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## **Project Report No. 541**

# **Assessing the impact of the restrictions on the use of neonicotinoid seed treatments**

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## **1. Background**

On 1 December 2013, a restriction on the use of the neonicotinoids, clothianidin, imidacloprid and thiamethoxam, was enforced by the European Commission. Neonicotinoid seed treatments were previously used to reduce the damage to seedlings caused by early attacks by cabbage stem flea beetle (CSFB) thereby improving crop establishment.

Autumn 2014 was the first season since the restriction was enforced in which neonicotinoid seed treatments were not available for protecting winter oilseed rape (WOSR) crops during establishment. This report summarises the results from questions added to the AHDB/HGCA Winter Planting Survey 2014 to assess the impact of the restrictions on the use of neonicotinoid seed treatments. The questions asked were specific to WOSR growers in England and Wales and allow us to report on changes to the area of WOSR planted, the area lost to CSFB, and how much of the area lost was successfully replanted to WOSR.

## **2. Methodology**

The data were collected through the AHDB/HGCA Winter Planting Survey 2014 (<http://www.hgca.com/new-market-data-centre/planting-variety-survey/winter-planting-surveys/planting-survey/cereals-and-oilseed-rape.aspx>) which included questions designed to gauge the impact of the neonicotinoid restrictions on WOSR.

Growers were asked additional questions to assess the impact of the restrictions on the use of neonicotinoid seed treatments (Figure 1). The survey referred to planted areas as at 1 December 2014.

1. Have you reduced the area you planted to winter oilseed rape for harvest 2015 because of the restriction on neonicotinoid seed treatments?	
Yes <input type="checkbox"/>	No <input type="checkbox"/>

2. If you answered 'Yes' to question 1, please state what area you would have planted if the use of neonicotinoid seed treatments had not been restricted. (If 'No', please leave this question blank)	
Area that would have been planted	<input type="text"/>

3. If you have planted winter oilseed rape for harvest in 2015, have you lost any of your <b>original</b> planted area because of adult cabbage stem flea beetle damage? (If you haven't planted winter oilseed rape for harvest 2015, please leave this question blank)	
Yes <input type="checkbox"/>	No <input type="checkbox"/>

4. If you answered 'Yes' to question 3, please can you provide the following information: (If 'No', please leave this question blank)	
Please give the area originally planted	<input type="text"/>
Of the area originally planted, please state the total area lost because of adult cabbage stem flea beetle damage	<input type="text"/>
Of the total area lost, how much was successfully replanted to winter oilseed rape?	<input type="text"/>

**Figure 1.** Questions included in the AHDB/HGCA Winter Planting Survey 2014

More than 1,300 WOSR growers, with crops equivalent to 8% of the national WOSR area in England and Wales, completed the survey. The AHDB/HGCA Winter Planting Survey 2014 was sent by both post (on 28 November 2014) and email (on 1 December 2014) to a representative sample of 4,993 arable farmers, weighted by the arable area in each region. As a result, the responses given by growers to the questions specific to WOSR could be used to represent the situation in their region. These regional results were then combined to provide estimates of the complete situation across England.

The AHDB/HGCA Winter Planting Survey 2014 is called a 'ratio-raising' survey because it uses a ratio (comparing the current and previous harvest's actual plantings). For each crop, growers were asked to provide details of the area in the ground as at 1 June 2014 (for harvest 2014), and the

area in the ground as at 1 December 2014 (for harvest 2015). For each region and crop combination, the percentage change between 1 June and 1 December 2014 was identified. This figure (the ratio) was multiplied by last year's actual regional figures (the 2014 June Survey of Agriculture by Defra) to give an estimate of the cropping area as at 1 December. This year's estimates are effectively 'raised' from last year's actual results.

The regional splits used were those used by Defra to produce regional agricultural statistics. These regions are classed as NUTS level 1 under the European Union hierarchy and more details of the counties/groups of unitary authorities that make up each region can be found at: <http://www.ons.gov.uk/ons/guide-method/geography/beginner-s-guide/eurostat/index.html>

Please note that results are not published for Wales due to confidentiality reasons. Wales accounts for 1% of the WOSR area grown in Great Britain, so this should not significantly affect the conclusions of the survey. Further, results for smaller regions should be treated with additional caution as they are subject to a higher level of uncertainty due to a smaller sample size.

The raw data from the survey are presented in the appendix in percentages (questions 1 and 3) and hectares (questions 2 and 4).

The responses to question 2 were scaled up to represent the national picture using the following methodology:

- For each region, the additional area that survey respondents indicated they would have planted if seed treatments had been available was added to the area reported as planted as at 1 December by all respondents in the AHDB/HGCA Winter Planting Survey. This gives an indication of the area that may have been planted in each region by all farmers taking part in the survey. Please note: this may slightly underestimate the theoretical area that may have been planted because the area reported as at 1 December 2014 by all farmers in the AHDB/HGCA Planting Survey included losses due to adult CSFB damage.
- Following the same method as the AHDB/HGCA Winter Planting Survey (detailed above), these theoretical areas were then compared to the area harvested in 2014 and the percentage change identified.
- This percentage change was then applied to last year's actual regional figures (the 2014 June Survey of Agriculture by Defra of the harvest area of both winter and spring OSR varieties) to give an estimate of the potential cropping area as at 1 December if seed treatments had been available.

A slightly different process was followed for question 4.

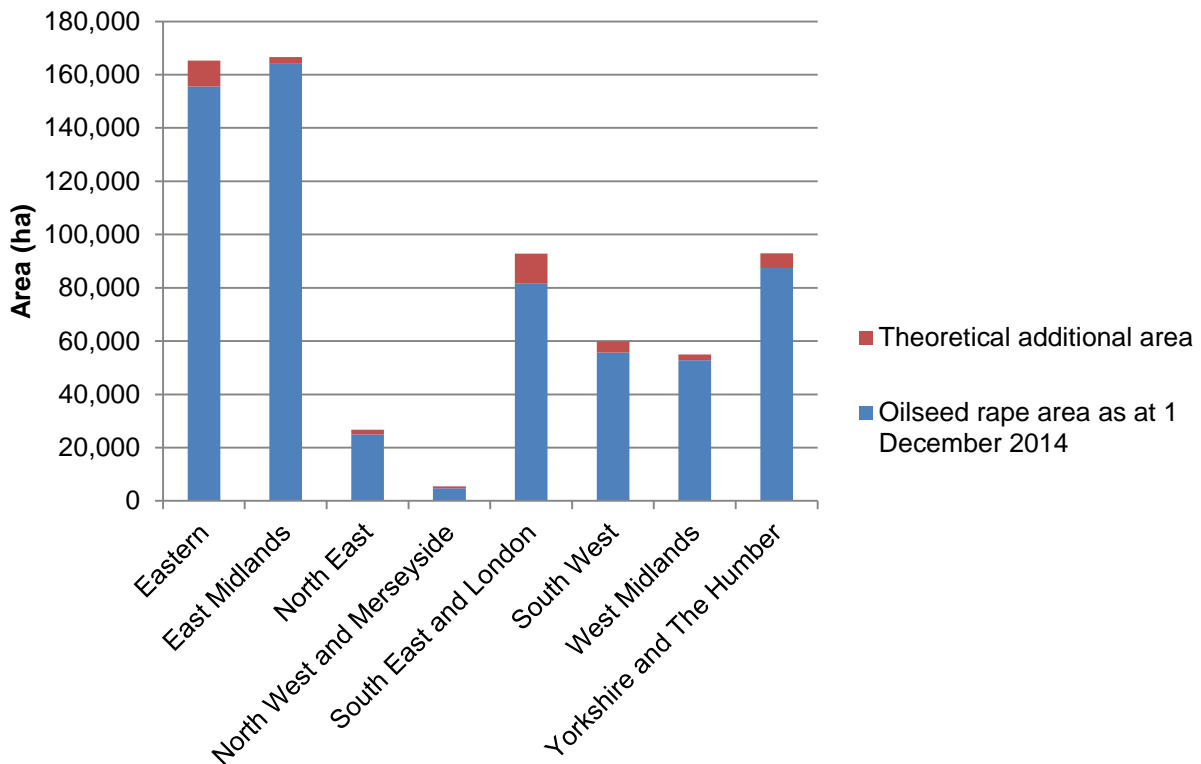
- The area originally planted by those survey respondents that reported losses due to adult CSFB (Q4A) was added to the area reported as planted as at 1 December 2014 by those that did not report losses (in the AHDB/HGCA Winter Planting Survey). This gives an estimate of the total area originally planted by all survey respondents.
- The areas reported as lost (Q4B) and lost but successfully replanted (Q4C) were then compared to the estimate of the area originally planted by all survey respondents.
- These percentages were then applied to the estimate of the regional and national areas planted as at 1 December 2014 (in the AHDB/HGCA Winter Planting Survey) to give estimates of the areas lost due to adult CSFB damage at a national and regional level.

### **3. Results**

#### **3.1. Changes to the area planted to winter oilseed rape for harvest 2015 because of the restriction on neonicotinoid seed treatments**

This section reports on results from survey questions 1 and 2. The survey showed that approximately 11% of respondents would have planted additional areas if neonicotinoid seed treatments had been available. The regional results ranged from 6% in the East Midlands and South West to 15% in the Eastern region.

The difference between the area these respondents intended to plant and actually planted was a total of just over 3,200 ha. When scaled up to a national level using the 2014 June Survey of Agriculture by Defra of the harvest area, this is theoretically equivalent to approximately 38,000 ha. A regional breakdown of this area is presented in Figure 2.



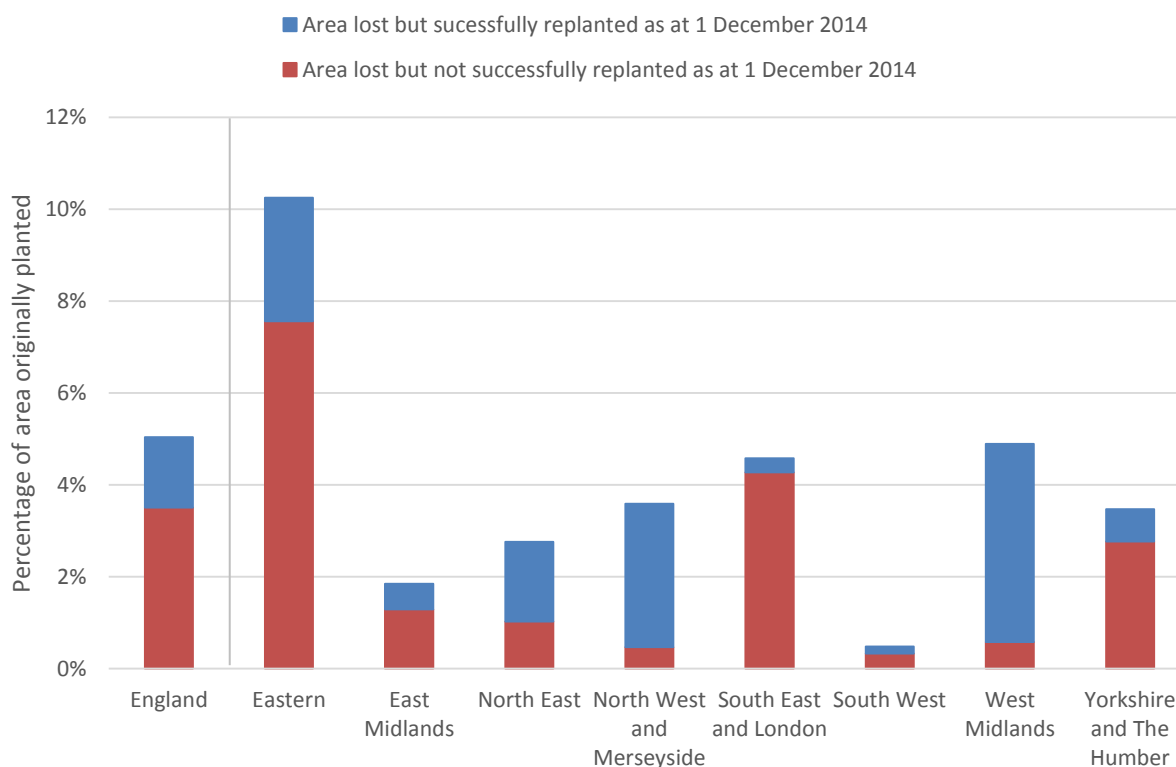
**Figure 2.** Regional breakdown of the additional area that might have been planted for harvest 2015 if neonicotinoid seed treatments had been available compared to the estimate of the oilseed rape area from the AHDB/HGCA Winter Planting Survey 2014.

### 3.2. Area lost due to adult cabbage stem flea beetle

This section reports on results from survey questions 3 and 4. These questions were specific to crop loss as of 1 December 2014 due to adult CSFB. The results do not, therefore, take into account any crop losses that may subsequently occur from CSFB larvae later in the season.

Approximately 5% of the original planting area (including data from those reporting no losses) was reported to have been lost to adult CSFB; however, about 1.5% of the original area was reported to have been successfully replanted as of 1 December 2014. Therefore, approximately 3.5% was lost and not successfully replanted to WOSR as of 1 December 2014. When scaled up using data from the HGCA/AHDB Winter Planting Survey, this is theoretically equivalent to approximately 22,000 ha.

The region which reported the highest crop losses to adult CSFB was the Eastern region with just over 10% of the original area lost, 3% of which was replanted. The South East and London region reported losses of just under 5%, of which about 0.5% was replanted. A regional breakdown is presented in Figure 3.



**Figure 3.** Percentage of the area originally planted that was lost to adult cabbage stem flea beetle damage as at 1 December 2014

Comments from the respondents included reports that some growers had lost whole fields to adult CSFB. Others reported patchy crops which they had not currently written off but would assess in the spring before making a decision whether or not to take the crop to harvest. There were also a number of comments on replanted crops suffering from slug and pigeon damage and black-grass competition, which they attributed to the lateness of the second planting. With regards to chemical control, a number of respondents commented that they had sprayed with a pyrethroid when they wouldn't have usually or that they had sprayed more times than usual.

#### 4. Summary

The questions included in the planting survey were asked to help assess the potential impact of the restrictions on the use of neonicotinoid seed treatments. Approximately 11% of respondents said they would have planted additional areas of WOSR if neonicotinoid seed treatments had been available. When scaled up to represent the whole of England, the difference between the area farmers intended to plant and did plant for harvest 2015 was approximately 38,000 ha. The total area that might have been planted if neonicotinoid seed treatments had been available would have been equivalent to a 5% increase over the area of OSR harvested in 2014 (both winter and spring varieties). This compares to the fall of 1% shown in the AHDB/HGCA Winter Planting Survey.



These findings demonstrate that the restriction on neonicotinoids did have an impact on the 2014 WOSR plantings.

Approximately 5% of the original planted area was reported to have been lost to adult CSFB. However, about 1.5% of area was reported to have been successfully replanted as of 1 December 2014. This loss of 3.5% is theoretically equivalent to approximately 22,000 ha across England. The restriction on the use of neonicotinoid seed treatments could potentially have affected the crop losses recorded as of 1 December 2014 because of the limited control options available to reduce the damage to seedlings caused by early attacks by adult CSFB. The only chemical control option during the main emergence period was a pyrethroid insecticide, to which there is evidence of resistance in CSFB in England.

The area lost reported here is that up to 1 December 2014 and is only accountable to adult CSFB. It, therefore, does not take into account any crop losses which may subsequently occur from CSFB larvae later in the season. Further work is continuing to assess the impact of CSFB larvae damage to WOSR.

## **5. Acknowledgements**

Thanks are given to Helen Plant, AHDB Market Intelligence Team, for completing data analysis.

## Appendix

**Table 1.** Results to question 1 presented as percentages (excluding Wales)

Region	Percentage of respondents in each region saying:	
	Yes – they had reduced the area they planted	No – they hadn't reduced the area they planted
Eastern	15%	85%
East Midlands	6%	94%
North East	13%	87%
North West and Merseyside	9%	91%
South East and London	14%	86%
South West	6%	94%
West Midlands	9%	91%
Yorkshire and The Humber	11%	89%
<b>England</b>	<b>11%</b>	<b>89%</b>

**Table 2.** Results to question 2 (excluding Wales)

Region	Total area (ha) that would have been planted by those answering "Yes" to Q1	Total area (ha) planted by those answering "Yes" to Q1	Difference between the area intended to plant and did plant (ha)
Eastern	3,464	2,543	921
East Midlands	877	688	189
North East	575	411	164
North West and Merseyside	154	79	76
South East and London	1,486	575	911
South West	698	344	353
West Midlands	418	222	196
Yorkshire and The Humber	956	504	451
<b>Total area in England</b>	<b>8,627</b>	<b>5,366</b>	<b>3,261</b>

**Table 3.** Results to question 3 presented as percentages (excluding Wales)

Region	Percentage of respondents in each region saying:	
	Yes – they had lost area due to CSFB damage	No – they hadn't lost area due to CSFB damage
Eastern	28%	72%
East Midlands	13%	87%
North East	12%	88%
North West and Merseyside	13%	88%
South East and London	15%	85%
South West	5%	95%
West Midlands	12%	88%
Yorkshire and The Humber	19%	81%
<b>England</b>	<b>17%</b>	<b>83%</b>

**Table 4.** Results to question 4 (excluding Wales)

Region	The area originally planted (ha) of those that reported crop losses	Of this originally planted area, the total area lost because of adult cabbage stem flea beetle damage (ha)	Of the total area lost, the area successfully replanted to WOSR (ha)	Area lost and not successfully replanted with WOSR (Q4B - Q4C)
Eastern	6,492	1,629	427	1,202
East Midlands	2,062	236	71	165
North East	240	64	40	24
North West and Merseyside	108	19	16	2
South East and London	1,139	313	21	292
South West	334	22	7	15
West Midlands	1,021	240	211	28
Yorkshire & the Humber	1,437	255	52	203
<b>Total area in England)</b>	<b>12,833</b>	<b>2,776</b>	<b>845</b>	<b>1,931</b>