduced area

grown. However, the weight of pesticides applied decreased by 38% over the same survey period. This was mainly attributed to the reduction in the weight of desiccants applied.
There was a decrease of 22% in fungicide application to potatoes compared with 2002, which was due to reduced fungicide inputs to both early and maincrop potatoes. This was reflected in a reduction of 27% in the weight of fungicides applied to potatoes.

Overall, in 2004 herbicide and desiccant application to potatoes increased by 34%, with the weight applied decreasing by 22%. This decrease can be mainly attributed to an reduction in application of sulphuric acid.

The insecticide-treated area of potato crops more than doubled in 2004 when compared with 2002. This was mainly due to the increased treated areas of early and seed potatoes, although maincrop treated areas increased also. This trend continued with the weight of insecticide applied increasing by almost five-fold, providing the highest level recorded since records began.

Both treated area and weight of molluscicide applied has reduced by over 90% when compared to 2002.

PESTICIDE USAGE ON POTATOES IN STORAGE (Tables 47-54)

In addition to information concerning field applications of pesticides to potato crops, data were collected relating to post-harvest/storage treatments applied to farm-stored potatoes. Data collected included; quantity of potatoes stored, the quantity treated, pesticides used, crop type and storage method. Of the 293 holdings visited, 60 grew potato crops, 56 of which stored potatoes on-farm. The data were raised to a province-wide level using raising factors discussed earlier.

An estimated 155,669 tonnes of potatoes were stored in Northern Ireland in 2004, of which, 3,772 tonnes were treated with pesticides.

County Antrim accounted for 25% of the potatoes grown and 34% of potatoes stored, and County Down 11% of the potatoes grown and 40% of potatoes stored. Counties Londonderry, Tyrone and Armagh represented 21%, 4% and 1% of all potatoes stored, respectively. No potato storage was recorded in County Fermanagh.

The total quantity of potatoes stored in Northern Ireland comprised 79% ware potatoes and 21% seed potatoes (Figure 4). County Armagh only stored ware potatoes, whereas the other four counties stored both types.

Approximately 2% of all potatoes stored received a pesticide treatment. County Down stored 78% of the total quantity treated and County Antrim 22%. No storage treatments were recorded in Counties Londonderry, Armagh and Tyrone (Figure 5).

An estimated 95% (147kg) of the quantity of pesticide active ingredients were applied in County Down with County Antrim accounting for the remaining 5% (7kg). Approximately 96% of the weight of pesticide active ingredients were applied to ware potato crops with the remaining 4% applied to seed potato crops.

The chlorobenzene fungicide and sprout suppressant tecnazene, applied as a single active ingredient to ware potatoes only, was the most frequently used active ingredient. It was applied to 2,937 tonnes (78% of the total) of treated potatoes in storage and represented 95% of the weight of pesticides applied. Imazilil was applied to the remaining 835 treated tonnes (22% of the total), representing 5% of the weight of pesticide active ingredients applied.

Potato stores were classified into five types; 'barn store', 'modified barn', 'ventilated store', 'refrigerated store' and 'unspecified'. Approximately 42% of potatoes held on-farm in 2004 were stored in barn stores, 28% in ventilated stores, 24% in refrigerated stores, 6% in modified barn stores and remainder being unspecified. Approximately 63% of all stored potatoes were boxed, 23% bulked and 13% held in stores with both boxes and bulk areas.

Seed Potatoes:

Seed potatoes accounted for 21% (33,321 tonnes) of the total quantity stored. An estimated 673 tonnes were treated with 5.5kg of pesticide active ingredients being applied. Imazalil, applied as a single active ingredient, was the only pesticide applied to stored seed potatoes.

An estimated 89% of all seed potatoes were stored in boxes with 10% being stored in bulk and the remaining 1% unknown. On-farm barn stores accounted for 30% of all types of storage buildings used, ventilated and refrigerated stores 28% each, modified barn stores 13% and 1% were unspecified.

Ware Potatoes:

Approximately 122,348 tonnes of ware potatoes were stored in 2004, accounting for 79% of the total quantity of potatoes stored. It was estimated that 39% were stored in County Down, 31% in County Antrim, 23% in County Londonderry, 4% in County Tyrone and 2% in County Armagh. However, only 3% were treated, with 148.5kg of pesticide being applied. Tecnazene, applied as a single active ingredient, was used on 95% of treated ware potatoes.

An estimated 56% of ware potatoes were stored in boxes and 27% in bulk. Approximately 55,942 tonnes (46%) were stored in barn stores, 34,279 tonnes (28%) in ventilated stores, 27,731 tonnes (23%) in refrigerated stores and 4,397 tonnes (4%) in modified barn stores.

COMPARISON OF PESTICIDE USAGE ON POTATOES IN STORAGE (Tables 55-58)

In 2002 potato storage levels decreased due to lower potato yields and extremely high rainfall which interrupted harvesting during the months of October and November, the main potato harvesting period in Northern Ireland. However, in 2004 the quantity of potatoes stored, increased by an estimated 78,026 tonnes when compared with 2002, returning to levels similar to 1998. An estimated 2% (3,772 tonnes) of potatoes stored were treated in 2004 compared with 22% (13,053 tonnes) in 2002 and 9% (14,051 tonnes) in 1998. The 3,772 tonnes represented a 71%, 73% and 90% reduction in quantity treated when considered with 2002, 1998 and 1996, respectively.

Reductions of 95% since 1992, 92% since 1994, 90% since 1996, 88% since 1998 and 68% since 2002 were recorded in the weight of pesticide active ingredients applied.

Imazalil was the most extensively applied pesticide in 2002 and 1998 treating 12,030 and 4,820 tonnes of potatoes, respectively. However, in 2004 the most extensively-used pesticide was tecnazene, which was used exclusively on 2,937 tonnes of ware potatoes.

In 1996 and 1998 the most popular type of storage building was the ‘barn store’ with ‘bulk’ storage being the most common method. Of those farms surveyed in 2002, the ‘barn store’ was the least popular with ‘refrigerated’ storage buildings and ‘boxed’ being the most extensively used. However, in 2004 the most popular type of storage building was the ‘barn store’ with ‘boxed’ being the most extensively used storage method.

The storage of ‘reserved seed’ was not recorded in 2004.

ACKNOWLEDGEMENTS

We, the authors, wish to thank all of the growers who participated in this survey without whose co-operation completion of this report would not have been possible. We are also grateful for the invaluable assistance of Mr Ross Neely (QUB) and the staff at the Scottish Agricultural Science Agency, Scottish Agricultural Statistics Service, Edinburgh and Central Science Laboratories, York. In addition, thanks are also given to Mrs Carol Hall (DARD) for information regarding the growing practices and storage of potatoes and Dr Peter Mercer (DARD) for advice on application of fungicides to cereals in Northern Ireland.

REFERENCES

Anon. (1998). Statistical Review of Northern Ireland Agriculture 1997. Norwich: HMSO.

Jess, S., McCallion, T., Kidd, S.L.B. (1992). Arable Crops 1990. Pesticide Usage Survey Report 105. Belfast: HMSO.

Jess, S., Kidd, S.L.B., McCallion, T. (1994). Arable Crops 1992. Pesticide Usage Survey Report 117. Belfast: HMSO.

Jess, S., Kidd, S.L.B., McCallion, T. (1997). Arable Crops 1994. Pesticide Usage Survey Report 132. Belfast: The Stationary Office.

Jess, S., Kidd, S.L.B., McCallion, T. (2000). Arable Crops 1996. Pesticide Usage Survey Report 146. Belfast: The Stationary Office.

Jess, S., Kearns C.A., Kidd, S.L.B., McCallion, T. (2002). Arable Crops 1998. Pesticide Usage Survey Report 168. Belfast: The Stationary Office.

Withers, J.A., Jess, S., Kearns, C.A., Kidd, S.L.B., McCallion, T. (2004). Arable Crops 2000. Pesticide Usage Survey Report 177. Belfast: The Stationary Office.

Withers, J.A., Jess, S., Kearns, C.A., McCallion, T., Matthews, D. (2004). Arable Crops 2002. Pesticide Usage Survey Report 194. Belfast: DARD.

Figure 1 The regional distribution of arable crops grown in Northern Ireland in 2004

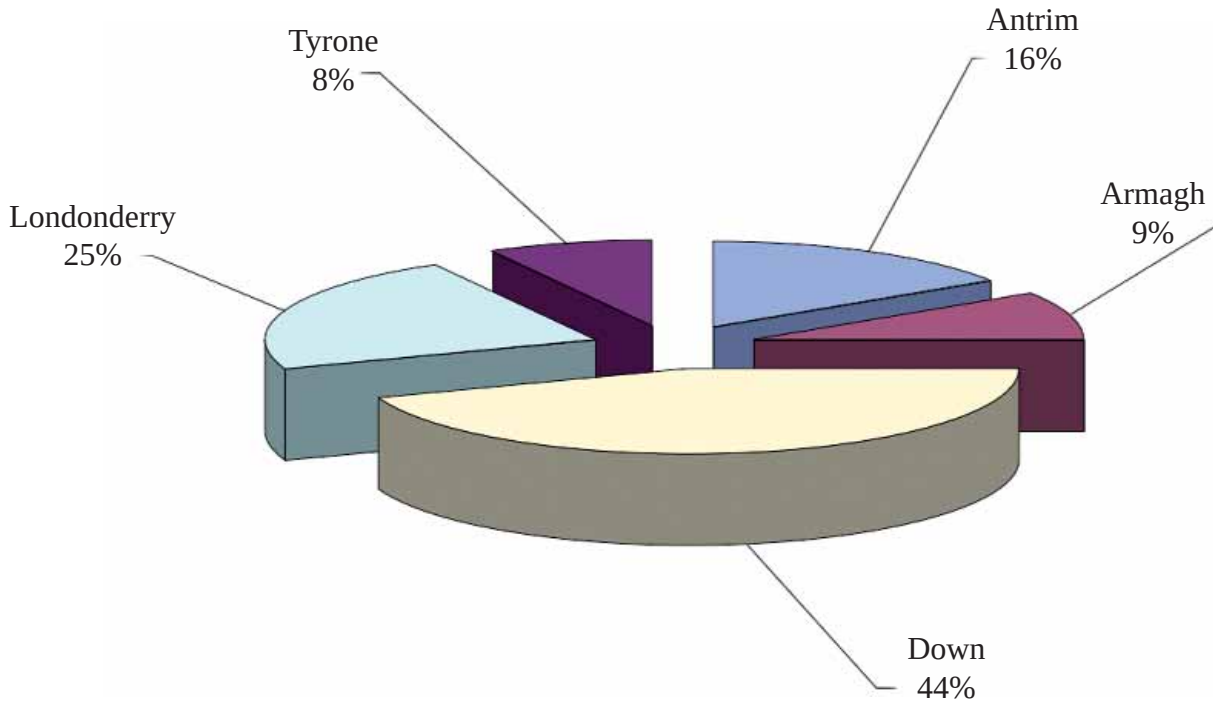

Figure 2 Utilization of arable land in Northern Ireland in 2004

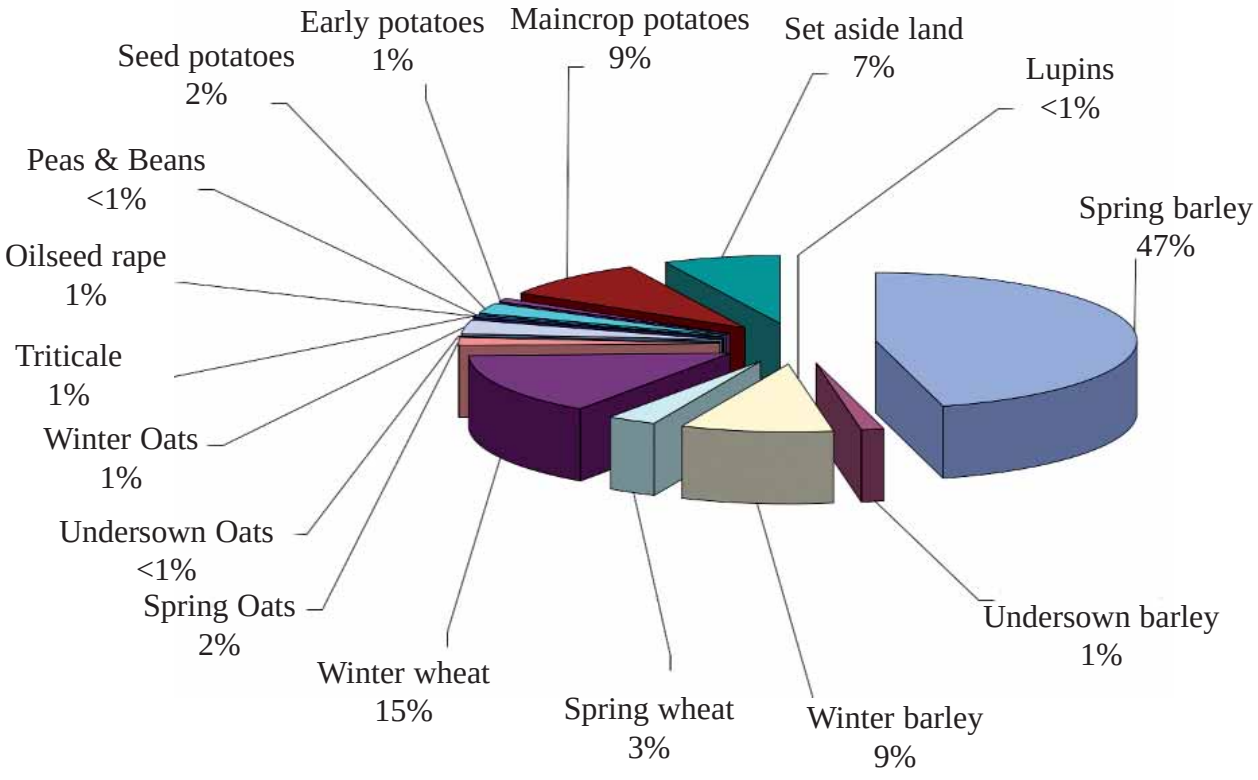

Figure 3 The areas of arable crops treated (spray hectares) with each pesticide type in the county regions of Northern Ireland in 2004

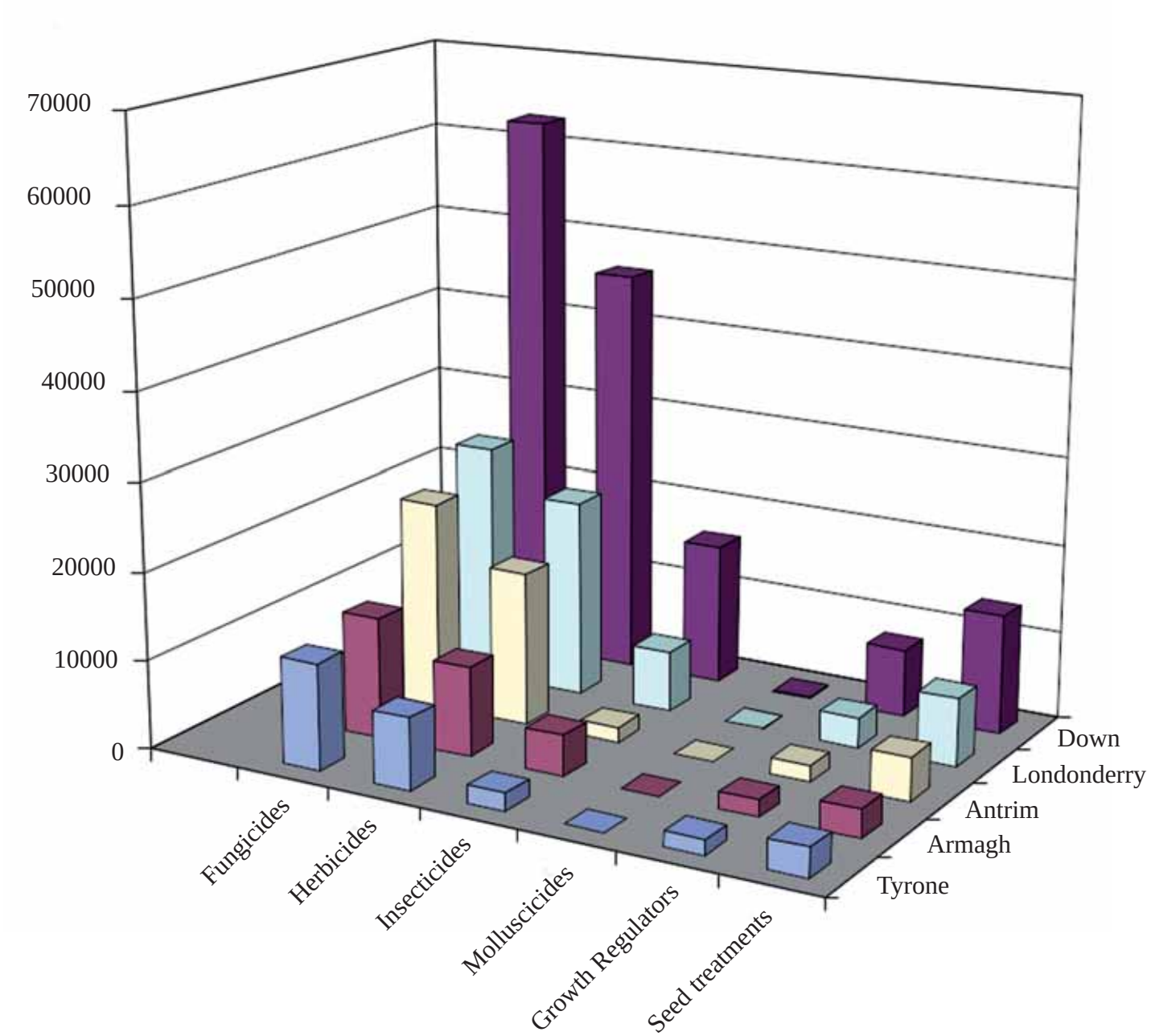

Figure 4 The proportion of potato crop types stored in Northern Ireland in 2004

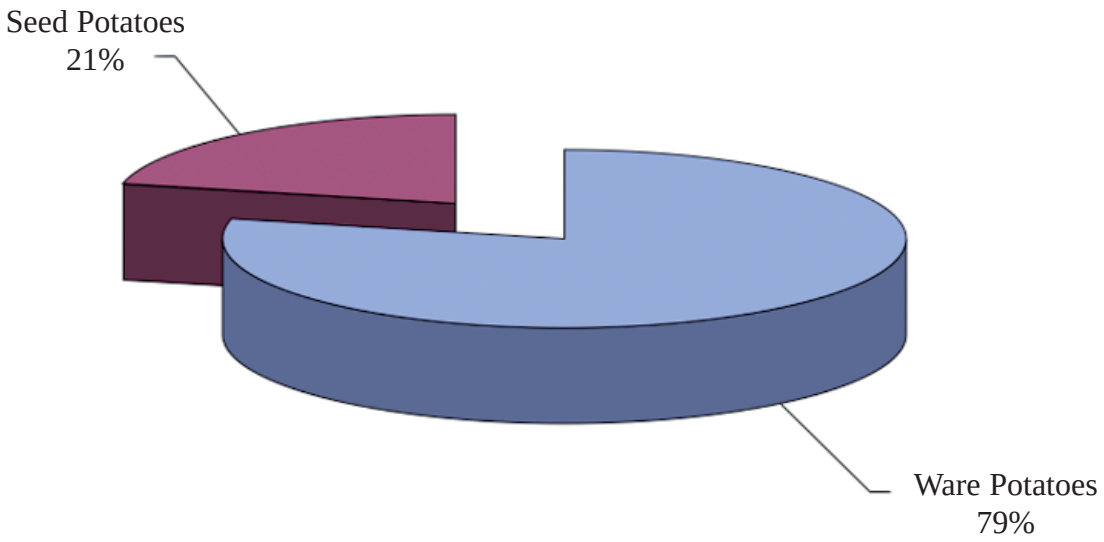

Figure 5 Regional distribution (%) of potato storage and treatments applied to potatoes in Northern Ireland in 2004

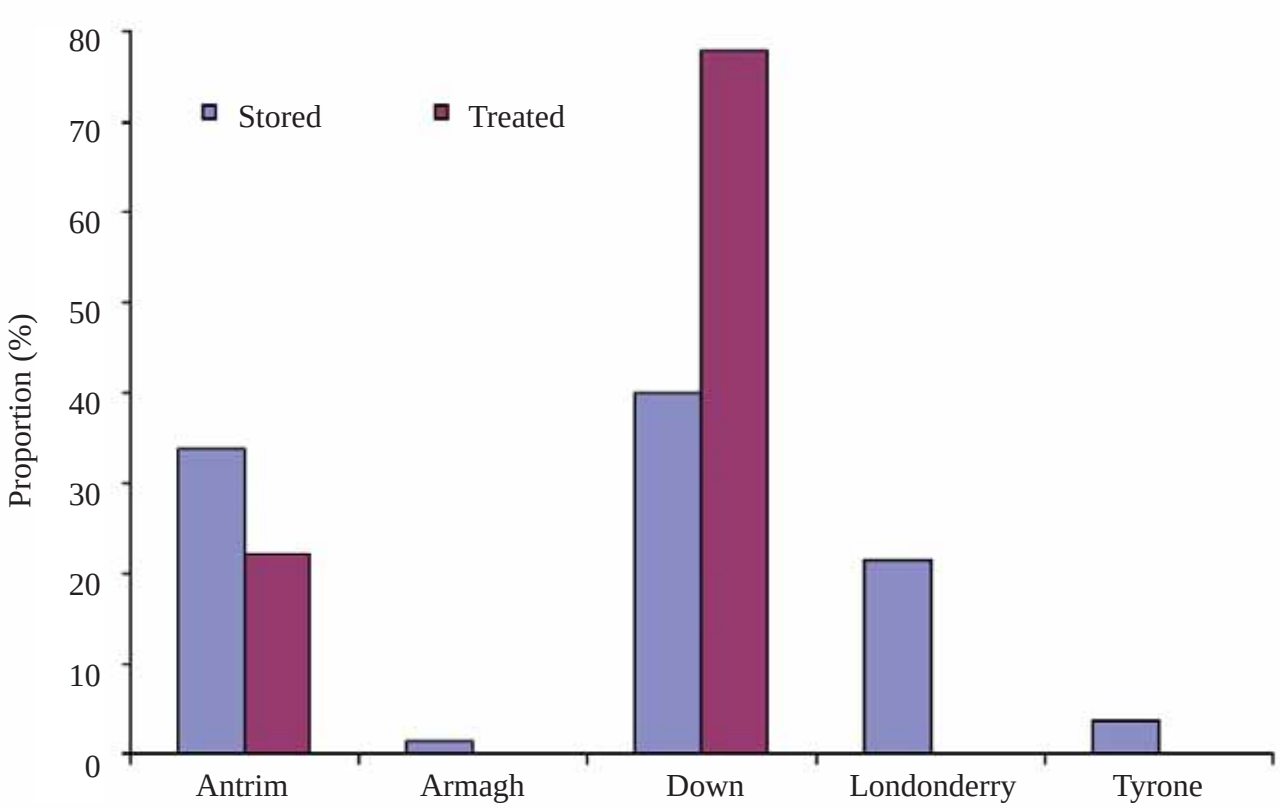

Table 1 **Number of farms in each size class with arable crops in the Northern Ireland June 2004 census and the number of samples from each class.**

	Size group (hectares)													
	< 2		2 < 5		5 <10		10 < 20		20 < 40		40+		Total	
County	Holdings in strata	Holdings sampled	Holdings in strata	Holdings sampled	Holdings in strata	Holdings sampled	Holdings in strata	Holdings sampled	Holdings in strata	Holdings sampled	Holdings in strata	Holdings sampled	Holdings in strata	Holdings sampled
Antrim	123	6	263	5	201	7	131	8	68	14	30	13	816	53
Armagh	41	1	60	0	74	6	64	6	10	2	18	4	267	19
Down	165	3	346	15	318	10	297	27	115	24	112	44	1353	123
Fermanagh	15	0	9	0	8	0	5	0	0	0	0	0	37	0
Londonderry	96	3	272	7	203	7	168	12	68	14	56	29	863	72
Tyrone	90	2	141	5	129	4	76	6	24	4	15	5	475	26
Northern Ireland	***530***	***15***	***1,091***	***32***	***933***	***34***	***741***	***59***	***285***	***58***	***231***	***95***	***3,811***	***293***

Table 2 **The total number and area (hectares) of crops sampled, and the proportion (%) of the total area of arable crops surveyed in Northern Ireland, 2004.**

CROP	Number of crops surveyed	Survey area (ha)	Proportion of crops surveyed (%)
Spring barley	355	4,399	20
Undersown barley	10	41	7
Winter barley	142	1,794	40
Spring wheat	28	475	31
Winter wheat	153	2,544	36
Spring oats	24	189	21
Undersown oats	5	11	4
Winter oats	27	402	26
Oilseed rape	4	68	27
Peas & beans	4	33	16
Triticale	7	59	32
Seed potatoes	50	191	17
Early potatoes	23	83	21
Maincrop potatoes	129	734	16
Set aside land	114	773	23
Lupins	1	4	40
Total	***1,076***	***11,801***	***24***

Table 3 **Estimated area (hectares) of arable crops grown regionally in Northern Ireland 2004.**

CROP	County					Northern Ireland
	Antrim	Armagh	Down	Londonderry	Tyrone	
Spring barley	3,652	1,113	8,787	5,647	2,760	21,959
Undersown barley	240	.	56	303	.	599
Winter barley	541	82	2,075	1,536	301	4,535
Spring wheat	218	319	764	155	67	1,523
Winter wheat	544	1,289	4,302	797	179	7,111
Spring oats	34	342	146	325	55	903
Undersown oats	-	.	158	76	.	234
Winter oats	262	786	416	73	18	1,556
Oilseed rape	.	.	106	149	.	255
Peas & beans	.	91	121	.	.	212
Triticale	14	50	50	67	.	182
Seed potatoes	394	.	464	273	17	1,148
Early potatoes	75	.	177	150	.	403
Maincrop potatoes	1,470	68	1,754	876	349	4,517
Set-aside land	193	424	2,057	545	175	3,394
Lupins	.	.	10	.	.	10
Total	***7,637***	***4,565***	***21,443***	***10.974***	***3,923***	***48,541***

Table 4 **Estimated area (spray-hectares) of arable crops treated regionally with each pesticide type in Northern Ireland 2004.**

Pesticide type	County					Northern Ireland
	Antrim	Armagh	Down	Londonderry	Tyrone	
Fungicides	23,623	13,676	62,888	27,234	12,054	139,474
Herbicides	17,470	10,171	46,229	22,498	8,171	104,539
Insecticides	1,711	4,626	16,105	6,921	2,059	31,421
Molluscicides	62	.	141	103	30	337
Growth regulators	1,821	1,929	7,691	3,436	1,681	16,559
Seed treatments	4,962	3,268	13,636	7,779	3,323	32,968
Total	***49,650***	***33,670***	***146,691***	***67,970***	***27,319***	***325,299***

Table 5 **The total area (spray-hectares) and the basic area (hectares), (in parentheses), of arable crops treated, in Northern Ireland 2004, with each pesticide type.**

CROP	Pesticide type													
	Fungicides		Herbicides & desiccants		Insecticides		Molluscicides		Growth regulators		Seed treatments		All pesticides	
	Sp ha	(ha)	Sp ha	(ha)	Sp ha	(ha)	Sp ha	(ha)	Sp ha	(ha)	Sp ha	(ha)	Sp ha	(ha)
Spring barley	29,406	(14,869)	45,626	(19,359)	11,734	(9,995)	.	.	4,580	(3,648)	16,047	(16,025)	107,393	(19,166)
Undersown barley	.	.	576	(557)	.	.	.	.	.	.	497	(497)	1,072	(557)
Winter barley	14,244	(4,008)	11,124	(4,130)	4,434	(3,209)	78	(78)	3,279	(2,336)	3,655	(3,655)	36,813	(4,056)
Spring wheat	3,537	(862)	3,201	(1,044)	924	(646)	.	.	715	(481)	1,184	(1,184)	9,562	(1,052)
Winter wheat	35,512	(6,397)	17,759	(6,049)	8,171	(5,200)	145	(145)	6,720	(5,274)	5,811	(5,811)	74,117	(5,992)
Spring oats	713	(415)	1,433	(867)	141	(141)	.	.	190	(190)	359	(359)	2,835	(867)
Undersown oats	.	.	177	(155)	.	.	.	.	.	.	164	(164)	341	(220)
Winter oats	2,761	(1,022)	2,988	(1,128)	1,145	(725)	.	.	993	(660)	1,353	(1,353)	9,240	(1,128)
Oilseed rape	238	(193)	448	(122)	55	(55)	.	.	.	.	106	(106)	846	(228)
Peas & beans	677	(115)	322	(115)	197	(106)	.	.	.	.	15	(15)	1,210	(115)
Triticale	237	(104)	370	(125)	54	(54)	.	.	84	(68)	89	(89)	833	(132)
Seed potatoes	10,226	(1,022)	4,917	(1,014)	1,589	(557)	.	.	.	.	1,224	(1,064)	17,956	(1,014)
Early potatoes	2,116	(362)	841	(403)	267	(63)	.	.	.	.	212	(212)	3,436	(367)
Maincrop potatoes	39,807	(4,335)	14,081	(4,090)	2,709	(1,333)	114	(114)	.	.	2,243	(2,181)	58,955	(4,092)
Set aside land	.	.	657	(565)	.	.	.	.	.	.	.	.	657	(565)
Lupins	.	.	20	(10)	.	.	.	.	.	.	10	(10)	30	(10)
Total	***139,474***	***(33,703)***	***104,539***	***(39,734)***	***31,421***	***(22,085)***	***337***	***(337)***	***16,559***	***(12,657)***	***32,968***	***(32,723)***	***325,299***	***(39,561)***

Table 6 **Total quantity (kilograms) of each pesticide type used on arable crops in Northern Ireland 2004.**

CROP	Fungicides	Herbicides & desiccants	Insecticides	Molluscicides	Growth regulators	Seed treatments	Total
Spring barley	6,433	18,453	790	.	3,141	711	29,527
Undersown barley	.	624	.	.	.	46	671
Winter barley	2,755	8,193	255	8	1,753	222	13,186
Spring wheat	804	1,110	6	.	487	42	2,449
Winter wheat	8,330	12,165	82	30	5,130	231	25,968
Spring oats	140	516	5	.	115	25	801
Undersown oats	.	151	.	.	.	28	180
Winter oats	690	1,002	11	.	1,016	51	2,770
Oilseed rape	28	245	<1	.	.	2	276
Peas & beans	540	197	1	.	.	2	740
Triticale	81	215	<1	.	63	18	377
Seed potatoes	8,791	31,623	215	.	.	408	41,036
Early potatoes	2,431	24,256	17	.	.	15	26,720
Maincrop potatoes	40,104	155,299	130	16	.	475	196,025
Set aside land	.	551	.	.	.	.	551
Lupins	.	24	.	.	.	<1	24
Total	***71,128***	***254,624***	***1,513***	***55***	***11,704***	***2,277***	***341,301***

Table 7 **The proportional area (%) of each crop treated with pesticides and the number of spray applications (in parentheses) in Northern Ireland, 2004.**

CROP	Fungicides		Herbicides & desiccants		Insecticides		Molluscicides		Growth regulators		Seed treatments	All pesticides	
	%	sp apps	%	sp apps	%	sp apps	%	sp apps	%	sp apps	%	%	sp apps
Spring barley	68	(1.6)	88	(1.8)	46	(1.1)	.	.	17	(1.2)	73	87	(1.6)
Undersown barley	.	.	93	(1.1)	.	.	.	.	.	.	83	93	(1.1)
Winter barley	88	(3.1)	91	(2.2)	71	(1.3)	2	(1.0)	52	(1.4)	81	89	(2.1)
Spring wheat	57	(2.3)	69	(1.7)	42	(1.2)	.	.	32	(1.0)	78	69	(1.7)
Winter wheat	90	(4.0)	85	(2.2)	73	(1.4)	2	(1.0)	74	(1.2)	82	84	(2.4)
Spring oats	46	(1.6)	96	(1.3)	16	(1.0)	.	.	21	(1.0)	40	96	(1.3)
Undersown oats	.	.	66	(1.2)	.	.	.	.	.	.	70	94	(1.2)
Winter oats	66	(1.8)	72	(1.9)	47	(1.1)	.	.	42	(1.4)	87	72	(1.7)
Oilseed rape	76	(1.4)	48	(2.3)	21	(1.0)	.	.	.	.	41	89	(1.7)
Peas & beans	54	(4.1)	54	(2.5)	50	(1.6)	.	.	.	.	7	54	(2.8)
Triticale	57	(2.2)	69	(2.7)	30	(1.0)	.	.	38	(1.2)	49	72	(1.9)
Seed potatoes	89	(8.4)	88	(3.7)	48	(2.9)	.	.	.	.	93	88	(5.7)
Early potatoes	90	(5.9)	100	(2.1)	16	(2.7)	.	.	.	.	53	91	(3.7)
Maincrop potatoes	96	(8.6)	91	(2.3)	30	(1.8)	3	(1.0)	.	.	48	91	(5.1)
Set aside land	.	.	17	(1.1)	.	.	.	.	.	.	.	17	(1.1)
Lupins	.	.	100	(2.0)	.	.	.	.	.	.	100	100	(2.0)
Total	***69***	***(4)***	***82***	***(2)***	***45***	***(1)***	***1***	***(1)***	***26***	***(1)***	***67***	***82***	***(2)***

Table 8 **Estimated area (spray-hectares) of arable crops treated with pesticide formulations in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under-sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Fungicides																	
Azoxystrobin	3,089	.	2,089	427	4,139	172	.	69	.	197	.	.	.	34	.	.	10,216
Azoxystrobin/fenpropimorph	55	.	73	.	10	.	.	14	.	.	.	.	.	.	.	.	152
Bromuconazole	42	.	.	68	25	24	.	.	.	.	.	.	.	.	.	.	159
Carbendazim/flusilazole	3,391	.	1,097	.	72	.	.	.	44	.	.	.	.	.	.	.	4,603
Chlorothalonil	1,673	.	850	241	6,849	.	.	22	.	288	85	.	.	52	.	.	10,060
Chlorothalonil/propamocarb hydrochloride	.	.	.	.	.	.	.	.	.	.	.	343	187	4,315	.	.	4,846
Cyazofamid	.	.	.	.	.	.	.	.	.	.	.	429	.	.	.	.	429
Cymoxanil	.	.	.	.	.	.	.	.	.	.	.	9	.	92	.	.	100
Cymoxanil/mancozeb	.	.	.	.	.	.	.	.	.	.	.	615	205	6,737	.	.	7,557
Cymoxanil/mancozeb/oxadixyl	.	.	.	.	.	.	.	.	.	.	.	231	60	1,244	.	.	1,535
Cyproconazole/cyprodinil	35	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	35
Cyproconazole/propiconazole	2,873	.	867	71	312	24	.	.	.	.	39	.	.	.	.	.	4,186
Cyproconazole/trifloxystrobin	1,145	.	110	30	.	.	.	.	.	.	.	.	.	.	.	.	1,286
Cyprodinil	1,116	.	1,070	.	69	.	.	.	.	.	.	.	.	.	.	.	2,255
Difenoconazole	64	.	.	.	562	.	.	.	95	.	.	.	.	.	.	.	720
Dimethomorph/mancozeb	.	.	.	.	.	.	.	.	.	.	.	2,682	233	6,731	.	.	9,645
Dimoxystrobin/epoxiconazole	.	.	.	.	457	.	.	.	.	.	.	.	.	.	.	.	457
Epoxiconazole	5,341	.	1,924	283	8,544	95	.	64	.	.	.	.	.	.	.	.	16,251
Epoxiconazole/fenpropimorph/kresoxim-methyl	571	.	230	44	444	16	.	.	.	.	.	.	.	.	.	.	1,305
Epoxiconazole/kresoxim-methyl	1,184	.	337	.	465	8	.	72	.	.	86	.	.	.	.	.	2,152
Epoxiconazole/kresoxim-methyl/pyraclostrobin	.	.	.	.	61	.	.	.	.	.	.	.	.	.	.	.	61
Epoxiconazole/pyraclostrobin	.	.	.	.	117	.	.	.	.	.	.	.	.	.	.	.	117
Fenamidone/mancozeb	.	.	.	.	.	.	.	.	.	.	.	169	.	256	.	.	425
Fenamidone/propamocarb hydrochloride	49	.	.	.	.	.	.	.	.	.	.	.	.	32	.	.	82
Fenpropidin	108	.	.	68	420	.	.	.	.	.	.	.	.	.	.	.	596
Fenpropidin/tebuconazole	51	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	51
Fenpropimorph	1,281	.	929	232	687	82	.	726	.	.	.	.	.	.	.	.	3,937
Fenpropimorph/flusilazole	1,881	.	396	56	110	13	.	.	.	.	.	.	.	.	.	.	2,456
Fenpropimorph/pyraclostrobin	261	.	44	34	169	.	.	.	.	.	.	.	.	.	.	.	508
Fenpropimorph/quinoxyfen	645	.	396	584	1,459	61	.	400	.	.	.	.	.	.	.	.	3,545
Fentin hydroxide	.	.	.	.	.	.	.	.	.	.	.	35	.	1,040	.	.	1,075
Fluazinam	.	.	.	.	.	.	.	.	.	.	.	3,495	672	11,970	.	.	16,138
Fluazinam/metalaxyl-m	.	.	.	.	.	.	.	.	.	.	.	347	.	249	.	.	595
Fluquinconazole/prochloraz	.	.	.	569	2,146	.	.	.	.	.	.	.	.	.	.	.	2,715
Flusilazole	656	.	1,107	.	8	.	.	.	44	.	.	.	.	.	.	.	1,815

Table 8 (cont.) **Estimated area (spray-hectares) of arable crops treated with pesticide formulations in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under-sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Fungicides (cont.)																	
Mancozeb	93	.	.	.	19	.	.	.	.	182	14	647	391	4,930	.	.	6,276
Mancozeb/metalaxyl	.	.	.	.	.	.	.	.	.	.	.	4	.	339	.	.	343
Mancozeb/metalaxyl-m	.	.	.	.	.	.	.	.	.	.	.	715	69	870	.	.	1,654
Mancozeb/propamocarb hydrochloride	.	.	.	.	.	.	.	.	.	.	.	506	299	896	.	.	1,701
Metrafenone	.	.	.	.	156	115	.	505	.	.	.	.	.	.	.	.	776
Picoxystrobin	1,736	.	1,292	91	94	6	.	.	.	.	14	.	.	.	.	.	3,232
Prochloraz	.	.	.	.	109	.	.	.	.	.	.	.	.	.	.	.	109
Propiconazole	.	.	80	.	45	.	.	.	.	.	.	.	.	.	.	.	125
Propiconazole/tebuconazole	206	.	72	47	423	14	.	.	.	.	.	.	.	.	.	.	761
Propiconazole/tridemorph	76	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	76
Pyraclostrobin	126	.	.	68	827	.	.	253	.	.	.	.	.	.	.	.	1,273
Quinoxyfen	.	.	.	.	6	14	.	413	.	.	.	.	.	.	.	.	433
Spiroxamine/tebuconazole	.	.	.	.	45	.	.	.	.	.	.	.	.	.	.	.	45
Tebuconazole	143	.	280	91	1,695	38	.	129	55	9	.	.	.	.	.	.	2,440
Tebuconazole/triadimenol	255	.	40	275	1,561	32	.	77	.	.	.	.	.	.	.	.	2,239
Trifloxystrobin	1,118	.	922	259	3,222	.	.	18	.	.	.	.	.	.	.	.	5,538
Unknown fungicide	143	.	41	.	188	.	.	.	.	.	.	.	.	21	.	.	391
All fungicides	***29,406***	***.***	***14,244***	***3,538***	***35,512***	***713***	***.***	***2,761***	***238***	***677***	***238***	***10,226***	***2,116***	***39,807***	***.***	***.***	***139,474***
Herbicides & desiccants																	
Amidosulfuron	.	.	133	50	127	342	.	772	.	.	.	.	.	.	.	.	1,424
Benazolin/Bromoxynil/ioxynil	55	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	55
Benazolin/2,4-DB/MCPA	.	56	.	.	.	24	.	.	.	.	.	.	.	.	14	.	94
Bentazone	.	.	.	.	.	.	.	.	.	91	.	.	.	.	.	.	91
Bentazone/MCPB	.	.	.	.	.	.	.	.	.	9	.	.	.	.	.	.	9
Bromoxynil/ioxynil	1,113	.	127	21	409	34	.	461	.	.	35	.	.	.	.	.	2,201
Carfentrazone-ethyl	.	.	.	.	.	.	.	.	.	.	.	51	.	237	.	.	288
Carfentrazone-ethyl/flypyrsulfuron-methyl	.	.	.	.	8	.	.	217	.	.	.	.	.	.	.	.	226
Carfentrazone-ethyl/thiometon	.	.	.	.	.	.	.	10	.	.	.	.	.	.	.	.	10
Chlorotoluron	.	.	31	.	263	.	.	.	.	.	.	.	.	.	.	.	294
Clodinafop-Propargyl	.	.	.	.	109	.	.	.	.	.	.	.	.	.	.	.	109
Clopyralid/triclopyr	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	2

Table 8 (cont.) **Estimated area (spray-hectares) of arable crops treated with pesticide formulations in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under-sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Herbicides & desiccants (cont.)																	
Cycloxydim	.	.	.	.	.	.	.	.	122	91	.	.	.	.	.	.	213
2,4-DB/linuron/MCPA	359	208	.	218	44	.	78	.	.	.	.	.	.	.	.	.	908
2,4-DB/MCPA	.	159	.	.	.	.	76	.	.	.	.	.	.	.	.	.	235
Dicamba/dichlorprop/ioxynil	77	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	77
Dicamba/MCPA/mecoprop	292	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	292
Dicamba/MCPA/mecoprop-P	715	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	715
Dicamba/mecoprop	36	.	.	.	.	6	.	.	.	.	.	.	.	.	.	.	42
Dicamba/mecoprop-P	801	.	.	22	79	21	.	21	.	.	.	.	.	.	.	.	944
Dichlorprop	116	.	28	.	.	.	.	.	.	.	.	.	.	.	.	.	143
Diclofop-methyl/fenoxaprop-P-ethyl	276	.	227	.	.	.	.	.	.	.	.	.	.	.	.	.	503
Diflufenican/Isoproturon	.	.	1,090	.	1,325	.	.	.	.	.	.	.	.	.	.	.	2,415
Diflufenican/trifluralin	.	.	67	.	.	.	.	.	.	.	.	.	.	.	.	.	67
Diquat	75	.	.	.	.	.	.	.	95	.	.	2,308	113	4,471	.	.	7,061
Diquat/paraquat	.	.	.	.	.	.	.	.	.	.	.	.	34	181	.	.	214
Fenoxaprop-P-ethyl	.	.	.	.	523	.	.	.	.	.	.	.	.	.	.	.	523
Fenoxaprop-P-ethyl/isoproturon	83	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	83
Flamprop-M-isopropyl	143	.	28	.	65	.	.	.	.	.	.	.	.	.	.	.	236
Fluazifop-P-butyl	.	.	.	.	.	.	.	.	27	.	.	.	.	.	.	.	27
Flufenacet/pendimethalin	.	.	24	.	.	.	.	.	.	.	.	.	.	.	.	.	24
Fluroxypyr	1,633	.	1,072	182	1,739	24	.	142	.	.	.	.	.	.	.	.	4,792
Glufosinate-ammonium	.	.	.	.	.	.	.	.	.	.	.	.	.	74	.	.	74
Glyphosate	11,335	19	2,402	826	2,899	382	22	482	55	24	110	624	132	1,916	643	10	21,879
Iodosulfron-methyl-sodium	486	.	.	73	176	14	.	.	.	.	.	.	.	.	.	.	748
Ioxynil	46	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	46
Isoproturon	453	.	2,518	38	3,962	.	.	.	.	.	.	.	.	.	.	.	6,972
Isoproturon/pendimethalin	34	.	702	.	1,567	.	.	.	.	.	.	.	.	.	.	.	2,303
Isoproturon/trifluralin	.	.	.	.	18	.	.	.	.	.	.	.	.	.	.	.	18
Linuron	.	.	.	.	.	.	.	.	.	.	.	.	.	67	.	.	67
MCPA	1,480	115	160	45	35	.	.	.	.	.	.	.	.	.	.	.	1,835
Mecoprop	3,125	.	151	105	427	65	.	212	.	.	28	.	.	.	.	.	4,113
Mecoprop-P	3,763	.	212	484	430	21	.	63	.	.	39	.	.	.	.	.	5,012
Mecoprop-P/metsulfuron-methyl	125	.	.	6	.	.	.	.	.	.	.	.	.	.	.	.	131
Metazachlor	.	.	.	.	.	.	.	.	149	.	.	.	.	.	.	.	149
Metribuzin	.	.	.	.	.	.	.	.	.	.	.	425	105	2,394	.	.	2,924
Metsulfuron-methyl	14,216	19	842	538	1,842	477	.	543	.	.	79	.	.	.	.	.	18,554
Metsulfuron-methyl/thifensulfuron-methyl	1,506	.	62	73	215	22	.	.	.	.	.	.	.	.	.	.	1,878
Metsulfuron-methyl/tribenuron-methyl	2,089	.	.	519	188	.	.	.	.	.	39	.	.	.	.	.	2,835

Table 8 (cont.) **Estimated area (spray-hectares) of arable crops treated with pesticide formulations in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under-sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Herbicides & desiccants (cont.)																	
Paraquat	.	.	.	.	21	.	.	.	.	.	.	1,283	330	3,571	.	.	5,205
Pendimethalin	14	.	488	.	761	.	.	.	.	.	39	.	.	.	.	10	1,312
Pendimethalin/picolinafen	.	.	47	.	75	.	.	.	.	.	.	.	.	.	.	.	122
Rimsulfuron	.	.	.	.	.	.	.	.	.	.	.	16	23	379	.	.	418
Simazine	.	.	.	.	.	.	.	.	.	91	.	.	.	.	.	.	91
Sulphuric acid	.	.	.	.	.	.	.	.	.	.	.	210	104	792	.	.	1,107
Terbuthylazine/terbutryn	.	.	.	.	.	.	.	.	.	15	.	.	.	.	.	.	15
Terbutryn	.	.	.	.	.	.	.	15	.	.	.	.	.	.	.	.	15
Thifensulfuron-methyl/tribenuron-methyl	970	.	46	.	.	.	.	.	.	.	.	.	.	.	.	.	1,016
Tralkoxydim	142	.	101	.	155	.	.	.	.	.	.	.	.	.	.	.	398
Tribenuron-methyl	70	.	48	.	.	.	.	.	.	.	.	.	.	.	.	.	118
Trifluralin	.	.	470	.	202	.	.	.	.	.	.	.	.	.	.	.	672
Unknown herbicide	.	.	47	.	97	.	.	50	.	.	.	.	.	.	.	.	194
All herbicides & desiccants	***45,626***	***576***	***11,124***	***3,201***	***17,759***	***1,433***	***177***	***2,988***	***448***	***322***	***370***	***4,917***	***841***	***14,081***	***657***	***20***	***104,539***
Insecticides																	
Alpha-cypermethrin	.	.	.	.	118	.	.	.	.	.	.	.	.	.	.	.	118
Bifenthrin	112	.	32	.	8	.	.	.	.	.	.	.	.	.	.	.	152
Chlorpyrifos	1,586	.	403	9	42	9	.	10	.	.	.	.	.	.	.	.	2,058
Cypermethrin	765	.	393	47	424	34	.	141	.	15	.	.	.	.	.	.	1,818
Deltamethrin	1,847	.	590	199	1,130	.	.	454	.	91	.	.	.	101	.	.	4,412
Deltamethrin/pirimicarb	.	.	.	.	.	.	.	.	.	.	.	453	.	.	.	.	453
Dimethoate	.	.	.	.	.	.	.	.	.	.	.	365	.	.	.	.	365
Esfenvalerate	3,717	.	1,363	497	2,955	52	.	88	.	.	.	.	.	.	.	.	8,671
Lambda-cyhalothrin	3,253	.	1,503	173	3,463	47	.	453	55	91	54	406	150	1,751	.	.	11,399
Lambda-cyhalothrin/pirimicarb	.	.	.	.	.	.	.	.	.	.	.	.	.	128	.	.	128
Pirimicarb	120	.	.	.	.	.	.	.	.	.	.	365	87	20	.	.	592
Pymetrozine	.	.	.	.	.	.	.	.	.	.	.	.	30	642	.	.	673
Zeta-cypermethrin	253	.	151	.	.	.	.	.	.	.	.	.	.	.	.	.	404
Unknown insecticide	83	.	.	.	32	.	.	.	.	.	.	.	.	66	.	.	180
All insecticides	***11,734***	***.***	***4,434***	***924***	***8,171***	***141***	***.***	***1,145***	***55***	***197***	***54***	***1,589***	***267***	***2,709***	***.***	***.***	***31,422***

Table 8 (cont.) **Estimated area (spray-hectares) of arable crops treated with pesticide formulations in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under-sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Molluscicides																	
Metaldehyde	.	.	45	.	36	.	.	.	.	.	.	.	.	62	.	.	144
Methiocarb	.	.	32	.	109	.	.	.	.	.	.	.	.	52	.	.	194
All molluscicides	***.***	***.***	***78***	***.***	***145***	***.***	***.***	***.***	***.***	***.***	***.***	***.***	***.***	***114***	***.***	***.***	***337***
Growth regulators																	
Chlormequat	2,729	.	1,527	715	5,176	77	.	927	.	.	15	.	.	.	.	.	11,166
Chlormequat/2-chloroethylphosphonic acid	155	.	88	.	149	.	.	.	.	.	.	.	.	.	.	.	391
2-chloroethylphosphonic acid	826	.	787	.	675	95	.	.	.	.	14	.	.	.	.	.	2,396
2-chloroethylphosphonic acid/mepiquat chloride	437	.	147	.	36	.	.	.	.	.	39	.	.	.	.	.	659
Trinexapac-ethyl	434	.	730	.	684	19	.	66	.	.	15	.	.	.	.	.	1,947
All growth regulators	***4,580***	***.***	***3,279***	***715***	***6,720***	***190***	***.***	***993***	***.***	***.***	***84***	***.***	***.***	***.***	***.***	***.***	***16,559***
Seed treatments																	
Bitertanol/fuberidazole	76	.	150	175	420	86	65	44	.	.	.	.	.	.	.	.	1,017
Carboxin/thiram	1,724	159	516	49	481	50	76	28	.	.	89	.	.	.	.	.	3,172
Fludioxonil	8,634	220	1,690	695	3,472	199	.	995	.	.	.	.	.	.	.	10	15,915
Flutolanil	.	.	.	.	.	.	.	.	.	.	.	16	.	62	.	.	78
Fuberidazole/triadimenol	.	.	.	.	351	.	.	.	.	.	.	.	.	.	.	.	351
Guazatine	255	.	134	.	50	.	.	.	.	.	.	.	.	.	.	.	438
Guazatine/imazalil	1,527	56	580	.	37	24	22	264	.	.	.	.	.	.	.	.	2,510
Imazalil	.	.	.	.	.	.	.	.	.	.	.	668	154	1,424	.	.	2,246
Imazalil/pencycuron	22	.	.	.	.	.	.	.	.	.	.	540	58	697	.	.	1,317
Imazalil/triticonazole	2,329	61	187	219	601	.	.	.	.	.	.	.	.	.	.	.	3,397
Silthiofam	.	.	.	.	390	.	.	.	.	.	.	.	.	.	.	.	390
Tebuconazole/triazoxide	1,481	.	398	47	8	.	.	22	.	.	.	.	.	.	.	.	1,956
Thiabendazole	.	.	.	.	.	.	.	.	.	.	.	.	.	61	.	.	61
Thiram	.	.	.	.	.	.	.	.	106	15	.	.	.	.	.	.	121
All seed treatments	***16,047***	***497***	***3,655***	***1,184***	***5,811***	***359***	***164***	***1,353***	***106***	***15***	***89***	***1,224***	***212***	***2,243***	***.***	***10***	***32,968***
All pesticides	***107,393***	***1,073***	***36,813***	***9,562***	***74,117***	***2,835***	***341***	***9,240***	***846***	***1,211***	***834***	***17,956***	***3,436***	***58,955***	***657***	***30***	***325,299***

Table 9 **Estimated quantities (kilograms) of pesticide formulations used on arable crops in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under-sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Fungicides																	
Azoxystrobin	543	.	357	65	790	27	.	13	.	31	.	.	.	50	.	.	1,876
Azoxystrobin/fenpropimorph	17	.	26	.	4	.	.	6	.	.	.	.	.	.	.	.	52
Bromuconazole	5	.	.	20	6	4	.	.	.	.	.	.	.	.	.	.	35
Carbendazim/flusilazole	752	.	198	.	12	.	.	.	3	.	.	.	.	.	.	.	966
Chlorothalonil	749	.	373	147	3,987	.	.	22	.	144	50	.	.	36	.	.	5,508
Chlorothalonil/propamocarb hydrochloride	.	.	.	.	.	.	.	.	.	.	.	656	380	7,932	.	.	8,968
Cyazofamid	.	.	.	.	.	.	.	.	.	.	.	34	.	.	.	.	34
Cymoxanil	.	.	.	.	.	.	.	.	.	.	.	1	.	12	.	.	13
Cymoxanil/mancozeb	.	.	.	.	.	.	.	.	.	.	.	1,869	272	8,660	.	.	10,800
Cymoxanil/mancozeb/oxadixyl	.	.	.	.	.	.	.	.	.	.	.	387	281	2,083	.	.	2,751
Cyproconazole/cyprodinil	19	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	19
Cyproconazole/propiconazole	317	.	114	5	49	3	.	.	.	.	4	.	.	.	.	.	492
Cyproconazole/trifloxystrobin	180	.	18	3	.	.	.	.	.	.	.	.	.	.	.	.	200
Cyprodinil	613	.	316	.	12	.	.	.	.	.	.	.	.	.	.	.	940
Difenoconazole	3	.	.	.	29	.	.	.	6	.	.	.	.	.	.	.	38
Dimethomorph/mancozeb	.	.	.	.	.	.	.	.	.	.	.	2,952	337	8,167	.	.	11,456
Dimoxystrobin/epoxiconazole	.	.	.	.	59	.	.	.	.	.	.	.	.	.	.	.	59
Epoxiconazole	281	.	109	16	627	3	.	4	.	.	.	.	.	.	.	.	1,040
Epoxiconazole/fenpropimorph/kresoxim-methyl	166	.	57	18	127	3	.	.	.	.	.	.	.	.	.	.	371
Epoxiconazole/kresoxim-methyl	207	.	113	.	74	2	.	11	.	.	24	.	.	.	.	.	430
Epoxiconazole/kresoxim-methyl/pyraclostrobin	.	.	.	.	64	.	.	.	.	.	.	.	.	.	.	.	64
Epoxiconazole/pyraclostrobin	.	.	.	.	11	.	.	.	.	.	.	.	.	.	.	.	11
Fenamidone/mancozeb	.	.	.	.	.	.	.	.	.	.	.	103	.	148	.	.	251
Fenamidone/propamocarb hydrochloride	33	.	.	.	.	.	.	.	.	.	.	.	.	29	.	.	63
Fenpropidin	46	.	.	25	123	.	.	.	.	.	.	.	.	.	.	.	195
Fenpropidin/tebuconazole	21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	21
Fenpropimorph	441	.	251	68	279	51	.	317	.	.	.	.	.	.	.	.	1,406
Fenpropimorph/flusilazole	824	.	168	26	39	7	.	.	.	.	.	.	.	.	.	.	1,064
Fenpropimorph/pyraclostrobin	131	.	17	20	48	.	.	.	.	.	.	.	.	.	.	.	216
Fenpropimorph/quinoxyfen	120	.	90	110	344	13	.	141	.	.	.	.	.	.	.	.	817
Fentin hydroxide	.	.	.	.	.	.	.	.	.	.	.	67	.	1,910	.	.	1,976
Fluazinam	.	.	.	.	.	.	.	.	.	.	.	447	67	1,492	.	.	2,006
Fluazinam/metalaxyl-m	.	.	.	.	.	.	.	.	.	.	.	64	.	45	.	.	109
Fluquinconazole/prochloraz	.	.	.	155	584	.	.	.	.	.	.	.	.	.	.	.	739
Flusilazole	490	.	210	.	3	.	.	.	9	.	.	.	.	.	.	.	712
Mancozeb	17	.	.	.	26	.	.	.	.	364	3	887	532	6,961	.	.	8,790

Table 9 (cont.) **Estimated quantities (kilograms) of pesticide formulations used on arable crops in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under-sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Fungicides (cont.)																	
Mancozeb/metalaxyl	.	.	.	.	.	.	.	.	.	.	.	5	.	215	.	.	220
Mancozeb/metalaxyl-m	.	.	.	.	.	.	.	.	.	.	.	396	70	1,003	.	.	1,468
Mancozeb/propamocarb hydrochloride	.	.	.	.	.	.	.	.	.	.	.	924	493	1,362	.	.	2,779
Metrafenone	.	.	.	.	23	10	.	30	.	.	.	.	.	.	.	.	64
Picoxystrobin	218	.	186	18	15	2	.	.	.	.	1	.	.	.	.	.	440
Prochloraz	.	.	.	.	34	.	.	.	.	.	.	.	.	.	.	.	34
Propiconazole	.	.	20	.	6	.	.	.	.	.	.	.	.	.	.	.	25
Propiconazole/tebuconazole	10	.	3	5	22	1	.	.	.	.	.	.	.	.	.	.	42
Propiconazole/tridemorph	22	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22
Pyraclostrobin	13	.	.	7	115	.	.	25	.	.	.	.	.	.	.	.	160
Quinoxyfen	.	.	.	.	<1	1	.	80	.	.	.	.	.	.	.	.	81
Spiroxamine/tebuconazole	.	.	.	.	13	.	.	.	.	.	.	.	.	.	.	.	13
Tebuconazole	31	.	31	11	225	8	.	17	10	<1	.	.	.	.	.	.	334
Tebuconazole/triadimenol	58	.	4	59	285	6	.	22	.	.	.	.	.	.	.	.	434
Trifloxystrobin	105	.	95	26	298	.	.	1	.	.	.	.	.	.	.	.	525
All fungicides	***6,433***	***.***	***2,755***	***804***	***8,330***	***140***	***.***	***690***	***28***	***540***	***81***	***8,791***	***2,431***	***40,105***	***.***	***.***	***71,128***
Herbicides & desiccants																	
Amidosulfuron	.	.	4	<1	3	10	.	19	.	.	.	.	.	.	.	.	37
Benazolin/Bromoxynil/ioxynil	9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	9
Benazolin/2,4-DB/MCPA	.	111	.	.	.	47	.	.	.	.	.	.	.	.	13	.	171
Bentazone	.	.	.	.	.	.	.	.	.	35	.	.	.	.	.	.	35
Bentazone/MCPB	.	.	.	.	.	.	.	.	.	15	.	.	.	.	.	.	15
Bromoxynil/ioxynil	474	.	56	8	206	14	.	285	.	.	33	.	.	.	.	.	1,076
Carfentrazone-ethyl	.	.	.	.	.	.	.	.	.	.	.	3	.	8	.	.	11
Carfentrazone-ethyl/flypyrsulfuron-methyl	.	.	.	.	<1	.	.	3	.	.	.	.	.	.	.	.	4
Carfentrazone-ethyl/thiometon	.	.	.	.	.	.	.	<1	.	.	.	.	.	.	.	.	<1
Chlorotoluron	.	.	76	.	592	.	.	.	.	.	.	.	.	.	.	.	668
Clodinafop-Propargyl	.	.	.	.	3	.	.	.	.	.	.	.	.	.	.	.	3
Clopyralid/triclopyr	.	.	<1	.	.	.	.	.	.	.	.	.	.	.	.	.	<1
Cycloxydim	.	.	.	.	.	.	.	.	24	13	.	.	.	.	.	.	37
2,4-DB/linuron/MCPA	91	62	.	92	36	.	22	.	.	.	.	.	.	.	.	.	301
2,4-DB/MCPA	.	223	.	.	.	.	107	.	.	.	.	.	.	.	.	.	330
Dicamba/dichlorprop/ioxynil	114	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	114
Dicamba/MCPA/mecoprop	414	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	414

Table 9 (cont.) **Estimated quantities (kilograms) of pesticide formulations used on arable crops in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under-sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Herbicides & desiccants (cont.)																	
Dicamba/MCPA/mecoprop-P	744	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	744
Dicamba/mecoprop	12	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	14
Dicamba/mecoprop-P	504	.	.	10	63	18	.	18	.	.	.	.	.	.	.	.	612
Dichlorprop	79	.	22	.	.	.	.	.	.	.	.	.	.	.	.	.	101
Diclofop-methyl/fenoxaprop-P-ethyl	121	.	96	.	.	.	.	.	.	.	.	.	.	.	.	.	217
Diflufenican/Isoproturon	.	.	995	.	1,228	.	.	.	.	.	.	.	.	.	.	.	2,223
Diflufenican/trifluralin	.	.	37	.	.	.	.	.	.	.	.	.	.	.	.	.	37
Diquat	34	.	.	.	.	.	.	.	47	.	.	489	45	1,291	.	.	1,905
Diquat/paraquat	.	.	.	.	.	.	.	.	.	.	.	.	28	94	.	.	122
Fenoxaprop-P-ethyl	.	.	.	.	37	.	.	.	.	.	.	.	.	.	.	.	37
Fenoxaprop-P-ethyl/isoproturon	26	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	26
Flamprop-M-isopropyl	56	.	16	.	35	.	.	.	.	.	.	.	.	.	.	.	107
Fluazifop-P-butyl	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	5
Flufenacet/pendimethalin	.	.	21	.	.	.	.	.	.	.	.	.	.	.	.	.	21
Fluroxypyr	227	.	177	33	290	3	.	16	.	.	.	.	.	.	.	.	746
Glufosinate-ammonium	.	.	.	.	.	.	.	.	.	.	.	.	.	33	.	.	33
Glyphosate	9,007	27	1,753	505	2,080	367	22	381	20	24	89	453	133	1,745	539	11	17,156
Iodosulfron-methyl-sodium	4	.	.	<1	2	<1	.	.	.	.	.	.	.	.	.	.	6
Ioxynil	11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	11
Isoproturon	555	.	2,655	38	3,718	.	.	.	.	.	.	.	.	.	.	.	6,966
Isoproturon/pendimethalin	42	.	965	.	2,110	.	.	.	.	.	.	.	.	.	.	.	3,117
Isoproturon/trifluralin	.	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	4
Linuron	.	.	.	.	.	.	.	.	.	.	.	.	.	81	.	.	81
MCPA	772	202	49	56	6	.	.	.	.	.	.	.	.	.	.	.	1,085
Mecoprop	1,837	.	96	71	270	37	.	119	.	.	16	.	.	.	.	.	2,444
Mecoprop-P	2,556	.	186	283	284	16	.	63	.	.	24	.	.	.	.	.	3,411
Mecoprop-P/metsulfuron-methyl	79	.	.	4	.	.	.	.	.	.	.	.	.	.	.	.	83
Metazachlor	.	.	.	.	.	.	.	.	149	.	.	.	.	.	.	.	149
Metribuzin	.	.	.	.	.	.	.	.	.	.	.	455	70	1,757	.	.	2,282
Metsulfuron-methyl	387	<1	4	2	12	2	.	2	.	.	<1	.	.	.	.	.	409
Metsulfuron-methyl/thifensulfuron-methyl	212	.	2	2	7	1	.	.	.	.	.	.	.	.	.	.	223
Metsulfuron-methyl/tribenuron-methyl	22	.	.	6	2	.	.	.	.	.	<1	.	.	.	.	.	31
Paraquat	.	.	.	.	9	.	.	.	.	.	.	635	226	2,011	.	.	2,880
Pendimethalin	11	.	497	.	909	.	.	.	.	.	52	.	.	.	.	13	1,482
Pendimethalin/picolinafen	.	.	32	.	50	.	.	.	.	.	.	.	.	.	.	.	82
Rimsulfuron	.	.	.	.	.	.	.	.	.	.	.	<1	<1	2	.	.	3

Table 9 (cont.) **Estimated quantities (kilograms) of pesticide formulations used on arable crops in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under-sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Herbicides & desiccants (cont.)																	
Simazine	.	.	.	.	.	.	.	.	.	91	.	.	.	.	.	.	91
Sulphuric acid	.	.	.	.	.	.	.	.	.	.	.	29,588	23,755	148,277	.	.	201,620
Terbuthylazine/terbutryn	.	.	.	.	.	.	.	.	.	19	.	.	.	.	.	.	19
Terbutryn	.	.	.	.	.	.	.	18	.	.	.	.	.	.	.	.	18
Thifensulfuron-methyl/tribenuron-methyl	17	.	<1	.	.	.	.	.	.	.	.	.	.	.	.	.	18
Tralkoxydim	34	.	26	.	28	.	.	.	.	.	.	.	.	.	.	.	88
Tribenuron-methyl	4	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Trifluralin	.	.	380	.	156	.	.	.	.	.	.	.	.	.	.	.	536
Unknown herbicide	.	.	47	.	26	.	.	76	.	.	.	.	.	.	.	.	149
All herbicides & dessicants	***18,453***	***624***	***8,193***	***1,110***	***12,165***	***516***	***151***	***1,002***	***245***	***197***	***215***	***31,623***	***24,256***	***155,299***	***552***	***24***	***254,625***
Insecticides																	
Alpha-cypermethrin	.	.	.	.	<1	.	.	.	.	.	.	.	.	.	.	.	<1
Bifenthrin	<1	.	<1	.	<1	.	.	.	.	.	.	.	.	.	.	.	1
Chlorpyrifos	700	.	224	<1	17	4	.	4	.	.	.	.	.	.	.	.	948
Cypermethrin	16	.	9	1	10	<1	.	4	.	<1	.	.	.	.	.	.	41
Deltamethrin	21	.	5	2	8	.	.	2	.	<1	.	.	.	3	.	.	40
Deltamethrin/pirimicarb	.	.	.	.	.	.	.	.	.	.	.	37	.	.	.	.	37
Dimethoate	.	.	.	.	.	.	.	.	.	.	.	124	.	.	.	.	124
Esfenvalerate	17	.	6	2	15	<1	.	<1	.	.	.	.	.	.	.	.	42
Lambda-cyhalothrin	19	.	8	<1	25	<1	.	2	<1	<1	<1	2	<1	9	.	.	67
Lambda-cyhalothrin/pirimicarb	.	.	.	.	.	.	.	.	.	.	.	.	.	14	.	.	14
Pirimicarb	12	.	.	.	.	.	.	.	.	.	.	51	12	3	.	.	79
Pymetrozine	.	.	.	.	.	.	.	.	.	.	.	.	5	97	.	.	102
Zeta-cypermethrin	4	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	6
Unknown insecticide	.	.	.	.	6	.	.	.	.	.	.	.	.	3	.	.	10
All insecticides	***790***	***.***	***255***	***6***	***82***	***5***	***.***	***11***	***<1***	***1***	***<1***	***215***	***17***	***130***	***.***	***.***	***1,513***

Table 9 (cont.) **Estimated quantities (kilograms) of pesticide formulations used on arable crops in Northern Ireland in 2004.**

Pesticide type and formulation	Spring barley	Under -sown barley	Winter barley	Spring wheat	Winter wheat	Spring oats	Winter oats	Oilseed rape	Peas & beans	Triticale	Flax & linseed	Seed potatoes	Early potatoes	Maincrop potatoes	Set-aside	Lupins	All crops
Molluscicides																	
Metaldehyde	.	.	4	.	12	.	.	.	.	.	.	.	.	11	.	.	28
Methiocarb	.	.	4	.	18	.	.	.	.	.	.	.	.	5	.	.	27
All molluscicides	***.***	***.***	***8***	***.***	***30***	***.***	***.***	***.***	***.***	***.***	***.***	***.***	***.***	***16***	***.***	***.***	***55***
Growth regulators																	
Chlormequat	2,459	.	1,313	487	4,756	98	.	1,010	.	.	21	.	.	.	.	.	10,145
Chlormequat/2-chloroethylphosphonic acid	150	.	105	.	104	.	.	.	.	.	.	.	.	.	.	.	359
2-chloroethylphosphonic acid	230	.	194	.	174	14	.	.	.	.	5	.	.	.	.	.	616
2-chloroethylphosphonic acid/mepiquat chloride	270	.	83	.	29	.	.	.	.	.	36	.	.	.	.	.	418
Trinexapac-ethyl	32	.	57	.	66	4	.	6	.	.	<1	.	.	.	.	.	166
All growth regulators	***3,141***	***.***	***1,753***	***487***	***5,130***	***115***	***.***	***1,016***	***.***	***.***	***63***	***.***	***.***	***.***	***.***	***.***	***11,704***
Seed treatments																	
Bitertanol/fuberidazole	8	.	14	21	39	11	6	5	.	.	.	.	.	.	.	.	104
Carboxin/thiram	355	36	104	10	99	9	19	5	.	.	18	.	.	.	.	.	655
Fludioxonil	78	2	15	6	29	2	.	8	.	.	.	.	.	.	.	<1	140
Flutolanil	.	.	.	.	.	.	.	.	.	.	.	4	.	14	.	.	18
Fuberidazole/triadimenol	.	.	.	.	26	.	.	.	.	.	.	.	.	.	.	.	26
Guazatine	29	.	14	.	6	.	.	.	.	.	.	.	.	.	.	.	48
Guazatine/imazalil	183	7	68	.	3	3	3	34	.	.	.	.	.	.	.	.	301
Imazalil	.	.	.	.	.	.	.	.	.	.	.	30	4	78	.	.	112
Imazalil/pencycuron	<1	.	.	.	.	.	.	.	.	.	.	374	11	284	.	.	670
Imazalil/triticonazole	45	1	3	4	10	.	.	.	.	.	.	.	.	.	.	.	63
Silthiofam	.	.	.	.	17	.	.	.	.	.	.	.	.	.	.	.	17
Tebuconazole/triazoxide	14	.	4	<1	<1	.	.	<1	.	.	.	.	.	.	.	.	18
Thiabendazole	.	.	.	.	.	.	.	.	.	.	.	.	.	99	.	.	99
Thiram	.	.	.	.	.	.	.	.	2	2	.	.	.	.	.	.	4
All seed treatments	***711***	***46***	***222***	***42***	***231***	***25***	***29***	***51***	***2***	***2***	***18***	***408***	***15***	***475***	***.***	***<1***	***2,277***
All pesticides	***29,527***	***671***	***13,186***	***2,449***	***25,968***	***801***	***180***	***2,770***	***276***	***740***	***377***	***41,036***	***26,720***	***196,025***	***552***	***24***	***341,301***

Table 10 **The fifty active ingredients most extensively used on arable crops in Northern Ireland in 2004, prioritised by area treated (spray-hectares).**

	Active ingredient	Treated area (sp ha)
1	Mancozeb	29,136
2	Metsulfuron-methyl	23,399
3	Glyphosate	21,879
4	Epoxiconazole	20,341
5	Fluazinam	16,733
6	Chlorothalonil	14,906
7	Fenpropimorph	11,902
8	Isoproturon	11,791
9	Chlormequat	11,557
10	Lambda-cyhalothrin	11,527
11	Azoxystrobin	10,368
12	Dimethomorph	9,645
13	Cymoxanil	9,192
14	Flusilazole	8,874
15	Esfenvalerate	8,671
16	Diquat	7,276
17	Trifloxystrobin	6,824
18	Mecoprop-P	6,803
19	Propamocarb hydrochloride	6,629
20	Tebuconazole	5,537
21	Cyproconazole	5,506
22	Paraquat	5,419
23	Propiconazole	5,148
24	Deltamethrin	4,864
25	Fluroxypyr	4,792
26	Carbendazim	4,603
27	Mecoprop	4,447
28	MCPA	4,079
29	Quinoxyfen	3,978
30	Tribenuron-methyl	3,970
31	Pendimethalin	3,761
32	Kresoxim-methyl	3,517
33	2-chloroethylphosphonic acid	3,446
34	Picoxystrobin	3,232
35	Metribuzin	2,924
36	Thifensulfuron-methyl	2,894
37	Prochloraz	2,824
38	Fluquinconazole	2,715
39	Diflufenican	2,482
40	Ioxynil	2,378
41	Cyprodinil	2,290
42	Bromoxynil	2,256
43	Metalaxyl-m	2,249
44	Triadimenol	2,239
45	Dicamba	2,071
46	Chlorpyrifos	2,058
47	Pyraclostrobin	1,958
48	Trinexapac-ethyl	1,947
49	Cypermethrin	1,818
50	Oxadixyl	1,535

Table 11 **The fifty active ingredients most extensively used on arable crops in Northern Ireland in 2004, prioritised by weight (kilograms).**

	Active ingredient	Quantity (kg)
1	Sulphuric acid	201,620
2	Mancozeb	34,691
3	Glyphosate	17,156
4	Chlormequat	10,384
5	Isoproturon	10,159
6	Chlorothalonil	9,992
7	Propamocarb hydrochloride	5,799
8	Mecoprop-P	4,113
9	Pendimethalin	3,506
10	Fenpropimorph	3,147
11	Paraquat	2,954
12	Mecoprop	2,556
13	Metribuzin	2,282
14	MCPA	2,086
15	Fluazinam	2,079
16	Fentin hydroxide	1,976
17	Diquat	1,954
18	Azoxystrobin	1,890
19	Flusilazole	1,671
20	Epoxiconazole	1,436
21	Dimethomorph	1,222
22	Cyprodinil	957
23	Chlorpyrifos	948
24	2-chloroethylphosphonic acid	877
25	Cymoxanil	872
26	Fluroxypyr	746
27	Chlorotoluron	668
28	Trifloxystrobin	666
29	Tebuconazole	654
30	2,4-DB	651
31	Prochloraz	598
32	Trifluralin	571
33	Ioxynil	565
34	Bromoxynil	543
35	Metsulfuron-methyl	461
36	Picoxystrobin	440
37	Propiconazole	353
38	Kresoxim-methyl	337
39	Oxadixyl	328
40	Carbendazim	322
41	Mepiquat chloride	277
42	Cyproconazole	254
43	Quinoxyfen	253
44	Diflufenican	250
45	Pyraclostrobin	225
46	Thifensulfuron-methyl	214
47	Diclofop-methyl	207
48	Fenpropidin	207
49	Dichlorprop	194
50	Fluquinconazole	175

Table 12 **Spring barley: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General disease control	Ear Wash	Mildew	*Rhyncho/ -sporium*	All reasons	Basic area (ha) of treatment	Weight (kgs)
Fungicides							
Azoxystrobin	2,992	.	.	98	3,089	2,725	543
Azoxystrobin/fenpropimorph	33	.	.	22	55	55	17
Bromuconazole	42	.	.	.	42	42	5
Carbendazim/flusilazole	3,391	.	.	.	3,391	2,799	752
Chlorothalonil	1,507	.	.	166	1,673	1,480	749
Cyproconazole/cyprodinil	35	.	.	.	35	35	19
Cyproconazole/propiconazole	2,839	.	.	34	2,873	2,596	317
Cyproconazole/trifloxystrobin	1,102	44	.	.	1,145	949	180
Cyprodinil	954	.	92	71	1,116	1,116	613
Difenoconazole	64	.	.	.	64	64	3
Epoxiconazole	4,992	.	159	190	5,341	4,820	281
Epoxiconazole/fenpropimorph/kresoxim-methyl	571	.	.	.	571	571	166
Epoxiconazole/kresoxim-methyl	1,184	.	.	.	1,184	1,138	207
Fenamidone/propamocarb hydrochloride	49	.	.	.	49	49	33
Fenpropidin	.	.	108	.	108	108	46
Fenpropidin/tebuconazole	51	.	.	.	51	51	21
Fenpropimorph	1,281	.	.	.	1,281	1,187	441
Fenpropimorph/flusilazole	1,650	.	.	232	1,881	1,549	824
Fenpropimorph/pyraclostrobin	261	.	.	.	261	261	131
Fenpropimorph/quinoxyfen	645	.	.	.	645	497	120
Flusilazole	656	.	.	.	656	656	490
Mancozeb	93	.	.	.	93	93	17
Picoxystrobin	1,736	.	.	.	1,736	1,587	218
Propiconazole/tebuconazole	206	.	.	.	206	206	10
Propiconazole/tridemorph	76	.	.	.	76	76	22
Pyraclostrobin	126	.	.	.	126	126	13
Tebuconazole	143	.	.	.	143	143	31
Tebuconazole/triadimenol	255	.	.	.	255	206	58
Trifloxystrobin	1,118	.	.	.	1,118	936	105
Unknown fungicide	100	.	42	.	143	143	
All fungicides	***28,149***	***44***	***401***	***812***	***29,406***	***26,262***	***6,433***

Table 12 (cont.) **Spring barley: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation

	Chickweed	Cleavers	Corn marigold	Couch	Docks	Desiccation	General Weed control	Ground preparation	Knotgrass	Redshank + chickweed	Volunteer potatoes	Wild oats	All reasons	Basic Area(ha) of treatment	Weight (kg)
Herbicides & desiccants															
Benazolin/Bromoxynil/ioxynil	.	.	.	.	.	.	.	.	55	.	.	.	55	55	9
Bromoxynil/ioxynil	.	.	42	.	.	.	1,071	.	.	.	.	.	1,113	1,113	474
2,4-DB/linuron/MCPA	.	.	.	.	.	.	359	.	.	.	.	.	359	359	91
Dicamba/dichlorprop/ioxynil	77	.	.	.	.	.	.	.	.	.	.	.	77	77	114
Dicamba/MCPA/mecoprop	.	.	.	.	.	.	292	.	.	.	.	.	292	292	414
Dicamba/MCPA/mecoprop-P	.	.	.	.	.	.	715	.	.	.	.	.	715	715	744
Dicamba/mecoprop	.	36	.	.	.	.	.	.	.	.	.	.	36	36	12
Dicamba/mecoprop-P	27	.	.	.	.	.	774	.	.	.	.	.	801	801	504
Dichlorprop	.	.	.	.	.	.	116	.	.	.	.	.	116	116	79
Diclofop-methyl/fenoxaprop-P-ethyl	.	.	.	.	.	.	.	.	.	.	.	276	276	276	121
Diquat	.	.	.	.	.	75	.	.	.	.	.	.	75	75	34
Fenoxaprop-P-ethyl/isoproturon	.	.	.	.	.	.	.	.	.	.	.	83	83	83	26
Flamprop-M-isopropyl	.	.	.	.	.	.	.	.	.	.	.	143	143	143	56
Fluroxypyr	64	277	.	.	.	.	1,210	.	.	.	83	.	1,633	1,538	227
Glyphosate	.	5	.	216	.	3,558	16	7,539	.	.	.	.	11,335	10,220	9,007
Iodosulfron-methyl-sodium	.	.	.	.	.	.	486	.	.	.	.	.	486	486	4
Ioxynil	.	.	.	.	.	.	46	.	.	.	.	.	46	46	11
Isoproturon	.	.	.	.	.	.	453	.	.	.	.	.	453	453	555
Isoproturon/pendimethalin	.	.	.	.	.	.	34	.	.	.	.	.	34	34	42
MCPA	96	216	.	.	.	.	976	.	.	163	29	.	1,480	1,480	772
Mecoprop	186	167	.	.	.	.	2,717	.	55	.	.	.	3,125	3,125	1,837
Mecoprop-P	223	83	.	.	.	.	3,366	.	91	.	.	.	3,763	3,750	2,556
Mecoprop-P/metsulfuron-methyl	.	.	.	.	.	.	125	.	.	.	.	.	125	125	79
Metsulfuron-methyl	.	.	.	.	54	.	14,153	.	.	.	9	.	14,216	14,216	387
Metsulfuron-methyl/thifensulfuron-methyl	27	13	.	.	.	.	1,378	.	89	.	.	.	1,506	1,506	212
Metsulfuron-methyl/tribenuron-methyl	92	.	.	.	.	.	1,997	.	.	.	.	.	2,089	1,995	22
Pendimethalin	.	.	.	.	.	.	14	.	.	.	.	.	14	14	11
Thifensulfuron-methyl/tribenuron-methyl	.	216	.	.	.	.	632	122	.	.	.	.	970	970	17
Tralkoxydim	.	.	.	.	.	.	14	.	.	.	.	128	142	142	34
Tribenuron-methyl	.	.	.	.	.	.	70	.	.	.	.	.	70	70	4
All herbicides & desiccants	***791***	***1,013***	***42***	***216***	***54***	***3,633***	***31,013***	***7,661***	***290***	***163***	***121***	***630***	***45,626***	***44,309***	***18,453***

Table 12 (cont.) **Spring barley: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Aphids	Cutworm	Ear wash	General insect control	Growth regulation	Leatherjackets	Slugs	BYDV*	All reasons	Basic area (ha) of treatment	Weight (kg)
Insecticides											
Bifenthrin	112	.	.	.	.	.	.	.	112	112	1
Chlorpyrifos	.	39	.	250	.	1,290	7	.	1,586	1,512	700
Cypermethrin	683	.	.	.	.	.	.	82	765	765	16
Deltamethrin	1,540	.	.	307	.	.	.	.	1,847	1,847	21
Esfenvalerate	3,586	.	.	131	.	.	.	.	3,717	3,553	17
Lambda-cyhalothrin	2,772	.	44	437	.	.	.	.	3,253	3,019	19
Pirimicarb	120	.	.	.	.	.	.	.	120	120	12
Zeta-cypermethrin	198	.	.	55	.	.	.	.	253	253	4
Unknown insecticide	83	.	.	.	.	.	.	.	83	83	0
All insecticides	***9,093***	***39***	***44***	***1,180***	***.***	***1,290***	***7***	***82***	***11,734***	***11,262***	***790***
*** Barley yellow dwarf virus**											
Growth regulators											
Chlormequat	.	.	.	.	2,729	.	.	.	2,729	2,729	2,459
Chlormequat/2-chloroethylphosphonic acid	.	.	.	.	155	.	.	.	155	155	150
2-chloroethylphosphonic acid	.	.	.	.	826	.	.	.	826	826	230
2-chloroethylphosphonic acid/mepiquat chloride	.	.	.	.	437	.	.	.	437	437	270
Trinexapac-ethyl	.	.	.	.	434	.	.	.	434	392	32
All growth regulators	***.***	***.***	***.***	***.***	***4,580***	***.***	***.***	***.***	***4,580***	***4,538***	***3,141***

Table 13 **Undersown barley: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General weed control	Ground preparation	All reasons	Basic area (ha) of treatment	Weight (kgs)
Herbicides & desiccants					
Benazolin/2,4-DB/MCPA	56	.	56	56	111
2,4-DB/linuron/MCPA	208	.	208	208	62
2,4-DB/MCPA	159	.	159	159	223
Glyphosate	.	19	19	19	27
MCPA	115	.	115	115	202
Metsulfuron-methyl	19	.	19	19	<1
All herbicides & desiccants	***557***	***19***	***576***	***576***	***624***

Table 14 **Winter barley: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type and formulation	Mildew	General weed control	Rust	Mildew/ *Rhynchosporium*	Ear wash	All reasons	Basic area(ha) of treatment	Weight (kgs)
Fungicides								
Azoxystrobin	.	2,066	.	23	.	2,089	1,631	357
Azoxystrobin/fenpropimorph	.	73	.	.	.	73	73	26
Carbendazim/flusilazole	.	1,036	.	.	61	1,097	775	198
Chlorothalonil	.	828	.	23	.	850	630	373
Cyproconazole/propiconazole	.	845	.	23	.	867	634	114
Cyproconazole/trifloxystrobin	.	110	.	.	.	110	110	18
Cyprodinil	.	1,061	9	.	.	1,070	942	316
Epoxiconazole	.	1,902	.	23	.	1,924	1,325	109
Epoxiconazole/fenpropimorph/kresoxim-methyl	.	230	.	.	.	230	230	57
Epoxiconazole/kresoxim-methyl	.	337	.	.	.	337	337	113
Fenpropimorph	.	855	.	.	74	929	812	251
Fenpropimorph/flusilazole	.	396	.	.	.	396	334	168
Fenpropimorph/pyraclostrobin	.	44	.	.	.	44	44	17
Fenpropimorph/quinoxyfen	189	207	.	.	.	396	396	90
Flusilazole	.	1,107	.	.	.	1,107	792	210
Picoxystrobin	.	1,213	.	.	80	1,292	902	186
Propiconazole	.	80	.	.	.	80	80	20
Propiconazole/tebuconazole	.	72	.	.	.	72	72	3
Tebuconazole	.	280	.	.	.	280	221	31
Tebuconazole/triadimenol	.	27	.	.	13	40	40	4
Trifloxystrobin	.	922	.	.	.	922	856	95
Unknown fungicide	.	41	.	.	.	41	41	0
All fungicides	***189***	***13,728***	***9***	***91***	***227***	***14,244***	***11,275***	***2,755***

Table 14 (cont.) **Winter barley: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type and formulation	General weed control	Chickweed	Cleavers	Corn marigold	Desiccation	Ground preparation	Wild Oats	All reasons	Basic area (ha) of treatment	Weight (kgs)
Herbicides & desiccants										
Amidosulfuron	72	.	62	.	.	.	.	133	133	4
Bromoxynil/ioxynil	127	.	.	.	.	.	.	127	127	56
Chlorotoluron	31	.	.	.	.	.	.	31	31	76
Clopyralid/triclopyr	.	.	.	2	.	.	.	2	2	<1
Dichlorprop	28	.	.	.	.	.	.	28	28	22
Diclofop-methyl/fenoxaprop-P-ethyl	22	.	.	.	.	.	205	227	227	96
Diflufenican/Isoproturon	1,090	.	.	.	.	.	.	1,090	1,056	995
Diflufenican/trifluralin	67	.	.	.	.	.	.	67	67	37
Flamprop-M-isopropyl	8	.	.	.	.	.	20	28	28	16
Flufenacet/pendimethalin	24	.	.	.	.	.	.	24	24	21
Fluroxypyr	251	250	571	.	.	.	.	1,072	864	177
Glyphosate	64	.	.	.	1,129	1,209	.	2,402	2,176	1,753
Isoproturon	2,518	.	.	.	.	.	.	2,518	2,470	2,655
Isoproturon/pendimethalin	702	.	.	.	.	.	.	702	702	965
MCPA	160	.	.	.	.	.	.	160	160	49
Mecoprop	71	80	.	.	.	.	.	151	151	96
Mecoprop-P	198	15	.	.	.	.	.	212	212	186
Metsulfuron-methyl	827	15	.	.	.	.	.	842	842	4
Metsulfuron-methyl/thifensulfuron-methyl	62	.	.	.	.	.	.	62	62	2
Pendimethalin	488	.	.	.	.	.	.	488	488	497
Pendimethalin/picolinafen	47	.	.	.	.	.	.	47	47	32
Thifensulfuron-methyl/tribenuron-methyl	46	.	.	.	.	.	.	46	46	1
Tralkoxydim	17	.	.	.	.	.	85	101	101	26
Tribenuron-methyl	48	.	.	.	.	.	.	48	48	2
Trifluralin	433	37	.	.	.	.	.	470	470	380
Unknown herbicide	47	.	.	.	.	.	.	47	47	47
All herbicides & desiccants	***7,447***	***395***	***632***	***2***	***1,129***	***1,209***	***309***	***11,124***	***10,609***	***8,193***

Table 14 (cont.) **Winter barley: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Aphids	Growth regulation	BYDV*	General insect control	Leatherjackets	Slugs	All reasons	Basic area (ha) of treatment	Weight (kg)
Insecticides									
Bifenthrin	32	.	.	.	.	.	32	32	<1
Chlorpyrifos	100	.	.	12	290	2	403	324	224
Cypermethrin	393	.	.	.	.	.	393	326	9
Deltamethrin	518	.	.	72	.	.	590	460	5
Esfenvalerate	1,090	.	92	273	.	.	1,363	1,134	6
Lambda-cyhalothrin	1,171	.	.	241	.	.	1,503	1,319	8
Zeta-cypermethrin	.	.	.	151	.	.	151	151	2
All Insecticides	***3,303***	***.***	***92***	***749***	***290***	***2***	***4,434***	***3,747***	***255***
**** Barley yellow dwarf virus***									
Molluscicides									
Metaldehyde	.	.	.	.	.	45	0	45	4
Methiocarb	.	.	.	.	.	32	0	32	4
All molluscicides	***.***	***.***	***.***	***.***	***.***	***78***	***0***	***78***	***8***
Growth regulators									
Chlormequat	.	1,527	.	.	.	.	1,527	1,503	1,313
Chlormequat/2-chloroethylphosphonic acid	.	88	.	.	.	.	88	88	105
2-chloroethylphosphonic acid	.	787	.	.	.	.	787	759	194
2-chloroethylphosphonic acid/mepiquat chloride	.	147	.	.	.	.	147	147	83
Trinexapac-ethyl	.	730	.	.	.	.	730	722	57
All growth regulators	***.***	***3,279***		***.***	***.***	***.***	***3,279***	***3,219***	***1,753***

Table 15 **Spring wheat: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Mildew	General disease control	*Septoria*	*Septoria* / mildew	Ear wash	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides								
Azoxystrobin	.	360	.	.	68	427	405	65
Bromuconazole	.	68	.	.	.	68	68	20
Chlorothalonil	.	233	9	.	.	241	174	147
Cyproconazole/propiconazole	.	71	.	.	.	71	49	5
Cyproconazole/trifloxystrobin	.	30	.	.	.	30	30	3
Epoxiconazole	68	193	.	.	23	283	277	16
Epoxiconazole/fenpropimorph/kresoxim-methyl	.	44	.	.	.	44	44	18
Fenpropidin	68	.	.	.	.	68	68	25
Fenpropimorph	.	164	.	68	.	232	164	68
Fenpropimorph/flusilazole	.	56	.	.	.	56	56	26
Fenpropimorph/pyraclostrobin	.	34	.	.	.	34	17	20
Fenpropimorph/quinoxyfen	23	561	.	.	.	584	315	110
Fluquinconazole/prochloraz	.	569	.	.	.	569	328	155
Picoxystrobin	.	91	.	.	.	91	64	18
Propiconazole/tebuconazole	.	47	.	.	.	47	47	5
Pyraclostrobin	.	.	.	68	.	68	68	7
Tebuconazole	.	6	.	.	85	91	91	11
Tebuconazole/triadimenol	.	225	.	.	50	275	275	59
Trifloxystrobin	.	237	.	.	23	259	259	26
All fungicides	***158***	***2,988***	***9***	***136***	***247***	***3,538***	***2,798***	***804***

Table 15 (cont.) **Spring wheat: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General weed control	Cleavers	Desiccation	Ground preparation	All reasons	Basic area (ha) of treatment	Weight (kg)
Herbicides & desiccants							
Amidosulfuron	.	50	.	.	50	50	1
Bromoxynil/ioxynil	21	.	.	.	21	21	8
2,4-DB/linuron/MCPA	218	.	.	.	218	218	92
Dicamba/mecoprop-P	22	.	.	.	22	22	10
Fluroxypyr	172	10	.	.	182	124	33
Glyphosate	.	.	239	587	826	650	505
Iodosulfron-methyl-sodium	73	.	.	.	73	73	<1
Isoproturon	38	.	.	.	38	19	38
MCPA	45	.	.	.	45	45	56
Mecoprop	105	.	.	.	105	105	71
Mecoprop-P	484	.	.	.	484	390	283
Mecoprop-P/metsulfuron-methyl	6	.	.	.	6	6	4
Metsulfuron-methyl	538	.	.	.	538	538	2
Metsulfuron-methyl/thifensulfuron-methyl	73	.	.	.	73	73	2
Metsulfuron-methyl/tribenuron-methyl	519	.	.	.	519	320	6
All herbicides & desiccants	***2,316***	***60***	***239***	***587***	***3,201***	***2,655***	***1,110***

Table 15 (cont.) **Spring wheat: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Aphids	Growth regulation	Leatherjackets	Ear wash	General insect control	All reasons	Basic area (ha) of treatment	Weight (kg)
Insecticides								
Chlorpyrifos	.	.	9	.	.	9	9	<1
Cypermethrin	47	.	.	.	.	47	47	1
Deltamethrin	123	.	.	.	77	199	169	2
Esfenvalerate	70	.	.	.	427	497	340	2
Lambda-cyhalothrin	59	.	.	90	24	173	173	<1
All insecticides	***299***	***.***	***9***	***90***	***527***	***924***	***737***	***6***
Growth regulators								
Chlormequat	.	715	.	.	.	715	507	487
All growth regulators	***.***	***715***	***.***	***.***	***.***	***715***	***507***	***487***

Table 16 **Winter wheat: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Ear wash	General disease control	Mildew	*Rhyncho/ sporium*	*Septoria*	Take all	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides									
Azoxystrobin	64	3,960	37	.	67	11	4,139	3,082	790
Azoxystrobin/fenpropimorph	.	10	.	.	.	.	10	10	4
Bromuconazole	.	25	.	.	.	.	25	25	6
Carbendazim/flusilazole	.	72	.	.	.	.	72	60	12
Chlorothalonil	165	6,536	.	.	147	.	6,849	4,553	3,987
Cyproconazole/propiconazole	.	291	.	.	21	.	312	209	49
Cyprodinil	.	69	.	.	.	.	69	69	12
Difenoconazole	102	410	.	.	50	.	562	562	29
Dimoxystrobin/epoxiconazole	.	457	.	.	.	.	457	457	59
Epoxiconazole	73	8,471	.	.	.	.	8,544	4,846	627
Epoxiconazole/fenpropimorph/kresoxim-methyl	.	444	.	.	.	.	444	444	127
Epoxiconazole/kresoxim-methyl	.	465	.	.	.	.	465	408	74
Epoxiconazole/kresoxim-methyl/pyraclostrobin	.	.	.	.	61	.	61	61	64
Epoxiconazole/pyraclostrobin	.	117	.	.	.	.	117	117	11
Fenpropidin	.	384	37	.	.	.	420	362	123
Fenpropimorph	.	687	.	.	.	.	687	635	279
Fenpropimorph/flusilazole	.	110	.	.	.	.	110	101	39
Fenpropimorph/pyraclostrobin	.	169	.	.	.	.	169	94	48
Fenpropimorph/quinoxyfen	.	1,450	.	8	.	.	1,459	1,355	344
Fluquinconazole/prochloraz	.	2,146	.	.	.	.	2,146	1,993	584
Flusilazole	.	.	8	.	.	.	8	8	3
Mancozeb	.	19	.	.	.	.	19	19	26
Metrafenone	.	156	.	.	.	.	156	156	23
Picoxystrobin	.	94	.	.	.	.	94	66	15
Prochloraz	.	109	.	.	.	.	109	109	34
Propiconazole	.	45	.	.	.	.	45	45	6
Propiconazole/tebuconazole	49	374	.	.	.	.	423	283	22
Pyraclostrobin	.	827	.	.	.	.	827	781	115
Quinoxyfen	.	.	6	.	.	.	6	6	<1
Spiroxamine/tebuconazole	.	45	.	.	.	.	45	45	13
Tebuconazole	400	1,295	.	.	.	.	1,695	1,695	225
Tebuconazole/triadimenol	74	1,488	.	.	.	.	1,561	1,465	285
Trifloxystrobin	73	3,149	.	.	.	.	3,222	2,183	298
Unknown fungicide	59	129	.	.	.	.	188	129	
All fungicides	***1,058***	***34,001***	***87***	***8***	***346***	***11***	***35,512***	***26,431***	***8,330***

Table 16 (cont.) **Winter wheat: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Chickweed	Cleavers	Docks	Desiccation	General weed control	Ground preparation	Nettles	Volunteer potatoes	Volunteer oats	Wild oats	All reasons	Basic area (ha) of treatment	Weight (kg)
Herbicides & desiccants													
Amidosulfuron	.	65	.	.	62	.	.	.	.	.	127	127	3
Bromoxynil/ioxynil	.	.	.	.	409	.	.	.	.	.	409	409	206
Carfentrazone-ethyl/flypyrsulfuron-methyl	.	.	.	.	8	.	.	.	.	.	8	8	<1
Chlorotoluron	.	.	.	.	263	.	.	.	.	.	263	263	592
Clodinafop-Propargyl	.	.	.	.	.	.	.	.	26	83	109	109	3
2,4-DB/linuron/MCPA	.	.	.	.	44	.	.	.	.	.	44	34	36
Dicamba/mecoprop-P	.	.	.	.	79	.	.	.	.	.	79	79	63
Diflufenican/Isoproturon	.	.	.	.	1,325	.	.	.	.	.	1,325	1,325	1,228
Fenoxaprop-P-ethyl	.	.	.	.	.	.	.	.	.	523	523	523	37
Flamprop-M-isopropyl	.	.	.	.	32	.	.	.	.	33	65	65	35
Fluroxypyr	.	593	.	.	1,109	.	.	37	.	.	1,739	1,729	290
Glyphosate	.	.	.	1,489	19	1,388	.	.	.	3	2,899	2,596	2,080
Iodosulfron-methyl-sodium	.	.	.	.	176	.	.	.	.	.	176	136	2
Isoproturon	.	.	.	.	3,962	.	.	.	.	.	3,962	3,939	3,718
Isoproturon/pendimethalin	.	.	.	.	1,567	.	.	.	.	.	1,567	1,567	2,110
Isoproturon/trifluralin	.	.	.	.	18	.	.	.	.	.	18	18	4
MCPA	.	.	.	.	35	.	.	.	.	.	35	35	6
Mecoprop	41	.	.	.	386	.	.	.	.	.	427	383	270
Mecoprop-P	.	.	.	.	411	.	19	.	.	.	430	430	284
Metsulfuron-methyl	.	.	101	.	1,741	.	.	.	.	.	1,842	1,842	12
Metsulfuron-methyl/thifensulfuron-methyl	.	.	.	.	215	.	.	.	.	.	215	215	7
Metsulfuron-methyl/tribenuron-methyl	.	.	.	.	188	.	.	.	.	.	188	145	2
Paraquat	.	.	.	.	21	.	.	.	.	.	21	21	9
Pendimethalin	.	.	.	.	761	.	.	.	.	.	761	761	909
Pendimethalin/picolinafen	.	.	.	.	75	.	.	.	.	.	75	75	50
Tralkoxydim	.	.	.	.	52	.	.	.	.	102	155	155	28
Trifluralin	.	.	.	.	202	.	.	.	.	.	202	202	156
Unknown herbicide	.	.	.	.	97	.	.	.	.	.	97	97	26
All herbicides & desiccants	***41***	***658***	***101***	***1,489***	***13,256***	***1,388***	***19***	***37***	***26***	***746***	***17,759***	***17,287***	***12,165***

Table 16 (cont.) **Winter wheat: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Aphids	Ear wash	Slugs	Growth regulation	General insect control	Leatherjackets	Root fly	BYDV *	All reasons	Basic area (ha) of treatment	Weight (kg)
Insecticides											
Alpha-cypermethrin	38	.	.	.	80	.	.	.	118	118	<1
Bifenthrin	8	.	.	.	.	.	.	.	8	8	<1
Chlorpyrifos	.	.	.	.	.	42	.	.	42	42	17
Cypermethrin	424	.	.	.	.	.	.	.	424	360	10
Deltamethrin	520	49	.	.	561	.	.	.	1,130	936	8
Esfenvalerate	2,431	73	.	.	450	.	.	.	2,955	2,496	15
Lambda-cyhalothrin	1,362	43	.	.	1,672	.	38	350	3,463	2,256	25
Unknown insecticide	.	.	.	.	32	.	.	.	32	32	6
All insecticides	***4,783***	***165***	***.***	***.***	***2,794***	***42***	***38***	***350***	***8,171***	***6,247***	***82***
Molluscicides											
Metaldehyde	.	.	36	.	.	.	.	.	36	36	12
Methiocarb	.	.	109	.	.	.	.	.	109	109	18
All molluscicides	***.***	***.***	***145***	***.***	***.***	***.***	***.***	***.***	***145***	***145***	***30***
Growth regulators											
Chlormequat	.	.	.	5,176	.	.	.	.	5,176	4,942	4,756
Chlormequat/2-chloroethylphosphonic acid	.	.	.	149	.	.	.	.	149	149	104
2-chloroethylphosphonic acid	.	.	.	675	.	.	.	.	675	652	174
2-chloroethylphosphonic acid/mepiquat chloride	.	.	.	36	.	.	.	.	36	36	29
Trinexapac-ethyl	.	.	.	684	.	.	.	.	684	656	66
All growth regulators	***.***	***.***	***.***	***6,720***	***.***	***.***	***.***	***.***	***6,720***	***6,435***	***5,130***

*** Barley yellow dwarf virus**

Table 17 **Spring oats: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Mildew	General disease control	General weed control	Cleavers	Desiccation	Ground preparation	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides									
Azoxystrobin	.	172	.	.	.	.	172	172	27
Bromuconazole	.	24	.	.	.	.	24	24	4
Cyproconazole/propiconazole	.	24	.	.	.	.	24	24	3
Epoxiconazole	.	95	.	.	.	.	95	95	3
Epoxiconazole/fenpropimorph/kresoxim-methyl	.	16	.	.	.	.	16	16	3
Epoxiconazole/kresoxim-methyl	.	8	.	.	.	.	8	8	2
Fenpropimorph	.	82	.	.	.	.	82	82	51
Fenpropimorph/flusilazole	.	13	.	.	.	.	13	13	7
Fenpropimorph/quinoxyfen	32	29	.	.	.	.	61	61	13
Metrafenone	.	115	.	.	.	.	115	115	10
Picoxystrobin	.	6	.	.	.	.	6	6	2
Propiconazole/tebuconazole	.	14	.	.	.	.	14	14	1
Quinoxyfen	.	14	.	.	.	.	14	14	1
Tebuconazole	.	38	.	.	.	.	38	38	8
Tebuconazole/triadimenol	.	32	.	.	.	.	32	32	6
All fungicides	***32***	***681***	***.***	***.***	***.***	***.***	***713***	***713***	***140***
Herbicides & desiccants									
Amidosulfuron	.	.	342	.	.	.	342	342	10
Benazolin/2,4-DB/MCPA	.	.	24	.	.	.	24	24	47
Bromoxynil/ioxynil	.	.	34	.	.	.	34	34	14
Dicamba/mecoprop	.	.	6	.	.	.	6	6	2
Dicamba/mecoprop-P	.	.	21	.	.	.	21	21	18
Fluroxypyr	.	.	8	16	.	.	24	24	3
Glyphosate	.	.	.	.	348	34	382	382	367
Iodosulfron-methyl-sodium	.	.	14	.	.	.	14	14	<1
Mecoprop	.	.	65	.	.	.	65	65	37
Mecoprop-P	.	.	21	.	.	.	21	21	16
Metsulfuron-methyl	.	.	477	.	.	.	477	477	2
Metsulfuron-methyl/thifensulfuron-methyl	.	.	22	.	.	.	22	22	1
All herbicides & desiccants	***.***	***.***	***1,035***	***16***	***348***	***34***	***1,433***	***1,433***	***516***

Table 17 (cont.) **Spring oats: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Aphids	Growth regulation	Slugs	All reasons	Basic area (ha) of treatment	Quantity (kgs)
Insecticides						
Chlorpyrifos	.	9		9	9	4
Cypermethrin	34	.		34	34	<1
Esfenvalerate	52	.		52	52	<1
Lambda-cyhalothrin	47	.		47	47	<1
All insecticides	***133***	***9***	***.***	***141***	***141***	***5***
Growth regulators						
Chlormequat	.	.	77	77	77	98
2-chloroethylphosphonic acid	.	.	95	95	95	14
Trinexapac-ethyl	.	.	19	19	19	4
All growth regulators	***.***	***.***	***190***	***190***	***190***	***115***

Table 18 **Winter oats: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Mildew	General disease control	Ear wash	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides						
Azoxystrobin	15	54	.	69	69	13
Azoxystrobin/fenpropimorph	.	14	.	14	14	6
Chlorothalonil	15	7	.	22	22	22
Epoxiconazole	.	64	.	64	64	4
Epoxiconazole/kresoxim-methyl	.	72	.	72	36	11
Fenpropimorph	.	726	.	726	518	317
Fenpropimorph/quinoxyfen	.	400	.	400	382	141
Metrafenone	.	505	.	505	253	30
Pyraclostrobin	.	253	.	253	253	25
Quinoxyfen	28	385	.	413	413	80
Tebuconazole	.	117	12	129	85	17
Tebuconazole/triadimenol	.	77	.	77	77	22
Trifloxystrobin	.	18	.	18	18	1
All fungicides	***58***	***2,692***	***12***	***2,761***	***2,203***	***690***

Table 18(cont) **Winter oats: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General weed control	Cleavers	Desiccation	Ground preparation	All reasons	Basic area (ha) of treatment	Weight (kg)
Herbicides & desiccants							
Amidosulfuron	607	165	.	.	772	564	19
Bromoxynil/ioxynil	461	.	.	.	461	461	285
Carfentrazone-ethyl/flypyrsulfuron-methyl	217	.	.	.	217	217	3
Carfentrazone-ethyl/thiometon	10	.	.	.	10	10	<1
Dicamba/mecoprop-P	21	.	.	.	21	21	18
Fluroxypyr	36	106	.	.	142	142	16
Glyphosate	.	.	227	255	482	471	381
Mecoprop	212	.	.	.	212	212	119
Mecoprop-P	63	.	.	.	63	63	63
Metsulfuron-methyl	543	.	.	.	543	543	2
Terbutryn	15	.	.	.	15	15	18
Unknown herbicide	50	.	.	.	50	50	76
All herbicides & desiccants	***2,235***	***271***	***227***	***255***	***2,988***	***2,770***	***1,002***

Table 18(cont) **Winter oats: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General insect Aphids	Growth control	All regulation	of reasons	Basic area (ha) Weight treatment	(kg)
Insecticides						
Chlorpyrifos	10	.	.	10	10	4
Cypermethrin	141	.	.	141	141	4
Deltamethrin	454	.	.	454	454	2
Esfenvalerate	52	36	.	88	88	<1
Lambda-cyhalothrin	200	253	.	453	453	2
All insecticides	***857***	***289***	***.***	***1,145***	***1,145***	***11***
Growth regulators						
Chlormequat	.	.	927	927	705	1,010
Trinexapac-ethyl	.	.	66	66	66	6
All growth regulators	***.***	***.***	***993***	***993***	***771***	***1,016***

Table 19 **Undersown Oats: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General weed control	Ground preparation	All reasons	Basic area (ha) of treatment	Weight (kg)
Herbicides & desiccants					
2,4-DB/linuron/MCPA	78	.	78	78	22
2,4-DB/MCPA	76	.	76	76	107
Glyphosate	.	22	22	22	22
All herbicides & desiccants	***155***	***22***	***177***	***177***	***151***

Table 20 **Seed potatoes: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General disease control	Blight	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides					
Chlorothalonil/propamocarb hydrochloride	17	325	343	306	656
Cyazofamid	269	160	429	295	34
Cymoxanil	.	9	9	4	1
Cymoxanil/mancozeb	12	603	615	487	1,869
Cymoxanil/mancozeb/oxadixyl	231	.	231	115	387
Dimethomorph/mancozeb	269	2,413	2,682	673	2,952
Fenamidone/mancozeb	140	29	169	169	103
Fentin hydroxide	.	35	35	17	67
Fluazinam	525	2,970	3,495	964	447
Fluazinam/metalaxyl-m	.	347	347	196	64
Mancozeb	141	506	647	421	887
Mancozeb/metalaxyl	.	4	4	4	5
Mancozeb/metalaxyl-m	.	715	715	291	396
Mancozeb/propamocarb hydrochloride	346	160	506	276	924
All fungicides	***1,950***	***8,276***	***10,226***	***4,218***	***8,791***

Table 20 (cont) **Seed potatoes: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Aphids	General weed control	Desiccation	Stubble treatment	Ground preparation	Knotgrass	All reasons	Basic area (ha) of treatment	Weight (kg)
Herbicides & desiccants									
Carfentrazone-ethyl	.	.	51	.	.	.	51	26	3
Diquat	.	.	2,308	.	.	.	2,308	810	489
Glyphosate	.	.	75	.	549	.	624	420	453
Metribuzin	.	409	.	.	.	16	425	425	455
Paraquat	.	859	.	407	17	.	1,283	1,080	635
Rimsulfuron	.	16	.	.	.	.	16	16	<1
Sulphuric acid	.	.	210	.	.	.	210	197	29,588
All herbicides & desiccants	***.***	***1,284***	***2,645***	***407***	***566***	***16***	***4,917***	***2,972***	***31,623***
Insecticides									
Deltamethrin/pirimicarb	453	.	.	.	.	.	453	151	37
Dimethoate	365	.	.	.	.	.	365	205	124
Lambda-cyhalothrin	406	.	.	.	.	.	406	406	2
Pirimicarb	365	.	.	.	.	.	365	205	51
All insecticides	***1,589***	***.***	***.***	***.***	***.***	***.***	***1,589***	***967***	***215***

Table 21 **Early potatoes: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General disease control	Blight	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides					
Chlorothalonil/propamocarb hydrochloride	.	187	187	144	380
Cymoxanil/mancozeb	.	205	205	67	272
Cymoxanil/mancozeb/oxadixyl	.	60	60	30	281
Dimethomorph/mancozeb	30	202	233	130	337
Fluazinam	92	580	672	149	67
Mancozeb	45	346	391	179	532
Mancozeb/metalaxyl-m	.	69	69	69	70
Mancozeb/propamocarb hydrochloride	30	269	299	92	493
All fungicides	***196***	***1,920***	***2,116***	***859***	***2,431***

Pesticide type & formulation	Aphids	Desiccation	General weed control	Ground preparation	All reasons	Basic area (ha) of treatment	Weight (kg)
Herbicides & desiccants							
Diquat	.	113	.	.	113	113	45
Diquat/paraquat	.	.	34	.	34	34	28
Glyphosate	.	.	.	132	132	132	133
Metribuzin	.	.	105	.	105	105	70
Paraquat	.	.	330	.	330	330	226
Rimsulfuron	.	.	23	.	23	23	<1
Sulphuric acid	.	104	.	.	104	104	23,755
All herbicides & desiccants	***.***	***217***	***492***	***132***	***841***	***841***	***24,256***
Insecticides							
Lambda-cyhalothrin	150	.	.	.	150	90	<1
Pirimicarb	87	.	.	.	87	46	12
Pymetrozine	30	.	.	.	30	30	5
All insecticides	***267***	***.***	***.***	***.***	***267***	***167***	***17***

Table 22 **Maincrop potatoes: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General disease control	Blight	Ground preparation	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides						
Azoxystrobin	.	.	34	34	34	50
Chlorothalonil	26	26	.	52	26	36
Chlorothalonil/propamocarb hydrochloride	1,194	3,121	.	4,315	1,855	7,932
Cymoxanil	.	92	.	92	46	12
Cymoxanil/mancozeb	1,470	5,267	.	6,737	2,143	8,660
Cymoxanil/mancozeb/oxadixyl	.	1,244	.	1,244	622	2,083
Dimethomorph/mancozeb	2,125	4,606	.	6,731	2,462	8,167
Fenamidone/mancozeb	59	197	.	256	256	148
Fenamidone/propamocarb hydrochloride	.	32	.	32	16	29
Fentin hydroxide	315	725	.	1,040	689	1,910
Fluazinam	5,132	6,838	.	11,970	2,529	1,492
Fluazinam/metalaxyl-m	249	.	.	249	124	45
Mancozeb	1,189	3,741	.	4,930	1,634	6,961
Mancozeb/metalaxyl	194	145	.	339	198	215
Mancozeb/metalaxyl-m	321	550	.	870	570	1,003
Mancozeb/propamocarb hydrochloride	.	896	.	896	327	1,362
Unknown fungicide	21	.	.	21	21	
All fungicides	***12,294***	***27,479***	***34***	***39,807***	***13,550***	***40,105***

Table 22 (cont) **Maincrop potatoes: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General weed control	Desiccation	Ground preparation	Couch	Corn marigold	Knotgrass	All reasons	Basic area (ha) of treatment	Weight (kg)
Herbicides & desiccants									
Carfentrazone-ethyl	.	237	.	.	.	.	237	125	8
Diquat	66	4,405	.	.	.	.	4,471	3,261	1,291
Diquat/paraquat	181	.	.	.	.	.	181	181	94
Glufosinate-ammonium	.	74	.	.	.	.	74	74	33
Glyphosate	.	.	1,869	47	.	.	1,916	1,916	1,745
Linuron	67	.	.	.	.	.	67	67	81
Metribuzin	2,193	.	.	.	61	139	2,394	2,394	1,757
Paraquat	3,525	.	46	.	.	.	3,571	3,571	2,011
Rimsulfuron	318	.	.	.	61	.	379	379	2
Sulphuric acid	.	792	.	.	.	.	792	715	148,277
All herbicides & desiccants	***6,350***	***5,509***	***1,914***	***47***	***122***	***139***	***14,081***	***12,682***	***155,299***

Table 22 (cont) **Maincrop potatoes: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Aphids	Slugs	General insect control	All reasons	Basic area (ha) of treatment	Weight (kg)
Insecticides						
Deltamethrin	101	.	.	101	101	3
Lambda-cyhalothrin	1,647	.	104	1,751	1,069	9
Lambda-cyhalothrin/pirimicarb	128	.	.	128	128	14
Pirimicarb	20	.	.	20	20	3
Pymetrozine	642	.	.	642	642	97
Unknown insecticide	66	.	.	66	66	3
All insecticides	***2,605***	***.***	***104***	***2,709***	***2,026***	***130***
Molluscicides						
Metaldehyde	.	62	.	62	62	11
Methiocarb	.	52	.	52	52	5
All molluscicides	***.***	***114***	***.***	***114***	***114***	***16***

Table 23 **Oilseed rape: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General disease control	General weed control	Desiccation	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides						
Carbendazim/flusilazole	44	.	.	44	44	3
Difenoconazole	95	.	.	95	95	6
Flusilazole	44	.	.	44	44	9
Tebuconazole	55	.	.	55	55	10
All fungicides	***238***	***.***	***.***	***238***	***238***	***28***
Herbicides & desiccants						
Cycloxydim	.	122	.	122	122	24
Diquat	.	.	95	95	95	47
Fluazifop-P-butyl	.	27	.	27	27	5
Glyphosate	.	.	55	55	55	20
Metazachlor	.	149	.	149	149	149
All herbicides & desiccants	***.***	***299***	***149***	***448***	***448***	***245***

Pesticide type & formulation	All Aphids	Basic area (ha) of reasons	Weight treatment	(kg)
Insecticides				
Lambda-cyhalothrin	55	55	55	<1
All insecticides	***55***	***55***	***55***	***<1***

Table 24 **Peas & beans: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General disease control	General weed control	Desiccation	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides						
Azoxystrobin	197	.	.	197	106	31
Chlorothalonil	288	.	.	288	106	144
Mancozeb	182	.	.	182	91	364
Tebuconazole	9	.	.	9	9	<1
All fungicides	***677***	***.***	***.***	***677***	***312***	***540***
Herbicides & desiccants						
Bentazone	.	91	.	91	91	35
Bentazone/MCPB	.	9	.	9	9	15
Cycloxydim	.	91	.	91	91	13
Glyphosate	.	.	24	24	24	24
Simazine	.	91	.	91	91	91
Terbuthylazine/terbutryn	.	15	.	15	15	19
All herbicides & desiccants	***.***	***297***	***24***	***322***	***322***	***197***

Pesticide type & formulation	Aphids	General insect control	All reasons	Basic area (ha) of treatment	Weight (kg)
Insecticides					
Cypermethrin	15	.	15	15	<1
Deltamethrin	.	91	91	91	<1
Lambda-cyhalothrin	.	91	91	91	<1
All insecticides	***15***	***182***	***197***	***197***	***1***

Table 25 **Triticale: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide Type & formulation	General disease control	General weed control	Desiccation	Ground preparation	All reasons	Basic area (ha) of treatment	Weight (kg)
Fungicides							
Chlorothalonil	85	.	.	.	85	49	50
Cyproconazole/propiconazole	39	.	.	.	39	39	4
Epoxiconazole/kresoxim-methyl	86	.	.	.	86	50	24
Mancozeb	14	.	.	.	14	14	3
Picoxystrobin	14	.	.	.	14	14	1
All fungicides	***238***	***.***	***.***	***.***	***238***	***167***	***81***
Herbicides & desiccants							
Bromoxynil/ioxynil	.	35	.	.	35	35	33
Glyphosate	.	28	35	46	110	110	89
Mecoprop	.	28	.	.	28	28	16
Mecoprop-P	.	39	.	.	39	39	24
Metsulfuron-methyl	.	79	.	.	79	79	<1
Metsulfuron-methyl/tribenuron-methyl	.	39	.	.	39	39	<1
Pendimethalin	.	39	.	.	39	39	52
All herbicides & dessicants	***.***	***288***	***35***	***46***	***370***	***370***	***215***

Table 25 (cont) **Triticale: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	Aphids	Growth regulation	All reasons	Basic area (ha) of treatment	Weight (kg)
Insecticides					
Lambda-cyhalothrin	54	.	54	54	<1
All insecticides	***54***	***.***	***54***	***54***	***<1***
Growth regulators					
Chlormequat	.	15	15	15	21
2-chloroethylphosphonic acid	.	14	14	14	5
2-chloroethylphosphonic acid/mepiquat chloride	.	39	39	39	36
Trinexapac-ethyl	.	15	15	15	<1
All growth regulators	***.***	***84***	***84***	***84***	***63***

Table 26 **Lupins: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General weed control	Desiccation	All reasons	Basic area (ha) of treatment	Weight (kg)
Herbicides & desiccants					
Glyphosate	.	10	10	10	11
Pendimethalin	10	.	10	10	13
All herbicides & dessicants	***10***	***10***	***20***	***20***	***24***

Table 27 **Set aside: pesticide-treated area (spray-hectares), weights of pesticides applied (kilograms) and reason for use.**

Pesticide type & formulation	General weed control	Wild oats	Ground preparation	All reasons	Basic area (ha) of treatment	Weight (kg)
Herbicides & desiccants						
Benazolin/2,4-DB/MCPA	14	.	.	14	14	13
Glyphosate	466	161	16	643	551	539
All herbicides & desiccants	***480***	***161***	***16***	***657***	***565***	***552***

Table 28 **Comparison of the area of arable crops grown (hectares) in Northern Ireland, 1990-2004.**

Crop	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Cereals															
Spring barley	29,893	24,729	20,890	21,256	23,066	23,901	22,658	21,959	-27%	-11%	5%	3%	-5%	-8%	-3%
Undersown barley	5,800	5,759	6,542	4,875	4,035	3,532	1,876	599	-90%	-90%	-91%	-88%	-85%	-83%	-68%
Winter barley	3,670	5,721	5,832	7,166	7,720	5,194	3,922	4,535	24%	-21%	-22%	-37%	-41%	-13%	16%
Spring wheat	348	136	32	129	400	863	1,428	1,523	338%	1020%	4661%	1079%	281%	76%	7%
Undersown wheat	27	.	42	.	.	.	.	.	.	.	.	.	.	.	.
Winter wheat	5,827	6,839	6,952	6,543	6,745	4,125	5,807	7,111	22%	4%	2%	9%	5%	72%	22%
Spring oats	2,220	1,257	953	858	978	1,920	804	903	-59%	-28%	-5%	5%	-8%	-53%	12%
Undersown oats	117	221	337	130	102	25	20	234	100%	6%	-31%	80%	130%	819%	1069%
Winter oats	673	1,008	1,125	1,481	1,523	967	1,547	1,556	131%	54%	38%	5%	2%	61%	1%
All cereals	***48,575***	***45,670***	***42,704***	***42,438***	***44,569***	***40,528***	***38062***	***38420***	***-21%***	***-16%***	***-10%***	***-9%***	***-14%***	***-5%***	***1%***
Spring oilseed rape	15	31	287	66	237	.	111	.	.	.	.	.	.	.	.
Winter oilseed rape	891	1,032	323	127	502	.	.	.	.	.	.	.	.	.	.
All oilseed rape *	906	1,063	610	193	739	131	111	255	-72%	-76%	-58%	32%	-65%	95%	130%
Linseed	.	158	.	.	.	.	14	.	.	.	.	.	.	.	.
Maize	.	45	.	.	.	.	.	.	.	.	.	.	.	.	.
Peas & beans	.	.	.	.	199	273	197	212	.	.	.	.	6%	-22%	7%
Triticale	37	.	.	.	17	64	49	182	391%	.	.	.	994%	184%	271%
Lupins	.	.	.	.	.	.	67	10	.	.	.	.	.	.	-85%
Set-aside	.	.	.	.	.	2,451	3,013	3,394	.	.	.	.	.	38%	13%
Potatoes									.	.	.	.	.	.	.
Seed potatoes	3,509	3,688	1,678	1,798	1,607	.	1,239	1,148	-67%	-69%	-32%	-36%	-29%	.	-7%
Early potatoes	463	836	813	729	391	.	728	403	-13%	-52%	-51%	-45%	3%	.	-45%
Maincrop potatoes	7,863	6,540	5,913	5,961	5,515	.	4,741	4,517	-43%	-31%	-24%	-24%	-18%	.	-5%
All potatoes	***11,835***	***11,064***	***8,404***	***8,488***	***7,513***	***.***	***6,708***	***6,068***	***-49%***	***-45%***	***-28%***	***-29%***	***-19%***	***.***	***-10%***
All crops	***61,355***	***57,999***	***51,718***	***51,119***	***53,036***	*****43,447***	***48,222***	***48,541***	***-21%***	***-16%***	***-6%***	***-5%***	***-8%***	***12%***	***1%***

*** both winter & spring oilseed rape** ****excluding potatoes**

Table 29 **The area (spray-hectares) of arable crops treated with pesticides in Northern Ireland 1990-2004.**

	Survey Year								Differences between:						
Pesticide type	**1990**	**1992**	**1994**	**1996**	**1998**	**2000**	**2002**	**2004**	**2004-90**	**2004-92**	**2004-94**	**2004-96**	**2004-98**	**2004-00**	**2004-02**
Fungicides	102,594	106,290	114,972	121,833	141,099	.	127,435	139,474	36%	31%	21%	14%	-1%	.	9%
Herbicides & desiccants	75,130	76,444	72,725	81,027	91,193	.	86,597	104,539	39%	37%	44%	29%	15%	.	21%
Insecticides															
Carbamates	.	111	167	520	297	.	594	592	.	433%	254%	14%	99%	.	0%
Organochlorines	.	79	255	222	.	.	.			.	.	.	.	.	.
Organophosphates	1,472	2,454	2,124	3,085	1,587	.	1,265	2,423	65%	-1%	14%	-21%	53%	.	91%
Pyrethroids	2,895	2,800	3,267	7,706	17,084	.	18,164	26,973	832%	863%	726%	250%	58%	.	49%
Azomethine	.	.	.	.	.	.	.	673	.	.	.	.	.	.	.
Mixed Formulations	.	.	.	.	.	.	.	581	.	.	.	.	.	.	.
Unknown insecticides	465	694	207	815	1,238	.	.	180	-61%	-74%	-13%	-78%	-85%	.	.
All insecticides	4,831	6,138	6,020	12,348	20,206	.	20,023	31,421	550%	412%	422%	154%	56%	.	57%
Molluscicides	834	871	243	434	1,123	.	1,926	337	-60%	-61%	39%	-22%	-70%	.	-82%
Growth regulators	8,681	10,594	12,836	13,953	19,049	.	17,445	16,559	91%	56%	29%	19%	-13%	.	-5%
Mixed formulations	233	186	134	137	128	.	86	.	.	.	.	.	.	.	.
Seed treatments	42,683	44,961	39,026	38,979	36,083	.	34,636	32,968	-23%	-27%	-16%	-15%	-9%	.	-5%
All pesticides	***234,985***	***245,485***	***245,971***	***268,710***	***308,881***	***.***	***288,348***	***325,299***	***38%***	***33%***	***32%***	***21%***	***5%***	***.***	***13%***
Area grown (ha)	61,355	57,999	51,718	51,119	53,036	.	48,222	48,541	-21%	-16%	-6%	-5%	-8%	.	1%

Table 30 **The weight (tonnes) of pesticides applied to arable crops in Northern Ireland 1990-2004.**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	97.57	101.76	90.99	94.22	91.06	.	85.20	71.13	-27%	-30%	-22%	-25%	-22%	.	-17%
Herbicides & desiccants	253.62	212.36	133.57	336.33	337.65	.	390.98	254.62	0%	20%	91%	-24%	-25%	.	-35%
Insecticides															
Carbamates	.	*0.02*	*0.02*	*0.07*	*0.04*	.	*0.08*	*0.08*	.	295%	276%	13%	122%	.	0%
Organochlorines	.	*0.09*	*0.29*	*0.23*	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	*0.68*	*0.80*	*0.85*	*1.51*	*0.87*	.	*0.57*	*1.07*	58%	34%	26%	-29%	23%	.	88%
Pyrethroids	*0.05*	*0.05*	*0.07*	*0.15*	*0.19*	.	*0.20*	*0.20*	296%	296%	187%	32%	4%	.	-3%
Azomethine	.	.	.	.	.	.	.	*0.10*	.	.	.	.	.	.	.
Mixed Formulations	.	.	.	.	.	.	.	*0.05*	.	.	.	.	.	.	.
Unknown Insecticide	.	.	.	.	.	.	.	*0.01*	.	.	.	.	.	.	.
All insecticides	0.72	0.96	1.23	1.95	1.10	.	0.85	1.51	110%	57%	23%	-23%	38%	.	77%
Molluscicides	0.33	0.27	0.12	0.09	0.17	.	0.34	0.06	-82%	-78%	-49%	-33%	-65%	.	-82%
Growth regulators	10.60	9.35	10.86	12.84	14.43	.	11.61	11.70	10%	25%	8%	-9%	-19%	.	1%
Mixed formulations	0.51	0.41	0.29	0.30	0.28	.	0.13	.	.	.	.	.	.	.	.
Seed treatments	0.38*	3.77	5.06	3.03	3.71	.	2.82	2.28	.	-40%	-55%	-25%	-39%	.	-19%
All pesticides	***363.74***	***328.89***	***242.12***	***448.78***	***448.40***	***.***	***491.93***	***341.30***	***-6%***	***4%***	***41%***	***-24%***	***-24%***	***.***	***-31%***
Area grown (ha)	61,355	57,999	51,718	51,119	53,036	.	48,222	48,541	-21%	-16%	-6%	-5%	-8%	.	1%

*** Seed treatments on potatoes not recorded**

Table 31 **The area (spray-hectares) of cereal crops treated with pesticides in Northern Ireland 1990-2004.**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	33,741	37,584	42,517	56,880	64,171	63,739	60,230	86,173	155%	129%	103%	51%	34%	35%	43%
Herbicides & desiccants	52,342	52,872	56,201	63,072	72,911	71,281	69,752	82,884	58%	57%	47%	31%	14%	16%	19%
Insecticides															
Carbamates	.	*88*	*167*	*493*	*249*	.	*182*	*120*	.	36%	-28%	-76%	-52%	.	-34%
Organochlorines	.	*79*	*255*	*222*	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	*1,164*	*2,359*	*1,857*	*2,447*	*1,440*	*3,773*	*1,140*	*2,058*	77%	-13%	11%	-16%	43%	-45%	81%
Pyrethroids	*2,381*	*2,670*	*3,267*	*7,047*	*16,481*	*23,617*	*16,709*	*24,258*	919%	809%	643%	244%	47%	3%	45%
Azomethine	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Unknown insecticides	*465*	*694*	*207*	*816*	*1,207*	*2,290*	.	*114*	-75%	-84%	-45%	-86%	-91%	-95%	.
All insecticides	4,010	5,890	5,754	11,028	19,377	29,681	18,031	26,550	562%	351%	361%	141%	37%	-11%	47%
Molluscicides	24	.	27	168	129	833	305	223	829%	.	726%	33%	73%	-73%	-27%
Growth regulators	8,607	10,509	12,836	13,953	18,998	17,237	17,330	16,476	91%	57%	28%	18%	-13%	-4%	-5%
Seed treatments	41,739	39,958	35,995	35,525	31,728	34,260	31,494	29,069	-30%	-27%	-19%	-18%	-8%	-15%	-8%
All pesticides	***140,465***	***146,819***	***153,330***	***180,624***	***207,314***	***217,031***	***197,144***	***241,374***	***72%***	***64%***	***57%***	***34%***	***16%***	***11%***	***22%***
Area grown (ha)	48,575	45,670	42,703	42,438	44,570	40,528	38,062	38,420	-21%	-16%	-10%	-9%	-14%	-5%	1%

Table 32 **The weight (tonnes) of pesticides applied to cereal crops in Northern Ireland 1990-2004.**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	14.97	18.43	14.96	24.52	22.82	13.32	15.18	19.15	28%	4%	28%	-22%	-16%	44%	26%
Herbicides & desiccants	55.07	39.43	35.67	42.87	46.26	41.68	35.35	42.21	-23%	7%	18%	-2%	-9%	1%	19%
Insecticides															
Carbamates	.	*0.01*	*0.02*	*0.07*	*0.03*	.	*0.03*	*0.012*	.	20%	-43%	-83%	-58%	.	-53%
Organochlorines	.	*0.09*	*0.29*	*0.23*	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	*0.51*	*0.68*	*0.49*	*1.24*	*0.74*	*2.51*	*0.56*	*0.948*	86%	39%	93%	-24%	29%	-62%	71%
Pyrethroids	*0.04*	*0.04*	*0.07*	*0.13*	*0.19*	*0.26*	*0.19*	*0.178*	345%	345%	158%	37%	-8%	-32%	-8%
Azomethine	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
All insecticides	0.55	0.83	0.88	1.66	0.96	2.75	0.78	1.14	107%	37%	30%	-31%	19%	-59%	47%
Molluscicides	0.01	.	0.01	0.04	0.02	0.14	0.06	0.04	300%	.	525%	0%	140%	-71%	-38%
Growth regulators	10.51	9.32	10.86	12.84	14.41	12.87	11.61	11.64	11%	25%	7%	-9%	-19%	-10%	0%
Seed treatments	0.33	0.94	3.80	2.41	1.72	2.34	1.57	1.35	309%	44%	-64%	-44%	-21%	-42%	-14%
All pesticides	***81.44***	***68.94***	***66.17***	***84.35***	***86.19***	***73.11***	***64.35***	***75.55***	***-7%***	***10%***	***14%***	***-10%***	***-12%***	***3%***	***17%***
Area grown (ha)	48,575	45,670	42,703	42,438	44,570	40,528	38,062	38,420	-21%	-16%	-10%	-9%	-14%	-5%	1%

Table 33 **The area (spray-hectares) of oilseed rape treated with pesticides in Northern Ireland 1990-2004.**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	467	525	86	226	664	244	70	238	-49%	-55%	178%	5%	-64%	-3%	237%
Herbicides & desiccants	1,603	1,343	597	292	1,171	366	194	448	-72%	-67%	-25%	53%	-62%	23%	131%
Insecticides															
Carbamates	.	.	.	.	*28.6*	.	.	.	.	.	.	.	.	.	.
Organochlorines	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	.	*67*	*180*	*25*	*5.4*	.	.	.	.	.	.	.	.	.	.
Pyrethroids	.	*131*	.	.	*190*	.	*49*	*55*	.	-58%	.	.	-71%	.	13%
Unknown insecticides	.	.	.	.	*10*	.	.	.	.	.	.	.	.	.	.
All insecticides	.	198	180	25	234	.	49	55	.	-72%	-70%	119%	-77%	.	12%
Molluscicides	810	871	216	72	522	.	39	.	.	.	.	.	.	.	.
Growth regulators	.	84	.	.	.	.	.	.	.	.	.	.	.	.	.
Seed treatments	906	1,063	610	140	339	123	98	106	-88%	-90%	-83%	-24%	-69%	-14%	8%
All pesticides	***3,786***	***4,084***	***1,689***	***755***	***2,931***	***732***	***450***	***846***	***-78%***	***-79%***	***-50%***	***12%***	***-71%***	***16%***	***88%***
Area grown (ha)	906	1,062	610	193	739	131	111	255	-72%	-76%	-58%	32%	-65%	95%	130%

Table 34 **The weight (tonnes) of pesticides applied to oilseed rape in Northern Ireland 1990-2004**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	0.53	0.06	0.03	0.30	0.60	0.64	0.01	0.03	-94%	-50%	-9%	-90%	-95%	-95%	152%
Herbicides & desiccants	1.31	0.98	0.62	0.20	0.74	0.16	0.10	0.25	-81%	-74%	-59%	25%	-66%	56%	155%
Insecticides															
Carbamates	.	.	.	.	*0.004*	.	.	.	.	.	.	.	.	.	.
Organochlorines	.	.	.	.	*<0.001*	.	.	.	.	.	.	.	.	.	.
Organophosphates	.	*0.02*	*0.08*	*0.01*	*0.004*	.	.	.	.	.	.	.	.	.	.
Pyrethroids	.	*0.01*	.	.	*0.001*	.	*0.0001*	*0.0003*	.	-97%	.	.	-73%	.	200%
All insecticides	.	0.03	0.08	0.01	0.009	.	0.0001	0.0003	.	-99%	-100%	-97%	-97%	.	170%
Molluscicides	0.32	0.27	0.11	0.01	0.06	.	0.01	.	.	.	.	.	.	.	.
Growth regulators	.	0.04	.	.	.	.	.	.	.	.	.	.	.	.	.
Seed treatments	0.05	0.11	0.06	0.02	0.005	.	0.01	0.002	-96%	-98%	-97%	-90%	-54%	.	-85%
All pesticides	***2.21***	***1.49***	***0.90***	***0.54***	***1.41***	***0.81***	***0.13***	***0.28***	***-87%***	***-81%***	***-69%***	***-48%***	***-80%***	***-65%***	***109%***
Area grown (ha)	906	1,062	610	193	739	131	111	255	-72%	-76%	-58%	32%	-65%	95%	130%

Table 35 **The area (spray-hectares) of peas and beans treated with pesticides in Northern Ireland 1998-2004.**

	Survey Year				Differences between:		
	1998	2000	2002	2004	2004-98	2004-00	2004-02
Pesticide type							
Fungicides	314	138	302.7	676.7	115%	390%	124%
Herbicides & desiccants	444	199	241.1	321.5	-28%	62%	33%
Insecticides							
Carbamates	19	18.3	54.2	.	.	.	.
Organochlorines	.	.	.	.	.	.	.
Organophosphates	22	.	.	.	.	.	.
Pyrethroids	64	.	66.1	197.20	208%	.	198%
Unknown insecticides	.	.	.	.	.	.	.
All insecticides	105	18.3	120.3	197.2	88%	978%	64%
Molluscicides	.	.	.	.	.	.	.
Growth regulators	.	.	.	.	.	.	.
Seed treatments	.	105	137.9	15.1	.	-86%	-89%
All pesticides	***863***	***459.9***	***802***	***1,210.5***	***40%***	***163%***	***51%***
Area grown (ha)	199	273	197	212	6%	-22%	7%

Table 36 **The weight (tonnes) of pesticides applied to peas and beans in Northern Ireland 1998-2004.**

	Survey Year				Differences between:		
	1998	2000	2002	2004	2004-98	2004-00	2004-02
Pesticide type							
Fungicides	0.20	0.05	0.1055	0.540	172%	908%	412%
Herbicides & desiccants	0.41	0.20	0.2545	0.197	-52%	0.02%	-23%
Insecticides							
Carbamates	0.003	0.005	0.003	.	.	.	.
Organochlorines	.	.	.	.	.	.	.
Organophosphates	0.002	.	.	.	.	.	.
Pyrethroids	<.001	.	<.001	0.001	0%	0%	0%
All insecticides	0.006	0.005	0.0032	0.001	-83%	-80%	-69%
Molluscicides	.	.	.	.	.	.	.
Growth regulators	.	.	.	.	.	.	.
Seed treatments	.	0.112	0.015	0.002	.	-98%	-85%
All pesticides	***0.614***	***0.367***	***0.3782***	***0.740***	***21%***	***102%***	***96%***
Area grown (ha)	199	273	197	212	6%	-22%	7%

Table 37 The area (spray-hectares) of set-aside treated with pesticides in Northern Ireland 2000-2004

	Survey Year			Differences between:	
	2000	2002	2004	2004-00	2004-02
Pesticide type					
Fungicides	.	.	.	.	.
Herbicides & desiccants	912	1,395	657	-28%	-53%
Insecticides					
Carbamates	.	.	.	.	.
Organochlorines	.	.	.	.	.
Organophosphates	.	.	.	.	.
Pyrethroids	.	.	.	.	.
All insecticides	.	.	.	.	.
Molluscicides	.	.	.	.	.
Growth regulators	.	.	.	.	.
Seed treatments	.	.	.	.	.
All pesticides	***912***	***1,395***	***657***	***-28%***	***-53%***
Area grown (ha)	2,451	3,013	3,394	38%	13%

Table 38 The weight (tonnes) of pesticides applied to set-aside in Northern Ireland 2000-2004

	Survey Year			Differences between:	
	2000	2002	2004	2004-00	2004-02
Pesticide type					
Fungicides	.	.	.	.	.
Herbicides & desiccants	0.866	1.037	0.551	-36%	-47%
Insecticides					
Carbamates	.	.	.	.	.
Organochlorines	.	.	.	.	.
Organophosphates	.	.	.	.	.
Pyrethroids	.	.	.	.	.
All insecticides	.	.	.	.	.
Molluscicides	.	.	.	.	.
Growth regulators	.	.	.	.	.
Seed treatments	.	.	.	.	.
All pesticides	***0.866***	***1.037***	***0.551***	***-36%***	***-47%***
Area grown (ha)	2,451	3,013	3,394	38%	13%

Table 39 **The area (spray-hectares) of potato crops treated with pesticides in Northern Ireland 1990-2004**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	68,384	68,178	72,369	64,727	75,933	.	66,810	52,149	-24%	-24%	-28%	-19%	-31%	.	-22%
Herbicides & desiccants	21,146	21,819	15,927	17,663	16,616	.	14,852	19,839	-6%	-9%	25%	12%	19%	.	34%
Insecticides															
Carbamates	.	*23*	.	*28*	.	.	*357*	*473*	.	1957%	.	1589%	.	.	32%
Organochlorines	.	.	.	.	.	.	.	.	.	.	.	.	.	.	. .
Organophosphates	*308*	*28*	*88*	*612*	*123*	.	*125*	*365*	19%	1204%	315%	-40%	197%	.	191%
Pyrethroids	*512*	.	.	*656*	*353*	.	*1,340*	*2,408*	370%	.	.	267%	582%	.	80%
Azomethine	.	.	.	.	.	.	.	673	.	.	.	.	.	.	.
Mixed Formulation	.	.	.	.	.	.	.	581	.	.	.	.	.	.	.
Unknown insecticides	.	.	*14*	.	*20*	.	.	*66*	.	.	371%	.	.	.	.
All insecticides	820	51	102	1,295	492	.	1,823	4,565	457%	8851%	4398%	253%	828%	.	150%
Molluscicides	.	.	.	195	472	.	1,581	114	.	.	.	-42%	-76%	.	-93%
Mixed formulations	233	186	134	137	128	.	86	.	.	.	.	.	.	.	.
Growth regulators	.	.	.	.	.	.	72	.	.	.	.	.	.	.	.
Seed treatments	*	3,738	2,420	3,314	4,017	.	3,071	3,679	.	-2%	52%	11%	-8%	.	20%
All pesticides	***90,583***	***93,972***	***90,952***	***87,330***	***97,658***	***.***	***88,295***	***80,347***	***-11%***	***-14%***	***-12%***	***-8%***	***-18%***	***.***	***-9%***
Area grown (ha)	11,835	11,064	8,404	8,488	7,513	.	6,708	6,068	-49%	-45%	-28%	-29%	-19%	.	-10%

*** Seed treatments not recorded**

Table 40 **The weight (tonnes) of pesticides applied to potato crops in Northern Ireland 1990-2004**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	82.07	83.28	76.00	69.41	67.43	.	69.90	51.33	-37%	-38%	-32%	-26%	-24%	.	-27%
Herbicides & desiccants	197.20	171.75	97.28	293.26	290.23	.	354.01	211.18	7%	23%	117%	-28%	-27%	.	-40%
Insecticides															
Carbamates	.	*<0.01*	.	*<0.01*	.	.	*0.05*	*0.07*	.	.	.	.	.	.	30%
Organochlorines	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	*0.17*	*0.10*	*0.28*	*0.26*	*0.12*	.	*0.02*	*0.12*	-27%	24%	-56%	-52%	1%	.	680%
Pyrethroids	*0.01*	.	.	*0.02*	*<0.01*	.	*0.01*	*0.01*	0%	.	.	-50%	.	.	20%
Azomethines	.	.	.	.	.	.	.	*0.102*	.	.	.	.	.	.	.
Mixed Formulation	.	.	.	.	.	.	.	*0.051*	.	.	.	.	.	.	.
Unknown Insecticide	.	.	.	.	.	.	.	*0.003*	.	.	.	.	.	.	.
All insecticides	0.17	0.10	0.28	0.28	0.13	.	0.08	0.36	113%	262%	30%	29%	178%	.	381%
Molluscicides	.	.	.	0.04	0.10	.	0.26	0.02	.	.	.	-60%	-84%	.	-94%
Mixed formulations	0.51	0.41	0.29	0.30	0.28	.	0.13	.	.	.	.	.	.	.	.
Growth regulators	.	.	.	.	.	.	0.17	.	.	.	.	.	.	.	.
Seed treatments	*	2.71	1.20	0.61	1.99	.	1.22	0.90	.	-67%	-25%	47%	-55%	.	-26%
All pesticides	***279.95***	***258.25***	***175.06***	***363.89***	***360.16***	***.***	***425.84***	***263.78***	***-6%***	***2%***	***51%***	***-28%***	***-27%***	***.***	***-38%***
Area grown (ha)	11,835	11,064	8,404	8,488	7,513	.	6,708	6,068	-49%	-45%	-28%	-29%	-19%	.	-10%

*** Seed treatments not recorded**

Table 41 **The area (spray-hectares) of seed potatoes treated with pesticides in Northern Ireland 1990-2004**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	18,326	18,603	16,465	13,462	14,242	.	9,219	10,226	-44%	-45%	-38%	-24%	-28%	.	11%
Herbicides & desiccants	6,535	8,118	3,784	4,035	3,363	.	2,650	4,917	-25%	-39%	30%	22%	46%	.	86%
Insecticides															
Carbamates	.	*23*	.	.	.	.	.	*365*	.	1487%	.	.	.	.	.
Organochlorines	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	.	*18*	.	.	*26*	.	.	*365*	.	1928%	.	.	1320%	.	.
Pyrethroids	*501*	.	.	*586*	*205*	.	*16*	*406*	-19%	.	.	-31%	98%	.	2391%
Mixed Formulations	.	.	.	.	.	.	.	*453*	.	.	.	.	.	.	.
All insecticides	501	41	8	586	230	.	16	1,589	217%	3776%	20274%	171%	590%	.	9650%
Molluscicides	.	.	.	.	66	.	267	.	.	.	.	.	.	.	.
Mixed formulations	8	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Seed treatments	*	2,039	744	1,065	882	.	512	1,224	.	-40%	65%	15%	39%	.	139%
All pesticides	***25,370***	***28,801***	***21,000***	***19,148***	***18,783***	***.***	***12,665***	***17,956***	***-29%***	***-38%***	***-14%***	***-6%***	***-4%***	***.***	***42%***
Area grown (ha)	3,509	3,688	1,678	1,798	1,607	.	1,239	1,148	-67%	-69%	-32%	-36%	-29%	.	-7%

*** Seed treatments not recorded**

Table 42 The weight (tonnes) of pesticides applied to seed potatoes in Northern Ireland 1990-2004

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	22.92	24.82	15.24	13.45	14.29	.	9.08	8.79	-62%	-65%	-42%	-35%	-38%	.	-3%
Herbicides & desiccants	127.42	100.45	41.73	146.03	148.63	.	129.71	31.62	-75%	-69%	-24%	-78%	-79%	.	-76%
Insecticides															
Carbamates	.	*<0.01*	.	.	.	.	.	*0.051*	.	.	.	.	.	.	.
Organochlorines	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	.	*0.06*	.	.	*<0.01*	.	.	*0.124*	.	107%	.	.	.	.	.
Pyrethroids	*0.01*	.	.	*0.02*	*<0.01*	.	*<0.01*	*0.002*	-80%	.	.	-90%	.	.	1900%
Mixed Formulations	.	.	.	.	.	.	.	*0.04*	.	.	.	.	.	.	.
All insecticides	0.01	0.06	0.03	0.02	0.01	.	<0.01	0.22	2050%	258%	714%	975%	2035%	.	214900%
Molluscicides	.	.	.	.	0.01	.	0.04	.	.	.	.	.	.	.	.
Mixed formulations	0.02	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Seed treatments	*	1.97	0.30	0.21	0.74	.	0.08	0.41	.	-79%	36%	94%	-45%	.	432%
All pesticides	***150.37***	***127.30***	***57.30***	***159.70***	***163.68***	***.***	***138.91***	***41.04***	***-73%***	***-68%***	***-28%***	***-74%***	***-75%***	***.***	***-70%***
Area grown (ha)	3,509	3,688	1,678	1,798	1,607	.	1,239	1,148	-67%	-69%	-32%	-36%	-29%	.	-7%

*** Seed treatments not recorded**

Table 43 **The area (spray-hectares) of early potatoes treated with pesticides in Northern Ireland 1990-2004**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	2,037	3,250	3,706	3,089	1,693	.	5,561	2,116	4%	-35%	-43%	-31%	25%	.	-62%
Herbicides & desiccants	849	1,304	835	1,312	618	.	1,520	841	-1%	-36%	1%	-36%	36%	.	-45%
Insecticides															
Carbamates	.	.	.	*28*	.	.	.	*87*	.	.	.	211%	.	.	.
Organochlorines	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	.	.	.	*63*	*66*	.	*24*	.	.	.	.	.	.	.	.
Pyrethroids	.	.	.	.	*39*	.	*173*	*150*	.	.	.	.	289%	.	-13%
Unknown insecticide	.	.	.	.	*2.2*	.	.	.	.	.	.	.	.	.	.
Azomethine	.	.	.	.	.	.	.	*30*	.	.	.	.	.	.	.
All insecticides	.	.	.	90	107	.	197	267	.	.	.	197%	151%	.	36%
Molluscicides	.	.	.	.	10	.	206	.	.	.	.	.	.	.	.
Seed treatments	*	360	130	303	154	.	481	212	.	-41%	63%	-30%	37%	.	-56%
All pesticides	***2,886***	***4,914***	***4,672***	***4,794***	***2,582***	***.***	***7,966***	***3,436***	***19%***	***-30%***	***-26%***	***-28%***	***33%***	***.***	***-57%***
Area grown (ha)	463	836	813	729	391	.	728	403	-13%	-52%	-51%	-45%	3%	.	-45%.

Table 44 **The weight (tonnes) of pesticides applied in Northern Ireland 1990-2004.**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	2.54	4.11	4.46	3.85	2.07	.	5.48	2.43	-4%	-41%	-46%	-37%	18%	.	-56%
Herbicides & desiccants	0.51	3.09	0.55	4.05	1.73	.	32.56	24.26	4656%	685%	4336%	499%	1299%	.	-26%
Insecticides															
Carbamates	.	.	.	*< 0.1*	.	.	*<.01*	*0.012*	.	.	.	.	.	.	.
Organochlorines	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	.	.	.	*0.02*	*0.08*	.	*0.01*	.	.	.	.	.	.	.	.
Pyrethroids	.	.	.	.	.	.	.	*0.001*	.	.	.	.	.	.	.
Azomethine	.	.	.	.	.	.	.	*0.005*	.	.	.	.	.	.	.
All insecticides	.	.	.	0.02	0.08	.	0.01	0.02	.	.	.	-15%	-80%	.	87%
Molluscicides	.	.	.	.	0.002	.	0.038	.	.	.	.	.	.	.	.
Seed treatments	*	0.20	0.04	0.05	0.03	.	0.11	0.02	.	-93%	-64%	-70%	-50%	.	-87%
All pesticides	***3.05***	***7.40***	***5.05***	***7.96***	***3.92***	***.***	***38.21***	***26.72***	***776%***	***261%***	***429%***	***236%***	***582%***	***.***	***-30%***
Area grown (ha)	463	836	813	729	391	.	728	403	-13%	-52%	-51%	-45%	3%	.	-45%

*** Seed treatments not recorded**

Table 45 **The area (spray-hectares) of maincrop potatoes treated with pesticides in Northern Ireland 1990-2004.**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	48,021	46,325	52,198	48,176	59,998	.	52,030	39,807	-17%	-14%	-24%	-17%	-34%	.	-23%
Herbicides & desiccants	13,762	12,397	11,309	12,316	12,635	.	10,682	14,081	2%	14%	25%	14%	11%	.	32%
Insecticides															
Carbamates	.	.	.	.	.	.	*357.4*	*20*	.	.	.	.	.	.	-94%
Organochlorines		.	.	.	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	*308*	*10*	.	*549*	*32*	.	*101*	.	.	.	.	.	.	.	.
Pyrethroids	*11*	.	.	*70*	*110*	.	*1151*	*1852*	16736%	.	.	2546%	1587%	.	61%
Azomethine	.	.	.	.	.	.	.	*642*	.	.	.	.	.	.	.
Mixed Formulations	.	.	.	.	.	.	.	*128*	.	.	.	.	.	.	.
Unkown insecticide	.	.	.	.	.	.	.	*66*	.	.	.	.	.	.	.
All insecticides	319	10	94	619	155	.	1609	2,709	749%	26987%	2791%	338%	1648%	.	68%
Molluscicides	.	.	.	195	396	.	1,108	114	.	.	.	-42%	-71%	.	-90%
Growth regulators	.	.	.	.	.	.	72	.	.	.	.	.	.	.	.
Mixed formulations	225	186	134	137	128	.	86	.	.	.	.	.	.	.	.
Seed treatments	*	1,339	1,546	1,945	2,980	.	2,078	2,243	.	68%	45%	15%	-25%	.	8%
All pesticides	***62,328***	***60,257***	***65,280***	***63,388***	***76,292***	***.***	***67,664***	***58,955***	***-5%***	***-2%***	***-10%***	***-7%***	***-23%***	***.***	***-13%***
Area grown (ha)	7,863	6,540	5,913	5,961	5,515	.	4,741	4,517	-43%	-31%	-24%	-24%	-18%	.	-5%

*** Seed treatments not recorded**

Table 46 **The weight (tonnes) of pesticides applied to maincrop potatoes in Northern Ireland 1990-2004.**

	Survey Year								Differences between:						
	1990	1992	1994	1996	1998	2000	2002	2004	2004-90	2004-92	2004-94	2004-96	2004-98	2004-00	2004-02
Pesticide type															
Fungicides	56.61	54.36	56.29	52.11	51.07	.	55.34	40.10	-29%	-26%	-29%	-23%	-21%	.	-28%
Herbicides & desiccants	69.27	68.21	55.01	143.18	139.86	.	191.80	155.30	124%	128%	182%	8%	11%	.	-19%
Insecticides															
Carbamates	.	.	.	.	.	.	*0.05*	*0.003*	.	.	.	.	.	.	-94%
Organochlorines	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
Organophosphates	*0.17*	*0.03*	.	*0.24*	*0.03*	.	*0.01*	.	.	.	.	.	.	.	.
Pyrethroids	*< 0.01*	.	.	*< 0.01*	*<0.01*	.	*<0.01*	*0.01*	.	.	.	.	.	.	.
Azomethines	.	.	.	.	.	.	.	0.097	.	.	.	.	.	.	.
Mixed Formulations	.	.	.	.	.	.	.	*0.014*	.	.	.	.	.	.	.
Unknown Insecticide	.	.	.	.	.	.	.	*0.003*	.	.	.	.	.	.	.
All insecticides	0.17	0.03	0.25	0.24	0.04	.	0.07	0.13	-24%	333%	-48%	-46%	256%	.	97%
Molluscicides	.	.	.	0.04	0.08	.	0.18	0.02	.	.	.	-60%	-80%	.	-91%
Growth regulators	.	.	.	.	.	.	0.1721	.	.	.	.	.	.	.	.
Mixed formulations	0.50	0.41	0.29	0.30	0.28	.	0.13	.	.	.	.	.	.	.	.
Seed treatments	*	0.54	0.86	0.36	1.22	.	.	0.48	.	-12%	-45%	32%	-61%	.	.
All pesticides	***126.55***	***123.55***	***112.71***	***196.23***	***192.56***	***.***	***248.72***	***196.03***	***55%***	***59%***	***74%***	***0%***	***2%***	***.***	***-21%***
Area grown (ha)	7,863	6,540	5,913	5,961	5,515	.	4,741	4,517	-43%	-31%	-24%	-24%	-18%	.	-5%

*** Seed treatments not recorded**

Table 47 **Estimated quantity (tonnes) of potato crops stored regionally in Northern Ireland 2004.**

Location of holding	Ware potatoes	Seed potatoes	All potatoes
Antrim	38,454	14,047	52,502
Armagh	1,991	.	1,991
Down	48,246	14,124	62,369
Londonderry	28,276	5,037	33,313
Tyrone	5,382	112	5,494
Northern Ireland	***122,348***	***33,321***	***155,669***

Table 48 **Estimated quantity (treated tonnes) of potatoes stored regionally in Northern Ireland 2004.**

Location of holding	Ware potatoes	Seed potatoes	Total quantity treated (tt)
Antrim	162	673	835
Down	2,937	.	2,937
Northern Ireland	***3,099***	***673***	***3,772***

Table 49 **The weight of pesticides (kilograms) applied regionally to potatoes stored in Northern Ireland, 2004.**

Location of holding	Ware potatoes	Seed potatoes	Total quantity (kg)
Antrim	1.62	5.48	7.10
Down	146.85		146.85
Northern Ireland	***148.47***	***5.48***	***153.95***

Table 50 **Estimated quantity (treated tonnes) of potatoes in storage receiving pesticide treatment in Northern Ireland 2004.**

Active ingredient	Ware potatoes	Seed potatoes	Total quantity treated (tt)
Imazalil	162	673	835
Tecnazene	2,937	.	2,937
Total all pesticides	***3,099***	***673***	***3,772***

Table 51 **Weight (kg) of active ingredients applied to stored potatoes in Northern Ireland, 2004 (weighted).**

Active ingredient	Ware potatoes	Seed potatoes	Total
Imazalil	1.62	5.48	7.10
Tecnazene	146.85	.	146.85
Total all pesticides	***148.47***	***5.48***	***153.95***

Table 52 **The active ingredients applied to stored potatoes in Northern Ireland in 2004, prioritised by weight (kilograms).**

	Active ingredient	Quantity used (kg)
1	Tecnazene	146.858
2	Imazalil	7.10

Table 53 **Type of storage building, storage method, potato type and quantity (tonnes) of potatoes stored in Northern Ireland, 2004**

Type of storage building	Ware potatoes	Seed potatoes	Total
Barn Store			
Boxed	17,840	6,976	24,815
Boxed & bulked	14,145	.	14,145
Bulk	23,771	3,168	26,939
Unknown	187	.	187
All barn stores	***55,942***	***10,144***	***66,086***
Modified Barn			
Boxed	415	4,431	4,847
Boxed & bulked	3,081	.	3,081
Bulk	901	.	901
All modified barn stores	***4,397***	***4,431***	***8,828***
Ventilated Store			
Boxed	22,599	9,201	31,801
Boxed & bulked	3,161	.	3,161
Bulk	8,518	112	8,630
All ventilated stores	***34,279***	***9,313***	***43,592***
Refrigerated store			
Boxed	27,731	9,192	36,922
Boxed & bulk	.	31	31
All refrigerated stores	***27,731***	***9,222***	***36,953***
Unspecified			
Unknown	.	210	210
All unspecified stores		***210***	***210***
Total	**122,349**	**33,320**	**155,669**

Table 54 **Type of storage method, potato type and total quantity (tonnes) of potatoes stored in Northern Ireland, 2004**

Type of Storage Method	Ware potatoes	Seed potatoes	Total
Boxed	68,585	29,800	98,385
Boxed & bulked	20,387	31	20,418
Bulk	33,190	3,280	36,470
Unknown	187	210	397
Total	***122,349***	***33,320***	***155,669***

Table 55 **Comparison of ware potatoes stored (tonnes), treated (treated tonnes) and the weight of pesticides applied (kilograms) to stored potatoes between 1992 and 2004.**

Ware potatoes

	1992	1994	1996	1998	2002	2004	1992-2002	1994-2002	1996-2002	1998-2002	2002-2004
Quantity stored (t)	139,570	84,868	135,933	112,675	44,322	122,348	-12%	44%	-10%	9%	176%
Quantity treated (tt)	16,289	11,630	19,022	5,899	9,024	3,099	-81%	-73%	-84%	-47%	-66%
Quantity of pesticides (kg)	1,998	1,001	750	227	439	148	-93%	-85%	-80%	-35%	-66%
Quantity untreated (t)	123,281	73,238	116,910	106,777	35,298	119,249	-3%	63%	2%	12 %	238%

Table 56 **Comparison of seed potatoes stored (tonnes), treated (treated tonnes) and the weight of pesticides applied (kilograms) to stored potatoes between 1992 and 2004.**

Seed potatoes

	1992	1994	1996	1998	2002	2004	1992-2002	1994-2002	1996-2002	1998-2002	2002-2004
Quantity stored (t)	33,420	24,238	39,290	39,809	16,032	33,321	0%	37%	-15%	-16%	108%
Quantity treated (tt)	7,536	14,950	12,915	5,628	4,029	673	-91%	-95%	-95%	-88%	-83%
Quantity of pesticides (kg)	1,052	851	480	896	48	5	-99%	-99%	-99%	-99%	-89%
Quantity untreated (t)	27,033	9,288	26,652	34,181	12,003	32,648	21%	252%	22%	-4%	172%

Table 57 **Comparison of reserved potatoes stored (tonnes), treated (treated tonnes) and the weight of pesticides applied (kilograms) to stored potatoes between 1992 and 2004.**

Reserved potatoes

	1992	1994	1996	1998	2002	2004	1992-2002	1994-2002	1996-2002	1998-2002	2002-2004
Quantity stored (t)	.	.	15,169	10,123	.	.	.	.	.	.	.
Quantity treated (tt)	.	.	6,705	2,524	.	.	.	.	.	.	.
Quantity of pesticides (kg)	.	.	375	121	.	.	.	.	.	.	.
Quantity untreated (t)	.	.	8,464	7,599	.	.	.	.	.	.	.

Table 58 **Comparison of all potatoes stored (tonnes), treated (treated tonnes) and the weight of pesticides applied (kilograms) to stored potatoes between 1992 and 2004.**

All potatoes

	1992	1994	1996	1998	2002	2004	1992-2002	1994-2002	1996-2002	1998-2002	2002-2004
Quantity stored (t)	191,019	119,447	190,392	162,608	60,353	155,669	-19%	30%	-18%	-4%	158%
Quantity treated (tt)	23,825	26,580	38,624	14,051	13,053	3,772	-84%	-86%	-90%	-73%	-71%
Quantity of pesticides (kg)	3,050	1,852	1,605	1,245	488	154	-95%	-92%	-90%	-88%	-68%
Quantity untreated (t)	168,344	92,868	152,027	148,557	47,300	151,897	-10%	64%	0%	2%	221%

Northern Ireland Pesticide Usage Survey Published Reports — Appendix 1

Report No.	Report title	ISBN
99	Grassland & Fodder Crops 1989	1-85527 079 X
105	Arable Crops 1990	1-85527 130 3
106	Soft Fruit Crops 1990	1-85527 149 4
109	Vegetable Crops 1991	1-85527 137 0
110	Protected Crops 1991 (edible & ornamental)	1-85527 283 0
111	Mushroom Crops 1991	1-85527 150 8
117	Arable Crops 1992	1-85527 193 1
118	Top Fruit Crops 1992	1-85527 194 X
124	Grassland & Fodder crops 1993	1-85527 221 0
131	Forestry 1993	1-85527 282 2
132	Arable Crops 1994	1-85527 314 4
139	Vegetable Crops 1995	1-85527 346 2
140	Mushroom Crops 1995	1-85527 347 0
146	Arable Crops 1996	1-85527 469 8
147	Top fruit 1996	1-85527 470 1
156	Grassland and Fodder Crops 1997	1-85527 506 6
157	Sheep Treatments 1997	1-85527 425 6
167	Soft Fruit 1998	1-85527 540 6
168	Arable Crops 1998	1-85527 536 8
169	Vegetable Crops 1999	1-85527 561 9
170	Mushroom Crops 1999	1-85527 549 X
177	Arable Crops 2000	1-85527 670 4
178	Top Fruit Crops 2002	1-85527 618 6
194	Arable Crops 2002	1-85527 674 7
198	Grassland and Fodder Crops 2003	1-85527 797 2
199	Hardy Nursery Stock Crops 2003	1-85527 798 1
201	Protected Ornamental Crops 2003	1-85527 739 5

ISBN 1 85527 833 2

11/05

Pesticide Usage Survey Group
Agriculture and Food Science Centre
Newforge Lane
Belfast BT9 5PX

INVESTOR IN PEOPLE

ww i .

AN ROINN
Talmhaíochta agus
Forbartha Tuaithe

MÄNNYSTRIE O
Fairms an
Kintra Fordèrin

ISBN 1 85527 833 2

DMS 05.06.212