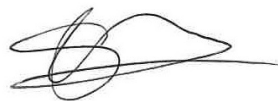


# SCEPTREPLUS

## Final Trial Report

<b>Trial code:</b>	SP52
<b>Title:</b>	AHDB SCEPTREplus apple residual herbicide screen
<b>Crop</b>	Apple, Malus
<b>Target</b>	General broadleaf weeds and grasses, 3WEEDT
<b>Lead researcher:</b>	Dr Sonia Newman
<b>Organisation:</b>	RSK ADAS Ltd, ADAS Boxworth, Cambridgeshire, CB23 4NN
<b>Period:</b>	April 2020 to Oct 2020
<b>Report date:</b>	20/12/2020
<b>Report author:</b>	Dr Sonia Newman
<b>ORETO Number: (certificate should be attached)</b>	409

I the undersigned, hereby declare that the work was performed according to the procedures herein described and that this report is an accurate and faithful record of the results obtained



.....20/12/2020.....  
Date

.....  
Authors signature

# Trial Summary

## Introduction

Tree fruit plantations cover approximately 24,449 ha in the UK, apples and pears forming a large percentage of this area. Dessert apples alone are worth £104.9m a year to the UK economy. Tree fruit crops are weak competitors and weed infestation can result in a yield penalty of between 10 to 20%. This equates to a loss of at least £10m per year for growers.

Gaps exist in contact herbicides for young tree fruit plantations of two years old. Second year trees are more sensitive to herbicides than established trees, which can make weed control difficult. Control of weeds at this stage is important to ensure good establishment of the crop. In addition, with few actives available for young cropping trees there is a risk of herbicide resistance developing.

The objective of this trial was to identify crop safe and effective residual herbicides for weed control in young apple trees, aiming to expand the options available to growers.

## Methods

A trial was sited at a commercial apple grower in Gloucestershire. Treatments were applied to the weeds in the herbicide strip when the apples were at bud break. The apple variety used in this trial was Gala and was planted in 2019. All treatments were applied on 3<sup>rd</sup> April with a single nozzle hooded lance and an Oxford Precision Sprayer knapsack at 300 L/ha water volume with plots 1.5 m wide by 6 m long.

A randomised block design was used with four replicates of six treatments, including an untreated control for comparison, totaling 24 plots. Plots were assessed for weed control on five occasions, recording the percentage of weed ground cover and species present. Crop damage was also assessed; recorded first at two weeks after the first treatment application, and on three subsequent occasions (four, seven and twelve weeks after treatment). In addition the longer term effects of the treatments were assessed by measuring the girth of the central five trees in the plot and the shoot extension in five shoots in each plot.

## Results

All of the treatments applied to the trial appeared to be crop safe with no phytotoxic effects seen at any assessment. The growth and vigour of the trees was not affected when assessed at harvest. The conditions were generally dry during the trial, which will have increased the safety of the residual herbicides. Based on these results all treatments would be suitable for further investigation in young apple trees.

Weed cover was initially low in the trial due to dry conditions at the trial site in the first half of the trial. At the seven week assessment the weed cover in the untreated control was 12.5 %. By the final weed assessment the weed cover had increased to 58.3 % in the untreated control (**Table 1**). The main weed species noted in the trials plots at the end of the weed assessments, twelve weeks after application, were groundsel, field bindweed, fat hen and redshank.

At the final assessment (24 June) all of the treatments had significantly lower weed cover compared to the untreated control. The weed cover in all of the treatments was comparable to the grower standard, Stomp Aqua + Flexidor. AHDB 9918 had the highest weed cover of the tested products at the end of the assessments, however this had significantly lower weed cover than the untreated control. This is to be expected as this product is a graminicide with some broad-leaved weed activity. AHDB 9947 had the lowest overall weed cover in the trial of the coded products, however this was not significantly lower than any of the other treatments.

**Table 1.** Mean total plot weed cover (%) at two, four, seven and twelve weeks after residual herbicide application to apple herbicide strip.

Date	16-Apr	30-Apr	21-May	24-Jun
Treatment				
Untreated	2.6	4.0	12.5	58.3
Stomp Aqua + Flexidor	1.4	1.8	3.9	11.4
AHDB9898	1.1	3.4	5.8	18.5
AHDB9900	1.4	1.9	6.3	18.3
AHDB9947	2.5	3.4	5.5	14.8
AHDB9918	4.5	4.2	8.0	24.0
P value	0.058	0.509	0.058	<0.001
d.f.	15	15	15	15
s.e.d.	1.07	1.56	2.56	8.67
l.s.d.	2.27	3.33	5.46	18.48
	Not significantly different from untreated control (p>0.05)			
	Significantly less than untreated control (p<0.05)			
	Significantly more than untreated control (p<0.05)			

## Conclusions

- All tested products were crop safe during the trial and no phytotoxic effects were seen. This may need to be repeated in wetter conditions to confirm safety.
- The coded products all significantly reduced the weed cover compared to the untreated control twelve weeks after initial application.

## Take home message:

AHDB 9947, AHDB 9900, AHDB 9898 and AHDB 9918 are promising products for weed control in apples and were shown in this trial to be safe and effective herbicide treatments. EAMU authorisations for any of these products in top fruit would help growers improve weed control during establishment of young apple trees.

## Objectives

To evaluate the effectiveness of six residual herbicide treatments, applied to an actively growing crop, for the control of broadleaved weeds and grasses in young apples as measured by crop safety and weed control efficacy.

## Methods

A trial was sited at a commercial apple grower in Gloucestershire. Treatments were applied to the weeds in the herbicide strip at bud break in the apples. The apple variety used in this trial was Gala and was planted in 2019. All treatments were applied on 3<sup>rd</sup> April with a single nozzle hooded lance and an Oxford Precision Sprayer knapsack at 300 L/ha water volume with plots 1.5 m wide by 6 m long.

A randomised block design was used with four replicates of six treatments, including an untreated control for comparison, totaling 24 plots. Plots were assessed for weed control on five occasions, recording the percentage of weed ground cover and species present. Crop damage was also assessed; recorded first at two weeks after the first treatment application, and on three subsequent occasions (four, seven and twelve weeks after treatment). In addition the longer term effects of the treatments were assessed by measuring the girth of the central five trees in the plot and the shoot extension in five shoots in each plot.

## Trial conduct

UK regulatory guidelines were followed but EPPO guidelines took precedence. The following EPPO guidelines were followed:

Relevant EPPO guideline(s)		Variation from EPPO
PP 1/152(4)	Guideline on design and analysis of efficacy evaluation trials	None
PP 1/135(4)	Phytotoxicity assessment	None
PP 1/181(3)	Conduct and reporting of efficacy evaluation trials including good experimental practice	None
PP 1/090(3)	Weeds in orchards and other fruiting tree crops such as citrus and olives	None

There were no deviations from EPPO guidance:

## Test site

Item	Details
Location address	Herridges Orchard, Poolhill, GL18 1LW
Crop	Apple
Cultivar	Gala
Soil or substrate type	Sandy
Agronomic practice	Modified – no herbicide applications
Prior history of site	Apples

## Trial design

Item	Details
Trial design:	Randomised block design
Number of replicates:	4
Row spacing:	1.5 m
Plot size: (w x l)	3 x 6 m
Plot size: (m <sup>2</sup> )	18
Number of plants per plot:	8
Leaf Wall Area calculations	N/A

## Treatment details

AHDB Code	Active substance	Product name/ manufacturers code	Formulation batch number	Content of active substance in product	Formulation type
Untreated	-	-	-	-	-
Standard	isoxaben	Flexidor	Unknown	500 g/l	Suspension concentrate
Standard	pendimethalin	Stomp aqua	ST12600518	455 g/l	Capsule suspension
AHDB9898	N/D	N/D	N/D	N/D	N/D
AHDB9900	N/D	N/D	N/D	N/D	N/D
AHDB9947	N/D	N/D	N/D	N/D	N/D
AHDB9918	N/D	N/D	N/D	N/D	N/D

## Application schedule

Treatment number	Treatment: product name or AHDB code	Rate of active substance (ml or g a.s./ha)	Rate of product (l or kg/ha)	Application code
1	Untreated	-	-	A
2	Stomp aqua	1319.5	2.9	A
	Flexidor	250	0.5	A
3	AHDB9898	720	1.0	A
4	AHDB9900	19.1	0.1	A
5	AHDB9947	1500	2.5	A
6	AHDB9918	240	0.48	A

### Application details

	Application A
Application date	03/04/2020
Time of day	13:45-16:45
Crop growth stage (Max, min average BBCH)	10
Crop height (cm)	200
Crop coverage (%)	5
Application Method	Spray
Application Placement	Soil
Application equipment	Oxford Precision Sprayer (knapsack)
Nozzle pressure	2.5 Bar
Nozzle type	Flat fan
Nozzle size	02F110
Application water volume/ha	300
Temperature of air - shade (°C)	12.9
Relative humidity (%)	58.5
Wind speed range (m/s)	3.2-2.9
Dew presence (Y/N)	N
Temperature of soil - 2-5 cm (°C)	11.6
Wetness of soil - 2-5 cm	Dry
Cloud cover (%)	90

### Untreated levels of pests/pathogens at application and through the assessment period

Common name	Scientific Name	EPPO Code	Infestation level pre-application	Infestation level at mid-point of assessment period	Infestation level at end of assessment period
Broad leaved weeds and grasses	N/A	3WEEDT	0.4 % <i>(untreated average)</i>	4.0 % <i>(untreated average)</i>	58.3 % <i>(untreated average)</i>

## Assessment details

Evaluation date	Evaluation Timing (DA)*	Crop Growth Stage (BBCH)	Evaluation type (efficacy, phytotox)	Assessment
03/04/2020	0	10	efficacy	Preliminary percentage of weed cover (whole plot score)
16/04/2020	13	11	efficacy, phytotox	Percentage of weed cover (whole plot score) Phytotox (scale 0-10, 10 = dead)
30/04/2020	27	60	efficacy, phytotox	Percentage of weed cover (whole plot score) Phytotox (scale 0-10, 10 = dead)
21/05/2020	48	69	efficacy, phytotox	Percentage of weed cover (whole plot score) Phytotox (scale 0-10, 10 = dead)
24/06/2020	84	72	efficacy, phytotox	Percentage of weed cover (whole plot score) Phytotox (scale 0-10, 10 = dead)
23/09/2020	173	89	phytotox	Phytotox (scale 0-10, 10 = dead) Tree girth and shoot elongation

\* DA – days after application

## Statistical analysis

The trial was analysed as a randomised block design with four replicates of 6 treatments using ANOVA (Genstat 18<sup>th</sup> edition). No data transformation was required.

## Results

### Phytotoxicity

The results of phytotoxicity assessments from four dates are presented in **Table 1** and **Figure 1**. These were scored on a scale from 0 to 10, with 0 being 'no effect', and 10 being 'dead'. Plots scored 2 or less were deemed to have a commercially acceptable level of damage.

Phytotoxicity was recorded using the following scale:

Crop tolerance score	(% phytotoxicity) Equivalent to crop damage
0	(no damage) 0%
1	10%
*2	20%
3	30%
4	40%
5	50%
6	60%
7	70%
8	80%
9	90%
10	(complete crop kill) 100%

\* ≤2 = acceptable damage, i.e. damage unlikely to reduce yield, and acceptable to the farmer.

There were no phytotoxic effects recorded in this trial and no significant differences between the treatments and the untreated trees.

**Table 1.** Mean crop phytotoxicity scores at two, four, seven and twelve weeks after residual herbicide treatment application in Gala apple.

Treatment	Mean crop damage scores				
	16-Apr	30-Apr	21-May	24-Jun	23-Sept
Untreated	0.0	0.0	0.0	0.0	0.0
Stomp Aqua + Flexidor	0.0	0.0	0.0	0.0	0.0
AHDB9898	0.0	0.0	0.0	0.0	0.0
AHDB9900	0.0	0.0	0.0	0.0	0.0
AHDB9947	0.0	0.0	0.0	0.0	0.0
AHDB9918	0.0	0.0	0.0	0.0	0.0

Further assessments were conducted on the plots at harvest (23 September 2020) to determine whether there were any effects of the herbicides on tree growth. The results for shoot extension and girth are below in **Table 2**. There were no significant differences in either the tree girth or the shoot extension for any of the treatments tested during the trial.



**Table 2.** Mean tree girth (mm) and shoot extension (mm) at harvest (23 September 2020) in Gala apple.

Treatment	Mean shoot extension (mm)	Mean tree girth (mm)
Untreated	248.7	71.3
Stomp Aqua + Flexidor	271.0	72.9
AHDB9898	243.8	70.9
AHDB9900	254.0	71.5
AHDB9947	248.2	73.2
AHDB9918	234.6	71.5
P value	0.283	0.624
d.f.	15	15
s.e.d.	15.24	1.57
l.s.d.	30.20	3.12

## Efficacy

The results for the mean percentage weed cover per treatment are presented in **Table 3** and **Figure 1**. The percent reduction in weed cover compared to the untreated control was calculated from these figures (using Abbott's formula), and results for each treatment are listed in **Table 4**.

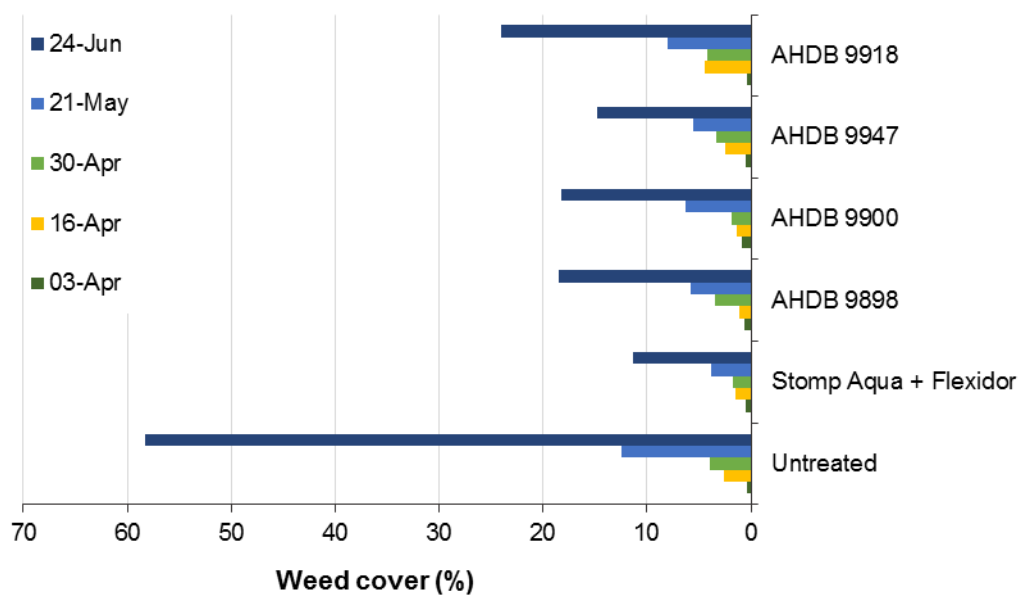
Weed cover was initially low in the trial due to a dry conditions at the trial site in the first half of the trial. At the seven week assessment the weed cover in the untreated control was 12.5 %. By the final weed assessment the weed cover had increased to 58.3 % in the untreated control. The main weed species noted in the trials plots at the end of the weed assessments, twelve weeks after application, were groundsel, field bindweed, fat hen and redshank (**Table 5**).

At the final weed assessment, twelve weeks after residual application, there was a significant difference in the weed cover across the trial. All of the coded treatments showed a significant reduction in the weed cover compared to the untreated control. The grower standard of Stomp Aqua + Flexidor had the lowest weed cover followed by AHDB 9947.

**Table 3.** Mean total plot weed cover (%) at two, four, seven and twelve weeks after residual herbicide application to apple herbicide strip.

Date	16-Apr	30-Apr	21-May	24-Jun
Treatment				
Untreated	2.6	4.0	12.5	58.3
Stomp Aqua + Flexidor	1.4	1.8	3.9	11.4
AHDB9898	1.1	3.4	5.8	18.5
AHDB9900	1.4	1.9	6.3	18.3
AHDB9947	2.5	3.4	5.5	14.8
AHDB9918	4.5	4.2	8.0	24.0
P value	0.058	0.509	0.058	<0.001
d.f.	15	15	15	15
s.e.d.	1.07	1.56	2.56	8.67
l.s.d.	2.27	3.33	5.46	18.48
	Not significantly different from untreated control (p>0.05)			
	Significantly less than untreated control (p<0.05)			

Significantly more than untreated control (p<0.05)



**Figure 1.** Mean weed cover (%) at application, two, four, seven, and twelve weeks after residual herbicide application.

**Table 4.** Percentage reduction in weed cover compared to the untreated control at two, four, nine and twelve weeks after residual herbicide application.

Treatment	Weed cover reduction (%)			
	16-Apr	30-Apr	21-May	24-Jun
Stomp Aqua + Flexidor	44.12	55.63	69.00	80.47
AHDB9898	58.82	14.38	54.00	68.24
AHDB9900	45.10	53.75	50.00	68.67
AHDB9947	1.96	16.25	56.00	74.68
AHDB9918	-74.51	-4.38	36.00	58.80

**Table 5.** Mean weed cover (%) of most common weeds at final weed assessment, twelve weeks (26 June) after residual herbicide application to apple herbicide strip.

Date	Groundsel	Field bindweed	Fat hen	Redshank
Treatment				
Untreated	3.0	2.6	0.8	1.1
Stomp Aqua + Flexidor	5.2	0.0	0.0	1.1
AHDB9898	2.4	0.1	0.4	0.2
AHDB9900	1.5	1.7	1.2	0.1
AHDB9947	1.3	0.4	0.1	1.7
AHDB9918	2.3	0.4	0.1	1.2
P value	0.493	0.059	0.107	0.464
d.f.	15	15	15	15
s.e.d.	2.08	0.88	0.45	0.89
l.s.d.	4.42	1.88	0.96	1.09
	Not significantly different from untreated control (p>0.05)			
	Significantly less than untreated control (p<0.05)			
	Significantly more than untreated control (p<0.05)			

## Discussion

All of the treatments applied to the trial appeared to be crop safe with no phytotoxic effects seen at any assessment. The growth and vigour of the trees was not affected when assessed at harvest. The conditions were generally dry during the trial, which will have increased the safety of the residual herbicides. Based on these results all treatments would be suitable for further investigation in young apple trees.

The weeds were slow to establish due to the dry conditions for much of the trial duration; there was limited rainfall between the start of the trial and 6<sup>th</sup> June. Although there were differences in the weed cover in the early assessments compared to the untreated control these were not significant until the final assessment (24 June), twelve weeks after the herbicide application.

At the final assessment (24 June) all of the treatments had significantly lower weed cover compared to the untreated control. The weed cover in all of the treatments was comparable to the grower standard, Stomp Aqua + Flexidor. AHDB 9918 had the highest weed cover of the tested products at the end of the assessments, however this had significantly lower weed cover than the untreated control. This is to be expected as this product is a graminicide with some broad-leaved weed activity. AHDB 9947 had the lowest overall weed cover in the trial of the coded products, however this was not significantly lower than any of the other treatments.

The use of AHDB 9947, AHDB 9900, AHDB 9898 or AHDB 9918 on young apple trees is not currently approved, though these products showed promise in this trial. By the conclusion of the trial, all showed lasting efficacy as early season residual treatments without any persistent phytotoxic effects after bud break and would be valuable additions to top fruit growers' weed control options.

AHDB9947 should aid in control of annual meadow grass, groundsel and fat hen. AHDB9900 should increase control of groundsel, nettle, willowherb and sow thistle. AHDB9918 is a graminicide with some broad-leaved weed activity, which could be a useful addition to a tank mix with other actives.

## Conclusions

- All tested products were crop safe during the trial and no phytotoxic effects were seen. This may need to be repeated in wetter conditions to confirm safety.
- The coded products all significantly reduced the weed cover compared to the untreated control twelve weeks after initial application.
- AHDB 9947, AHDB 9900, AHDB 9898 and AHDB 9918 are promising products for weed control in apples and were shown in this trial to be safe and effective herbicide treatments. EAMU authorisations for any of these products in top fruit would help growers improve weed control during establishment of young apple trees.

## Acknowledgements

AHDB for funding the work, and the crop protection companies for their financial contributions and provision of samples for the trials. Thanks should also be given to Nigel Kitney who provided the site and crops for the trials as well as technical input.

## Appendix

- a. Crop diary – events related to growing crop

Crop	Cultivar	Planting date	Row width (m)
Apple	Gala	2019	3 m

- b. Trial diary

Date	Event
03/04/2020	Trial set-up Treatment application Weed assessment 1
16/04/2020	Weed assessment 2 Crop safety assessment 1
30/04/2020	Weed assessment 3 Crop safety assessment 2
21/05/2020	Weed assessment 4 Crop safety assessment 3
24/06/2020	Weed assessment 5 Crop safety assessment 4
23/09/2020	Postharvest crop safety and vigour assessments -Tree girth and shoot extension

c. Photos



Trial at set up – 03/04/2020



Untreated control – after 12 weeks



AHDB 9900 – after 12 weeks



Untreated control – after 12 weeks



AHDB 9947 – after 12 weeks



Untreated control – after 12 weeks



AHDB 9998 – after 12 weeks

d. Climatological data during study period

Date	Average Temp (°C)	Min temp (°C)	Max Temp (°C)	Average R Humidity (%)	Min R Humidity (%)	Max R Humidity (%)	Rainfall (mm)
01/04/2020	9.4	5.3	-1.0	94	75	56	0.00
02/04/2020	13.1	9.2	5.6	86	75	63	0.00
03/04/2020	14.2	8.5	2.1	95	72	48	0.00
04/04/2020	16.1	7.6	0.0	98	79	49	0.00
05/04/2020	20.7	11.0	0.0	97	70	45	0.00
06/04/2020	17.1	11.8	1.9	95	73	45	1.52
07/04/2020	18.5	9.3	-1.3	98	73	39	1.52
08/04/2020	21.9	13.3	5.1	95	71	40	0.00
09/04/2020	23.9	14.5	5.5	97	71	38	0.00
10/04/2020	25.0	14.8	6.6	92	69	37	0.00
11/04/2020	25.4	15.2	5.0	97	69	33	0.00
12/04/2020	21.7	14.2	5.3	98	72	38	0.00
13/04/2020	11.0	7.8	0.0	87	67	49	0.00
14/04/2020	14.6	5.2	-3.3	97	73	41	0.00
15/04/2020	18.3	8.0	-2.0	98	69	28	0.00
16/04/2020	20.7	10.8	-0.9	98	68	35	0.00
17/04/2020	13.2	10.5	7.0	90	79	66	5.33
18/04/2020	9.6	7.4	5.5	95	90	83	8.89
19/04/2020	16.3	11.1	6.9	94	71	45	8.89
20/04/2020	17.5	10.5	4.4	90	66	39	0.00
21/04/2020	18.6	12.0	6.3	85	65	38	0.00
22/04/2020	20.4	12.9	5.9	90	67	42	0.00
23/04/2020	21.6	12.6	4.6	95	71	42	0.00
24/04/2020	22.6	13.9	7.0	90	67	39	0.00
25/04/2020	19.8	11.7	4.8	94	72	46	0.00
26/04/2020	20.5	11.6	1.6	98	76	49	0.00
27/04/2020	16.9	12.2	7.5	94	70	51	0.00
28/04/2020	11.8	8.0	6.8	96	91	71	11.4
29/04/2020	15.3	9.7	6.3	98	85	57	11.4
30/04/2020	11.7	8.1	5.2	97	86	66	7.87
01/05/2020	14.8	9.9	4.5	98	78	47	8.38
02/05/2020	17.5	10.0	1.6	99	74	42	0.51
03/05/2020	14.9	10.7	5.3	97	83	61	0.25
04/05/2020	16.7	12.2	6.5	97	77	56	0.25
05/05/2020	16.5	10.6	5.8	89	69	42	0.00
06/05/2020	22.2	10.8	1.9	95	70	35	0.00
07/05/2020	22.5	13.1	1.8	99	74	46	0.00
08/05/2020	23.6	15.9	7.2	99	77	47	0.00
09/05/2020	23.8	17.1	9.6	98	74	48	0.00
10/05/2020	16.9	11.1	4.6	91	77	56	0.00
11/05/2020	12.2	7.4	3.1	84	63	40	0.00
12/05/2020	16.1	8.1	-1.6	97	67	36	0.00
13/05/2020	12.8	7.0	0.0	97	69	40	0.00
14/05/2020	16.3	8.2	-2.0	96	63	38	0.00
15/05/2020	16.8	9.8	-0.1	97	70	46	0.00
16/05/2020	19.1	12.1	5.7	90	67	39	0.00
17/05/2020	20.4	16.2	10.2	84	62	46	0.00

18/05/2020	21.0	14.9	7.5	93	70	48	0.00
19/05/2020	25.2	17.1	10.3	96	74	45	0.00
20/05/2020	26.0	16.0	5.9	99	73	33	0.00
21/05/2020	24.5	16.6	6.4	95	70	38	0.00
22/05/2020	18.3	15.2	11.0	91	69	50	0.76
23/05/2020	18.0	13.0	10.1	88	72	43	2.03
24/05/2020	22.9	15.9	7.5	87	65	35	2.03
25/05/2020	24.1	15.0	2.3	97	66	37	0.00
26/05/2020	25.4	16.5	6.4	96	70	46	0.00
27/05/2020	29.2	18.3	11.2	94	64	27	0.00
28/05/2020	24.6	17.8	10.2	93	64	34	0.00
29/05/2020	26.0	16.8	4.5	94	59	30	0.00
30/05/2020	25.6	16.7	5.1	91	60	35	0.00
31/05/2020	25.2	17.9	9.9	75	56	34	0.00
01/06/2020	25.5	17.9	8.7	85	60	36	0.00
02/06/2020	26.7	19.0	8.6	88	56	33	0.00
03/06/2020	16.1	13.4	10.2	94	83	62	2.54
04/06/2020	15.9	11.4	6.3	95	80	54	2.54
05/06/2020	17.0	12.5	8.1	87	62	39	0.25
06/06/2020	17.0	10.9	6.9	90	75	55	2.29
07/06/2020	20.1	13.1	5.9	97	77	53	2.29
08/06/2020	20.4	13.8	5.9	96	72	46	0.00
09/06/2020	20.1	14.3	5.5	95	69	42	0.00
10/06/2020	17.7	14.0	11.1	90	76	59	0.00
11/06/2020	18.0	13.4	11.3	92	82	64	1.27
12/06/2020	19.3	15.4	12.1	95	85	70	1.27
13/06/2020	23.3	16.6	8.8	99	76	42	0.76
14/06/2020	23.2	16.4	7.1	98	79	57	1.27
15/06/2020	25.7	17.7	8.1	99	72	40	1.27
16/06/2020	24.9	16.6	11.6	98	84	49	23.8
17/06/2020	20.9	14.9	10.6	99	92	69	23.8
18/06/2020	14.8	14.2	13.3	99	96	93	32.2
19/06/2020	17.8	14.1	10.0	99	90	64	32.2
20/06/2020	21.5	15.8	10.0	99	84	61	2.79
21/06/2020	20.1	15.8	9.8	96	77	53	2.29
22/06/2020	23.1	16.1	7.0	99	76	53	2.29
23/06/2020	27.2	19.7	11.8	92	72	51	0.00
24/06/2020	32.3	22.2	10.4	98	69	39	0.00
25/06/2020	33.0	23.9	13.3	97	66	34	0.00
24/06/2020	26.8	21.1	15.1	90	74	50	0.51
27/06/2020	19.9	15.8	11.8	95	83	67	5.08
28/06/2020	19.1	14.3	9.8	97	77	57	5.33
29/06/2020	16.2	13.8	12.6	80	74	66	0.25
30/06/2020	20.5	15.3	12.4	93	79	69	0.00

e. Trial design

TREATMENT	DISCARD	2	6	4	1	DISCARD
BLOCK	DISCARD	1	2	3	4	DISCARD
PLOT		106	206	306	406	
TREATMENT	DISCARD	4	3	1	3	DISCARD
BLOCK	DISCARD	1	2	3	4	DISCARD
PLOT		105	205	305	405	
TREATMENT	DISCARD	1	1	3	6	DISCARD
BLOCK	DISCARD	1	2	3	4	DISCARD
PLOT		104	204	304	404	
TREATMENT	DISCARD	5	2	6	5	DISCARD
BLOCK	DISCARD	1	2	3	4	DISCARD
PLOT		103	203	303	403	
TREATMENT	DISCARD	6	5	5	2	DISCARD
BLOCK	DISCARD	1	2	3	4	DISCARD
PLOT		102	202	302	402	
TREATMENT	DISCARD	3	4	2	4	DISCARD
BLOCK	DISCARD	1	2	3	4	DISCARD
PLOT		101	201	301	401	

Treatment number	Product
1	Untreated
2	Stomp Aqua + Flexidor
3	AHDB9898
4	AHDB9900
5	AHDB9947
6	AHDB9918



f. ORETO certificate.



*Certificate of*  
**Official Recognition of Efficacy Testing Facilities  
or Organisations in the United Kingdom**

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*This certifies that*  
**RSK ADAS Ltd**  
complies with the minimum standards laid down in  
Regulation (EC) 1107/2009 for efficacy testing.  
The above Facility/Organisation has been officially  
recognised as being competent to carry out efficacy trials/tests  
in the United Kingdom in the following categories:

**Agriculture/Horticulture  
Stored Crops  
Biologicals and Semiochemicals**

**Date of issue:** 1 June 2018  
**Effective date:** 18 March 2018  
**Expiry date:** 17 March 2023

**Signature**   
Authorised signatory

<b>Certification Number</b> ORETO 409
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Chemicals Regulation Division

 Department of  
Agriculture and  
Rural Development