Agri-Food and Biosciences Institute ®

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

PESTICIDE USAGE IN NORTHERN IRELAND
SURVEY REPORT 248

NORTHERN IRELAND SOFT FRUIT CROPS 2012

A National Statistics Publication

PESTICIDE USAGE
IN NORTHERN IRELAND

Survey Report 248

Northern Ireland Soft Fruit Crops 2012

A National Statistics Publication

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 customer's needs. They are free from any political interference.

For general enquires about National Statistics, contact the National Statistics Public Enquiry Service on 02075 335888 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.

PESTICIDE USAGE SURVEY REPORT 248

NORTHERN IRELAND SOFT FRUIT CROPS 2012

M.K. Lavery, S. Jess, D. Matthews, T. Kelly and A. Patton

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

Tel: 028 90255003
Fax: 028 90255380
email: stephen.jess@afbini.gov.uk

Agri-food and Biosciences Institute for Northern Ireland

ISBN 978-1-84807-402-6

CONTENTS

The County Regions of Northern Ireland

SUMMARY

This report presents information from a survey of pesticide usage practices on soft fruit crops in Northern Ireland in 2012. Data was collected from 20 growers representing 67% of all soft fruit holdings in Northern Ireland. No soft fruit crops were grown in County Fermanagh during this survey period. The data have been raised using SPSS (Statistical Package for the Social Sciences) software to give estimates of regional pesticide usage.

Compared with the previous survey, carried out in 2010, the total area of soft fruit crops grown has increased by 8% to approximately 18 hectares, whereas the quantity of pesticide used decreased by 31%. The area treated with pesticides (spray hectares) decreased by 39% between 2010 and 2012.

A total of 40 kilograms of pesticides were applied to 72 spray hectares of soft fruit crops in 2012. Strawberries were the most commonly produced soft fruit (protected, semi-protected and non-protected), with 36 kilograms of pesticides being applied to 64 spray hectares. This represented 89% of both the total weight of pesticides applied and the area treated.

Fungicide usage decreased by 39% compared with 2010. Fungicides were applied to 70% of the total pesticide-treated area representing 76% of the total weight of pesticides used in 2012. Iprodione and myclobutanil were the fungicides applied to the largest area whilst iprodione and foestyl-aluminium were the most frequently used fungicides by weight applied. Sulphur has been used as a fungicide on protected and semi-protected strawberries for the treatment of strawberry powdery mildew (*Podosphaera aphanis*).

Herbicide usage decreased by an estimated 13% compared with 2010. Herbicide active ingredients were applied to 8% of the total pesticide-treated area (18% of the total weight of pesticides used) with pendimethalin being the most commonly used herbicide.

Insecticide and acaricide usage decreased by 39% compared with 2010, and 66% compared with 2006. Insecticide and acaricide active ingredients accounted for 18% of the total pesticide-treated area and 6% of the total weight of pesticides applied in 2012. The ovicidal tetrazine acaricide clofentezine was the most frequently applied, primarily on strawberries, replacing chlorpyrifos as the most commonly used insecticide/acaricide type.

Biopesticides (including invertebrate parasites and predators) were applied to 3% of the treated area in 2012, compared with 6% in 2010. Applications were principally to control two-spotted spider mites (*Tetranychus urticae*), with *Phytoseiulus persimilis* being the most commonly used biopesticide.

Molluscicides were applied to approximately 1 hectare of strawberries (both protected and non-protected), for the control of slugs. Methiocarb was the only recorded molluscicide active substance used during soft fruit production in 2012.

INTRODUCTION

As a participant in the UK Working Party on Pesticide Usage Surveys, the Agri-Food and Biosciences Institute (AFBI), on behalf of the Department of Agriculture and Rural Development for Northern Ireland (DARDNI), 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. In addition, the information may also be used by those involved in residue testing, for public information and to evaluate the impact of policy and trends in pesticide usage.

This is the fifth survey of pesticide usage on soft fruit crops in Northern Ireland. Results from the previous surveys, which reported on pesticide usage practices on soft fruit crops in 1990 (Kidd *et al*; 1994), 1998 (Kearns *et al*; 2002), 2006 (Kearns *et al*; 2008) and 2010 (Lavery *et al*, 2011) are included in the report for comparative purposes.

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

Soft fruit grown under permanent protection (glasshouse and polythene tunnel), outdoors under semi-protection (Spanish tunnels) and in the field without any protection were recorded in this survey.

The soft fruit industry in Northern Ireland has continually decreased in size from an estimated 75 hectares in 1990 to approximately 18 hectares in 2012. Of all soft fruit crops grown, 34% were grown under permanent protection, 30% were grown under semi-protection and the remaining 36% had no protection (Figure 3). Reports prior to 2010 combined protected and semi-protected crops.

The crop types recorded in this survey (area grown in hectares) were strawberries (15.14 ha), raspberries (2.38 ha), gooseberries (0.32 ha), blackcurrants (0.26 ha) and 'other crops' (0.39 ha). 'Other crops' refers to blackberries and redcurrants combined, but in previous years may have included blueberries, tayberries and hybridberries.

The principal pests and diseases recorded were two-spotted spider mites (*Tetranychus urticae*), aphids, grey mould (*Botrytis cinerea*) and strawberry powdery mildew (*Podosphaera aphanis*).

Many of the growers interviewed regarded the increasingly adverse and unpredictable nature of the weather as a major contributing factor in the decline of soft fruit production in Northern Ireland, particularly non-protected field-grown crops. This has resulted in a 21% increase in soft fruit crops being grown under some form of permanent or temporary cover since 2010.

METHODS

Using the Northern Ireland Agricultural Census, June 2011 (Anon; 2012), a list of growers from the Department of Agriculture and Rural Development Northern Ireland (DARDNI), the College of Agriculture, Food and Rural Enterprise (CAFRE), and details of growers from previous surveys, the population of soft fruit growers was established and holdings to be surveyed selected. A preliminary letter was sent to growers explaining the purpose of the survey. Of a possible 30 growers, 20 participated in the survey. Growers were visited during October and November 2012 and data relating to pesticide usage were collected by personal interview. This survey covers the period from September 2011 to September 2012. The growers' stated reasons for pesticide use were also included, but may not always be appropriate.

DEFINITIONS AND NOTES

- 'Total grown area' refers to the actual planted area of crop, and is referred to in hectares (ha).
- 'Basic-treated area' refers to the actual planted area of crop which was treated with at least one pesticide application, and is referred to in hectares (ha).
- 'Total-treated area' refers to all applications made to the 'basic-treated area', including all repeat applications, and is referred to in spray hectares (spha).
- 'Protected crops' refers to all crops grown under permanent protection, i.e. glasshouse or polythene tunnel, for the entire duration of their production cycle.
- 'Semi-protected crops' refers to all crops grown outdoors which were covered at various times during production with Spanish tunnels.
- 'Non-protected crops' refers to all crops grown outdoors in field conditions without any protection during their production cycle.
- 'Reasons for use'; the reasons reported for the use of pesticides are the growers' stated reasons for use and may sometimes not reflect label recommendations.
- Some treatments to soft fruit are restricted to the plants or to the ground between them. For the purposes of this report, where a field or crop is referred to, it is assumed the entire field / area was treated with the exception of herbicide usage where 40% of the total area treated for all crops is accounted for by the inter-row area within these crops.
- 'Rounding'; due to rounding of figures, there may be slight differences in totals both within and between tables.
- 'Biopesticides' are recorded by area treated (spha) only, as they are applied in units other than weight or volume (e.g. million per hectare) and this does not translate readily into a conventional weight.
- 'Other crops' refers to blackberries and redcurrants combined, but in previous years may have included blueberries, tayberries and hybridberries.

KEY POINTS

- 8% increase in area of soft fruit crops grown since 2010, primarily strawberries
- 39% decrease in total area (spray hectares) treated with pesticide active ingredients
- 31% decrease in total quantity (kilogrammes) of active ingredients applied
- 70% of all soft fruit received a fungicide treatment, with iprodione and myclobutanil remaining the two most commonly used fungicides
- Increased incidence of 'two-spotted spider mite' (*Tetranychus urticae*) resulting in 38% increase in the area treated with the acaricide clofentizine

TRENDS

Figure 1 **Changes in the area (ha) of soft fruit crops grown in Northern Ireland, 1990-2012.**

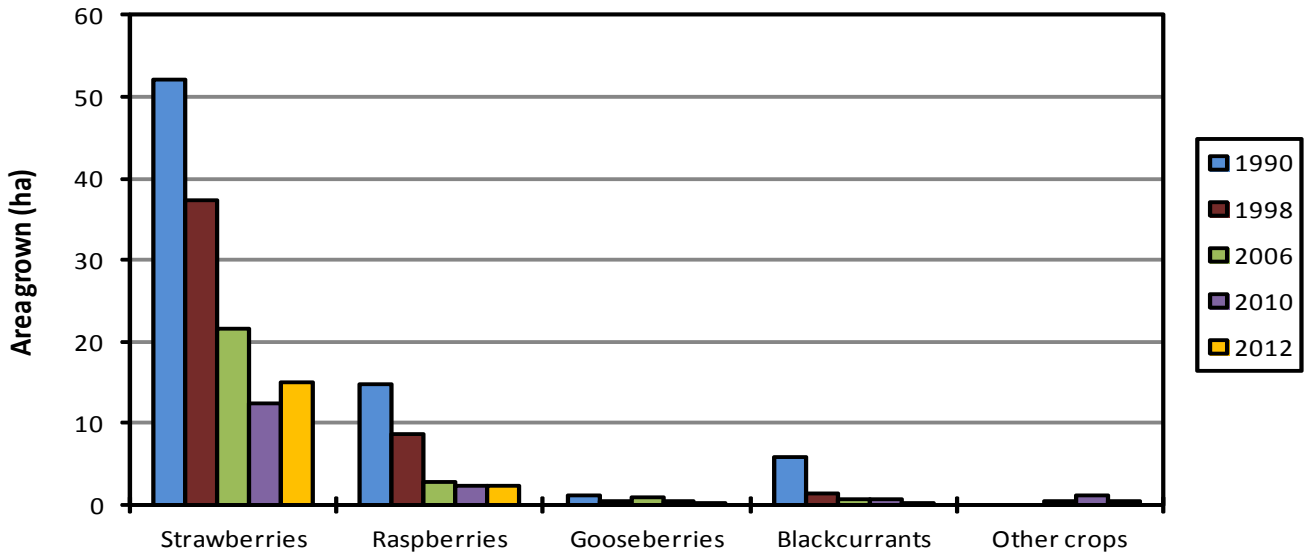
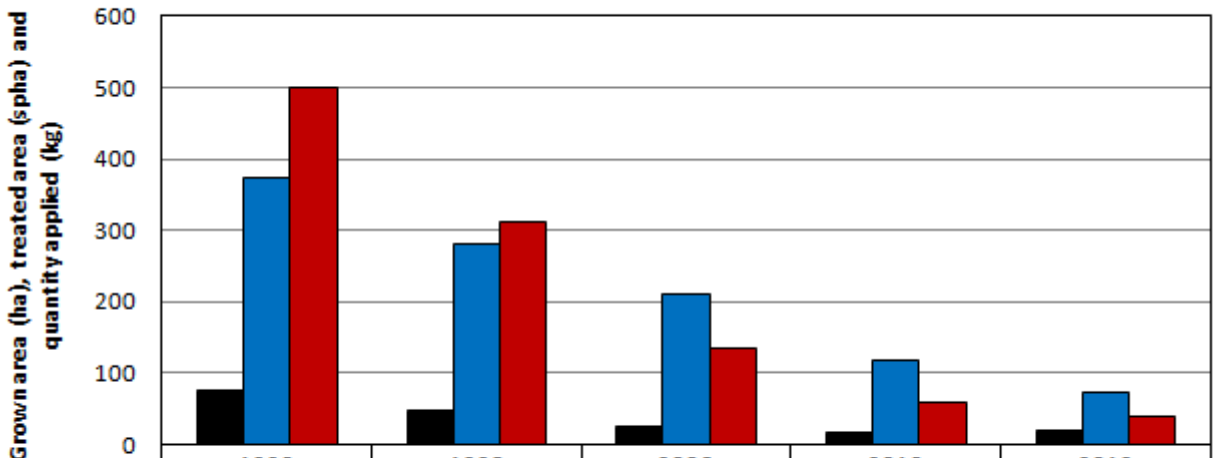


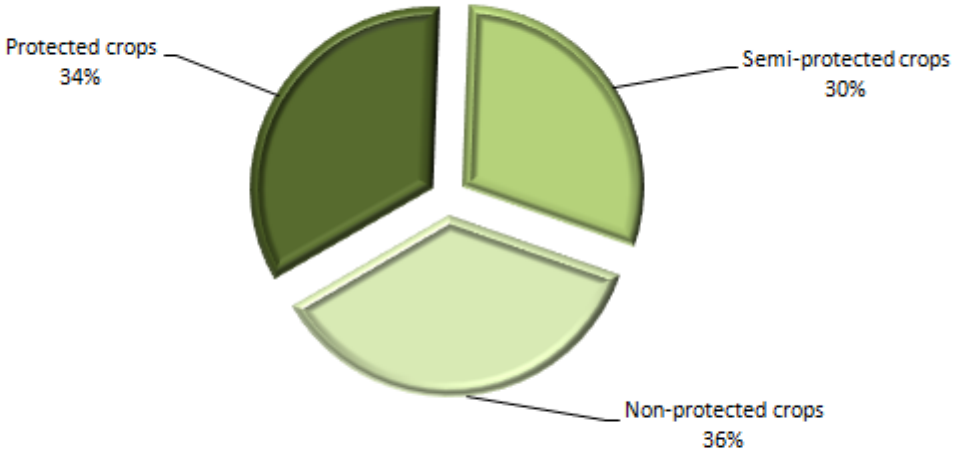
Figure 2 **Changes in the overall grown area (ha), pesticide-treated area (spha) and the total quantity (kg) of active ingredient applied to soft fruit crops in Northern Ireland, 1990-2012.**



	1990	1998	2006	2010	2012
ha	74.99	48.73	26.67	17.09	18.48
spha	373.31	281.6	210.94	117.27	71.97
kg	498.55	311.4	134.19	58.39	40.38

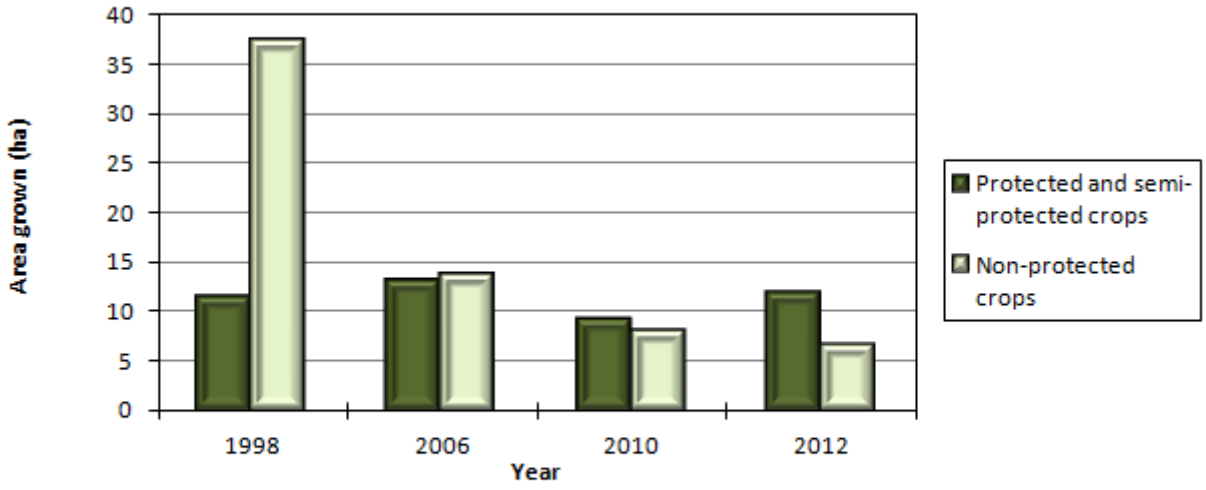
CROP DISTRIBUTION

Figure 3 **The proportion of soft fruit crops grown in Northern Ireland, 2012 by method of protection.**



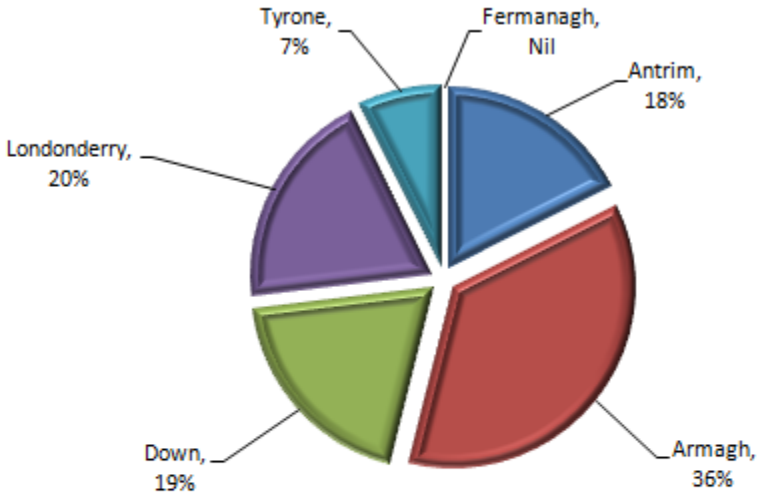
Method of protection	*Estimated cropping area of soft fruit (ha)*
Protected crops	6.27
Semi-protected crops	5.50
Non-protected crops	6.72

Figure 4 **Changes in protected and non-protected growing methods used for soft fruit crops between 1998 and 2012.**



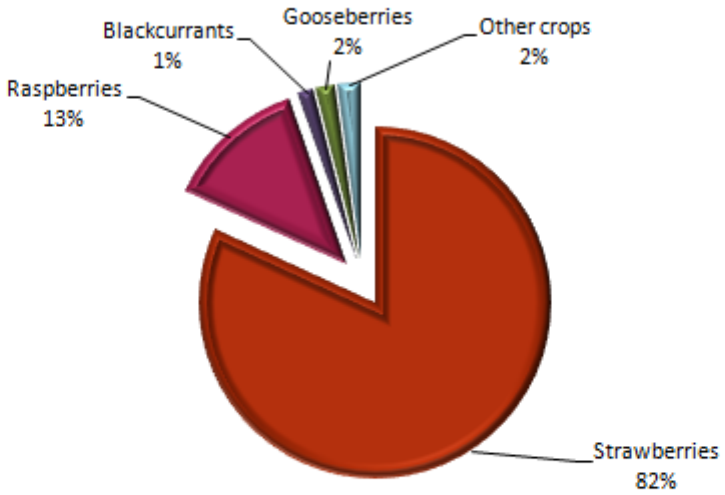
Method of protection	*1998 (ha)*	*2006 (ha)*	*2010 (ha)*	*2012 (ha)*
Protected and semi-protected crops	11.37	12.99	9.03	11.77
Non-protected crops	37.36	13.69	8.06	6.72

Figure 5 **The regional distribution of soft fruit crops grown in Northern Ireland, 2012.**



County	*Estimated cropping area of soft fruit (ha)*
Antrim	3.24
Armagh	6.72
Down	3.55
Fermanagh	Nil
Tyrone	1.35
Londonderry	3.62

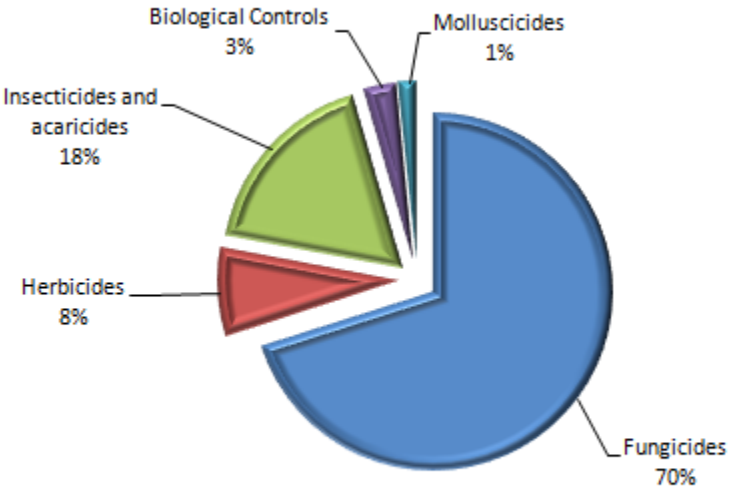
Figure 6 **The proportional distribution of soft fruit crops grown in Northern Ireland, 2012, by crop group.**



Crop	*Estimated cropping area of soft fruit (ha)*
Strawberries	15.14
Raspberries	2.38
Blackcurrants	0.26
Gooseberries	0.32
Other crops	0.39

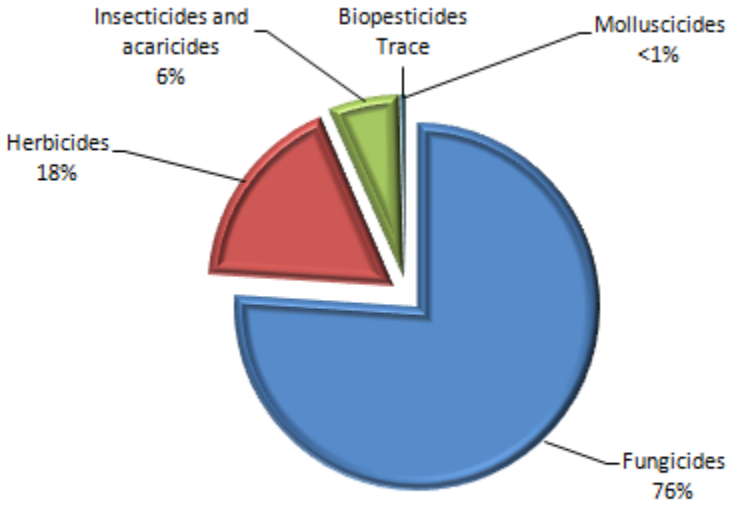
PESTICIDE USAGE ON CROPS

Figure 7 **The proportional area (%) of soft fruit crops treated with each pesticide group, 2012.**



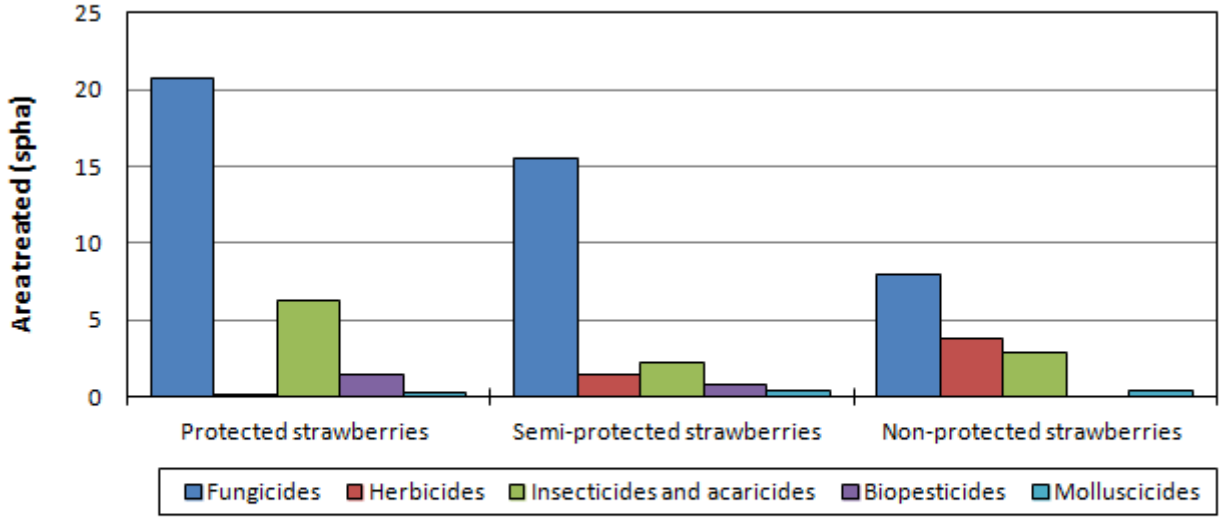
Pesticide group	Fungicides	Herbicides	Insecticides and acaricides	Biopesticides	Molluscicides
Treated area (spha)	50.44	5.63	12.65	2.15	1.09

Figure 8 **The proportional quantities (%) of pesticides applied to soft fruit crops, 2012.**



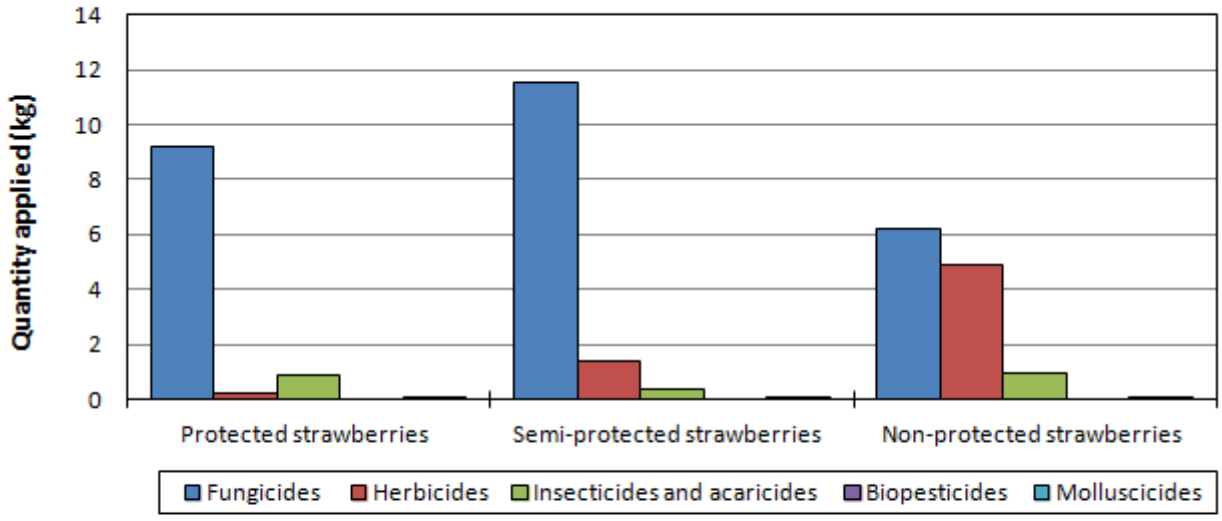
Pesticide group	Fungicides	Herbicides	Insecticides and acaricides	Biopesticides	Molluscicides
Quantity applied (kg)	30.71	7.08	2.45	Trace	0.16

Figure 9 **Estimated area (spha) of strawberry crops treated with each pesticide type in Northern Ireland, 2012.**



Method of protection	Fungicides (spha)	Herbicides (spha)	Insecticides and acaricides (spha)	Biopesticides (spha)	Molluscicides (spha)
Protected strawberries	20.71	0.15	6.32	1.43	0.27
Semi-protected strawberries	15.54	1.42	2.26	0.73	0.37
Non-protected strawberries	8.00	3.74	2.82	0.00	0.45

Figure 10 **Estimated quantity (kg) of each pesticide type applied to strawberry crops in Northern Ireland, 2012.**

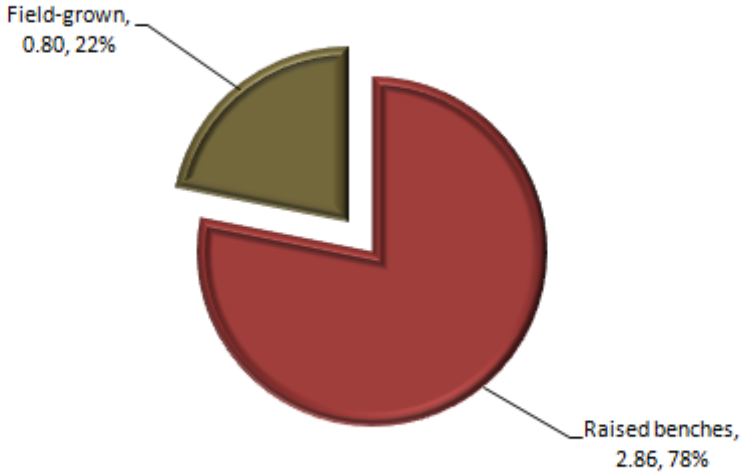


Method of protection	Fungicides (kg)	Herbicides (kg)	Insecticides and acaricides (kg)	Biopesticides (kg)	Molluscicides (kg)
Protected strawberries	9.17	0.22	0.89	Trace	0.04
Semi-protected strawberries	11.53	1.42	0.39	Trace	0.05
Non-protected strawberries	6.18	4.92	0.95	Trace	0.07

Figure 11 **The proportional area (%) of permanent-protected soft fruit crops grown in Northern Ireland, 2012 by method of protection.**

Method of protection	*Estimated growing area of permanent-protected soft fruit crops (ha)*
Glasshouse	1.76
Polythene tunnel	2.42

Figure 12 **The proportional area (%) of semi-protected soft fruit crops grown in Northern Ireland, 2012 by growing method.**



Growing method	*Estimated growing area of semi-protected soft fruit crops (ha)*
Raised benches	2.86
Field-grown	0.80

PROTECTED STRAWBERRIES (Table 11)

- Total area grown: 5.97 hectares
- Basic area treated: 5.17 hectares
- Total area treated: 28.88 spray hectares
- Weight of active substances applied: 10.31 kilogrammes
- 17 different fungicide substances, 9 insecticide/acaricides, 4 biopesticides, 1 herbicide and 1 molluscicide were applied to protected strawberry crops

Figure 13 **Pesticide usage (spha) on protected strawberry crops in Northern Ireland, 2012.**

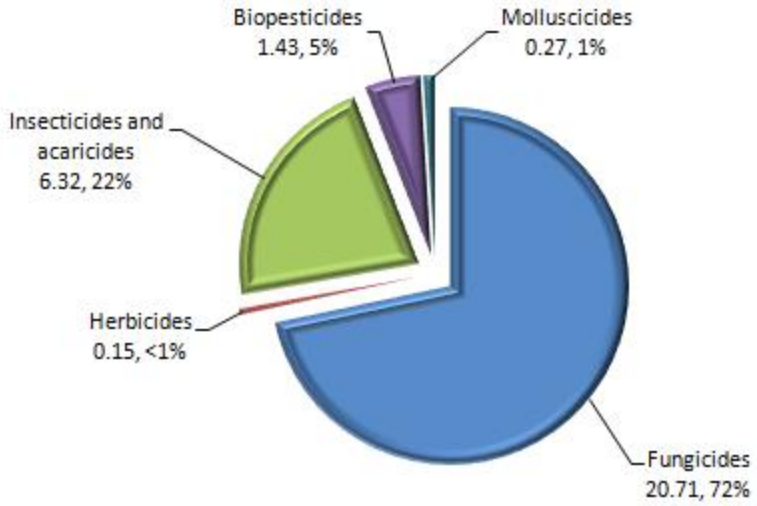
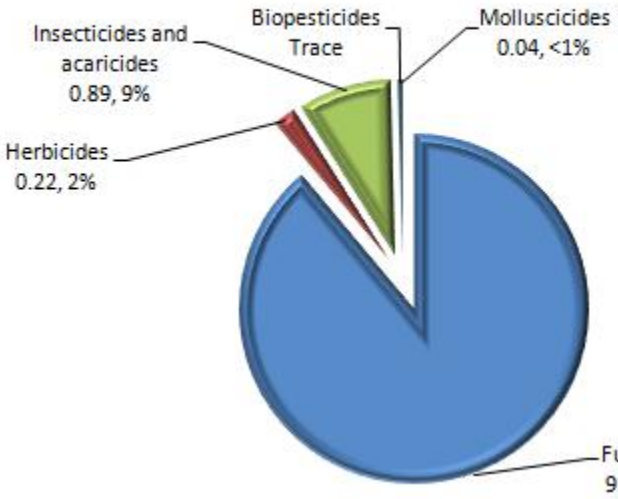


Figure 14 **Weight of pesticides (kg) applied to protected strawberry crops in Northern Ireland, 2012.**



Fungicides – protected strawberries

- Basic area treated: 2.16 hectares
- Total area treated: 20.71 spray hectares
- Weight of active substances applied: 9.71 kilogrammes
- 36% of the area grown treated with fungicides
- The five most common formulations were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Myclobutanil	3.68	2.10	0.22	35%
Mepanipyrim	1.91	1.16	0.77	19%
Pyrimethanil	1.81	1.14	0.81	19%
Iprodione	3.37	1.02	1.47	17%
Fenhexamid	1.96	0.96	0.58	16%

Figure 15 **Fungicide active ingredient usage on protected strawberry crops in Northern Ireland, (spha) 2012.**

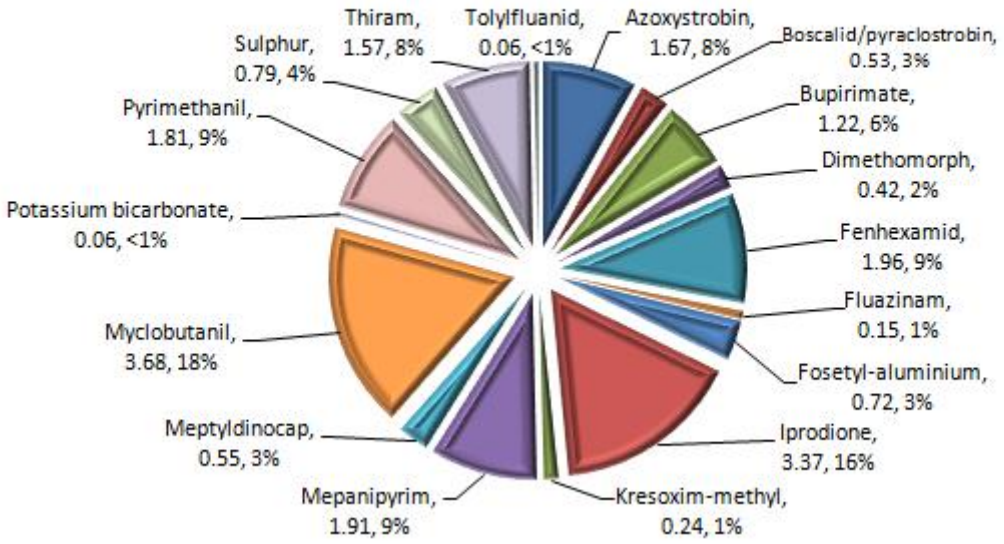


Figure 16 **Fungicide active ingredient usage on protected strawberry crops in Northern Ireland, (kg) 2012.**

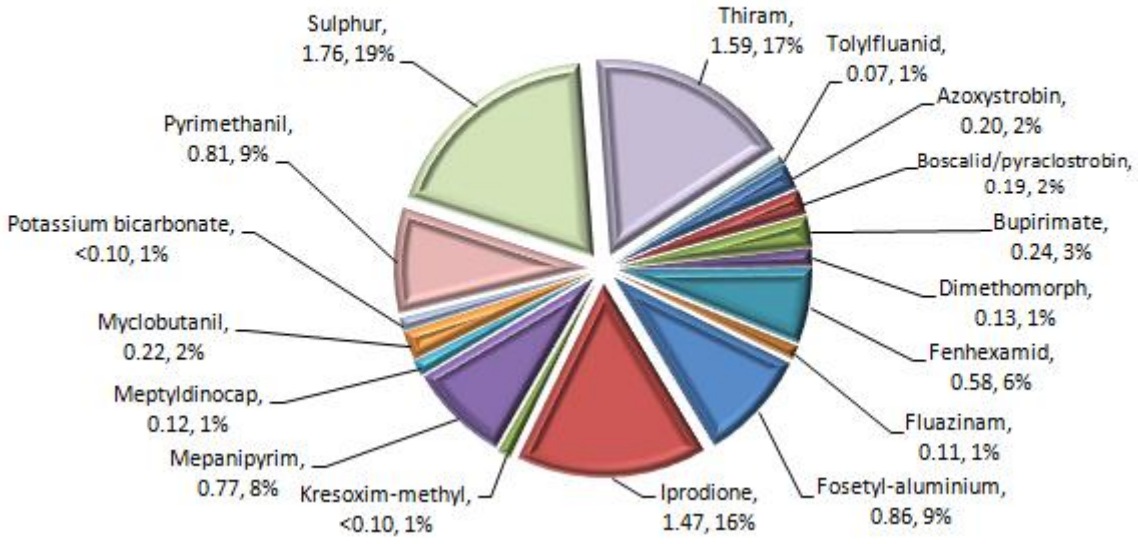
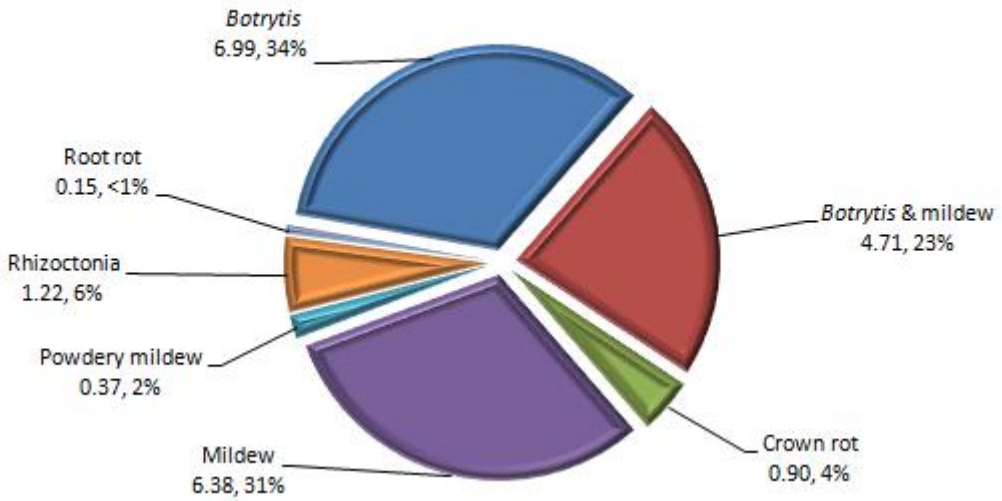


Figure 17 **Protected strawberries: reasons for fungicide use (spha), 2012.**



Insecticides and acaricides – protected strawberries

- Basic area treated: 1.56 hectares
- Total area treated: 6.32 spray hectares
- Weight of active substances applied: 0.89 kilogrammes
- 26% of the area grown treated with insecticides/acaricides
- The five most common formulations were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Abamectin	1.43	0.96	<0.1	16%
Thiacloprid	1.04	0.81	<0.1	14%
Clofentezine	1.74	0.77	0.3	13%
Tebufenpyrad	0.72	0.72	0.2	12%
Pirimicarb	0.86	0.62	0.2	10%

Figure 18 **Insecticide and acaricide active ingredient usage on protected strawberry crops in Northern Ireland, (spha) 2012.**

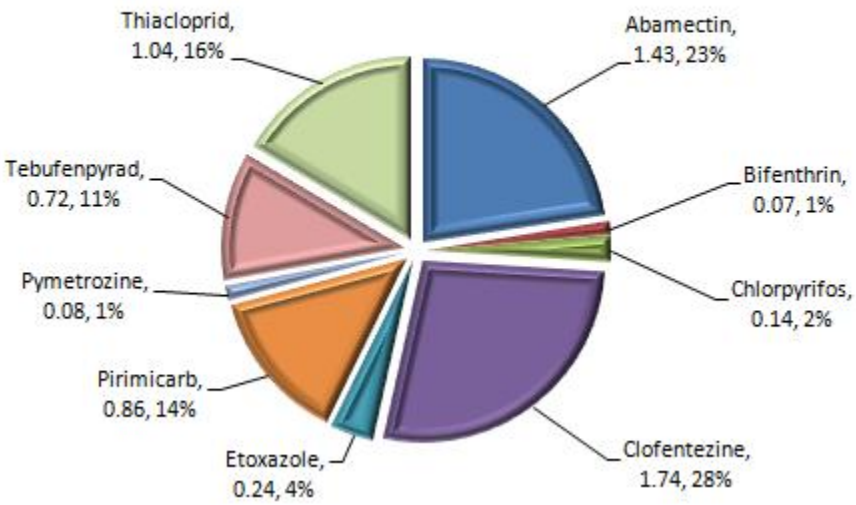


Figure 19 **Insecticide and acaricide active ingredient usage on protected strawberry crops in Northern Ireland, (kg) 2012.**

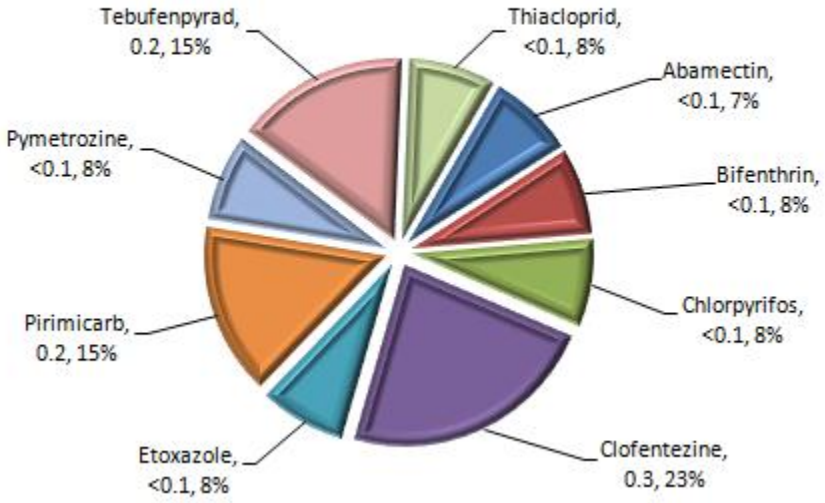
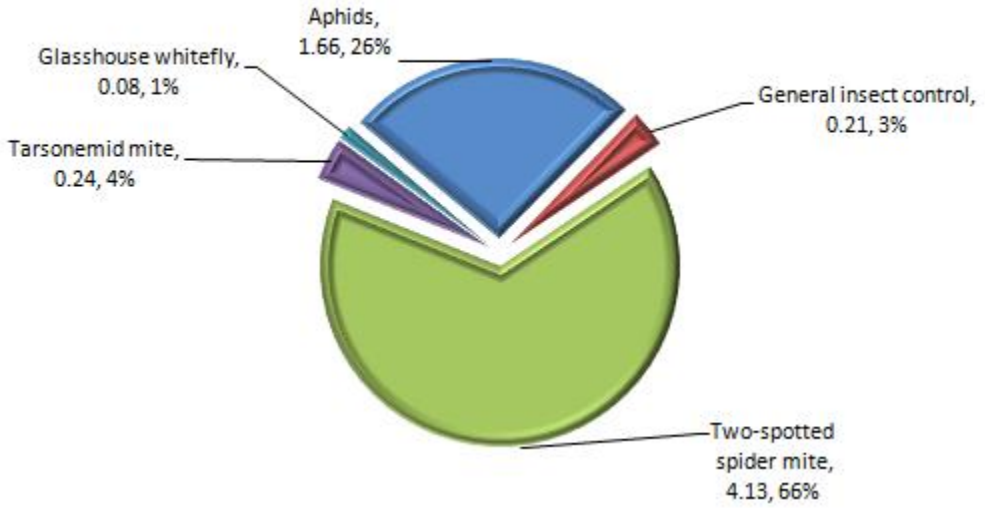


Figure 20 **Protected strawberries: reasons for insecticide and acaricide use (spha), 2012.**



Biopesticides – protected strawberries

- Basic area treated: 1.03 hectares
- Total area treated: 1.43 spray hectares
- Weight of active substances applied: Trace
- 17% of the area grown treated with biopesticides
- The following biopesticides were applied:

Biological agent	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Bacillus subtilis	0.47	0.25	Trace	4%
Phasmarhabditis hermaphrodita	0.12	0.12	Trace	2%
Phytoseiulus persimilis	0.66	0.66	Trace	11%
Steinernema kraussei	0.17	0.17	Trace	3%

Figure 21 **Biopesticide usage on protected strawberry crops in Northern Ireland, (spha) 2012.**

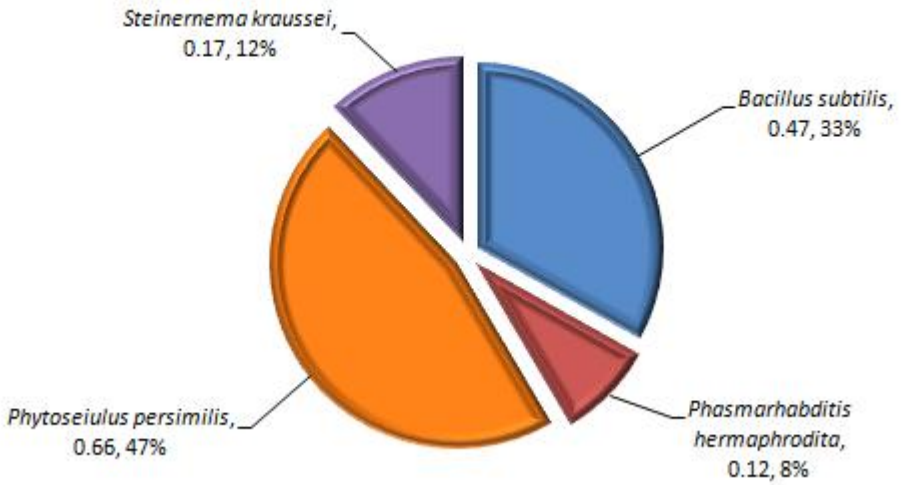
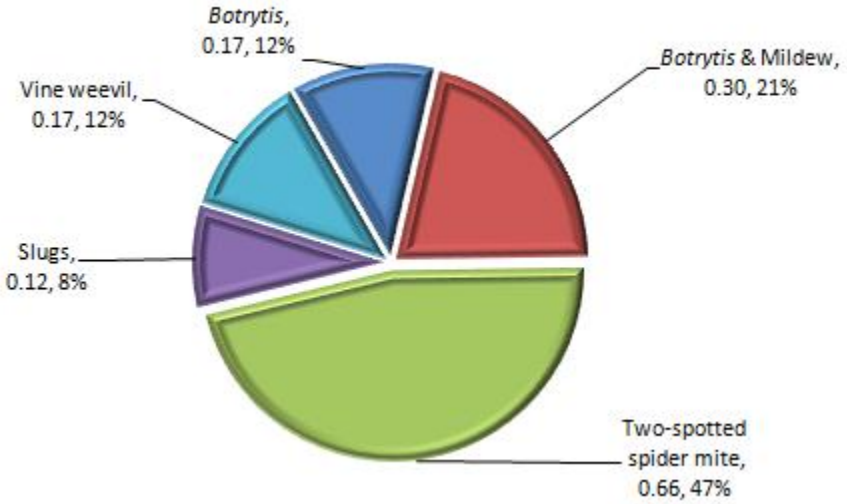


Figure 22 **Protected strawberries: reasons for biopesticide use (spha), 2012.**



Herbicides – protected strawberries

- Basic area treated: 0.15 hectares
- Total area treated: 0.15 spray hectares
- Weight of active substances applied: 0.22 kilogrammes
- 3% of the area grown treated with herbicides
- The only reason given for herbicide use was ‘General weed control’
- Herbicides were only applied to the ground area below raised benches
- The only active substance applied was:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Glyphosate	0.15	0.15	0.22	3%

Molluscicides – protected strawberries

- Basic area treated: 0.27 hectares
- Total area treated: 0.27 spray hectares
- Weight of active substances applied: <0.1 kilogram
- 5% of the area grown treated with molluscicides
- The only reason given for molluscicide use was ‘slugs’
- The only active substance applied was:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Methiocarb	0.27	0.27	<0.1	5%

SEMI-PROTECTED STRAWBERRIES (Table 12)

- Total area grown: 4.30 hectares
- Basic area treated: 5.09 hectares
- Total area treated: 20.30 spray hectares
- Weight of active substances applied: 13.40 kilogrammes
- All semi-protected strawberries were grown on raised benches under Spanish tunnels
- 13 different fungicide substances, 2 insecticide/acaricides, 2 biopesticides, 2 herbicides and 1 molluscicide were applied to semi-protected strawberry crops

Figure 23 Pesticide usage (spha) on semi-protected strawberry crops in Northern Ireland, 2012.

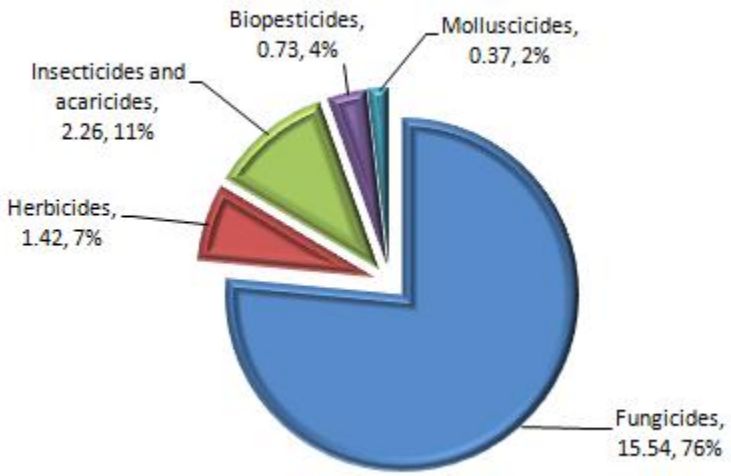
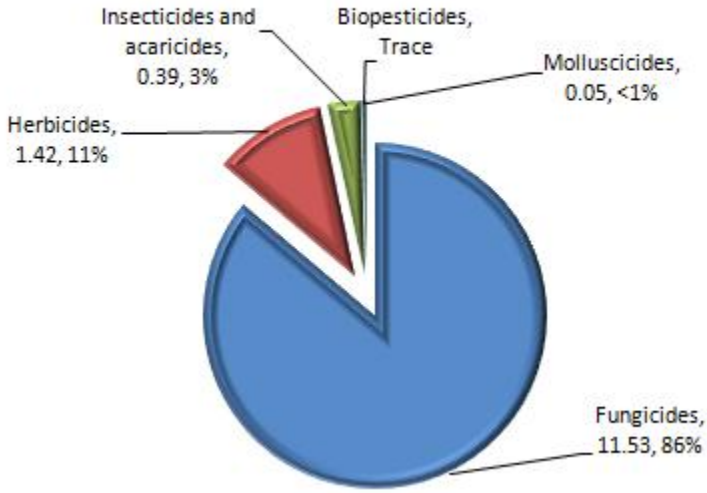


Figure 24 **Weight of pesticides (kg) applied to semi-protected strawberry crops in Northern Ireland, 2012.**



Fungicide - semi-protected strawberries

- Basic area treated: 1.34 hectares
- Total area treated: 15.54 spray hectares
- Weight of active substances applied: 11.53 kilogrammes
- 31% of the area grown treated with fungicides
- The five most common formulations were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Iprodione	3.92	1.23	2.90	29%
Myclobutanil	3.56	1.23	0.30	29%
Pyrimethanil	2.69	1.23	2.10	29%
Meptyldinocap	0.73	0.73	0.20	17%
Cyprodinil/fludioxonil	1.45	0.73	0.90	17%

Figure 25 **Fungicide active ingredient usage on semi-protected strawberry crops in Northern Ireland, (spha) 2012.**

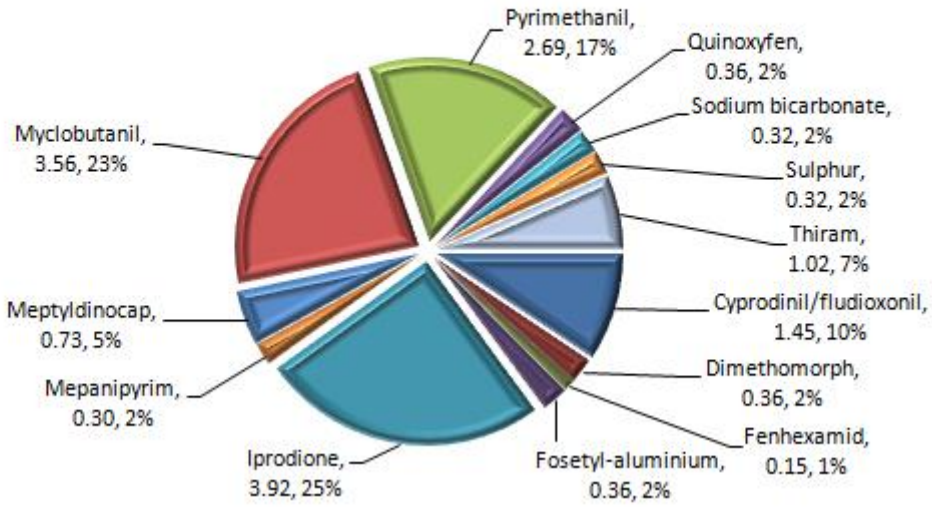


Figure 26 **Fungicide active ingredient usage on semi-protected strawberry crops in Northern Ireland, (kg) 2012.**

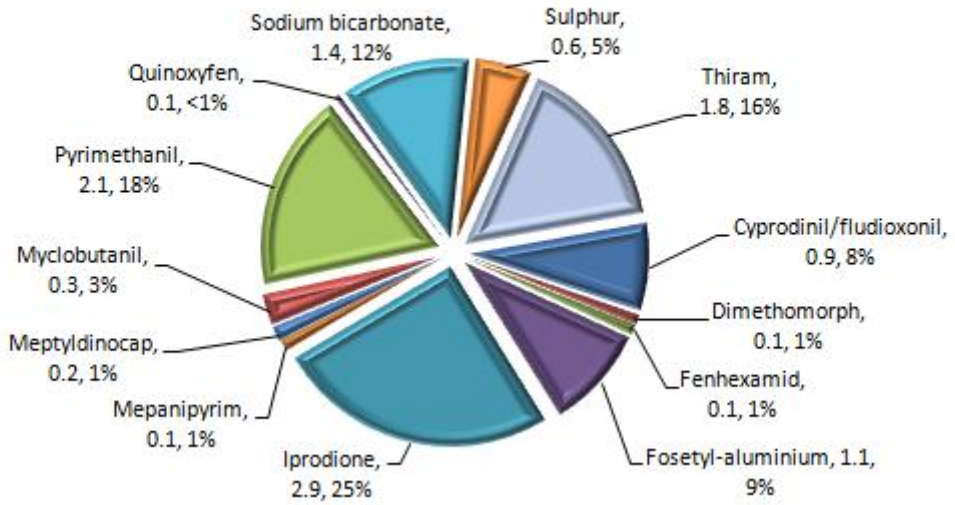
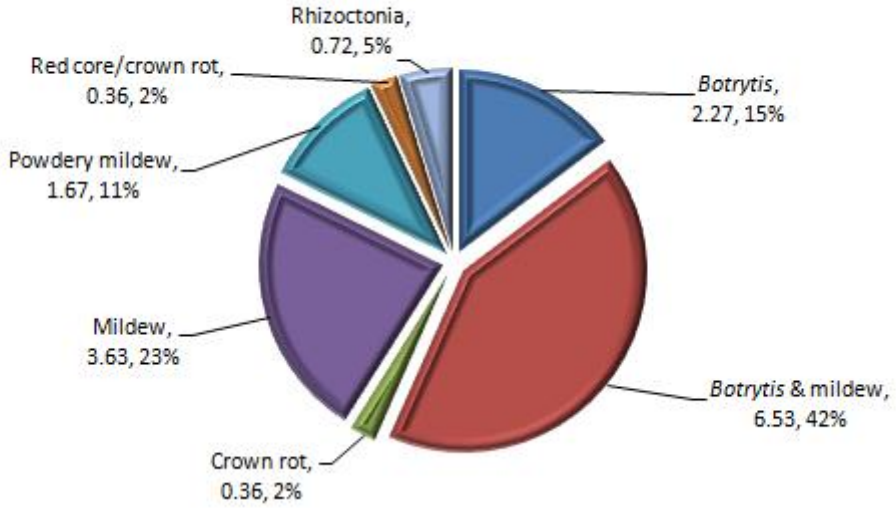


Figure 27 **Semi-protected strawberries: reasons for fungicide use (spha), 2012.**



Insecticides and acaricides – semi-protected strawberries

- Basic area treated: 1.23 hectares
- Total area treated: 2.26 spray hectares
- Weight of active substances applied: 0.39 kilogrammes
- 29% of the area grown treated with insecticides/acaricides
- The only reason given for insecticide/acaricide use was 'Two-spotted spider mite' (*Tetranychus urticae*)
- The only active substances applied were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Abamectin	0.30	0.15	<0.10	3%
Clofentezine	1.96	1.23	0.39	29%

Figure 28 **Insecticide and acaricide active ingredient usage on semi-protected strawberry crops in Northern Ireland, (spha) 2012.**

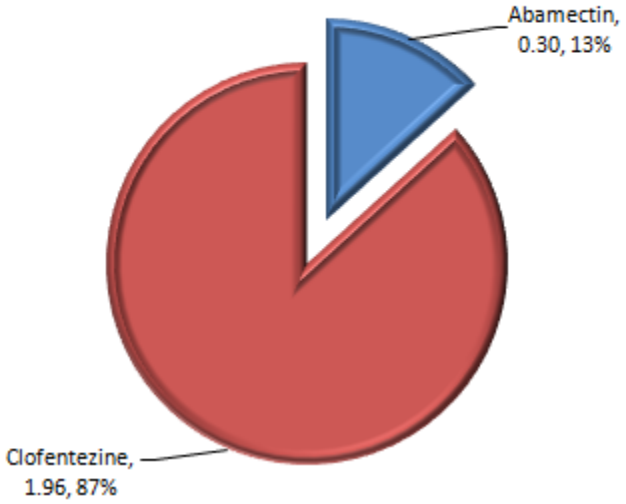
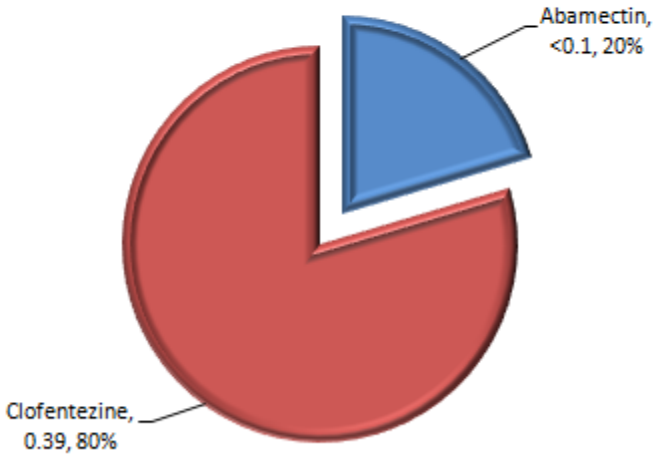


Figure 29 **Insecticide and acaricide active ingredient usage on semi-protected strawberry crops in Northern Ireland, (kg) 2012.**



Biopesticides – semi-protected strawberries

- Basic area treated: 0.73 hectares
- Total area treated: 0.73 spray hectares
- Weight of active substances applied: Trace
- 17% of the area grown treated with biopesticides
- The only biopesticides applied were:

Biological agent	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Phasmarhabditis hermaphrodita	0.37	0.37	Trace	9%
Steinernema kraussei	0.36	0.36	Trace	8%

Figure 30 **Biopesticide usage on semi-protected strawberry crops in Northern Ireland, (spha) 2012.**

Figure 31 **Semi-protected strawberries: reasons for biopesticide use (spha), 2012.**

Herbicides – semi-protected strawberries

- Basic area treated: 1.42 hectares
- Total area treated: 1.42 spray hectares
- Weight of active substances applied: 1.42 kilogrammes
- 33% of the area grown treated with herbicides
- The only reason given for herbicide use was 'General weed control'
- Herbicides were only applied to the ground area below raised benches
- The only active substances applied were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Glufosinate-ammonium	0.9	0.90	0.68	21%
Glyphosate	0.52	0.52	0.74	12%

Figure 32 **Herbicide active ingredient usage on semi-protected strawberry crops in Northern Ireland, (spha) 2012.**

Figure 33 **Herbicide active ingredient usage on semi-protected strawberry crops in Northern Ireland, (kg) 2012.**

Molluscicides – semi-protected strawberries

- Basic area treated: 0.37 hectares
- Total area treated: 0.37 spray hectares
- Weight of active substances applied: <0.1 kilogram
- 9% of the area grown treated with molluscicides
- The only reason given for molluscicide use was ‘slugs’
- The only active substance applied was:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Methiocarb	0.37	0.37	0.05	9%

NON-PROTECTED STRAWBERRIES (Table 13)

- Total area grown: 4.88 hectares
- Basic area treated: 8.99 hectares
- Total area treated: 15.01 spray hectares
- Weight of active substances applied: 12.11 kilogrammes
- 9 different fungicide substances, 5 insecticide/acaricides, 3 herbicides and 1 molluscicide were applied to non-protected strawberry crops

Figure 34 **Pesticide usage (spha) on non-protected strawberry crops in Northern Ireland, 2012.**

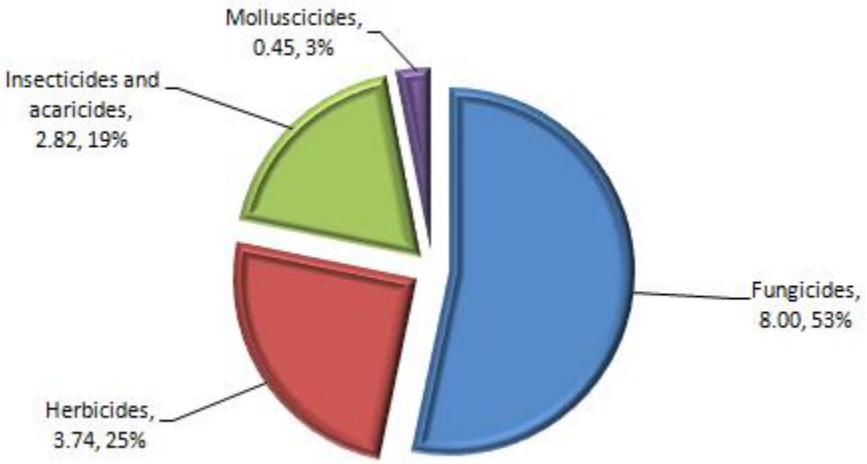
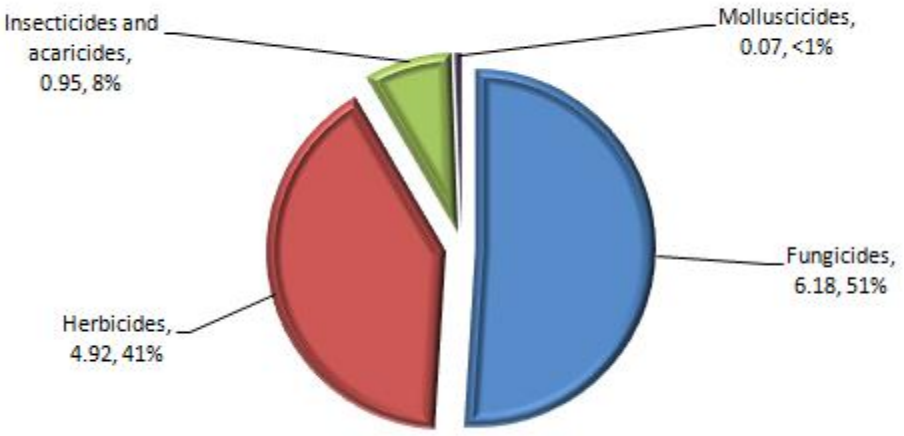


Figure 35 **Weight of pesticides (kg) applied to non-protected strawberry crops in Northern Ireland, 2012.**



Fungicides – non-protected strawberries

- Basic area treated: 2.28 hectares
- Total area treated: 8.00 spray hectares
- Weight of active substances applied: 6.18 kilogrammes
- 47% of the area grown treated with fungicides
- The five most common formulations were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Fenhexamid	1.79	0.80	1.30	37%
Iprodione	1.21	1.21	0.90	25%
Myclobutanil	0.99	0.35	0.10	20%
Azoxystrobin	0.91	0.91	0.20	19%
Tolylfluanid	0.87	0.23	1.00	18%

Figure 36 **Fungicide active ingredient usage on non-protected strawberry crops in Northern Ireland, (spha) 2012.**

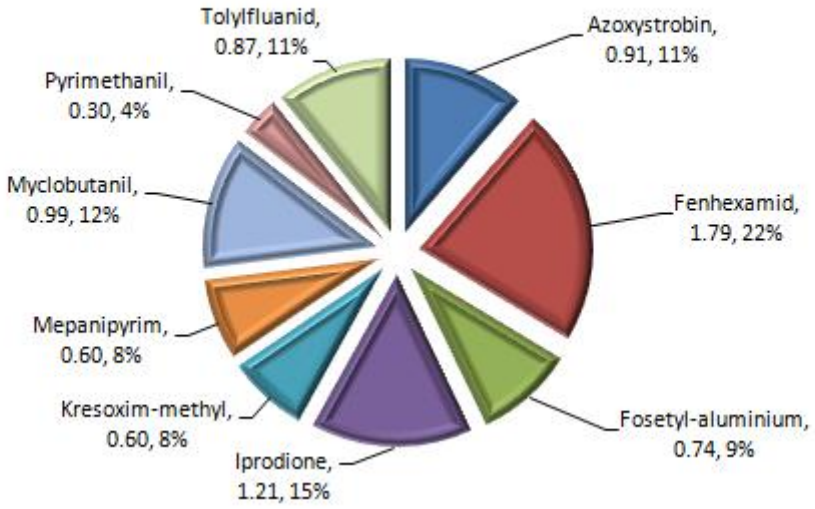


Figure 37 **Fungicide active ingredient usage on non-protected strawberry crops in Northern Ireland, (kg) 2012.**

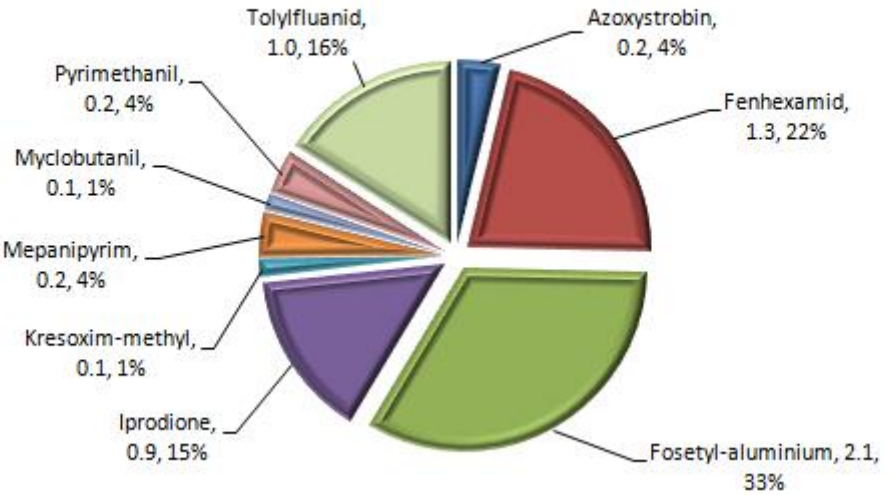
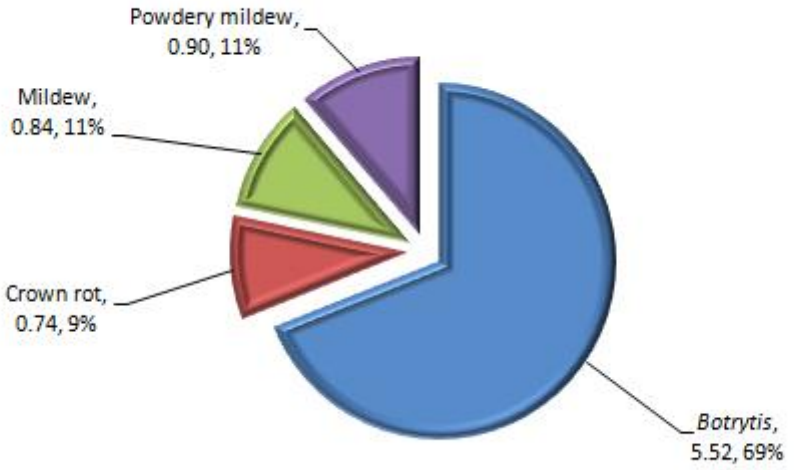


Figure 38 **Non-protected strawberries: reasons for fungicide use (spha), 2012.**



Insecticides and acaricides - non-protected strawberries

- Basic area treated: 2.82 hectares
- Total area treated: 2.82 spray hectares
- Weight of active substances applied: 0.95 kilogrammes
- 58% of the area grown treated with insecticides/acaricides
- The main reason given for insecticide/acaricide use was 'Aphids'
- The five most commonly used active ingredients were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Pirimicarb	1.82	1.82	0.50	37%
Chlorpyrifos	0.36	0.36	0.40	7%
Clofentezine	0.30	0.30	0.10	6%
Dimethoate	0.30	0.30	<0.10	6%
Cypermethrin	0.05	0.05	<0.10	1%

Figure 39 **Insecticide and acaricide active ingredient usage on non-protected strawberry crops in Northern Ireland, (spha) 2012.**

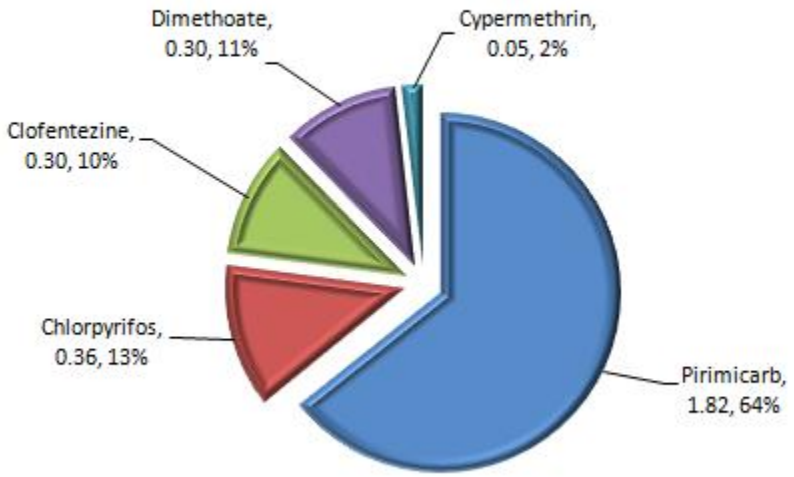


Figure 40 **Insecticide and acaricide active ingredient usage on non-protected strawberry crops in Northern Ireland, (kg) 2012.**

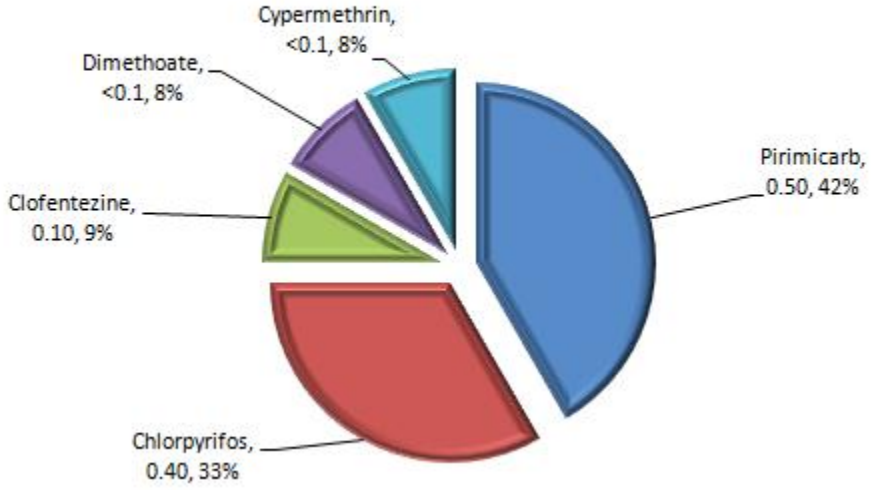
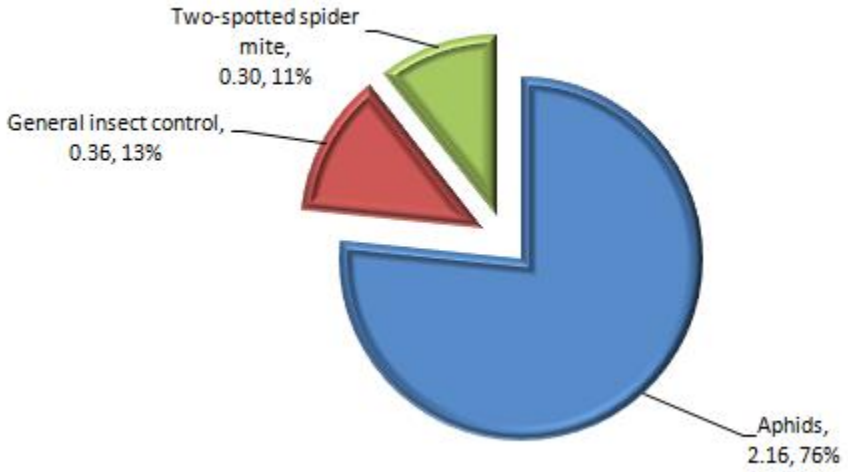


Figure 41 **Non-protected strawberries: reasons for insecticide and acaricide use (spha), 2012.**



Molluscicides - non-protected strawberries

- Basic area treated: 0.45 hectares
- Total area treated: 0.45 spray hectares
- Weight of active substances applied: <0.1 kilogram
- 9% of the area grown treated with molluscicides
- The only reason given for molluscicide use was ‘slugs’
- The only active substance applied was:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Methiocarb	0.45	0.45	0.07	9%

Herbicides - non-protected strawberries

- Basic area treated: 3.74 hectares
- Total area treated: 3.74 spray hectares
- Weight of active substances applied: 4.92 kilogrammes
- 77% of the area grown treated with herbicides
- The only reason given for herbicide use was 'General weed control'
- The three active substances applied were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Pendimethalin	1.82	1.82	2.4	37%
Propyzamide	1.21	1.21	1.5	25%
Glyphosate	0.72	0.72	1.0	15%

Figure 42 **Herbicide active ingredient usage on non-protected strawberry crops in Northern Ireland, (spha) 2012.**

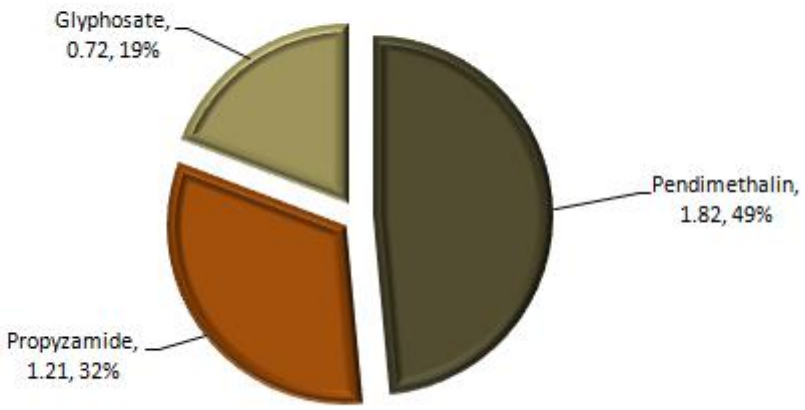


Figure 43 **Herbicide active ingredient usage on non-protected strawberry crops in Northern Ireland, (kg) 2012.**

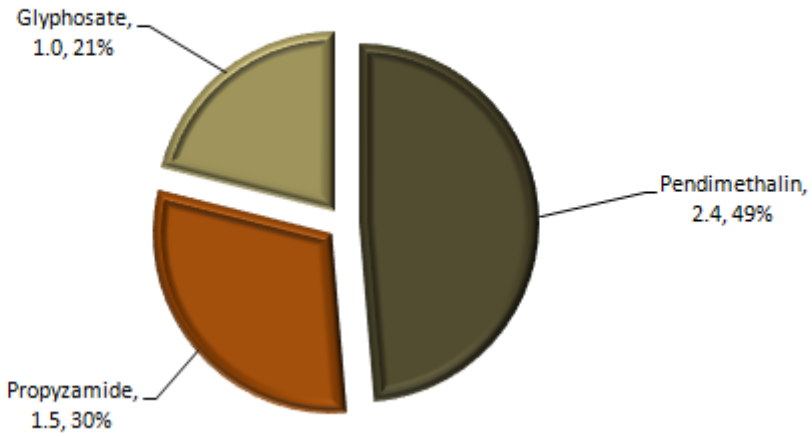
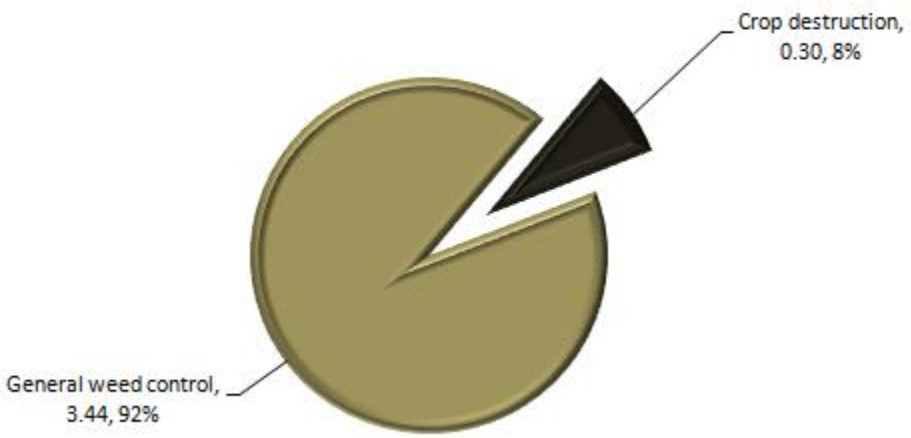


Figure 44 **Non-protected strawberries: reasons for herbicide use (spha), 2012.**



PROTECTED RASPBERRIES (Table 14)

- Total area grown: 0.30 hectares
- Basic area treated: 0.30 hectares
- Total area treated: 1.35 spray hectares
- Weight of active substances applied: 0.76 kilogrammes
- 3 fungicide substances and 1 insecticide/acaricide were applied to protected raspberry crops

Figure 45 **Pesticide usage (spha) on protected raspberry crops in Northern Ireland, 2012.**

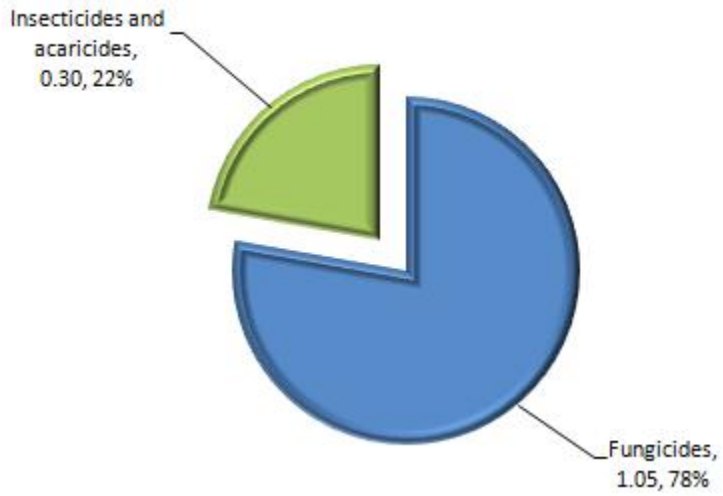
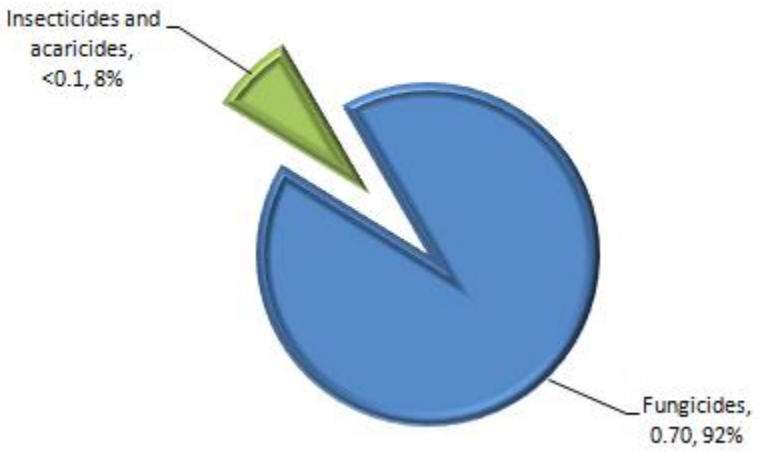


Figure 46 **Weight of pesticides (kg) applied to protected raspberry crops in Northern Ireland, 2012.**



Fungicides - protected raspberries

- Basic area treated: 0.15 hectares
- Total area treated: 1.05 spray hectares
- Weight of active substances applied: 0.70 kilogrammes
- 50% of the area grown treated with fungicides
- The three active substances applied were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Iprodione	0.60	0.15	0.45	50.0%
Pyrimethanil	0.30	0.15	0.24	50.0%
Myclobutanil	0.15	0.15	0.01	50.0%

Figure 47 **Fungicide active ingredient usage on protected raspberry crops in Northern Ireland, (spha) 2012.**

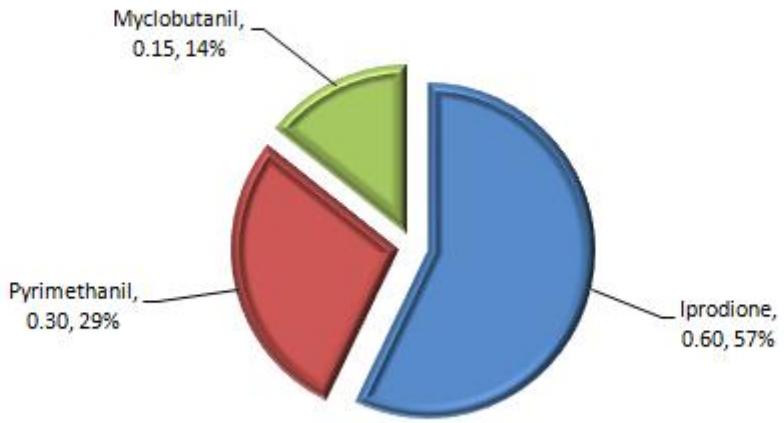


Figure 48 **Fungicide active ingredient usage on protected raspberry crops in Northern Ireland, (kg) 2012.**

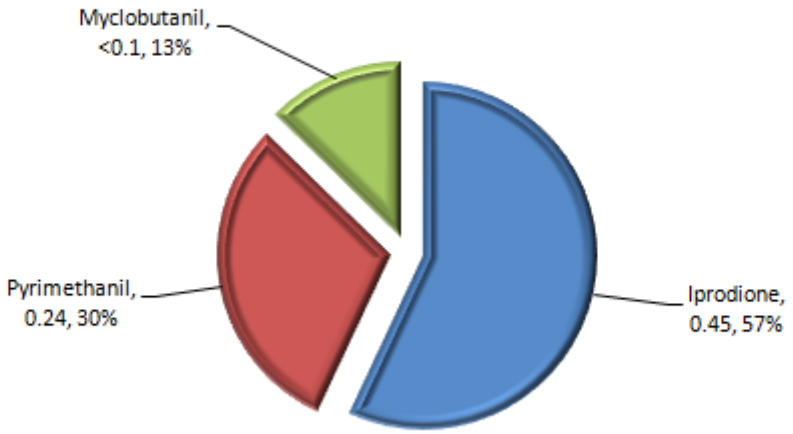
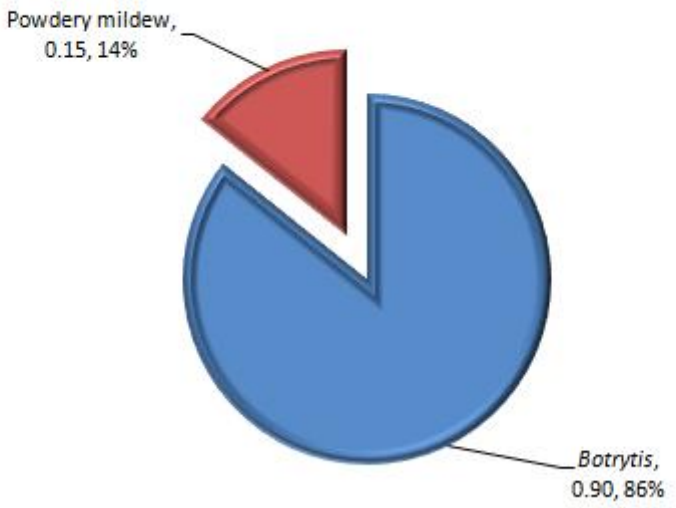


Figure 49 **Protected raspberries: reasons for fungicide use (spha), 2012.**



Insecticides and acaricides - protected raspberries

- Basic area treated: 0.15 hectares
- Total area treated: 0.30 spray hectares
- Weight of active substances applied: 0.06 kilogrammes
- 50% of the area grown treated with insecticides/acaricides
- The only reason given for insecticide/acaricide use was 'Two-spotted spider mite' (*Tetranychus urticae*)
- The only active substance used was:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Clofentezine	0.30	0.15	0.06	50%

SEMI-PROTECTED RASPBERRIES (Table 15)

- Total area grown: 1.20 hectares
- Basic area treated: 0.96 hectares
- Total area treated: 5.28 spray hectares
- Weight of active substances applied: 2.66 kilogrammes
- All semi-protected raspberries were field-grown under Spanish tunnels
- 7 different fungicide substances and 2 insecticide/acaricides were applied to semi-protected raspberry crops

Figure 50 **Pesticide usage (spha) on semi-protected raspberry crops in Northern Ireland, 2012.**

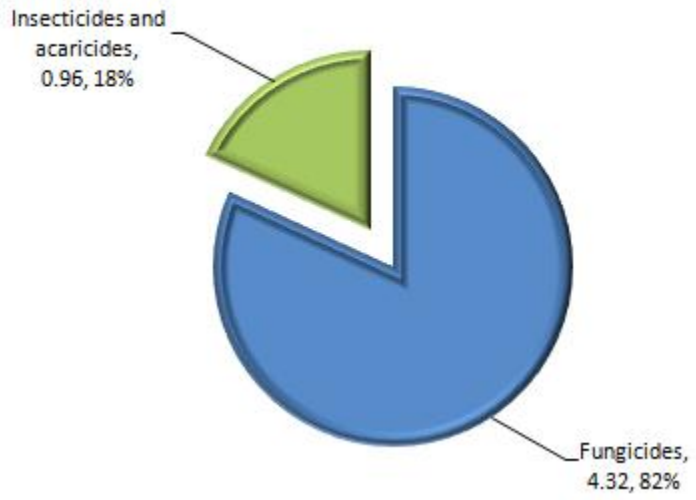
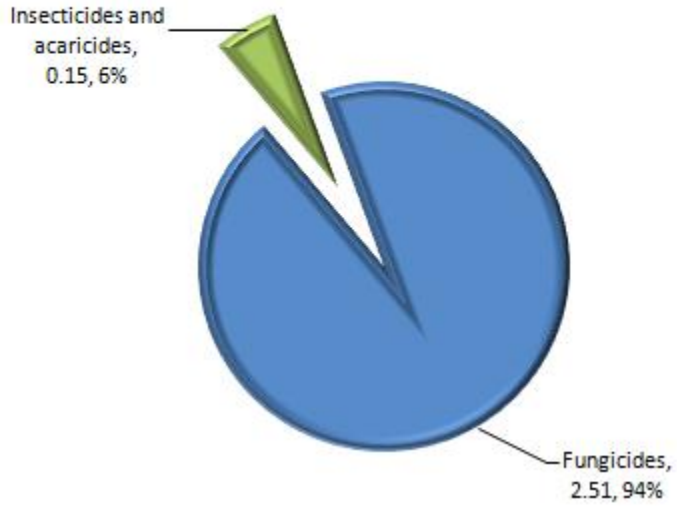


Figure 51 **Weight of pesticides (kg) applied to semi-protected raspberry crops in Northern Ireland, 2012.**



Fungicides – semi-protected raspberries

- Basic area treated: 0.48 hectares
- Total area treated: 4.32 spray hectares
- Weight of active substances applied: 2.51 kilogrammes
- 40% of the area grown treated with fungicide
- The five most common formulations were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Fluazinam	0.96	0.48	0.72	40%
Myclobutanil	0.96	0.48	0.09	40%
Iprodione	0.48	0.48	0.54	40%
Pyrimethanil	0.48	0.48	0.38	40%
Fenhexamid	0.48	0.48	0.36	40%

Figure 52 **Fungicide active ingredient usage on semi-protected raspberry crops in Northern Ireland, (spha) 2012.**

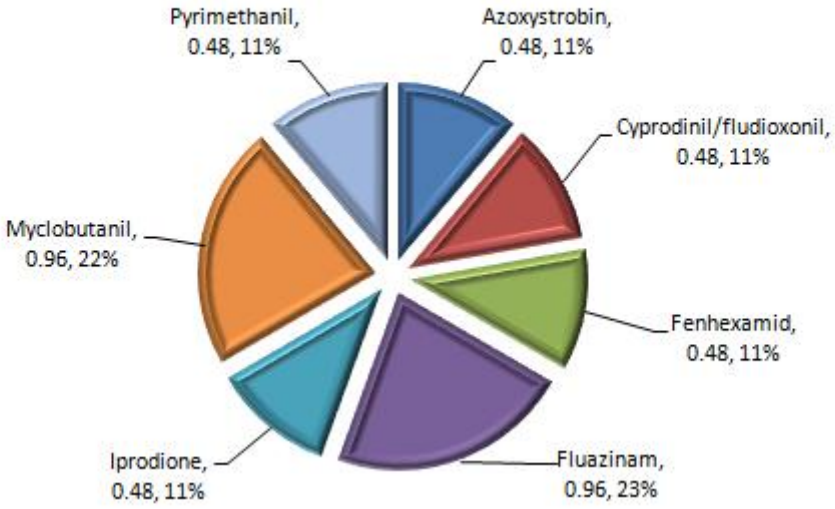


Figure 53 **Fungicide active ingredient usage on semi-protected raspberry crops in Northern Ireland, (kg) 2012.**

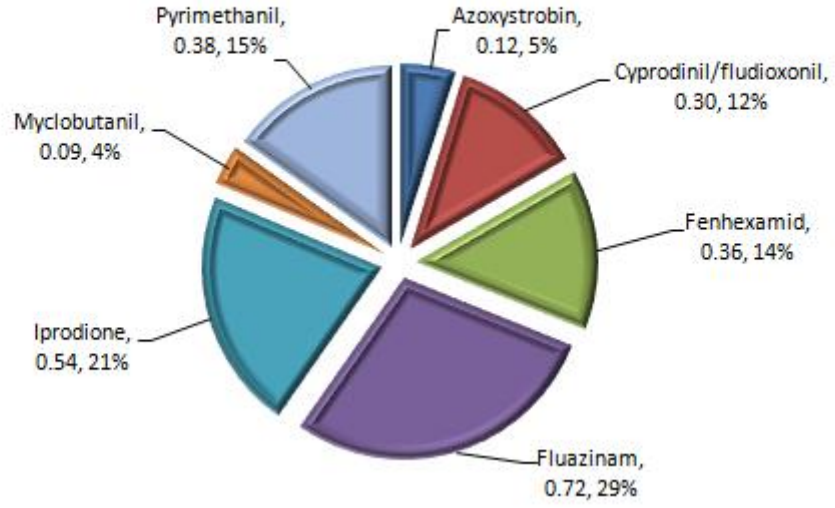
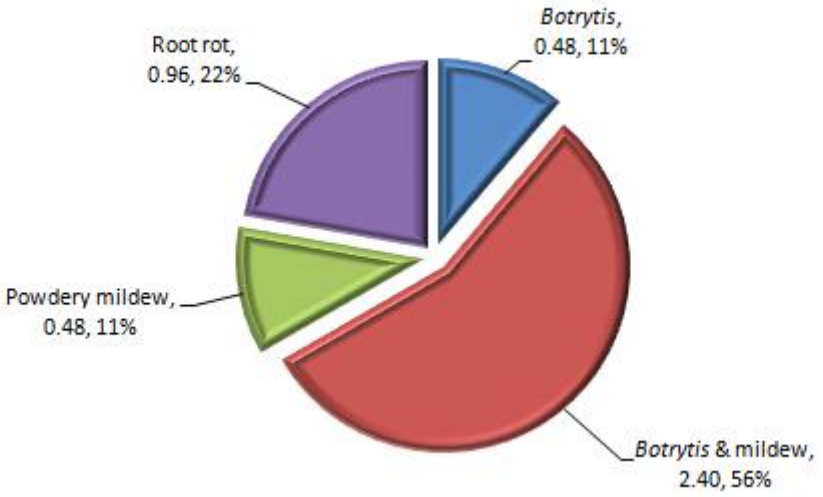


Figure 54 **Semi-protected raspberries: reasons for fungicide use (spha), 2012.**



Insecticides and acaricides – semi-protected raspberries

- Basic area treated: 0.48 hectares
- Total area treated: 0.96 spray hectares
- Weight of active substances applied: 0.15 kilogrammes
- 40% of the area grown treated with insecticides/acaricides
- The only two active substances used were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Clofentezine	0.48	0.48	0.10	40%
Thiacloprid	0.48	0.48	0.06	40%

Figure 55 **Insecticide and acaricide active ingredient usage on semi-protected raspberry crops in Northern Ireland, (spha) 2012.**

Figure 56 **Insecticide and acaricide active ingredient usage on semi-protected raspberry crops in Northern Ireland, (kg) 2012.**

Figure 57 **Semi-protected raspberries: reasons for insecticide and acaricide use (spha), 2012.**

NON-PROTECTED RASPBERRIES (Table 16)

- Total area grown: 0.88 hectares
- Basic area treated: 0.15 hectares
- Total area treated: 0.25 spray hectares
- Weight of active substances applied: 0.27 kilogrammes
- 1 fungicide and 1 herbicide were applied to non-protected raspberry crops
- Fungicide was used to treat *Botrytis* and herbicide was used for 'General weed control'
- The two active substances applied were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Fenhexamid (fungicide)	0.15	0.05	0.11	6%
Propyzamide (herbicide)	0.10	0.10	0.16	11%

Figure 58 **Pesticide usage (spha) on non-protected raspberry crops in Northern Ireland, 2012.**

Figure 59 **Weight of pesticides (kg) applied to non-protected raspberry crops in Northern Ireland, 2012.**

NON-PROTECTED GOOSEBERRIES (Table 17)

- Total area grown: 0.32 hectares
- Basic area treated: 0.15 hectares
- Total area treated: 0.30 spray hectares
- Weight of active substances applied: 0.29 kilogrammes
- 1 fungicide and 1 herbicide were applied to non-protected gooseberry crops
- Fungicide was used to treat *Botrytis* and herbicide was used for 'General weed control'
- The two active substances applied were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Fenhexamid (fungicide)	0.23	0.08	0.17	25%
Propyzamide (herbicide)	0.08	0.08	0.12	25%

Figure 60 **Pesticide usage (spha) on non-protected gooseberry crops in Northern Ireland, 2012.**

Figure 61 **Weight of pesticides (kg) applied to non-protected gooseberry crops in Northern Ireland, 2012.**

NON-PROTECTED BLACKCURRANTS (Table 18)

- Total area grown: 0.26 hectares
- Basic area treated: 0.15 hectares
- Total area treated: 0.30 spray hectares
- Weight of active substances applied: 0.29 kilogrammes
- 1 fungicide and 1 herbicide were applied to non-protected blackcurrant crops
- Fungicide was used to treat *Botrytis* and herbicide was used for 'General weed control'
- The two active substances applied were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Fenhexamid (fungicide)	0.23	0.08	0.17	31%
Propyzamide (herbicide)	0.08	0.08	0.12	31%

Figure 62 **Pesticide usage (spha) on non-protected blackcurrant crops in Northern Ireland, 2012.**

Figure 63 **Weight of pesticides (kg) applied to non-protected blackcurrant crops in Northern Ireland, 2012.**

NON-PROTECTED 'OTHER CROPS' (Table 19)

- Total area grown: 0.39 hectares
- Basic area treated: 0.15 hectares
- Total area treated: 0.30 spray hectares
- Weight of active substances applied: 0.29 kilogrammes
- 1 fungicide and 1 herbicide were applied to non-protected 'Other crops'
- Fungicide was used to treat *Botrytis* and herbicide was used for 'General weed control'
- The two active substances applied were:

Acitve ingredient	Total-treated area (spha)	Basic-treated area (ha)	Quantity applied (kg)	% grown area treated
Fenhexamid (fungicide)	0.23	0.08	0.17	21%
Propyzamide (herbicide)	0.08	0.08	0.12	21%

Figure 64 **Pesticide usage (spha) on non-protected 'Other crops' in Northern Ireland, 2012.**

Figure 65 **Weight of pesticides (kg) applied to non-protected 'Other crops' in Northern Ireland, 2012.**

ACKNOWLEDGEMENTS

We, the authors, wish to thank all of the growers who participated in this survey, without whose co-operation the completion of this report would not have been possible. We are also grateful for the invaluable assistance of Mr David Williams who worked tirelessly on key aspects of this report. We are particularly grateful for the support of Dr. Anne Stone (Edible Crops Development Adviser, CAFRE) for her invaluable advice and her contribution to the compilation of the list of soft fruit growers.

REFERENCES

Kidd, S.L.B., Jess, S., McCallion, T. (1994) Soft Fruit Crops 1990. *Pesticide Usage Survey Report 106* Belfast: HMSO.

Kearns, C.A., Jess, S., Matthews, D., McCallion, T. (2002) Soft Fruit Crops 1998. *Pesticide Usage Survey Report 167* Belfast: Textflow Astron.

Kearns, C.A., Jess, S., Keatings, T., Kelly, T. (2008) Soft Fruit Crops 2006. *Pesticide Usage Survey Report 218* Belfast: AFBINI.

Lavery, M.K., Jess, S., Matthews, D., Kelly, T. (2011) Soft Fruit Crops 2010. *Pesticide Usage Survey Report 240* Belfast: AFBINI.

Table 1 Number of holdings and area (ha) of soft fruit crops sampled in Northern Ireland, 2012.

Region	Total number of holdings	Number of holdings sampled	Area of holding sampled (ha)	Raised area of population (ha)
Northern Ireland	30	20	12.32	18.48

Table 2 Number and area (ha) of soft fruit crops surveyed in Northern Ireland, 2012.

Crop type and crop location	No. of crops Surveyed	Surveyed area (ha)
Strawberries permanent protection	17	3.98
Strawberries semi-protection	5	2.86
Strawberries field-grown	13	3.25
Raspberries permanent protection	1	0.20
Raspberries semi-protection	1	0.80
Raspberries field-grown	2	0.59
Gooseberries field-grown	3	0.21
Blackcurrants field-grown	3	0.17
Other crops field-grown	2	0.26
All crops	**47**	**12.32**

Table 3 Estimated area (ha) of soft fruit crops grown in Northern Ireland, 2012, by method of protection.

	Method of protection			
Crop Type	Protected crops	Semi-protected crops	Non-protected crops	Total
Strawberries	5.97	4.30	4.88	15.14
Raspberries	0.30	1.20	0.88	2.38
Gooseberries	.	.	0.32	0.32
Blackcurrants	.	.	0.26	0.26
Other crops	.	.	0.39	0.39
All crops	**6.27**	**5.50**	**6.72**	**18.48**

Table 4 Basic-treated area (ha) and the total-treated area (spha) of soft fruit crops in Northern Ireland 2012 treated with each pesticide type.

Method of protection and crop type	Fungicides		Herbicides		Insecticides and acaricides		Biopesticides		Molluscicides		All pesticides	
	(ha)	(spha)	(ha)	(spha)	(ha)	(spha)	(ha)	(spha)	(ha)	(spha)	(ha)	(spha)
Protected												
Strawberries	2.16	20.71	0.15	0.15	1.56	6.32	1.03	1.43	0.27	0.27	5.17	28.88
Raspberries	0.15	1.05	.	.	0.15	0.30	.	.	.	.	0.30	1.35
All protected	**2.31**	**21.76**	**0.15**	**0.15**	**1.71**	**6.62**	**1.03**	**1.43**	**0.27**	**0.27**	**5.47**	**30.23**
Semi-protected												
Strawberries	1.34	15.54	1.42	1.42	1.23	2.26	0.73	0.73	0.37	0.37	5.09	20.30
Raspberries	0.48	4.32	.	.	0.48	0.96	.	.	.	.	0.96	5.28
All semi-protected	**1.82**	**19.86**	**1.42**	**1.42**	**1.71**	**3.22**	**0.73**	**0.73**	**0.37**	**0.37**	**6.05**	**25.58**
Non-protected												
Strawberries	2.28	8.00	3.44	3.74	2.82	2.82	.	.	0.45	0.45	8.99	15.01
Raspberries	0.05	0.15	0.10	0.10	.	.	.	.	.	.	0.15	0.25
Gooseberries	0.08	0.23	0.08	0.08	.	.	.	.	.	.	0.15	0.30
Blackcurrants	0.08	0.23	0.08	0.08	.	.	.	.	.	.	0.15	0.30
Other crops	0.08	0.23	0.08	0.08	.	.	.	.	.	.	0.15	0.30
All non-protected	**2.55**	**8.82**	**3.77**	**4.07**	**2.82**	**2.82**	**0.00**	**0.00**	**0.45**	**0.45**	**9.59**	**16.16**
All crops												
Strawberries	5.79	44.24	5.01	5.31	5.61	11.39	1.76	2.16	1.09	1.09	19.25	64.19
Raspberries	0.68	5.52	0.10	0.10	0.63	1.26	.	.	.	.	1.41	6.88
Gooseberries	0.08	0.23	0.08	0.08	.	.	.	.	.	.	0.15	0.30
Blackcurrants	0.08	0.23	0.08	0.08	.	.	.	.	.	.	0.15	0.30
Other crops	0.08	0.23	0.08	0.08	.	.	.	.	.	.	0.15	0.30
Total	**6.69**	**50.44**	**5.33**	**5.63**	**6.24**	**12.65**	**1.76**	**2.16**	**1.09**	**1.09**	**21.11**	**71.97**

Table 5 **Total quantity (kg) of pesticide type applied to soft fruit crops in Northern Ireland, 2012.**

Method of protection and crop type	Fungicides (kg)	Herbicides (kg)	Insecticides and acaricides (kg)	Biopesticides (kg)	Molluscicides (kg)	All pesticides (kg)
Protected						
Strawberries	9.17	0.22	0.89	Trace	0.04	10.31
Raspberries	0.70	.	0.06	.	.	0.76
All Protected	**9.87**	**0.22**	**0.95**	**Trace**	**0.04**	**11.07**
Semi-protected						
Strawberries	11.53	1.42	0.39	.	0.05	13.40
Raspberries	2.51	.	0.15	.	.	2.66
All semi-protected	**14.04**	**1.42**	**0.54**	**.**	**0.05**	**16.06**
Non-protected						
Strawberries	6.18	4.92	0.95	Trace	0.07	12.11
Raspberries	0.11	0.16	.	Trace	.	0.27
Gooseberries	0.17	0.12	.	.	.	0.29
Blackcurrants	0.17	0.12	.	.	.	0.29
Other crops	0.17	0.12	.	.	.	0.29
All non-protected	**6.80**	**5.44**	**0.95**	**Trace**	**0.07**	**13.25**
All locations						
Strawberries	26.88	6.55	2.23	Trace	0.16	35.82
Raspberries	3.32	0.16	0.21	Trace	.	3.69
Gooseberries	0.17	0.12	.	.	.	0.29
Blackcurrants	0.17	0.12	.	.	.	0.29
Other crops	0.17	0.12	.	.	.	0.29
All crops	**30.71**	**7.07**	**2.44**	**Trace**	**0.16**	**40.38**

Table 6 **The proportional area (%) of each crop treated with pesticides and the mean number of spray applications, Northern Ireland 2012.**

	Fungicides		Herbicides		Insecticides and acaricides		Biopesticides		Molluscicides		All pesticides	
Crop type	%	sp app.	%	sp app.	%	sp app.	%	sp app.	%	sp app.	%	sp app.
Strawberries	57.3	7.6	49.6	1.1	55.7	2.5	17.4	1.4	10.8	1.0	99.6	3.9
Raspberries	42.8	6.3	6.3	1.0	39.7	2.0	.	.	.	.	69.4	4.0
Gooseberries	35.7	3.0	35.7	1.0	.	.	.	.	.	.	47.6	2.0
Blackcurrants	44.1	3.0	44.1	1.0	.	.	.	.	.	.	58.8	2.0
Other crops	28.6	3.0	28.6	1.0	.	.	.	.	.	.	38.2	2.0
All crops	**54.3**	**7.1**	**43.3**	**1.1**	**50.7**	**2.5**	**14.2**	**1.4**	**1.0**	**1.0**	**93.0**	**3.8**

Table 7 **Estimated area (spha) of soft fruit crops treated with pesticide active ingredients in Northern Ireland, 2012.**

	Crop type							
Pesticide group & active ingredient	**Strawberries**	**Raspberries**	**Gooseberries**	**Blackcurrants**	**Other crops**	**Total treated area (spha)**	**2010 totals (spha)**	**2006 totals (spha)**
Fungicides								
Azoxystrobin	2.58	0.48	.	.	.	3.06	7.80	6.76
Boscalid/pyraclostrobin	0.53	.	.	.	.	0.53	5.64	0.58
Bupirimate	1.22	.	.	.	.	1.22	4.72	6.88
Chlorothalonil	.	.	.	.	.	.	1.55	4.46
Cyprodinil/fludioxonil	1.45	0.48	.	.	.	1.93	1.44	.
Dimethomorph	0.78	.	.	.	.	0.78	1.55	.
Fenhexamid	3.89	0.63	0.23	0.23	0.23	5.20	7.09	5.24
Fluazinam	0.15	0.96	.	.	.	1.11	.	.
Fosetyl-aluminium	1.82	.	.	.	.	1.82	3.94	5.48
Iprodione	8.50	1.08	.	.	.	9.58	12.36	29.89
Kresoxim-methyl	0.85	.	.	.	.	0.85	0.07	.
Mepanipyrim	2.81	.	.	.	.	2.81	1.90	4.35
Meptyldinocap	1.28	.	.	.	.	1.28	.	.
Myclobutanil	8.23	1.11	.	.	.	9.34	13.88	28.98
Potassium bicarbonate	0.06	.	.	.	.	0.06	7.41	.
Pyrimethanil	4.80	0.78	.	.	.	5.58	7.90	9.81
Quinoxyfen	0.36	.	.	.	.	0.36	0.72	0.25
Sodium bicarbonate	0.32	.	.	.	.	0.32	.	.
Sulphur	1.11	.	.	.	.	1.11	2.20	.
Thiram	2.59	.	.	.	.	2.59	1.91	1.62
Tolylfluanid	0.93	.	.	.	.	0.93	0.22	24.86
All fungicides	**44.24**	**5.52**	**0.23**	**0.23**	**0.23**	**50.44**	**82.31**	**129.16**

Table 7 (cont) **Estimated area (spha) of soft fruit crops treated with pesticide active ingredients in Northern Ireland, 2012.**

	Crop type							
Pesticide group & active ingredient	**Strawberries**	**Raspberries**	**Gooseberries**	**Blackcurrants**	**Other crops**	**Total treated area (spha)**	**2010 totals (spha)**	**2006 totals (spha)**
Herbicides								
Diquat	.	.	.	.	.	.	0.02	0.97
Glufosinate-ammonium	0.90	.	.	.	.	0.90	.	.
Glyphosate	1.39	.	.	.	.	1.39	3.17	2.72
Isoxaben	.	.	.	.	.	.	0.22	1.21
Lenacil	.	.	.	.	.	.	0.90	2.50
Pendimethalin	1.82	.	.	.	.	1.82	0.22	1.57
Propachlor	.	.	.	.	.	.	0.41	.
Propyzamide	1.21	0.10	0.08	0.08	0.08	1.53	0.41	2.05
Simazine	.	.	.	.	.	.	1.09	3.33
All herbicides	**5.31**	**0.10**	**0.08**	**0.08**	**0.08**	**5.64**	**6.44**	**14.35**
Insecticides and acaricides								
Abamectin	1.73	.	.	.	.	1.73	1.07	1.71
Bifenthrin	0.07	.	.	.	.	0.07	1.38	12.89
Chlorpyrifos	0.50	.	.	.	.	0.50	4.52	6.62
Clofentezine	4.00	0.78	.	.	.	4.78	3.46	3.56
Cypermethrin	0.05	.	.	.	.	0.05	.	.
Deltamethrin	.	.	.	.	.	.	0.11	.
Dimethoate	0.30	.	.	.	.	0.30	0.96	0.02
Etoxazole	0.24	.	.	.	.	0.24	2.69	.
Pirimicarb	2.68	.	.	.	.	2.68	4.14	9.97
Pymetrozine	0.08	.	.	.	.	0.08	.	.
Tebufenpyrad	0.72	.	.	.	.	0.72	1.68	0.83
Thiacloprid	1.04	0.48	.	.	.	1.52	0.86	.
All insecticdes and acaricides	**11.39**	**1.26**	**.**	**.**	**.**	**12.65**	**20.87**	**35.60**

Table 7 (cont) **Estimated area (spha) of soft fruit crops treated with pesticide active ingredients in Northern Ireland, 2012.**

	Crop type							
Pesticide group & active ingredient	**Strawberries**	**Raspberries**	**Gooseberries**	**Blackcurrants**	**Other crops**	**Total treated area (spha)**	**2010 totals (spha)**	**2006 totals (spha)**
Biopesticides								
Bacillus subtilis	0.47	.	.	.	.	0.47	4.15	.
Phasmarhabditis hermaphrodita	0.49	.	.	.	.	0.49	.	
Phytoseiulus persimilis	0.66	.	.	.	.	0.66	0.85	5.25
Steinernema feltiae	0.36	.	.	.	.	0.36	.	.
Steinernema kraussei	0.17	.	.	.	.	0.17	1.79	.
All biopesticides	**2.15**	**.**	**.**	**.**	**.**	**2.15**	**7.03**	**5.25**
Molluscicides								
Methiocarb	1.09	.	.	.	.	1.09	.	.
All molluscicides	**1.09**	**.**	**.**	**.**	**.**	**1.09**	**.**	**.**

Table 8 **Estimated quantities (kg) of pesticide active ingredients applied to soft fruit crops in Northern Ireland, 2012.**

	Crop type							
Pesticide group & active ingredient	**Strawberries**	**Raspberries**	**Gooseberries**	**Blackcurrants**	**Other crops**	**Total quantity applied (kg)**	**2010 totals (kg)**	**2006 totals (kg)**
Fungicides								
Azoxystrobin	0.43	0.12	.	.	.	0.55	1.60	4.98
Boscalid/pyraclostrobin	0.19	.	.	.	.	0.19	3.18	0.15
Bupirimate	0.24	.	.	.	.	0.24	1.28	2.31
Chlorothalonil	.	.	.	.	.	.	1.55	6.19
Cyprodinil/fludioxonil	0.91	0.30	.	.	.	1.21	0.90	.
Dimethomorph	0.16	.	.	.	.	0.16	0.16	.
Fenhexamid	2.03	0.47	0.17	0.17	0.17	3.01	2.56	3.38
Fluazinam	0.11	0.72	.	.	.	0.83	.	.
Fosetyl-aluminium	4.00	.	.	.	.	4.00	7.94	12.31
Iprodione	5.32	0.99	.	.	.	6.31	7.71	17.44
Kresoxim-methyl	0.13	.	.	.	.	0.13	0.01	.
Mepanipyrim	1.13	.	.	.	.	1.13	0.59	1.64
Meptyldinocap	0.27	.	.	.	.	0.27	.	.
Myclobutanil	0.63	0.10	.	.	.	0.73	0.84	2.00
Potassium bicarbonate	0.01	.	.	.	.	0.01	2.07	.
Pyrimethanil	3.13	0.62	.	.	.	3.75	4.02	8.23
Quinoxyfen	0.05	.	.	.	.	0.05	0.09	0.06
Sodium bicarbonate	1.35	.	.	.	.	1.35	.	.
Sulphur	2.35	.	.	.	.	2.35	4.13	.
Thiram	3.39	.	.	.	.	3.39	1.57	4.10
Tolylfluanid	1.06	.	.	.	.	1.06	0.34	29.69
All fungicides	**26.88**	**3.33**	**0.17**	**0.17**	**0.17**	**30.71**	**40.52**	**92.48**

Table 8 (cont) **Estimated quantities (kg) of pesticide active ingredients applied to soft fruit crops in Northern Ireland, 2012.**

	Crop type							
Pesticide group & active ingredient	**Strawberries**	**Raspberries**	**Gooseberries**	**Blackcurrants**	**Other crops**	**Total quantity applied (kg)**	**2010 totals (kg)**	**2006 totals (kg)**
Herbicides								
Diquat	.	.	.	.	.	.	0.02	0.97
Glufosinate-ammonium	0.90	.	.	.	.	0.90	.	.
Glyphosate	1.39	.	.	.	.	1.39	3.17	2.72
Isoxaben	.	.	.	.	.	.	0.22	1.21
Lenacil	.	.	.	.	.	.	0.90	2.50
Pendimethalin	1.82	.	.	.	.	1.82	0.22	1.57
Propachlor	.	.	.	.	.	.	0.41	.
Propyzamide	1.21	0.10	0.08	0.08	0.08	1.53	0.41	2.05
Simazine	.	.	.	.	.	.	1.09	3.33
All herbicides	**5.31**	**0.10**	**0.08**	**0.08**	**0.08**	**5.64**	**6.44**	**14.35**
Insecticides and acaricides								
Abamectin	1.73	.	.	.	.	1.73	1.07	1.71
Bifenthrin	0.07	.	.	.	.	0.07	1.38	12.89
Chlorpyrifos	0.50	.	.	.	.	0.50	4.52	6.62
Clofentezine	4.00	0.78	.	.	.	4.78	3.46	3.56
Cypermethrin	0.05	.	.	.	.	0.05	.	.
Deltamethrin	.	.	.	.	.	.	0.11	.
Dimethoate	0.30	.	.	.	.	0.30	0.96	0.02
Etoxazole	0.24	.	.	.	.	0.24	2.69	.
Pirimicarb	2.68	.	.	.	.	2.68	4.14	9.97
Pymetrozine	0.08	.	.	.	.	0.08	.	.
Tebufenpyrad	0.72	.	.	.	.	0.72	1.68	0.83
Thiacloprid	1.04	0.48	.	.	.	1.52	0.86	.
All insecticdes and acaricides	**11.39**	**1.26**	**.**	**.**	**.**	**12.65**	**20.87**	**35.60**

Table 8 (cont) **Estimated quantities (kg) of pesticide active ingredients applied to soft fruit crops in Northern Ireland, 2012.**

	Crop type							
Pesticide group & active ingredient	**Strawberries**	**Raspberries**	**Gooseberries**	**Blackcurrants**	**Other crops**	**Total quantity applied (kg)**	**2010 totals (kg)**	**2006 totals (kg)**
Biopesticides								
Bacillus subtilis	0.47	.	.	.	.	0.47	4.15	.
Phasmarhabditis hermaphrodita	0.49	.	.	.	.	0.49	.	.
Phytoseiulus persimilis	0.66	.	.	.	.	0.66	0.85	5.25
Steinernema feltiae	0.36	.	.	.	.	0.36	.	.
Steinernema kraussei	0.17	.	.	.	.	0.17	1.79	.
All biopesticides	**2.15**	**.**	**.**	**.**	**.**	**2.15**	**7.03**	**5.25**
Molluscicides								
Methiocarb	1.09	.	.	.	.	1.09	.	.
All molluscicides	**1.09**	**.**	**.**	**.**	**.**	**1.09**	**.**	**.**

Table 9 **The active ingredients most extensively used on soft fruit crops in Northern Ireland 2012 and 2010 ranked by treated area (spha).**

No.	Active ingredient	Treated area (spha)	2010 totals (spha)
1	Iprodione	9.58	12.36
2	Myclobutanil	9.34	13.88
3	Pyrimethanil	5.58	7.90
4	Fenhexamid	5.20	7.09
5	Clofentezine	4.78	3.46
6	Azoxystrobin	3.06	7.80
7	Mepanipyrim	2.81	1.90
8	Pirimicarb	2.68	4.14
9	Thiram	2.59	1.91
10	Cyprodinil/fludioxonil	1.93	1.44
11	Fosetyl-aluminium	1.82	3.94
12	Pendimethalin	1.82	0.22
13	Abamectin	1.73	1.07
14	Propyzamide	1.53	0.41
15	Thiacloprid	1.52	0.86
16	Glyphosate	1.39	3.17
17	Meptyldinocap	1.28	.
18	Bupirimate	1.22	4.72
19	Sulphur	1.11	2.20
20	Fluazinam	1.11	.
21	Methiocarb	1.09	.
22	Tolylfluanid	0.93	0.22
23	Glufosinate-ammonium	0.90	.
24	Kresoxim-methyl	0.85	0.07
25	Dimethomorph	0.78	1.55
26	Tebufenpyrad	0.72	1.68
27	*Phytoseiulus persimilis*	0.66	0.85
28	Boscalid	0.53	5.64
29	Chlorpyrifos	0.50	4.52
30	*Phasmarhabditis hermaphrodita*	0.49	.
31	*Bacillus subtilis*	0.47	4.15
32	Quinoxyfen	0.36	0.72
33	*Steinernema feltiae*	0.36	.
34	Sodium bicarbonate	0.32	.
35	Dimethoate	0.30	0.96
36	Etoxazole	0.24	2.69
37	*Steinernema kraussei*	0.17	1.79
38	Pymetrozine	0.08	.
39	Bifenthrin	0.07	1.38
40	Potassium bicarbonate	0.06	7.41
41	Cypermethrin	0.05	.
42	Chlorothalonil	.	1.55
43	Simazine	.	1.09
44	Lenacil	.	0.90
45	Propachlor	.	0.41

Table 10 **The active ingredients most extensively used on soft fruit crops in Northern Ireland 2012 and 2010 ranked by weight (kg).**

No.	Active ingredient	Quantity applied (kg)	2010 totals (kg)
1	Iprodione	6.31	7.71
2	Fosetyl-aluminium	4.00	7.94
3	Pyrimethanil	3.75	4.02
4	Thiram	3.39	1.57
5	Fenhexamid	3.01	2.56
6	Pendimethalin	2.40	0.44
7	Sulphur	2.35	4.13
8	Propyzamide	2.01	0.52
9	Glyphosate	2.00	4.75
10	Sodium bicarbonate	1.35	.
11	Cyprodinil/fludioxonil	1.21	0.90
12	Mepanipyrim	1.13	0.59
13	Tolylfluanid	1.06	0.34
14	Clofentezine	0.91	0.53
15	Fluazinam	0.83	.
16	Pirimicarb	0.74	1.11
17	Myclobutanil	0.73	0.84
18	Glufosinate-ammonium	0.68	.
19	Azoxystrobin	0.55	1.60
20	Chlorpyrifos	0.45	3.40
21	Meptyldinocap	0.27	.
22	Bupirimate	0.24	1.28
23	Tebufenpyrad	0.22	0.43
24	Boscalid	0.19	3.18
25	Methiocarb	0.16	.
26	Dimethomorph	0.16	0.16
27	Kresoxim-methyl	0.13	0.01
28	Thiacloprid	0.11	0.06
29	Quinoxyfen	0.05	0.09
30	Potassium bicarbonate	0.01	2.07
31	Abamectin	0.01	<0.01
32	Etoxazole	0.01	0.09
33	Pymetrozine	0.01	.
34	Bifenthrin	<0.01	0.03
35	Dimethoate	<0.01	0.33
36	Cypermethrin	<0.01	.
37	*Phytoseiulus persimilis*	Trace	Trace
38	*Phasmarhabditis hermaphrodita*	Trace	.
39	*Bacillus subtilis*	Trace	Trace
40	*Steinernema feltiae*	Trace	.
41	*Steinernema kraussei*	Trace	Trace
42	Lenacil	.	1.97
43	Chlorothalonil	.	1.55
44	Simazine	.	1.22
45	Propachlor	.	0.98

Table 11 **Strawberries (protected): Reason for use, total cropping area (ha), total-treated area (spha), basic-treated area (ha), percentage of cropping area treated and quantity applied (kg).**

	Reason for use								*Total grown area of protected strawberries = 5.97 ha*		
Pesticide group & active ingredient	***Botrytis***	***Botrytis* & mildew**	**Crown rot**	**Mildew**	**Powdery mildew**	**Rhizoctonia**	**Root rot**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Fungicides											
Azoxystrobin	.	0.23	.	1.45	.	.	.	1.67	0.57	10%	0.20
Boscalid/pyraclostrobin	0.21	0.32	.	.	.	.	.	0.53	0.38	6%	0.19
Bupirimate	.	0.15	.	1.07	.	.	.	1.22	0.69	12%	0.24
Dimethomorph	.	.	0.42	.	.	.	.	0.42	0.42	7%	0.13
Fenhexamid	1.88	0.08	.	.	.	.	.	1.96	0.96	16%	0.58
Fluazinam	.	.	.	.	.	.	0.15	0.15	0.15	3%	0.11
Fosetyl-aluminium	.	.	0.48	.	.	0.24	.	0.72	0.72	12%	0.86
Iprodione	3.00	0.38	.	.	.	.	.	3.37	1.02	17%	1.47
Kresoxim-methyl	.	.	.	0.24	.	.	.	0.24	0.24	4%	<0.10
Mepanipyrim	0.30	1.61	.	.	.	.	.	1.91	1.16	19%	0.77
Meptyldinocap	.	.	.	0.48	0.07	.	.	0.55	0.31	5%	0.12
Myclobutanil	.	1.50	.	1.88	0.30	.	.	3.68	2.10	35%	0.22
Potassium bicarbonate	.	.	.	0.06	.	.	.	0.06	0.06	1%	<0.10
Pyrimethanil	1.17	0.23	.	0.42	.	.	.	1.81	1.14	19%	0.81
Sulphur	.	.	.	0.79	.	.	.	0.79	0.30	5%	1.76
Thiram	0.37	0.23	.	.	.	0.97	.	1.57	0.54	9%	1.59
Tolylfluanid	0.06	.	.	.	.	.	.	0.06	0.06	1%	0.07
All fungicides	**6.99**	**4.71**	**0.90**	**6.38**	**0.37**	**1.22**	**0.15**	**20.71**	**2.16**	**36%**	**9.17**

Table 11 (cont) **Strawberries (protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use											*Total grown area of protected strawberries = 5.97 ha*		
Pesticide group & active ingredient	**Aphids**	***Botrytis***	***Botrytis* & Mildew**	**General insect control**	**General weed control**	**Two-spotted spider mite**	**Slugs**	**Tarsonemid mite**	**Vine weevil**	**Glass-house white fly**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Herbicides														
Glyphosate	.	.	.	.	0.15	.	.	.	.	.	0.15	0.15	3%	0.2
All herbicides	**.**	**.**	**.**	**.**	**0.15**	**.**	**.**	**.**	**.**	**.**	**0.15**	**0.15**	**3%**	**0.2**
Insecticides and acaricides														
Abamectin	.	.	.	.	.	1.43	.	.	.	.	1.43	0.96	16%	<0.1
Bifenthrin	.	.	.	0.07	.	.	.	.	.	.	0.07	0.07	1%	<0.1
Chlorpyrifos	.	.	.	0.14	.	.	.	.	.	.	0.14	0.14	2%	<0.1
Clofentezine	.	.	.	.	.	1.74	.	.	.	.	1.74	0.77	13%	0.3
Etoxazole	.	.	.	.	.	0.24	.	.	.	.	0.24	0.24	4%	<0.1
Pirimicarb	0.86	.	.	.	.	.	.	.	.	.	0.86	0.62	10%	0.2
Pymetrozine	0.08	.	.	.	.	.	.	.	.	.	0.08	0.08	1%	<0.1
Tebufenpyrad	.	.	.	.	.	0.72	.	.	.	.	0.72	0.72	12%	0.2
Thiacloprid	0.72	.	.	.	.	.	.	0.24	.	0.08	1.04	0.81	14%	<0.1
All insecticides and acaricides	**1.66**	**.**	**.**	**0.21**	**.**	**4.13**	**.**	**0.24**	**.**	**0.08**	**6.32**	**1.56**	**26%**	**0.9**
Biopesticides														
Bacillus subtilis	.	0.17	0.30	.	.	.	.	.	.	.	0.47	0.25	4%	Trace
Phasmarhabditis hermaphrodita	.	.	.	.	.	.	0.12	.	.	.	0.12	0.12	2%	Trace
Phytoseiulus persimilis	.	.	.	.	.	0.66	.	.	.	.	0.66	0.66	11%	Trace
Steinernema kraussei	.	.	.	.	.	.	.	.	0.17	.	0.17	0.17	3%	Trace
All biopesticides	**.**	**0.17**	**0.30**	**.**	**.**	**0.66**	**0.12**	**.**	**0.17**	**.**	**1.43**	**1.03**	**17%**	**Trace**

Table 11 (cont) **Strawberries (protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use											*Total grown area of protected strawberries = 5.97 ha*		
Pesticide group & active ingredient	**Aphids**	***Botrytis***	***Botrytis* & Mildew**	**General insect control**	**General weed control**	**Two-spotted spider mite**	**Slugs**	**Tarsonemid mite**	**Vine weevil**	**Glass-house white fly**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Molluscicides														
Methiocarb	.	.	.	.	.	.	0.27	.	.	.	0.27	0.27	5%	<0.1
All molluscicides	**.**	**.**	**.**	**.**	**.**	**.**	**0.27**	**.**	**.**	**.**	**0.27**	**0.27**	**5%**	**<0.1**

Table 12 **Strawberries (semi-protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use								*Total grown area of semi-protected strawberries = 4.30 ha*		
Pesticide group & active ingredient	***Botrytis***	***Botrytis* & mildew**	**Crown rot**	**Mildew**	**Powdery mildew**	**Red core/ crown rot**	**Rhizoctonia**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Fungicides											
Cyprodinil/fludioxonil	.	1.45	.	.	.	.	.	1.45	0.73	17%	0.9
Dimethomorph	.	.	0.36	.	.	.	.	0.36	0.36	8%	<0.1
Fenhexamid	0.15	.	.	.	.	.	.	0.15	0.15	3%	0.1
Fosetyl-aluminium	.	.	.	.	.	0.36	.	0.36	0.36	8%	1.1
Iprodione	1.02	2.90	.	.	.	.	.	3.92	1.23	29%	2.9
Mepanipyrim	0.30	.	.	.	.	.	.	0.30	0.15	3%	0.1
Meptyldinocap	.	.	.	0.73	.	.	.	0.73	0.73	17%	0.2
Myclobutanil	.	.	.	2.90	0.66	.	.	3.56	1.23	29%	0.3
Pyrimethanil	0.51	2.18	.	.	.	.	.	2.69	1.23	29%	2.1
Quinoxyfen	.	.	.	.	0.36	.	.	0.36	0.36	8%	0.1
Sodium bicarbonate	.	.	.	.	0.32	.	.	0.32	0.11	3%	1.4
Sulphur	.	.	.	.	0.32	.	.	0.32	0.11	3%	0.6
Thiram	0.30	.	.	.	.	.	0.72	1.02	0.51	12%	1.8
All fungicides	**2.27**	**6.53**	**0.36**	**3.63**	**1.67**	**0.36**	**0.72**	**15.54**	**1.34**	**31%**	**11.5**

Table 12 (cont) **Strawberries (semi-protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use					*Total grown area of semi-protected strawberries = 4.30 ha*		
Pesticide group & active ingredient	**General weed control**	**Two-spotted spider mite**	**Slugs**	**Vine weevil**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Herbicides								
Glufosinate-ammonium	0.90	.	.	.	0.90	0.90	21%	0.7
Glyphosate	0.52	.	.	.	0.52	0.52	12%	0.7
All herbicides	**1.42**	**.**	**.**	**.**	**1.42**	**1.42**	**33%**	**1.4**
Insecticides and acaricides								
Abamectin	.	0.30	.	.	0.30	0.15	3%	<0.10
Clofentezine	.	1.96	.	.	1.96	1.23	29%	0.4
All insecticides and acaricides	**.**	**2.26**	**.**	**.**	**2.26**	**1.23**	**29%**	**0.4**
Biopesticides								
Phasmarhabditis hermaphrodita	.	.	0.37	.	0.37	0.37	9%	Trace
Steinernema feltiae	.	.	.	0.36	0.36	0.36	8%	Trace
All biopesticides	**.**	**.**	**0.37**	**0.36**	**0.73**	**0.73**	**17%**	**Trace**
Molluscicides								
Methiocarb	.	.	0.37	.	0.37	0.37	9%	0.1
All molluscicides	**.**	**.**	**0.37**	**.**	**0.37**	**0.37**	**9%**	**0.1**

Table 13 **Strawberries (non-protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use					*Total grown area of non-protected strawberries = 4.88 ha*		
Pesticide group & active ingredient	***Botrytis***	**Crown rot**	**Mildew**	**Powdery mildew**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Fungicides								
Azoxystrobin	0.91	.	.	.	0.91	0.91	19%	0.2
Fenhexamid	1.79	.	.	.	1.79	0.80	16%	1.3
Fosetyl-aluminium	.	0.74	.	.	0.74	0.62	13%	2.1
Iprodione	1.21	.	.	.	1.21	1.21	25%	0.9
Kresoxim-methyl	.	.	0.60	.	0.60	0.30	6%	0.1
Mepanipyrim	0.60	.	.	.	0.60	0.30	6%	0.2
Myclobutanil	.	.	0.09	0.90	0.99	0.35	7%	0.1
Pyrimethanil	0.30	.	.	.	0.30	0.30	6%	0.2
Tolylfluanid	0.72	.	0.15	.	0.87	0.23	5%	1.0
All fungicides	**5.52**	**0.74**	**0.84**	**0.90**	**8.00**	**2.28**	**47%**	**6.2**

Table 13 (cont) **Strawberries (non-protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use							*Total grown area of non-protected strawberries = 4.88 ha*		
Pesticide group & active ingredient	**Aphids**	**Crop destruction**	**General insect control**	**General weed control**	**Two-spotted spider mite**	**Slugs**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Herbicides										
Glyphosate	.	0.30	.	0.42	.		0.72	0.72	15%	1.0
Pendimethalin	.	.	.	1.82	.		1.82	1.72	35%	2.4
Propyzamide	.	.	.	1.21	.		1.21	1.21	25%	1.5
All herbicides	**.**	**0.30**	**.**	**3.44**	**.**	**.**	**3.74**	**3.44**	**70%**	**4.9**
Insecticides and acaricides										
Chlorpyrifos	.	.	0.36	.	.	.	0.36	0.36	7%	0.4
Clofentezine	.	.	.	.	0.30	.	0.30	0.30	6%	0.1
Cypermethrin	0.05	.	.	.	.	.	0.05	0.05	1%	<0.1
Dimethoate	0.30	.	.	.	.	.	0.30	0.30	6%	<0.1
Pirimicarb	1.82	.	.	.	.	.	1.82	1.82	37%	0.5
All insecticides and acaricides	**2.16**	**.**	**0.36**	**.**	**0.30**	**.**	**2.82**	**2.82**	**58%**	**1.0**
Molluscicides										
Methiocarb	.	.	.	.	.	0.45	0.45	0.45	9%	0.1
All biopesticides	**.**	**.**	**.**	**.**	**.**	**0.45**	**0.45**	**0.45**	**9%**	**0.1**

Table 14 **Raspberries (protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use				*Total grown area of protected raspberries = 0.30 ha*		
Pesticide group & active ingredient	***Botrytis***	**Powdery mildew**	**Two-spotted spider mite**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity (kg)**
Fungicides							
Iprodione	0.60	.	.	0.60	0.15	50.0%	0.45
Myclobutanil	.	0.15	.	0.15	0.15	50.0%	0.01
Pyrimethanil	0.30	.	.	0.30	0.15	50.0%	0.24
All fungicides	**0.90**	**0.15**	**.**	**1.05**	**0.15**	**50.0%**	**0.70**
Insecticides and acaricides							
Clofentezine	.	.	0.30	0.30	0.15	50.0%	0.06
All insecticides and acaricides	**.**	**.**	**0.30**	**0.30**	**0.15**	**50.0%**	**0.06**

Table 15 **Raspberries (semi-protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use							*Total grown area of semi-protected raspberries = 1.20 ha*		
Pesticide group & active ingredient	***Botrytis***	***Botrytis* & mildew**	**Powdery mildew**	**Raspberry beetle**	**Two-spotted spider mite**	**Root rot**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity (kg)**
Fungicides										
Azoxystrobin	.	.	0.48	.	.	.	0.48	0.48	40%	0.12
Cyprodinil/fludioxonil	.	0.48	.	.	.	.	0.48	0.48	40%	0.30
Fenhexamid	.	0.48	.	.	.	.	0.48	0.48	40%	0.36
Fluazinam	.	.	.	.	.	0.96	0.96	0.48	40%	0.72
Iprodione	.	0.48	.	.	.	.	0.48	0.48	40%	0.54
Myclobutanil	.	0.96	.	.	.	.	0.96	0.48	40%	0.09
Pyrimethanil	0.48	.	.	.	.	.	0.48	0.48	40%	0.38
All fungicides	**0.48**	**2.40**	**0.48**	**.**	**.**	**0.96**	**4.32**	**0.48**	**40%**	**2.51**
Insecticides and acaricides										
Clofentezine	.	.	.	.	0.48	.	0.48	0.48	40%	0.10
Thiacloprid	.	.	.	0.48	.	.	0.48	0.48	40%	0.06
All insecticides and acaricides	**.**	**.**	**.**	**0.48**	**0.48**	**.**	**0.96**	**0.48**	**40%**	**0.16**

Table 16 **Raspberries (non-protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use			*Total grown area of non-protected raspberries = 0.88 ha*		
Pesticide group & active ingredient	***Botrytis***	**General weed control**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity (kg)**
Fungicides						
Fenhexamid	0.15	.	0.15	0.05	6%	0.11
All fungicides	**0.15**	**.**	**0.15**	**0.05**	**6%**	**0.11**
Herbicides						
Propyzamide	.	0.10	0.10	0.10	11%	0.16
All herbicides	**.**	**0.10**	**0.10**	**0.10**	**11%**	**0.16**

Table 17 **Gooseberries (non-protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use			*Total grown area of non-protected gooseberries = 0.32 ha*		
Pesticide group & active ingredient	***Botrytis***	**General weed control**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Fungicides						
Fenhexamid	0.23	.	0.23	0.08	25%	0.17
All fungicides	**0.23**	**.**	**0.23**	**0.08**	**25%**	**0.17**
Herbicides						
Propyzamide	.	0.08	0.08	0.08	25%	0.12
All herbicides	**.**	**0.08**	**0.08**	**0.08**	**25%**	**0.12**

Table 18 **Blackcurrants (non-protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use			*Total grown area of non-protected blackcurrants = 0.26 ha*		
Pesticide group & active ingredient	***Botrytis***	**General weed control**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Fungicides						
Fenhexamid	0.23	.	0.23	0.08	31%	0.17
All fungicides	**0.23**	**.**	**0.23**	**0.08**	**31%**	**0.17**
Herbicides						
Propyzamide	.	0.08	0.08	0.08	31%	0.12
All herbicides	**.**	**0.08**	**0.08**	**0.08**	**31%**	**0.12**

Table 19 **Other crops (non-protected): Reason for use, total grown area (ha), total-treated area (spha), basic-treated area (ha), percentage of grown area treated and quantity applied (kg).**

	Reason for use			*Total grown area of non-protected 'other crops' = 0.39 ha*		
Pesticide group & active ingredient	***Botrytis***	**General weed control**	**Total treated area (spha)**	**Basic treated area (ha)**	**Percentage of grown area treated**	**Quantity applied (kg)**
Fungicides						
Fenhexamid	0.23	.	0.23	0.08	21%	0.17
All fungicides	**0.23**	**.**	**0.23**	**0.08**	**21%**	**0.17**
Herbicides						
Propyzamide	.	0.08	0.08	0.08	21%	0.12
All herbicides	**.**	**0.08**	**0.08**	**0.08**	**21%**	**0.12**

Table 20 **Comparison of pesticide usage on soft fruit crops 1990-2012, total area treated (spha) with main pesticide groups and quantities of active ingredient (kg) used.**

Pesticide group	1990		1998		2006		2010		2012	
	(spha)	(kg)	(spha)	(kg)	(spha)	(kg)	(spha)	(kg)	(spha)	(kg)
Fungicides	171.37	277.61	154.09	189.10	134.88	97.65	82.30	40.52	50.44	30.71
Herbicides	159.40	199.54	61.80	95.60	25.57	27.60	6.45	9.96	5.63	7.07
Insecticides and acaricides	33.71	19.61	41.25	16.70	37.37	7.65	20.86	5.99	12.66	2.44
Molluscicides	8.83	1.79	22.96	10.00	1.72	1.29	.	.	1.09	0.16
Biopesticides	.	.	1.50	.	11.40	.	7.04	.	2.15	.
Other products	.	.	.	.	.	.	0.62	1.91	.	.
Total	**373.31**	**498.55**	**281.60**	**311.40**	**210.94**	**134.19**	**117.27**	**58.39**	**71.97**	**40.38**

Table 21 **Comparison of pesticide usage on strawberry crops* 1990-2012, total area (spha) treated with main pesticide groups and quantities of active ingredient (kg) used.**

Pesticide group	1990		1998		2006		2010		2012	
	(spha)	(kg)	(spha)	(kg)	(spha)	(kg)	(spha)	(kg)	(spha)	(kg)
Fungicides	135.67	229.57	132.16	156.41	121.53	81.42	80.05	39.31	44.24	26.88
Herbicides	112.80	133.31	41.11	52.60	22.00	22.25	4.73	7.46	5.31	6.55
Insecticides and acaricides	23.64	14.56	37.49	12.82	35.62	6.84	20.67	5.92	11.39	2.23
Molluscicides	8.42	1.70	22.47	9.91	1.72	1.29	.	.	1.09	0.16
Biopesticides	.	.	1.45	.	11.31	.	6.79	.	2.15	.
Other products	.	.	.	.	.	.	0.62	1.91	.	.
Total	**280.53**	**379.14**	**234.68**	**231.74**	**192.18**	**111.80**	**112.86**	**54.60**	**64.18**	**35.82**

Combined total of protected, semi-protected & non-protected strawberries.

Northern Ireland Pesticide Usage Survey Published Reports Appendix 1

Report No.	Report title	ISBN
99	Grassland & Fodder Crops 1989	1-855 27 079 X
105	Arable Crops 1990	1-855 27 130 3
106	Soft Fruit Crops 1990	1-855 27 149 4
109	Vegetable Crops 1991	1-855 27 137 0
110	Protected Crops 1991 (edible & ornamental)	1-855 27 283 0
111	Mushroom Crops 1991	1-855 27 150 8
117	Arable Crops 1992	1-855 27 193 1
118	Top Fruit Crops 1992	1-855 27 194 X
124	Grassland & Fodder crops 1993	1-855 27 221 0
131	Forestry 1993	1-855 27 282 2
132	Arable Crops 1994	1-855 27 314 4
139	Vegetable Crops 1995	1-855 27 346 2
140	Mushroom Crops 1995	1-855 27 347 0
146	Arable Crops 1996	1-855 27 469 8
147	Top fruit 1996	1-855 27 470 1
156	Grassland & Fodder Crops 1997	1-855 27 506 6
157	Sheep Treatments 1997	1-855 27 425 6
167	Soft Fruit 1998	1-855 27 540 6
168	Arable Crops 1998	1-855 27 536 8
169	Vegetable Crops 1999	1-855 27 561 9
170	Mushroom Crops 1999	1-855 27 549 X
177	Arable Crops 2000	1-855 27 670 4
178	Top Fruit Crops 2002	1-855 27 618 6

Northern Ireland Pesticide Usage Survey Published Reports Appendix 1 (contd.)

Report No.	Report title	ISBN
194	Arable Crops 2002	1-855 27 674 7
198	Grassland & Fodder Crops 2003	1-855 27 797 2
199	Hardy Nursery Stock Crops 2003	1-855 27 789 1
201	Protected Ornamental Crops 2003	1-855 27 739 5
206	Arable Crops 2004	1-855 27 833 2
207	Vegetable crops 2004	1-855 27 869 3
208	Grassland & Fodder Crops 2005	1-855 27 998 8
209	Sheep Treatments 2005	1-855 27 999 5
216	Arable Crops 2006	1-848 07 035 6
217	Top Fruit Crops 2006	1-848 07 019 6
218	Soft Fruit Crops 2006	1-848 07 036 3
222	Vegetable Crops 2007	1-848 07 062 2
223	Mushroom Crops 2007	1 848 07 061 5
230	Arable Crops 2008	1 848 07 135 3
231	Top Fruit Crops 2008	1-848 07 134 6
238	Grassland & Fodder Crops 2009	1-848 07 186 5
239	Hardy Nursery Stock Crops 2009	1-848 07 187 2
240	Soft Fruit Crops 2010	1-848 07 251 0
241	Top Fruit Crops 2010	1-848 07 250 3
242	Arable Crops 2010	1-848 07 252 7
245	Mushroom Crops 2011	1-848 07 308 1
246	Vegetable Crops 2011	1-848 07 309 8

ISBN 978-1-84807-402-6

06/13


INVESTORS
IN PEOPLE