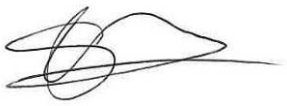
SCEPTREPLUS

Final Trial Report

Trial code:	SP31. 2020
Title:	AHDB SCEPTREplus blackcurrant residual herbicide screen
Crop	Blackcurrant, *Ribes,* Bush fruit
Target	General broadleaf weeds and grasses, 3WEEDT
Lead researcher:	Dr Sonia Newman
Organisation:	RSK ADAS Ltd, ADAS Boxworth, Cambridgeshire, CB23 4NN
Period:	April 2020 to Oct 2020
Report date:	17/12/2020
Report author:	Dr Sonia Newman
ORETO Number: (certificate should be attached)	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



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Trial Summary

Introduction

New options for weed control are sought by blackcurrant growers, with herbicide resistance a constant threat and approvals for effective actives regularly being lost.

The limited availability of herbicides currently available to blackcurrant growers leaves gaps in the weed control spectrum. There are a wide range of weed species that are problematic for blackcurrant growers, although grasses have become less of an issue due to a recent EAMU for clethodim. Black nightshade is an annual weed which is not well controlled by the residual herbicides currently applied just prior to bud burst in March. Lack of control is due to partial resistance to the herbicides currently available and the germination period of the weed being late spring when the herbicides have lost some residual activity. The berries of black nightshade can be harvested alongside blackcurrants by the mechanised harvester making it an undesirable contaminant.

The objective of this trial was to identify crop safe and effective residual herbicides for blackcurrant weed control with a later application date, aiming to expand the options available to growers with a focus on black nightshade control.

Methods

A trial was sited at a commercial blackcurrant grower in Gloucestershire. Treatments were applied to the soil after bud break in the blackcurrants. The blackcurrant crop (Ben Hope) was planted in 2002. All treatments were applied on 23rd 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 10 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 four 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 two subsequent occasions (6 and 12 weeks after treatment).

Results

Phytotoxicity

Minor phytotoxic damage was seen in two of the treatments tested in the trial, including in the grower standard, but the damage was transient and the blackcurrant bushes showed no effects from the herbicides after the four week assessment. There was low rainfall during the trial, however rain fell in three out of seven days after the treatment application, which would have provided sufficient water for the herbicide activity.

Efficacy

Weed cover was low in the trial due to an unusually dry period after treatment application. The main weed species noted in the trial plots were creeping thistle, clover and creeping buttercup. Black nightshade was present in the plots, but the percentage cover was low.

At the earlier assessments, two and four weeks after the treatment application, there were few weeds in the trial area, with an average of only 13.75 % weed cover in the untreated plots at the four-week assessment (21 May). Weed levels built up as the trial progressed, with an average weed cover of 42.5 % in untreated plots at the final assessment (16 July) twelve weeks after treatment application. By the conclusion of the trial, all treatments showed significantly lower weed cover than the untreated control.

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

Date / Treatment	07-May	21-May	24-Jun	16-Jul
Untreated	10.00	13.75	16.25	42.50
Stomp Aqua + Artist	4.50	7.50	9.50	19.50
AHDB 9900	6.25	8.00	12.50	20.00
AHDB 9975	7.50	10.25	13.50	22.50
AHDB 9898	6.75	11.50	16.50	28.75
AHDB 9917	6.50	11.75	15.00	25.00
P value	0.170	0.775	0.784	0.025
d.f.	5	5	5	5
s.e.d.	2.10	4.85	6.00	6.43
l.s.d.	4.47	10.35	12.78	13.71
	Not significantly different from untreated control (p>0.05)			
	Significantly less than untreated control (p<0.05)			

The use of AHDB9900, AHDB9975, AHDB9898 or AHDB9917 on blackcurrants 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 bush fruit growers' weed control options.

Conclusions

- AHDB9900, AHDB9975, AHDB9898 and AHDB9917 are promising products for weed control in blackcurrants and were shown in this trial to be safe and effective herbicide treatments. EAMU authorisations for any of these products in bush fruit would help growers improve weed control.

Take home message:

AHDB9900, AHDB9975, AHDB9898 and AHDB9917 could give growers alternative options for residual weed control and improve control of black nightshade if approved for use on blackcurrants.

Objectives

To evaluate the effectiveness of six residual herbicide treatments for the control of broadleaved weeds and grasses applied after bud break in blackcurrants as measured by crop safety and weed control efficacy.

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 1/135(4)	Phytotoxicity assessment	None
PP 1/152(4)	Guideline on design and analysis of efficacy evaluation trials	None
PP 1/225(2)	Minimum effective dose	None
PP 1/181(4)	Conduct and reporting of efficacy evaluation trials including good experimental practice	None
PP 1/214(3)	Principles of acceptable efficacy	None
PP 1/224(2)	Principles of efficacy evaluation for minor uses	None
PP 1/119(3)	Weed control in *Ribes* and *Rubus*	None

There were no deviations from EPPO guidance:

Test site

Item	**Details**
Location address	Moat Farm, Newent, GL18 1JG
Crop	Blackcurrant
Cultivar	Ben Hope – susceptible to *D. ribis*
Soil or substrate type	Clay loam
Agronomic practice	Modified commercial practice – no pesticide inputs by the host grower; crop was harvested by machine to the floor
Prior history of site	Blackcurrants

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 10 m
Plot size: (m^2)	30
Number of plants per plot:	Approx. 33
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	flufenacet + metribuzin	Artist	EM3H002475	240 g/kg 175 g/kg	Water dispersible granule
	pendimethalin	Stomp Aqua	16724770	455 g/l	Capsule suspension
AHDB9900	N/D	N/D	N/D	N/D	N/D
AHDB9975	N/D	N/D	N/D	N/D	N/D
AHDB9898	N/D	N/D	N/D	N/D	N/D
AHDB9917	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	N/A	N/A	A
2	Artist	600 437.5	2.5	A
	Stomp Aqua	1319.5	2.9	A
3	AHDB9900	19.1	0.1	A
4	AHDB9975	743.8 875	3.5	A
5	AHDB9898	864	1.2	A
6	AHDB9917	Not stated	0.7	A

Application details

	Application A
Application date	23/04/2020
Time of day	11:15-12:30
Crop growth stage (Max, min average BBCH)	65-39
Crop height (cm)	150
Crop coverage (%)	50
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)	23.2
Relative humidity (%)	50.2
Wind speed range (m/s)	1.0-1.1
Dew presence (Y/N)	N
Temperature of soil - 2-5 cm	17.5

(°C)	
Wetness of soil - 2-5 cm	Dry
Cloud cover (%)	25

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 start of assessment period	Infestation level at end of assessment period
Broad leaved weeds and grasses	*N/A*	3WEEDT	1.25% *(untreated average)*	10.0% *(untreated average)*	42.5% *(untreated average)*

Assessment details

Evaluation date	Evaluation Timing (DA)*	Crop Growth Stage (BBCH)	Evaluation type (efficacy, phytotox)	Assessment
23/04/2020	0	59	efficacy	Preliminary percentage of weed cover (whole plot score)
07/05/2020	14	71	efficacy, phytotox	Percentage of weed cover (whole plot score) Phytotox (scale 0-10, 10 = dead)
21/05/2020	28	75	efficacy, phytotox	Percentage of weed cover (whole plot score) Phytotox (scale 0-10, 10 = dead)
24/06/2020	62	81	efficacy, phytotox	Percentage of weed cover (whole plot score) Phytotox (scale 0-10, 10 = dead)
16/07/2020	84	87	efficacy, phytotox	Percentage of weed cover (whole plot score) Phytotox (scale 0-10, 10 = dead)

* DA – days after application

Statistical analysis

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

Results

Phytotoxicity

The results of phytotoxicity assessments from four dates are presented in **Table 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 very few phytotoxic effects recorded in this trial and no significant differences between the treatments and the untreated plots. The grower standard and AHDB 9975 caused a small amount of scorching to expanded leaves on low branches that had been hit during the treatment application. These effects were transient and not of commercial concern.

Table 1. Mean crop phytotoxicity scores at two, four and nine weeks after residual herbicide application in blackcurrant.

Date / Treatment	07-May	21-May	24-Jun
Untreated	0.00	0.00	0.00
Stomp Aqua + Artist	0.75	0.75	0.00
AHDB 9900	0.00	0.00	0.00
AHDB 9975	0.25	0.25	0.00
AHDB 9898	0.00	0.00	0.00
AHDB 9917	0.00	0.00	0.00
P value	0.170	0.775	-
d.f.	5	5	-
s.e.d.	2.10	4.85	-
l.s.d.	4.47	10.35	-
	Not significantly different from untreated control (p>0.05)		
	Significantly less than untreated control (p<0.05)		

Efficacy

The results for the mean percentage weed cover per treatment are presented in **Table 2** 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 3**.

Weed cover was low in the trial due to an unusually dry period after treatment application. The main weed species noted in the trial plots were creeping thistle, clover and creeping buttercup. Black nightshade was present in the plots, but the percentage cover was low (**Table 4**).

At the earlier assessments, two and four weeks after the treatment application, there were few weeds in the trial area, with an average of only 13.75 % weed cover in the untreated plots

at the four-week assessment (21 May). Weed levels built up as the trial progressed, with an average weed cover of 42.5 % in untreated plots at the final assessment (16 July) twelve weeks after treatment application. By the conclusion of the trial, all treatments showed significantly lower weed cover than the untreated control.

Table 2. Mean total plot weed cover (%) at two, four, nine and twelve weeks after residual herbicide application to blackcurrant herbicide strip.

Date Treatment	07-May	21-May	24-Jun	16-Jul
Untreated	10.00	13.75	16.25	42.50
Stomp Aqua + Artist	4.50	7.50	9.50	19.50
AHDB 9900	6.25	8.00	12.50	20.00
AHDB 9975	7.50	10.25	13.50	22.50
AHDB 9898	6.75	11.50	16.50	28.75
AHDB 9917	6.50	11.75	15.00	25.00
P value	0.170	0.775	0.784	0.025
d.f.	5	5	5	5
s.e.d.	2.10	4.85	6.00	6.43
l.s.d.	4.47	10.35	12.78	13.71
	Not significantly different from untreated control (p>0.05)			
	Significantly less than untreated control (p<0.05)			

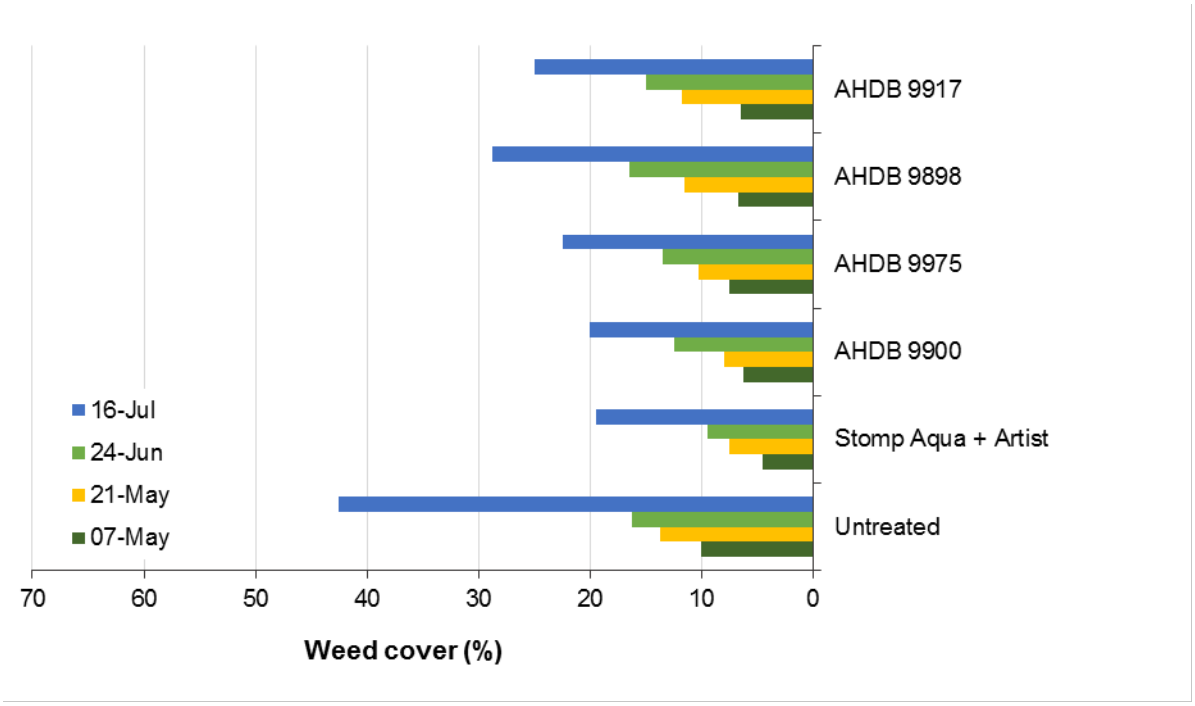


Figure 1. Mean weed cover (%) at two, four, nine, and twelve weeks after residual herbicide application.

Table 3. Percentage reduction in weed cover compared to the untreated control at two, four, nine and twelve weeks after pre-planting treatment application.

Treatment	Weed cover reduction (%)			
	07-May	21-May	24-Jun	16-Jul
Stomp Aqua + Artist	55.0	45.5	41.5	54.1
AHDB 9900	37.5	41.8	23.1	52.9
AHDB 9975	25.0	25.5	16.9	47.1
AHDB 9898	32.5	16.4	-1.5	32.4
AHDB 9917	35.0	14.6	7.7	41.2

Table 4. Mean weed cover (%) of most common weeds at final assessment, twelve weeks after residual herbicide application to blackcurrant herbicide strip.

Date Treatment	Creeping thistle	Creeping buttercup	Clover	Black nightshade
Untreated	8.33	12.92	6.25	0.17
Stomp Aqua + Artist	1.33	2.50	3.00	0.08
AHDB 9900	2.17	4.25	1.75	0.50
AHDB 9975	3.42	8.58	1.00	0.08
AHDB 9898	3.17	13.42	1.92	0.50
AHDB 9917	3.83	7.25	2.75	0.58
P value	0.368	0.094	0.344	0.544
d.f.	5	5	5	5
s.e.d.	3.19	4.12	2.36	0.36
l.s.d.	6.80	8.78	5.02	0.77
	Not significantly different from untreated control (p>0.05)			
	Significantly less than untreated control (p<0.05)			

Discussion

Minor phytotoxic damage was seen in two of the treatments tested in the trial, including in the grower standard, but the damage was transient and the blackcurrant bushes showed no effects from the herbicides after the four week assessment. There was low rainfall during the trial, however rain fell in three out of seven days after the treatment application, which would have provided sufficient water for the herbicide activity.

The weeds were slow to establish due to the dry conditions for much of the trial duration; there was no substantial rainfall from 1st May until 18th 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 twelve weeks after the herbicide application.

At the final assessment (16 July) 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, Artist + Stomp Aqua, at this assessment. AHDB9900 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 AHDB9900, AHDB9975, AHDB9898 or AHDB9917 on blackcurrants 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 bush fruit growers' weed control options.

AHDB9975 should aid in control of black bindweed and black nightshade. AHDB9900 should increase control of creeping thistle, groundsel and sow thistle. AHDB9917 is a graminicide with some broad-leaved weed activity.

Conclusions

- AHDB9900, AHDB9975, AHDB9898 and AHDB9917 are promising products for weed control in blackcurrants and were shown in this trial to be safe and effective herbicide treatments. EAMU authorisations for any of these products in bush fruit would help growers improve weed control.

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 Harriet Prosser from Lucozade Ribena Suntory and grower Edward Keene 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)
Blackcurrant	Ben Hope	2002	3 m

Previous cropping

Year	**Crop**
2002-2020	Blackcurrants

Active ingredients(s)/fertiliser(s) applied to trial area

Date	**Product**	**Rate** (kg/ha)
04/04/2020	13-13-29.5	308kg

No herbicides, fungicides or pesticides were applied to the trial rows.

b. Table showing sequence of events by date – this relates to treatments and assessments.

Date	**Event**
23/04/2020	Trial set-up Treatment application Weed assessment 1
07/05/2020	Weed assessment 2 Crop safety assessment 1
21/05/2020	Weed assessment 3 Crop safety assessment 2
24/06/2020	Weed assessment 4 Crop safety assessment 3
21/07/2020	Weed assessment 5 Crop safety assessment 4

c. Photos

Trial at set up – 23/04/2020

Untreated control – after 12 weeks

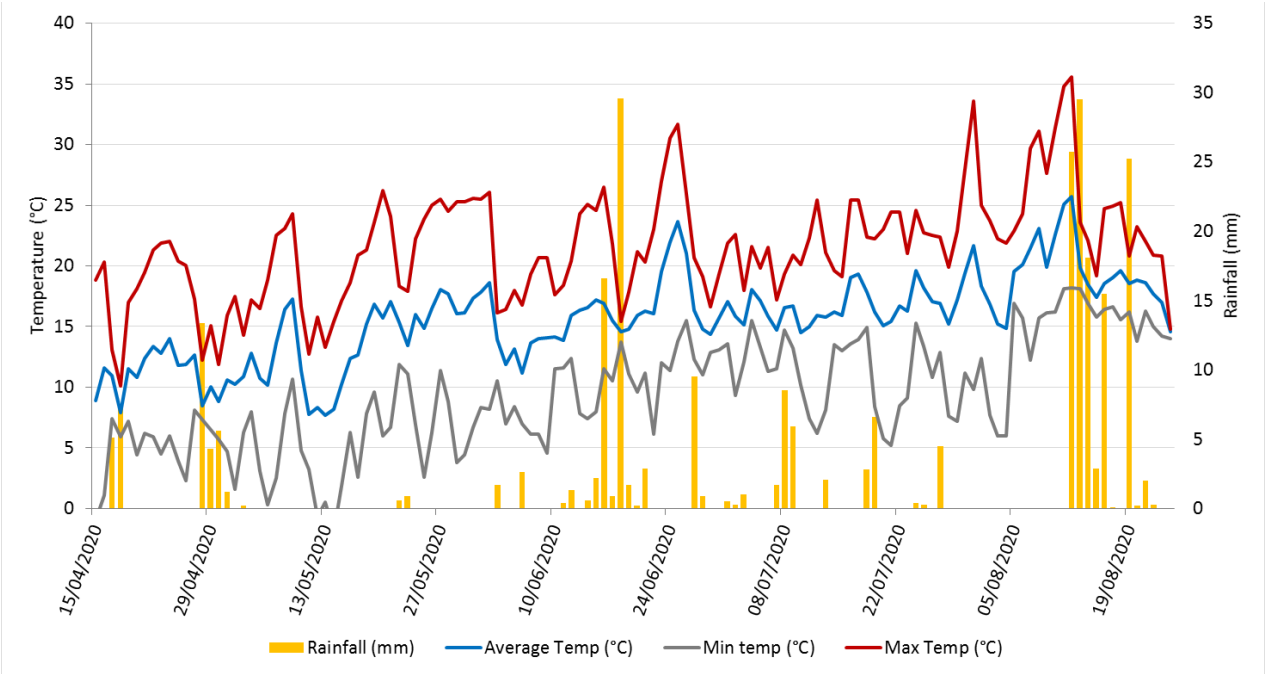
AHDB 9900 – after 12 weeks

AHDB 9975 – after 12 weeks

AHDB 9947 – after 12 weeks

AHDB 9917 – 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)
15/04/2020	8.9	-1.0	18.8	71.7	31.6	100.0	0.0
16/04/2020	11.6	1.1	20.3	70.2	38.5	99.2	0.0
17/04/2020	10.9	7.4	13.1	83.8	71.8	93.9	5.1
18/04/2020	7.9	5.9	10.1	94.6	89.5	99.1	7.3
19/04/2020	11.5	7.2	17.0	75.6	50.8	98.6	0.0
20/04/2020	10.8	4.4	18.1	71.0	41.6	95.0	0.0
21/04/2020	12.4	6.2	19.5	68.3	39.0	90.9	0.0
22/04/2020	13.3	5.9	21.3	70.3	42.5	95.4	0.0
23/04/2020	12.8	4.5	21.9	75.7	44.9	98.7	0.0
24/04/2020	14.0	6.0	22.0	71.1	43.8	95.5	0.0
25/04/2020	11.8	3.9	20.4	78.0	51.8	98.2	0.0
26/04/2020	11.9	2.3	20.0	79.0	41.7	100.0	0.0
27/04/2020	12.7	8.1	17.3	74.1	54.8	98.3	0.0
28/04/2020	8.5	7.3	12.2	95.0	72.9	99.4	13.4
29/04/2020	10.1	6.5	15.1	87.8	58.1	100.0	4.3
30/04/2020	8.8	5.7	11.9	87.3	69.1	96.6	5.6
01/05/2020	10.6	4.7	15.9	78.7	50.8	97.9	1.2
02/05/2020	10.2	1.6	17.5	79.2	51.8	99.6	0.0
03/05/2020	10.9	6.3	14.3	88.2	65.5	100.0	0.2
04/05/2020	12.8	8.0	17.2	79.4	58.2	98.5	0.0
05/05/2020	10.7	3.1	16.5	71.7	45.0	96.0	0.0
06/05/2020	10.2	0.3	18.8	74.7	41.0	100.0	0.0
07/05/2020	13.6	2.5	22.5	75.3	48.7	100.0	0.0
08/05/2020	16.4	7.8	23.1	79.9	49.3	100.0	0.0
09/05/2020	17.3	10.7	24.3	77.4	52.3	98.3	0.0

10/05/2020	11.3	4.8	16.6	81.0	57.6	95.5	0.0
11/05/2020	7.8	3.2	12.7	63.0	40.4	82.7	0.0
12/05/2020	8.4	-0.7	15.8	70.4	42.2	97.7	0.0
13/05/2020	7.7	0.5	13.3	70.3	41.3	99.9	0.0
14/05/2020	8.2	-1.9	15.4	65.2	39.7	98.5	0.0
15/05/2020	10.2	1.9	17.1	73.0	51.1	98.3	0.0
16/05/2020	12.3	6.3	18.6	70.7	45.6	94.0	0.0
17/05/2020	12.7	2.6	20.9	75.5	47.0	99.9	0.0
18/05/2020	15.2	7.8	21.3	71.6	49.8	96.1	0.0
19/05/2020	16.8	9.6	23.6	79.2	57.3	99.3	0.0
20/05/2020	15.7	6.0	26.2	76.3	33.9	100.0	0.0
21/05/2020	17.0	6.7	24.1	72.0	42.7	96.9	0.0
22/05/2020	15.3	11.9	18.3	71.4	53.2	95.2	0.6
23/05/2020	13.4	11.1	17.9	72.2	49.0	86.5	0.9
24/05/2020	16.0	6.9	22.2	68.6	43.0	95.1	0.0
25/05/2020	14.9	2.6	23.9	69.4	38.8	100.0	0.0
26/05/2020	16.5	6.3	25.0	74.2	47.4	99.7	0.0
27/05/2020	18.0	11.4	25.5	68.3	37.1	97.3	0.0
28/05/2020	17.7	8.8	24.5	64.5	37.8	98.3	0.0
29/05/2020	16.1	3.8	25.3	63.2	34.3	98.5	0.0
30/05/2020	16.2	4.4	25.3	64.1	35.2	97.2	0.0
31/05/2020	17.3	6.7	25.6	60.3	34.4	93.5	0.0
01/06/2020	17.8	8.3	25.5	61.9	37.1	89.5	0.0
02/06/2020	18.6	8.2	26.1	61.1	34.4	94.5	0.0
03/06/2020	13.9	10.5	16.1	87.1	67.0	98.0	1.7
04/06/2020	11.9	7.0	16.4	83.3	57.5	98.8	0.0
05/06/2020	13.1	8.4	18.0	63.9	41.0	92.1	0.0
06/06/2020	11.1	7.0	16.8	78.3	64.2	94.5	2.6
07/06/2020	13.6	6.1	19.3	78.6	57.0	98.6	0.0
08/06/2020	14.0	6.1	20.7	74.3	48.9	98.9	0.0
09/06/2020	14.1	4.6	20.7	72.4	42.9	100.0	0.0
10/06/2020	14.1	11.5	17.6	78.2	63.0	93.7	0.0
11/06/2020	13.9	11.6	18.4	84.6	68.1	94.1	0.4
12/06/2020	15.9	12.4	20.4	87.1	69.9	98.8	1.3
13/06/2020	16.3	7.8	24.3	78.9	43.6	100.0	0.0
14/06/2020	16.5	7.4	25.1	82.0	53.3	100.0	0.6
15/06/2020	17.2	8.0	24.6	75.3	46.3	100.0	2.2
16/06/2020	16.9	11.5	26.5	87.1	47.1	100.0	16.6
17/06/2020	15.5	10.5	21.8	92.1	72.4	100.0	0.9
18/06/2020	14.6	13.7	15.4	99.3	97.0	100.0	29.6
19/06/2020	14.8	11.1	17.8	89.5	67.0	100.0	1.7
20/06/2020	15.9	9.6	21.2	86.8	61.3	100.0	0.2
21/06/2020	16.2	11.2	20.3	78.5	59.0	99.6	2.9
22/06/2020	16.1	6.1	23.0	78.0	57.4	100.0	0.0
23/06/2020	19.5	12.0	27.0	74.3	53.6	97.3	0.0
24/06/2020	22.0	11.4	30.5	73.0	44.2	100.0	0.0
25/06/2020	23.7	13.8	31.7	69.2	38.8	99.0	0.0
26/06/2020	21.0	15.5	25.9	77.6	57.5	96.9	0.0
27/06/2020	16.3	12.3	20.7	85.1	69.8	98.5	9.5
28/06/2020	14.8	11.0	19.1	78.5	60.0	97.4	0.9
29/06/2020	14.4	12.9	16.6	74.5	66.2	81.8	0.0
30/06/2020	15.7	13.1	19.3	81.4	72.7	90.5	0.0

01/07/2020	17.0	13.6	21.9	79.3	59.4	95.9	0.5
02/07/2020	15.8	9.3	22.6	81.3	59.1	99.6	0.3
03/07/2020	15.2	12.1	18.0	85.6	72.6	96.0	1.0
04/07/2020	18.1	15.5	21.6	86.1	74.1	96.2	0.0
05/07/2020	17.1	13.3	19.8	69.9	53.2	91.2	0.0
06/07/2020	15.8	11.3	21.5	69.3	52.9	86.2	0.0
07/07/2020	14.7	11.5	17.2	83.5	67.9	97.9	1.7
08/07/2020	16.5	14.7	19.3	96.6	85.3	100.0	8.5
09/07/2020	16.7	13.2	20.9	93.6	80.1	100.0	5.9
10/07/2020	14.5	10.2	20.1	77.4	52.8	100.0	0.0
11/07/2020	15.0	7.4	22.3	74.0	44.9	99.6	0.0
12/07/2020	15.9	6.2	25.4	70.8	40.5	100.0	0.0
13/07/2020	15.7	8.1	21.1	87.1	59.0	100.0	2.1
14/07/2020	16.2	13.5	19.6	84.6	65.4	100.0	0.0
15/07/2020	15.9	13.0	19.1	84.7	74.3	96.2	0.0
16/07/2020	19.1	13.6	25.4	79.2	60.3	97.9	0.0

e. Trial design

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

Treatment number	Product
1	Untreated
2	Stomp Aqua + Artist
3	AHDB 9900
4	AHDB 9975
5	AHDB 9898
6	AHDB 9917

f. ORETO certificate

Certificate of

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

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 Alison Richardson
Authorised signatory

Certification Number
ORETO 409

HSE
Chemicals Regulation Division

Department of Agriculture and Rural Development