

Resource Futures

Pesticide user habits survey 2013: public purchasing, use, storage, and disposal of pesticides in plant protection products

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Executive summary

A pesticide user habits survey was carried out in six garden centres across the UK in May 2013. This followed a similar approach to previous surveys undertaken in 2007 and 2010 designed to determine gardener user habits in relation to purchase, storage, use and disposal of pesticides. The 2013 survey limited responses to plant protection products and also included an online element to the survey to increase the overall response rate.

The questionnaire remained largely the same to previous years with the exception of the disposal section. This section was extended to split all possible answers by product type (e.g. ready-to-use and concentrate). Additional questions were also asked to ascertain whether respondents, disposed of containers with pesticide still in the container, whether they removed the lid/cap/trigger spray handle, whether they rinsed the container before disposal and the disposal route of rinsings.

1,686 respondents of the survey used plant protection products and included gardeners in all age categories and all gardener 'types' although the majority of respondents were the keen and regular gardeners (52%) and those aged over 44 (71%). The most popular types of product purchased were weedkillers, slug/snail killers and insecticides. There were some differences in purchasing habits between different respondent locations. The majority of respondents purchased between one and two products a year again with some variations in the number of products purchased by the location of the respondent.

The most popular storage location was the garden shed (58%), followed by the garage (32%). 14% of respondents stated they used some form of safety precaution for storing plant protection products (i.e. high shelf or locked cupboard). Almost half of the respondents stored products for one to two years (46%) with a further 23% storing for less than a year.

In terms of product use, 64% of respondents stated they read the instructions on how to use the product before purchasing and 38% would read before they used the product for the first time. Websites have further increased in popularity as an additional source of information on how to use plant protection products. The majority (86%) of respondents stated the instructions for use provided with the product were clear. The majority (95%) of respondents claimed to follow the instructions either 'very closely' or 'fairly closely'. Over half of the respondents (53%) used ready-to-use products only. 29% stated they used both ready-to-use and concentrate products. The majority of respondents that used concentrate products used the measuring device / cap provided to measure the volume of concentrate product required when diluting (86%).

The majority of respondents did not dispose of excess/unwanted plant protection product before disposing of the container (80% for ready-to-use and concentrate products). For those disposing of the container with ready-to-use pesticide in the container nearly half disposed in the normal household bin (49%). For concentrate products, the majority disposed in either the normal household bin (38%) or a hazardous chemical waste disposal facility at a household waste recycling centre (HWRC) (38%).

The majority of respondents using ready-to-use plant protection products disposed of the empty container in the household recycling bin/bag used for kerbside collection (52%). 41% of respondents disposed of the empty container in the normal household bin. Similarly, the largest percentage of respondents using concentrate products disposed of the empty container in household recycling bin/bag used for kerbside collection (48%). 39% of respondents disposed of the empty container in the normal household bin.

This report set out the findings from the 2013 survey in detail, and also compares them to the 2007 and 2010 findings. The survey, including all changes made to the disposal section for 2013 can be found appended to this report.

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1. Introduction

The Chemicals Regulation Directorate (CRD) of the Health and Safety Executive (HSE) approached Resource Futures to carry out a third survey to identify the user habits of amateur plant protection product users. This follows previous surveys carried out in 2007 and 2010 to inform the CRD on user habits and disposal of plant protection products. The survey contributes to the knowledge base for continuing research and communications on amateur pesticide use by providing robust information on the purchasing, use, storage and disposal of plant protection products by domestic gardeners in the UK. The project continues to support the ongoing work of the Amateur Liaison Group (ALG) (formerly the Amateur Use Action Plan Implementation Group (AUAPIG)) which involves CRD and other stakeholders encouraging best practice in use, storage, and safe disposal of unused products and empty containers.

Importantly, the research highlights whether any changes in pesticide user habits has occurred over recent years. Where the research indicates a change in behaviour, this can support the development of communication resources to provide consumer advice on best practice.

The specific objectives of the project were:

- Conduct face to face surveys at six garden centres across the UK over one week in May;
- Develop an online version of the survey and disseminate through Amateur Liaison Group;
- Collate and analyse survey responses from both face to face and online surveys;
- Compare the results from 2013 with surveys undertaken in 2007 and 2010;
- Provide raw data to the CRD; and
- Present the findings to the Pesticides Forum and Amateur Liaison Group.

2. Background

Plant protection products are pesticides which include weedkillers, slug and snail killers (e.g. pellets), fungicides, insecticides (including acaricides), lawn treatments which contain moss killers and weedkillers, animal repellents and hormone rooting substances.

Plant protection products are regulated in the European Union (EU) by Regulation (EC) No 1107/2009 which came into force in June 2011. The regulation harmonises the overall arrangements for authorisation of plant protection products within the EU. This replaces previous EU legislation for plant protection products (Council Directive 91/414/EEC), which was implemented by the Plant Protection Product Regulations 2005. Although EU regulation applies directly in the UK, national legislation was needed to underpin its operation and to introduce new fees and charges to replace the previous fees legislation. These new provisions were implemented by the Plant Protection Products Regulations 2011, with separate legislation for Northern Ireland. The CRD is the competent authority regulating plant protection products in the UK. Further information can be found on their [website](#).

3. Methods

The questions for the 2013 survey were updated from those used in the 2007 and 2010 surveys. The introduction of the survey was amended to emphasise that respondents need to use plant protection products to take part in the survey. Table 3.1 below provides an overview of the amendments made and where appropriate, why they were made.

Table 3.1 Minor amendments to the 2013 survey questionnaire

2007/2010 Question	2013 Question	Amendment / reason
N/A	Which region do you live in?	Inclusion of additional question in the 'about you' section to capture the location of those replying to the online survey
Which types of pesticides do you use?	Unchanged	Removal of responses that do not fall under the category 'plant protection' e.g. patio cleaners, ant killers
Where do you usually buy your pesticides from?	Unchanged	Inclusion of 'internet' as an answer
Do you generally find the instructions for use on pesticides clear?	Are the instructions for use on pesticides generally clear?	Amendment to wording of the question
Do you follow the instructions for use on pesticides?	How closely do you follow the instructions for use on pesticides?	Amendment to wording of the question. Responses amended from previous yes/no to very closely/fairly closely/not very closely/not at all/hardly at all
What other places do you get information on how to use pesticides?	Other than on the product label, where do you get information on how to use pesticides?	Amendment to wording of the question
Do you tend to use ready-to-use products or products that need diluting before use?	Do you tend to use ready-to-use products or concentrate products that need diluting before use?	Slight amendment to wording of the question

In addition to the changes outlined above, the disposal section of the questionnaire was significantly updated for the 2013 survey to provide CRD with more detailed information on the disposal route of plant protection products, rinsings and containers. The disposal section now separates each answer for those that use ready-to-use, concentrate products and those that use both.

The 2013 survey took the same approach for the face to face surveys as previous years with garden centre customers asked to complete the survey over a one week period in May. In addition, an online element was introduced to increase the response rate and provide more representative data. The following sections provide a detailed method for both elements of the survey.

A copy of the questionnaire is provided at Appendix 1 with the same questions asked, for both the face to face and online surveys, to ensure a consistent approach.

3.1 Face to face surveys

3.1.1 Survey locations

Resource Futures liaised with the Horticultural Trades Association (HTA) to confirm the garden centre locations where the survey could be conducted. With the exception of Notcutts Bagshot, all the garden centres remained the same of those used for the 2010 survey.¹ The table below lists the six garden centres where the survey was carried out.

Table 3.2 Survey locations for face to face surveys in garden centres

Name of garden centre	Location of garden centre	Region of garden centre
Dobbies Garden World	Clifton, near Preston	North West England
Dobbies Garden World	Milngavie, Glasgow	Scotland
Chepstow Garden Centre	Chepstow	Wales
Notcutts	Oxford	South East England
Notcutts	Bagshot	South East England
Notcutts	Woodbridge	East of England

3.1.2 Survey implementation

The face to face survey was carried out at garden centres from Wednesday 15th May to Sunday 19th May 2013. The survey was conducted in the same week in May as the previous two surveys in 2007 and 2010. The survey was carried out between the hours of 10am and 5pm, with modification of working hours on Sunday to fit in with store opening hours. A briefing note was updated and provided to survey staff, which is provided at Appendix 2 for reference.

Questionnaires were only undertaken with garden centre shoppers that confirmed they used plant protection products in their gardens. For 2013 the total number of garden centre customers approached was recorded. A total of 3,551 customers were approached with 638 confirming they used plant protection products. A total of 2,913 respondents stated 'no' when asked whether they used plant protection products and were subsequently disqualified from the survey. However, this figure should be treated with caution as respondents may have stated 'no' in order to avoid completing the survey. The number of respondents to the face to face survey was lower than previous years (e.g. 1,050 in 2010). This lower response rate can be accounted to the single shift of survey staff working on the Saturday and Sunday compared with previous survey years in which two survey staff were onsite for the weekend.

Responses were inputted to the Snap Surveys software via Smartphone's as the respondent answered the questions. This software allowed the questionnaire to be routed automatically depending on answers to previous questions, and improved the overall flow of the survey, which reduced the risk of respondents being asked the wrong question. Completed responses were automatically emailed to a specific email address to reduce the potential for data loss. During the survey periods there were two occasions when the Smartphone's stopped working and needed to be rebooted. At these times a paper back up for the survey was used to ensure no potential respondents were lost. These responses were subsequently inputted to the Snap Survey software at the end of the survey day.

Resource Futures quality checked all data received from the face to face surveys, ensuring all routing of questions were followed, and removed surveys that had been cancelled before completion from the results.

¹ Notcutts Bagshot replaced Notcutts Tunbridge Wells as the store was undergoing a refit on the dates of the survey

3.2 Online survey

To increase the overall response rate to the survey, an online version of the questionnaire was developed using the Snap Survey software. The online survey was open for responses from Wednesday 15th May to Friday 14th June.

The online survey was advertised through various sources to ensure the maximum possible response rate. The CRD used their contacts within the Amateur Liaison Group to invite amateur users of plant protection products to respond. Advertising of the survey took the form of providing links on websites and posting tweets via Twitter. Figure 3.1 shows how the online survey was advertised on the Health and Safety Executive website with further screenshots of the how the survey was advertised provided at Appendix 3.

Figure 3.1 Link to online survey on Health and Safety Executive website



A total of 1,048 completed surveys were received from those that confirmed they used plant protection products. A further 506 respondents were disqualified from the survey as they stated they did not use plant protection products.

All responses to the online survey were uploaded straight to the Snap Survey software. Resource Futures quality checked the results received, ensuring any incomplete responses were removed from the results.

3.3 Comparison of survey results

The report includes a table comparing the results over the three survey years (2007, 2010 and 2013) in Table 7.1. The table provides analysis of differences of key variables to show whether an increase or decrease in percentages occurred between survey years indicated with arrows. Due to the response rates achieved (1,050 in 2007 and 2010, 1,686 in 2013) it should be noted that a margin of error of $\pm 3\%$ ² could be applied to these results. Therefore, percentage increases or decreases less than 6% should be treated with less confidence.

² Calculated using <http://www.raosoft.com/samplesize.html>

4. 2013 survey results

The following presents the results from the 2013 survey. The analysis includes the results of the both the face to face and online surveys. Each question has been analysed below, with comparisons made between the 2007 and 2010 surveys where applicable.

4.1 Respondent characteristics

4.1.1 Number of respondents

The first question of the survey asked respondents whether they used pesticides in their garden. For both the face to face and online surveys it was made clear to respondents that pesticides related to plant protection products only. Table 4.1 provides the total number of responses received for both the face to face and online surveys. The results show a total of 1,686 respondents (1,048 from the online survey and 638 from the face to face surveys) did use pesticides. The results show 3,419 respondents did not use pesticides. However, the figure for the face to face surveys should be treated with caution as they may have stated 'no' in order to avoid completing the survey.

Table 4.1 Do you use pesticides in your garden?

Response	Online	Face to face	Total
Yes	1,048	638	1,686
No	506	2,913	3,419
	1,554	3,551	5,105

4.1.2 Location of respondents

Respondents were asked which region they reside in from twelve possible options based on the Nomenclature of Territorial Units for Statistics (NUTS)³ subdivisions for the UK. This was a new question to the 2013 survey to capture the location of the online survey respondents. The results in Table 4.2 show some regions had notably more respondents than other regions. Those highlighted in light green below are regions in which the face to face survey took place, so therefore it is fair to say these regions have been overrepresented to some degree. Figure 4.1 shows each region has been represented within the survey results.

The largest group of respondents were from South East England (n=331, 20%), followed by North West England (n=279, 17%) and East of England (n=244, 14%). The fewest number of respondents were from Greater London (n=47, 3%) and Northern Ireland (n=7, 0.4%). One respondent did not provide an answer to this question.

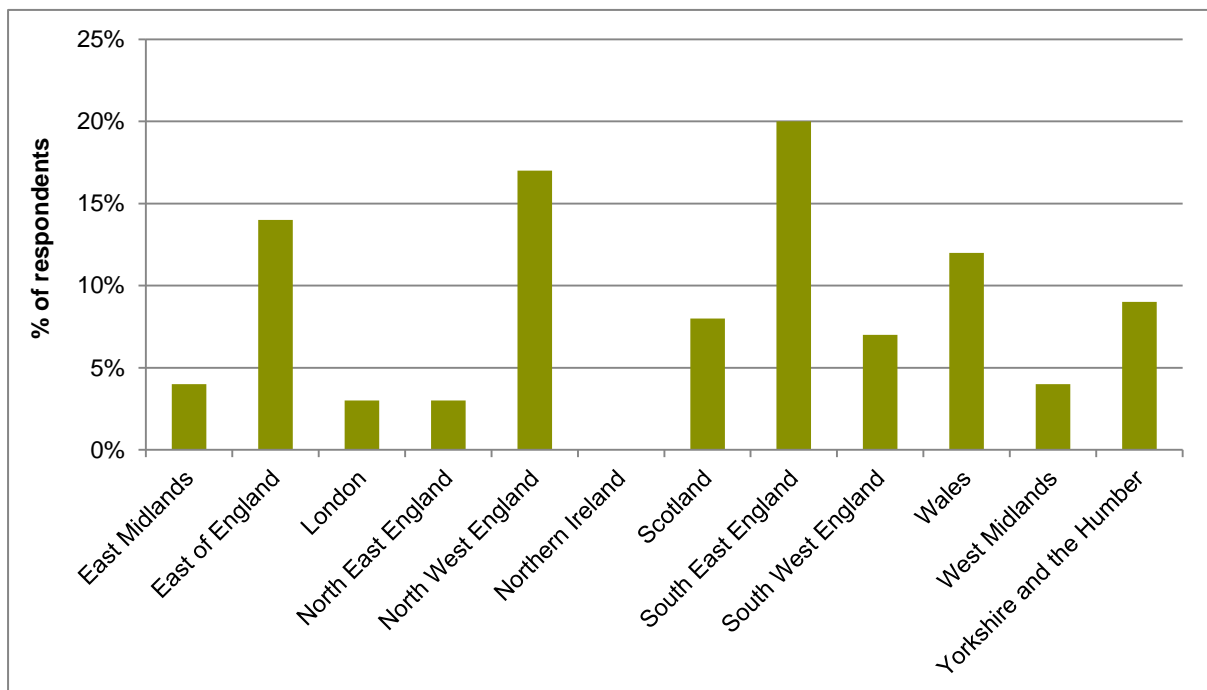
³ http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/introduction

Table 4.2 Location of respondents in 2013

Response	Frequency	Percentage
East Midlands	65	4%
East of England	244	14%
Greater London	47	3%
North East England	54	3%
North West England	279	17%
Northern Ireland	7	0%
Scotland	130	8%
South East England	331	20%
South West England	119	7%
Wales	195	12%
West Midlands	60	4%
Yorkshire and the Humber	154	9%
Not answered	1	0%

Number of respondents (n) =1,686

Figure 4.1 Location of respondents in 2013



4.1.3 Gardener type

As with previous years, respondents were asked “*which of these descriptions best describes how you feel about gardening?*” and asked to select an answer from the statements provided at Table 4.4. These descriptions were developed for the 2007 survey in consultation with the Horticultural Trades Association (HTA) and are based on the categories used by the association in their Garden Industry Monitor reports.

The thinking and definitions underlying these categories has been used in developing the attitude statements in Table 4.4, which can be seen as corresponding roughly to the HTA categories shown in Table 4.3 as follows:

- The *‘keen and regular gardener’* statement corresponds to the HTA’s *‘very keen’* and *‘quite keen’* gardener categories.
- The *‘enjoy gardening but don’t always have the time’* statement corresponds approximately to the HTA’s *‘marginal gardener’* category.
- The *‘I like to keep the garden tidy’* statement can be seen as straddling the *‘marginal gardener’* and the *‘not keen’* categories.
- The *‘gardening is a chore’* statement corresponds to the HTA’s *‘not keen’* category.

The HTA’s *‘definitely hostile’* and *‘unavailable’* categories were considered unlikely to account for much plant protection product use and, as with previous years, have not been addressed in this survey.

Table 4.3 Gardener categories from the Garden Industry Monitor

Category of Gardener	Description	Proportion of the Great Britain population
Very keen gardeners	Those who positively enjoy gardening are interested and knowledgeable and spend time pursuing what is really an established hobby.	13%
Quite keen gardeners	Those who claim to be quite interested and who make a positive claim about enjoyment. Although they actively work in their own gardens, they do not express a desire to increase the amount of gardening that they currently do.	11%
Marginal gardeners	Those who do some gardening, are not hostile to gardening and express a willingness to do more.	30%
Not keen gardeners	Those who do some gardening, but do not wish to do more, coupled with negative attitudinal responses indicating that the gardening undertaken is not because it interests them. Largely those who see gardening as a chore.	27%
Definitely hostile	Those with a place to grow outdoor plants who do very little or no gardening and who have totally negative attitudes to, or interest and enjoyment in gardening, with low knowledge and absolutely no wish to do more.	16%
Unavailable	This group does not lack interest in gardening nor do they lack knowledge. However, they do little or no gardening, possibly due to insurmountable obstacles such as health or domestic responsibilities.	3%

Source: Horticultural Trades Association, Gardening Continuum 2011 (www.the-hta.org.uk/page.php?pageid=210)

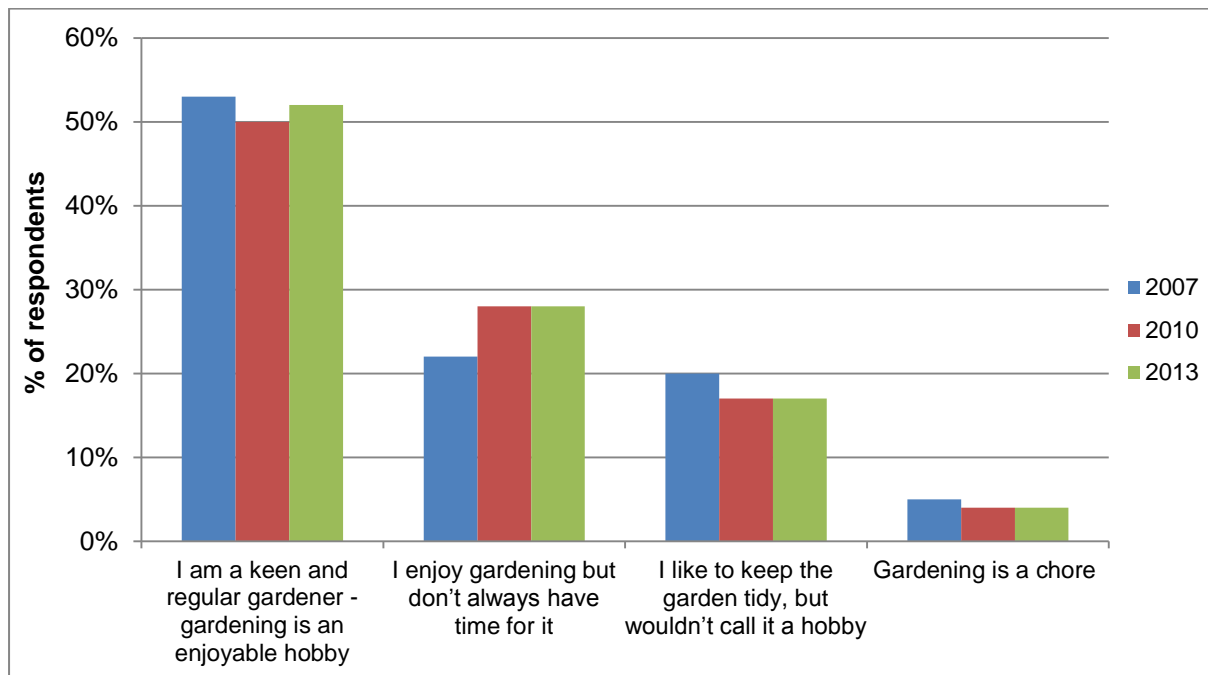
Table 4.4 and Figure 4.2 show over half of respondents felt they were keen and regular gardeners (n=870, 52%). This is similar to the past two surveys (53% in 2007 and 50% in 2010). 471 respondents (28%) stated they enjoyed gardening but did not always have time for it. This is similar to the 2010 results and an increase of 7% from the 2007 survey. The percentage of respondents that stated gardening is a chore is similar to 2007 (5%) and 2013 (4%).

Table 4.4 Attitudes to gardening in 2013

Response	Frequency	Percentage
I am a keen and regular gardener – gardening is an enjoyable hobby	870	52%
I enjoy gardening but don't always have time for it	471	28%
I like to keep the garden tidy, but wouldn't call it a hobby	281	17%
Gardening is a chore	62	4%
Not answered	2	0%

n=1,686

Figure 4.2 Comparison of attitudes to gardening in 2007, 2010 and 2013



4.1.4 Home and allotment gardening

Respondents were asked where they garden, with the possible options provided at Table 4.5. As with previous years the majority of respondents stated they carry out their gardening at home (n=1,643, 97%). A further 199 respondents (12%) stated they garden at an allotment. This question also received 63 answers in the 'other' category. The highest share of the 'other' answers could be categorised as gardening for a family member, friend or neighbour (17 out of 46 that provided a specific answer). However, answers also included school gardens and voluntary work at community gardens. Respondents could answer 'yes' to more than one garden location and therefore the overall percentages for the question are higher than 100%.

The percentage of respondents gardening at home in 2013 (97%) remains similar to the 2010 survey (99%). However, there has been an increase in the percentage of respondents that garden at an allotment, from 4% in 2007 and 2010 to 12% in 2013. This increase could be associated with wider trends of people increasing the amount of food they grow themselves.

Table 4.5 Home and allotment gardening in 2013

Response	Frequency	Percentage
Garden at home	1,643	97%
Allotment	199	12%
Other (including friend or relative's garden)	63	4%

Multiple answers n=1,686, total responses=1,905

4.1.5 Age bracket

The age profile of the respondents was also recorded as part of the surveys. Table 4.6 and Figure 4.3 shows the majority of respondents were aged between 45 and 64 (n=842, 50%). As with previous years the least represented age bracket was 16 to 24 (n=18, 1%).

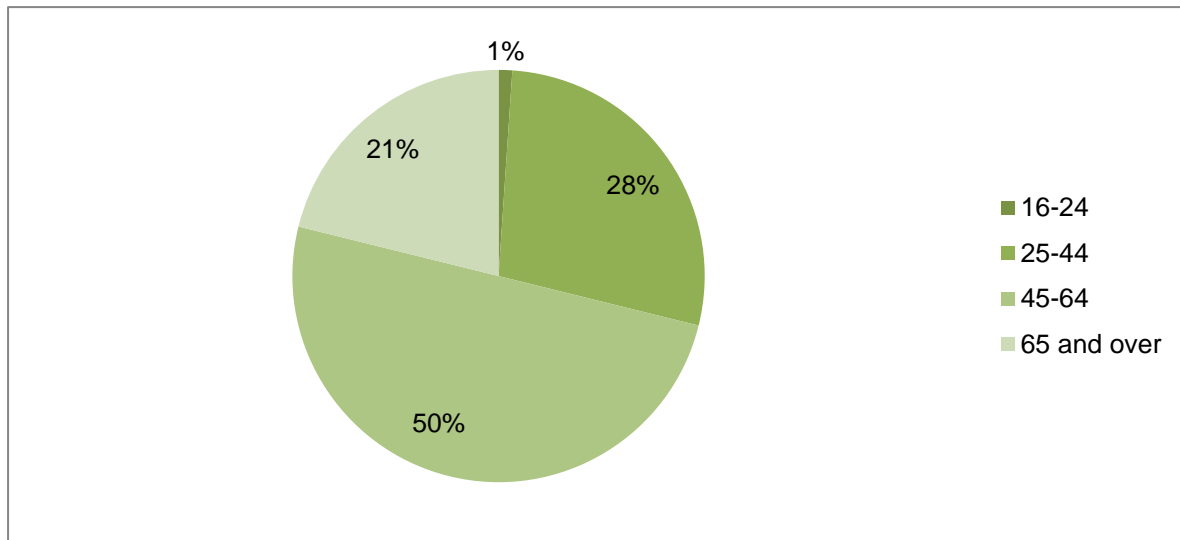
The percentage of respondents in the 25-44 age bracket (28%) shows an increase from the 2010 survey (20%). The percentage of respondents in the 45-64 age bracket (50%) has remained largely the same (46% in 2010) but the percentage of respondents aged 65 and over has decreased from 34% in 2010 to 21% in 2013. This could be a result of including an online version of the survey, which was advertised via social media sites capturing a wider age range than surveying only at garden centres.

Table 4.6 Age profile of respondents in 2013

Response	Frequency	Percentage
16-24	18	1%
25-44	468	28%
45-64	842	50%
65 and over	356	21%
Not answered	2	0%

n=1,686

Figure 4.3 Percentage of age profile of respondents in 2013



4.2 Purchasing habits

4.2.1 Types of product

The survey respondents were asked about the type of products they used. As can be seen from Table 4.7 the most popular products were weedkillers (n=1,121, 66%), slug/snail killers (n=1,094, 65%) and insecticides (n=737, 44%). Figure 4.4 shows a general increase of each type of plant protection product used (with the exception of lawn treatments and slug/snail killers). The chart shows a continued increase in the percentage of respondents using weedkillers from 50% in 2007 to 66% in 2013.

The percentage of respondents that used insecticides shows a considerable increase from the 2010 survey (18%) to 44% in 2013. This reverses the trend seen between the 2007 and 2010 surveys in which the percentage of insecticides decreased from 23% to 18%.

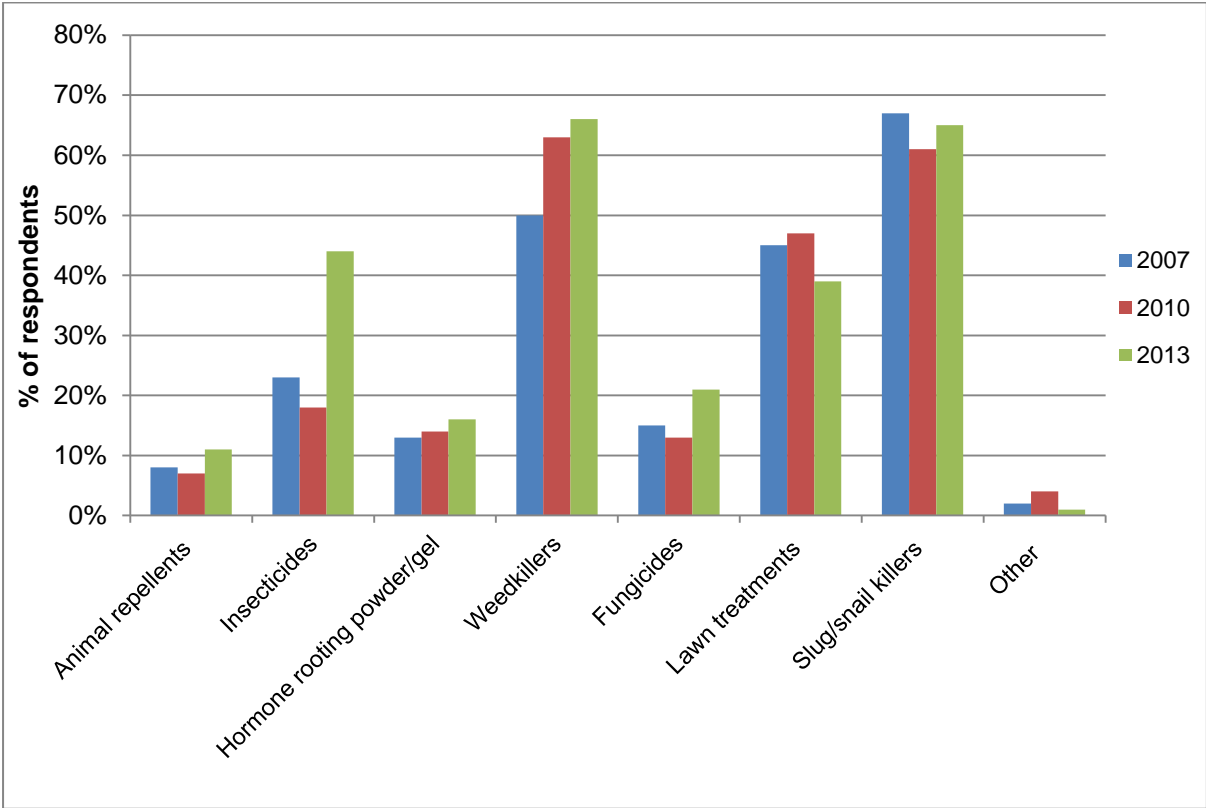
It should be noted that the number of product type options available to respondents decreased for the 2013 survey to ensure that only plant protection products were included in the results. However, it is unlikely this change in product type answers available to respondents would have an effect on the response type received as the main product types have remained the same.

Table 4.7 Plant protection product types used in 2013

Response	Frequency	Percentage
Animal repellents (to protect planted areas)	178	11%
Insecticides (to control plant pests) (not general house fly sprays)	737	44%
Hormone rooting powder/gel	272	16%
Weedkillers	1,121	66%
Fungicides (to control plant diseases)	350	21%
Lawn treatments (containing moss killers and/or weedkillers)	661	39%
Slug/snail killers (e.g. pellets)	1,094	65%
Other	22	1%

Multiple answers n=1,686, total responses=4,435

Figure 4.4 Comparison of plant protection product types used in 2007, 2010 and 2013



4.2.2 Quantities of products purchased

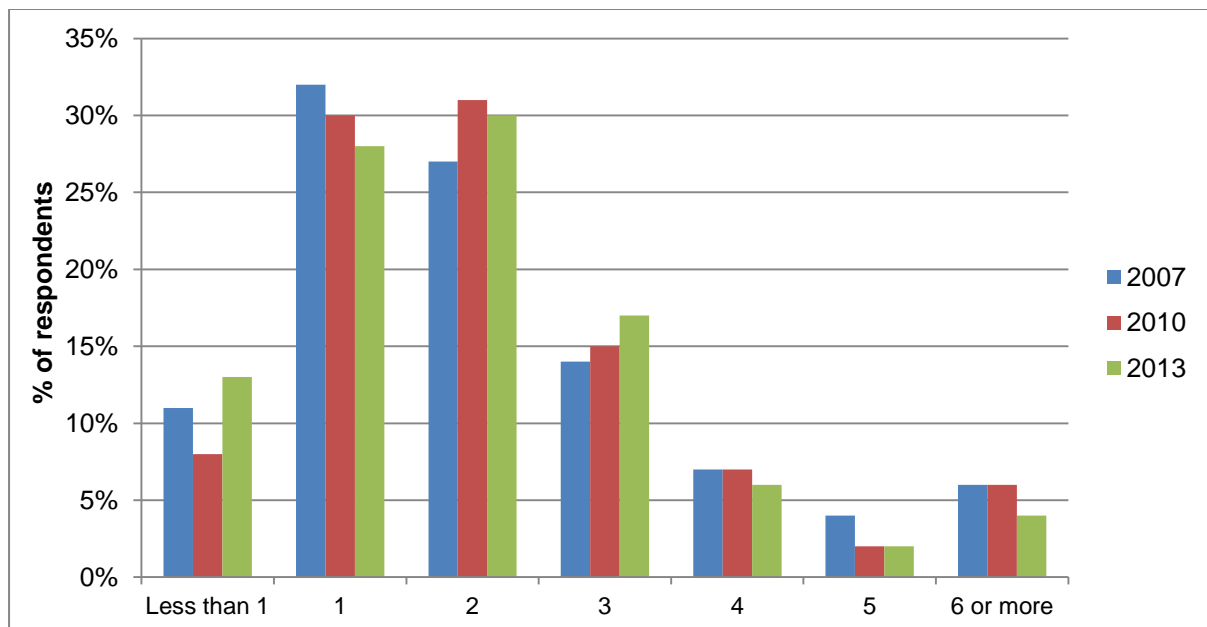
Respondents were asked how many plant protection products they purchased each year. Table 4.8 and Figure 4.5 show the majority of people buy one or two products per year. The figures for 2013 fairly closely match those for the 2007 and 2010 surveys, with the biggest difference being an increase in the percentage of respondents that purchased less than one plant protection product per year (from 8% in 2010 to 13% in 2013). Just 4% of respondents stated they purchased six or more products per year.

Table 4.8 Responses in 2013 for number of plant protection products purchased per year

Response	Frequency	Percentage
Less than 1	212	13%
1	468	28%
2	508	30%
3	280	17%
4	100	6%
5	39	2%
6 or more	71	4%
Not answered	8	0%

n=1,686

Figure 4.5 Comparison of number of plant protection products used in 2007, 2010 and 2013



4.2.3 Purchase locations

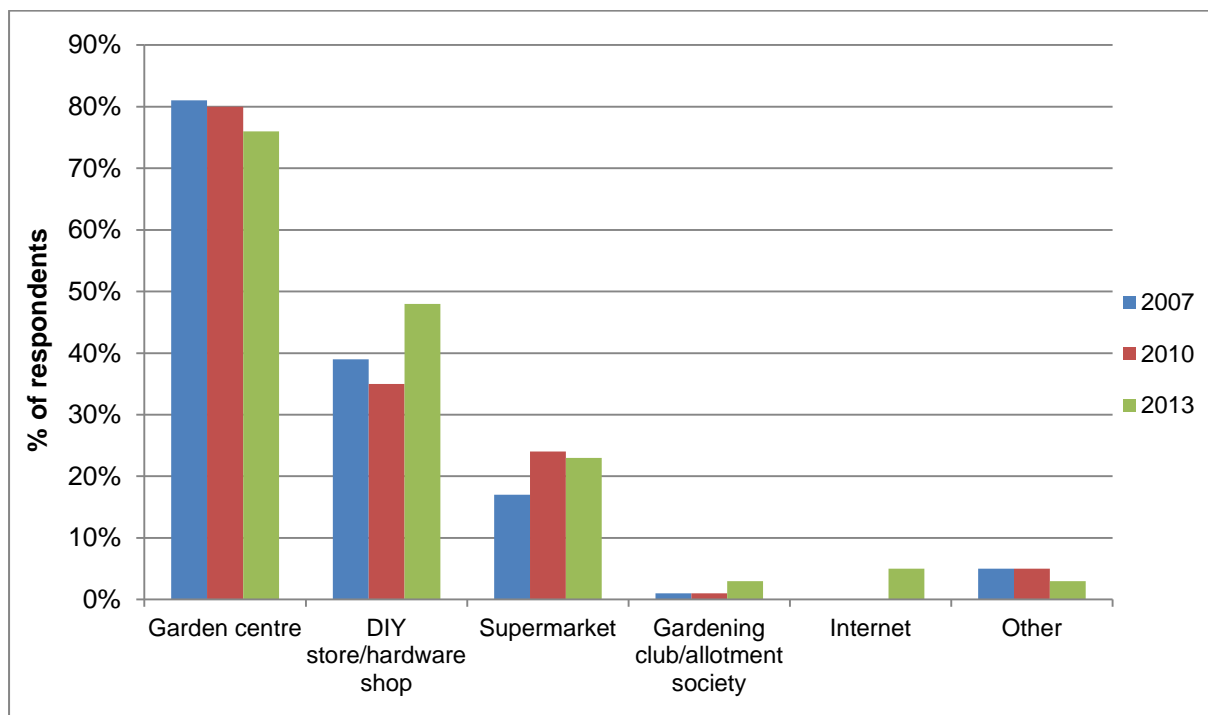
Respondents were asked where they normally bought plant protection products from. The most popular response was garden centre (n=1,276, 76%) followed by DIY store/hardware store (n=806, 48%). One comment made within the 2010 report was that the percentage of respondents purchasing pesticides from garden centres may be impacted by the surveys taking place at garden centres. With the additional results received via the online survey for 2013, it can be seen in Figure 4.6 that this may be true with a slight decrease in the percentage purchasing from garden centres between 2007 (81%) and 2013 (76%). However, these results should be treated with caution as an 'internet' option was provided for the first time this year accounting for 5% of respondents. Figure 4.6 does show an increase in the purchase of pesticide products from DIY stores/hardware shops (from 35% in 2010 to 48% in 2013).

Table 4.9 Main purchase locations for plant protection products in 2013

Response	Frequency	Percentage
Garden centre	1276	76%
DIY store/hardware shop	806	48%
Supermarket	393	23%
Gardening club or allotment society	50	3%
Internet	91	5%
Other	55	3%
Not answered	2	0%

Multiple answers n=1,686, total responses=2,673

Figure 4.6 Comparison of main purchase locations for plant protection products in 2007, 2010 and 2013



4.3 Storage

4.3.1 Storage location

Respondents were asked to provide the location where they store their plant protection products. Multiple answers could be selected for this question and therefore the total percentage in Table 4.10 is over 100%. The results show the most common location is the shed (n=971, 58%) followed by garage (n=546, 32%) and greenhouse (n=200, 12%). 14% of respondents stated some form of safety precaution such as a high shelf or locked cupboard, which is an improvement from 2010 when only 4% of respondents stored products out of reach of children and pets. This is similar to the 2007 results of 11%.

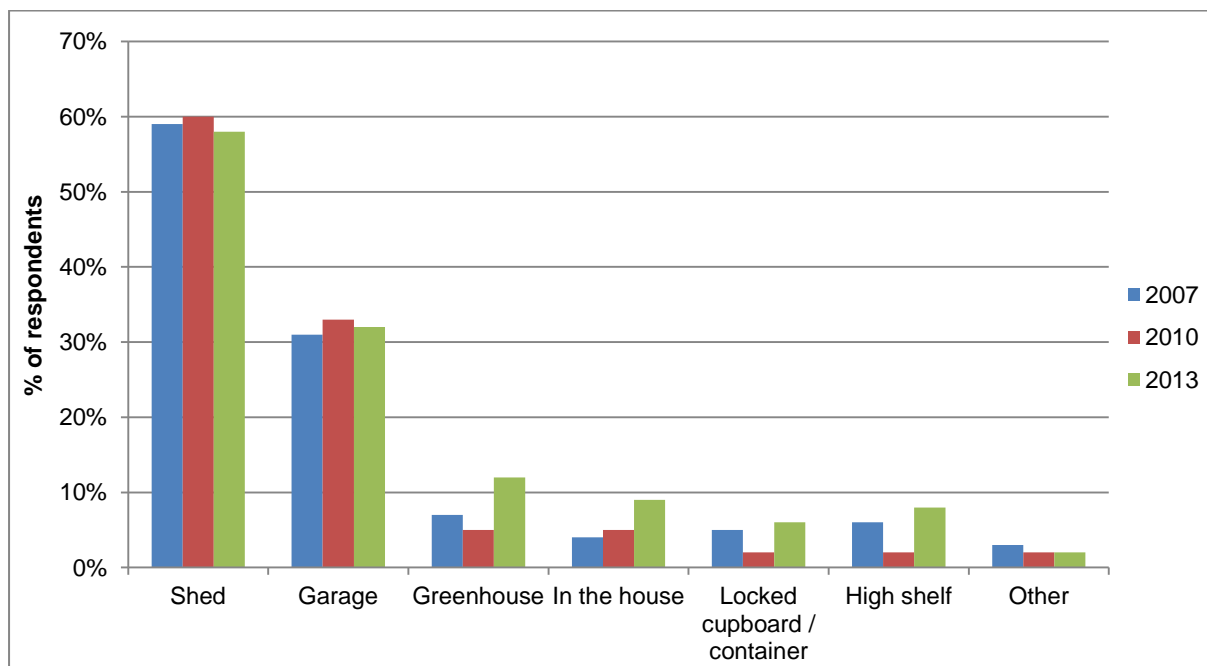
Figure 4.7 shows the comparison between the survey years showing the percentage of those storing in the shed, house or garage has remained largely the same. However, a slight increase from 5% in 2010 to 12% in 2013 can be seen in the percentage of respondents storing products in a greenhouse. Plant protection products are best stored at an even temperature. Storage in greenhouses (and sheds) is not considered to be good practice as temperatures can be very high in summer and very low in winter.

Table 4.10 Storage locations for plant protection products in 2013

Response	Frequency	Percentage
Shed	971	58%
Garage	546	32%
Greenhouse	200	12%
In the house	155	9%
Locked cupboard / container	104	6%
High shelf	137	8%
Other	29	2%

Multiple answers n=1,686, total responses=2,142

Figure 4.7 Comparison of storage locations for plant protection products (2007, 2010 and 2013)



4.3.2 Length of storage

Respondents were asked how long they stored plant protection products for before disposing of them. As shown in Table 4.11, the most common length of time products were stored for was for one to two years (n=783, 46%), which is similar to 2010 (46%). A further 329 respondents (20%) stored products for two to three years. Under a quarter of respondents stored products for less than a year (n=383, 23%).

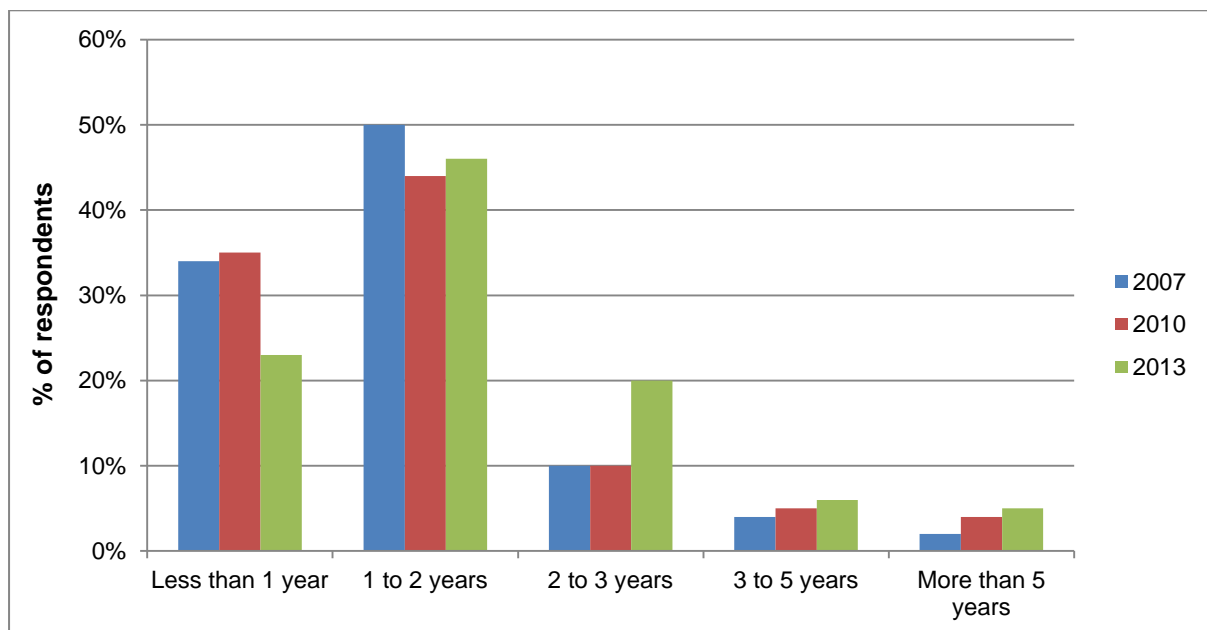
The biggest change in length of storage was seen for those storing for less than 1 year. In 2007 this figure was 34%, and 35% in 2010, decreasing to 23% in 2013 (a drop of 12% from 2010).

Table 4.11 Length of storage of plant protection products in 2013

Response	Frequency	Percentage
Less than 1 year	383	23%
1 to 2 years	783	46%
2 to 3 years	329	20%
3 to 5 years	102	6%
More than 5 years	82	5%
Not answered	7	0%

n=1,686

Figure 4.8 Comparison of length of storage of plant protection products in 2007, 2010 and 2013



4.4 Use

4.4.1 Product instructions

Respondents were asked three questions on product instructions as in previous years. However, as noted in Section 3 the questions have been slightly amended in this section for 2013. Respondents were asked:

- When do you read the instructions for use on pesticides?
- Are the instructions for use on pesticides generally clear?
- How closely do you follow the instructions for use on pesticides?

The possible answers for the first two questions on product instructions remain the same as previous survey years (2007 and 2010). However, the choice of responses for how closely respondents follow instructions has been amended from a yes/no response to understand whether instructions are followed very closely, fairly closely, not very closely or not at all/hardly at all.

As some gardeners may, for example, have read the instructions before purchase and again before use, respondents were allowed to give multiple answers to the first question. Overall, 64% of respondents read the instructions before purchase, with this remaining the same as the 2010 survey. 38% of respondents stated they read the instructions before using for the first time, an increase from the 2010 survey (29%). 29% of respondents also stated they read the instructions before using every time, an increase from the 13% reported in 2010. Figure 4.9 shows a clear trend of respondents reading the instructions more often after purchase than previous surveys.

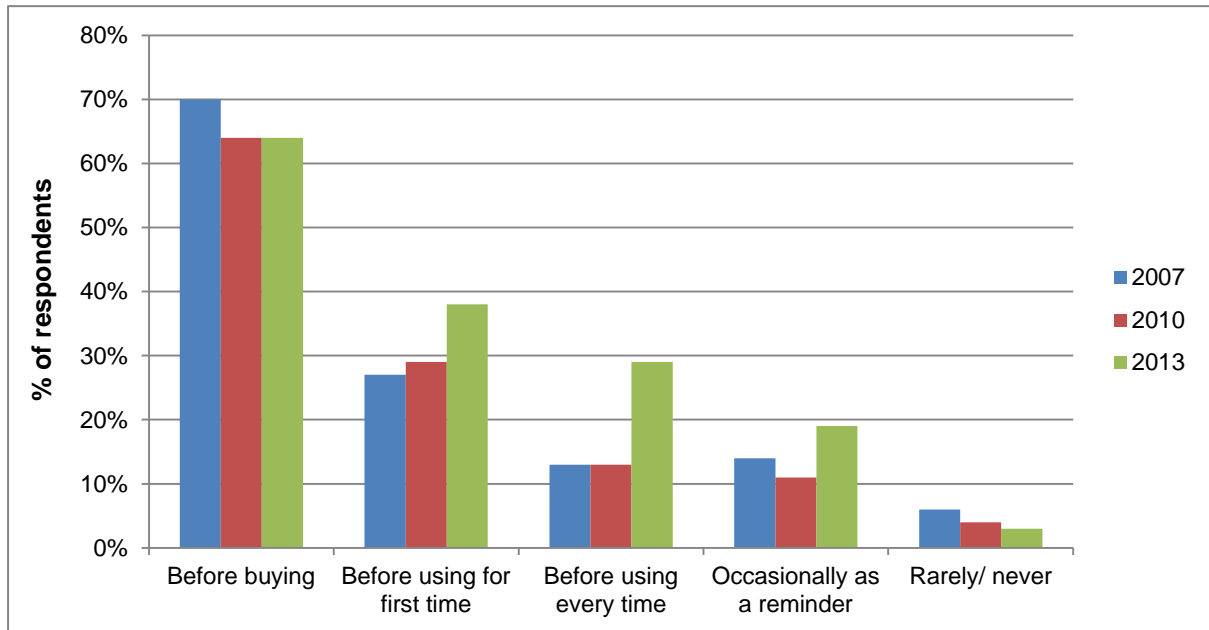
The overall percentage of people that rarely or never read the product instructions remains low (6% in 2007, 4% in 2010 and 3% in 2013).

Table 4.12 Reading of plant protection product instructions in 2013

Response	Frequency	Percentage
Before buying	1082	64%
Before using for first time	639	38%
Before using every time	482	29%
Occasionally as a reminder	317	19%
Rarely/ never	59	3%

Multiple answers n=1,686, total responses=2,579

Figure 4.9 Comparison of reading of plant protection product instructions in 2007, 2010 and 2013



Respondents were asked whether the instructions on how to use the product were generally clear. Table 4.13 shows the majority (n=1,458, 86%) believed the instructions were clear. 92 respondents (5%) stated they did not find the instructions clear with a further 129 (8%) unsure.

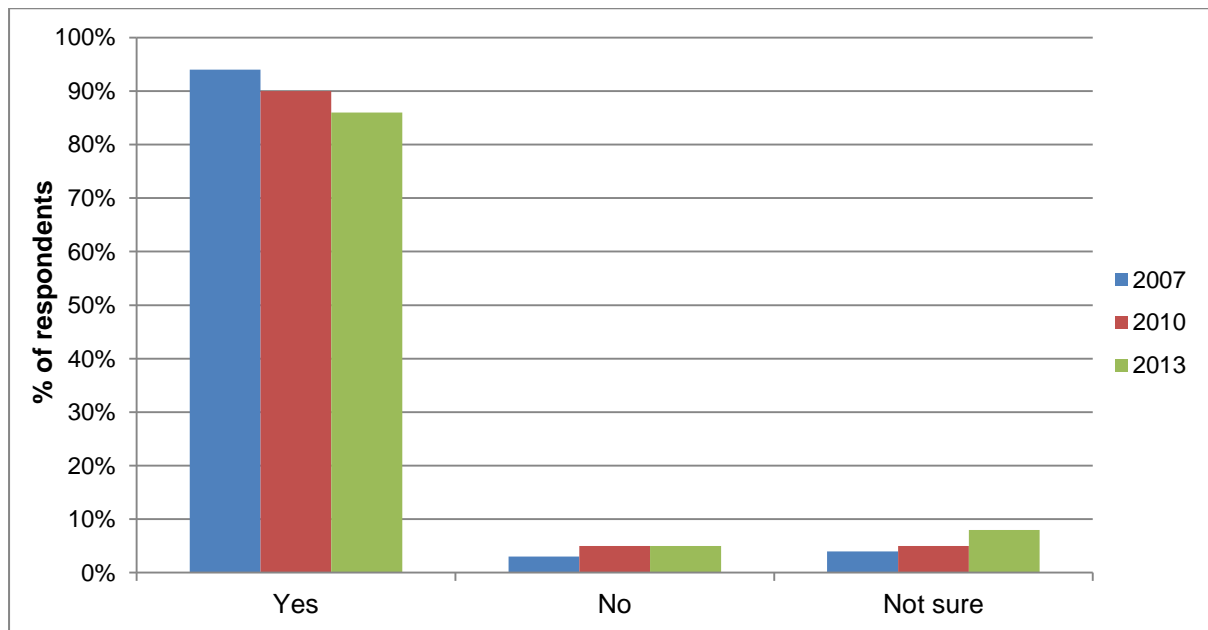
When compared with previous survey years (2007 and 2010) in Figure 4.10 it can be seen that the percentage of respondents stating they find the instructions clear has decreased slightly from 94% in 2007 and 90% in 2010 to 86% in 2013.

Table 4.13 Perceptions of instruction clarity on plant protection product labels in 2013

Response	Frequency	Percentage
Yes	1458	86%
No	92	5%
Not sure	129	8%
Not answered	7	0%

n=1,686

Figure 4.10 Comparison of perceptions of instruction clarity on plant protection product labels in 2007, 2010 and 2013



When asked how closely respondents followed instructions, over half of the respondents (n=865, 51%) stated 'very closely', followed by 750 respondents (44%) that stated they followed the instructions 'fairly closely'. Table 4.14 and Figure 4.11 show only 51 respondents (3%) did not follow the instructions very closely and 15 (1%) did not follow the instructions at all.

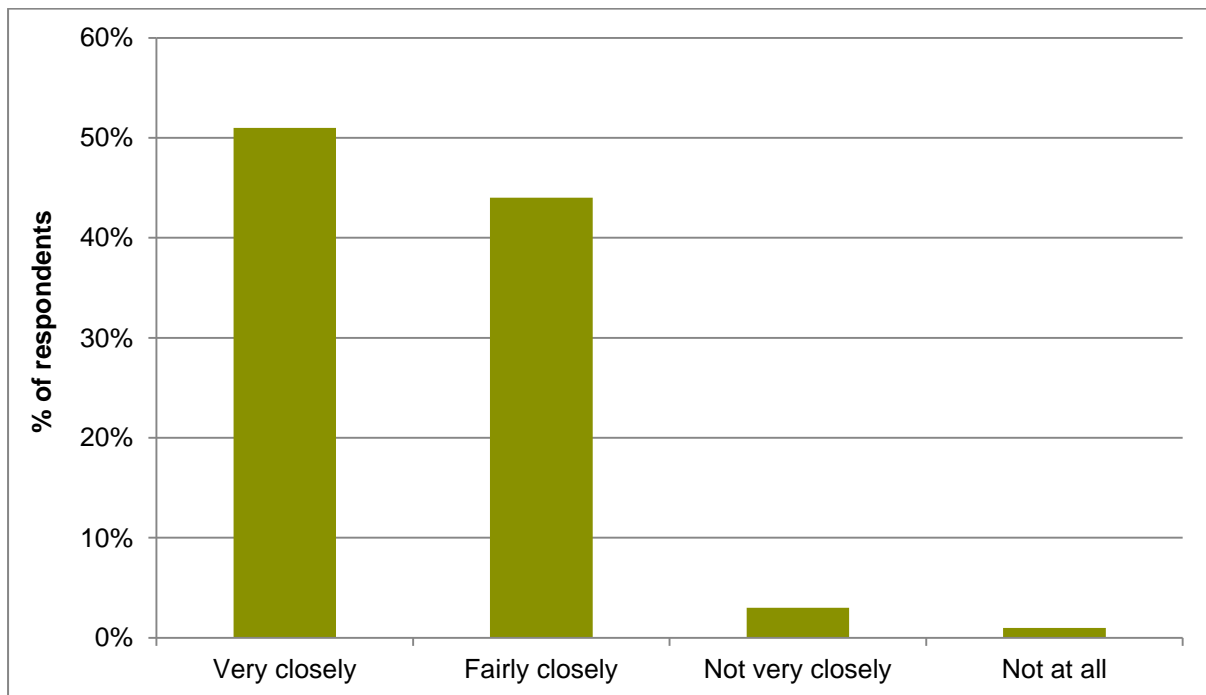
The possible answers to this question were amended for the 2013 survey so a direct comparison to previous survey years (2007 and 2010) is not possible. In previous survey years the options available were either 'yes', 'no' or 'sometimes'. From Table 4.14 it can be assumed that 95% of respondents would have answered 'yes' in previous years. This is similar to 92% in 2010.

Table 4.14 Following plant protection product instructions in 2013

Response	Frequency	Percentage
Very closely	865	51%
Fairly closely	750	44%
Not very closely	51	3%
Not at all	15	1%
Not answered	5	0%

n=1,686

Figure 4.11 Following plant protection product instructions in 2013



4.4.2 Other sources of information used

Respondents were asked which other sources of information they look to other than the product label when trying to find information on safe pesticide usage. Table 4.15 shows websites are the most popular source of information after the product label (25%). Table 4.16 provides more detail on the specific sources of information for the most popular responses. For websites, RHS was cited most frequently by respondents (23%), followed by the Google search engine (21%). The second most common source of information was magazines, followed by other gardeners. Most popular magazines cited were *BBC Gardener's World* (33%) and *RHS The Garden* (22%).

Figure 4.12 provides a comparison of the sources of information with the 2007 and 2010 results. The chart shows websites have continued to grow in popularity as a source of information, almost doubling with each survey (8% in 2007, to 14% in 2010, and 25% in 2013). The percentage of respondents stating magazines as a source of information in 2013 (13%) has increased from 2010 (8%) and now reflects the 2007 results (13%). It should be noted that the percentage of respondents stating 'other gardeners' (12%) as a source of information has increased from 2010 (4%), with Table 4.16 showing friends and family as the most common answer.

Table 4.15 Other sources of information used in 2013 for plant protection products

Response	Frequency	Percentage
Websites	415	25%
Magazines	226	13%
Leaflets	68	4%
Books	105	6%
TV	130	8%
Radio	60	4%
Gardening advice helpline	16	1%
Product company helpline	21	1%
Garden centre staff	140	8%
Other gardeners	205	12%
Other	85	5%
None	784	47%

Multiple answers n=1,686, total responses=2,256

Figure 4.12 Comparison of other sources of information used for plant protection products in 2007, 2010 and 2013

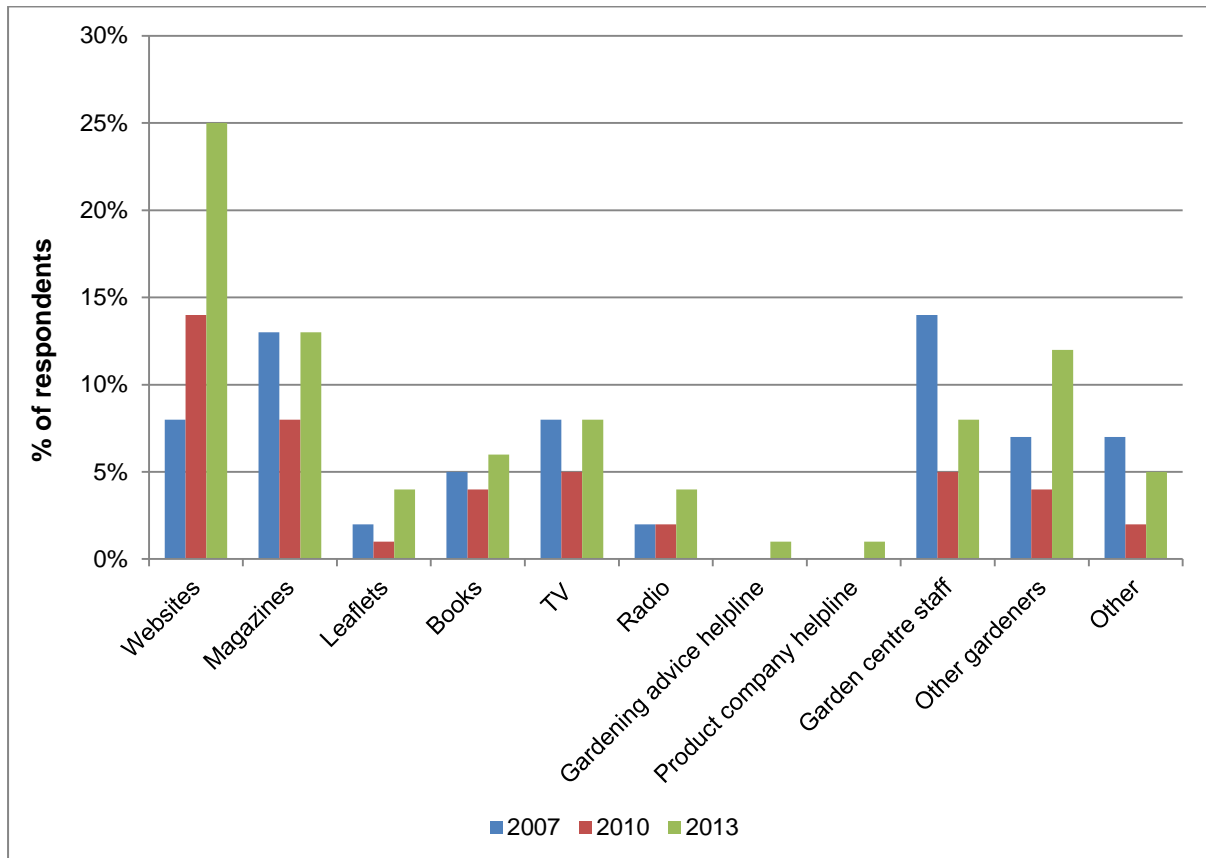


Table 4.16 Specific source of information used in 2013 for plant protection products

Category	Total in category	Specific responses	Number of responses	Percentage of category
Websites	415	RHS Google Product/manufacture's website Gardening sites	95 88 58 23	23% 21% 14% 6%
Magazines	226	BBC Gardeners World RHS The Garden Which? Gardening Garden News	74 49 8 6	33% 22% 4% 3%
Books	105	RHS books Expert range	15 8	14% 8%
TV	130	BBC Gardener's World TV adverts	57 14	44% 11%
Other gardeners	205	Friends / family Allotment users Neighbours	100 27 22	49% 13% 11%
Garden centre staff	140	B&Q Dobbies Notcutts	9 7 6	6% 5% 4%

4.4.3 Ready-to-use and concentrate products

As with previous years, respondents were asked whether they used ready-to-use products, concentrate products that need diluting or both types of products. 889 respondents (53%) stated they only used ready-to-use products, 303 respondents (18%) stated they only used concentrate products and 494 respondents (29%) used both types of products.

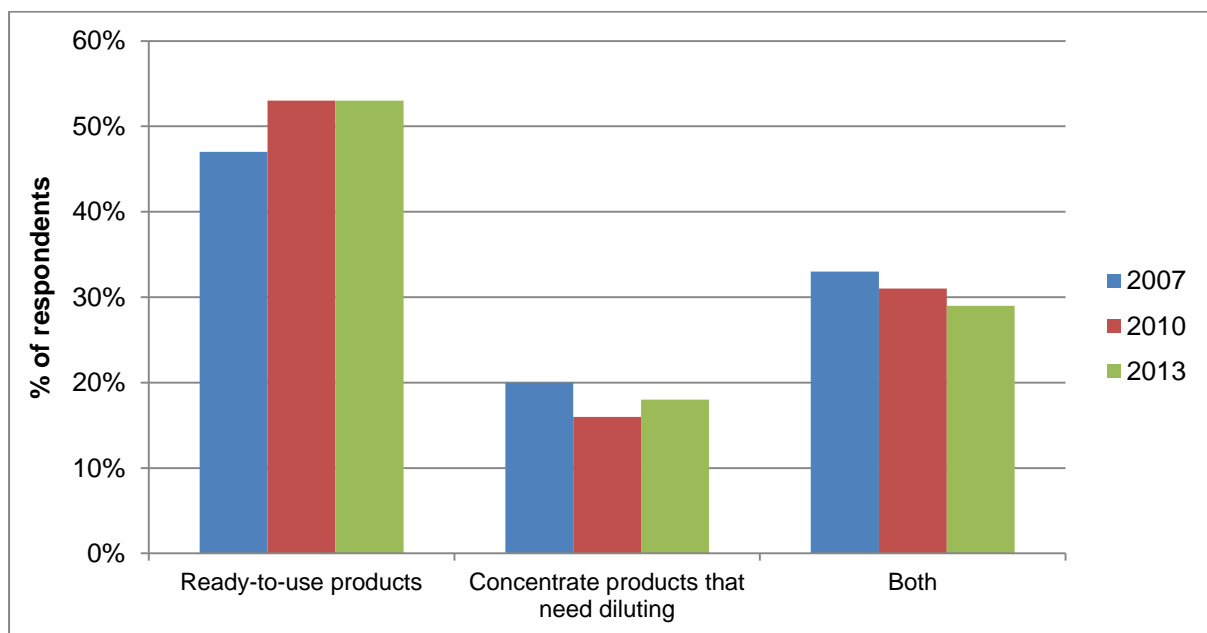
The percentage of respondents using ready-to-use products remains consistent with the 2010 survey at 53%. Figure 4.13 shows a slight decrease in the percentage of respondents using both types of product (29%) since 2007 (33%).

Table 4.17 Ready-to-use and concentrate products used in 2013

Response	Frequency	Percentage
Ready-to-use products	889	53%
Concentrate products that need diluting	303	18%
Both	494	29%

n=1,686

Figure 4.13 Comparison of use of ready-to-use and concentrate products in 2007, 2010 and 2013



4.4.4 Measuring concentrate products

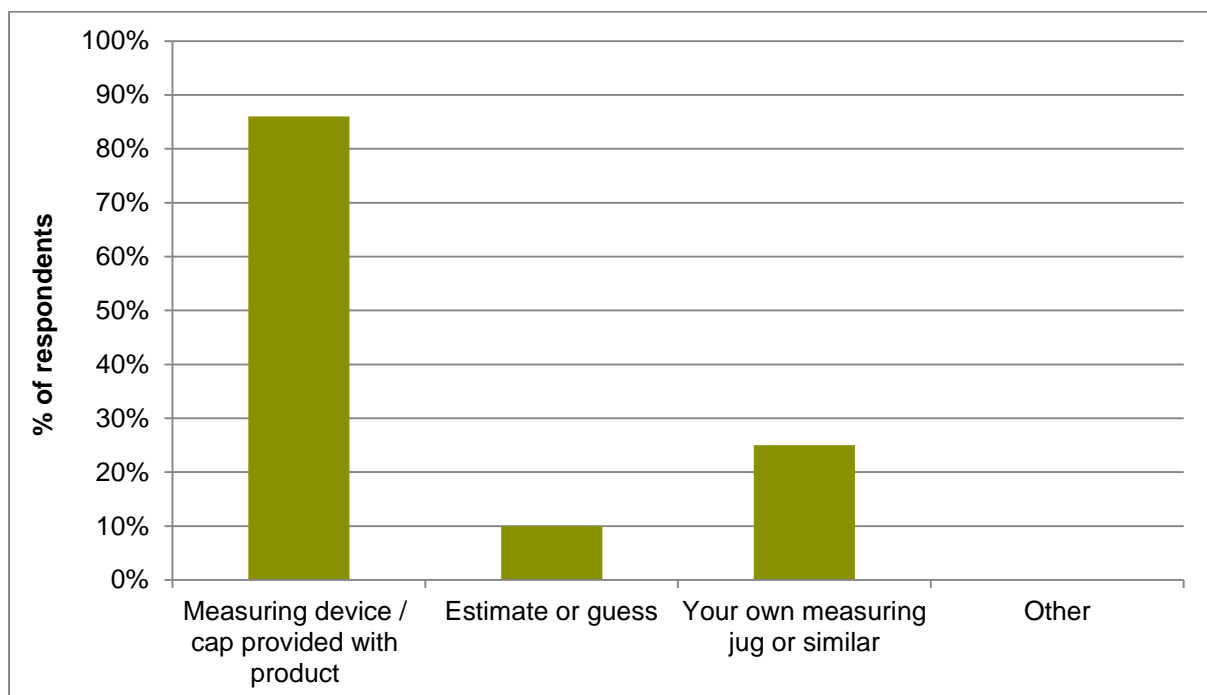
Respondents that stated they used concentrate products were then asked how they measured the product when diluting it. An additional response was included to this year's survey for those measuring using 'your own measuring jug or similar.' Respondents could state more than one answer to this question and therefore the percentages total over 100%. The majority of respondents (n=686, 86%) stated they used the measuring device / cap provided with the product. This is a slight decrease from the 2010 survey where 91% of respondents stated they used the measuring device / cap provided with the product. This is followed by 204 respondents (26%) that stated they use their own measuring jug or similar. This response includes 12 responses originally provided in the 'other' category which included using a syringe or measuring cylinder. Only 81 (10%) respondents stated they estimated or guessed how much concentrated product should be used when diluting. This is similar to previous years when 8% in 2010, and 10% in 2007 estimated or guessed the amount of concentrate product to be diluted.

Table 4.18 Measurement methods used in 2013 when diluting concentrate plant protection products

Response	Frequency	Percentage
Measuring device / cap provided with product	686	86%
Estimate or guess	81	10%
Your own measuring jug or similar	204	26%
Other	3	0%

n=797 (not asked = 889)

Figure 4.14 Measurement methods used in 2013 when diluting concentrate plant protection products



4.5 Disposal

4.5.1 Disposing of unused/excess diluted concentrate spray solution

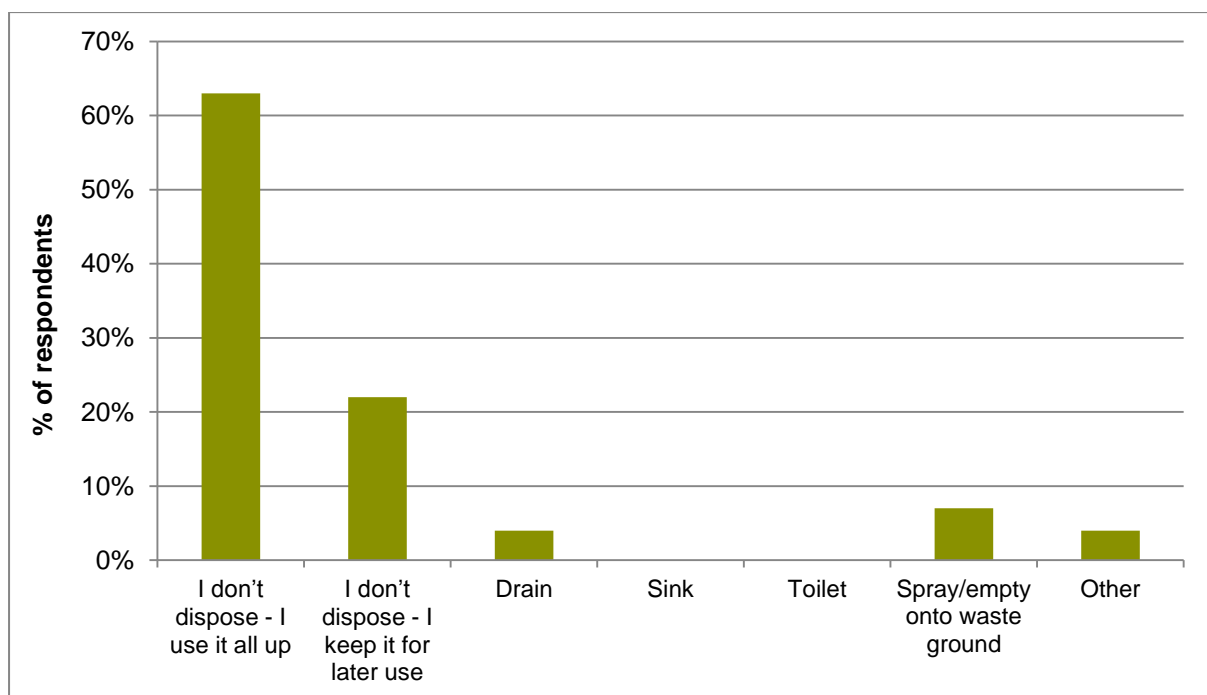
For respondents that used concentrate products a separate question was asked to ascertain the disposal method for any unused/excess diluted concentrate spray solution. This question was asked generally last year for all types of pesticide product rather than specific ready-to-use or concentrate products. Therefore a comparison between the results is not possible. However, Table 4.19 and Figure 4.15 show the majority (n=499, 63%) did not dispose of diluted product and used it all up. A further 178 respondents (22%) stated they did not dispose of diluted spray solution and kept it for later use. Table 4.19 also shows 53 respondents (7%) sprayed/emptied solution onto waste ground and 33 (4%) disposed of the solution down the drain. Of the 28 responses received in the 'other' category to this question, 16 misunderstood the question and provided an answer for how they disposed of the container rather than the excess diluted concentrate spray solution.

Table 4.19 Disposal of unused/excess diluted concentrate spray solution (2013)

Response	Frequency	Percentage
I don't dispose - I use it all up	499	63%
I don't dispose - I keep it for later use	178	22%
Drain	33	4%
Sink	2	0%
Toilet	2	0%
Spray/empty onto waste ground	53	7%
Other	28	4%
Not answered	3	0%

n=797 (not asked = 889)

Figure 4.15 Disposal of unused/excess diluted concentrate spray solution (2013)



Depending on the type of product respondents used, they were then asked how they disposed of unused/unwanted pesticide before disposing of the container. For ready-to-use products, Table 4.20 and Figure 4.16 show the majority (n=1,112, 80%) did not have any excess and used the entire product up. This is followed by 164 respondents (12%) that stated they disposed of any unused/unwanted product with the bottle. 36 respondents (3%) sprayed/emptied solution onto waste ground, 26 (2%) disposed of down the drain and 6 disposed of down the sink.

Table 4.20 Disposal of unused/unwanted ready-to-use pesticide before disposing of the container in 2013

Response	Frequency	Percentage
I don't - I dispose of it WITH the bottle	164	12%
I don't have any excess – I use it all up	1,112	80%
Drain	26	2%
Sink	6	0%
Toilet	0	0%
Spray/empty onto waste ground	36	3%
Other	39	3%

n=1,383 (not asked = 303)

The same question was asked to respondents that stated they used concentrate products. Similarly to ready-to-use products, Table 4.21 and Figure 4.16 shows the majority (n=635, 80%) of respondents did not have any excess product left as they used it all up. This was followed by 82 (10%) respondents that stated they disposed of the pesticide with the bottle. 24 respondents (3%) sprayed/emptied onto waste ground, 23 (3%) poured down the drain and 1 respondent disposed of pesticide down the sink.

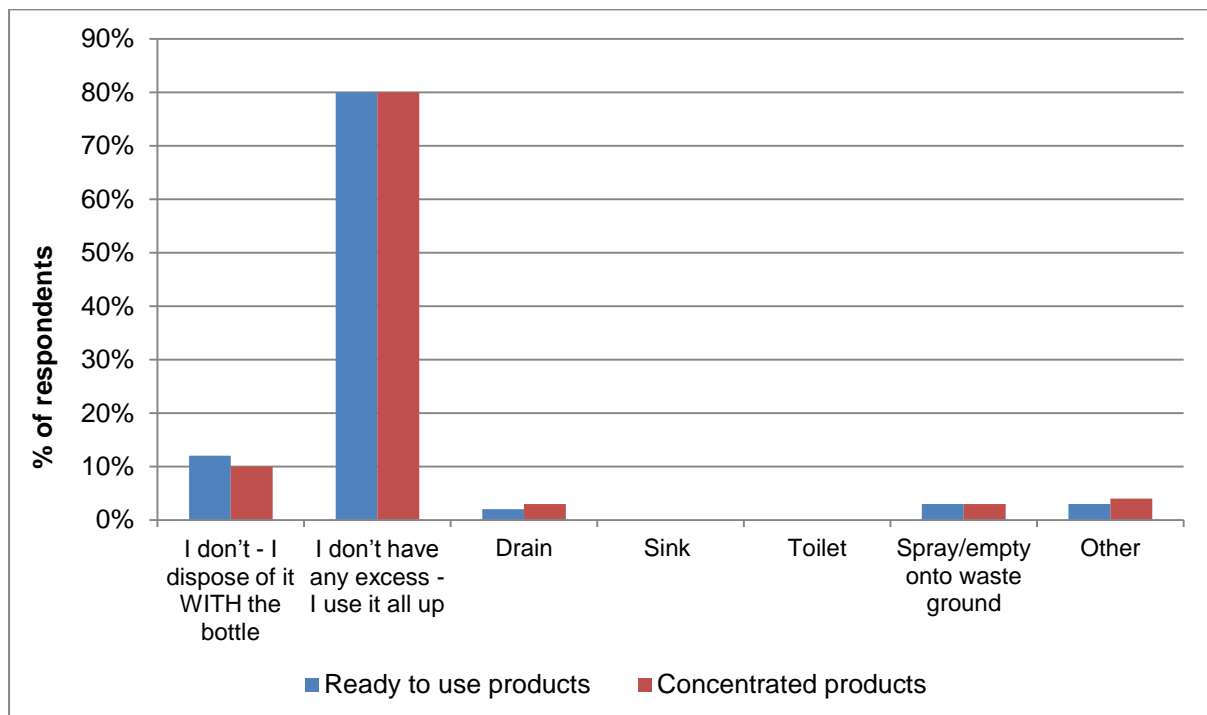
When comparing results for ready-to-use and concentrate products in Figure 4.16 it can be seen that similar disposal methods for unused/unwanted pesticide are used for both product types.

Table 4.21 Disposal of unused/unwanted concentrate pesticide before disposing of the container (2013)

Response	Frequency	Percentage
I don't - I dispose of it WITH the bottle	82	10%
I don't have any excess – I use it all up	635	80%
Drain	23	3%
Sink	1	0%
Toilet	0	0%
Spray/empty onto waste ground	24	3%
Other	29	4%
Not answered	3	0%

n=797 (not asked = 889)

Figure 4.16 Disposal of unused/unwanted ready-to-use and concentrate pesticide before disposing of the container (2013)



4.5.2 Disposing of containers with pesticide still in the container

For respondents that disposed of ready-to-use products with pesticide still in the container (n=164) a follow on question was asked to ascertain the disposal route. More than one answer could be selected from the options provided in Table 4.22. The results in Table 4.22 and Figure 4.17 show the most common disposal route was the normal household bin (n=81, 49%), followed by hazardous chemical waste disposal facility at an household waste recycling centre (HWRC) (n=35, 21%). Other common responses included household recycling bin/bag collected from the kerbside (n=27, 16 %) and landfill via a HWRC (n=26, 16%).

Table 4.22 Disposal of ready-to-use containers with pesticide still in the container (2013)

Response	Frequency	Percentage
Normal household bin	81	49%
Household recycling bin/bag (kerbside / street collection)	27	16%
Landfill - tip / local authority waste site / HWRC	26	16%
Plastic recycling - tip / local authority waste site / HWRC	16	10%
Glass recycling - tip / local authority waste site / HWRC	3	2%
Hazardous chemical waste disposal facility - tip / local authority waste site / HWRC	35	21%
Hazardous chemical waste disposal facility - doorstep collection by local authority	4	2%
Plastic recycling point (supermarkets / car parks etc.)	5	3%
Glass recycling point (supermarkets / car parks etc.)	0	0%
Burn e.g. bonfire	0	0%
Other	1	1%

Multiple answers n=164 (not asked = 1,522) total responses=198

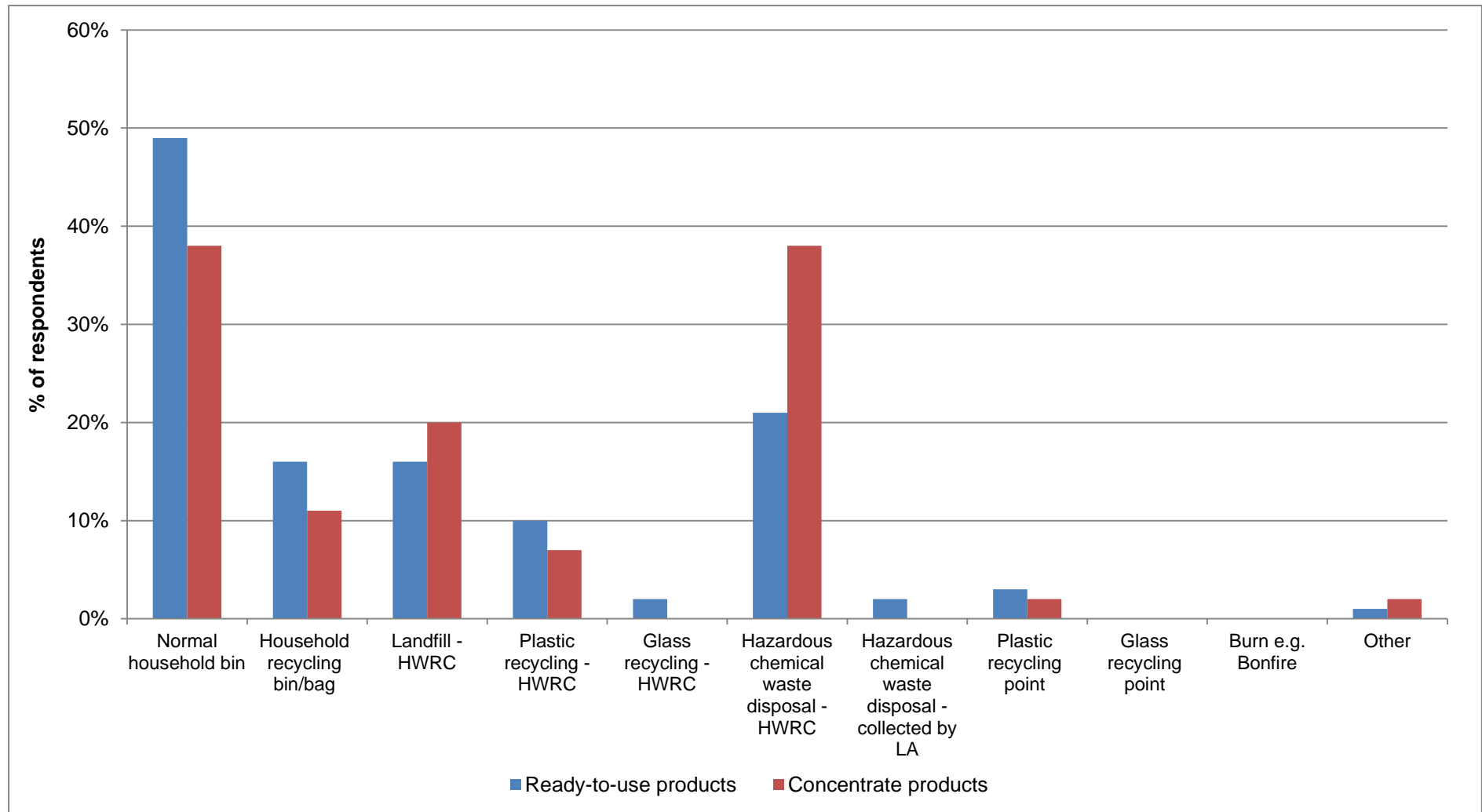
The same question was asked to respondents that used concentrate products and dispose of the container with pesticide still inside (n=82). Table 4.23 and Figure 4.17 show the most common responses to this question were normal household bin (n=31, 38%) and hazardous chemical waste disposal facility at an HWRC (n=31, 38%). 16 respondents (20%) disposed of concentrate containers with pesticide still in the container at an HWRC where it is thought it goes to landfill.

Table 4.23 Disposal of concentrate containers with pesticide still in the container (2013)

Response	Frequency	Percentage
Normal household bin	31	38%
Household recycling bin/bag (kerbside / street collection)	9	11%
Landfill - tip / local authority waste site / HWRC	16	20%
Plastic recycling - tip / local authority waste site / HWRC	6	7%
Glass recycling - tip / local authority waste site / HWRC	0	0%
Hazardous chemical waste disposal facility - tip / local authority waste site / HWRC	31	38%
Hazardous chemical waste disposal facility - doorstep collection by local authority	0	0%
Plastic recycling point (supermarkets / car parks etc.)	2	2%
Glass recycling point (supermarkets / car parks etc.)	0	0%
Burn e.g. bonfire	0	0%
Other	2	2%

Multiple answers n=82 (not asked = 1,604) total responses=97

Figure 4.17 Disposal of ready-to-use and concentrate containers with pesticide still in the container (2013)



4.5.3 Rinsing out of empty product container

Respondents were asked whether they rinsed out the empty product container before disposal. In previous years this question was only asked to those that used concentrate products. For the 2013 survey this question was asked to all respondents as was reasonable to assume those respondents that use ready-to-use products would also have rinsed out the container before disposing.

For respondents that used ready-to-use products, the majority (n=804, 66%) did not rinse out the container before disposing. A total 415 respondents (34%) did rinse out the container.

Table 4.24 Rinsing out of empty ready-to-use plant protection product container before disposal (2013)

Response	Frequency	Percentage
Yes	415	34%
No	804	66%

n=1,219 (not asked = 467)

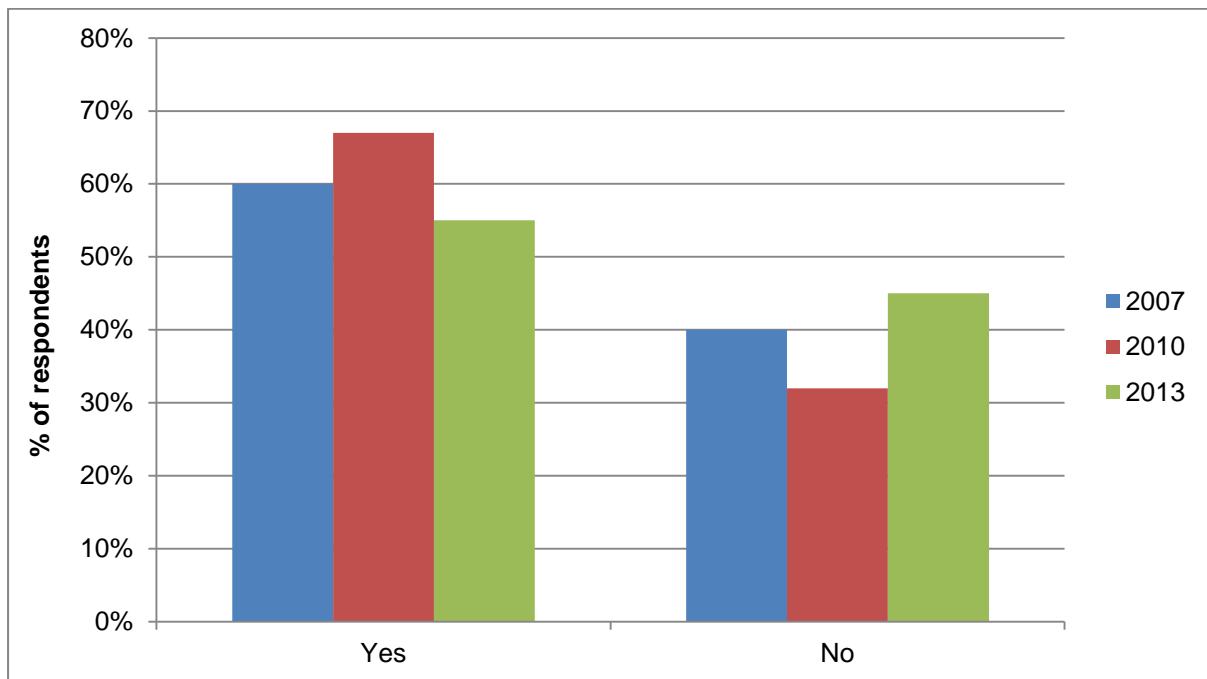
As with previous years (2007 and 2010), this question was also asked to those that used concentrate products. In contrast to respondents that used ready-to-use products, the majority (n=393, 55%) did rinse out the container before disposing. A total of 321 respondents (45%) did not rinse out the container before disposing. One respondent did not answer this question. As shown in Figure 4.18 the results for 2013 show there has been a decrease in the percentage of respondents that used concentrate products and rinsed out the container before disposal. In 2010 the percentage of respondents that rinsed out the container was 67% and 60% in 2007.

Table 4.25 Rinsing out of empty concentrate plant protection product container before disposal (2013)

Response	Frequency	Percentage
Yes	393	55%
No	321	45%
Not answered	1	0%

n=715 (not asked = 971)

Figure 4.18 Comparison of whether respondents using concentrate products rinse out the empty plant protection product container before disposal (2007, 2010 and 2013)



4.5.4 Disposal of liquid from rinsing empty product containers

For respondents that stated they did rinse out containers before disposing, a follow up question was asked to find out where they disposed of the rinsing. In previous years this was only asked to those that used concentrate products. However, for the 2013 survey this question was asked to those that used ready-to-use products and concentrate products.

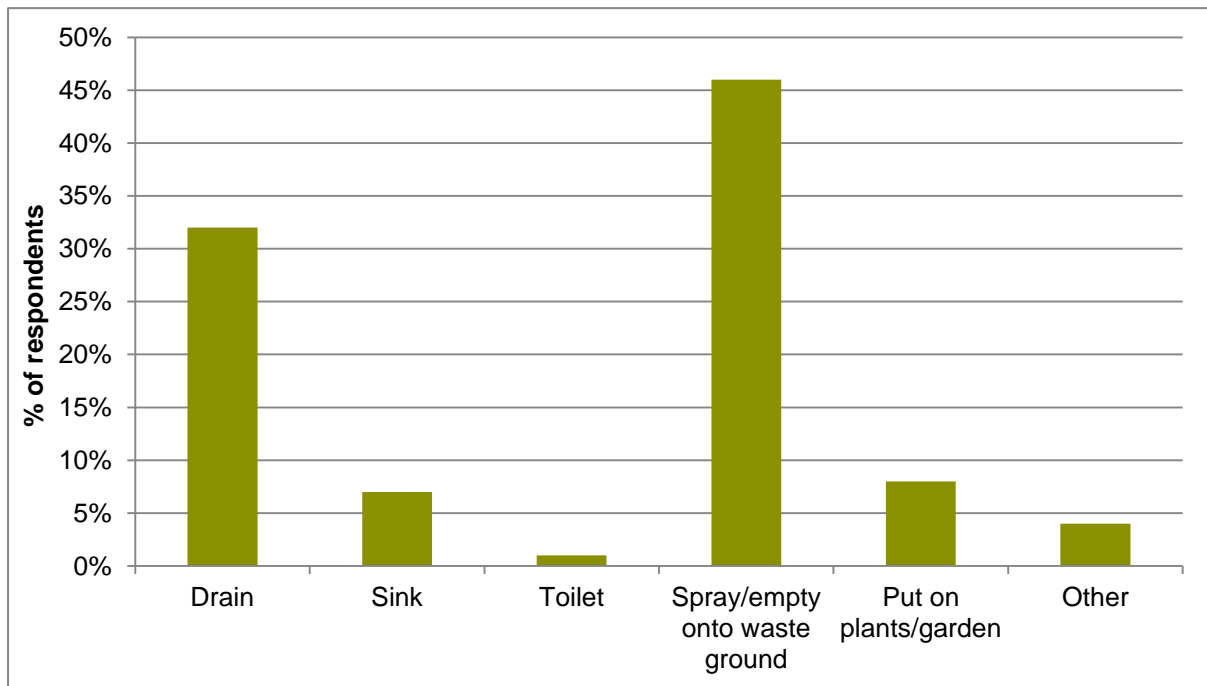
Table 4.26 shows that almost half (n=189, 46%) of respondents that used ready-to-use products disposed of rinsings by spraying/emptying them onto waste ground. This is followed by 133 respondents (32%) that disposed of rinsings down the drain. 30 respondents (7%) disposed of rinsings down the sink and 4 (1%) disposed down the toilet. The 'other' responses received to this question have been separated to include a new answer 'put on plants/garden' as with previous survey years (2007 and 2010) even though this was not an option for respondents.

Table 4.26 Disposal of liquid from rinsing empty ready-to-use plant protection product containers (2013)

Response	Frequency	Percentage
Drain	133	32%
Sink	30	7%
Toilet	4	1%
Spray/empty onto waste ground	189	46%
Put on plants/garden	32	8%
Other	18	4%
Not answered	9	2%

n=415 (not asked = 1,271)

Figure 4.19 Disposal of liquid from rinsing empty ready-to-use plant protection product containers (2013)



For concentrate products Table 4.27 provides the results for 2013, with Figure 4.20 providing a comparison with previous survey years (2007 and 2010). The highest percentage (n=134, 34%) of respondents stated they added the rinsings to the diluted spray solution. This is followed by 125 respondents (32%) that sprayed/emptied the rinsings onto waste ground. A further 76 respondents (19%) stated they poured the rinsing down the drain. The results show a considerable decrease from the 2010 survey where the majority (52%) of respondents poured rinsings down the drain, indicating an improvement in good practice. The percentage of respondents spraying/emptying rinsings on waste ground has increased from 24% in 2010 to 32% in 2013. In addition the percentage of respondents adding rinsings to diluted spray solution has also increased from 5% in 2010 to 34% in 2013. Again, this is a substantial improvement in good practice.

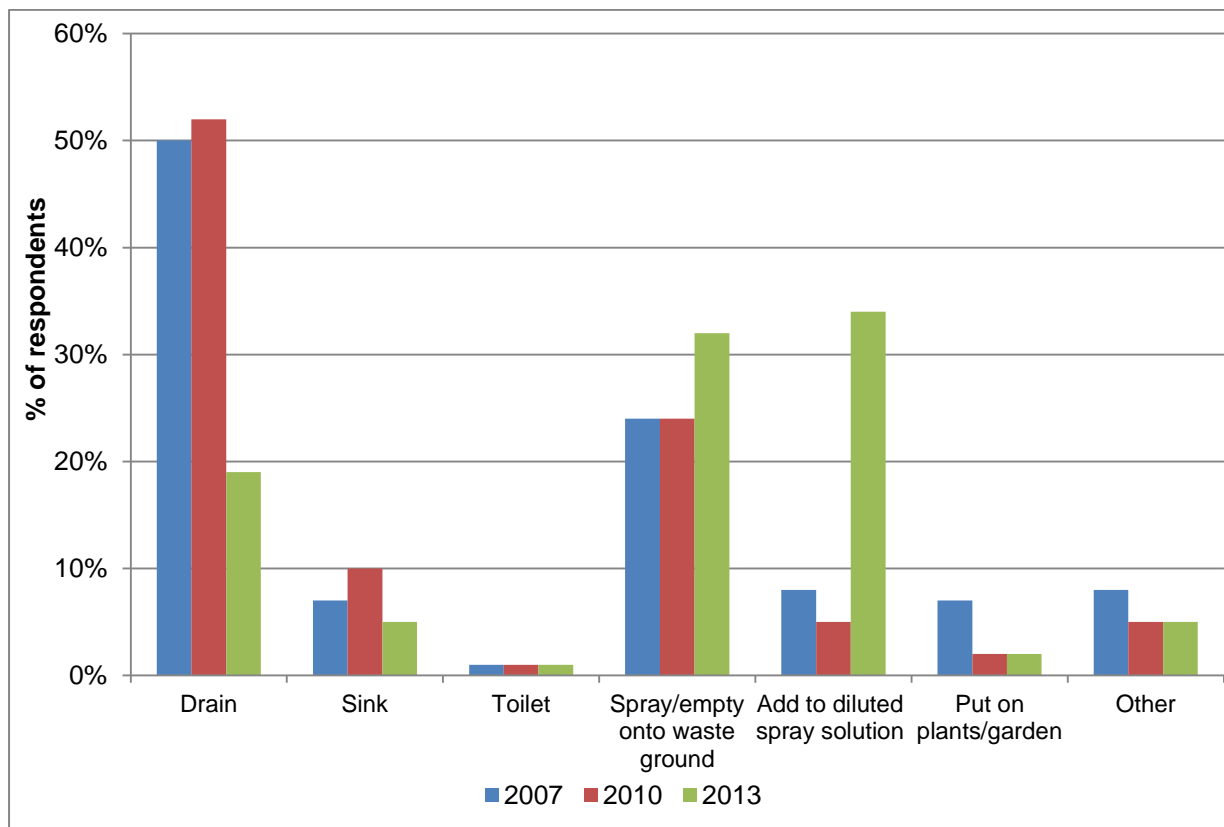
Similarly to ready-to-use products, the table below (4.27) has separated the 'other' responses received into an additional option 'put on plants/garden' even though this was not an option to respondents, but one that was listed by respondents.

Table 4.27 Disposal of liquid from rinsing empty concentrate plant protection product containers (2013)

Response	Frequency	Percentage
Drain	76	19%
Sink	20	5%
Toilet	3	1%
Spray/empty onto waste ground	125	32%
Add to diluted spray solution	134	34%
Put on plants/garden	9	2%
Other	20	5%
Not answered	6	2%

n=393 (not asked = 1,293)

Figure 4.20 Comparison of disposal of liquid from rinsing empty concentrate plant protection product containers (2007, 2010 and 2013)



4.5.5 Disposal of empty product containers

This question was updated for the 2013 survey with the main difference being the number of options available as answers. For the 2007 and 2010 surveys the options for this question were bin / recycling box / household waste and recycling centre and other. Table 4.28 and 4.29 show the potential options available have increased to show more specific disposal routes with respondents able to provide multiple answers to this question. Figure 4.21 provides a comparison of the answers received for both ready-to-use and concentrate product containers.

For respondents that used ready-to-use product containers the majority (n=632, 52%) stated they disposed of the empty container in the household recycling bin / bag used for the kerbside collection. The second most common disposal route was the normal household bin (n=498, 41%). A further 150 (12%) stated they disposed of empty containers at plastic recycling facilities at their household waste recycling centre (HWRC). It should be noted that 28 respondents (2%) stated they disposed of the containers by burning them on a bonfire. This is poor practice and discouraged, as burning plastic containers can give off poisonous chemicals and harm health.

Table 4.28 Disposal of empty ready-to-use plant protection product containers (2013)

Response	Frequency	Percentage
Normal household bin	498	41%
Household recycling bin / bag (kerbside / street collection)	632	52%
Landfill - tip / local authority waste site / HWRC	103	8%
Plastic recycling - tip / local authority waste site / HWRC	150	12%
Glass recycling - tip / local authority waste site / HWRC	29	2%
Hazardous chemical waste disposal facility - tip / local authority waste site / HWRC	64	5%
Hazardous chemical waste disposal facility - doorstep collection by local authority	4	0%
Plastic recycling point (supermarkets / car parks etc.)	30	2%
Glass recycling point (supermarkets / car parks etc.)	5	0%
Burn e.g. bonfire	28	2%
Other	11	1%

Multiple answers n=1,219 total responses = 1,554

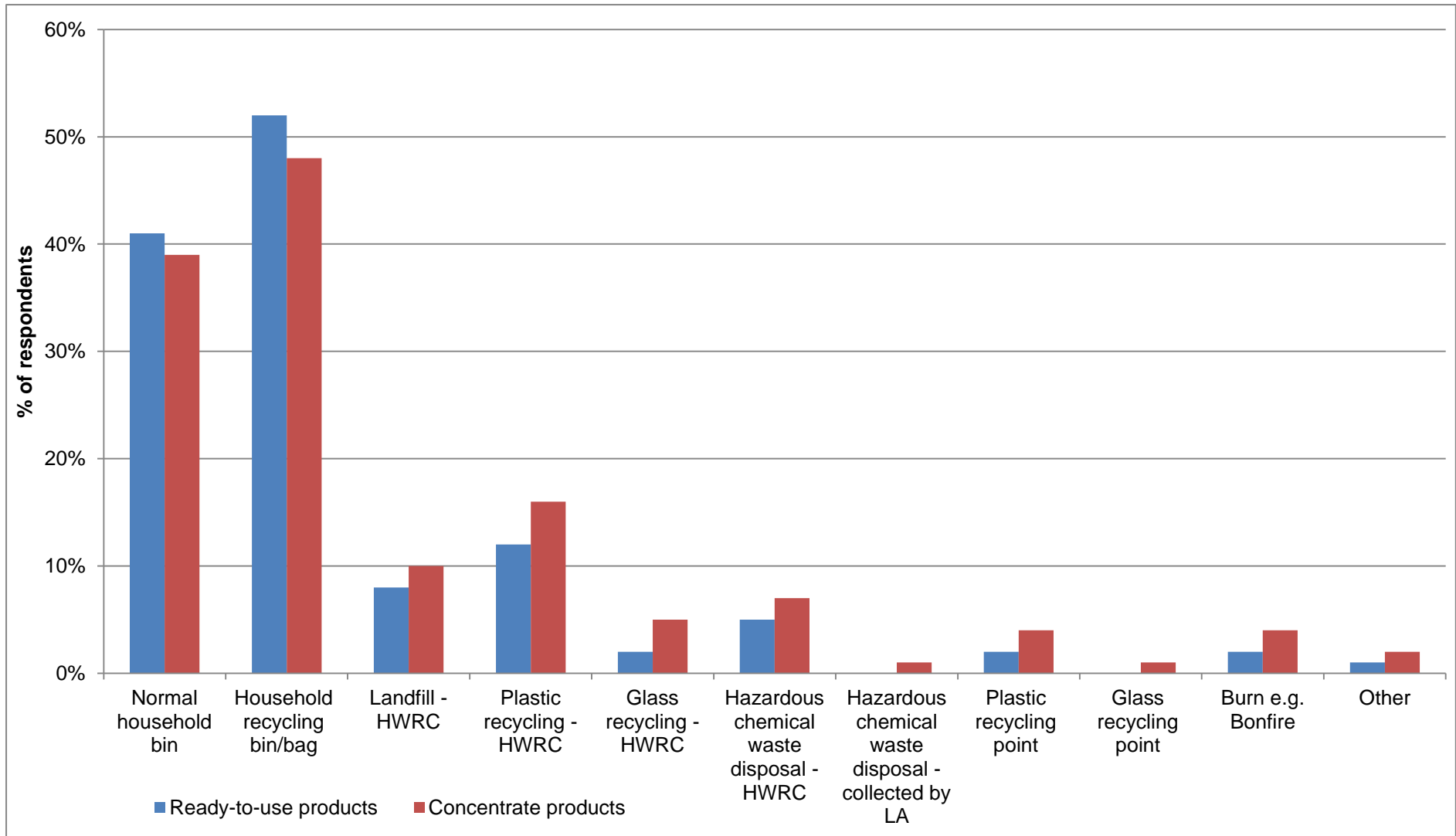
The same question was asked to respondents that used concentrate products. Table 4.29 shows that nearly half of respondents (n=344, 48%) disposed of empty concentrate product containers in the household recycling bin / bag via their kerbside collection. This is followed by a further 276 (39%) respondents that disposed of the containers in their normal household bin. Similarly to the ready-to-use products, the third most popular disposal route was plastic recycling facilities at the HWRC (n=113, 16%). It should also be noted that, similarly to the ready-to-use containers, 27 respondents (4%) stated they disposed of their empty containers by burning them on a bonfire. Again this is poor practice and discouraged, as burning plastic containers can give off poisonous chemicals and harm health.

Table 4.29 Disposal of empty concentrate plant protection products containers (2013)

Response	Frequency	Percentage
Normal household bin	276	39%
Household recycling bin / bag (kerbside / street collection)	344	48%
Landfill - tip / local authority waste site / HWRC	70	10%
Plastic recycling - tip / local authority waste site / HWRC	113	16%
Glass recycling - tip / local authority waste site / HWRC	35	5%
Hazardous chemical waste disposal facility - tip / local authority waste site / HWRC	51	7%
Hazardous chemical waste disposal facility - doorstep collection by local authority	8	1%
Plastic recycling point (supermarkets / car parks etc.)	28	4%
Glass recycling point (supermarkets / car parks etc.)	9	1%
Burn e.g. bonfire	27	4%
Other	13	2%

Multiple answers n=715 total responses = 974

Figure 4.21 Disposal of empty ready-to-use and concentrate plant protection product containers in 2013



4.5.6 Removal of lid / cap / trigger spray handle before disposal of the container

This was a new question to the 2013 survey and therefore no comparison can be made to previous results. Respondents that used ready-to-use products were asked whether they removed the lid / cap / trigger spray handle from the container of ready-to-use products before disposal. The majority of respondents stated they did not remove them and left them on the container (n=942, 77%). 266 (22%) of respondents that used ready-to-use products did remove the lid / cap / trigger spray handle before disposal. 11 respondents (1%) did not provide an answer to this question.

Table 4.30 Removal of lid / cap / trigger spray handle on ready-to-use plant protection product containers before disposal (2013)

Response	Frequency	Percentage
Yes, remove and dispose of separately	266	22%
No, leave on the container	942	77%
Not answered	11	1%

n=1,219 (not asked = 467)

The same question was asked for those that used concentrate products. Similarly to ready-to-use products, the majority of respondents (n=518, 72%) did not remove the lid / cap from the container before disposal. A total of 191 (27%) of respondents that used concentrate products did remove the lid / cap before disposal. 6 respondents (1%) did not provide an answer to this question.

Table 4.31 Removal of lid / cap on concentrate plant protection product containers before disposal (2013)

Response	Frequency	Percentage
Yes, remove and dispose of separately	191	27%
No, leave on the container	518	72%
Not answered	6	1%

n=715 (not asked = 971)

5. Cross-tabulation

This section summarises the results from cross-tabulation of key variables: location, age bracket and attitude towards gardening. There is also further analysis into the characteristics of respondents disposing of pesticides.

5.1 Location

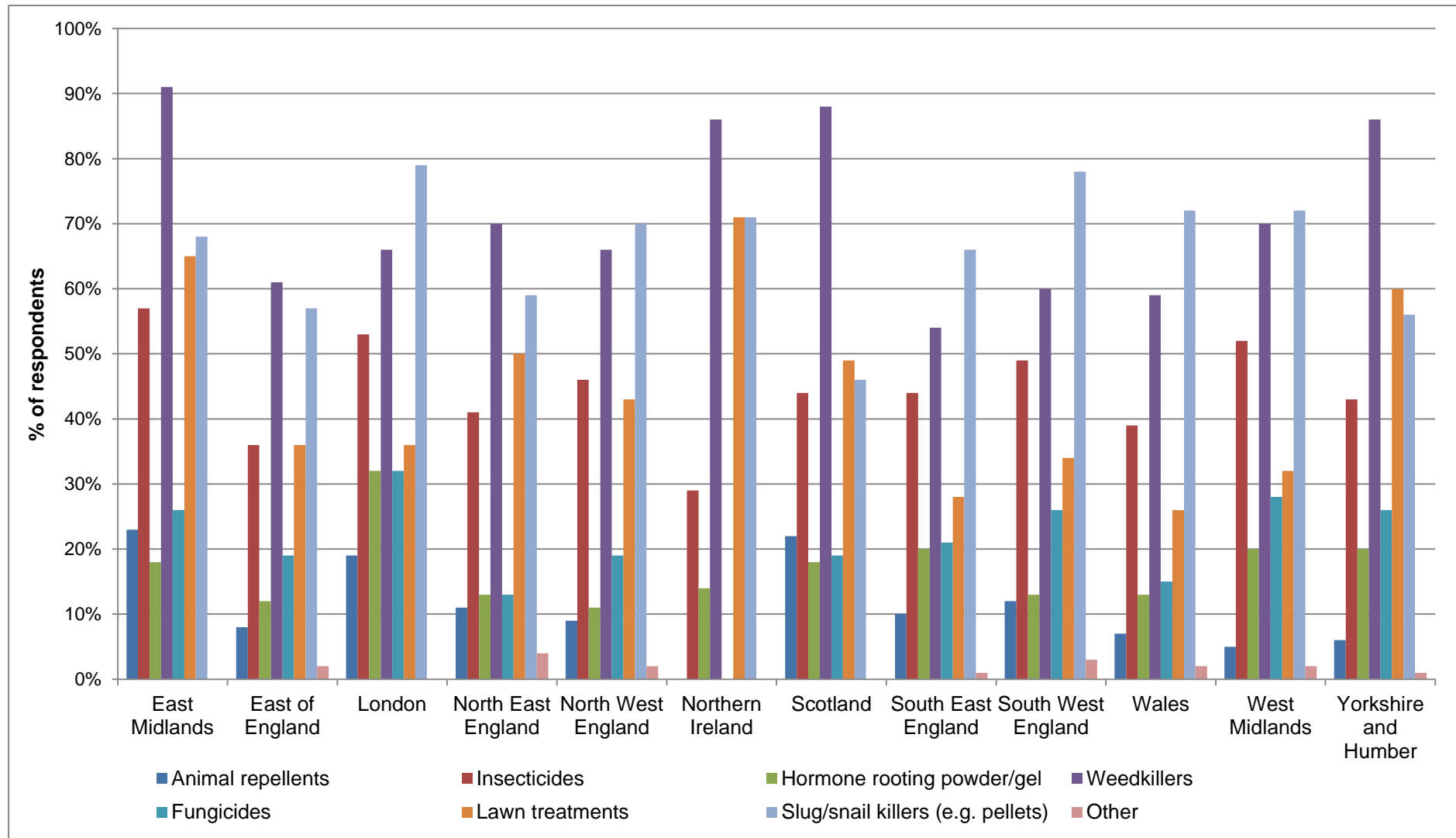
The results have firstly been analysed by the type of product purchased and location of the respondent. Table 5.1 provides the percentage breakdown for each location with respondents able to select more than one type of product they purchased. The results should be treated with some caution as some locations received a small number of respondents compared to others (e.g. there were 7 respondents from Northern Ireland and 331 from South East England). A comparison across all regions can be seen at Figure 5.1. The results can be summarised as:

- Animal repellent use highest in East Midlands and Scotland (over 20%);
- Greater use of insecticides in East Midlands, Greater London and West Midlands (over 50%);
- Use of hormone rooting powder/gel highest in Greater London (over 30%);
- Weedkiller use greatest in East Midlands, Northern Ireland, Scotland and Yorkshire and the Humber (over 80%). Lowest in South East England (54%);
- Use of slug/snail killers lowest in Scotland (46%). Highest in South West England and Greater London;
- Use of lawn treatments highest in Northern Ireland and East Midlands (over 60%). Lowest in Wales (26%).

Table 5.1 Percentage of plant protection product types used by location (2013)

Region	Number of responses	Animal repellents	Insecticides	Hormone rooting powder/gel	Weedkillers	Fungicides	Lawn treatments	Slug/snail killers	Other
East Midlands	65	23%	57%	18%	91%	26%	65%	68%	0%
East of England	244	8%	36%	12%	61%	19%	36%	57%	2%
London	47	19%	53%	32%	66%	32%	36%	79%	0%
North East England	54	11%	41%	13%	70%	13%	50%	59%	4%
North West England	279	9%	46%	11%	66%	19%	43%	70%	2%
Northern Ireland	7	0%	29%	14%	86%	0%	71%	71%	0%
Scotland	130	22%	44%	18%	88%	19%	49%	46%	0%
South East England	331	10%	44%	20%	54%	21%	28%	66%	1%
South West England	119	12%	49%	13%	60%	26%	34%	78%	3%
Wales	195	7%	39%	13%	59%	15%	26%	72%	2%
West Midlands	60	5%	52%	20%	70%	28%	32%	72%	2%
Yorkshire and the Humber	154	6%	43%	20%	86%	26%	60%	56%	1%

Figure 5.1 Percentage of plant protection product type used by location (2013)



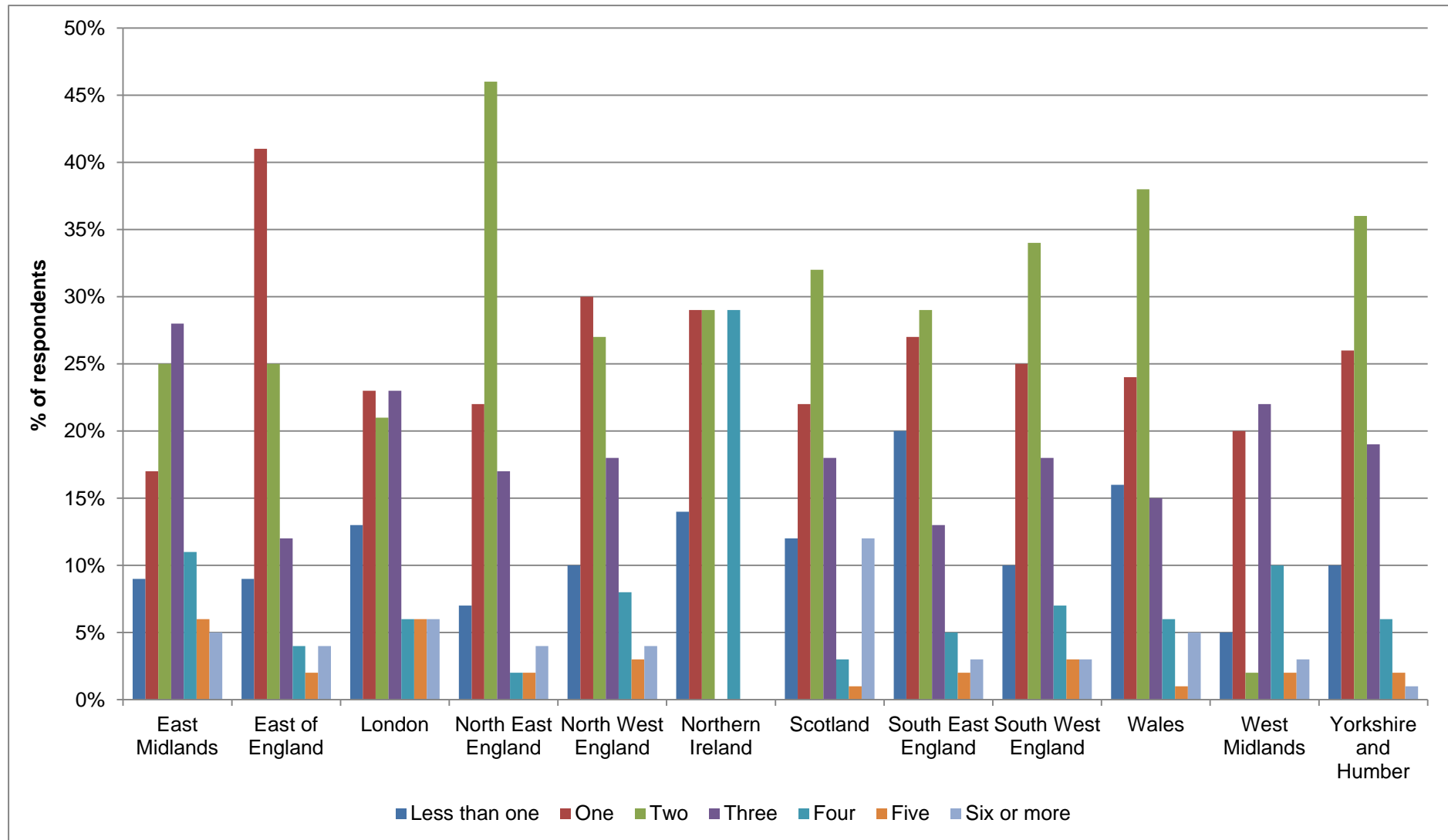
Analysis has also been undertaken on the number of products purchased each year by location. Table 5.2 provides the percentage breakdown for each location with Figure 5.2 providing a graphical comparison. The results can be summarised as:

- Purchase of less than one product per year greatest in South East England and Wales;
- Purchase of six or more products per year greatest in Scotland (12%);

Table 5.2 Percentage of plant protection products purchased by location (2013)

Region	Number of responses	Less than one	One	Two	Three	Four	Five	Six or more
East Midlands	65	9%	17%	25%	28%	11%	6%	5%
East of England	244	9%	41%	25%	12%	4%	2%	4%
London	47	13%	23%	21%	23%	6%	6%	6%
North East England	54	7%	22%	46%	17%	2%	2%	4%
North West England	279	10%	30%	27%	18%	8%	3%	4%
Northern Ireland	7	14%	29%	29%	0%	29%	0%	0%
Scotland	130	12%	22%	32%	18%	3%	1%	12%
South East England	331	20%	27%	29%	13%	5%	2%	3%
South West England	119	10%	25%	34%	18%	7%	3%	3%
Wales	195	16%	24%	32%	15%	6%	1%	5%
West Midlands	60	5%	20%	38%	22%	10%	2%	3%
Yorkshire and the Humber	154	10%	26%	36%	19%	6%	2%	1%

Figure 5.2 Percentage of plant protection products purchased by location (2013)



5.2 Age bracket

As with previous years the 16-24 age bracket was under represented in the survey results, with just 18 (1%) of respondents falling into this category, as a result they have been removed from this section. Half of respondents were aged between 45 and 64 (50%), 28% were aged between 25 and 44 and 21% were aged 65 and over.

Table 5.3 shows the percentage of respondents that used websites for information (in addition to the product label) by the total number of respondents in each age bracket. The table shows those aged between 25 and 44 were most likely to use websites (28%), followed by those aged between 45 and 64 (27%). Respondents 65 and over were least likely to use websites for information (14%).

Table 5.3 Percentage of respondents that used websites for information by age bracket (2013)

	Number of respondents in age group	Number of respondents that used websites for information on product use	Percentage of age group
25-44	468	133	28%
45-64	842	226	27%
65 and over	356	50	14%

The results in Table 5.4 show the over 65 age bracket were most likely to use ready-to-use products (60%), although 59% of the 25 to 44 age bracket also used this type of product.

Table 5.4 Percentage of ready-to-use and concentrate plant protection products used by age bracket (2013)

	Ready-to-use products	Concentrate products that need diluting	Both
25-44	59%	13%	28%
45-64	46%	21%	33%
65 and over	60%	19%	21%

Figure 5.3 Percentage of ready-to-use and concentrate plant protection products used by age bracket (2013)

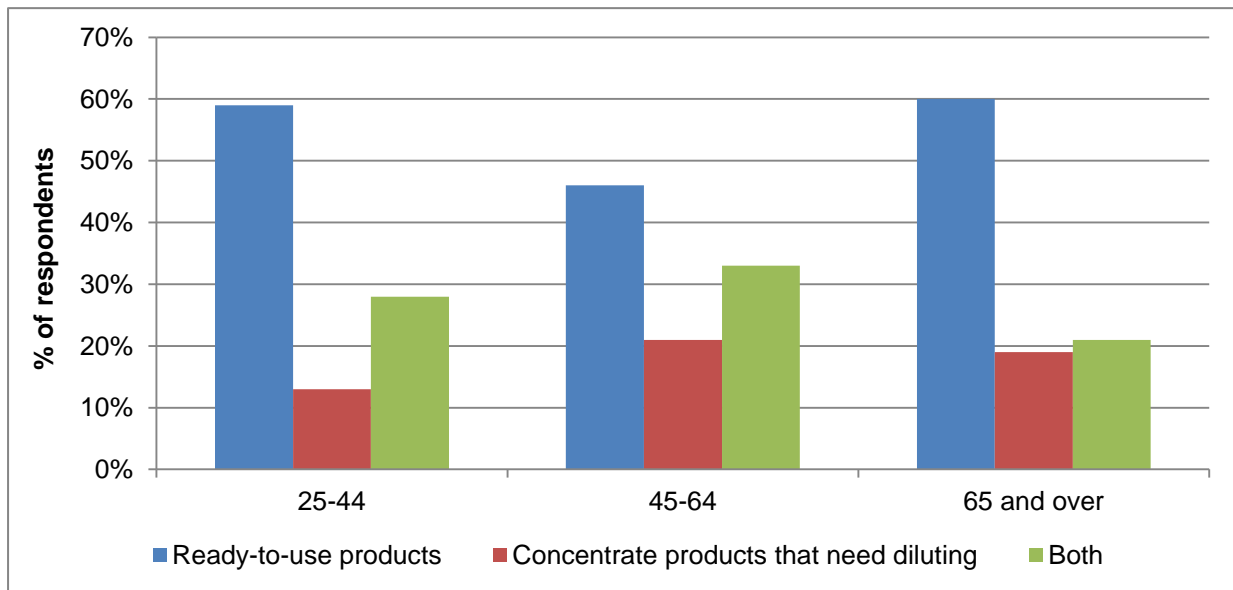


Table 5.5 provides analysis of measurement method for concentrate products by age bracket. By examining Figure 5.4 it can be seen there is a relationship between the age of the respondent and whether they used the measuring device/cap provided with the product. As the age of the respondent increases, the more likely they are to use the measuring device/cap and less likely to make an estimate or guess. This is consistent with the findings of previous surveys. The percentage of respondents using their own measuring jug or similar is not related to age.

Table 5.5 Measurement method used (by percentage) for measuring concentrate plant protection products by age bracket in 2013

	Measuring device / cap provided with product	Estimate or guess	Your own measuring jug or similar	Other
25-44	67%	15%	17%	1%
45-64	72%	7%	22%	0%
65 and over	73%	4%	23%	1%

Figure 5.4 Measurement method used (by percentage) for measuring concentrate plant protection products by age bracket in 2013

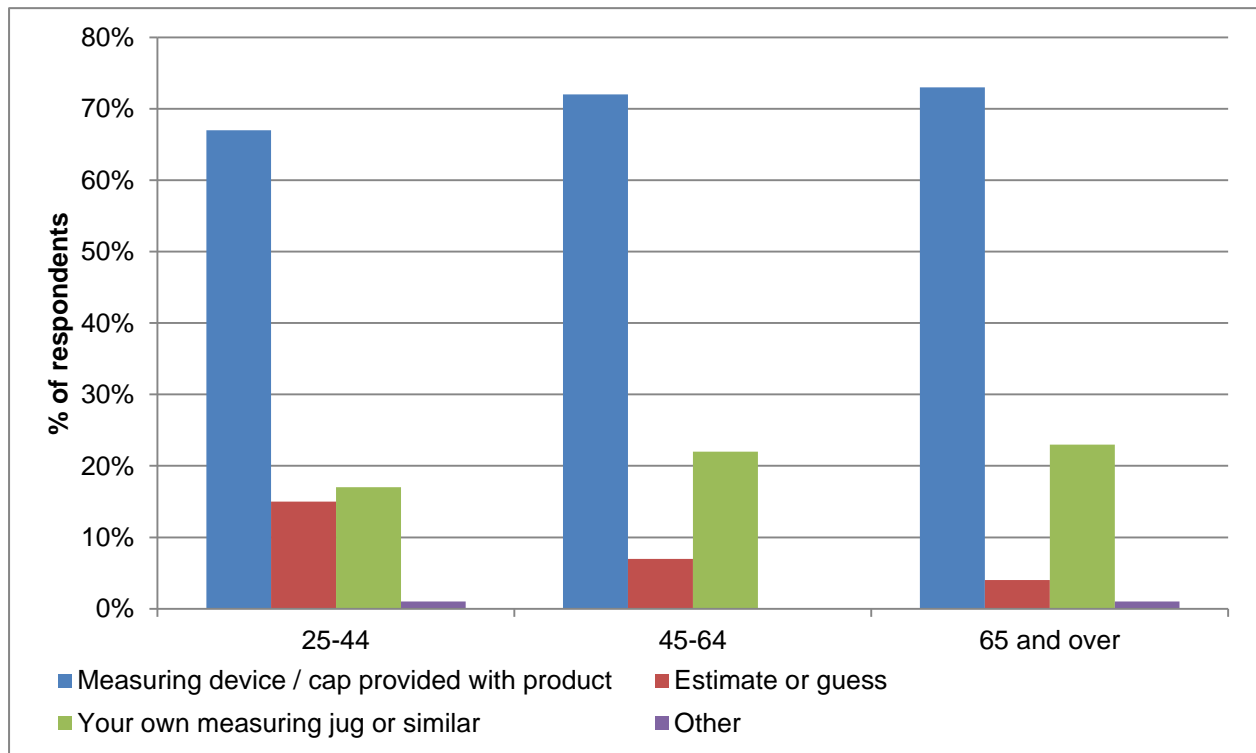


Table 5.6 provides analysis of rinsing out empty ready-to-use and concentrate containers by age bracket. For ready-to-use products, it can be seen that across the age brackets represented, the majority did not rinse out the empty container before disposal. For the 25 to 44 age bracket, 74% of respondents did not rinse out the empty container for ready-to-use products, compared to 64% of the 45 to 64 age bracket and 61% of the 65 and over age bracket. Rinsing of empty ready-to-use containers shows a relationship to age where ready-to-use containers are more likely to be rinsed with increasing age.

For concentrate products, the majority (57% of 45-64, and 59% of 65 and over age brackets) rinsed out the concentrate container before disposal, except for those aged between 25 and 44.

Table 5.6 Rinsing out of empty ready-to-use/concentrate plant protection product container by age bracket in 2013 by percentage

	Ready-to-use products		Concentrate products	
	Yes	No	Yes	No
25-44	26%	74%	46%	54%
45-64	36%	64%	57%	43%
65 and over	39%	61%	59%	41%

Table 5.7 analyses the disposal of excess/unwanted ready-to-use products before container disposal by the respondent's age. The table shows the majority of respondents in each age bracket reported in the table did not have any excess product as they used it all up. Within this category, there is a relationship between the age of the respondent and whether they used the entire product up. 84% of respondents aged 65 and over (n=245) used up ready-to-use products, compared to 76% of respondents aged 25-44. The 25-44 age bracket were more likely to dispose of excess ready-to-use product with the bottle (16%) when compared with the other age brackets (10% of 45-64 and 65 and over).

Table 5.7 Disposal of excess/unwanted ready-to-use plant protection products BEFORE container disposal by age bracket in 2013 (by percentage)

	I don't - I dispose of it WITH the bottle	I don't have any excess - I use it all up	Drain	Sink	Toilet	Spray/empty onto waste ground	Other
25-44	16%	76%	1%	1%	0%	3%	3%
45-64	10%	82%	3%	0%	0%	3%	2%
65 and over	10%	84%	1%	0%	0%	1%	3%

Table 5.8 provides similar analysis for concentrate products. The percentage that used the entire concentrate product up is very similar across the age brackets (between 79% and 81%). A similar trend can be seen to the ready-to-use products for respondents that disposed of excess pesticide with the bottle. Those aged between 25 and 44 were most likely to dispose of product with the bottle (12%) and respondents aged 65 and over least likely (9%, n=12).

Table 5.8 Disposal of excess/unwanted concentrate plant protection products BEFORE container disposal by age bracket in 2013 (by percentage)

	I don't - I dispose of it WITH the bottle	I don't have any excess - I use it all up	Drain	Sink	Toilet	Spray/empty onto waste ground	Other
25-44	12%	79%	3%	0%	1%	4%	3%
45-64	10%	81%	4%	0%	0%	3%	2%
65 and over	9%	79%	1%	0%	0%	3%	9%

5.3 Attitudes to gardening

The following section focuses on the attitudes towards gardening reported by respondents and how this may affect their use of plant protection products. Table 5.9 and Figure 5.5 provide analysis of attitude to gardening by type of product. The data shows:

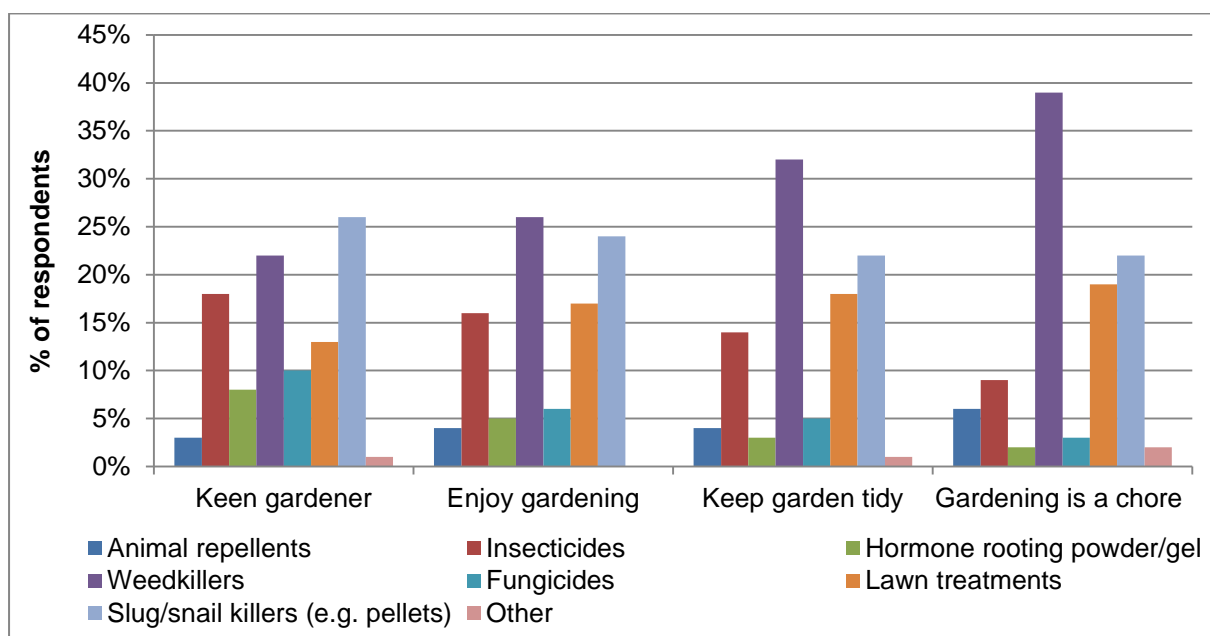
- Keen gardeners are more likely to use insecticides, fungicides and hormone rooting powder/gel than the other attitude groups;
- Keen gardeners less likely to use weedkiller;
- Those that find gardening a chore are most likely to use weedkiller;
- Higher percentage of those that are keen gardeners are likely to use slug / snail killers.

The analysis shows keen gardeners are most likely to use insecticides, fungicides and hormone rooting powder/gel and less likely to use weedkillers is consistent with the results from the 2007 and 2010 surveys.

Table 5.9 Percentage of product type used by attitude to gardening in 2013

	Animal repellents	Insecticides	Hormone rooting powder / gel	Weedkillers	Fungicides	Lawn treatments	Slug / snail killers	Other
Keen gardener	3%	18%	8%	22%	10%	13%	26%	1%
Enjoy gardening	4%	16%	5%	26%	6%	17%	24%	0%
Like garden tidy	4%	14%	3%	32%	5%	18%	22%	1%
Gardening is a chore	6%	9%	2%	39%	3%	19%	22%	2%

Figure 5.5 Percentage of product type used by attitude to gardening in 2013



Analysis of the number of products purchased by attitude to gardening in Table 5.10 and Figure 5.6 shows those that considered gardening a chore were more likely to purchase less than one (19%) or one product per year (37%), although this group were least likely to purchase one product a year in 2010 (20%). Respondents that liked to keep the garden tidy (34%) and those that enjoyed gardening (38%) were more likely to purchase two products per year than keen gardeners (25%) and those that considered gardening a chore (26%). The overall results for 2013 show some consistency with those for 2010.

In 2010 the gardening is a chore group had the greatest percentage of respondents purchasing less than one product (18%) and the greatest percentage purchasing four (11%) and more than six products (9%). It was suggested that there were two types of 'not keen' gardeners – those who did very little to their garden (and so purchased less than one product on average per year), and those whose approach was to control their garden with a variety of plant protection products and so purchased a large number per year. The 2013 results show similar evidence of this with this group most likely to purchase less than one product per year (19%) and the second most likely group to purchase more than six products in a year (5%).

Table 5.10 Percentage of number of products purchased by attitude to gardening in 2013

	Less than one	One	Two	Three	Four	Five	Six or more
Keen gardener	13%	27%	25%	18%	7%	4%	6%
Enjoy gardening	13%	27%	38%	14%	5%	0%	2%
Like garden tidy	10%	28%	34%	18%	5%	2%	2%
Gardening is a chore	19%	37%	26%	6%	5%	0%	5%

Figure 5.6 Percentage of number of products purchased by attitude to gardening in 2013

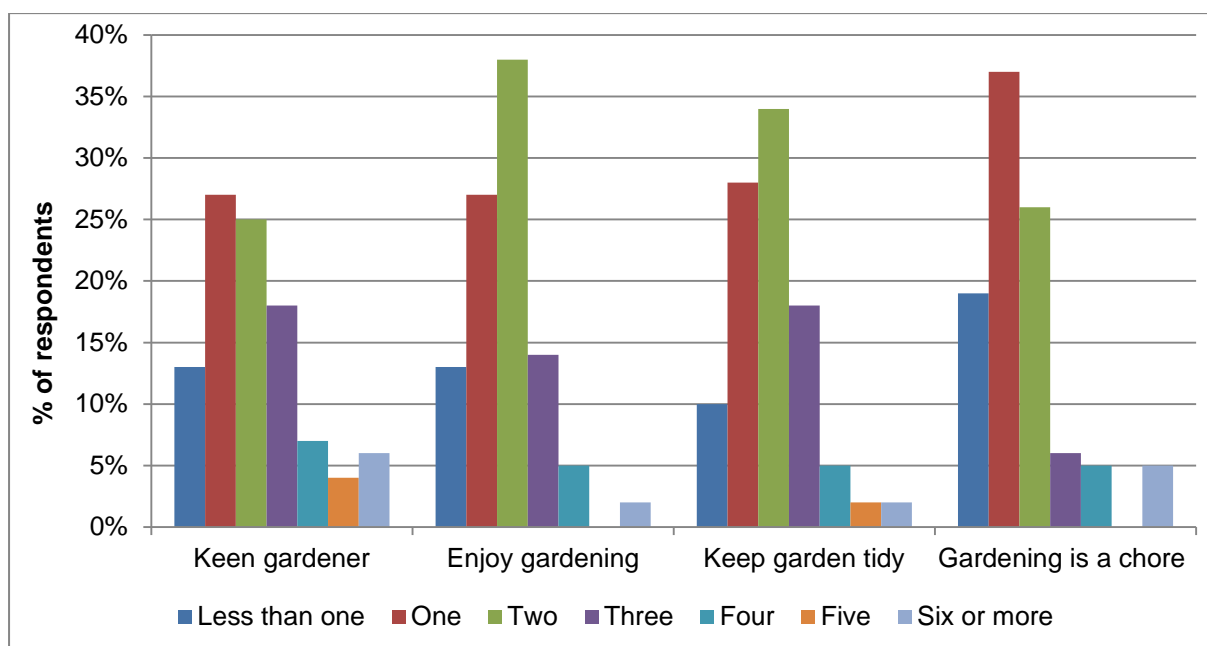


Table 5.11 and Figure 5.7 show the habits of the different gardener types in relation to how closely they followed the product instructions. Keen gardeners were most likely to follow the instructions very closely (59%). Those that considered gardening a chore were more likely not to follow instructions closely (10%) or not to follow instructions at all (2%). This is consistent with the results from previous surveys in 2007 and 2010, although there has been a reduction for all gardening types in not following instructions. This would indicate that more are likely to follow label instructions to some extent, which is an improvement in good practice.

Table 5.11 Following of instructions by attitude to gardening in 2013 (by percentage)

	Very closely	Fairly closely	Not very closely	Not at all
Keen gardener	59%	38%	2%	1%
Enjoy gardening	47%	50%	2%	0%
Like garden tidy	40%	53%	6%	1%
Gardening is a chore	32%	55%	10%	2%

Figure 5.7 Following of instructions by attitude to gardening in 2013 (by percentage)

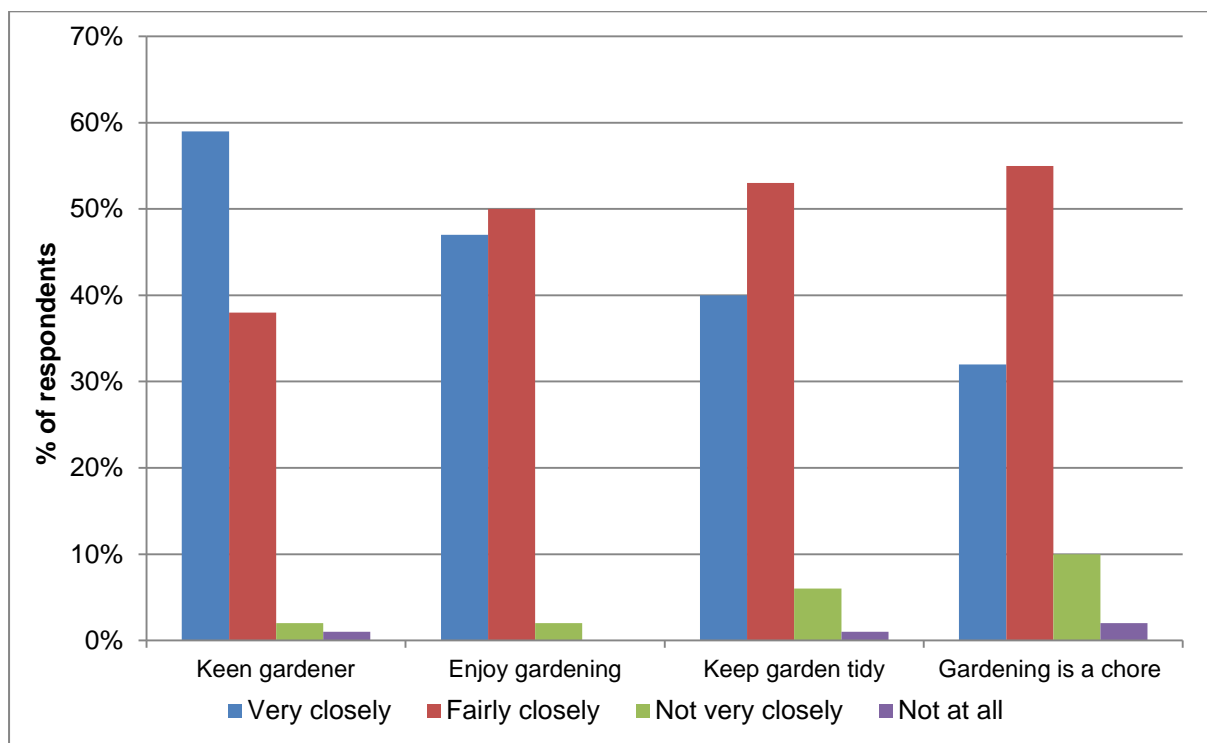


Table 5.12 and Figure 5.8 show the use of different types of products (ready-to-use and concentrate products) by gardener type. Analysis shows each gardener type has a similar pattern in terms of the type of product used, with ready-to-use products the most popular followed by both types and then concentrate products. Those respondents that considered gardening a chore were more likely to use ready-to-use products (69%) than the other groups (48 - 61%). This contrasts with the results from 2010 whereby they were the group least likely to use ready-to-use products (48%, while other groups ranged from 50% to 57%). However, this is more in keeping with the 2007 results, when the gardening is a chore group were more likely to use ready-to-use products (53%, while the other groups ranged from 44 - 50%). Those that were keen gardeners were least likely to use ready-to-use products (48%). This is similar to the 2010 results where they were one of the groups least likely to use ready-to-use products (50%).

Table 5.12 Percentage of ready-to-use and concentrate products used by attitude to gardening in 2013

	Ready-to-use products	Concentrate products that need diluting	Both
Keen gardener	48%	22%	30%
Enjoy gardening	55%	13%	32%
Like garden tidy	61%	15%	23%
Gardening is a chore	69%	13%	18%

Figure 5.8 Percentage of ready-to-use and concentrate products used by attitude to gardening in 2013

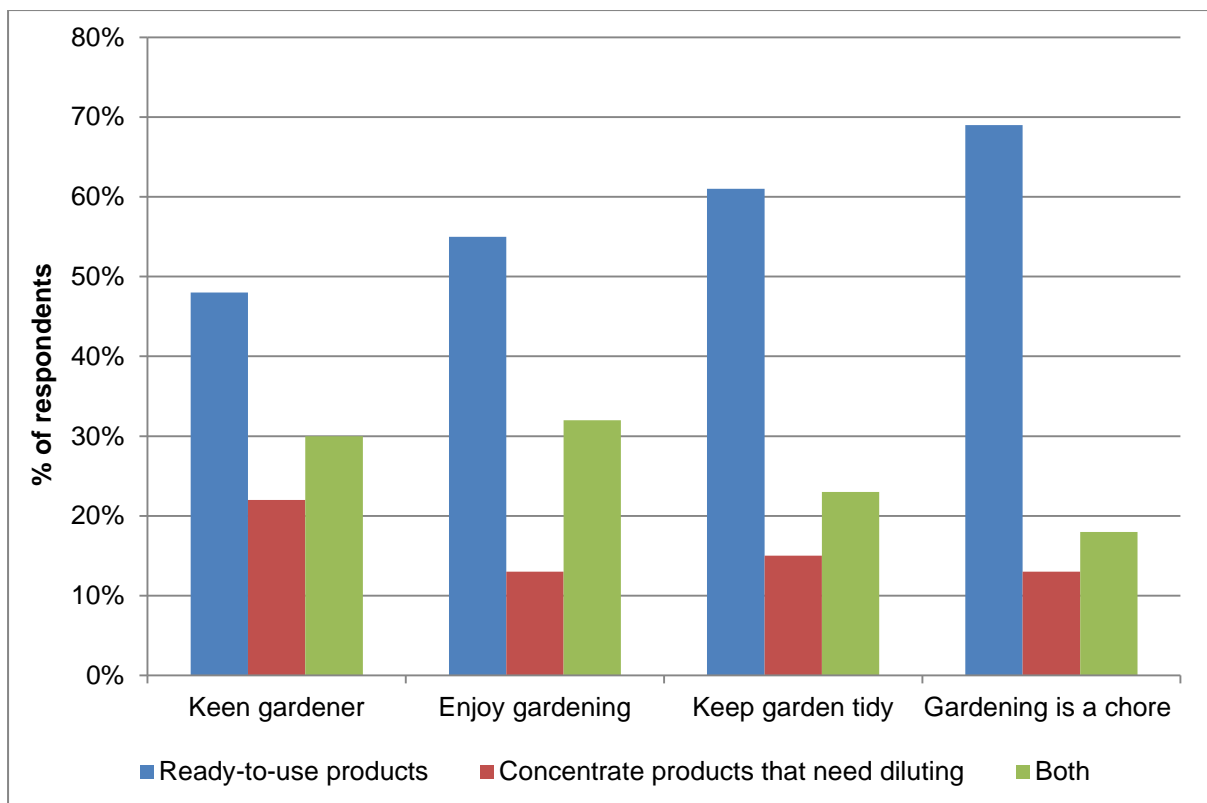


Table 5.13 provides analysis of whether respondents rinsed out the empty ready-to-use or concentrate container by their attitude to gardening. For ready-to-use products it can be seen that the majority across all gardener groups did not rinse out the empty container (64 - 73%). This is more prevalent for those that considered gardening as a chore (73%). For concentrate products the split between those that did rinse the empty container and did not is roughly half for keen gardeners, those that enjoy gardening and those that like to have a tidy garden. For these groups there is a slight trend towards rinsing out the empty container before disposal. Respondents that considered gardening as a chore were more likely to not rinse out the empty container before disposal (63%).

Table 5.13 Rinsing out empty ready-to-use/concentrate plant protection product container by attitude to gardening in 2013 (by percentage)

	Ready-to-use products		Concentrate products	
	Yes	No	Yes	No
Keen gardener	36%	64%	56%	44%
Enjoy gardening	32%	68%	55%	45%
Like garden tidy	34%	66%	52%	48%
Gardening is a chore	27%	73%	38%	63%

Table 5.14 provides analysis of disposal of excess/unwanted ready-to-use product before the container is disposed of by the respondents attitude to gardening. The table shows the majority of respondents did not have any excess as they used the entire product up. Keen gardeners were more likely to use the product up (83%) when compared to those that considered gardening as a chore (67%). The table also shows those that considered gardening as a chore were more likely to dispose of any excess/unwanted ready-to-use pesticide with the bottle (24%) and keen gardeners the least likely (10%).

Table 5.14 Disposal of excess/unwanted ready-to-use plant protection products BEFORE container disposal by attitude to gardening in 2013 (by percentage)

	I don't - I dispose of it WITH the bottle	I don't have any excess - I use it all up	Drain	Sink	Toilet	Spray/empty onto waste ground	Other
Keen gardener	10%	83%	1%	0%	0%	2%	3%
Enjoy gardening	12%	79%	3%	1%	0%	3%	2%
Like garden tidy	14%	78%	1%	0%	0%	3%	4%
Gardening is a chore	24%	67%	4%	0%	0%	2%	4%

Similar analysis was undertaken for concentrate products to understand how attitude to gardening affects the disposal of excess/unwanted pesticide. Table 5.15 again shows the majority of respondents did not have excess pesticide as they used it all up. 81% of keen gardeners stated they did not dispose as they used all the product up, although the highest percentage of those that did not have any excess were respondents that like to keep the garden tidy (83%). Respondents that considered gardening as a chore were least likely to not have any excess although the percentage for this group remained high (74%). However, this group were most likely to dispose of concentrate pesticide with the container (16%).

Table 5.15 Disposal of excess/unwanted concentrate plant protection products BEFORE container disposal by attitude to gardening in 2013 (by percentage)

	I don't - I dispose of it WITH the bottle	I don't have any excess - I use it all up	Drain	Sink	Toilet	Spray/ empty onto waste ground	Other
Keen gardener	10%	81%	2%	0%	0%	4%	4%
Enjoy gardening	10%	77%	5%	0%	0%	3%	4%
Like garden tidy	10%	83%	3%	0%	0%	1%	4%
Gardening is a chore	16%	74%	0%	0%	0%	5%	5%

5.4 Disposal

The following section focuses on disposal route of empty containers by how closely respondents stated that they followed the product instructions. The results for respondents that followed the instructions 'not very closely' should be treated with some caution as they represent a small percentage of the overall respondents (51 respondents, 3%). Those that did not follow instructions at all have not been included within this analysis as they only represent 15 respondents (1%).

Table 5.16 and Figure 5.9 provide the results for empty ready-to-use containers. The results show:

- Respondents that follow the instructions very closely are more likely to use hazardous chemical disposal facilities and collection services provided by Local Authorities than those who follow instructions 'fairly closely' and 'not very closely'; and
- Respondents that follow instructions either 'fairly closely' or 'not very closely' are more likely to use the normal household bin for disposal of empty containers as currently instructed on labels.

Table 5.16 Disposal of empty ready-to-use plant protection product containers by how closely respondents follow the product instructions (2013)

	Very closely		Fairly closely		Not very closely	
Normal household bin	215	28%	260	36%	17	33%
Household recycling bin / bag (kerbside / street collection)	310	40%	289	40%	24	46%
Landfill - tip / local authority waste site / HWRC	61	8%	39	5%	3	6%
Plastic recycling - tip / local authority waste site / HWRC	78	10%	67	9%	5	10%
Glass recycling - tip / local authority waste site / HWRC	15	2%	13	2%	1	2%
Hazardous chemical waste disposal facility - tip / local authority waste site / HWRC	45	6%	19	3%	0	0%
Hazardous chemical waste disposal facility - doorstep collection by local authority	3	0%	1	0%	0	0%
Plastic recycling point (supermarkets / car parks etc.)	16	2%	12	2%	2	4%
Glass recycling point (supermarkets / car parks etc.)	2	0%	3	0%	0	0%
Burn e.g. bonfire	17	2%	9	1%	0	0%
Other	6	1%	5	1%	0	0%

Figure 5.9 Disposal of empty ready-to-use plant protection product containers by how closely respondents follow the product instructions (2013) (by percentage)

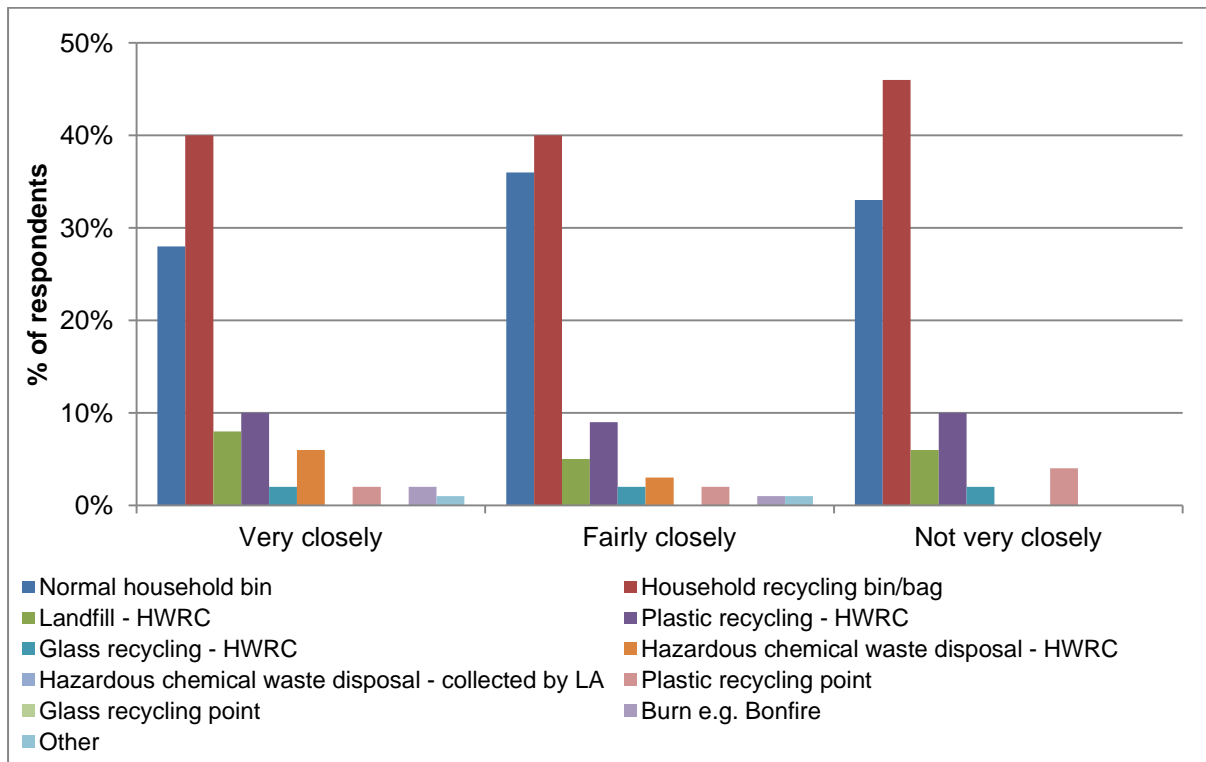


Table 5.17 and Figure 5.10 provide the analysis for empty concentrate containers by how closely respondents claimed to follow the product instructions. The results show:

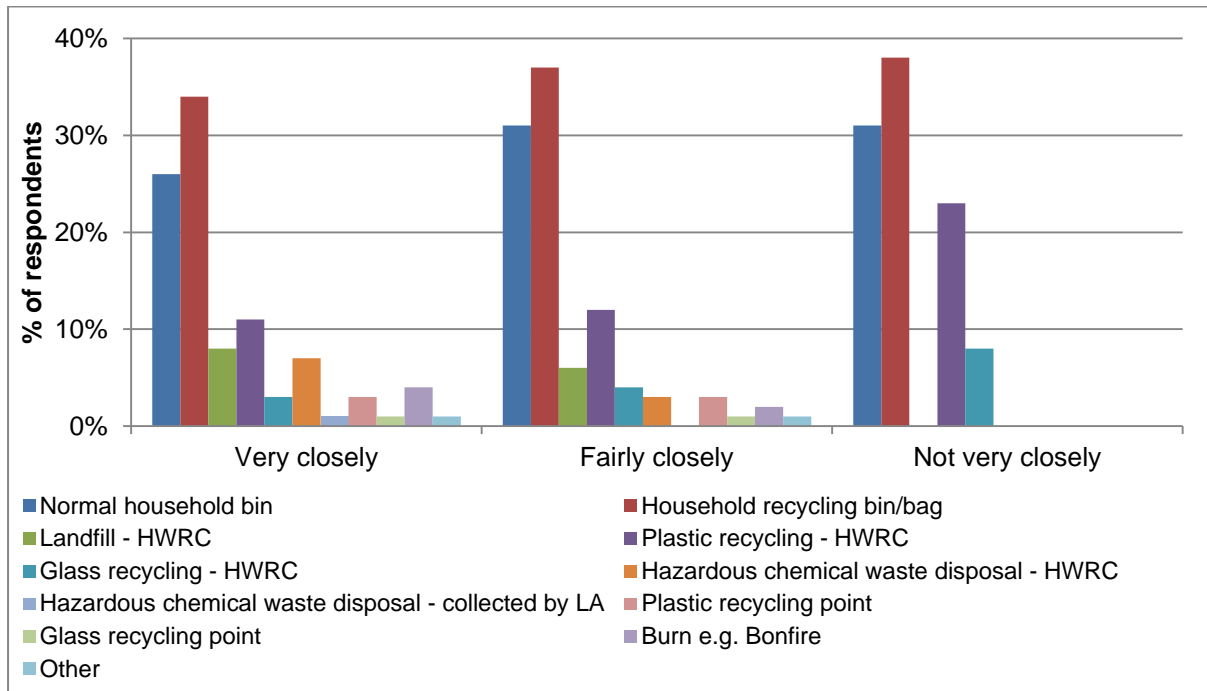
- Respondents that follow instructions ‘very closely’ are more likely to dispose of empty concentrate containers via a hazardous chemical waste disposal facility at a household waste recycling centre (HWRC) or collection service provided by the Local Authority;
- Respondents that follow instructions ‘very closely’ are least likely to dispose of empty concentrate containers via the household recycling bin/bag; and
- Respondents that follow instructions ‘very closely’ are less likely to dispose of empty concentrate containers via the normal household bin.

Overall for ready-to-use and concentrate products, this highlights that even though most people claimed to follow the label instructions to varying degrees, the majority were not actually doing so with regard to disposal. Current label instructions for amateur plant protection products instruct users to dispose of empty containers in the normal household bin.

Table 5.17 Disposal of empty concentrate plant protection product containers by how closely respondents follow the product instructions (2013)

	Very closely		Fairly closely		Not very closely	
Normal household bin	141	26%	131	31%	4	31%
Household recycling bin / bag (kerbside / street collection)	185	34%	153	37%	5	38%
Landfill - tip / local authority waste site / HWRC	43	8%	26	6%	0	0%
Plastic recycling - tip / local authority waste site / HWRC	62	11%	48	12%	3	23%
Glass recycling - tip / local authority waste site / HWRC	17	3%	17	4%	1	8%
Hazardous chemical waste disposal facility - tip / local authority waste site / HWRC	39	7%	12	3%	0	0%
Hazardous chemical waste disposal facility - doorstep collection by local authority	7	1%	1	0%	0	0%
Plastic recycling point (supermarkets / car parks etc.)	17	3%	11	3%	0	0%
Glass recycling point (supermarkets / car parks etc.)	5	1%	4	1%	0	0%
Burn e.g. bonfire	19	4%	8	2%	0	0%
Other	7	1%	5	1%	0	0%

Figure 5.10 Disposal of empty concentrate plant protection product containers by how closely respondents follow the product instructions 2013 (by percentage)



Tables 5.18 to 5.19 and Figures 5.11 to 5.12 provide analysis on the disposal of ready-to-use and concentrate containers with pesticide still in the container by how closely respondents follow the product instructions. Respondents that stated they follow instructions either 'not very closely' or 'not at all' have been excluded from this analysis due to the low response within these categories.

The majority of those following instructions 'fairly closely' put containers with pesticide inside in the normal household bin for both ready-to-use (54%) and concentrate (49%) products. This indicates that respondents were not following label instructions as claimed, because the correct disposal method is to dispose of all containers with unused pesticide to hazardous chemical waste disposal facilities provided by local authorities. Only 11% of this group dispose of ready-to-use containers with pesticide still in the container correctly, with 18% correctly disposing of concentrate containers with pesticide still inside.

For those following the label 'very closely', 28% dispose of ready-to-use containers with unused pesticide still in the container to the normal household bin, while a similar amount (27%) dispose of correctly to hazardous chemical waste disposal facilities provided by local authorities. Correct disposal increases to 45% for concentrate products with unused pesticide still in the container.

However, it should be noted that the overall amount of respondents disposing of containers with unused/unwanted pesticide in the container is only 12% of respondents using ready-to-use products, and 10% of respondents using concentrate products.

Table 5.18 Disposal of ready-to-use containers with pesticide still in the plant protection product container by how closely respondents follow the product instructions (2013)

	Very closely		Fairly closely	
Normal household bin	28	28%	50	54%
Household recycling bin / bag (kerbside / street collection)	16	16%	9	10%
Landfill - tip / local authority waste site / HWRC	17	17%	9	10%
Plastic recycling - tip / local authority waste site / HWRC	6	6%	10	11%
Glass recycling - tip / local authority waste site / HWRC	1	1%	2	2%
Hazardous chemical waste disposal facility - tip / local authority waste site / HWRC	24	24%	9	10%
Hazardous chemical waste disposal facility - doorstep collection by local authority	3	3%	1	1%
Plastic recycling point (supermarkets / car parks etc.)	3	3%	2	2%
Glass recycling point (supermarkets / car parks etc.)	0	0%	0	0%
Burn e.g. bonfire	0	0%	0	0%
Other	1	1%	0	0%

Figure 5.11 Disposal of ready-to-use containers with pesticide still in the plant protection product container by how closely respondents follow the product instructions (2013) (by percentage)

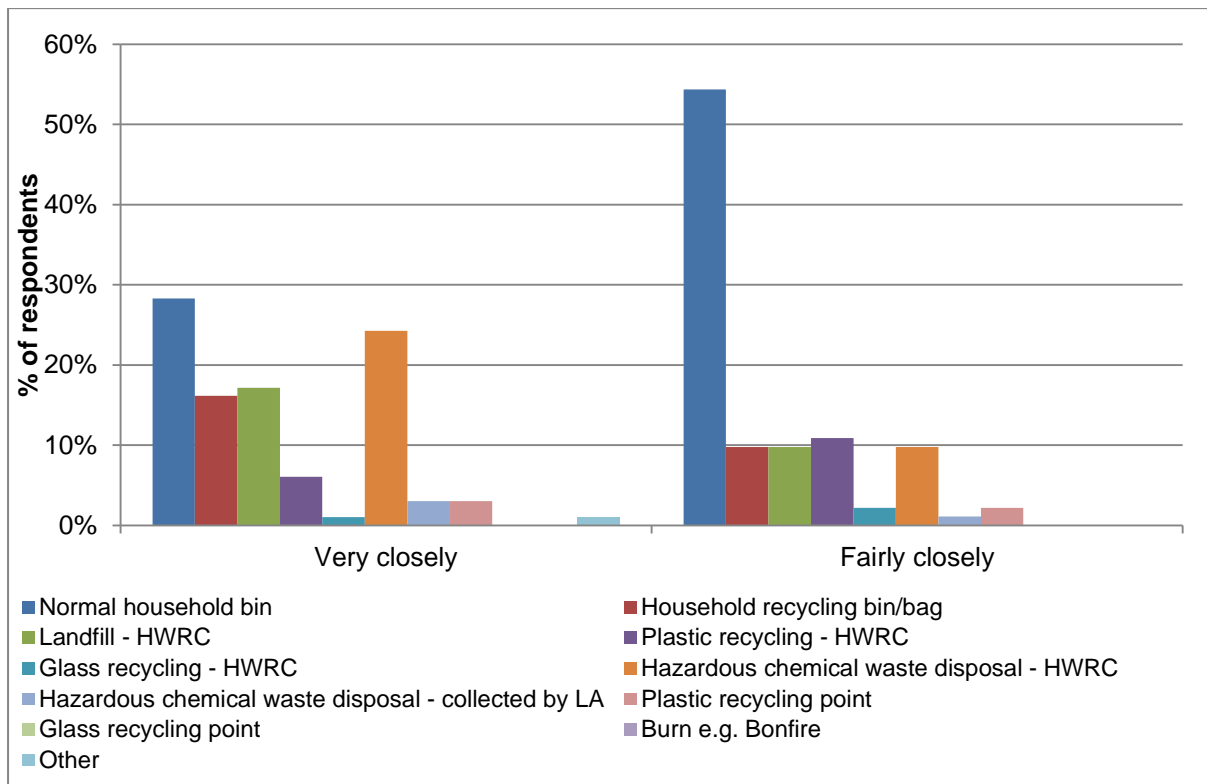
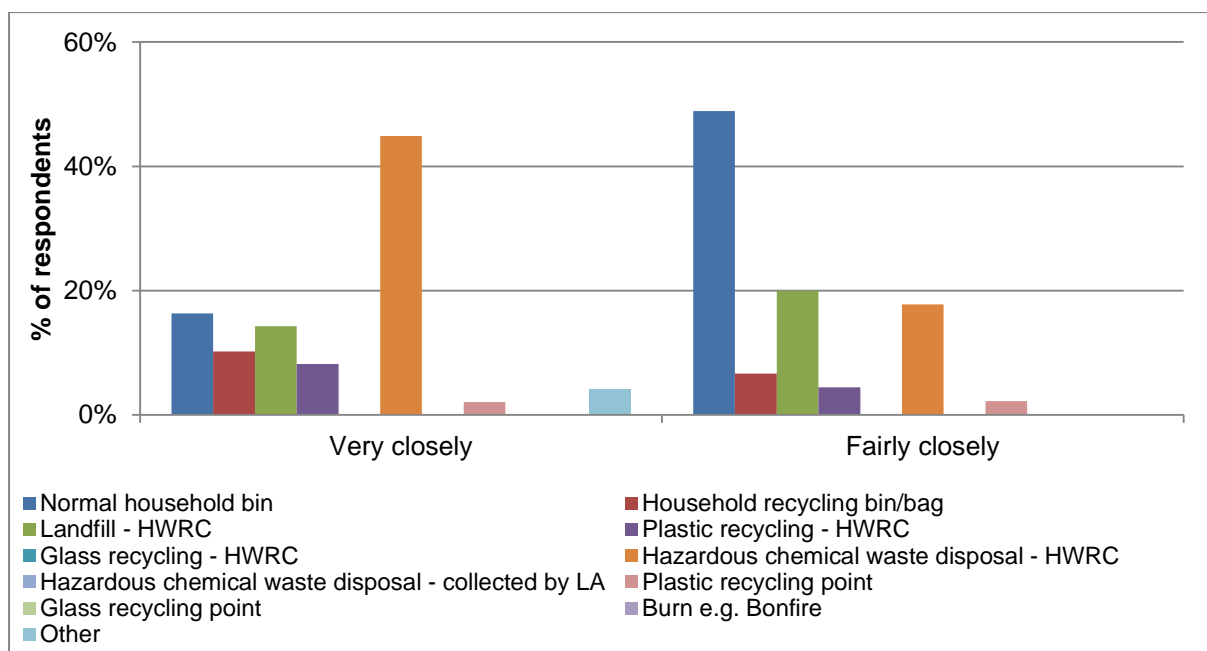


Table 5.19 Disposal of concentrate containers with pesticide still in the plant protection product container by how closely respondents follow the product instructions (2013)

	Very closely		Fairly closely	
	Count	Percentage	Count	Percentage
Normal household bin	8	16%	22	49%
Household recycling bin / bag (kerbside / street collection)	5	10%	3	7%
Landfill - tip / local authority waste site / HWRC	7	14%	9	20%
Plastic recycling - tip / local authority waste site / HWRC	4	8%	2	4%
Glass recycling - tip / local authority waste site / HWRC	0	0%	0	0%
Hazardous chemical waste disposal facility - tip / local authority waste site / HWRC	22	45%	8	18%
Hazardous chemical waste disposal facility - doorstep collection by local authority	0	0%	0	0%
Plastic recycling point (supermarkets / car parks etc.)	1	2%	1	2%
Glass recycling point (supermarkets / car parks etc.)	0	0%	0	0%
Burn e.g. bonfire	0	0%	0	0%
Other	2	4%	0	0%

Figure 5.12 Disposal of concentrate containers with pesticide still in the plant protection product container by how closely respondents follow the product instructions (2013) (by percentage)



6. Summary and discussion

Key survey findings in 2013 can be summarised as follows:

6.1 Respondent profile

- Due to the inclusion of an online survey for 2013, respondents were from a range of regions in the UK. The most represented regions were South East England (20%) and North West England (17%).
- The majority (52%) of respondents identified themselves as 'keen and regular gardeners', with a further 28% stating they 'enjoy gardening but don't always have the time for it'. Only 4% of respondents saw gardening as a chore.
- 97% of all respondents carried out their gardening at home. There has been an increase in the number of respondents also stating they carried out gardening at an allotment from 2007 and 2010 (from 4% to 12%).
- The sample was biased towards older age groups as in previous survey years, with 71% of respondents over the age of 45. As in 2010, only 1% of respondents were aged between 16 and 24.

6.2 Purchasing habits

- The most frequently purchased products were weedkillers, slug/snail killers and insecticides. This shows a change from the previous survey years (2007 and 2010) in which the third most frequently purchased products were lawn treatments. There were differences in purchasing habits between different respondent locations, for example, animal repellent use was highest in East Midlands and Scotland. In addition slug/snail killer use was lowest in Scotland and highest in South West England and Greater London.
- The majority of respondents purchased between one and two products a year as in previous years. There were some variations in the number of products purchased by the location of the respondent. For example, those in South East England and Wales were more likely to purchase less than one product per year. Respondents in Scotland were more likely to purchase six or more products per year.
- Analysis also showed evidence of variation in the number of products purchased per year depending upon the attitude of the gardener. Those that considered gardening a chore were more likely to purchase less than one or one product per year. Respondents that liked to keep the garden tidy were more likely to purchase two products per year than keen gardeners and those that considered gardening a chore. This shows some consistency with the 2010 results although the gardening is a chore group were least likely to purchase one product a year in 2010.
- The most popular purchase location for plant protection products was garden centres (76%), followed by DIY store/hardware store (48%).

6.3 Storage

- As with previous survey years, the shed was the most popular location to store plant protection products (58%). A further 32% of respondents stored plant protection products in the garage. 14% of respondents cited some form of safety precaution such as a high shelf or locked cupboard.
- The largest percentage of respondents stored plant protection products for one to two years (46%), with a further 23% storing for less than one year. There was evidence of respondents keeping plant protection products for extended periods of time with 5% storing for more than five years.

6.4 Product usage

- 64% of respondents stated they read the instructions on how to use the product before purchase. 38% would read before they used the product for the first time. Only 3% of respondents would rarely or never read the instructions. 29% of respondents read the label again before using every time, which is an improvement of 16% from 2010. This indicates an improvement in good practice.
- 86% of respondents stated the instructions for use were clear.
- The majority of respondents (95%) followed the instructions either 'very closely' or 'fairly closely.' Only 1% of respondents did not follow the instructions at all. Keen gardeners were most likely to follow the instructions very closely (59%). Those that considered gardening a chore were more likely not to follow instructions closely (10%) or not to follow instructions at all (2%). However, this is lower than in previous years, again indicating an improvement in good practice.
- Other than the product label the most popular source of additional information was websites (25%) with the most popular sites being the Royal Horticultural Society (RHS) and the Google search engine. As in 2010, magazines were the second most popular source of information (13%).
- Over half of the respondents (53%) used ready-to-use products only. 29% stated they used both ready-to-use and concentrate products.
- Of the respondents that purchased concentrate products that need diluting: The majority (86%) used the measuring device / cap provided with the product to measure the volume of concentrate product required. Older age groups were more likely to use the measuring device / cap than younger age groups as in previous survey years.

6.5 Disposal

- The majority of respondents did not dispose of excess/unwanted pesticide before disposing of the container (80% used up the product for both ready-to-use and concentrate products).
- For those disposing of the container with ready-to-use pesticide in the container nearly half disposed in the normal household bin (49%), indicating that they were not following the label contrary to claims that 95% followed the instructions either 'very closely' or 'fairly closely'. For concentrate products, the highest percentage disposed in either the normal household bin (38%), which is again contrary to claims that respondents followed the label; or a hazardous chemical waste disposal facility at a household waste recycling centre (HWRC) (38%), which is good practice and indicates that respondents are following label instructions.
- 66% of respondents using ready-to-use products did not rinse out the empty container before disposal. Older respondents (39% 65 and over) and those that considered themselves as keen gardeners (36%) were more likely to rinse out the empty container.
- 55% of respondents using concentrate products did rinse out the empty container before disposal. Similarly, the older respondents (59% 65 and over) and those that considered themselves as keen gardeners (56%) were more likely to rinse out the empty container.
- The majority of respondents using ready-to-use products disposed of the empty container in the household recycling bin/bag used for kerbside collection (52%). 41% of respondents disposed of the empty container in the normal household bin.
- Similarly, the highest percentage of respondents using concentrate products disposed of the empty container in household recycling bin/bag used for kerbside collection (48%). 39% of respondents disposed of the empty container in the normal household bin, which is good practice and indicates that respondents are following current label instructions.
- For both ready-to-use and concentrate products the majority of respondents did not remove the lid/cap/trigger spray handle from the container before disposal (72% and 77% respectively).

6.6 Comparison of findings

Table 6.1 below compares the findings from the surveys in 2007 and 2010 with this year's survey.

Table 6.1 Comparison of findings

Question	2007 responses	2010 responses	Difference (2007 and 2010) (↑↓)	2013 responses	Difference (2010 and 2013) (↑↓)
Percentage of “keen and regular gardeners”	53%	50%	↓	52%	↑
Percentage of respondents over 45	81%	80%	↓	71%	↓
Most frequently purchased products	Slug pellets (67%) Weed killers (50%) Lawn treatments (45%)	Slug pellets (61%) Weed killer (63%) Lawn treatments (47%)	↓ ↑ ↑	Slug pellets (65%) Weed killer (66%) Lawn treatments (39%)	↑ ↑ ↓
Number of products purchased per year	Most purchase one or two products: One (32%) Two (27%)	Most purchase one or two products: One (30%) Two (31%)	↓ ↑	Most purchase one or two products: One (28%) Two (30%)	↓ ↓
One product or less purchased per year by gardener category	Keen and regular: 39% Gardening is a chore: 59%	Keen and regular: 35% Gardening is a chore: 38%	↓ ↓	Keen and regular: 40% Gardening is a chore: 56%	↑ ↑

Question	2007 responses	2010 responses	Difference (2007 and 2010) (↑↓)	2013 responses	Difference (2010 and 2013) (↑↓)
Not reading / understanding instructions	Rarely or never read: 6% Instructions are unclear: 3% Do not follow: 2% Only sometimes follow: 6%	Rarely or never read: 4% Instructions are unclear: 5% Do not follow: 3% Only sometimes follow: 5%	↓ ↑ ↑ ↓	Rarely or never read: 3% Instructions are unclear: 5% Do not follow: 1% Not very closely: 3%	↓ - ↓ ↓
Other sources of instructions	Garden centre staff: 14% Magazines: 13% Websites: 8% TV: 8%	Garden centre staff: 5% Magazines: 8% Websites: 14% TV: 5%	↓ ↓ ↑ ↓	Garden centre staff: 8% Magazines: 13% Websites: 25% TV: 8%	↑ ↑ ↑ ↑
Percentage only using 'ready-to-use' products	47% Younger age groups more likely to use these Keen and regular gardeners: 44%	53% Younger groups more likely to use these Keen and regular gardeners: 50%	↑ ↑	53% Those aged over 65 more likely to use these Keen and regular gardeners: 48%	- ↓
Percentage estimating the amount of product to be diluted	10% Likelihood becomes slightly lower with ascending age	8% Likelihood becomes slightly lower with ascending age	↓	10% Likelihood becomes slightly lower with ascending age	↑

Question	2007 responses	2010 responses	Difference (2007 and 2010) (↑↓)	2013 responses	Difference (2010 and 2013) (↑↓)
Percentage that rinse empty containers	<u>Concentrate products</u> 60% Those in the 65+ age group and keen and regular gardener category are most likely to rinse empty containers: 66%/67%	<u>Concentrate products</u> 67% Again, those in the 65+ age group and keen and regular gardener category are most likely to rinse empty containers: 74%/70%	↑ ↑	<u>Concentrate products</u> 55% New analysis for 2013 <u>Ready-to-use products</u> 34% Younger and 65+ respondents and keen and regular gardeners are most likely to rinse empty containers (concentrate and ready-to-use)	↓
Where rinsings are poured (from rinsing empty pesticide containers)	<u>Concentrate products</u> Down the drain: 50% Waste ground: 24% Sink: 7% Toilet: 1%	<u>Concentrate products</u> Drain: 52% Waste ground: 24% Sink: 10% Toilet: 1%	↑ - ↑ -	<u>Concentrate products</u> Drain: 19% Waste ground: 32% Sink: 5% Toilet: 1% New analysis for 2013 Add to diluted spray solution: 34% <u>Ready-to-use products</u> Drain: 32% Waste ground: 46% Sink: 7% Toilet: 1%	↓ ↑ ↓ -

Question	2007 responses	2010 responses	Difference (2007 and 2010) (↑↓)	2013 responses	Difference (2010 and 2013) (↑↓)
Storage location	Shed: 60% Garage: 31% Home: 4% 11% specify safety precautions	Shed: 60% Garage: 33% Home: 5% 4% specify safety precautions	- ↑ ↑ ↓	Shed: 58% Garage: 32% Home: 9% 14% specify safety precautions	↓ ↓ ↑ ↑
Storage duration	One season: 34% 1-2 years: 50% 2-3 years: 10% 3+ years: 6%	One season: 35% 1-2 years: 44% 2-3 years: 10% 3+ years: 9%	↑ ↓ - ↑	One season: 23% 1-2 years: 46% 2-3 years: 20% 3+ years: 11%	↓ ↑ ↑ ↑
Percentage of all respondents that dispose of unwanted pesticides	14%	11%	↓	New analysis for 2013: <u>Ready-to-use products:</u> 20% <u>Concentrate products:</u> 20%	

Question	2007 responses	2010 responses	Difference (2007 and 2010) (↑↓)	2013 responses	Difference (2010 and 2013) (↑↓)
Disposal of containers WITH pesticide	Results not available	Results not available	-	New analysis for 2013: <u>Ready-to-use products:</u> Residual waste bin: 49% Hazardous chemical waste disposal facility at HWRC: 21% Household recycling collection: 16% Landfill via HWRC: 16% <u>Concentrate products:</u> Residual waste bin: 38% Hazardous chemical waste disposal facility at HWRC: 38% Household recycling collection: 11% Landfill via HWRC: 20%	

Question	2007 responses	2010 responses	Difference (2007 and 2010) (↑↓)	2013 responses	Difference (2010 and 2013) (↑↓)
Disposal of empty containers	<u>All containers</u> Residual waste bin: 48% Recycling container: 35% Household Waste Recycling Centre: 18%	<u>All containers</u> Residual waste bin: 38% Recycling container: 44% Household Waste Recycling Centre: 21%	↓ ↑ ↑	New analysis for 2013: <u>Ready-to-use products:</u> Residual waste bin: 41% Household recycling collection: 52% Plastic recycling at HWRC: 12% <u>Concentrate products:</u> Residual waste bin: 39% Household recycling collection: 48% Plastic recycling at HWRC: 16%	

Appendix 1: Questionnaire

Excuse me:

1. Do you use pesticides in your garden? (prompt with examples if required)

Yes	
No	

If YES: continue with opening

If NO, thank and close interview

The government wants to know more about how pesticides are used in gardens. In order to improve the safe use of pesticides, we need information on how they are currently being used. My name is _____ and I work for Resource Futures. Could you spare a few minutes to answer a few questions? You will be entered into a prize draw if you like.

When we talk about pesticides, we mean those used for plant protection purposes in the garden, allotment or on houseplants. These may include: weedkillers, slug and snail killers, fungicides, insecticides, lawn treatments which contain moss killers or weedkillers, animal repellents and hormone rooting substances.

Questions about you

2. Which region do you live in? (tick one only)

East Midlands		Scotland	
East of England		South East England	
London		South West England	
North East England		Wales	
North West England		West Midlands	
Northern Ireland		Yorkshire and Humber	

3. Which of these descriptions best describes how you feel about gardening? (tick one only):

I am a keen and regular gardener – gardening is an enjoyable hobby	
I enjoy gardening but don't always have time for it	
I like to keep the garden tidy, but wouldn't call it a hobby	
Gardening is a chore	

4. Where do you do your gardening? (tick all that apply)

Garden at home	
Allotment	
Other (please specify) _____	

5. Which of the following age brackets do you fall into? (tick one only)

16-24	
25-44	
45-64	
65 and over	

Continue to purchasing questions

Purchasing

6. Which types of pesticides do you use? (tick all that apply)

Animal repellents (to protect planted areas)		Fungicides (to control plant diseases)	
Insecticides (to control plant pests) (<u>not</u> general house fly sprays)		Lawn treatments (containing moss killers and/or weedkillers)	
Hormone rooting powder/gel		Slug/snail killers (e.g. pellets)	
Weedkillers		Other plant protection products (please specify) _____	

7. How many pesticide products do you purchase each year on average? (tick one only)

Less than 1	
1	
2	
3	
4	
5	
6 or more	

8. Where do you usually buy your pesticides from? (tick all that apply)

Garden centre	
DIY store/hardware shop	
Supermarket	
Gardening club or allotment society	
Internet	
Other (please specify) _____	

Continue to storage questions

Storage

9. Where do you store pesticides? (tick all that apply)

Shed	<input type="checkbox"/>	In the house	<input type="checkbox"/>
Garage	<input type="checkbox"/>	Locked cupboard / container	<input type="checkbox"/>
Greenhouse	<input type="checkbox"/>	High shelf	<input type="checkbox"/>
Other (please specify) _____	<input type="checkbox"/>		

10. How long do you store pesticides for on average before using them up or disposing of them? (tick one only)

Less than 1 year	<input type="checkbox"/>
1 to 2 years	<input type="checkbox"/>
2 to 3 years	<input type="checkbox"/>
3 to 5 years	<input type="checkbox"/>
More than 5 years	<input type="checkbox"/>

Continue to use questions page

Use

11. When do you read the instructions for use on pesticides? (tick all that apply)

Before buying	<input type="checkbox"/>
Before using for first time	<input type="checkbox"/>
Before using every time	<input type="checkbox"/>
Occasionally as a reminder	<input type="checkbox"/>
Rarely/ never	<input type="checkbox"/>

12. Are the instructions for use on pesticides generally clear? (tick one only)

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>
Not sure	<input type="checkbox"/>

13. How closely do you follow the instructions for use on pesticides? (tick one only)

Very closely	<input type="checkbox"/>
Fairly closely	<input type="checkbox"/>
Not very closely	<input type="checkbox"/>
Not at all	<input type="checkbox"/>

14. Other than on the product label, where else do you get information on how to use pesticides? (tick all that apply) (please specify which if possible)

	Tick below	Specify
Websites		
Magazines		
Leaflets		
Books		
TV		
Radio		
Gardening advice helpline		
Product company helpline		
Garden centre staff		
Other gardeners		
Other		

15. Do you tend to use ready-to-use products or concentrate products that need diluting before use? (tick one only)

Ready-to-use products		Continue to question 17
Concentrate products that need diluting		Continue to question 16
Both		Continue to question 16

The questions on this page relate only to concentrate products.

16a). How do you measure amounts of product when diluting concentrate pesticides? (tick all that apply)

Measuring device / cap provided with product	
Estimate or guess	
Your own measuring jug or similar	
Other (please specify) _____	

16b). How do you generally dispose of any unused/excess, diluted spray solution? (tick one only)

	Excess spray solution
I don't dispose – I use it all up	
I don't dispose – I keep it for later use	
Drain	
Sink	
Toilet	
Spray/empty onto waste ground	
Other (please specify) _____	

Disposal

Ask only for product group ticked in Q15

17. For ready to use products, how do you generally dispose of any unused/unwanted pesticide BEFORE disposing of the container? (tick one only)

For concentrate products, how do you generally dispose of any unused/unwanted pesticide BEFORE disposing of the container? (tick one only)

	Ready to use products	Concentrate products that need diluting
I don't - I dispose of it WITH the bottle Go to Q18		
I don't have any excess – I use it all up Go to Q19		
Drain Go to Q19		
Sink Go to Q19		
Toilet Go to Q19		
Spray/empty onto waste ground Go to Q19		
Other (please specify) Go to Q19 _____		

18. For ready to use products, how do you dispose of containers with some pesticide still in the container? (tick all that apply)

For concentrate products, how do you dispose of containers with some pesticide still in the container? (tick all that apply)

	Ready to use products	Concentrate products that need diluting
Normal household bin		
Household recycling bin/bag (kerbside / street collection)		
Landfill – tip / local authority waste site / HWRC		
Plastic recycling – tip / local authority waste site / HWRC		
Glass recycling – tip / local authority waste site / HWRC		
Hazardous chemical waste disposal facility – tip / local authority waste site / HWRC		
Hazardous chemical waste disposal facility - doorstep collection by local authority		
Plastic recycling point (supermarkets / car parks etc.)		
Glass recycling point (supermarkets / car parks etc.)		
Burn e.g. bonfire		
Other (please specify) _____		

19a). For ready to use products, do you generally rinse out the empty pesticide container before disposal?

For concentrate products, do you generally rinse out the empty pesticide container before disposal?

	Ready to use products	Concentrate products that need diluting
Yes		
No		

If NO continue to Q20

19b). **For ready to use products**, what do you generally do with the liquid from rinsing the empty pesticide container?

For concentrate products, what do you generally do with the liquid from rinsing the empty pesticide container?

	Ready to use products	Concentrate products that need diluting
Drain		
Sink		
Toilet		
Spray/empty onto waste ground		
Add to diluted spray solution (for concentrate products that need diluting)		
Other (please specify) _____		

20a. **For ready to use products**, how do you dispose of empty pesticide containers? (tick all that apply)

For concentrate products, how do you dispose of empty pesticide containers? (tick all that apply)

	Ready to use products	Concentrate products that need diluting
Normal household bin		
Household recycling bin / bag (kerbside / street collection)		
Landfill – tip / local authority waste site / HWRC		
Plastic recycling – tip / local authority waste site / HWRC		
Glass recycling – tip / local authority waste site / HWRC		
Hazardous chemical waste disposal facility – tip / local authority waste site / HWRC		
Hazardous chemical waste disposal facility - doorstep collection by local authority		
Plastic recycling point (supermarkets / car parks etc.)		
Glass recycling point (supermarkets / car parks etc.)		
Burn e.g. bonfire		
Other (please specify) _____		

20b). **For ready to use products**, do you remove the lid / cap / trigger spray handle from the empty container first?

For concentrate products, do you remove the lid / cap from the empty container first?

	Ready to use products	Concentrate products that need diluting
No, leave on container		
Yes, remove and dispose of separately		

Close

Thank you very much, that is now the end of the survey

If you would like to enter the prize draw, please provide us with your contact details.

NB: Your details will ONLY be used to enter you in the prize draw.

Name: Address: Postcode: Telephone number:

Appendix 2: Briefing sheet for User Habits Questionnaire

What are Pesticides?

'Pesticide' is a broad term, covering a range of products that are used to control pests. Pesticides you may have heard of include:

- Animal repellents (to protect planted areas)
- Insecticides (to control plants pests) (not general house fly sprays)
- Hormone rooting powder/gel
- Weedkillers
- Fungicides (to control plant diseases)
- Lawn treatments (containing moss killers and/or weedkillers)
- Slug/snail killers (e.g. pellets)

Often people only think of pesticides as chemicals, but they include a huge range of different types of products. Some are natural (e.g. pyrethrums, obtained from chrysanthemums), while many are altered versions of natural chemicals (e.g. fatty acids). These 'natural' versions may be considered suitable for use by organic gardeners.

Organic gardening

However, organic gardening involves a lot more than just avoiding the use of chemicals. Organic gardeners focus their energy into increasing the natural health of their soil, choosing appropriate plant varieties, and working with nature to produce a healthy and productive garden.

Ready to use / concentrate products

Liquid ready-to-use products are often sold in trigger spray bottles. Liquid concentrate products are usually in plastic bottles with child proof screw caps that then need measuring out and diluting.

Granular products (e.g. some lawn treatments) are often ready to use as many can be bought in a container that will dispense the product at a particular rate. Although larger bags can also be bought which can be applied with a separate spreader.

Should I save pesticides that I have diluted?

No. You should try to avoid storing diluted pesticide by only mixing up or diluting the amount you need for a specific job.

Should I rinse out pesticide containers before disposing of them? What should I do with the rinsings?

It is good practice to rinse out pesticide containers that have held concentrated product (i.e. requiring dilution for use) before disposing of them. The container should be rinsed three times and the washings added to the final spray solution. Trigger bottles (Ready-to-Use products) and other containers do not need to be rinsed.

Should I keep pesticides locked up?

Garden pesticides do not need to be kept locked away, although they should be kept out of the reach of children and pets.

After you have used the pesticide, make sure that the packaging is tightly closed or sealed.

Take particular care to use and store slug pellets safely, so as to avoid accidentally poisoning any pets – particularly dogs.

How long should I store pesticides for before using them?

If you store it carefully, any remaining pesticide will be effective for some years to come. Check whether you can still legally use it by visiting our [Garden Pesticides Search](https://secure.pesticides.gov.uk/garden/prodsearch.asp) (<https://secure.pesticides.gov.uk/garden/prodsearch.asp>).

Garden sheds and greenhouses are not ideal for storing pesticides as they can get very hot in summer or cold in winter. Pesticide products are best stored at an even temperature.

How should I dispose of empty pesticide containers?

First of all, check the label for advice.

Empty containers of Ready-to-Use products (e.g. trigger sprays) can be disposed of directly into your household waste.

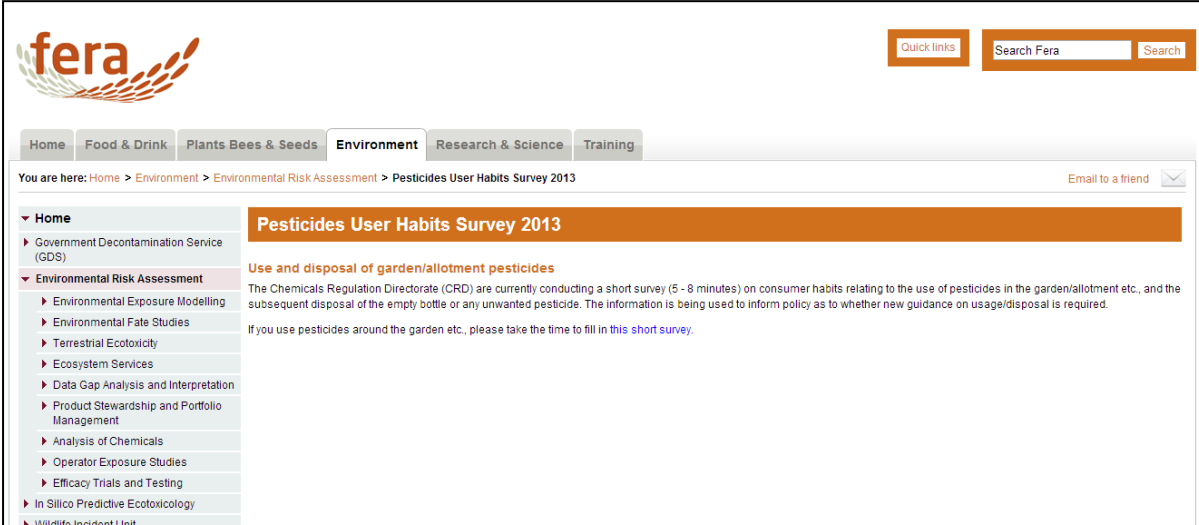
Empty bottles of concentrates (pesticides you dilute with water for use) need to be rinsed out three times first and the washings added to the spray solution.

How should I dispose of unwanted pesticides?

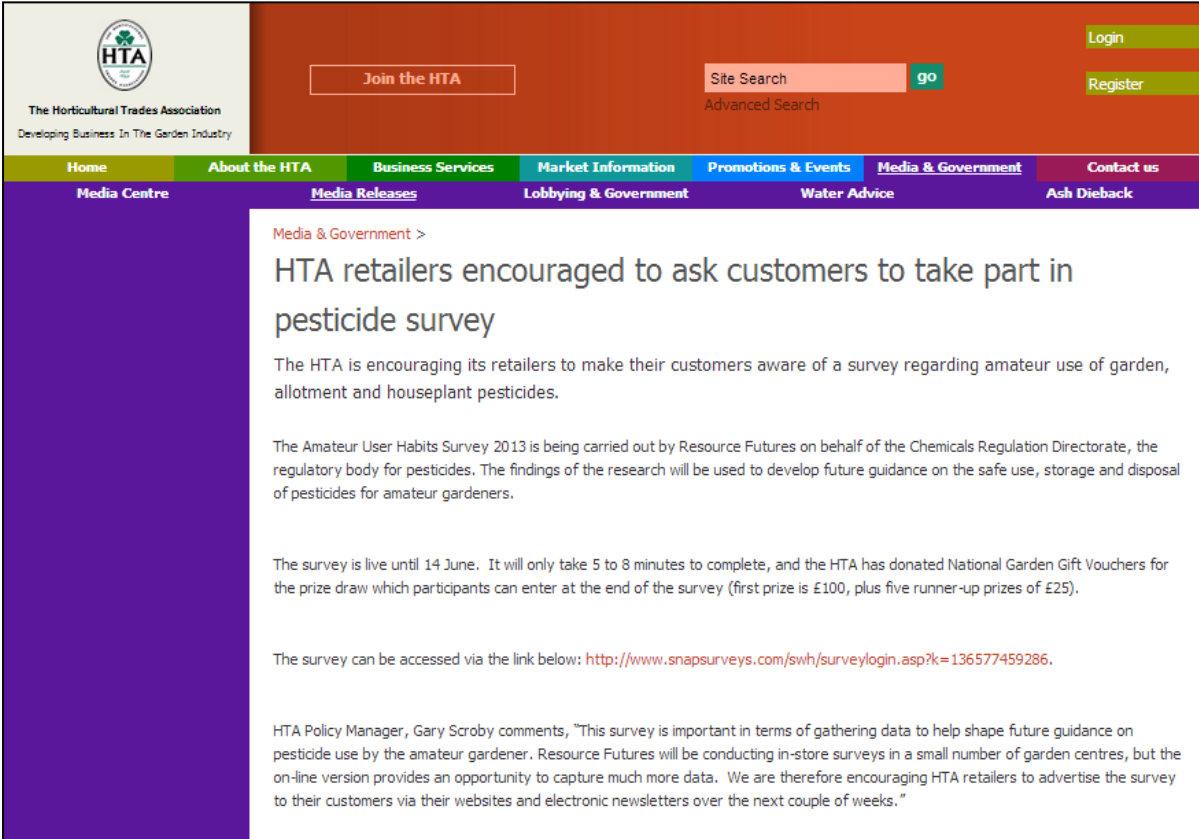
Unwanted pesticides should be disposed of safely through your local amenity waste disposal site that accepts hazardous household waste. All local councils should make arrangements for disposing of hazardous household waste, so you should contact them for the nearest suitable site. Alternatively some councils offer a collection service.

Pesticides (and other chemicals) are securely separated from other waste and disposed of safely later, usually in special high temperature incinerators that destroy them completely.

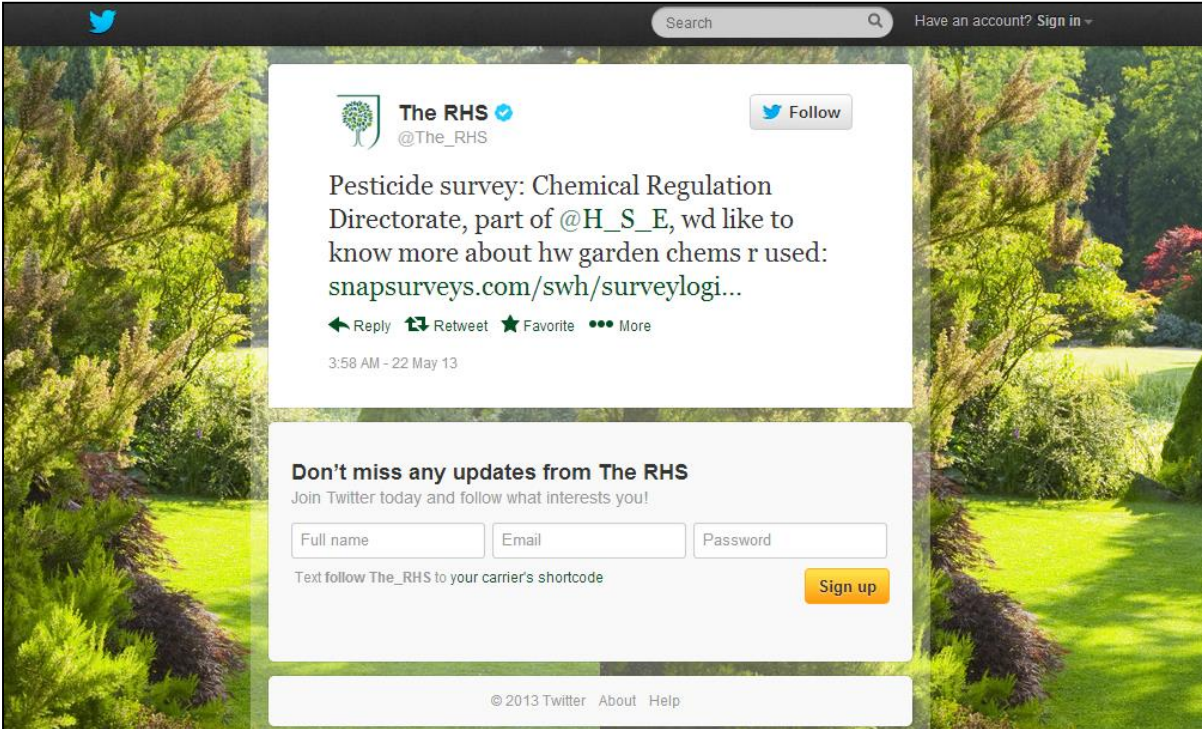
Appendix 3: Online survey advertising



The screenshot shows the Fera website interface. At the top left is the Fera logo. To the right are 'Quick links' and a search box labeled 'Search Fera'. Below the logo is a navigation menu with tabs for 'Home', 'Food & Drink', 'Plants Bees & Seeds', 'Environment', 'Research & Science', and 'Training'. The 'Environment' tab is selected. Below the menu, a breadcrumb trail reads: 'You are here: Home > Environment > Environmental Risk Assessment > Pesticides User Habits Survey 2013'. On the right of this trail is an 'Email to a friend' link. A left-hand navigation menu is expanded to show 'Environmental Risk Assessment' with sub-items like 'Environmental Exposure Modelling', 'Environmental Fate Studies', etc. The main content area is titled 'Pesticides User Habits Survey 2013' and contains the text: 'Use and disposal of garden/allotment pesticides. The Chemicals Regulation Directorate (CRD) are currently conducting a short survey (5 - 8 minutes) on consumer habits relating to the use of pesticides in the garden/allotment etc., and the subsequent disposal of the empty bottle or any unwanted pesticide. The information is being used to inform policy as to whether new guidance on usage/disposal is required. If you use pesticides around the garden etc., please take the time to fill in [this short survey](#).'



The screenshot shows the HTA website. At the top left is the HTA logo and the text 'The Horticultural Trades Association - Developing Business In The Garden Industry'. To the right are 'Join the HTA', 'Site Search' (with a 'go' button), and 'Advanced Search' links. Further right are 'Login' and 'Register' buttons. Below the header is a navigation menu with tabs for 'Home', 'About the HTA', 'Business Services', 'Market Information', 'Promotions & Events', 'Media & Government', and 'Contact us'. The 'Media & Government' tab is selected. Below the menu, a breadcrumb trail reads: 'Media & Government >'. The main content area is titled 'HTA retailers encouraged to ask customers to take part in pesticide survey'. The text reads: 'The HTA is encouraging its retailers to make their customers aware of a survey regarding amateur use of garden, allotment and houseplant pesticides. The Amateur User Habits Survey 2013 is being carried out by Resource Futures on behalf of the Chemicals Regulation Directorate, the regulatory body for pesticides. The findings of the research will be used to develop future guidance on the safe use, storage and disposal of pesticides for amateur gardeners. The survey is live until 14 June. It will only take 5 to 8 minutes to complete, and the HTA has donated National Garden Gift Vouchers for the prize draw which participants can enter at the end of the survey (first prize is £100, plus five runner-up prizes of £25). The survey can be accessed via the link below: <http://www.snapsurveys.com/swh/surveylogin.asp?k=136577459286>. HTA Policy Manager, Gary Scroby comments, "This survey is important in terms of gathering data to help shape future guidance on pesticide use by the amateur gardener. Resource Futures will be conducting in-store surveys in a small number of garden centres, but the on-line version provides an opportunity to capture much more data. We are therefore encouraging HTA retailers to advertise the survey to their customers via their websites and electronic newsletters over the next couple of weeks."



The RHS @The_RHS

Pesticide survey: Chemical Regulation Directorate, part of @H_S_E, wd like to know more about hw garden chems r used: snapsurveys.com/swh/surveylogi...

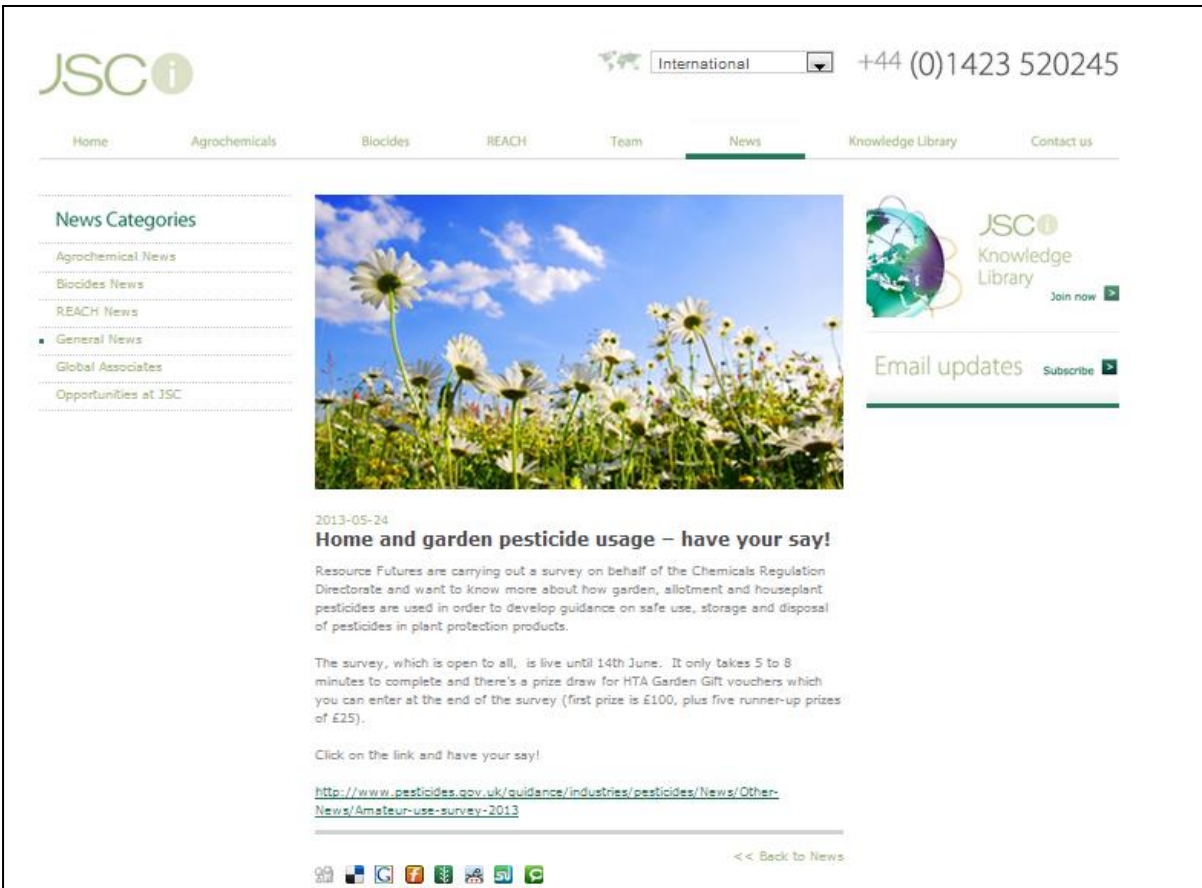
3:58 AM - 22 May 13

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Home and garden pesticide usage – have your say!

2013-05-24

Resource Futures are carrying out a survey on behalf of the Chemicals Regulation Directorate and want to know more about how garden, allotment and houseplant pesticides are used in order to develop guidance on safe use, storage and disposal of pesticides in plant protection products.

The survey, which is open to all, is live until 14th June. It only takes 5 to 8 minutes to complete and there's a prize draw for HTA Garden Gift vouchers which you can enter at the end of the survey (first prize is £100, plus five runner-up prizes of £25).

Click on the link and have your say!

<http://www.pesticides.gov.uk/guidance/industries/pesticides/News/Other-News/Amateur-use-survey-2013>

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Bayer Garden We can help 15
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me

May 30, 2013

Amateur User Habits Survey 2013

Regulators for gardening chemicals in amateur use are looking for feedback and giving you the chance to win a prize. If you use garden care chemicals please fill in the Amateur Users habits Survey (link below). It will only take 5 to 8 minutes to complete, and the Horticultural Trades Association has donated National Garden Gift Vouchers for the prize draw which participants can enter at the end of the survey (first prize is £100, plus five runner-up prizes of £25).

The survey is designed to look at how garden care chemicals are used and the results will be used to develop further guidance on safe use, storage and disposal of garden care chemicals.

The survey is live until 14th June.

The survey can be accessed via the link below:

<http://www.snapsurveys.com/swh/surveylogin.asp?k=136577459286>

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Survey on the use of pesticides in the garden

Posted by Landscape Juice on June 6, 2013 at 11:37 [View Blog](#)

If you have customers who are a little more 'hands on' in the garden then you might want to make them aware of a survey regarding amateur use of garden, allotment and house plant pesticides.

The survey is being carried out on behalf of the Chemicals Regulation Directorate, part of the Health and Safety Executive.

The government wants to know more about how pesticides are used in order to develop guidance on safe use, storage and disposal of pesticides in plant protection products.

The survey is live until 14 June, 2013 and it will take between five and eight minutes to complete: Pesticides User Habits Survey 2013

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Pesticides user habits survey 2013 (PS2817 and RF1990)

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Garden Expert

There's always something to learn in gardening and that's true however long it is since you first picked up a trowel.

Garden Care Chemicals Survey

Enter before the 14th June for a chance to win some National Garden Gift Vouchers. First prize drawn out is for £100 and there are five further prizes of £25.

The survey is being carried out on behalf of DEFRA (Chemicals Regulation Directorate) and the results will be used to develop further guidance on safe use, storage and disposal of garden care chemicals.

The survey will take about 5 to 8 minutes to complete.

The survey can be accessed via the link www.snapsurveys.com/swh/surveylogin.asp?k=136577459286