SCEPTREPLUS

Final Trial Report

Trial code:	SP31
Title:	AHDB SCEPTREplus blackcurrant contact herbicide screen
Crop	Blackcurrant, *Ribes,* Bush fruit
Target	General broadleaf weeds and grasses, 3WEEDT Field bindweed, C*onvolvulus arvensis*, CONAR
Lead researcher:	Dr Sonia Newman
Organisation:	RSK ADAS Ltd, ADAS Boxworth, Cambridgeshire, CB23 4NN
Period:	April 2018 to Oct 2018
Report date:	31/10/2018
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

……29//10/2018…… ……  ……

Date Authors signature

Grower 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 to blackcurrant, although grasses have become less of an issue due to a recent EAMU for clethodim. Field bindweed is not controlled by herbicide programmes used in blackcurrants. If uncontrolled it climbs over the bush making it impossible to harvest fruit. The only remedy is to manually pull off the bindweed by hand prior to harvest, a time consuming and expensive task. Some control can be achieved by directed hooded sprays of glyphosate (approved under EAMU) but this is not always sufficiently effective in suppressing the field bindweed prior to harvest.

The objective of this trial was to identify crop safe and effective contact herbicides for weed control in blackcurrants, aiming to expand the options available to growers with a focus on field bindweed control.

Methods

A trial was sited at a commercial blackcurrant grower in Suffolk. Treatments were applied to the weed vegetation after bindweed germination in the blackcurrant row. The blackcurrant crop (Ben Hope) was planted in 2003. The first treatments were applied on 15th May. The treatments were applied with a single nozzle hooded lance and an Oxford Precision Sprayer knapsack at 400 L/ha water volume with plots 1.5 m wide by 10 m long.

A randomised block design was used with four replicates of seven treatments, including an untreated control for comparison, totaling 28 plots. Plots were assessed for weed control on four occasions, recording the percentage of weed ground cover. Crop damage was also assessed; recorded first at two weeks after the first treatment application, and on two subsequent occasions (6 and 8 weeks after treatment).

Results and discussion

All treatments were shown to be crop safe during the trial, and although some phytotoxicity effects were noted, the damage was transient and the blackcurrant bushes grew through, and showed no effects from the herbicides by harvest (Table 1). The initial level of damage shown was not commercially unacceptable. After six weeks there were no significant differences in the phytotoxicity symptoms shown by the bushes compared to the control. Based on the results of crop safety in this trial all of the treatments appear to be suitable for further investigation.

All of the treatments tested reduced the percentage weed cover, giving a significant reduction compared to the untreated control at six and eight weeks after application. The grower standard (Roundup Powermax) performed well, with AHDB9866 showing a similar levels of control. The other treatments did not perform quite as well, but had a significantly lower weed cover when compared to the control at the end of the trial. The treatments may have been affected by the drought conditions and thus slow weed growth experienced during the trial, as many of these require active growth in order to be effective. This may explain the longer than expected delay in effectiveness of the treatments. Due to the extremely dry conditions following the application of the treatments these results should be treated with caution as herbicide activity and movement may also have been reduced.

All of the treatments gave a significant reduction in the percentage cover of the bind weed at the six week assessment. AHDB9868 showed a good initial reduction in bindweed cover, though this was short-lived. AHDB9866 showed levels of control similar to that of the grower

standard, although the levels of bindweed had started to increase by the harvest assessment. AHDB9976 also showed potential and appeared to have a smaller increase in bindweed cover by harvest than some of the other treatments.

Table 1. Summary of crop damage and percentage weed cover from key assessment timings (8th May 2018, 2 weeks post-treatment and 1st June 2018, 6 weeks post-treatment)

Application A	Crop damage (0-10) 2 weeks post-treatment	Total weed cover (%) 6 weeks post-treatment	Bindweed cover (%) 6 weeks post-treatment
Untreated	10.00	99.68	17.13
Roundup Powermax	9.00	32.18	4.61
AHDB9868	9.00	71.28	6.25
AHDB9982	9.00	76.64	7.92
AHDB9976	9.00	80.12	6.25
AHDB9867	8.75	81.23	6.16
AHDB9866	9.50	50.38	2.00
F prob. value	0.254	<0.001	0.022
d.f.	18	18	18
S.E.D.	0.502	5.22	3.82
L.S.D.	1.055	10.96	8.03

Conclusions

- All treatments were crop safe.
- All treatments resulted in significantly lower total weed and bindweed cover compared to the control plots. AHDB9866 gave the greatest reduction in overall weed and bindweed control, and AHDB9868 and AHDB9976 also gave significant reductions and show promise for future investigation.
- The standard performed as expected, achieving good control, though the drought conditions may have affected the efficacy of all treatments in the trial.
- Further studies should be carried out to assess the performance of the most promising products under more normal meteorological conditions, and investigate if tank-mixing of products could improve longevity of control

Take Home Message

An approval for AHDB9866 could give blackcurrant growers an alternative to Roundup PowerMax for control of bindweed and general broad leaved weeds. Further investigation could determine if tank-mixing of a different timing could increase longevity of control.

Objectives

1. To evaluate the effectiveness of six herbicide treatments, applied to an actively growing crop, for the control of broadleaved weeds and grasses in blackcurrants as measured by crop safety and weed control efficacy.
2. To compare the performance of novel treatments against the commercial standard (Roundup PowerMax).
3. To monitor the treated crop for phytotoxicity

Trial conduct

UK regulatory guidelines were followed but EPPO guideline 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(4)	Conduct and reporting of efficacy evaluation trials including good experimental practice	None
PP 1/119(3)	Weed control in *Ribes* and *Rubus*	None

Test site

Item	**Details**
Location address	Hall Farm, Woodbridge, Suffolk IP13 7PW
Crop	Blackcurrants
Cultivar	Ben Hope
Soil or substrate type	Sandy clay loam
Agronomic practice	See appendix
Prior history of site	Blackcurrants since 2003

Trial design

Item	**Details**
Trial design:	Randomised block design
Number of replicates:	4
Row spacing:	1.5 m
Plot size: (w x l)	3 m 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 or manufacturers code**	**Formulation batch number**	**Content of active substance in product**	**Formulation type**
N/A	glyphosate	Roundup PowerMax	AXJ272910O	720 g/l	Water soluble granule
AHDB 9868	N/D	N/D	N/D	N/D	N/D
AHDB 9982	N/D	N/D	N/D	N/D	N/D

AHDB 9976	N/D	N/D	N/D	N/D	N/D
AHDB 9867	N/D	N/D	N/D	N/D	N/D
AHDB 9866	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	N/A
2	Roundup Powermax	1440 g	2.00	A
3	AHDB9868	150 g	1.50	A
4	AHDB9982	45 g	0.75	A
5	AHDB9976	199.8 g	0.60	A
6	AHDB9867	350 g	0.50	A
7	AHDB9866	1400 g	2.80	A

Application details

	Application A
Application date	15/05/2018
Time of day	12:15
Crop growth stage (Max, min average BBCH)	60-65
Crop height (cm)	1.2
Crop coverage (%)	25
Application Method	Spray
Application Placement	Foliar
Application equipment	Oxford Precision Sprayer (knapsack)
Nozzle pressure	2.5 Bar
Nozzle type	Flat fan
Nozzle size	02F110
Application water volume/ha	400
Temperature of air - shade (°C)	26.3
Relative humidity (%)	71.0
Wind speed range (m/s)	1-3
Dew presence (Y/N)	N
Temperature of soil - 2-5 cm (°C)	21
Wetness of soil - 2-5 cm	Dry
Cloud cover (%)	20

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

Common name	Scientific Name	EPPO Code	Infection level pre-application	Infection level at start of assessment period	Infection level at end of assessment period
Broad leaved weeds and grasses	*N/A*	3WEEDT	88.36% *(untreated average)*	95.57% *(untreated average)*	100% *(untreated average)*
Field bindweed	*Convolvulus arvensis*	CONAR	13.23% *(untreated average)*	14.54% *(untreated average)*	19.37% *(untreated average)*

Assessment details

Evaluation date	Evaluation Timing (DA)*	Crop Growth Stage (BBCH)	Evaluation type (efficacy, phytotox)	What was assessed and how (e.g. dead or live pest; disease incidence and severity; yield, marketable quality)
15/05/2018	0	65	efficacy	Percentage of weed and bindweed cover (whole plot score)
01/06/2018	17	75	efficacy, phytotox	Percentage of weed and bindweed cover (whole plot score) Phytotox (scale 0-10, 0 = dead)
28/06/2018	44	81	efficacy, phytotox	Percentage of weed and bindweed cover (whole plot score) Phytotox (scale 0-10, 0 = dead)
13/07/2018	59	87	efficacy, phytotox	Percentage of weed and bindweed cover (whole plot score) Phytotox (scale 0-10, 0 = dead)

* DA – days after application

Statistical analysis

The trial design was a randomised block design, with four replicates of seven treatments, including one control.

As the distribution of weeds was uneven across the trial, which is not unexpected in field situations, there was a need to transform these variables prior to analysis. An angular transformation was used.

All data were analysed by ANOVA using Genstat 18.4 by Chris Dyer at RSK ADAS. For the % efficacy data, calculated by Abbotts formula, an angular transformation was carried out and then the back transformed means are presented from which the Abbotts Formula was used to calculate the % reduction in weeds.

Results

Phytotoxicity

The results of phytotoxicity assessments from three dates are presented in Table 2, and from two dates in Figure 1. These were scored on a scale of 0 to 10, with 0 being 'dead', and 10 being 'no effect'. Those scores at 8 or above were deemed to be commercially acceptable damage.

Phytotoxicity was recorded using the following scale:

Crop tolerance score	Equivalent to crop damage (% phytotoxicity)
0	complete crop kill 100%
1	80-95% damage
2	70-80%
3	60-70%
4	50-60%
5	40-50%
6	25-40%
7	15-25%
8*	10-15%
9	5-10%
10	no damage

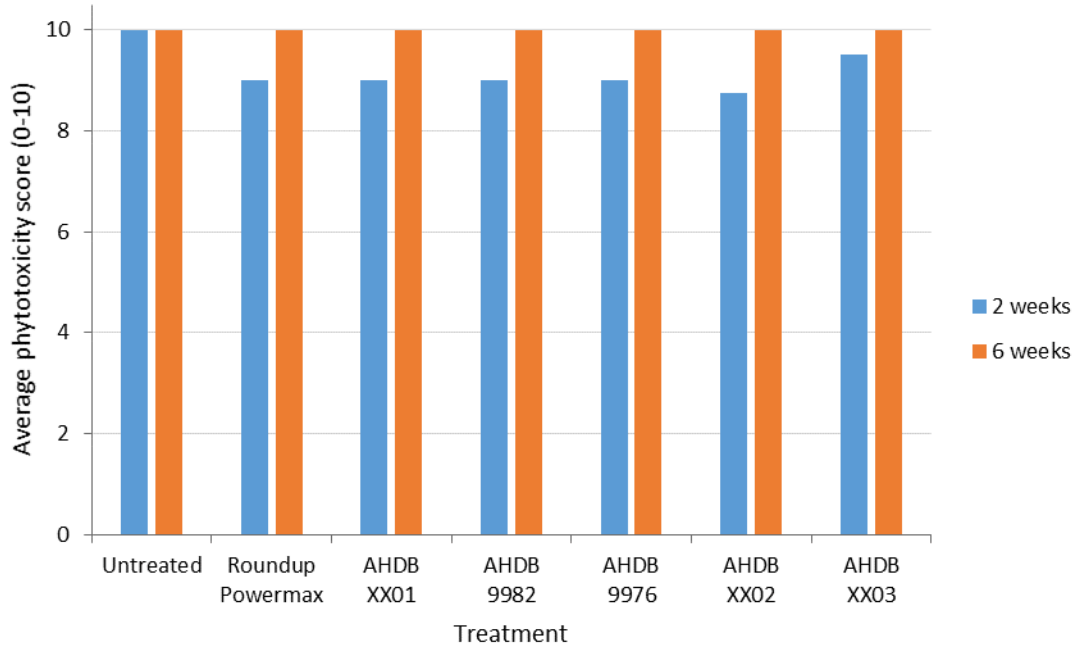
* 8 = acceptable damage, i.e. damage unlikely to reduce yield, and acceptable to the farmer.

The average phytotoxicity at 2, 6 and 8 weeks after treatment are shown in Table 2 and Figure 1. At the two week assessment, there were notable phytotoxicity symptoms seen. These were typically scorch, leaf rolling or chlorosis on the leaves that had been hit by the herbicides during spraying (Figure 4; Appendix E). These scores were not below the 8 deemed to be commercially unacceptable and not significantly lower than the untreated control. The damaged caused was transient and by the six week assessment no further phytotoxicity was seen, with the bushes growing through the symptoms.

Table 2. Mean phytotoxicity scores (0-10; 0 = complete crop death, 10 = no damage) through the trial. Scores ≥ 8 deemed commercially acceptable damage, those < 8 represent unacceptable damage.

Application A	Mean crop damage scores		
	1st Jun	28th Jun	13th Jul
Untreated	10.00	10.00	10.00
Roundup Powermax	9.00	10.00	10.00
AHDB9868	9.00	10.00	10.00
AHDB9982	9.00	10.00	10.00
AHDB9976	9.00	10.00	10.00
AHDB9867	8.75	10.00	10.00
AHDB9866	9.50	10.00	10.00
F prob. value	0.254	N/S	N/S

d.f.	18	18	18
S.E.D.	0.502	N/A	N/A
L.S.D.	1.055	N/A	N/A



creeping cinquefoil and silverweed. The results for the mean percentage weed cover per treatment are presented in Table 3 and Figure 2. The percent reduction in weed cover compared to the untreated control was calculated (using Abbotts formula) from these figures, and results for each treatment are listed in Table 4.

All of the treatments significantly reduced the weed cover in the plots compared to the control at the six week and eight week (pre-harvest) assessments (Table 3; Figure 2). The grower standard (Roundup PowerMax) and AHDB9866 performed well, particularly by the six week assessment, with the weeds being noted as having turned brown. These treatments also had significantly lower weed cover compared to the other treatments applied. The same pattern was found at the eight week assessment, with the standard and AHDB9866 both having significantly lower weed cover compared to the other treatments, but all treatments had significantly lower weed cover than the untreated control.

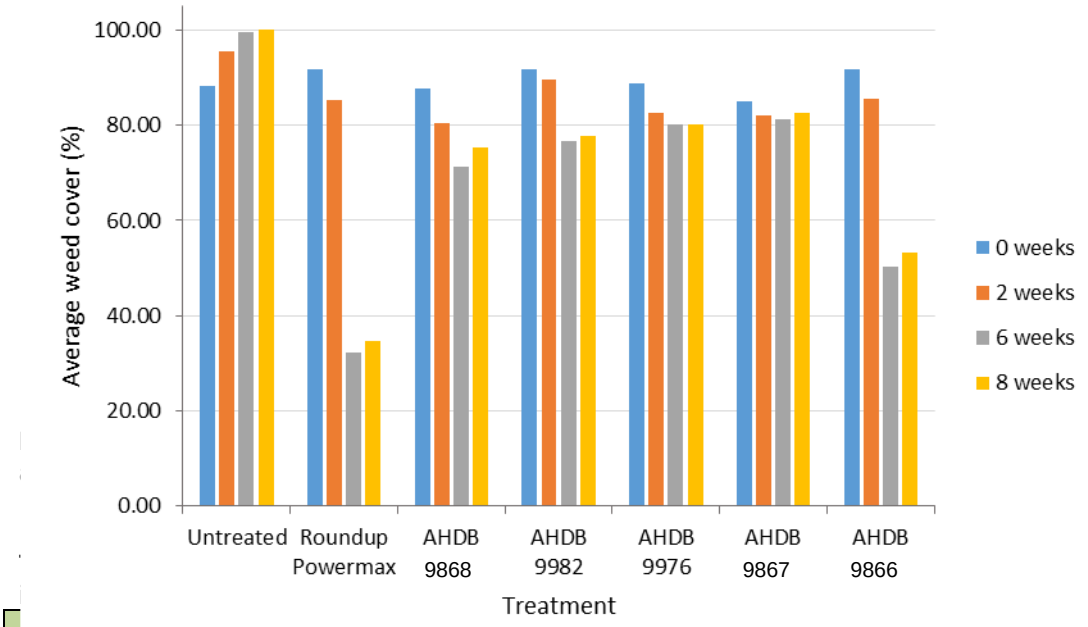
At the final assessment, which was just before blackcurrant harvest, the untreated control had 100% total weed cover. The treated plots all saw an increase in the weed cover at the final assessment as the products no longer had complete control and new plant material had grown up where other weeds had died (Table 4).

Table 3. Mean percentage weed cover values (angular and back transformed).

Trt No.	15th May		1st Jun		28th Jun		13th Jul	
	Ang.	Back-trans	Ang.	Back-trans	Ang.	Back-trans	Ang.	Back-trans
UTC*	70.10	88.36	77.80	95.57	86.80	99.68	90.00	100.00
2	73.20	91.68	67.40	85.18	34.60	32.18	36.10	34.79
3	69.50	87.78	63.70	80.37	57.60	71.28	60.20	75.30
4	73.20	91.68	71.20	89.62	61.10	76.64	61.90	77.76
5	70.50	88.83	65.40	82.68	63.50	80.12	63.70	80.32
6	67.20	85.00	65.00	82.11	64.30	81.23	65.30	82.50

7	73.20	91.68	67.60	85.46	45.20	50.38	46.90	53.36
F pr. value	0.722		0.093		<0.001		<0.001	
d.f.	18		18		18		18	
S.E.D.	4.23		4.64		5.22		5.4	
L.S.D.	8.89		9.75		10.96		11.35	

* Untreated control; treatment 1



Application A	15th May*	1st Jun	28th Jun	13th Jul
Roundup PowerMax	-3.76	10.87	67.72	65.21
AHDB9868	0.66	15.90	28.49	24.70
AHDB9982	-3.76	6.23	23.11	22.24
AHDB9976	-0.53	13.49	19.62	19.68
AHDB9867	3.80	14.08	18.51	17.50
AHDB9866	-3.76	10.58	49.46	46.64

* Baseline assessment

Bindweed cover

The results for the mean percentage field bindweed cover per treatment are presented in Table 5 Table 3and Figure 3. The percent reduction in bindweed cover compared to the untreated control was calculated (using Abbotts formula) from these figures, and results for each treatment are listed in Table 6.

There was a decrease in the bindweed cover in all the plots treated at the two week assessment, though the levels were not significantly different to the control in any treatment. Overall, the grower standard (Roundup PowerMax) was not statistically significantly better

than any of the other treatments except the untreated control, although overall it did have the lowest cover of bindweed in the plot at harvest.

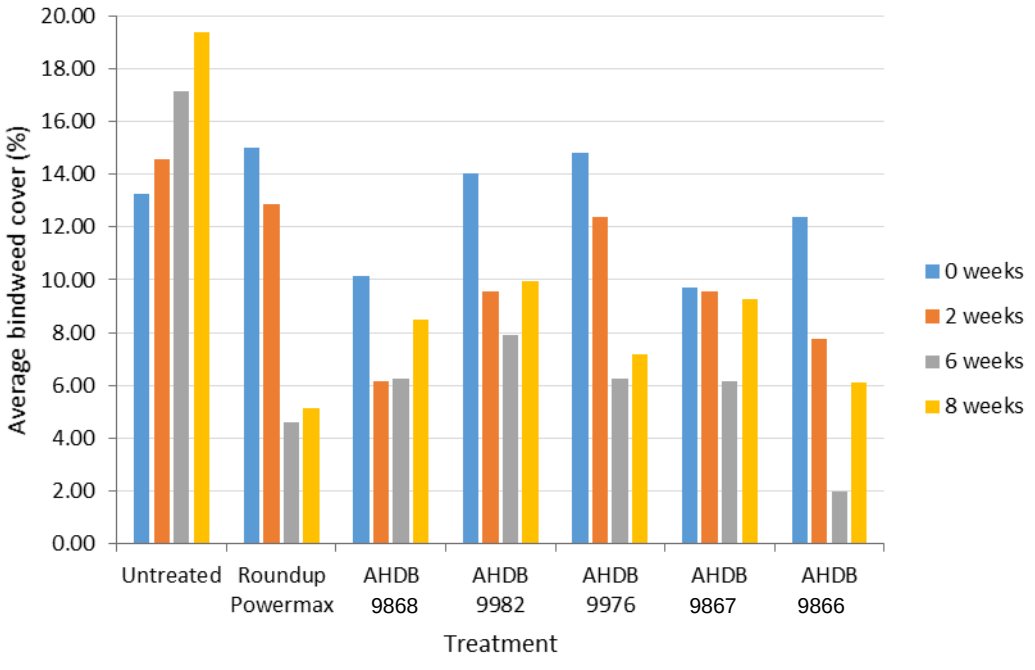
The other treatments that performed well were AHDB9866 and AHDB9976. In particular AHDB9866 at the six week assessment had very low bindweed cover. However, at the eight week assessment regrowth was beginning and field bindweed levels had increased again. AHDB9868 initially performed well at the two and six week assessments, however by the harvest assessment date (eight weeks after treatment), the bind weed cover had started to increase again.

Of the treatments tested AHDB9867 was the poorest performing, with little initial effect and the levels in the plot increasing to the same level as the start by the end of the trial. The field bindweed was growing through the bushes at the pre-harvest assessment eight weeks after application.

Table 5. Mean percentage bindweed cover values (angular and back transformed).

Trt No.	15th May		1st Jun		28th Jun		13th Jul	
	Ang.	Back-trans	Ang.	Back-trans	Ang.	Back-trans	Ang.	Back-trans
UTC*	21.30	13.23	22.40	14.54	24.40	17.13	26.10	19.37
2	22.80	15.00	21.00	12.88	12.40	4.61	13.10	5.14
3	18.50	10.12	14.40	6.16	14.50	6.25	16.90	8.50
4	22.00	14.01	18.00	9.58	16.30	7.92	18.40	9.94
5	22.60	14.82	20.60	12.39	14.50	6.25	15.60	7.20
6	18.10	9.70	18.00	9.58	14.40	6.16	17.70	9.25
7	20.60	12.38	16.20	7.74	8.10	2.00	14.30	6.10
F pr. value	0.94		0.77		0.022		0.134	
d.f.	18		18		18		18	
S.E.D.	5.04		5.49		3.82		3.29	
L.S.D.	10.6		11.53		8.03		6.91	

* Untreated control; treatment 1



A	15th May*	1st Jun	28th Jun	13th Jul
Roundup PowerMax	-13.38	11.42	73.10	73.47
AHDB9868	23.51	57.63	63.50	56.13
AHDB9982	-5.90	34.11	53.74	48.65
AHDB9976	-12.02	14.79	63.50	62.81
AHDB9867	26.68	34.11	64.03	52.22
AHDB9866	6.42	46.77	88.32	68.50

* Baseline assessment

Discussion

All treatments were shown to be crop safe during the trial, and although some phytotoxicity effects were noted, the damage was transient and the blackcurrant bushes grew through, and showed no effects from the herbicides by harvest. The initial level of damage shown was not commercially unacceptable. After six weeks there were no significant differences in the phytotoxicity symptoms shown by the bushes compared to the control. Based on the results of crop safety in this trial all of the treatments appear to be suitable for further investigation.

All of the treatments tested reduced the percentage weed cover, giving a significant reduction compared to the untreated control at six and eight weeks after application. The grower standard (Roundup PowerMax) performed well, with AHDB9866 showing a similar levels of control. The other treatments did not perform quite as well, but had a significantly lower weed cover when compared to the control at the end of the trial. The treatments may have been affected by the drought conditions and thus slow weed growth experienced during the trial, as many of these require active growth in order to be effective. This may explain the longer than expected delay in effectiveness of the treatments.

All of the treatments gave a significant reduction in the percentage cover of the bind weed at the six week assessment. AHDB9868 showed a good initial reduction in bindweed cover, though this was short-lived. AHDB9866 showed levels of control similar to that of the grower standard, although the levels of bindweed had started to increase by the harvest assessment. AHDB9976 also showed potential and appeared to have a smaller increase in bindweed cover by harvest than some of the other treatments.

AHDB9867 was not particularly effective in terms of overall weed control or bindweed control compared to some of the other treatments. A reduction in weed cover was seen and it was significantly lower than the control, however the cover had returned to its starting point by the end of the trial.

Conclusions

- All treatments were shown to be crop safe.
- All treatments resulted in significantly lower total weed and bindweed cover compared to the control plots. AHDB9866 gave the greatest reduction in overall weed and bindweed control, and AHDB9868 and AHDB9976 also gave significant reductions and show promise for future investigation.
- The standard performed as expected, achieving good control, though the drought conditions may have affected the efficacy of all treatments in the trial.
- Further studies should be carried out to assess the performance of the most promising products under more normal meteorological conditions, and investigate if tank-mixing of products could improve longevity of control.

Acknowledgements

AHDB for funding the work, and also the crop protection companies for their financial contributions as well as providing samples for the trials. Thanks should also be given to the Harriet Prosser from Lucozade Ribena Suntory and grower Andy Youngman 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	12/12/2003	1.5

Previous cropping

Year	Crop
2017	Blackcurrant
2016	Blackcurrant

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

Date	Product	Rate (kg/ha)
31/03/2017	13-13-29.5	308kg
10/05/2017	34.5% AN	123kg
06/04/2018	13-13-29.5	308kg
22/05/2018	34.5% AN	123kg

Pesticides applied to trial area

Date	Product	Rate (L/ha)
26/11/2016	Kerb Flo 400	3.0
17/02/2017	Stomp Aqua	2.9
	Artist	2.5
05/04/2017	Roundup	3.5
25/05/2017	Roundup	3.5
	Shark	0.3
22/11/2017	Kerb Flo 400	3.0
23/03/2018	Stomp Aqua	2.9
	Artist	2.5
	No further chemical applied as per request of lead researcher	-

Details of irrigation regime

Date	Type, rate and duration	Amount applied (mm)
N/A	-	-

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

Date	Event
15/05/2018	Trial marked out and temperature/relative humidity data logger set up in centre of trial. Weed levels assessed.
01/06/2018	Weed levels and crop safety assessed.
28/06/2018	Weed levels and crop safety assessed.

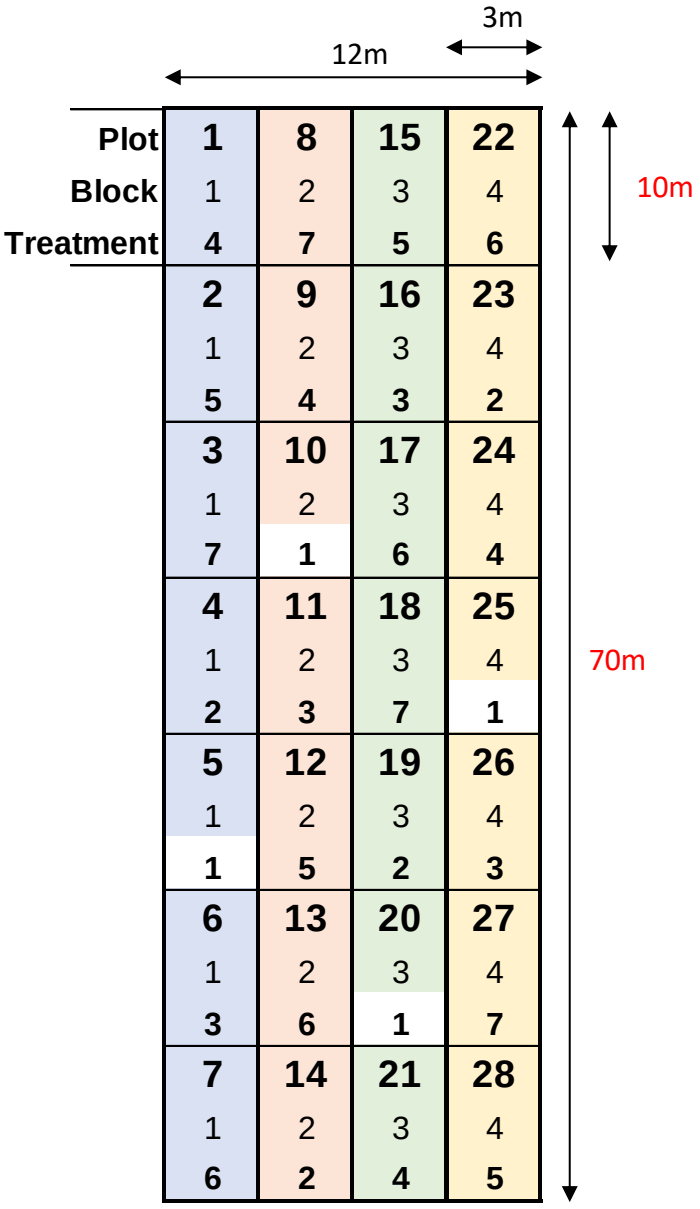
13/07/2018	Weed levels and crop safety assessed before harvest.

c. Table showing climatological data during study period.

Date	Temperature °C (maximum)	Temperature °C (minimum)	Rainfall (mm)
15/5/2018	25.0	9.5	0.0
16/5/2018	15.0	7.0	0.0
17/5/2018	18.5	3.5	0.0
18/5/2018	20.5	4.0	0.0
19/5/2018	21.0	1.0	0.0
20/5/2018	22.0	6.5	0.0
21/5/2018	23.5	5.0	0.0
22/5/2018	24.5	8.5	0.0
23/5/2018	21.0	9.5	0.0
24/5/2018	24.0	11.0	1.8
25/5/2018	21.0	12.5	2.5
26/5/2018	24.5	13.0	0.0
27/5/2018	25.0	12.5	0.0
28/5/2018	29.0	10.5	0.0
29/5/2018	25.0	13.0	2.3
30/5/2018	23.0	12.5	2.3
31/5/2018	21.5	12.0	0.0
01/6/2018	24.0	14.0	0.3
02/6/2018	25.5	15.5	2.3
03/6/2018	27.0	12.0	0.3
04/6/2018	18.0	11.0	0.5
05/6/2018	19.0	8.0	0.3
06/6/2018	22.5	6.5	0.0
07/6/2018	23.0	10.0	0.0
08/6/2018	21.0	9.0	0.0
09/6/2018	23.0	9.0	0.3
10/6/2018	22.0	10.0	0.3
11/6/2018	23.5	6.0	0.3
12/6/2018	17.0	11.5	0.3
13/6/2018	24.5	7.5	0.0
14/6/2018	25.0	11.0	0.0
15/6/2018	25.5	8.0	0.0
16/6/2018	24.0	11.0	0.0
17/6/2018	22.0	9.5	0.0
18/6/2018	29.0	14.5	0.3
19/6/2018	28.5	16.0	0.0
20/6/2018	29.0	13.0	0.0
21/6/2018	21.5	8.5	0.0
22/6/2018	23.5	6.0	0.0
23/6/2018	27.0	6.5	0.0
24/6/2018	25.0	6.5	0.0
25/6/2018	30.0	9.0	0.0
26/6/2018	27.5	9.0	0.0
27/6/2018	24.5	11.5	0.0
28/6/2018	28.0	10.5	0.0

Date	Temperature °C (maximum)	Temperature °C (minimum)	Rainfall (mm)
29/6/2018	28.0	11.5	0.0
30/6/2018	27.5	12.5	0.0
01/7/2018	27.5	12.0	0.0
02/7/2018	27.5	9.5	0.0
03/7/2018	27.0	10.0	0.0
04/7/2018	27.0	8.5	0.0
05/7/2018	30.0	9.0	0.0
06/7/2018	31.0	12.0	0.0
07/7/2018	30.5	14.0	0.0
08/7/2018	32.0	10.0	0.0
09/7/2018	29.0	10.5	0.0
10/7/2018	23.5	13.5	0.0
11/7/2018	25.5	13.5	0.0
12/7/2018	26.5	10.5	0.0
13/7/2018	31.5	8.5	0.0

d. Trial plan



Plot	1	8	15	22
Block	1	2	3	4
Treatment	4	7	5	6
	2	9	16	23
	1	2	3	4
	5	4	3	2
	3	10	17	24
	1	2	3	4
	7	1	6	4
	4	11	18	25
	1	2	3	4
	2	3	7	1
	5	12	19	26
	1	2	3	4
	1	5	2	3
	6	13	20	27
	1	2	3	4
	3	6	1	7
	7	14	21	28
	1	2	3	4
	6	2	4	5

e. Phytotoxic effects

Figure 4. Examples of phytotoxic effects

Scorch and leaf rolling to blackcurrant leaves from AHDB9866 (2.8 l/ha)
(2 weeks after treatment – 01/06/2018)

Chlorosis on blackcurrant leaves from AHDB9868 (1.5 kg/ha)
(2 weeks after treatment – 01/06/2018)

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