October 2014

Project Report No. 546 – Extension

Cabbage stem flea beetle snapshot assessment – incidence and severity at end September 2014

Sarah Wynn, Steve Ellis and Lottie Alves

ADAS UK Ltd

This is the report of a 1 month extension to project (214-0009) which started in September 2014. The work was funded by a contract for £2,500 from AHDB Cereals & Oilseeds.

CONTENTS

1. Background

On 1 December 2013, a restriction on the use of the neonicotinoids, clothianidin, imidacloprid and thiamethoxam, was enforced by the European Commission. Autumn 2014 is the first season since the restriction was enforced in which neonicotinoid seed treatments have not been available for protecting winter oilseed rape crops during establishment.

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. This report provides a snapshot assessment across England and Scotland, at county level, of the level of CSFB damage in winter oilseed rape and the requirement for insecticide treatment at the end of September. It also provides an estimation of the number of pyrethroid treatments applied from the crop emergence period until the end of September.

2. Methodology

County level information on the damage and impacts of CSFB was provided by a network of 23 local agronomists, covering 30 counties. They provided estimates of incidence and severity based on crops walked in the period 22–29 September 2014. Assessments are based on approximately 32,000ha of winter oilseed rape crops, equivalent to 5% of the national area. The county information was weighted (based on total county area) and multiplied up to give a regional and national picture. The national area is based on the Defra June Survey (2014) England area of 618,000 plus HGCA planting survey estimates (2014) for Scotland and Wales, it is not currently expected that there are any significant changes in crop area from last year. English regional data was published in the Defra provisional survey, these have been applied pro rata to the final English area. County splits are based on historical crop areas applied pro rata. Analysis of the proportion of the winter oilseed rape crop affected by CSFB (incidence) and the level of damage (severity) observed at the end of September has been conducted on a county, regional and Great Britain level. The proportion of winter oilseed rape crops treated against CSFB over the crop emergence period until the end of September has also been determined at county, regional and Great Britain level.

The main headline results are presented. Results for Wales are not included in this report as there have been few problems with CSFB this season in the principality. Wales accounts for 1% of the winter oilseed rape area grown in Great Britain, so this should not significantly affect the conclusions of the snapshot assessment. A full breakdown of the results by county and region can be found in the appendix.

3. Results

3.1. Proportion of winter oilseed rape crops affected by cabbage stem flea beetle and above the control threshold

Nationally, 41.0% of the winter oilseed rape crop was at a vulnerable growth stage (cotyledon to 4 true leaf stage) and affected by CSFB at the time the assessments were made. Crops that had grown beyond the risk stage may have been affected earlier in the season but this was not recorded in the assessments. Of the 41.0% of crop affected by CSFB, it was estimated that 6.2% had CSFB damage that exceeded control thresholds (Figure 1 – orange bars). Over half (56.2%) of the crop nationally was either unaffected by CSFB (24.0%) or had grown past the susceptible growth stages (32.2%) at the time the assessments were made. An estimated 2.7% (equivalent to 18,000ha), of the national area of winter oilseed rape has been lost this season of which most is attributed to CSFB damage with half this area re-drilled and half currently left bare.

There was some regional variation in the proportion of winter oilseed rape crops affected by CSFB, as shown in Figure 1. The orange bars show the proportion of the crop affected, with damage above spray threshold levels, at the time of assessment. The green bars show the proportion of the crop with damage, but below threshold level at the time of assessment. The blue bars show the proportion of crops that either had no damage or were beyond the at-risk growth stage at the time of assessment. The worst affected regions appear to be the South East and Eastern region, where 65% and 48% of the crop showed signs of damage, respectively (green and orange bars). In the South East region, approximately 12% (orange bars) was above the control threshold at the time the assessment was made. The results were similar in the Eastern region with 16% of the crop above the control threshold. The majority of the crop above the control threshold was at the cotyledon–two true leaf stage and had lost 25–50% of leaf area. The majority of crop lost appears to be in the South East and Eastern regions, and parts of Yorkshire.

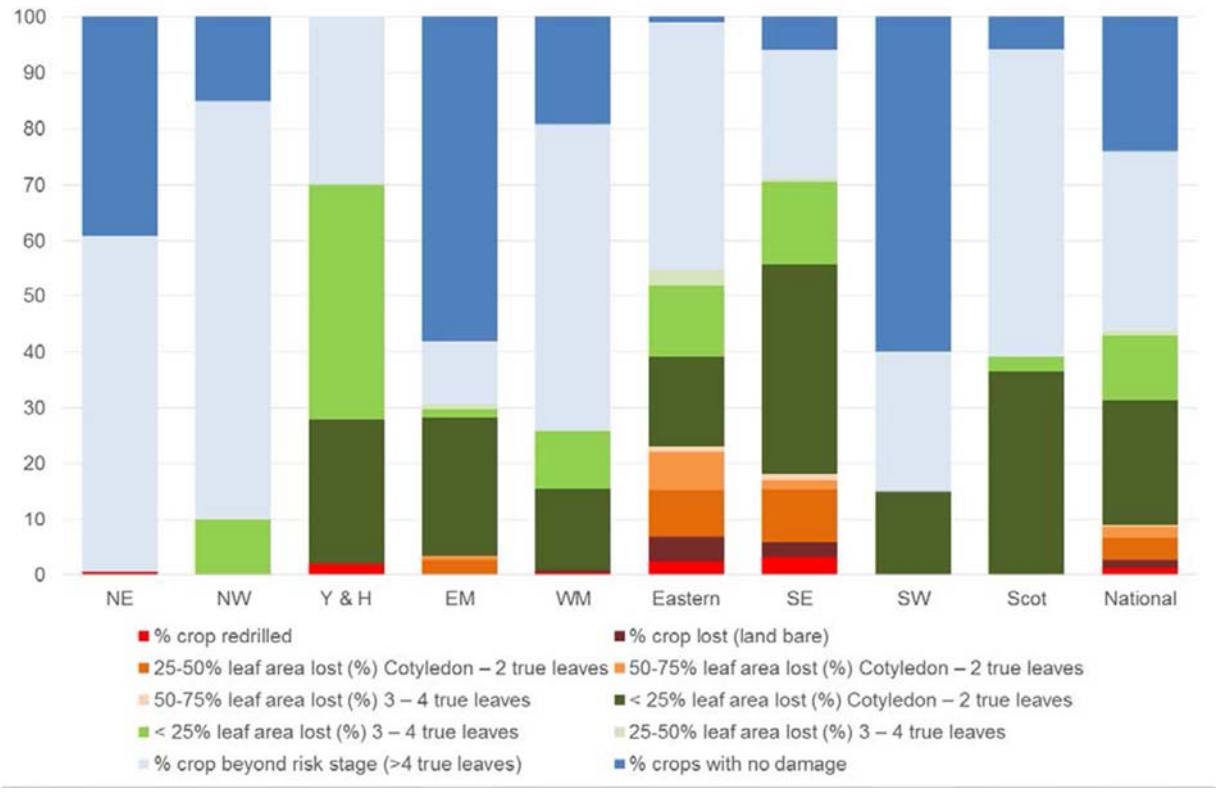


Figure 1. Proportion of crops in each region affected by CSFB at the time the assessment was made, at the end of September.
Red bars = Crop lost; Orange bars = Control threshold exceeded; Green bars = Below control threshold; Blue bars = No damage seen or crops beyond at risk growth stages

In Yorkshire and Humber, 68% of crops showed some damage at the end of September but not sufficient to breach spray thresholds. The remainder of the crop was beyond the susceptible growth stage. In the West Midlands, East Midlands and Scotland, damage was present on 25-40% of crops (that were still at a susceptible growth stage) and in most cases was below threshold levels. There was just 3% of crop in the East Midlands where damage levels at the time of assessment exceeded spray thresholds.

Crops in the North East, North West and South West weren't significantly affected by CSFB in late September, with 99%, 90% and 85% showing no damage at the end of September.

At the time of assessment the counties with the highest proportion of the county area with damage that exceeded threshold levels were Hampshire and Surrey (46%), Bedfordshire (43%) and Hertfordshire (43%). Other counties where damage levels at the time of assessment exceeded threshold levels were Suffolk (20%), Northamptonshire (14%), Cambridgeshire (12%), Essex (10%), Kent (5%), Sussex(5%), Berkshire (2%), Oxfordshire (2%) Buckinghamshire (2%), Derbyshire (1%) and Nottinghamshire (1%).

3.2. Insecticide treatment of winter oilseed rape crops

An estimate was also made on the number of pyrethroid applications made between crop emergence and the end of September in order to determine the proportion of the crop area treated with a foliar spray.

On a national scale, it is estimated that 58% of the winter oilseed rape crop was treated with pyrethroids by the end of September, approximately 387,000ha.

On a regional level there was greater usage of pyrethroids in the South East and Eastern region, where damage from CSFB was higher, with an estimated 99% of the crop area treated. Indications are that there were repeat applications in the Eastern region. Other regions with a high proportion of pyrethroid usage were Yorkshire and Humber, and the South West with 90–100% of the crop area treated. The estimated level of usage of pyrethroids in the South West is high despite the fact that more than 80% of crops were reported to have no CSFB damage. This could have been because sprays applied were effective against CSFB, however, HGCA has no resistance data from this region.

In regions where pressure from CSFB was lower, e.g. the West Midlands, East Midlands and Scotland, the use of pyrethroids was reported to be similar to previous years.

Mesurol seed treatment usage was generally low, with only 8% of the national crop estimated to have been treated. Regionally, usage differed considerably; in the South East and Eastern regions the usage of mesurol was estimated at 20% and 14% of the crop area respectively. In comparison, the estimated usage in the West Midlands and Scotland was below 5%.

Treatment specifically for peach–potato aphid was reported to have not yet begun in any of the counties.

3.3. Susceptibility to cabbage stem flea beetle

Across the majority of counties, the view was that the earlier the oilseed rape was drilled the less susceptible it was to CSFB. It was reported that crops drilled in mid-August tended to have developed beyond the susceptible growth stage by the time the adult beetle migration started. Some of the later September drilled crops were also mostly unaffected, possibly because the number of adult beetles migrating had decreased. Where crops were drilled into dry/cloddy seed beds, e.g. those drilled in early September, they would have been slower to emerge and had reduced vigour. This would have left them more vulnerable to CSFB damage, as the crops were

slower to grow beyond the vulnerable growth stages than earlier drilled crops that went into moist seed beds.

County reporters indicated that they did not feel that Mesurol treatment was having a noticeable impact on the susceptibility of crops to CSFB damage.

There was a mixed response to the susceptibility of hybrids versus non-hybrid varieties. The majority of county reporters stated that no difference could be seen. Two of the reporters, however, noted that, due to a lower plant density, hybrid crops were more susceptible, as there was believed to be greater beetle activity per plant.

Nationally, 37% of the winter oilseed rape crop was estimated to have been planted with hybrid varieties. However, in the North East and Yorkshire and Humber the proportion of hybrid crops was estimated to be above 60%. In the East Midlands and South West the proportion of hybrids was estimated to be lower at 27% and 30% respectively.

3.4. Actions/measures undertaken specifically as a result of the neonicotinoid restriction

Reports of severe damage from CSFB in the South and East have resulted in more intensive crop monitoring and greater usage of pyrethroids (mainly due to repeat applications). Early drilling and production of good seed beds have also been adopted to encourage quick establishment and rapid crop development to try and reduce the susceptibility of crops to CSFB.

4. Summary

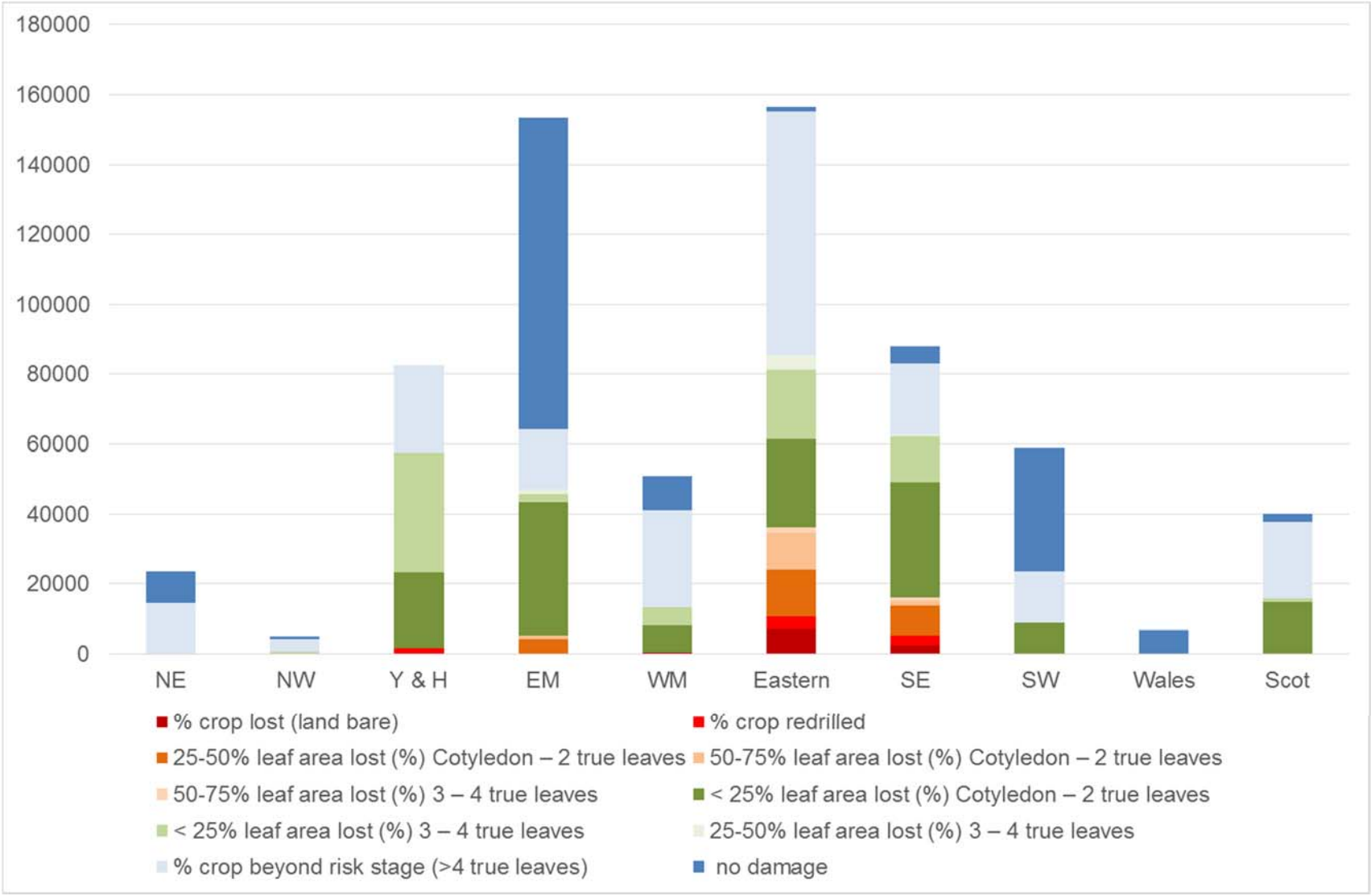
This snapshot assessment provides a view of the winter oilseed rape crop in Great Britain at the end of September 2014. It indicated that 41.0% of the crop was still at vulnerable growth stages at the time the assessments were made, including 6.2% which had sufficient damage to exceed control thresholds. It was also reported that 2.7% of the crop that had been lost completely was mostly in the South East and Eastern regions. The remaining area either had no observed damage or was beyond the at-risk growth stages (more than 4 true leaves). At a national level, the impact of CSFB at the time the assessments were made, was modest, however, the assessments did not take into account the level of crop damage that occurred before the end of September or any exceeded control thresholds that may have occurred in the estimated 32% of crop now past the susceptible growth stages. There were indications from the west of the country that, at the time the assessments were made, damage was no worse than in recent years. At a regional and county level, the impact of CSFB in the South East and Eastern regions, and in particular the counties of Hampshire, Hertfordshire, and Bedfordshire, was high. This is reported to have led to increased use of pyrethroids in these regions, with an estimated average of three treatments applied from the crop emergence period to the end of September. This increased use of pyrethroids could have a significant impact on the selection of CSFB resistant to these insecticides.

Appendix 1

Table 1. Proportion of winter oilseed rape crops affected by CSFB on a regional and national scale at the end of September

		< 25% leaf area lost (%)		25-50% leaf area lost (%)		50-75% leaf area lost (%)				
Region	% crops with no damage	Cotyledon – 2 true leaves	3–4 true leaves	Cotyledon – 2 true leaves	3–4 true leaves	Cotyledon – 2 true leaves	3–4 true leaves	% crop lost (land bare)	% crop re-drilled	% crop beyond risk stage (>4 true leaves)
NE	39.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	60.5
NW	15.0	0.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	75.0
Yorks & Humbs	0.0	26.0	42.0	0.0	0.0	0.0	0.0	0.0	2.0	30.0
EM	58.1	24.9	1.5	2.6	0.9	0.7	0.0	0.0	0.0	11.3
WM	19.1	14.8	10.2	0.0	0.0	0.0	0.0	0.4	0.4	55.1
Eastern	0.9	16.0	12.6	8.4	2.8	7.0	1.0	4.4	2.4	44.5
SE	5.9	37.5	15.0	9.7	0.6	1.4	1.2	2.8	3.0	22.9
SW	60.0	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.0
Wales	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Scot	5.8	36.5	2.7	0.0	0.0	0.0	0.0	0.0	0.0	54.9
National	24.0	22.4	11.5	3.9	0.9	2.0	0.4	1.4	1.3	32.2

Figure 2. Regional area impacted by CSFB and the severity of impact



Red bars = Crop lost; **Orange bars** = Control threshold exceeded; **Green bars** = Below control threshold; **Blue bars** = No damage seen or crops beyond at risk growth stages

Table 2. Proportion of winter oilseed rape crops affected by CSFB on a county scale at the end of September

		< 25% leaf area lost (%)		25–50% leaf area lost (%)		50–75% leaf area lost (%)				
County	**% crops with no damage**	**Cotyledon – 2 true leaves**	**3–4 true leaves**	**Cotyledon – 2 true leaves**	**3–4 true leaves**	**Cotyledon– 2 true leaves**	**3–4 true leaves**	**% crop lost (land bare)**	**% crop redrilled**	**% crop beyond risk stage (>4 true leaves)**
Durham/Northumberland	39%	0%	0%	0%	0%	0%	0%	0%	1%	61%
Lancashire	15%	0%	10%	0%	0%	0%	0%	0%	0%	75%
Yorkshire	0%	26%	42%	0%	0%	0%	0%	0%	2%	30%
Derbyshire/Nottinghamshire	60%	6%	2%	1%	1%	0%	0%	0%	0%	30%
Lincolnshire	80%	10%	0%	0%	0%	0%	0%	0%	0%	10%
Northamptonshire	0%	77%	5%	11%	3%	3%	0%	0%	0%	1%
Herefordshire/Worcestershire	30%	20%	0%	0%	0%	0%	0%	0%	0%	50%
Shropshire/Staffordshire	0%	10%	15%	0%	0%	0%	0%	1%	1%	73%
Warwickshire/Leicester	30%	15%	15%	0%	0%	0%	0%	0%	0%	40%
Bedfordshire/Hertfordshire	0%	15%	0%	15%	5%	24%	5%	10%	2%	25%
Essex	0%	15%	15%	10%	0%	0%	0%	0%	0%	60%
Cambridgeshire	0%	31%	8%	8%	4%	4%	1%	8%	4%	34%
Norfolk	5%	0%	25%	0%	0%	0%	0%	0%	0%	70%
Suffolk	0%	15%	15%	10%	5%	10%	0%	5%	5%	35%
Berkshire/Oxfordshire/Bucks	2%	40%	40%	1%	0%	1%	0%	0%	1%	15%
Hampshire/Surrey	0%	0%	9%	34%	3%	6%	6%	14%	14%	14%
Kent/Sussex	10%	50%	5%	5%	0%	0%	0%	0%	0%	30%
Dorset/Somerset	60%	15%	0%	0%	0%	0%	0%	0%	0%	25%
Wales	60%	15%	0%	0%	0%	0%	0%	0%	0%	25%
NE Scotland	60%	15%	0%	0%	0%	0%	0%	0%	0%	25%
SE Scotland	60%	15%	0%	0%	0%	0%	0%	0%	0%	25%
SW Scotland	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table 3. Regional summary of agronomist views on insecticide usage in oilseed rape crops up to end of September 2014.

Region	Proportion (%) of crop that received a pyrethroid spray	Typical number of pyrethroid spray applications (applied to date) this season	Proportion (%) of the crop treated with Mesurol seed treatment	Proportion (%) of crop that received an insecticide spray for peach–potato aphids (TuYV)	Proportion (%) of the total crop that is a hybrid variety
NE	60	1	5	0	70
NW	10	1	0	0	0
Yorks & Humbs	100	2	10	0	60
EM	12	1	7	0	27
WM	27	1	5	0	43
Eastern	99	3–4	14	0	41
SE	100	1	20	0	53
SW	90	0–1	5	0	30
Wales	N/A	N/A	N/A	N/A	N/A
Scots	2	0-1	1	0	47
National	58	**1**	8	**0**	37

Table 4. County summary of agronomist views on insecticide usage in oilseed rape crops up to end of September 2014.

County	Proportion (%) of crop that received a pyrethroid spray	Typical number of pyrethroid spray applications (applied to date) this season	Proportion (%) of the crop treated with Mesurol seed treatment	Proportion (%) of crop that received an insecticide spray for peach–potato aphids (TuYV)	Proportion (%) of the total crop that is a hybrid variety
Durham/Northumberland	60	1	5	0	70
Lancashire	10	1	0	0	0
Yorkshire	100	2	10	0	60
Derbyshire/Nottinghamshire	2	0	5	0	30
Lincolnshire	19	<1	10	0	37
Northamptonshire	100	2	<1	0	5
Herefordshire/Worcestershire	10	1	0	0	50
Shropshire/Staffordshire	10	<1	15	0	40
Warwickshire/Leicester	65	1	0	0	40
Bedfordshire/Hertfordshire	100	4	0	0	70
Essex	100	2	15	0	30
Cambridgeshire	100	4	10	0	40
Norfolk	95	1	0	0	55
Suffolk	100	3	10	0	22
Berkshire/Oxfordshire/Bucks	100	1	40	0	75
Hampshire/Surrey	100	1	20	0	55
Kent/Sussex	100	1	10	0	42
Dorset/Somerset	90	1	5	0	30
Wales	N/A	N/A	N/A	N/A	N/A
NE Scotland	0	0	0	0	100
SE Scotland	0	0	0	0	0
SW Scotland	100	1	50	0	100