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PESTICIDE USAGE IN NORTHERN IRELAND
SURVEY REPORT 249

NORTHERN IRELAND TOP FRUIT CROPS 2012

A National Statistics Publication

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PESTICIDE USAGE SURVEY REPORT 249

NORTHERN IRELAND TOP FRUIT CROPS 2012

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The County Regions of Northern Ireland

(An estimated 96% of Northern Ireland top fruit is produced in County Armagh)

SUMMARY

This report presents information from a survey of the pesticide usage practices of top fruit growers in Northern Ireland in 2012. It is the seventh pesticide survey to be conducted on top fruit crops in the region since 1992. There were an estimated 223 top fruit growers in Northern Ireland in 2012, of which 100 were selected to be surveyed regarding information on crop applications, storage treatments and orchard floor treatments. The total area of top fruit crops grown decreased by less than 1% to 1,506 hectares when compared with the previous survey in 2010. An estimated 96% of all top fruit crops were grown in County Armagh, with Bramley apple orchards accounting for 99% of the total top fruit grown in Northern Ireland. There were an estimated 23,789 tonnes of Bramley apples harvested in 2012, a 52% decrease since 2010.

Overall, an estimated 35 tonnes of pesticide active ingredients were applied to 37,832 spray hectares. The pesticide-treated area increased by 9% compared with 2010, and the weight of active ingredients applied increased by 17%.

In common with previous years, fungicides were the most frequently applied pesticide. When compared with 2010, the area treated with fungicides and the weight applied increased by 14% and 22%, respectively. This may have been as a consequence of the particularly wet summer in 2012 and also the withdrawal from use of the storage treatment diphenylamine. In 2012, fungicides were applied to 86% of the pesticide-treated area and accounted for 94% of the weight of pesticides used. Mancozeb, dithianon, captan and pyrimethanil were the fungicide active ingredients most commonly used on top fruit crops. An estimated 91% of all fungicide applications were applied to control apple scab (*Venturia inaequalis*).

The area treated with insecticides and acaricides decreased by 14% when compared with 2010. Insecticides and acaricides were applied to 6% of the entire pesticide-treated area, accounting for 2% of the total weight of pesticides used. The pyrethroid insecticide cypermethrin and the organophosphate insecticide chlorpyrifos were the two most frequently applied insecticides, collectively accounting for 80% of the area treated with insecticide/acaricides. An estimated 46% of insecticide/acaricides were applied to control aphids, with a further 33% applied for ‘insect control’.

Overall, the area treated and weight of herbicides applied decreased by 22% and 36%, respectively, when compared with 2010. Glyphosate and dicamba/MCPA/mecoprop-P were the herbicides most frequently used. The most common weed management practice was to apply herbicides in strips under the tree canopy and mow the inter-row grass area between the rows of trees, with 96% of growers using this method. The remaining 4% of growers either mowed or grazed the strips under the tree canopy as well as the inter-row area.

Growth regulators accounted for 5% of the pesticide-treated area and 1% of the total weight of pesticide applied. Prohexadione-calcium, paclobutrazol and gibberellins were the only growth regulator active ingredients applied. Gibberellins accounted for 16% of the area treated with a growth regulator but only 1% of the total weight applied.

An estimated 14 tonnes of 'other products', which included foliar feeds, trace elements and calcium-based products, were applied to the crops during this survey period, representing a 13% decrease when compared to 2010. The majority of applications were to treat potential nutritional disorders.

Data were also collected on post-harvest storage treatments applied to top fruit crops (only Bramley fruiting apples were stored in Northern Ireland in 2012). An estimated 10,159 tonnes of Bramley apples were stored, of which 8,992 tonnes were treated. The most commonly used active ingredient on stored Bramley apples was 1-methylcyclopropene which was applied to 89% of stored fruit, in contrast to all previous surveys when diphenylamine was the most commonly applied storage treatment. This was the first year since surveys began that diphenylamine was not available to growers as a storage treatment in Northern Ireland.

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 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 seventh survey of pesticide usage on top fruit crops in Northern Ireland. Results from the previous surveys which reported on pesticide usage practices on top fruit crops in 1992 (Kidd *et al*., 1994), 1997 (Kidd *et al*., 2001), 2002 (Kearns *et al*., 2004), 2006 (Kearns *et al*., 2007), 2008 (Kirbas *et al*., 2009) 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.

METHODS

Using the Northern Ireland Agricultural Census, June 2011 (Anon., 2012), a sample of holdings to be surveyed was selected. The sample was stratified into five county regions of Northern Ireland, (there is limited top fruit production in County Londonderry which was omitted from this survey) and into five size groups based on the total area of top fruit crops grown in each county. The total number of holdings', together with the number surveyed, are shown in Table 1. Due to the relatively low numbers involved, counties Antrim, Down, Fermanagh and Tyrone have been combined and renamed 'All other counties'.

The period for survey comprises the end of the 2011 harvest to the end of the 2012 harvest.

The purpose of the survey was explained to selected growers in preliminary correspondence. A total of 48 holdings (representing 22% of all top fruit growers) were visited and data collected by personal interview. The growers' reasons for pesticide use were also included, but may not always seem appropriate. Holdings selected in the original sample which were unable to provide data were replaced with those from the same county and size group held on a reserve list. The less than 2 hectare size group, which in previous surveys had its own stratification, has now been included with the less than 4 hectare size group. Many of the top fruit crops grown on these smaller holdings were for personal use and were not treated with pesticides.

The collected data were analysed using SPSS (Statistical Package for the Social Sciences) software.

DEFINITIONS AND NOTES

- 'Grown area' refers to the actual planted area of crop, and is referred to in hectares (ha).
- 'Basic area' refers to the actual planted area of crop, which was treated with at least one pesticide, and is referred to in hectares (ha).
- 'Treated area' refers to the total area treated with a pesticide, which includes all repeated applications to the basic area, and is referred to in spray hectares (spha).
- 'Spray applications' refers to the number of treatments by any pesticide type to the treated areas.
- Generally, orchards recorded in this survey are laid out with trees planted in rows and the area between the rows, referred to in the report as the 'inter-row' area, is sown with grass. 'Herbicide strip' refers to the area beneath the canopy of each tree. Herbicide treatments are applied solely to 'Herbicide strips' and not the entire orchard floor.
- 'Reasons for use'; the reasons reported for the use of pesticides are the growers' stated reasons for use and may not reflect label recommendations.

- Non-fruiting and fruiting crops were combined and recorded only as ‘Bramley apples’ and ‘Other’ top fruit which covered all ages of top fruit crops. Non-fruiting crops are generally newly planted trees that have not yet produced fruit.
- ‘Rounding’; due to rounding of figures, there may be slight differences in totals both within and between tables.
- In all tables ‘red spider mite’ refers to ‘fruit-tree red spider mite’ (*Panonychus ulmi*).

RESULTS AND DISCUSSION

Crops

The estimated area of crops grown and the area of crops surveyed are shown in Table 2, together with the proportion of each crop surveyed. An estimated 96% of the total area of top fruit crops were grown in County Armagh, with Bramley apples accounting for 99% of the total area of top fruit crops grown. ‘Other’ top fruit crops accounted for the remaining 1%. (Table 3, Figure 1).

Regional Pesticide Usage (Tables 4 & 5, Figures 4 & 5)

Regionally, County Armagh is the main production centre for top fruit in Northern Ireland (primarily Bramley apples), accounting for 95% of the total pesticide-treated area and 96% of the weight of pesticides applied. A very limited amount of top fruit is produced in the other counties of Northern Ireland.

Pesticide Usage on Crops (Tables 6 & 7, Figures 19 to 30)

The estimated quantities of pesticide active ingredients applied and the area of crops treated with pesticides are shown in Tables 6 & 7 (Figures 19 to 30). Bramley apples accounted for 99% of both the pesticide-treated area and the weight of active ingredients applied. ‘Other’ top fruit crops accounted for less than 1% of the top fruit crops grown, and 1% of both the weight of pesticides applied and the pesticide-treated area.

Number of Spray Applications (Table 8)

The mean number of spray applications of pesticides to top fruit crops is shown in Table 8. All pesticide types were used on all crops with the exception of growth regulators which were not applied to dessert apples and pears. The total grown area of top fruit crops received at least one pesticide application.

Bramley apples received a mean of 21 fungicide applications from 13 spray rounds. On average these crops also received 3 herbicide applications, 2 insecticide/acaricide applications and 2 applications of growth regulators. Bramley apples also received on average 10 applications of 'Other products' from 8 spray rounds.

'Other' top fruit crops received a mean of 13 fungicide applications from 7 spray rounds, 2 herbicide applications and 1 application of insecticide/acaricides.

Total Pesticide Usage (Tables 4, 5, 9, 10, 11 & 12, Figures 2, 3, 4 & 5)

Approximately 35 tonnes of pesticide active ingredients were applied to 37,832 spray hectares of top fruit crops grown in Northern Ireland in 2012 (Tables 4 & 5, Figures 4 & 5).

Fungicides were applied to 86% of the pesticide-treated area, representing 94% of the weight of pesticides applied. Herbicides were applied to 3% of the area treated, accounting for 3% of the total weight of pesticides used.

Insecticides/acaricides, applied to 6% of the pesticide-treated area, represented 2% of the total weight of pesticides used. Growth regulators represented 5% and 1% of the total pesticide-treated area and weight of active ingredients applied, respectively. The pesticide groups and active ingredients applied are shown in Tables 9 and 10.

Mancozeb was applied to 21% of the fungicide-treated area, representing 36% of the weight of fungicides applied. Dithianon was applied to 18% of the fungicide-treated area, accounting for 11% of the weight of fungicides applied. Applications to orchards for the control of apple scab (*Venturia inaequalis*) accounted for 91% of all fungicides used. In total, 18 fungicide active ingredients were applied to Bramley apple crops.

Glyphosate (applied to 60% of the herbicide-treated area) was the most commonly applied herbicide active ingredient accounting for 62% of the weight of herbicide active ingredients applied.

The organophosphorus active ingredient chlorpyrifos accounted for 40% of the insecticide/acaricide-treated area and represented 88% of the weight of insecticides applied. Conversely, cypermethrin which represented 40% of the insecticide/acaricide-treated area, accounted for only 3% of the weight of insecticides applied. The ovicidal tetrazine acaricide clofentezine accounted for 5% of both the insecticide/acaricide-treated area and weight of insecticide/acaricides applied. This was used solely for the control of fruit-tree red spider mite' (*Panonychus ulmi*).

Growth regulators were applied to an estimated 2,150 spray hectares of top fruit crops. The cyclohexanecarboxylate growth regulator prohexadione-calcium was applied to 47% of the

area treated, accounting for 49% of the weight of growth regulators applied. Paclobutrazol, a triazole plant growth regulator, was applied to 37% of the treated area, accounting for 50% of the weight of growth regulators applied. Gibberellins was the only other active ingredient recorded in this group, accounting for 16% of the treated area but only 1% of the weight of growth regulators applied.

The active ingredients recorded, ranked by application area and weight applied, are shown in Tables 11 & 12, respectively.

An estimated 14 tonnes of 'other products' were applied to 8,202 spray hectares of Bramley apples (Table 15, Figures 31 & 32). 'Other products' included foliar feeds, trace elements and calcium-based products of which the majority were used to treat potential nutritional disorders. Calcium-based products were applied to 31% of the treated area of 'other products' used on Bramley apple orchards, primarily as foliar feeds and trace elements. Seaweed extract products were applied to 29% of the area treated, representing 33% of the weight of 'other products' applied.

'OTHER' TOP FRUIT CROPS (TABLE 14)

There was very limited evidence of any top fruit being grown in Northern Ireland other than Bramley apples. An estimated 3 hectares of dessert apples and pears were grown in 2012, in comparison with 2010 when an estimated 25 hectares of 'other' top fruit was grown, which included plums. There may be other small holdings of top fruit which were not recorded on the Northern Ireland Agricultural Census (2012) and therefore not selected for this survey. This made it extremely difficult to estimate the amount of 'other' top fruit being grown. On average dessert apples and pears received the same treatments as those applied to Bramley apple crops, with the exception of growth regulators. A comparison of the grown area of 'other' top fruit is shown in Table 16.

COMPARISON WITH PREVIOUS SURVEYS

Comparative information on pesticide usage on top fruit crops grown in Northern Ireland in 1992, 1996, 2002, 2006, 2008, 2010 and 2012 is included in Tables 16, 17a, 17b and Figures 6 to 15.

Area of top fruit crops grown (Table 16)

Overall, the area of top fruit grown in Northern Ireland in 2012 increased marginally (1%) compared with that recorded in 2010, with the area of Bramley apple crops increasing by 12 hectares. The data indicate an 88% decrease in the overall area of 'other' top fruit crops grown (previous surveys included plum orchards), from 25 hectares to 3 hectares. As in all previous surveys the majority of the total top fruit area in Northern Ireland was used for Bramley apple production (99%).

Comparison of pesticide usage (Tables 17a & 17b, Figures 6 to 14)

There was a 9% increase in the total area of pesticide application to top fruit crops between 2010 and 2012 and a 15% increase since 2008. The weight of pesticides applied in 2012 increased by 17% when compared to 2010 and 33% since 2008 (Figures 6 & 7).

The area of top fruit crops treated with fungicides increased by 14% since 2010, and the weight of fungicides applied increased by 22%.

Herbicide applications decreased by 22% for the total area treated and 37% for the total weight of active ingredients applied. Similarly to 2010, glyphosate and dicamba/MCPA/mecoprop-P continue to be the most commonly used herbicides in Bramley apple orchards.

Insecticide/acaricide applications decreased by 15% and 7%, in the area treated and the weight of active ingredients applied, respectively (Figures 10 & 11). Applications of carbamate active ingredients reduced by 38% for the total area treated and 33% of the total weight applied. The area treated with organophosphates also fell by 11%, with a 3% reduction in weight of active ingredients being applied compared with 2010. The area treated with pyrethroids decreased by less than 1% from 983 spray hectares in 2010 to 980 spray hectares in 2012 and the quantity applied also decreased marginally from 27 kg to 26 kg during the same period.

An estimated 2,151 spray hectares were treated with growth regulators in 2012, a decrease of 7% since 2010. The weight of growth regulators applied also decreased by 14% between 2012 and 2010.

The active ingredients most extensively used in 2012 are shown in Table 17b, which also provides the trend in application from 1992 -2012.

Storage of top fruit crops (Tables 18 - 21, Figures 15 to 18)

An estimated 10,159 tonnes of Bramley apples were stored in 2012, of which 89% received a post-harvest treatment. Approximately 3 kilogrammes of pesticide active ingredients were applied to 8,992 tonnes of apples all of which were stored in bulk bins in either refrigerated or controlled atmosphere stores. There was a 41% decrease in the weight of apples stored in 2012 when compared with 2010 (Figure 15), a clear reflection of the reduced quantity of apples harvested in 2012 (Table 21).

Three different storage methods were identified during this survey. CO2 scrubbed controlled atmosphere stores, representing 14% of stored apples, are refrigerated un-vented stores which use a method to remove and expel carbon dioxide and other gasses from the atmosphere. Unscrubbed controlled atmosphere stores, which are refrigerated and use vents to reduce carbon dioxide levels, accounted for 57% of stored apples. Cold/refrigerated stores, which have no modified atmosphere and use cooled, forced air ventilation, accounted for 29% of stored apples. The 11% of apples which were not treated were also stored in cold/refrigerated stores.

A fungicide and an ethylene inhibitor were the only products recorded in use on stored apples.

Fungicide applications accounted for 5% of stored apple crop treatments but accounted for 98% of the total weight of active ingredients used. In keeping with 2010, cyprodinil/fludioxonil was used to treat storage rots. No other fungicides were recorded in this survey for storage diseases.

The ethylene inhibitor 1-methylcyclopropene, which in 2010 accounted for just 2% of stored apples, accounted for 95% of treated tonnage but only 2% of the weight of all treatments applied, due to the small percentage of active ingredient within the product. The antioxidant diphenylamine, which was the most frequently used active ingredient in all previous surveys, is no longer available for use in Northern Ireland, which accounts for the increase in use of 1-methylcyclopropene.

The active ingredients recorded in use on stored apples are shown in tables 18 to 21.

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.

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Figure 1 **Utilisation of top fruit production area in Northern Ireland, 2012.**

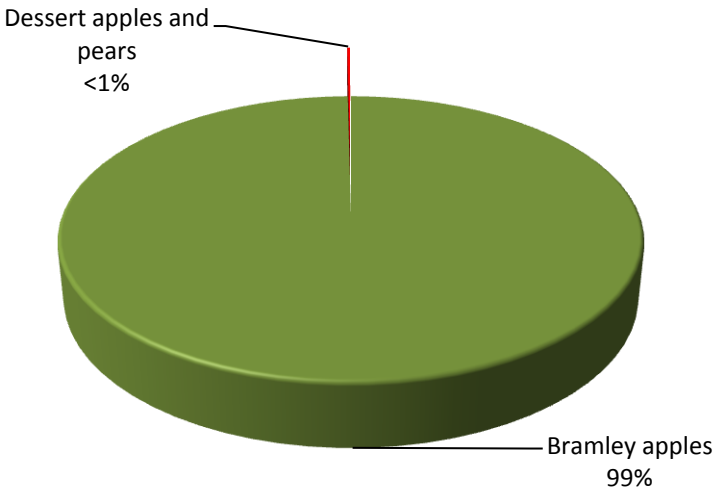


Figure 2 **Proportional area (spha) of top fruit crops treated with each pesticide type in Northern Ireland, 2012.**

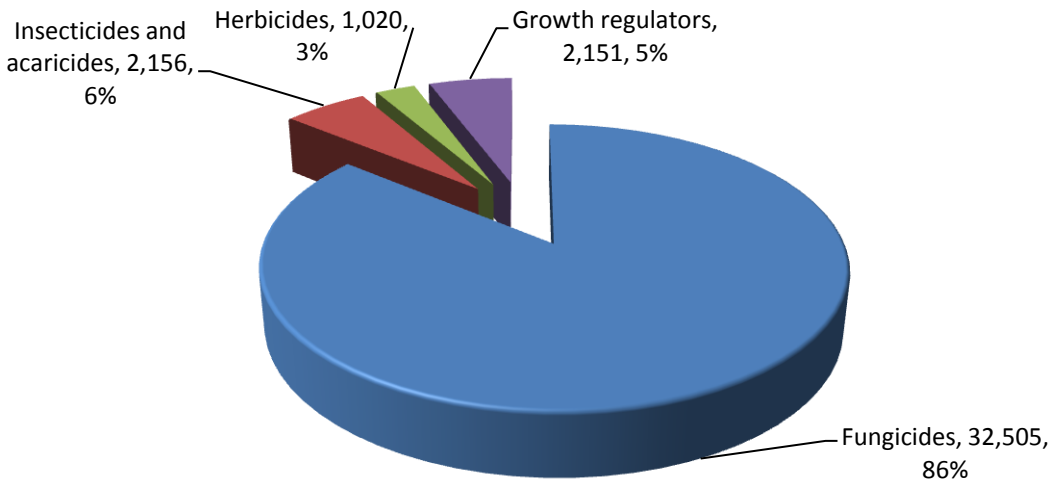


Figure 3 **Proportion of top fruit crops treated with each pesticide type by weight (kg) in Northern Ireland, 2012.**

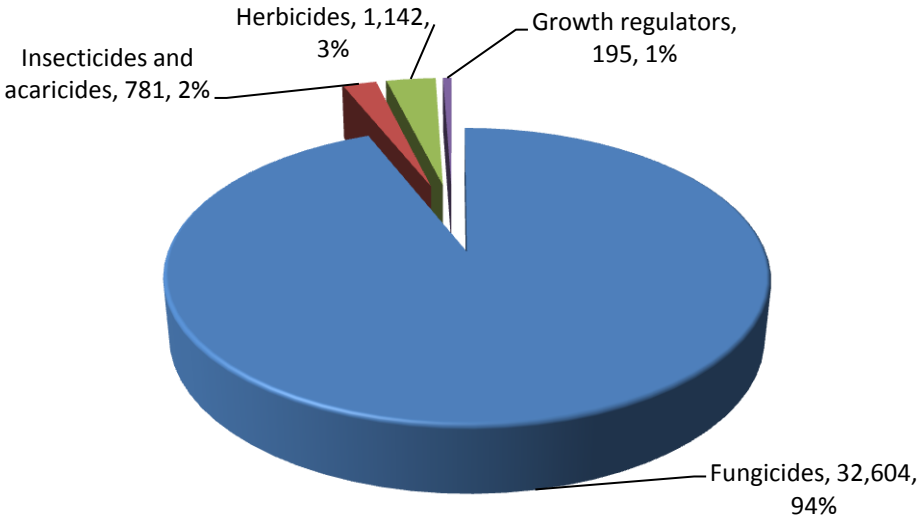
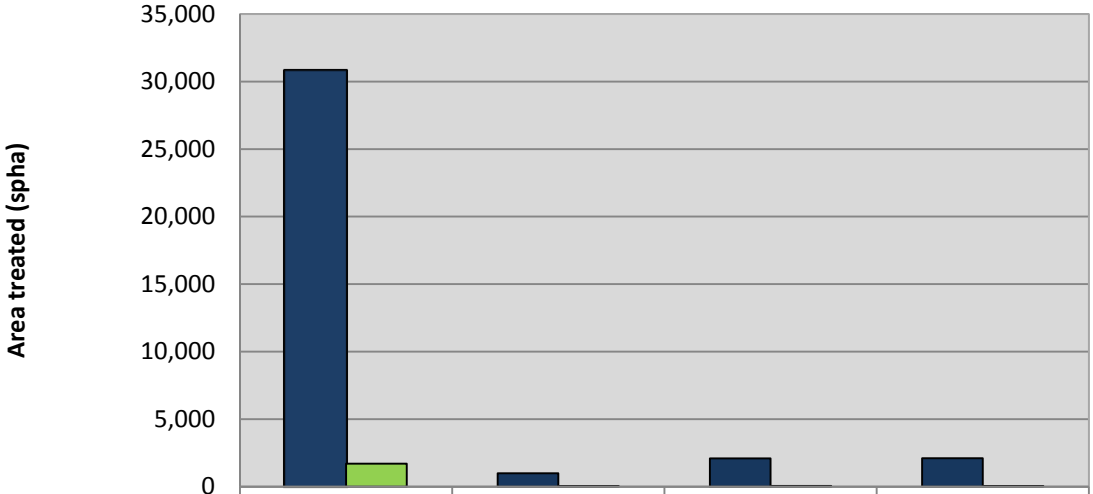
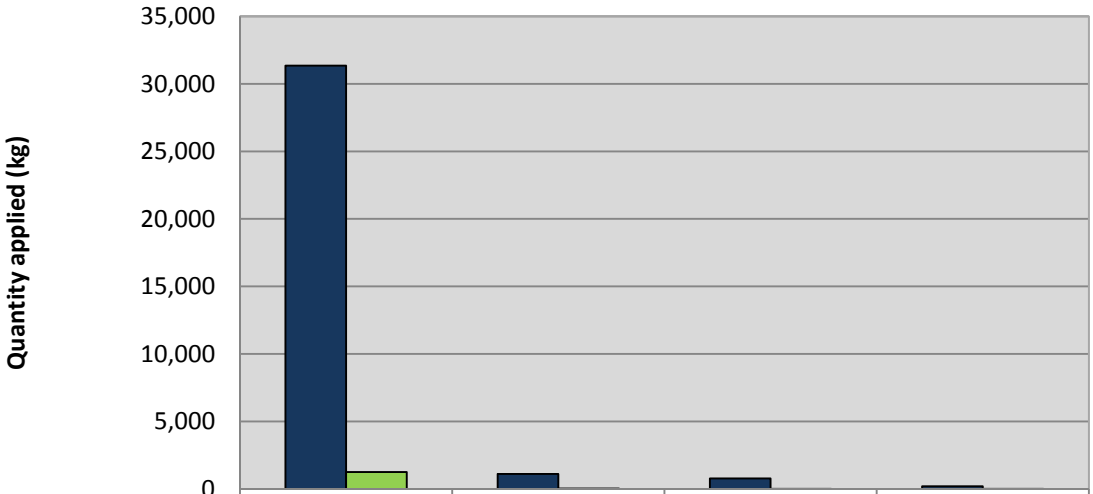


Figure 4 **Area (spha) of top fruit crops treated with each pesticide type in the county regions of Northern Ireland, 2012.**



	Fungicides	Herbicides	Insecticides and acaricides	Growth Regulators
Armagh	30,801	989	2,096	2,111
All other counties	1,704	31	60	40

Figure 5 **Quantity (kg) of each pesticide type applied to top fruit crops in the county regions of Northern Ireland, 2012.**



	Fungicides	Herbicides	Insecticides and acaricides	Growth Regulators
Armagh	31,354	1,113	779	193
All other counties	1,249	29	2	2

Figure 6 **Comparison of pesticide usage on top fruit crops by area treated (spha) in Northern Ireland, 1992-2012.** *Bars show Standard Error.*

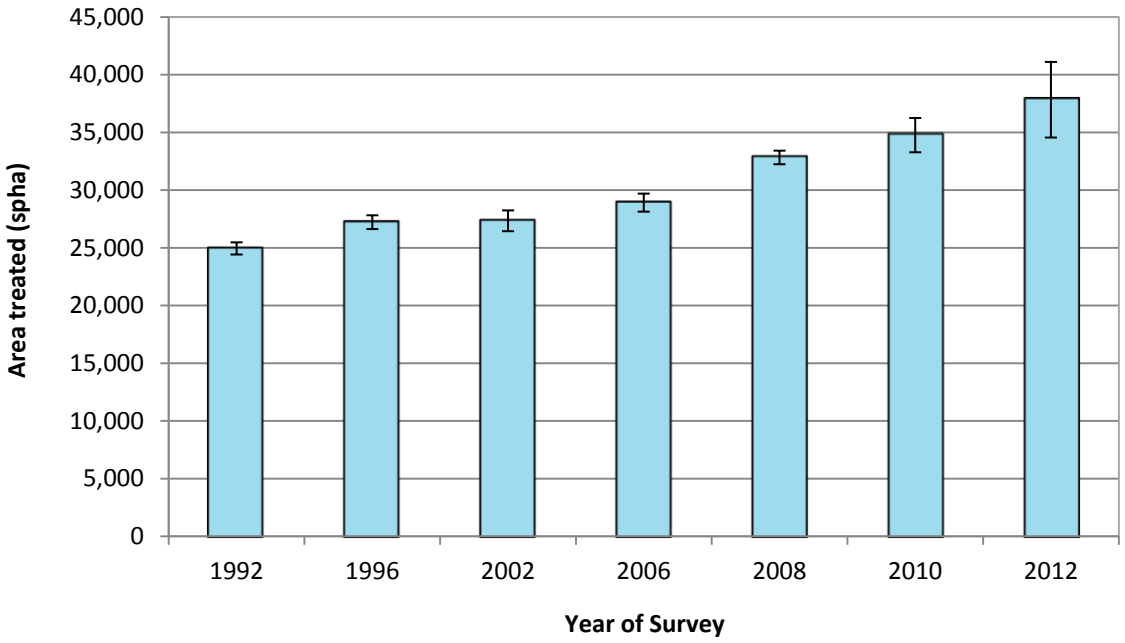


Figure 7 **Comparison of pesticide usage on top fruit crops by total weight applied (kg) in Northern Ireland, 1992-2012.** *Bars show Standard Error.*

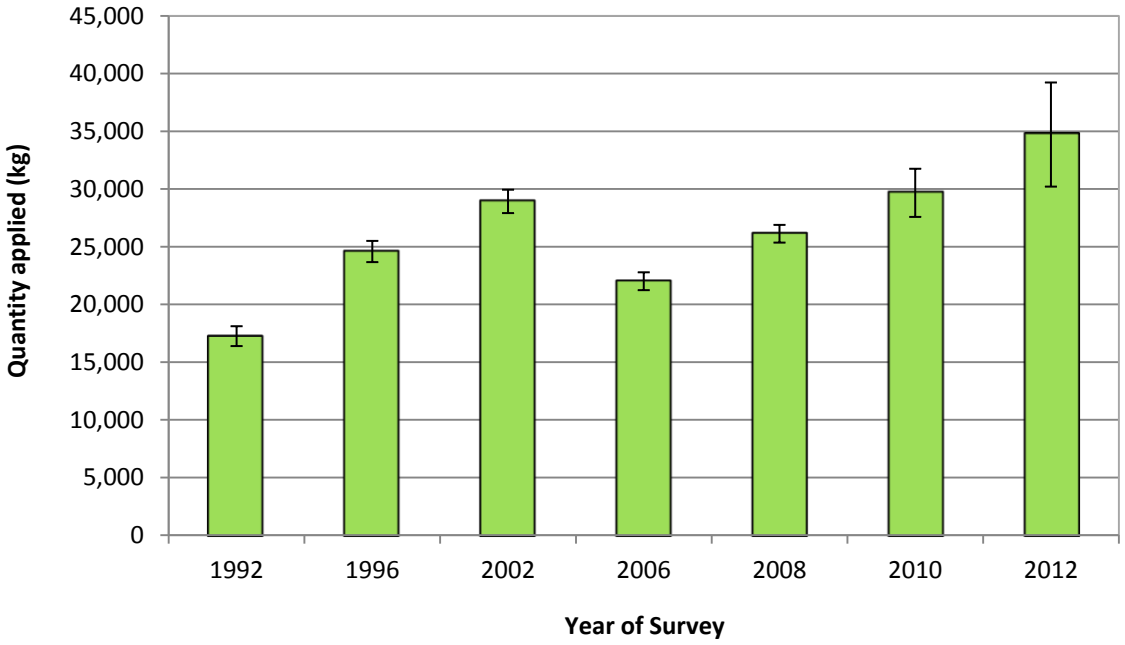


Figure 8 **Comparison of area treated (spha) with different pesticide groups in Northern Ireland, 1992-2012.**

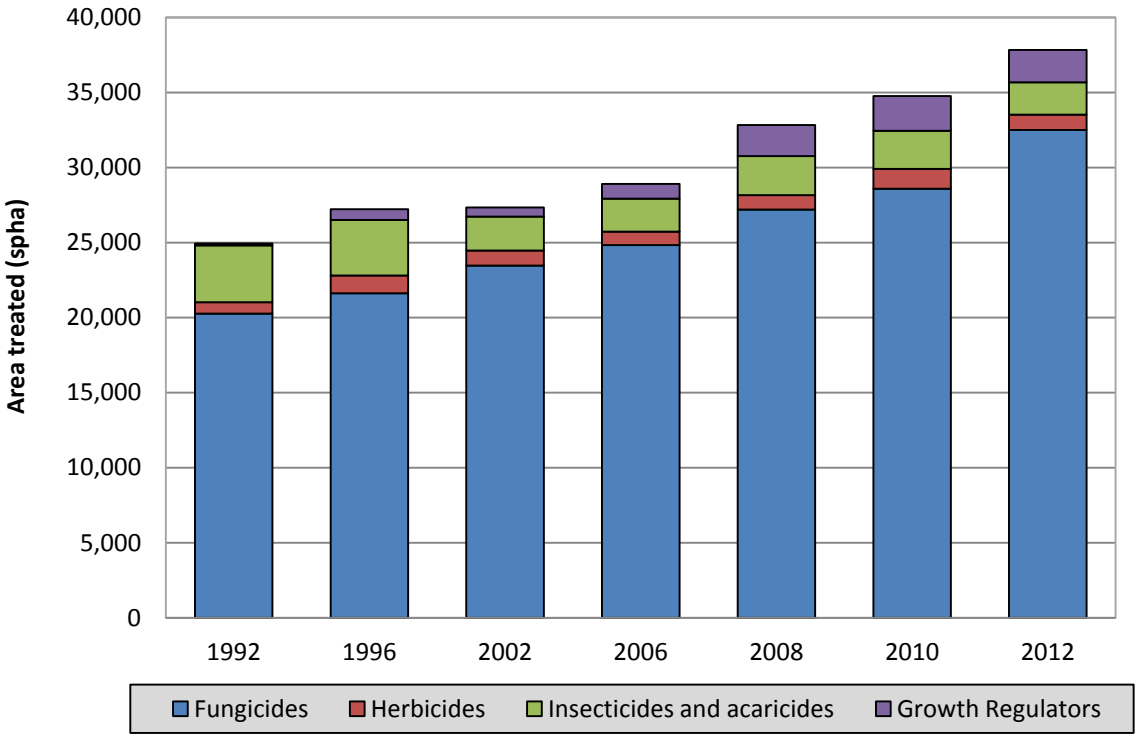


Figure 9 **Comparison of quantity (kg) of different pesticide groups applied to top fruit crops in Northern Ireland, 1992-2012.**

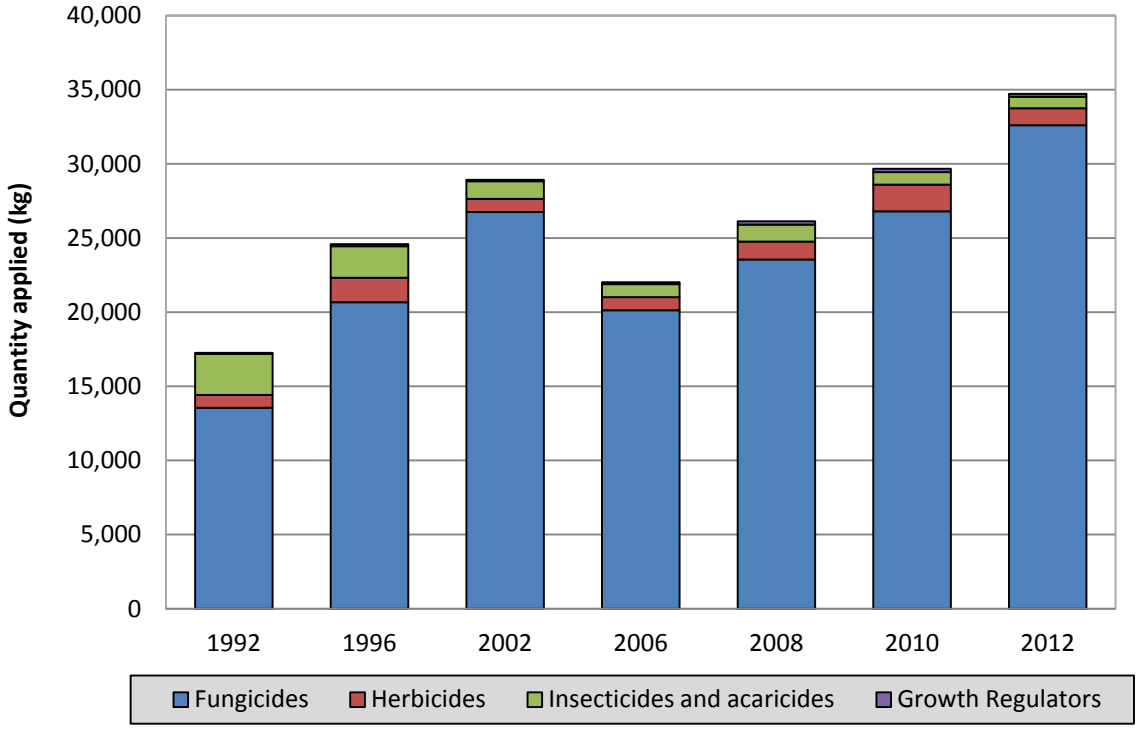
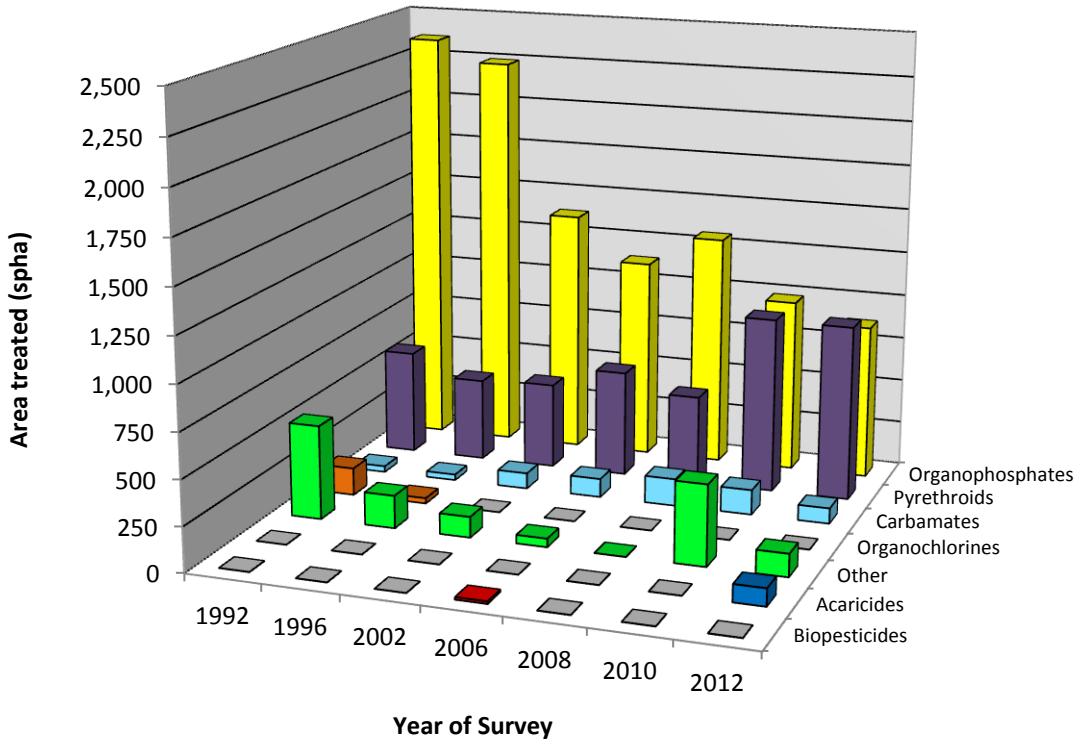
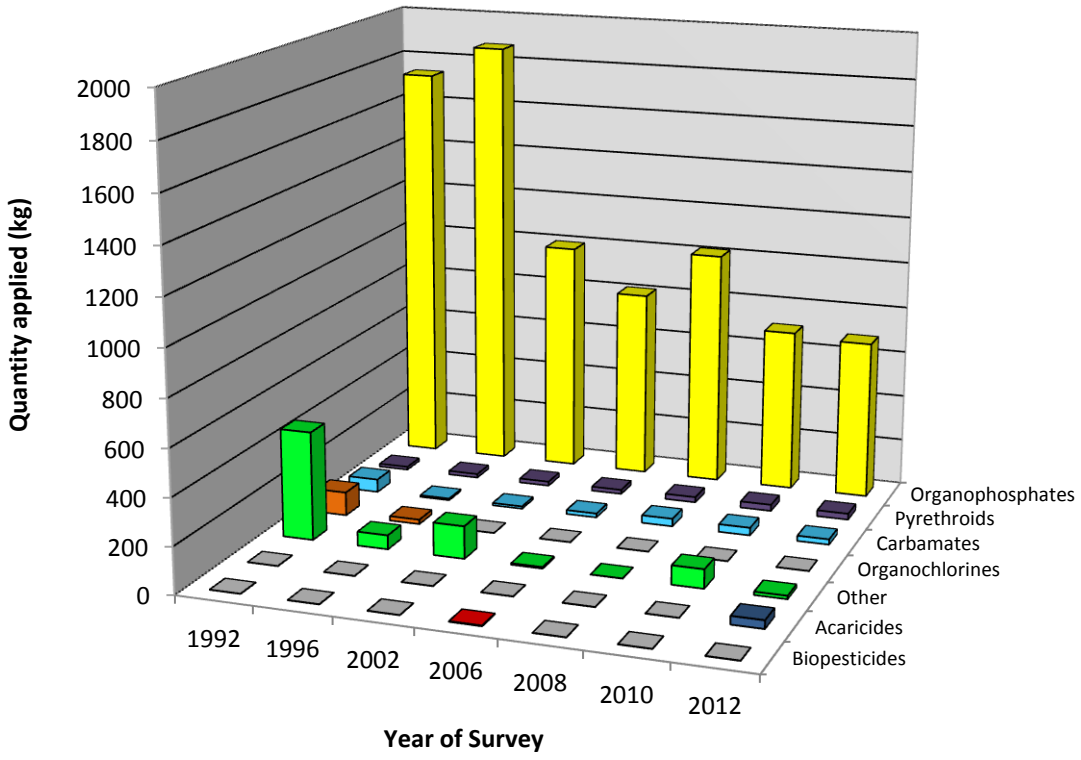


Figure 10 **Comparison of area (spha) of top fruit crops treated with different insecticide types in Northern Ireland, 1992-2012.**



Acaricides previously included with 'Other'

Figure 11 **Comparison of quantity (kg) of different insecticide types applied to top fruit crops in Northern Ireland, 1992-2012.**



Acaricides previously included with 'Other'

Figure 12 **Comparison of application rates (kg/spha) for pesticide types used on top fruit crops in Northern Ireland, 1992-2012.**

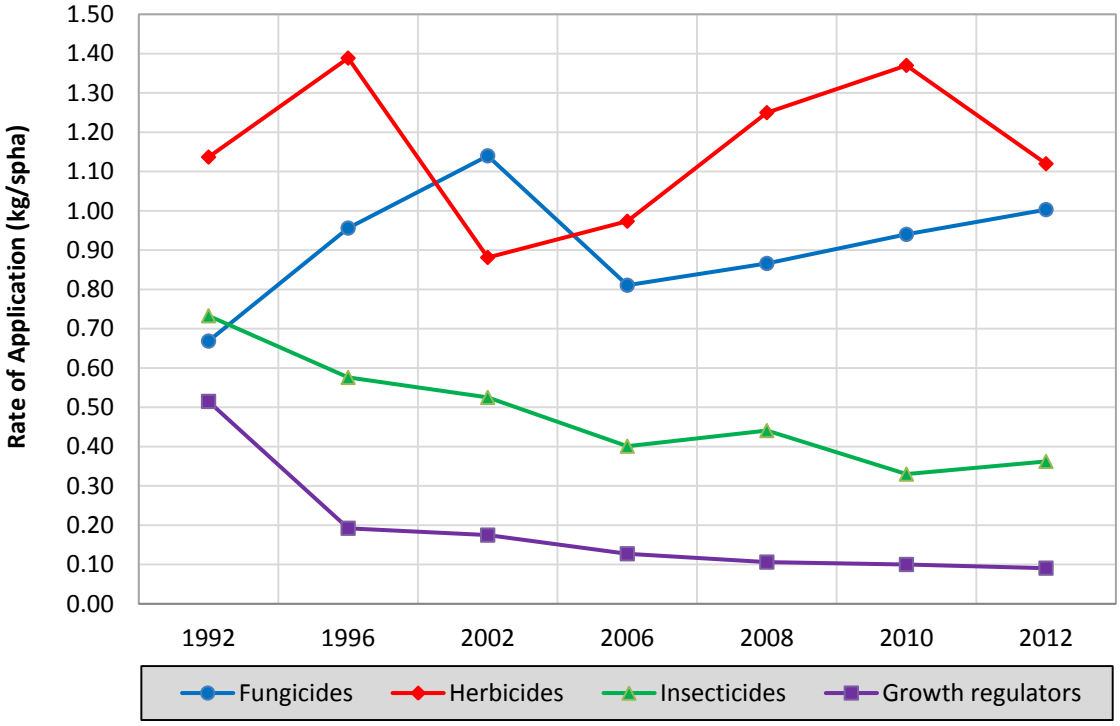


Figure 13 **Quantity of fungicides applied (kg/ha) per hectare of total top fruit crop in Northern Ireland, 1992-2012.**

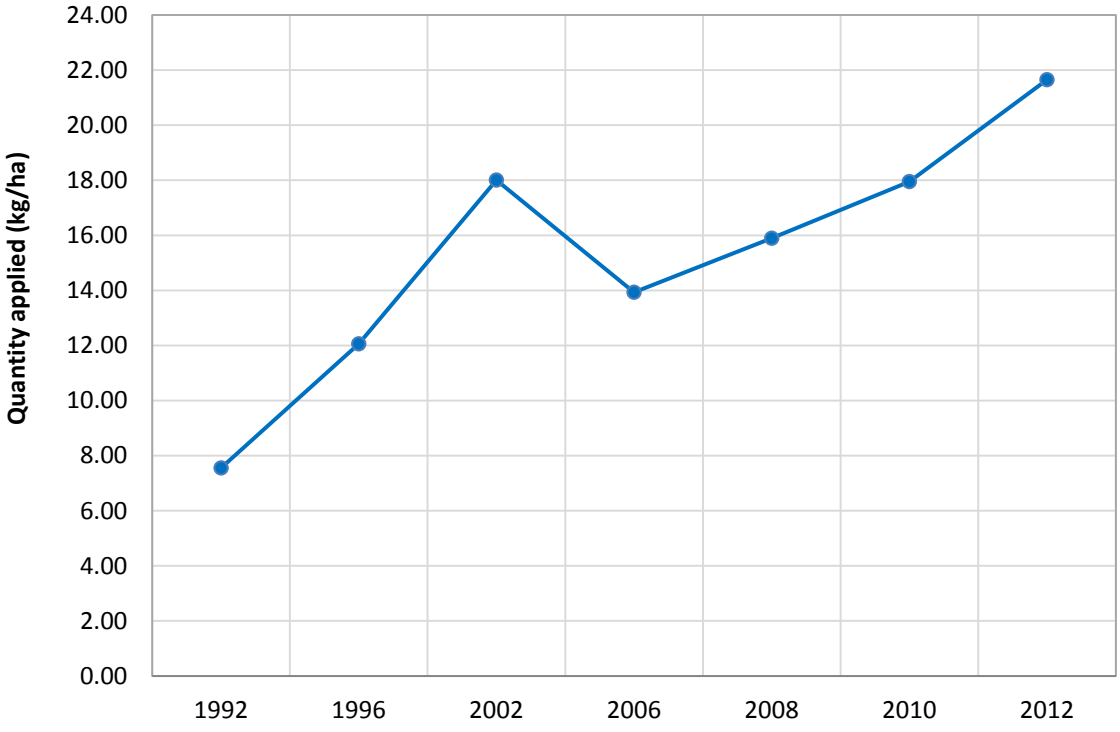


Figure 14 **Quantity of herbicides, insecticides and growth regulators applied per hectare of total top fruit crop (kg/ha) in Northern Ireland, 1992-2012.**

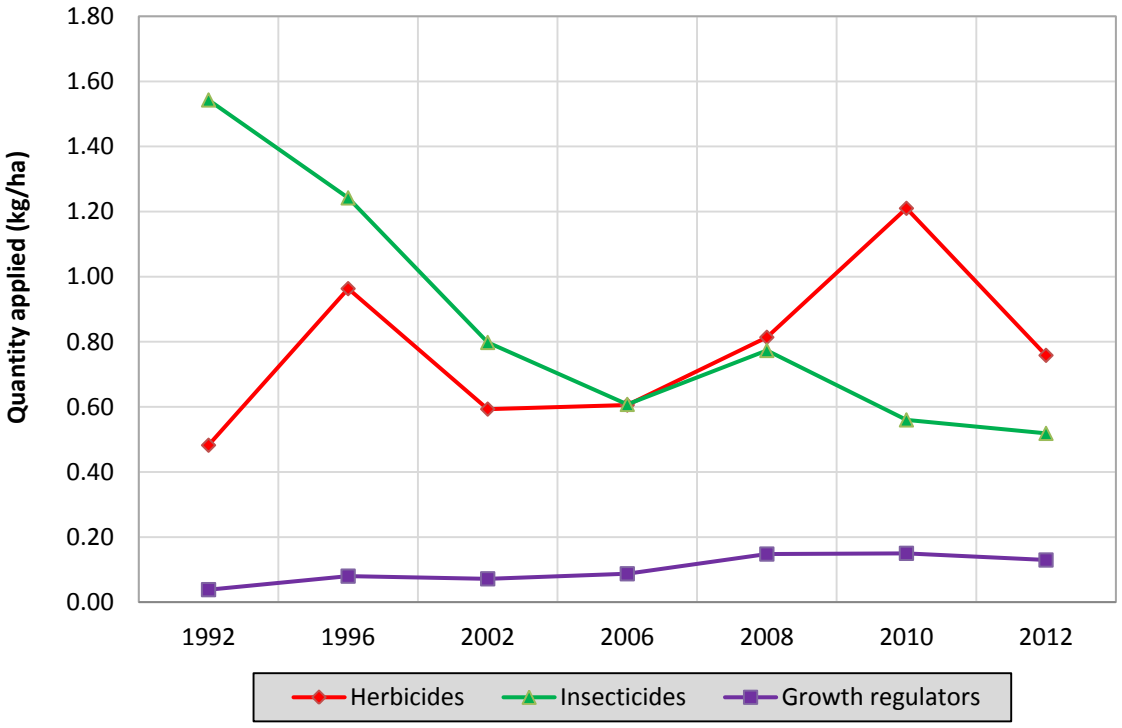
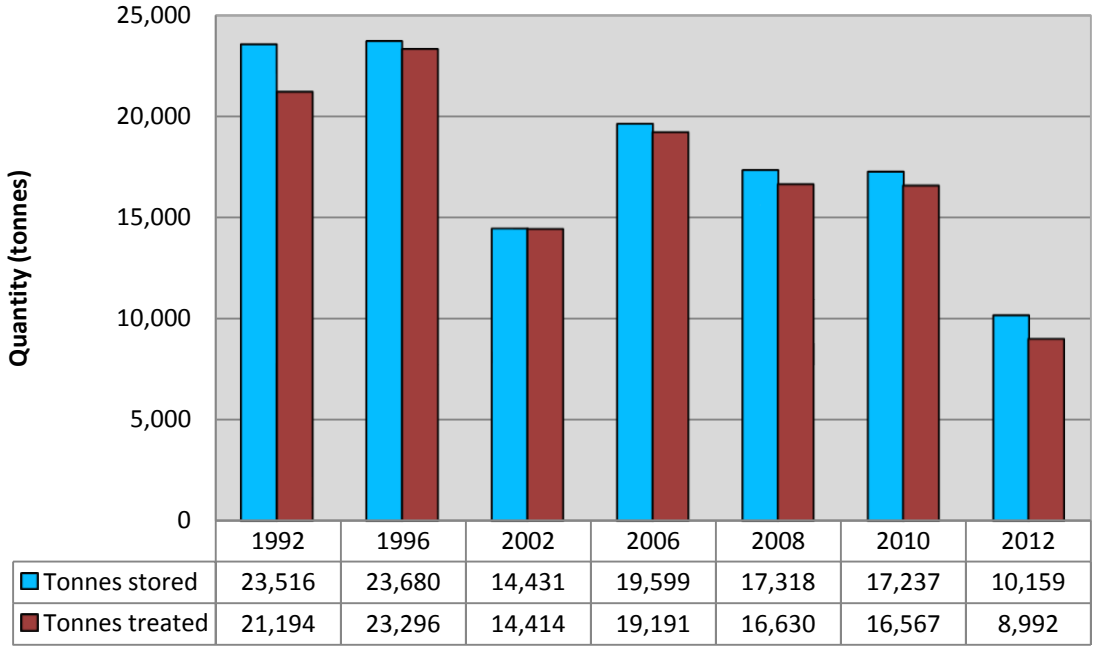


Figure 15 **Quantity of Bramley apples stored and quantity receiving a post-harvest treatment (tonnes) in Northern Ireland, 1992-2012.**



	1992	1996	2002	2006	2008	2010	2012
Tonnes stored	23,516	23,680	14,431	19,599	17,318	17,237	10,159
Tonnes treated	21,194	23,296	14,414	19,191	16,630	16,567	8,992

Figure 16 **Quantity (tonnes) of stored Bramley apples receiving post-harvest treatments in Northern Ireland, 2012.**

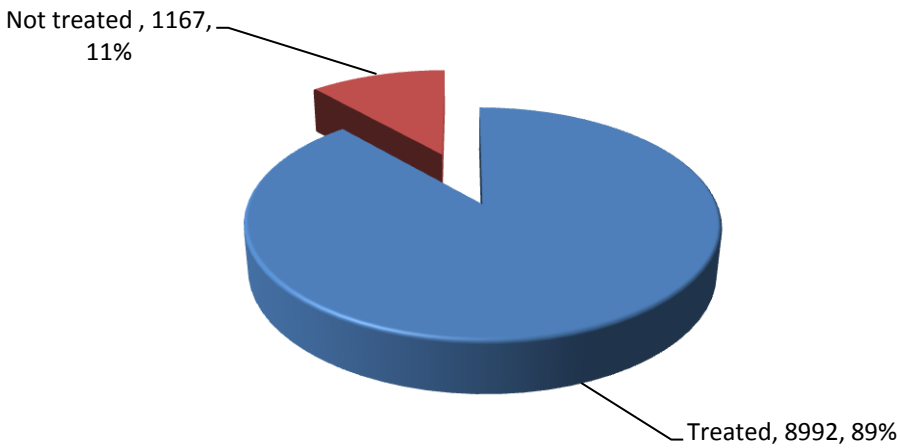


Figure 17 **Quantity of Bramley apples stored (tonnes) and the storage methods used in Northern Ireland, 2012.**

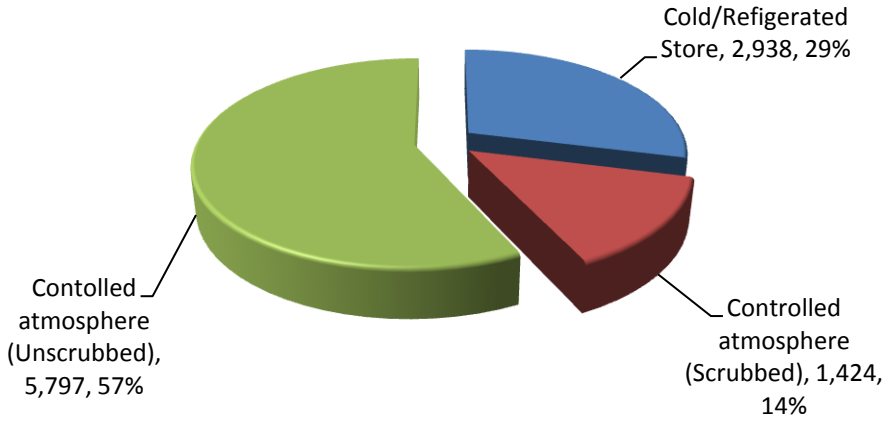
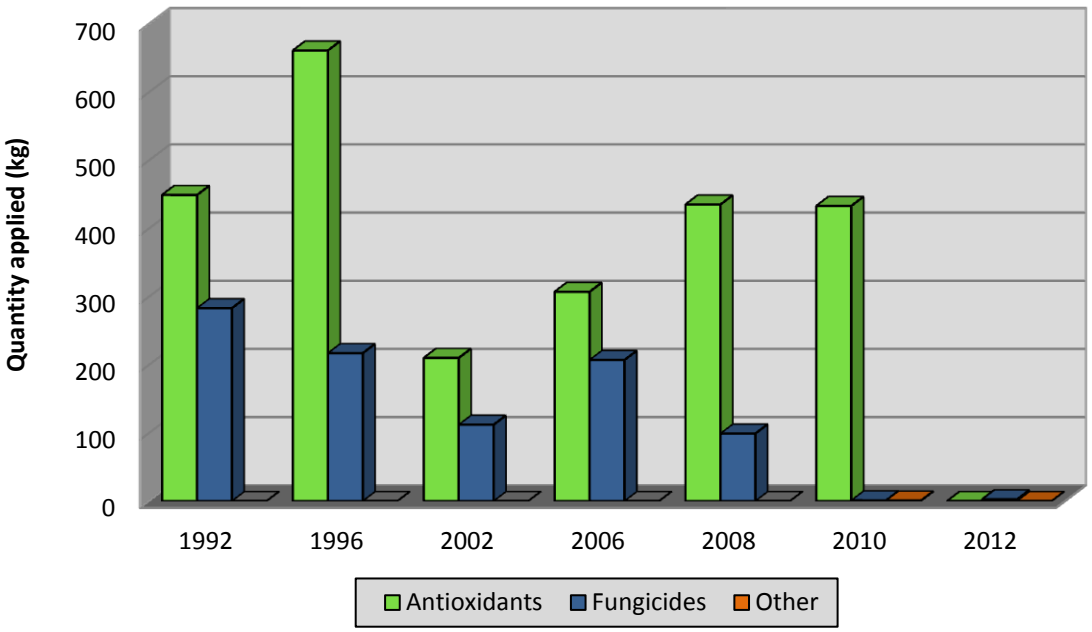


Figure 18 **Quantities of pesticide (kg) applied to stored Bramley apples in Northern Ireland, 1992-2012.**



PESTICIDE USAGE ON BRAMLEY APPLE CROPS

- Total area grown: 1,503 hectares
- Basic area treated: 3,915 hectares
- Total area treated: 37,787 spray hectares
- Weight of active substances applied: 34,677 kilogrammes
- 18 different fungicide substances, 9 insecticide/acaricides, 4 herbicides and 3 growth regulators were applied to Bramley apple crops

Fungicides – Bramley apples

- Basic area treated: 1,503 hectares
- Total area treated: 32,466 spray hectares
- Weight of active substances applied: 32,563 kilogrammes
- Fungicides accounted for 86% of total area treated and 94% of total weight applied
- The most commonly used fungicides were mancozeb, dithianon, captan, pyrimethanil and fenbuconazole, being applied to 25,109 spray hectares of Bramley apple crops

Figure 19 **Total area (spha) of Bramley apple crops treated with fungicide active ingredients in Northern Ireland, 2012.**

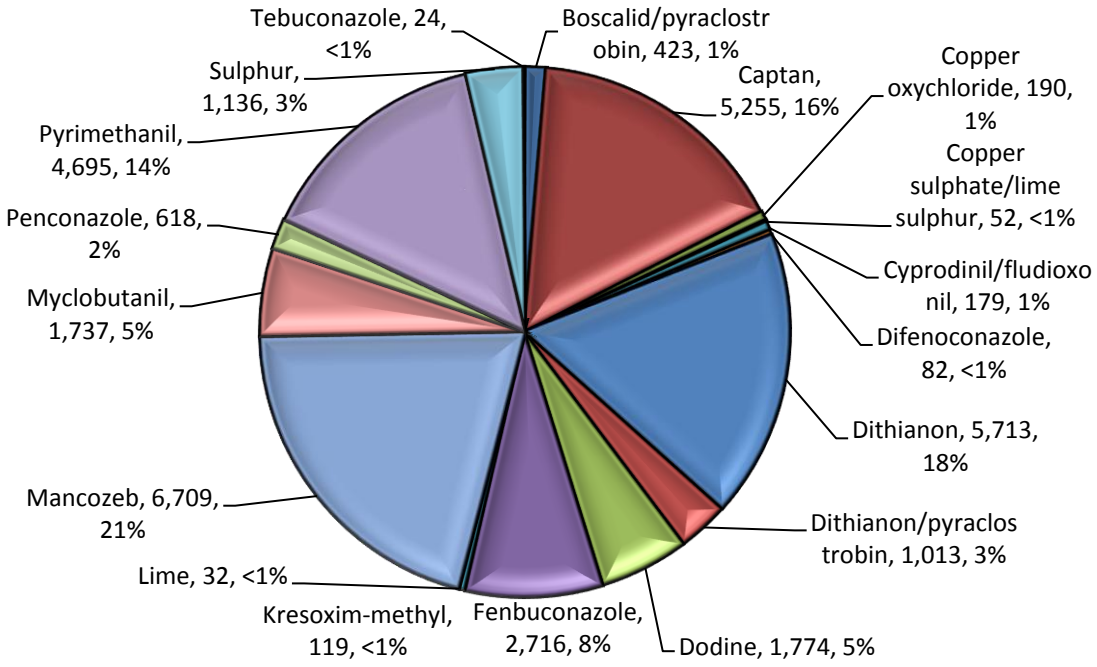


Figure 20 **Total quantity (kg) of fungicide active ingredients applied to Bramley apple crops in Northern Ireland, 2012.**

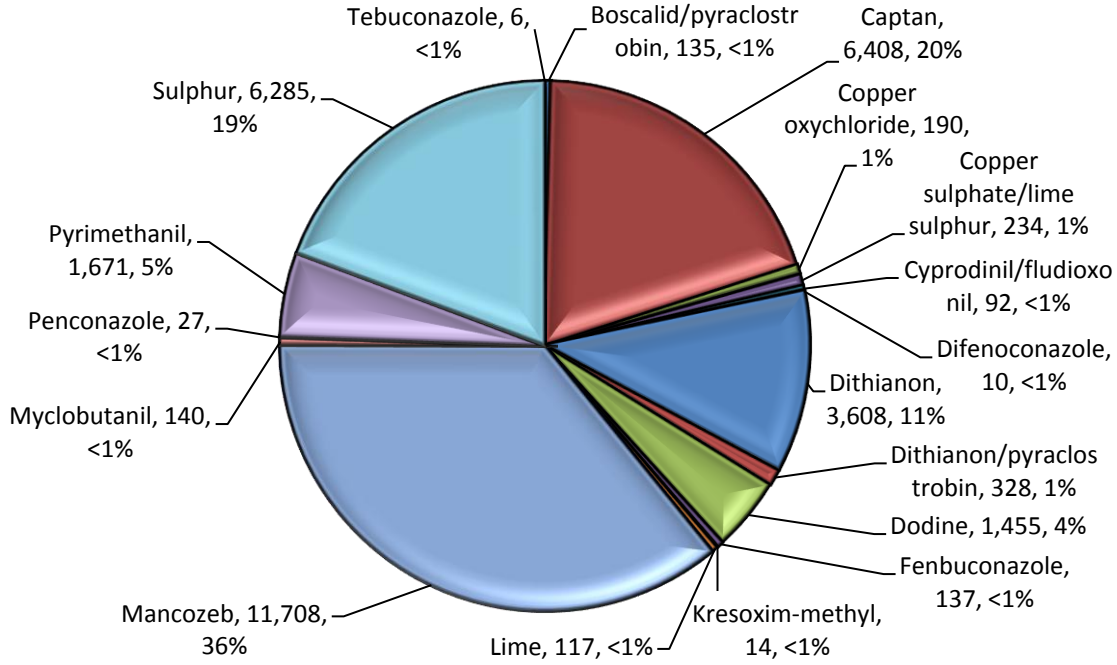
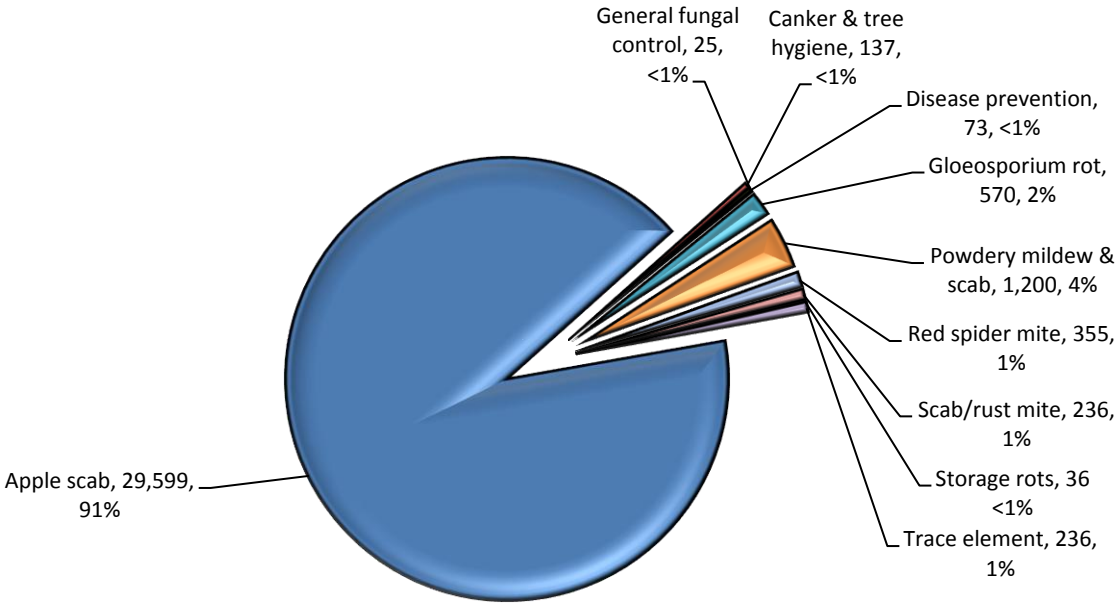


Figure 21 **Bramley apples: Reasons for fungicide use (spha), 2012.**



Herbicides – Bramley apples

- Basic area treated: 409 hectares
- Total area treated: 1,018 spray hectares
- Weight of active substances applied: 1,139 kilogrammes
- Herbicides accounted for 3% of both the total area treated and total weight applied
- The most frequently used herbicide was glyphosate, applied to 609 spray hectares of Bramley orchard floor areas, accounting for 62% of the total weight of herbicides applied

Figure 22 **Total area (spha) of Bramley apple crops treated with herbicide active ingredients in Northern Ireland, 2012.**

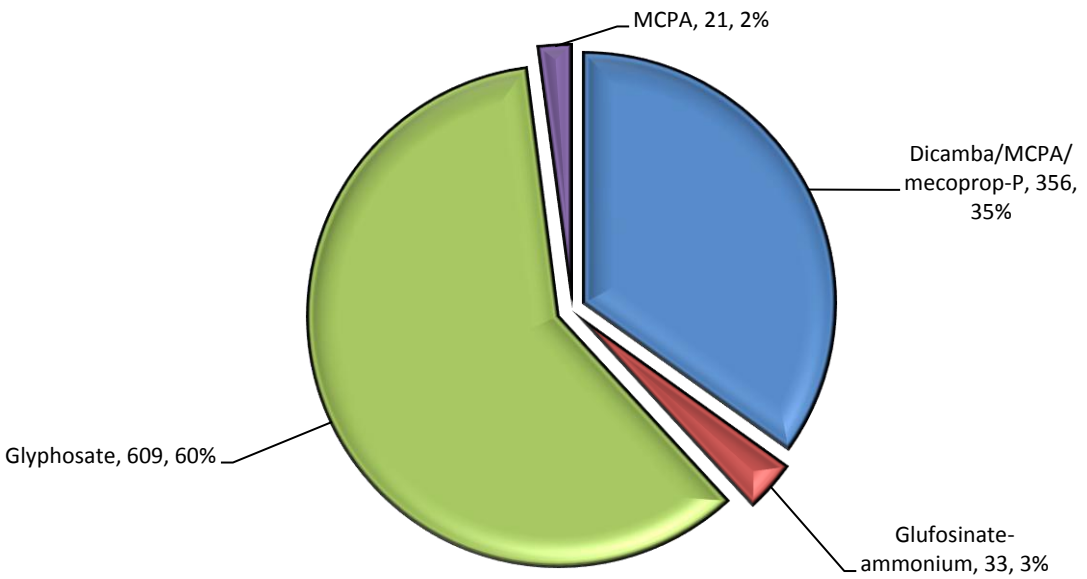


Figure 23 **Total quantity (kg) of herbicide active ingredients applied to Bramley apple crops in Northern Ireland, 2012.**

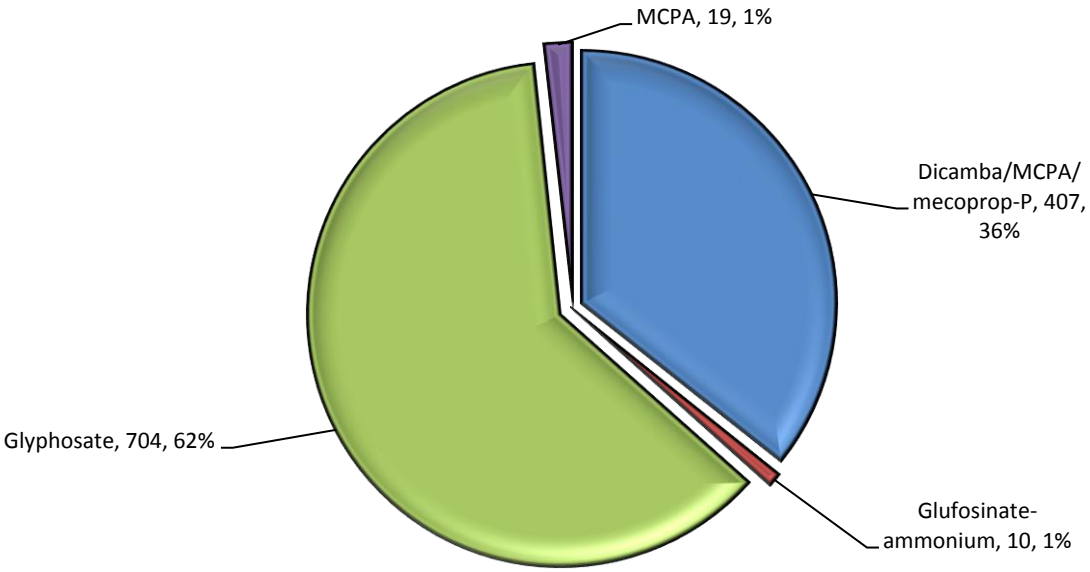
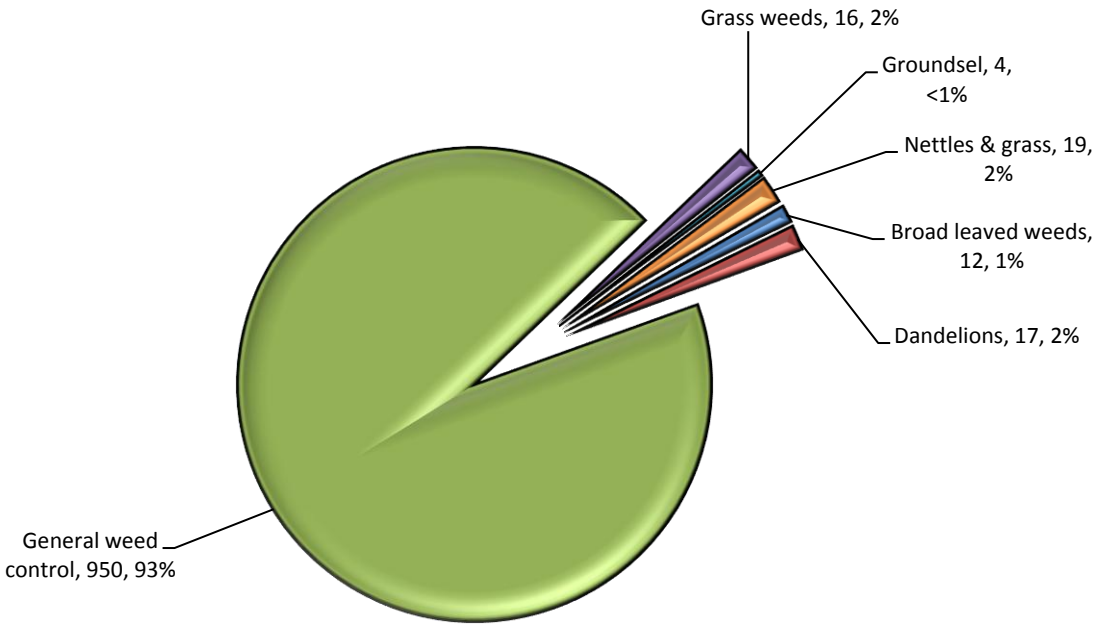


Figure 24 Bramley apples: Reasons for herbicide use (spha), 2012.



Insecticide/acaricides – Bramley apples

- Basic area treated: 1,231 hectares
- Total area treated: 2,153 spray hectares
- Weight of active substances applied: 780 kilogrammes
- Insecticide/acaricides accounted for 6% of the total area treated and 2% of the total weight applied

Figure 25 Total area (spha) of Bramley apple crops treated with insecticide/acaricide active ingredients in Northern Ireland, 2012.

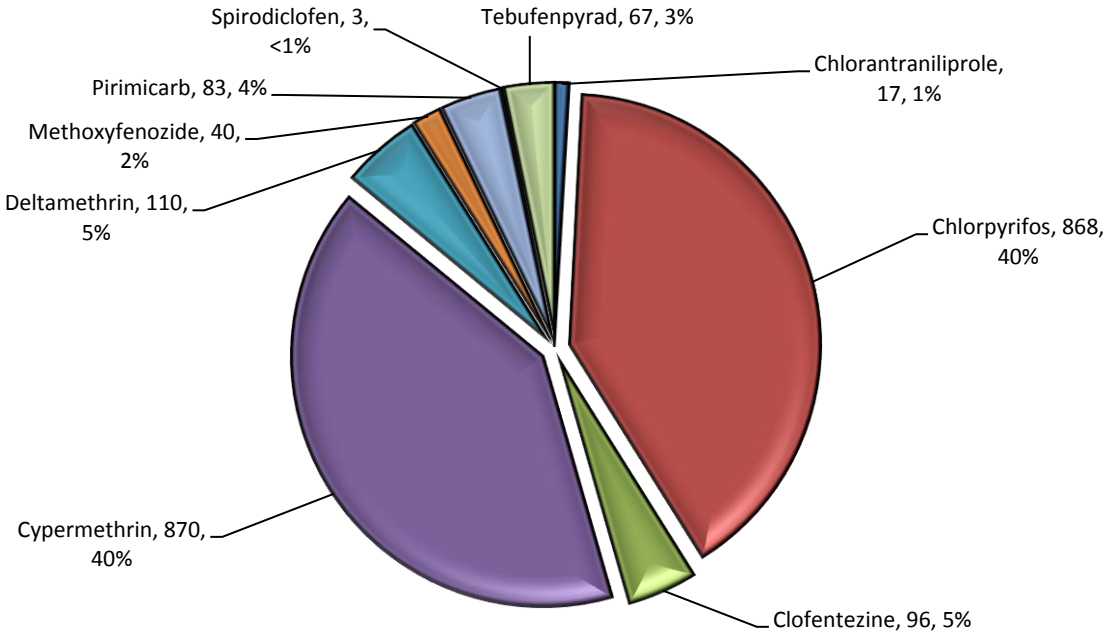


Figure 26 **Total quantity (kg) of insecticide/acaricide active ingredients applied to Bramley apple crops in Northern Ireland, 2012.**

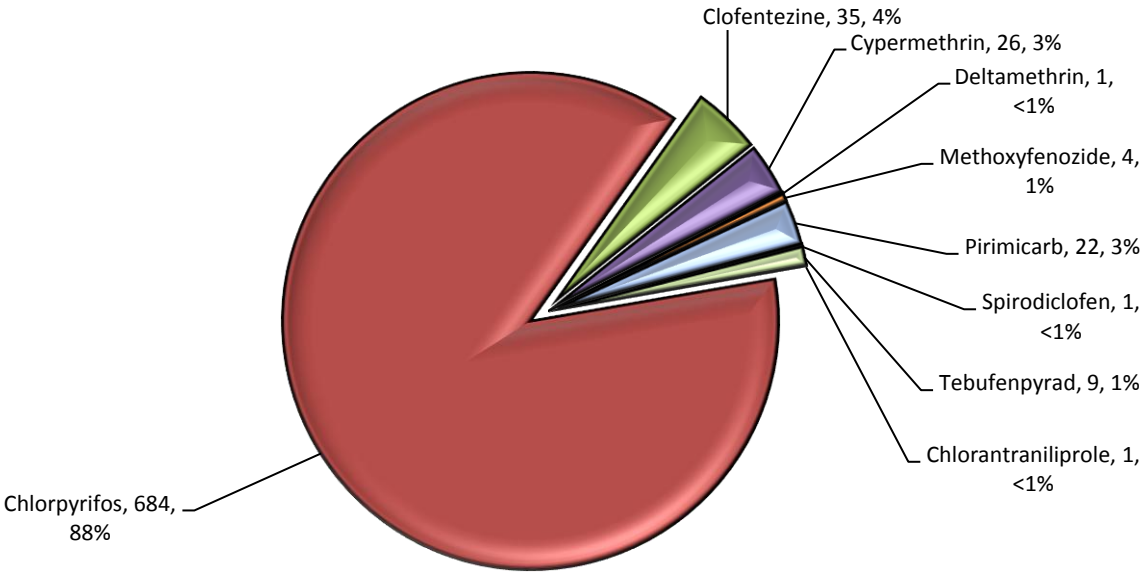
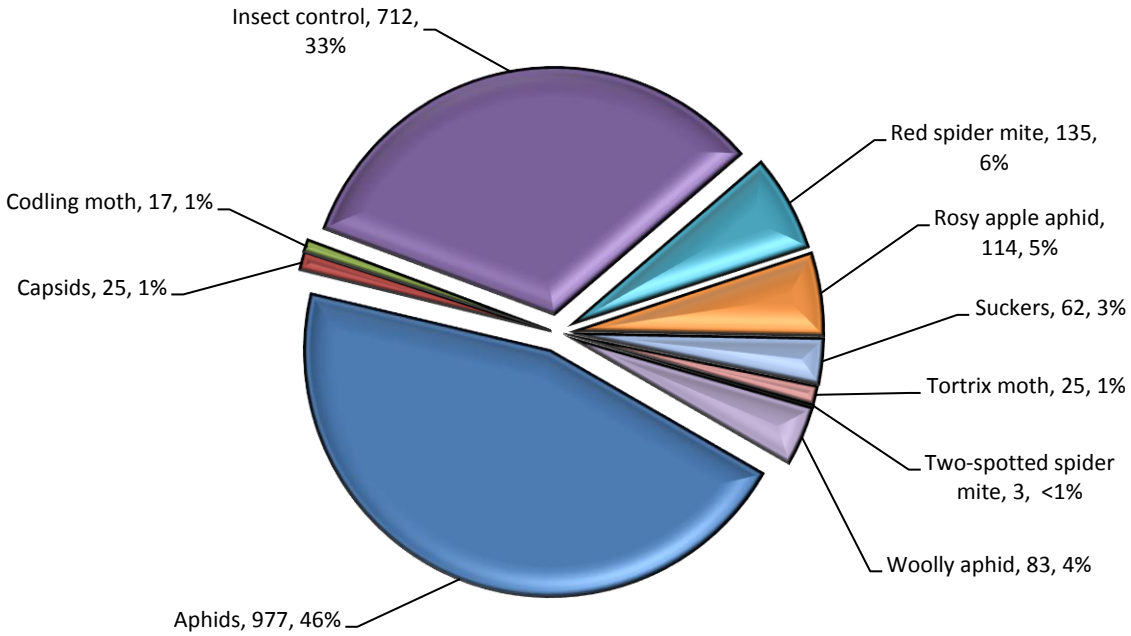


Figure 27 **Bramley apples: Reasons for insecticide/acaricide use (spha), 2012.**



Growth regulators – Bramley apples

- Basic area treated: 773 hectares
- Total area treated: 2,151 spray hectares
- Weight of active substances applied: 195 kilogrammes
- Growth regulators accounted for 5% of the total area treated and 1% of the total weight applied

Figure 28 **Total area (spha) of Bramley apple crops treated with growth regulator active ingredients in Northern Ireland, 2012.**

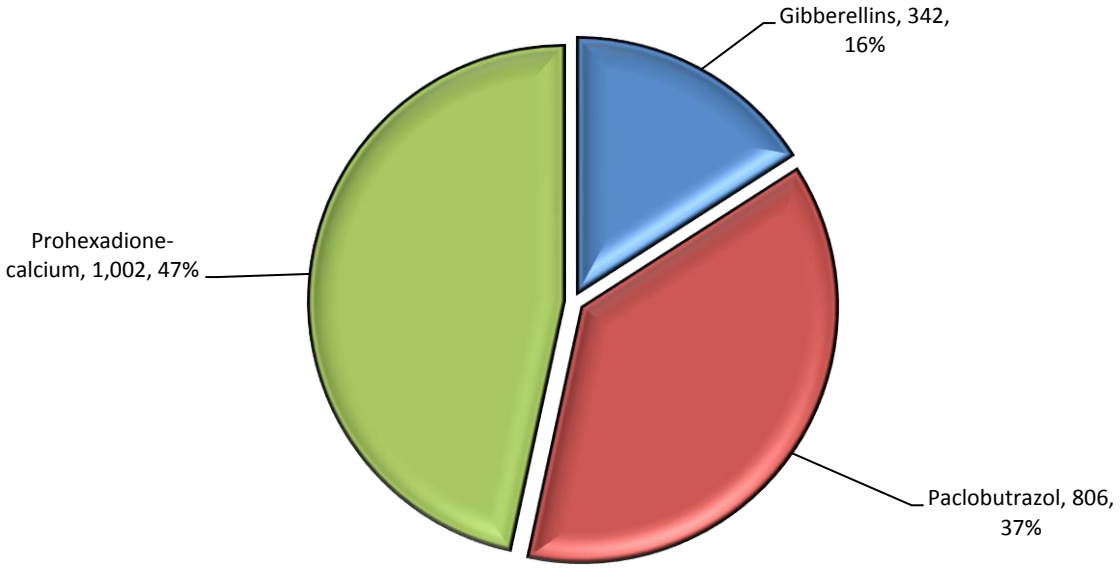


Figure 29 **Total quantity (kg) of growth regulator active ingredients applied to Bramley apple crops in Northern Ireland, 2012.**

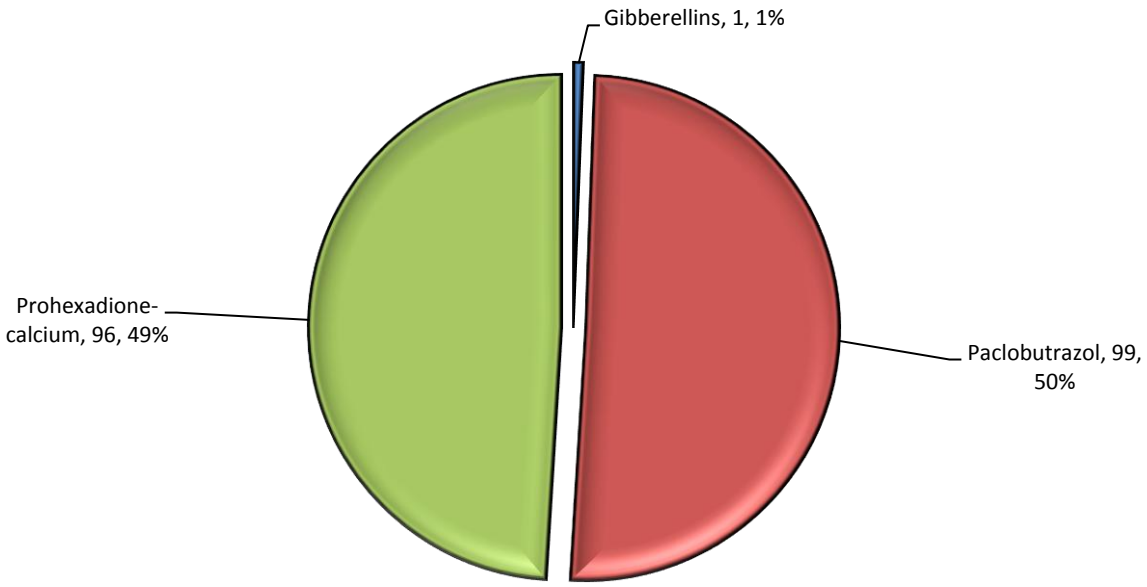
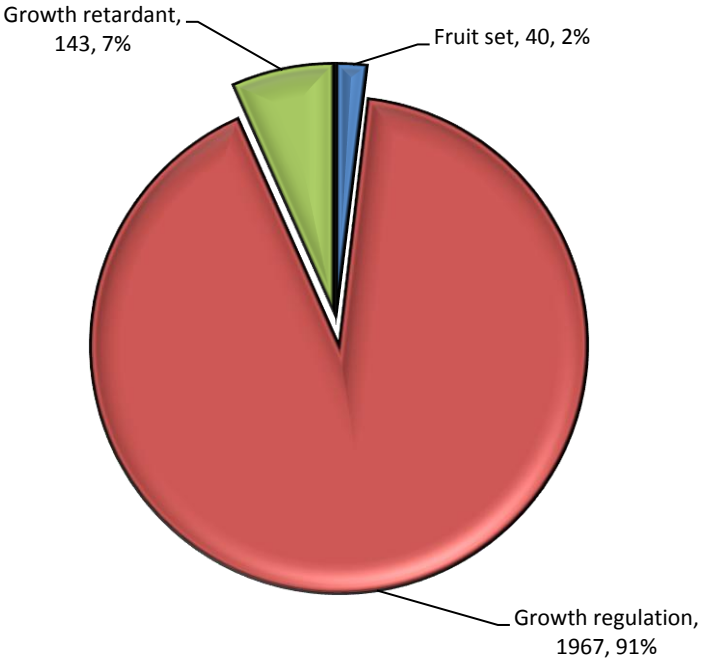


Figure 30 **Bramley apples: Reasons for growth regulator use (spha), 2012.**



'Other products' – Bramley apples

- Total area treated: 8,202 spray hectares
- Weight of 'other products' applied: 14,090 kilogrammes

Figure 31 **Total area (spha) of Bramley apple crops treated with 'other products' in Northern Ireland, 2012.**

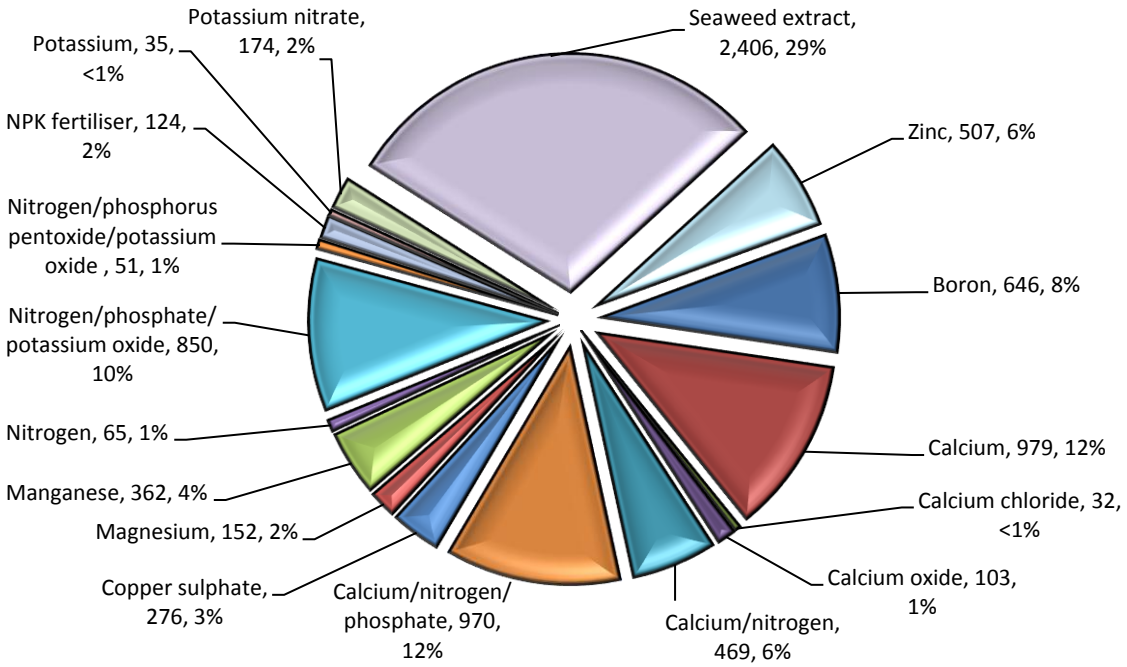
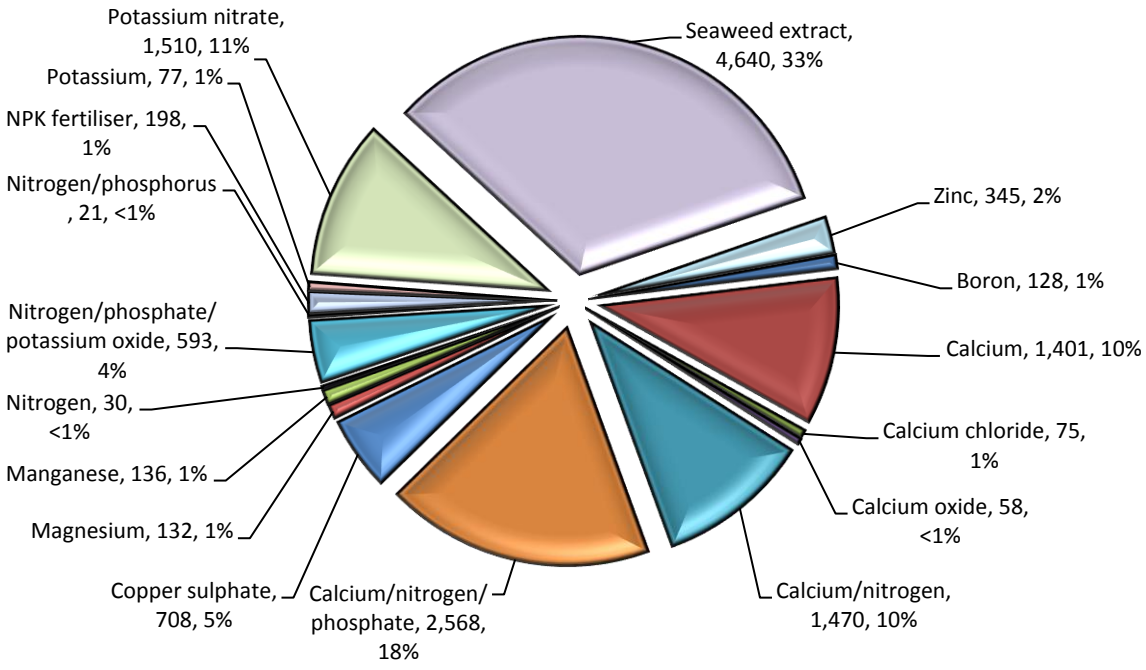


Figure 32 **Total quantity (kg) of 'other products' applied to Bramley apple crops in Northern Ireland, 2012.**



'Other products' included foliar feeds, trace elements and calcium-based products of which the majority were used to treat potential nutritional disorders.

PESTICIDE USAGE ON 'OTHER' TOP FRUIT CROPS

Figure 33 **Total area (spha) of 'other' top fruit crops treated with fungicide active ingredients in Northern Ireland, 2012.**

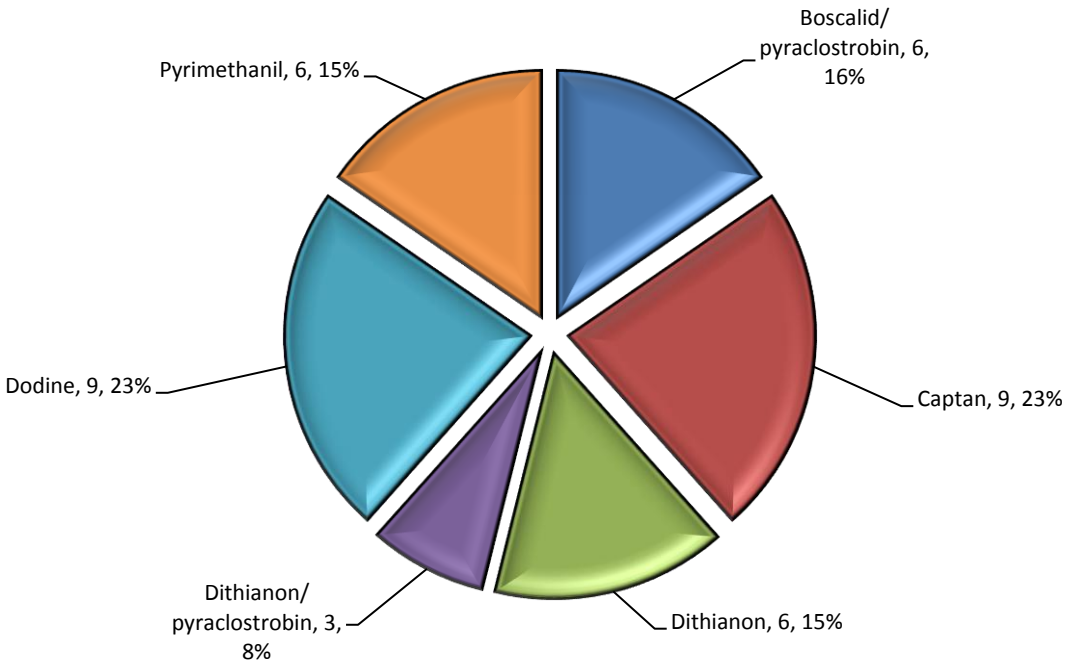
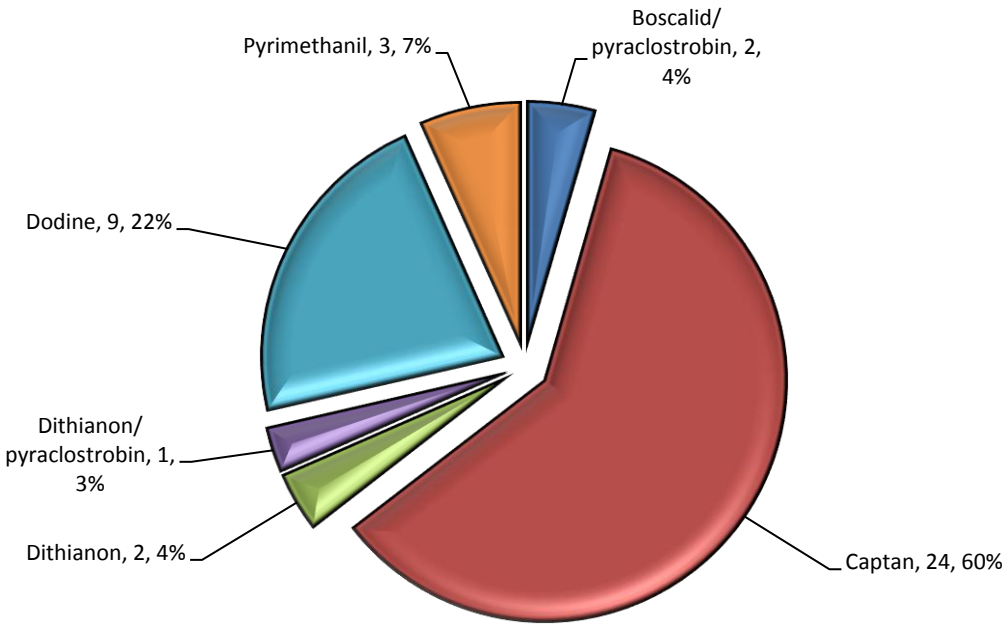


Figure 34 **Total quantity (kg) of fungicides applied to 'other' top fruit crops in Northern Ireland, 2012.**



The only reason given for fungicide use on 'other' top fruit crops was 'Scab control'. An estimated 3kg of Glyphosate was applied to 2 hectares of 'other' top fruit orchard floor areas for 'General weed control'.

Approximately 1kg of pirimicarb was applied to 3 hectares of 'other' top fruit orchards to control 'Woolly aphid'. No other products were used on these crops.

Table 1 The total number of farms and the number of holdings surveyed from each size group in Northern Ireland, 2012.

	Size Group (hectares)											
	<4		4<6		6<9		9<14		14+		Total	
County	A	B	A	B	A	B	A	B	A	B	A	B
Armagh	87	**6**	24	**5**	14	**9**	22	**8**	34	**18**	181	**46**
All other counties	34	**.**	2	**1**	2	**.**	1	**.**	3	**1**	42	**2**
Northern Ireland	121	**6**	26	**6**	16	**9**	23	**8**	37	**19**	223	**48**

Legend

A = Total number of holdings in strata

B = Number of holdings surveyed

Table 2 Estimated grown area of crops (ha), total surveyed area of crops (ha) and proportion (%) of the total area of top fruit crops surveyed in Northern Ireland, 2012.

Crop type	Grown area	Surveyed area	Proportion of crop surveyed
Bramley apples	1,503	728	48%
Other top fruit	3	2	67%

Table 3 Estimated area (ha) of top fruit crops grown regionally in Northern Ireland, 2012.

	County		
Crop type	Armagh	All other counties	Northern Ireland
Bramley apples	1,443	60	1,503
Other top fruit	3	.	3
All Crops	**1,446**	**60**	**1,506**

Table 4 **Estimated area (spha) of top fruit crops receiving treatments, categorised by pesticide type and region in Northern Ireland, 2012.**

	Pesticide Type				
County	**Fungicides**	**Herbicides**	**Insecticides and acaricides**	**Growth regulators**	**Northern Ireland**
Armagh	30,801	989	2,096	2,111	35,996
All other counties	1,704	32	60	40	1,834
Total	**32,505**	**1,020**	**2,156**	**2,151**	**37,832**

Table 5 **Estimated quantity (kg) of pesticide active ingredients applied to top fruit crops, categorised by pesticide type and region in Northern Ireland, 2012.**

	Pesticide Type				
County	**Fungicides**	**Herbicides**	**Insecticides and acaricides**	**Growth regulators**	**Northern Ireland**
Armagh	31,354	1,113	779	193	33,440
All other counties	1,250	29	2	2	1,283
All pesticides	**32,604**	**1,142**	**781**	**195**	**34,722**

Table 6 **Estimated quantity (kg) of pesticide active ingredients applied to top fruit crops, categorised by pesticide type and crop type in Northern Ireland, 2012.**

	Pesticide Type				
Crop Type	**Fungicides**	**Herbicides**	**Insecticides and acaricides**	**Growth Regulators**	**Total quantity (kg)**
Bramley apples	32,563	1,139	780	195	34,677
Other top fruit	41	3	1	.	45
All Crops	**32,604**	**1,142**	**781**	**195**	**34,722**

Table 7 **The basic area (ha) and the total area (spha) of top fruit crops treated with each pesticide type in Northern Ireland, 2012.**

	Pesticide Type									
	Fungicides		Herbicides		Insecticides and acaricides		Growth regulators		All pesticides	
Crop Type	(ha)	(spha)	(ha)	(spha)	(ha)	(spha)	(ha)	(spha)	(ha)	(spha)
Bramley apples	1,503	32,466	409	1,018	1,231	2,153	773	2,151	3,915	37,787
Other top fruit	3	39	1	2	3	3	.	.	7	44
All Crops	**1,506**	**32,505**	**410**	**1,202**	**1,234**	**2,156**	**773**	**2,151**	**3,922**	**37,831**

Table 8 **The mean number of spray applications of pesticides applied to Top Fruit crops in Northern Ireland, 2012.**

	Pesticide Type									
	Fungicides		Herbicides		Insecticides and acaricides		Growth Regulators		Other products	
Crop Type	A	B	A	B	A	B	A	B	A	B
Bramley apples	21.2	12.5	2.6	1.6	1.9	1.9	2.1	2.0	9.8	7.9
Other top fruit	13.0	7.0	2.0	2.0	1.0	1.0	.	.	.	.
All crops average	17.1	9.8	2.3	1.8	1.5	1.5	2.1	2.0	9.8	7.9

Legend

A = Number of applications of treatment type.

B = Number of Spray applications accounting for tank mixes.

Table 9 **Estimated area (spha) of top fruit crops treated with pesticide formulations in Northern Ireland, 2012.**

	Crop type		
Pesticide group and active ingredient	**Bramley apples**	**Other top fruit**	**Total area**
Fungicides			
Boscalid/pyraclostrobin	423	6	429
Captan	5,255	9	5,264
Copper oxychloride	189	.	189
Copper sulphate/lime sulphur	52	.	52
Cyprodinil/fludioxonil	179	.	179
Difenoconazole	82	.	82
Dithianon	5,713	6	5,719
Dithianon/pyraclostrobin	1,014	3	1,017
Dodine	1,773	9	1,782
Fenbuconazole	2,716	.	2,716
Kresoxim-methyl	119	.	119
Lime	32	.	32
Mancozeb	6,709	.	6,709
Myclobutanil	1,737	.	1,736
Penconazole	618	.	618
Pyrimethanil	4,695	6	4,701
Sulphur	1,137	.	1,137
Tebuconazole	24	.	24
All fungicides	**32,467**	**39**	**32,506**
Herbicides			
Dicamba/MCPA/mecoprop-P	355	.	355
Glufosinate-ammonium	33	.	33
Glyphosate	608	2	610
MCPA	21	.	21
All herbicides	**1,017**	**2**	**1,019**
Insecticides and acaricides			
Chlorantraniliprole	17	.	17
Chlorpyrifos	868	.	868
Clofentezine	96	.	96
Cypermethrin	870	.	870
Deltamethrin	110	.	110
Methoxyfenozide	40	.	40
Pirimicarb	83	3	86
Spirodiclofen	3	.	3
Tebufenpyrad	66	.	66
All insecticides and acaricides	**2,152**	**3**	**2,156**
Growth Regulators			
Gibberellins	342	.	342
Paclobutrazol	806	.	806
Prohexadione-calcium	1,002	.	1,002
All growth regulators	**2,151**	**.**	**2,151**
All pesticides	**37,787**	**44**	**37,831**

Table 10 **Estimated quantities (kg) of pesticide active ingredients applied to top fruit crops in Northern Ireland, 2012.**

	Crop type		
Pesticide group and active ingredient	**Bramley apples**	**Other top fruit**	**Total quantity**
Fungicides			
Boscalid/pyraclostrobin	135	2	137
Captan	6,408	24	6,432
Copper oxychloride	190	.	190
Copper sulphate/lime sulphur	234	.	234
Cyprodinil/fludioxonil	92	.	92
Difenoconazole	9	.	9
Dithianon	3,608	2	3,609
Dithianon/pyraclostrobin	328	1	329
Dodine	1,455	9	1,464
Fenbuconazole	137	.	137
Kresoxim-methyl	14	.	14
Lime	117	.	117
Mancozeb	11,708	.	11,707
Myclobutanil	140	.	140
Penconazole	27	.	27
Pyrimethanil	1,671	3	1,673
Sulphur	6,285	.	6,285
Tebuconazole	6	.	6
All fungicides	**32,563**	**41**	**32,604**
Herbicides			
Dicamba/MCPA/mecoprop-P	407	.	407
Glufosinate-ammonium	10	.	10
Glyphosate	704	3	707
MCPA	19	.	19
All herbicides	**1,140**	**3**	**1,143**
Insecticides and acaricides			
Chlorantraniliprole	<1	.	<1
Chlorpyrifos	684	.	684
Clofentezine	35	.	35
Cypermethrin	25	.	25
Deltamethrin	1	.	1
Methoxyfenozide	3	.	3
Pirimicarb	22	1	23
Spirodiclofen	<1	.	<1
Tebufenpyrad	9	.	9
All insecticides and acaricides	**780**	**1**	**781**
Growth Regulators			
Gibberellins	1	.	1
Paclobutrazol	99	.	99
Prohexadione-calcium	96	.	96
All growth regulators	**195**	**.**	**195**
All pesticides	**34,678**	**45**	**34,723**

Table 11 **The active ingredients most extensively used on top fruit crops ranked by treated area (spha) in Northern Ireland, 2012.**

No.	Active ingredient	Treated area
1	Dithianon	6,736
2	Mancozeb	6,710
3	Captan	5,264
4	Pyrimethanil	4,701
5	Fenbuconazole	2,716
6	Dodine	1,782
7	Myclobutanil	1,736
8	Pyraclostrobin	1,446
9	Sulphur	1,137
10	Prohexadione-calcium	1,002
11	Cypermethrin	870
12	Chlorpyrifos	868
13	Paclobutrazol	806
14	Penconazole	618
15	Glyphosate	610
16	Boscalid	429
17	MCPA	376
18	Dicamba	355
19	Mecoprop-P	355
20	Gibberellins	342
21	Copper oxychloride	189
22	Cyprodinil	179
23	Fludioxonil	179
24	Kresoxim-methyl	119
25	Deltamethrin	110
26	Clofentezine	96
27	Pirimicarb	86
28	Difenoconazole	82
29	Tebufenpyrad	66
30	Lime sulphur	52
31	Copper sulphate	52
32	Methoxyfenozide	40
33	Glufosinate-ammonium	33
34	Lime	32
35	Tebuconazole	24
36	Chlorantraniliprole	17
37	Spirodiclofen	3

**** Active ingredients not always sprayed as separate actives but also in formulated mixtures.***

Table 12 **The active ingredients most extensively used on top fruit crops ranked by weight (kg) in Northern Ireland, 2012.**

No.	Active ingredient	Quantity applied
1	Mancozeb	11,707
2	Captan	6,432
3	Sulphur	6,285
4	Dithianon	3,856
5	Pyrimethanil	1,673
6	Dodine	1,464
7	Glyphosate	706
8	Chlorpyrifos	684
9	MCPA	347
10	Copper oxychloride	190
11	Myclobutanil	140
12	Fenbuconazole	137
13	Pyraclostrobin	128
14	Lime sulphur	117
15	Copper sulphate	117
16	Lime	117
17	Paclobutrazol	99
18	Prohexadione-calcium	96
19	Boscalid	91
20	Mecoprop-P	61
21	Cyprodinil	55
22	Fludioxonil	37
23	Clofentezine	35
24	Penconazole	27
25	Cypermethrin	25
26	Pirimicarb	23
27	Dicamba	18
28	Kresoxim-methyl	14
29	Glufosinate-ammonium	10
30	Difenoconazole	9
31	Tebufenpyrad	9
32	Tebuconazole	6
33	Methoxyfenozide	3
34	Gibberellins	1
35	Deltamethrin	1
36	Chlorantraniliprole	<1
37	Spirodiclofen	<1

**** Active ingredients not always sprayed as separate actives but also in formulated mixtures.***

Table 13 **Bramley apples: Reasons for use, total area treated (spha), basic area treated (ha) and total quantity applied (kg).**

	Reason for use												
Pesticide group and active ingredient	**Apple scab**	**Canker & tree hygiene**	**Disease prevention**	**General fungal control**	**Gloeo-sporium rot**	**Powdery mildew & scab**	**Red spider mite**	**Scab/ rust mite**	**Storage rots**	**Trace element**	**Total area treated (spha)**	**Basic area treated (ha)**	**Total quantity applied (kg)**
Fungicides													
Boscalid/pyraclostrobin	365	32	.	.	.	26	.	.	.	.	423	306	135
Captan	4,685	.	.	.	570	.	.	.	.	.	5,255	1,067	6,408
Copper oxychloride	112	53	.	25	.	.	.	.	.	.	190	108	190
Copper sulphate/lime sulphur	0	52	.	.	.	.	.	.	.	.	52	51	234
Cyprodinil/fludioxonil	179	.	.	.	.	.	.	.	.	.	179	179	92
Difenoconazole	82	.	.	.	.	.	.	.	.	.	82	47	10
Dithianon	5,661	.	.	.	.	52	.	.	.	.	5,713	961	3,608
Dithianon/pyraclostrobin	977	.	.	.	.	.	.	.	36	.	1,013	566	328
Dodine	1,774	.	.	.	.	.	.	.	.	.	1,774	916	1,455
Fenbuconazole	2,684	.	.	.	.	32	.	.	.	.	2,716	828	137
Kresoxim-methyl	119	.	.	.	.	.	.	.	.	.	119	59	14
Lime	32	.	.	.	.	.	.	.	.	.	32	32	117
Mancozeb	6,666	.	.	.	.	43	.	.	.	.	6,709	1,202	11,708
Myclobutanil	794	.	.	.	.	943	.	.	.	.	1,737	657	140
Penconazole	514	.	.	.	.	104	.	.	.	.	618	319	27
Pyrimethanil	4,695	.	.	.	.	.	.	.	.	.	4,695	1,300	1,671
Sulphur	236	.	73	.	.	.	355	236	.	236	1,136	420	6,285
Tebuconazole	24	.	.	.	.	.	.	.	.	.	24	24	6
All fungicides	**29,599**	**137**	**73**	**25**	**570**	**1,200**	**355**	**236**	**36**	**236**	**32,466**	***1,503**	**32,563**

**** As in Table 7 rather than the sum of the above***

Note 'tree hygiene' refers to a winter wash applied to remove any lichens, dormant spores etc. on the trees.

Table 13 (cont) **Bramley apples: Reasons for use, total area treated (spha), basic area treated (ha) and total quantity applied (kg).**

	Reason for use								
Pesticide group and active ingredient	**Broad leaved weeds**	**Dandelions**	**General weed control**	**Grass weeds**	**Groundsel**	**Nettles & grass**	**Total area treated (spha)**	**Basic area treated (ha)**	**Total quantity applied (kg)**
Herbicides									
Dicamba/MCPA/mecoprop-P	12	3	327	.	4	10	356	261	407
Glufosinate-ammonium	.	.	33	.	.	.	33	33	10
Glyphosate	.	.	583	16	.	10	609	399	704
MCPA	.	14	7	.	.	.	21	14	19
All herbicides	**12**	**17**	**950**	**16**	**4**	**19**	**1,018**	***409**	**1,140**

	Reason for use												
Pesticide group and active ingredient	**Aphids**	**Capsids**	**Codling moth**	**Insect control**	**Red spider mite**	**Rosy apple aphid**	**Suckers**	**Tortrix moth**	**Two-spotted spider mite**	**Woolly aphid**	**Total area treated (spha)**	**Basic area treated (ha)**	**Total quantity applied (kg)**
Insecticides and acaricides													
Chlorantraniliprole	.	.	17	.	.	.	.	.	.	.	17	17	1
Chlorpyrifos	297	.	.	541	.	.	31	.	.	.	868	576	684
Clofentezine	.	.	.	.	96	.	.	.	.	.	96	96	35
Cypermethrin	571	25	.	129	.	114	31	.	.	.	870	755	26
Deltamethrin	49	.	.	.	.	.	.	.	.	61	110	106	1
Methoxyfenozide	.	.	.	15	.	.	.	25	.	.	40	40	4
Pirimicarb	61	.	.	.	.	.	.	.	.	22	83	82	22
Spirodiclofen	.	.	.	.	.	.	.	.	3	.	3	3	<1
Tebufenpyrad	.	.	.	27	39	.	.	.	.	.	67	66	9
All Insecticides and acaricides	**977**	**25**	**17**	**712**	**135**	**114**	**62**	**25**	**3**	**83**	**2,153**	***1,231**	**780**

**** As in Table 7 rather than the sum of the above***

Table 13 (cont) **Bramley apples: Reasons for use, total area treated (spha), basic area treated (ha) and total quantity applied (kg).**

	Reason for use					
Pesticide group and active ingredient	**Fruit set**	**Growth regulation**	**Growth retardant**	**Total area treated (spha)**	**Basic area treated (ha)**	**Total quantity applied (kg)**
Growth regulators						
Gibberellins	.	342	.	342	114	1
Paclobutrazol	.	806	.	806	261	99
Prohexadione-calcium	40	819	143	1,002	708	96
All Growth regulators	**40**	**1,967**	**143**	**2,150**	***773**	**196**

**** As in Table 7 rather than the sum of the above***

Table 14 **'Other' top fruit: Reasons for use, total area treated (spha), basic area treated (ha) and total quantity applied (kg).**

	Reason for use					
Pesticide Type and formulation	**Apple/Pear scab**	**General weed control**	**Woolly aphid**	**Total area treated (spha)**	**Basic area treated (ha)**	**Total quantity applied (kg)**
Fungicides						
Boscalid/pyraclostrobin	6	.	.	6	3	2
Captan	9	.	.	9	3	24
Dithianon	6	.	.	6	3	2
Dithianon/pyraclostrobin	3	.	.	3	3	1
Dodine	9	.	.	9	3	9
Pyrimethanil	6	.	.	6	3	3
All fungicides	**39**	**.**	**.**	**39**	***3**	**41**
Herbicides						
Glyphosate	.	2	.	2	1	3
All herbicides	**.**	**2**	**.**	**2**	***1**	**3**
Insecticides and acaricides						
Pirimicarb	.	.	3	3	3	1
All insecticides and acaricides	**.**	**.**	**3**	**3**	***3**	**1**

**** As in Table 7 rather than the sum of the above***

Table 15 **Estimated area treated (spha) and quantity of 'other products' applied (kg) to Bramley apple crops, 2012.**

	Crop type			
	Bramley apples		Total	
Formulation	**spha**	**kg**	**spha**	**kg**
Boron	646	128	646	128
Calcium	979	1,401	979	1,401
Calcium chloride	32	75	32	75
Calcium oxide	103	58	103	58
Calcium/nitrogen	469	1,470	469	1,470
Calcium/nitrogen/phosphate	970	2,568	970	2,568
Copper sulphate	276	708	276	708
Magnesium	152	132	152	132
Manganese	362	136	362	136
Nitrogen	65	30	65	30
Nitrogen/phosphate/potassium oxide	850	593	850	593
Nitrogen/phosphorus pentoxide/potassium oxide	51	21	51	21
NPK fertiliser	124	198	124	198
Potassium	35	77	35	77
Potassium nitrate	174	1,510	174	1,510
Seaweed extract	2,406	4,640	2,406	4,640
Zinc	507	345	507	345
Total	8,202	14,090	8,202	14,090

Table 16 **Comparison of area (ha) of top fruit crops grown in Northern Ireland, 1992-2012.**

	Survey Year							
Crop Type	**1992**	**1996**	**2002**	**2006**	**2008***	**2010***	**2012***	**% change in area grown 2010/2012**
Bramley apples								
Bramley apples (fruiting)	1,574	1,511	1,265	1,341	1,463	1,491	1,503	+1%
Bramley apples (non-fruiting)	158	189	197	74	N/A	N/A	N/A	N/A
All Bramley apples	**1,732**	**1,701**	**1,462**	**1,415**	**1,463**	**1,491**	**1,503**	**+1%**
Other top fruit crops								
Other top fruit crops (fruiting)	57	13	20	21	19	25	3	-88%
Other top fruit crops (non-fruiting)	5	0.4	4	14	N/A	N/A	N/A	N/A
All other top fruit crops	**62**	**13**	**24**	**35**	**19**	**25**	**3**	**-88%**
Total crops	**1,794**	**1,714**	**1,486**	**1,450**	**1,482**	**1,516**	**1,506**	**-1%**

**** Note: In 2008, 2010 and 2012 fruiting and non-fruiting crops were recorded together.***

Table 17a **Comparison of area treated (spha) and quantity of pesticides applied (kg) to top fruit crops in Northern Ireland, 1992-2012.**

	Survey Year													
	1992		1996		2002		2006		2008		2010		2012	
Pesticide Type	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**	**A**	**B**
Fungicides	20,272	13,549	21,620	20,672	23,473	26,756	24,836	20,132	27,200	23,554	28,593	26,796	32,505	32,604
Herbicides	761	865	1,190	1,652	1,000	881	899	875	965	1,206	1,314	1,805	1,020	1,142
Growth regulators	134	69	713	137	610	107	990	126	2,066	219	2,313	226	2,151	195
Mixed activity a.i.'s	11	73	17	14	.	.	.	.	.	.	.	.	.	.
Insecticides (by classification)														
Carbamates	33	56	32	7	88	10	104	17	152	33	139	33	86	23
Organochlorines	153	101	30	19	.	.	.	.	.	.	.	.	.	.
Organophosphates	2,357	1,733	2,239	1,870	1,373	996	1,129	811	1,305	1,016	976	702	868	684
Pyrethroids	586	13	464	16	481	18	595	18	496	23	983	27	980	26
Acaricides	112	31	751	157	201	24	301	24	645	93	.	.	96	35
Biopesticides	.	.	.	.	.	.	13	2	.	.	.	.	.	.
Other insecticides	524	465	182	60	115	139	47	6	.	.	445	81	126	14
All Insecticides	**3,765**	**2,399**	**3,698**	**2,129**	**2,258**	**1,186**	**2,189**	**878**	**2,598**	**1,165**	**2,543**	**843**	**2,156**	**782**
All pesticides	**24,943**	**16,955**	**27,238**	**24,604**	**27,341**	**28,930**	**28,914**	**22,011**	**32,831**	**26,125**	**34,763**	**29,669**	**37,832**	**34,723**

Legend

A = Area treated (spha)

B = Quantity of pesticides applied (kg)

Table 17b **Comparison of application ratios (kg/ha) of the active ingredients most extensively used on top fruit crops in Northern Ireland, 1992-2012.**

		Survey Year						
No.	**Active Ingredient**	**1992**	**1996**	**2002**	**2006**	**2008**	**2010**	**2012**
1.	Mancozeb	2.2	5.9	11.4	7.2	6.7	6.8	7.8
2.	Captan	1.9	1.9	1.3	1.4	1.7	3.8	4.3
3.	Sulphur	.	<0.1	0.2	0.1	0.7	0.9	4.2
4.	Dithianon	1.4	2.4	3.3	2.5	4.0	3.3	2.6
5.	Pyrimethanil	.	<0.1	0.3	0.6	1.1	0.9	1.1
6.	Dodine	0.1	0.5	0.3	0.7	0.6	0.7	1.0
7.	Glyphosate	0.1	0.4	0.3	0.3	0.6	0.8	0.5
8.	Chlorpyrifos	0.3	0.3	0.4	0.6	0.7	0.5	0.5
9.	MCPA	<0.1	0.1	0.1	0.1	0.2	0.3	0.2
10.	Copper oxychloride	0.7	0.4	0.7	0.4	0.7	0.5	0.1
11.	Myclobutanil	0.3	0.1	<0.1	<0.1	<0.1	0.1	0.1
12.	Fenbuconazole	.	<0.1	0.1	0.1	0.1	0.1	0.1
13.	Pyraclostrobin	.	.	.	<0.1	0.1	0.1	0.1
14.	Lime sulphur	0.2	.	.	.	.	<0.1	0.1
15.	Copper sulphate	0.3	0.1	0.2	.	.	<0.1	0.1
16.	Lime	.	.	.	.	.	.	0.1
17.	Paclobutrazol	<0.1	0.1	.	0.1	<0.1	0.1	0.1
18.	Prohexadione-calcium	.	.	.	<0.1	0.1	0.1	0.1
19.	Boscalid	.	.	.	<0.1	0.1	0.1	0.1
20.	Mecoprop-P	.	.	<0.1	0.1	<0.1	0.1	<0.1
21.	Cyprodinil	.	.	.	.	<0.1	<0.1	<0.1
22.	Fludioxonil	.	.	.	.	<0.1	<0.1	<0.1
23.	Clofentezine	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
24.	Penconazole	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
25.	Cypermethrin	.	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
26.	Pirimicarb	.	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
27.	Dicamba	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
28.	Kresoxim-methyl	.	.	.	<0.1	<0.1	<0.1	<0.1
29.	Glufosinate-ammonium	<0.1	<0.1	<0.1	.	<0.1	<0.1	<0.1
30.	Difenoconazole	.	.	<0.1	.	<0.1	<0.1	<0.1

Table 17b (cont) **Comparison of application ratios (kg/ha) of the active ingredients most extensively used on top fruit crops in Northern Ireland, 1992-2012.**

		Survey Year						
No.	**Active Ingredient**	**1992**	**1996**	**2002**	**2006**	**2008**	**2010**	**2012**
31.	Tebufenpyrad	.	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
32.	Tebuconazole	.	.	.	.	.	.	<0.1
33.	Methoxyfenozide	.	.	.	.	.	.	<0.1
34.	Gibberellins	.	.	.	<0.1	<0.1	<0.1	<0.1
35.	Deltamethrin	<0.1	.	<0.1	.	.	<0.1	<0.1
36.	Chlorantraniliprole	.	.	.	.	.	<0.1	<0.1
37	Spirodiclofen	.	.	.	.	.	.	<0.1

Note: Based on active ingredients recorded in the 2012 survey and their comparable amounts from previous years.

Table 18 **Estimated quantities (tonnes) of stored apples receiving treatment, and the total amount of active ingredients applied (kg) in Northern Ireland, 2012.**

Pesticide formulation	Quantity treated	Quantity applied
Fungicides		
Cyprodinil/fludioxonil	490	2.51
All fungicides	**490**	**2.51**
Other products		
1-methylcyclopropene	8,502	0.05
All other products	**8,502**	**0.05**
All treatments	**8,992**	**2.56**

Table 19 **The active ingredients used in apple storage ranked by weight (kg) in Northern Ireland, 2012.**

Active ingredient	Quantity used
Cyprodinil/fludioxonil	2.51
1-methylcyclopropene	0.05
Total active ingredients	**2.56**

Table 20 **Estimated quantities (tonnes) of Bramley apples treated in storage and reason for use of each active ingredient in Northern Ireland, 2012.**

	Reason for use					
Active ingredient	Antioxidant	Scab control	Storage scald	Storage rots	Storage scab	Total
Cyprodinil/fludioxonil	.	.	.	490	.	490
1-methylcyclopropene	4,642	1,211	2,039	397	213	8,502
All treatments	**4,642**	**1,211**	**2,039**	**887**	**213**	**8,992**

Note: Only Bramley fruiting apples were stored in Northern Ireland, 2012.

Table 21 **Comparison of the estimated quantities (tonnes) of Bramley apples stored and the total weight of active ingredients applied (kg) in Northern Ireland, 1992-2012.**

	Survey Year													
	1992		1996		2002		2006		2008		2010		2012	
Pesticide formulation	Total quantity stored	Total quantity applied	Total quantity stored	Total quantity applied	Total quantity stored	Total quantity applied	Total quantity stored	Total quantity applied	Total quantity stored	Total quantity applied	Total quantity stored	Total quantity applied	Total quantity stored	Total quantity applied
Antioxidants														
Diphenylamine	2,154	71	10,496	611	7,778	195	13,216	307	16,630	435	15,966	433	.	.
Ethoxyquin	8,350	378	1,381	50	750	15	.	.	.	.	.	.	.	.
All antioxidants	**10,504**	**449**	**11,877**	**661**	**8,528**	**210**	**13,216**	**307**	**16,630**	**435**	**15,966**	**433**	**.**	**.**
Fungicides														
Benomyl	4,166	124	.	.	385	4	332	2	.	.	.	.	.	.
Carbendazim	1,789	39	6,372	87	5,384	44	830	4	.	.	.	.	.	.
Carbendazim/metalaxyl	4,299	115	3,901	90	.	.	.	.	.	.	.	.	.	.
Captan	.	.	.	.	117	64	477	195	.	.	.	.	.	.
Cyprodinil/fludioxonil	.	.	.	.	.	.	.	.	214	1	256	1	490	3
Thiophanate-methyl	436	5	1,146	40	.	.	129	1	.	.	.	.	.	.
Metalaxyl-M	.	.	.	.	.	.	4,207	5	.	.	.	.	.	.
All fungicides	**10,690**	**283**	**11,419**	**217**	**5,886**	**112**	**5,975**	**207**	**214**	**1**	**256**	**1**	**490**	**3**
Other products														
1-methylcyclopropene	.	.	.	.	.	.	.	.	.	.	345	1	8,502	<1
All other products	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**345**	**1**	**8,502**	**<1**
All treatments	**21,194**	**732**	**23,296**	**878**	**14,414**	**322**	**19,191**	**514**	**16,844**	**436**	**16,567**	**435**	**8,992**	**3**
Stored without treatment	***2,322***	***.***	***384***	***.***	***17***	***.***	***408***	***.***	***689***	***.***	***670***	***.***	***1,167***	***.***
Total stored	**23,516**	**.**	**23,680**	**.**	**14,431**	**.**	**19,599**	**.**	**17,533**	**.**	**17,237**	**.**	**10,159**	**.**

Table 22 **Total grown area (ha), total quantity harvested (tonnes) and total yield (tonnes/ha) of Bramley apple crops in Northern Ireland, 2012.**

Age of orchard (years)	Total grown area (ha)	Total quantity harvested (tonnes)	Yield (tonnes/ha)
Bramley apples			
< 5	110	919	8
5 to 9	147	1,891	13
10 to 14	191	2,958	15
15 to 24	175	2,814	16
25 to 34	221	3,333	15
> 35	659	11,873	18
Total Bramley apples	**1,503**	**23,789**	**16**
Dessert apples and pears			
5 to 9	3	17	6
Total dessert apples and pears	**3**	**17**	**6**
Total top fruit	**1,506**	**23,806**	**16**

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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
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139	Vegetable Crops 1995	1-855 27 346 2
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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
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194	Arable Crops 2002	1-855 27 674 7

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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
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