SCEPTREPLUS

Final Trial Report

Trial code:	SP08
Title:	**Efficacy and crop safety assessment of new and novel products for the control of *Aulacorthum solani* (glasshouse potato aphid) on glasshouse pepper**
Crop:	Sweet Pepper; trial data expected to apply to other Solanaceae
Target:	Glasshouse potato aphid, *Aulacorthum solani*, AULASO
Lead researcher:	Dr David George
Organisation:	Stockbridge Technology Centre, Cawood, Selby YO8 3TZ
Period:	May 2018 to August 2018
Report date:	29.03.19
Report author:	Dr Jennifer Banfield-Zanin, Dr David George
ORETO Number: (certificate should be attached)	372

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.

29.03.19…… D. George ……
…
Date Authors signature

Trial Summary

Introduction

Glasshouse potato aphid (*Aulacorthum solani*) is an economically important pest of glasshouse sweet pepper and other Solanaceous crops, reducing yield and being able to transmit viral disease. The aim of this trial was to evaluate efficacy of new (to the crop) and near-market products for control of this pest that could be incorporated into future IPM programmes in glasshouse peppers.

Methods

Sweet peppers were grown under glass and artificially infested with glasshouse potato aphid in August 2018. Spray programmes started 13th August, based on three applications and with water rates set to suit crop growth. Conventional products were applied only on the first occasion. Of the bio-insecticides, AHDB9929 was re-applied after 4 and 8 days and AHDB9932 and AHDB9971 were re-applied after 8 days, in line with manufacturer recommendations. Efficacy was determined by counting the number of live aphids on foliage. Assessments were made pre-application and on 3 further occasions, 3 days after each application. Monitoring for evidence of phytotoxicity was also undertaken at each assessment.

Results

	Mean live aphid counts per plant (back-transformed)			
Date	**13/08/2018**	**16/08/2018**	**20/08/2018**	**24/08/2018**
Treatment				
Negative control	108.17	148.50	181.33	229.83
Chess WG	173.00	143.83	100.67	194.67
AHDB9951	212.00	14.50	0.83	1.50
AHDB9948	196.50	80.83	43.67	31.50
AHDB9943	148.33	65.33	1.67	0.17
AHDB9932*	105.83	94.33	112.83	233.00
AHDB9929*	130.33	106.00	132.33	102.17
AHDB9971*	107.50	115.83	128.33	169.00
	Not significantly different from untreated control (p>0.05)			
	Significantly different from untreated control (p<0.05) *Bio-insecticide			

Conclusions

- All experimental conventional products (AHDB9951, AHDB9948 and AHDB9943) caused statistically-significant reductions in numbers of aphids, with two reducing numbers by >99% on the final assessment date and AHDB9951 leading to rapid knockdown.
- None of the bio-insecticides reduced aphid numbers significantly (possibly due to the high infestation levels of aphids), though repeat applications of AHDB9929 appeared to check population growth.
- No treatments caused phytotoxic effects.

Take home message

This trial has identified a number of safe and effective products for controlling glasshouse potato aphid. The conventional products tested performed particularly well, with two products leading to >99% aphid control over the duration of the trial.

Objectives

1. To evaluate the efficacy of selected plant protection products for control of glasshouse potato aphid on glasshouse peppers as measured by pest abundance.
2. To monitor the treated crop for phytotoxicity.
3. To identify products that could be incorporated into future IPM programmes for greenhouse peppers.

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)	Design and analysis of efficacy evaluation trials	None
PP 1/135(3)	Phytotoxicity assessment	None
PP 1/181(3)	Conduct and reporting of efficacy evaluation trials, including good experimental practice	None
PP 1/239(2)	Dose expression for plant protection products	None
PP 1/300(1)	Aphids on fruiting vegetables of the Solanaceae and Cucurbitaceae families under protected and field conditions	None

There were no deviations from EPPO guidance.

Test site

Item	**Details**
Location address	MFU 2 (M5), STC, Cawood, Selby, YO8 3TZ
Crop	Sweet pepper (*Capsicum annum*), CPSAN
Cultivar	Ferrari
Soil or substrate type	Rockwool slab (Grotop Master, Grodan)
Agronomic practice	Drip irrigation. Applied STC Tomato Main Feed (EC 3.3, pH5.5). Crop side-shoots trimmed and stopped; main stem untrimmed. Standard glasshouse pepper crop management.
Prior history of site	n/a

Trial design

Item	**Details**
Trial design:	Incomplete Trojan square
Number of replicates:	6
Row spacing:	1.0m
Plot size: (w x l)	0.88m x 4.2m
Plot size: (m^2)	3.7m^2
Number of plants per plot:	9
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	Adjuvant
Untreated	Water only	Water	n/a	n/a	n/a	None
N/A	Pymetrozine	Chess WG	POR7D3*	50%	WG	None
AHDB9951	N/A	N/A	N/A	N/A	N/A	None
AHDB9948	N/A	N/A	N/A	N/A	N/A	None
AHDB9943	N/A	N/A	N/A	N/A	N/A	None
AHDB9932	N/A	N/A	N/A	N/A	N/A	None
AHDB9929	N/A	N/A	N/A	N/A	N/A	None
AHDB9971	N/A	N/A	N/A	N/A	N/A	None

** Any remaining batch designators were illegible*

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	-	NA	A B C
2	Chess WG	60 g	0.12 kg	A
3	AHDB9951	126 g	0.63 L	A
4	AHDB9948	78 g	0.78 L	A
5	AHDB9943	80 g	0.16 kg	A
6	AHDB9932	288 ml	0.60 L	A C
7	AHDB9929	550 ml	5.00 L	A B C
8	AHDB9971	14.5 ml	0.56 L	A C

Application details

	Application A	Application B	Application C
Application date	13/08/2018	17/08/2018	21/08/2018
Time of day	14:00	09:00	09:30
Crop growth stage (Max, min average BBCH)	Av. 610	Av. 610	Av. 611
Crop height (cm)	50	65	80
Crop coverage (%)	>90	>90	>90
Application Method	Spray	Spray	Spray
Application Placement	Foliar	Foliar	Foliar
Application equipment	Oxford Precision Sprayer	Oxford Precision Sprayer	Oxford Precision Sprayer
Nozzle pressure	2 bar	2 bar	2 bar
Nozzle type	Hollow cone (HC)	Hollow cone (HC)	Hollow cone (HC)
Nozzle size	30HCX4	30HCX4	30HCX4

	Application A	Application B	Application C
Application water volume/ha	600L/ha	600L/ha	800L/ha
Temperature of air - shade (°C)	24.0	20.7	23.0
Relative humidity (%)	70	66	75
Wind speed range (m/s)	0	0	0
Dew presence (Y/N)	N	N	N
Temperature of soil - 2-5 cm (°C)	Ambient	Ambient	Ambient
Wetness of soil - 2-5 cm	Damp	Damp	Damp
Cloud cover (%)	75	87.5	100

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
Glasshouse potato aphid	*Aulacorthum solani*	AULASO	108[1]	149[1]	230[1]

[1]*Mean number of live aphids per plant.*

Assessment details

Assessments of efficacy were made by counting the number of live aphids (adult apterous and alate aphids, as well as live nymphs) on all sweet pepper shoot growth above the trimmed leading stem on the five central plants of each plot. An initial assessment was made on the day of first application in all plots, before spraying took place, to evaluate infestation levels. Subsequently, whole trial assessments were then completed three days after each application event. Phytotoxicity was assessed at each assessment point by examining foliage for evidence of damage (e.g. scorch).

	Evaluation Timing (DA)*					
Evaluation date	**After conventional insecticides**	**After Bio-insecticides**	**After botanical insecticides**	**Crop Growth Stage (BBCH)**	**Evaluation type (efficacy, phytotox)**	**Assessment**
13/08/2018	-0	-0	-0	610	Infestation level	Number of live aphids. Phytotox leaf damage.
16/08/2018	3	3	3	610	Efficacy, phytotox	Number of live aphids. Phytotox leaf damage.
20/08/2018	7	3	7	611	Efficacy, phytotox	Number of live aphids. Phytotox leaf damage.

	Evaluation Timing (DA)*					
Evaluation date	**After conventional insecticides**	**After Bio-insecticides**	**After botanical insecticides**	**Crop Growth Stage (BBCH)**	**Evaluation type (efficacy, phytotox)**	**Assessment**
24/08/2018	11	3	3	612	Efficacy, phytotox	Number of live aphids. Phytotox leaf damage.

* *DA – days after application*

Statistical analysis

The trial was designed by Andrew Mead (Rothamsted Research) as an incomplete Trojan Square for eight treatments, each replicated six times. All data were analysed by ANOVA using the Minitab (v17) program by David George at STC. Prior to analysis, data were checked for normality and homoscedasticity, being transformed if required. Where ANOVA reported a statistically-significant effect of treatment, post-hoc testing was conducted by calculating one-tailed LSDs to allow treatments to be compared against the negative control for demonstration of efficacy.

Results

Phytotoxicity

There was no evidence of phytotoxicity with any treatment.

Efficacy

Number of live aphids

The results for the mean numbers of live glasshouse potato aphid on four assessment dates are presented in Figure 1 and Table 1. Results significantly different from the untreated control at $P<0.05$ are highlighted by shading.

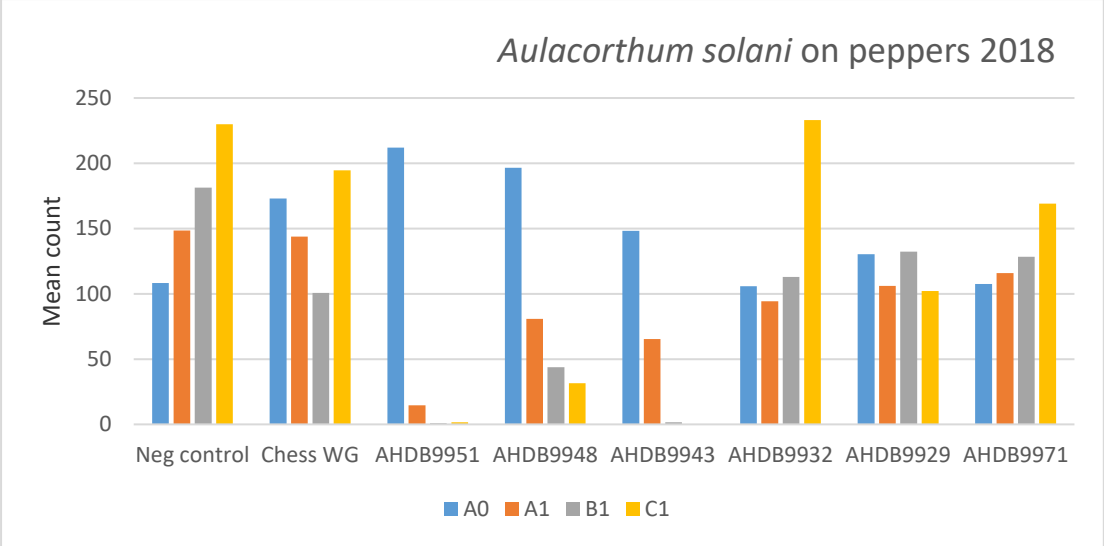


Figure 1. Live glasshouse potato aphid, *Aulacorthum solani*, counts according to treatment on four assessment dates during the trial. A0 = immediately before first product application; A1 = 3 days after first application (applied to all treatments on 13/08/2018); B1 = 3 days after second application (applied to all treatments on 17/08/2018); C1 = 3 days after third application (applied to all treatments on 21/08/2018)

Table 1. Live glasshouse potato aphid, *Aulacorthum solani*, (back-transformed) numbers according to treatment on four assessment dates during the trial. Shading indicates a significant difference (at P<0.05) from the untreated control. A0 = immediately before first product application; A1 = 3 days after first application (applied to all treatments on 13/08/2018); B1 = 3 days after second application (applied to all treatments on 17/08/2018); C1 = 3 days after third application (applied to all treatments on 21/08/2018)

Date	**A0 - 13/08/2018**		**A1 - 16/08/2018**		**B1 - 20/08/2018**		**C1 - 24/08/2018**	
Transformation	**Ln(x+1)**	**Back-trans.**	**Ln(x+1)**	**Back-trans.**	**Ln(x+1)**	**Back-trans.**	**Ln(x+1)**	**Back-trans.**
Treatment								
Neg. control	4.670	108.167	4.887	148.500	4.991	181.333	4.755	229.833
Chess WG	4.982	173.000	4.789	143.833	4.447	100.667	4.881	194.667
AHDB9951	4.936	212.000	2.222	14.500	0.384	0.833	0.567	1.500
AHDB9948	5.022	196.500	4.103	80.833	3.707	43.667	2.443	31.500
AHDB9943	4.945	148.333	3.852	65.333	0.730	1.667	0.116	0.167
AHDB9932	4.559	105.833	4.480	94.333	4.536	112.833	5.000	233.000
AHDB9929	4.812	130.333	4.398	106.000	4.539	132.333	4.396	102.167
AHDB9971	4.575	107.500	4.643	115.833	4.733	128.333	4.928	169.000

F value	0.54	-	7.19	-	41.07	-	19.83	-
P-value	0.802	-	0.000	-	0.000	-	0.000	-
d.f.	40	-	40	-	40	-	40	-
l.s.d.	0.614	-	0.763	-	0.691	-	1.100	-

Percentage reduction in numbers of aphids (Henderson-Tilton formula)

The Henderson-Tilton formula (see below) was used to calculate percentage efficacy based on live aphid counts, and results are presented in Table 2. Percentage reduction in aphids was calculated compared with the 13/08/18 (pre-spray) assessment, and was also compared with the previous assessment:

% efficacy = (1 – (number on control before spraying x number on treatment after spraying)/(number on control after spraying x number on treatment before spraying))

Table 2. Percentage reduction in live aphids at A1, B1 and C1 counts, compared with both the baseline (A0 count made on the 13/08/18) and previous counts. A0 = immediately before first product application; A1 = 3 days after first application (applied to all treatments on 13/08/2018); B1 = 3 days after second application (applied to all treatments on 17/08/2018); C1 = 3 days after third application (applied to all treatments on 21/08/2018)

	Compared with 13/08 assessment			Compared with previous assessment		
Treatment	**A1**	**B1**	**C1**	**A1**	**B1**	**C1**
Chess WG	39.4	65.3	47.0	39.4	42.7	-52.6
AHDB9951	95.0	99.8	99.7	95.0	95.3	-42.0
AHDB9948	70.0	86.7	92.5	70.0	55.8	43.1
AHDB9943	67.9	99.3	99.9	67.9	97.9	92.1
AHDB9932	35.1	36.4	-3.6	35.1	2.0	-62.9
AHDB9929	40.8	39.4	63.1	40.8	-2.2	39.1
AHDB9971	21.5	28.8	26.0	21.5	9.3	-3.9

Discussion

The initial level of infestation by glasshouse potato aphid was moderate throughout the trial, and increased steadily post-infestation in the control treatment throughout the trial period. The industry standard, Chess WG, performed less well than expected, failing to reduce aphid numbers significantly on any sampling date, although due to its mode of action, rapid knock-down with this product was not expected. Some level of control was nevertheless seen with Chess WG at assessments A1 (3 days after the single application of Chess WG) and B1 (7 days after this application). In a commercial situation a repeat application of Chess WG would have been permissible after 7 days.

Three experimental treatments, AHDB9951, AHDB9948 and AHDB9943, significantly reduced aphid numbers at all assessments compared with the untreated control ($P<0.05$). All were conventional products, with >99% control achieved with both AHDB9951 and AHDB9943 by the final sampling date. A high level of 95% control was achieved with the AHDB9951 at the first sampling date, indicating rapid knock-down by this product.

Of the three bio-insecticide products tested, none reduced aphid numbers significantly compared with the negative control, although repeat applications of AHDB9929 during the trial appeared to check population growth over the assessment period compared with the negative control.

All treatments mixed and sprayed well. No wetter was required. There were no phytotoxic effects.

Conclusions

- All experimental conventional products (AHDB9951, AHDB9948 and AHDB9943) caused statistically-significant reductions in the numbers of glasshouse potato aphid relative to the negative control treatment on all post-treatment assessment dates.
- By the final assessment date, two experimental conventional products had reduced aphid numbers by >99%, with AHDB9951 rapidly reducing numbers to a high level (95%) by the first post-spray assessment.
- No bio-insecticide product significantly reduced aphid counts, though repeat application of AHDB9929 appeared to check population growth.
- No treatments caused phytotoxic effects.

Acknowledgements

We would like to thank AHDB for funding and supporting this project and for the financial and in kind contributions from the crop protection manufactures and distributors involved with the SCEPTREplus programme as listed below: Agrii, Alpha Biocontrol Ltd, Andermatt, Arysta Lifescience, BASF, Bayer, Belchim, Bionema Limited, Certis Europe, Dow, DuPont, Eden Research, Fargro Limited, FMC, Gowan, Interfarm, Lallemand Plant Care, Novozymes, Oro Agri, Russell IPM, Sumitomo Chemicals, Syngenta, UPL.

We would also like to thank the SCEPTREplus consortium for input into trial design and product selection, as well as industry representative Owen Groves for advice on crop variety selection.

Appendix

a. Crop diary – events related to growing crop

Date	Event
01/06/2018	Pepper seed (var. Ferrari) sown into rockwool blocks.
17/07/2018	Crop transplanted into glasshouse (4 true leaf stage).
07/08/2018	Crop lead stem trimmed back, lower side-shoots stopped.

b. Trial diary

Date	Event
01/06/2018	Crop sown.
10/08/2018	Crop infested with approx. 10-15 *Aulacorthum solani* aphids per plant from stock culture.
11/08/2018	Crop checked for infestation levels – noted to be low.
12/08/2018	Second round of crop infestation. Crop infested with approx. 25 *Aulacorthum solani* per plant from stock culture.
13/08/2018	AM: Initial count (A0) of infestation levels. PM: All sprays applied.
16/08/2018	Aphid counts (efficacy assessment) and phytotox assessment.
17/08/2018	Bio-insecticide spray applied, all other treatments sprayed with water.
20/08/2018	Aphid counts (efficacy assessment) and phytotox assessment.
21/08/2018	Bio-insecticide sprays applied, all other treatments sprayed with water.
24/08/2018	Final aphid counts (efficacy assessment) and phytotox assessment.

c. Trial photos

Fig.1. Row of trial peppers in situ.

Fig.2. *Aulacorthum solani* on an untreated plant at the end of the trial, showing aphid-induced foliar damage.

d. Climatological data during study period

Day	June			July			August		
	Air min. (°C)	Air max. (°C)	RH (%)	Air min. (°C)	Air max. (°C)	RH (%)	Air min. (°C)	Air max. (°C)	RH (%)
1	17.7	28.8	79	17.7	34.1	62	15.7	27.4	65
2	18.1	24.6	86	17.6	33.4	65	18.7	30.7	67
3	18.2	26.4	78	17.7	31.0	74	19.3	28.4	76
4	17.7	22.1	85	17.8	29.5	81	16.7	28.6	66
5	17.8	24.9	70	17.9	34.1	81	16.2	31.1	64
6	17.3	21.8	79	18.9	32.6	80	18.4	29.6	68
7	17.7	25.5	70	18.8	32.9	82	19.4	30.3	69
8	17.5	22.3	79	18.1	31.5	84	16.0	25.4	67
9	17.8	27.1	75	18.4	25.5	93	15.1	24.1	69
10	17.8	29.2	75	17.6	27.5	89	14.2	24.4	71
11	17.8	29.6	73	17.8	30.1	91	12.6	26.1	65
12	18.1	25.0	71	18.6	27.5	93	18.2	23.6	83
13	17.7	25.5	63	18.3	26.5	93	18.5	27.2	85
14	17.9	25.6	66	17.7	31.1	89	17.2	24.6	78
15	17.8	24.6	67	18.5	31.9	91	18.4	27.0	73
16	17.6	24.2	74	19.2	27.6	96	16.9	24.4	74
17	17.8	24.1	76	15.3	26.0	61	13.8	22.6	76
18	18.3	26.7	75	12.3	28.4	59	17.8	27.3	74
19	17.9	25.3	75	15.4	29.9	58	19.5	26.4	76
20	17.8	25.4	76	16.8	30.0	62	17.8	27.5	82
21	17.7	24.7	69	18.9	25.8	68	18.7	27.8	76
22	17.8	29.0	71	18.6	33.2	66	16.4	25.5	78
23	17.7	26.5	78	20.5	32.5	66	14.6	23.1	79
24	17.8	32.3	77	19.6	30.5	66	13.0	23.6	81
25	17.8	34.7	82	15.7	32.1	62			
26	17.9	35.5	90	18.5	33.2	72			
27	17.9	33.1	95	19.6	33.5	75			
28	17.8	34.6	66	17.2	24.7	70			
29	17.8	34.6	57	16.1	24.6	85			
30	17.8	32.2	60	15.4	28.6	76			
31				16.0	26.5	66			

e. Raw data from assessments

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
13-Aug-18	A0	1.1	1	1	1	8	6	0	14	15.6
13-Aug-18	A0	1.1	1	1	2	16	7	0	23	
13-Aug-18	A0	1.1	1	1	3	18	4	0	22	
13-Aug-18	A0	1.1	1	1	4	3	4	0	7	
13-Aug-18	A0	1.1	1	1	5	10	2	0	12	
13-Aug-18	A0	1.2	1	2	1	35	2	0	37	21.4
13-Aug-18	A0	1.2	1	2	2	15	5	0	20	
13-Aug-18	A0	1.2	1	2	3	4	0	0	4	
13-Aug-18	A0	1.2	1	2	4	20	3	0	23	
13-Aug-18	A0	1.2	1	2	5	20	3	0	23	
13-Aug-18	A0	1.3	1	3	1	32	14	0	46	19.4
13-Aug-18	A0	1.3	1	3	2	5	2	0	7	
13-Aug-18	A0	1.3	1	3	3	14	6	0	20	
13-Aug-18	A0	1.3	1	3	4	14	4	0	18	
13-Aug-18	A0	1.3	1	3	5	3	3	0	6	
13-Aug-18	A0	1.4	1	4	1	17	10	2	29	31.2
13-Aug-18	A0	1.4	1	4	2	22	3	4	29	
13-Aug-18	A0	1.4	1	4	3	33	7	1	41	
13-Aug-18	A0	1.4	1	4	4	26	2	5	33	
13-Aug-18	A0	1.4	1	4	5	19	1	4	24	
13-Aug-18	A0	1.5	1	5	1	11	6	0	17	19.2
13-Aug-18	A0	1.5	1	5	2	12	7	0	19	
13-Aug-18	A0	1.5	1	5	3	13	10	1	24	
13-Aug-18	A0	1.5	1	5	4	10	9	0	19	
13-Aug-18	A0	1.5	1	5	5	5	11	1	17	
13-Aug-18	A0	1.6	1	6	1	11	12	7	30	23
13-Aug-18	A0	1.6	1	6	2	6	4	2	12	
13-Aug-18	A0	1.6	1	6	3	16	6	2	24	
13-Aug-18	A0	1.6	1	6	4	6	12	3	21	
13-Aug-18	A0	1.6	1	6	5	16	7	5	28	
13-Aug-18	A0	2.1	2	1	1	40	7	3	50	26.8
13-Aug-18	A0	2.1	2	1	2	20	4	4	28	
13-Aug-18	A0	2.1	2	1	3	18	11	1	30	
13-Aug-18	A0	2.1	2	1	4	11	7	4	22	
13-Aug-18	A0	2.1	2	1	5	3	0	1	4	
13-Aug-18	A0	2.2	2	2	1	181	54	1	236	76.8
13-Aug-18	A0	2.2	2	2	2	11	7	1	19	
13-Aug-18	A0	2.2	2	2	3	37	16	5	58	
13-Aug-18	A0	2.2	2	2	4	17	13	0	30	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
13-Aug-18	A0	2.2	2	2	5	21	17	3	41	
13-Aug-18	A0	2.3	2	3	1	20	9	0	29	27.2
13-Aug-18	A0	2.3	2	3	2	8	5	1	14	
13-Aug-18	A0	2.3	2	3	3	24	16	1	41	
13-Aug-18	A0	2.3	2	3	4	6	2	0	8	
13-Aug-18	A0	2.3	2	3	5	36	7	1	44	
13-Aug-18	A0	2.4	2	4	1	15	3	0	18	16.4
13-Aug-18	A0	2.4	2	4	2	9	7	2	18	
13-Aug-18	A0	2.4	2	4	3	7	3	2	12	
13-Aug-18	A0	2.4	2	4	4	5	2	5	12	
13-Aug-18	A0	2.4	2	4	5	17	2	3	22	
13-Aug-18	A0	2.5	2	5	1	5	4	0	9	13.6
13-Aug-18	A0	2.5	2	5	2	7	2	0	9	
13-Aug-18	A0	2.5	2	5	3	14	4	0	18	
13-Aug-18	A0	2.5	2	5	4	15	5	0	20	
13-Aug-18	A0	2.5	2	5	5	10	2	0	12	
13-Aug-18	A0	2.6	2	6	1	13	0	6	19	46.8
13-Aug-18	A0	2.6	2	6	2	19	0	5	24	
13-Aug-18	A0	2.6	2	6	3	103	4	12	119	
13-Aug-18	A0	2.6	2	6	4	14	4	1	19	
13-Aug-18	A0	2.6	2	6	5	40	7	6	53	
13-Aug-18	A0	3.1	3	1	1	7	2	1	10	17.4
13-Aug-18	A0	3.1	3	1	2	17	6	0	23	
13-Aug-18	A0	3.1	3	1	3	16	7	0	23	
13-Aug-18	A0	3.1	3	1	4	6	4	0	10	
13-Aug-18	A0	3.1	3	1	5	12	7	2	21	
13-Aug-18	A0	3.2	3	2	1	16	0	5	21	34
13-Aug-18	A0	3.2	3	2	2	13	0	2	15	
13-Aug-18	A0	3.2	3	2	3	12	0	4	16	
13-Aug-18	A0	3.2	3	2	4	61	2	5	68	
13-Aug-18	A0	3.2	3	2	5	43	3	4	50	
13-Aug-18	A0	3.3	3	3	1	32	16	2	50	23.2
13-Aug-18	A0	3.3	3	3	0	18	13	0	31	
13-Aug-18	A0	3.3	3	3	3	8	8	0	16	
13-Aug-18	A0	3.3	3	3	4	9	3	1	13	
13-Aug-18	A0	3.3	3	3	5	5	1	0	6	
13-Aug-18	A0	3.4	3	4	1	68	7	0	75	141.2
13-Aug-18	A0	3.4	3	4	2	43	20	8	71	
13-Aug-18	A0	3.4	3	4	3	106	38	12	156	
13-Aug-18	A0	3.4	3	4	4	240	115	0	355	
13-Aug-18	A0	3.4	3	4	5	40	9	0	49	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
13-Aug-18	A0	3.5	3	5	1	0	0	0	0	7.2
13-Aug-18	A0	3.5	3	5	2	4	1	0	5	
13-Aug-18	A0	3.5	3	5	3	8	2	0	10	
13-Aug-18	A0	3.5	3	5	4	10	4	0	14	
13-Aug-18	A0	3.5	3	5	5	5	2	0	7	
13-Aug-18	A0	3.6	3	6	1	17	14	10	41	31.4
13-Aug-18	A0	3.6	3	6	2	22	12	5	39	
13-Aug-18	A0	3.6	3	6	3	2	4	1	7	
13-Aug-18	A0	3.6	3	6	4	21	14	14	49	
13-Aug-18	A0	3.6	3	6	5	13	6	2	21	
13-Aug-18	A0	4.1	4	1	1	10	2	1	13	6.4
13-Aug-18	A0	4.1	4	1	2	0	2	0	2	
13-Aug-18	A0	4.1	4	1	3	5	4	0	9	
13-Aug-18	A0	4.1	4	1	4	1	3	0	4	
13-Aug-18	A0	4.1	4	1	5	3	1	0	4	
13-Aug-18	A0	4.2	4	2	1	57	28	6	91	76
13-Aug-18	A0	4.2	4	2	2	12	10	0	22	
13-Aug-18	A0	4.2	4	2	3	17	5	0	22	
13-Aug-18	A0	4.2	4	2	4	36	16	3	55	
13-Aug-18	A0	4.2	4	2	5	149	37	4	190	
13-Aug-18	A0	4.3	4	3	1	15	6	0	21	45.4
13-Aug-18	A0	4.3	4	3	2	34	15	2	51	
13-Aug-18	A0	4.3	4	3	3	36	15	0	51	
13-Aug-18	A0	4.3	4	3	4	47	23	0	70	
13-Aug-18	A0	4.3	4	3	5	29	5	0	34	
13-Aug-18	A0	4.4	4	4	1	57	22	7	86	50.8
13-Aug-18	A0	4.4	4	4	2	48	11	7	66	
13-Aug-18	A0	4.4	4	4	3	18	14	6	38	
13-Aug-18	A0	4.4	4	4	4	33	11	1	45	
13-Aug-18	A0	4.4	4	4	5	10	6	3	19	
13-Aug-18	A0	4.5	4	5	1	8	6	1	15	15.8
13-Aug-18	A0	4.5	4	5	2	10	8	0	18	
13-Aug-18	A0	4.5	4	5	3	11	2	0	13	
13-Aug-18	A0	4.5	4	5	4	18	5	0	23	
13-Aug-18	A0	4.5	4	5	5	7	3	0	10	
13-Aug-18	A0	4.6	4	6	1	39	11	1	51	41.4
13-Aug-18	A0	4.6	4	6	2	43	12	2	57	
13-Aug-18	A0	4.6	4	6	3	12	17	4	33	
13-Aug-18	A0	4.6	4	6	4	32	8	0	40	
13-Aug-18	A0	4.6	4	6	5	13	12	1	26	
13-Aug-18	A0	5.1	5	1	1	20	12	0	32	22.6

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
13-Aug-18	A0	5.1	5	1	2	10	3	0	13	
13-Aug-18	A0	5.1	5	1	3	11	6	2	19	
13-Aug-18	A0	5.1	5	1	4	13	11	1	25	
13-Aug-18	A0	5.1	5	1	5	21	3	0	24	
13-Aug-18	A0	5.2	5	2	1	24	4	0	28	48.2
13-Aug-18	A0	5.2	5	2	2	31	10	1	42	
13-Aug-18	A0	5.2	5	2	3	108	36	4	148	
13-Aug-18	A0	5.2	5	2	4	8	8	0	16	
13-Aug-18	A0	5.2	5	2	5	4	3	0	7	
13-Aug-18	A0	5.3	5	3	1	13	14	0	27	35.2
13-Aug-18	A0	5.3	5	3	2	34	13	0	47	
13-Aug-18	A0	5.3	5	3	3	25	13	4	42	
13-Aug-18	A0	5.3	5	3	4	20	11	0	31	
13-Aug-18	A0	5.3	5	3	5	19	10	0	29	
13-Aug-18	A0	5.4	5	4	1	12	5	1	18	28.4
13-Aug-18	A0	5.4	5	4	2	36	18	10	64	
13-Aug-18	A0	5.4	5	4	3	8	4	3	15	
13-Aug-18	A0	5.4	5	4	4	17	8	3	28	
13-Aug-18	A0	5.4	5	4	5	11	4	2	17	
13-Aug-18	A0	5.5	5	5	1	8	2	0	10	15.2
13-Aug-18	A0	5.5	5	5	2	16	2	0	18	
13-Aug-18	A0	5.5	5	5	3	18	1	0	19	
13-Aug-18	A0	5.5	5	5	4	3	10	0	13	
13-Aug-18	A0	5.5	5	5	5	10	6	0	16	
13-Aug-18	A0	5.6	5	6	1	5	4	0	9	28.4
13-Aug-18	A0	5.6	5	6	2	29	11	3	43	
13-Aug-18	A0	5.6	5	6	3	16	16	4	36	
13-Aug-18	A0	5.6	5	6	4	5	5	3	13	
13-Aug-18	A0	5.6	5	6	5	27	12	2	41	
13-Aug-18	A0	6.1	6	1	1	18	8	0	26	20.6
13-Aug-18	A0	6.1	6	1	2	21	5	1	27	
13-Aug-18	A0	6.1	6	1	3	4	3	4	11	
13-Aug-18	A0	6.1	6	1	4	9	7	0	16	
13-Aug-18	A0	6.1	6	1	5	14	9	0	23	
13-Aug-18	A0	6.2	6	2	1	7	3	3	13	31
13-Aug-18	A0	6.2	6	2	2	32	4	2	38	
13-Aug-18	A0	6.2	6	2	3	36	8	3	47	
13-Aug-18	A0	6.2	6	2	4	17	6	0	23	
13-Aug-18	A0	6.2	6	2	5	25	5	4	34	
13-Aug-18	A0	6.3	6	3	1	19	7	3	29	24.6
13-Aug-18	A0	6.3	6	3	2	12	0	1	13	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
13-Aug-18	A0	6.3	6	3	3	27	12	2	41	
13-Aug-18	A0	6.3	6	3	4	23	6	5	34	
13-Aug-18	A0	6.3	6	3	5	2	2	2	6	
13-Aug-18	A0	6.4	6	4	1	15	10	1	26	23.6
13-Aug-18	A0	6.4	6	4	2	8	5	1	14	
13-Aug-18	A0	6.4	6	4	3	21	4	2	27	
13-Aug-18	A0	6.4	6	4	4	27	5	0	32	
13-Aug-18	A0	6.4	6	4	5	7	4	8	19	
13-Aug-18	A0	6.5	6	5	1	1	2	0	3	5.6
13-Aug-18	A0	6.5	6	5	2	6	6	0	12	
13-Aug-18	A0	6.5	6	5	3	1	0	0	1	
13-Aug-18	A0	6.5	6	5	4	3	5	0	8	
13-Aug-18	A0	6.5	6	5	5	2	2	0	4	
13-Aug-18	A0	6.6	6	6	1	11	2	3	16	21.6
13-Aug-18	A0	6.6	6	6	2	18	5	3	26	
13-Aug-18	A0	6.6	6	6	3	14	7	4	25	
13-Aug-18	A0	6.6	6	6	4	4	7	2	13	
13-Aug-18	A0	6.6	6	6	5	15	9	4	28	
13-Aug-18	A0	7.1	7	1	1	15	8	0	23	21.6
13-Aug-18	A0	7.1	7	1	2	9	4	0	13	
13-Aug-18	A0	7.1	7	1	3	15	10	0	25	
13-Aug-18	A0	7.1	7	1	4	23	6	0	29	
13-Aug-18	A0	7.1	7	1	5	15	3	0	18	
13-Aug-18	A0	7.2	7	2	1	54	19	4	77	47.6
13-Aug-18	A0	7.2	7	2	2	19	13	8	40	
13-Aug-18	A0	7.2	7	2	3	21	9	4	34	
13-Aug-18	A0	7.2	7	2	4	44	12	5	61	
13-Aug-18	A0	7.2	7	2	5	16	6	4	26	
13-Aug-18	A0	7.3	7	3	1	22	14	0	36	16.2
13-Aug-18	A0	7.3	7	3	2	7	4	0	11	
13-Aug-18	A0	7.3	7	3	3	7	5	0	12	
13-Aug-18	A0	7.3	7	3	4	8	9	0	17	
13-Aug-18	A0	7.3	7	3	5	4	1	0	5	
13-Aug-18	A0	7.4	7	4	1	24	9	1	34	49.6
13-Aug-18	A0	7.4	7	4	2	18	11	1	30	
13-Aug-18	A0	7.4	7	4	3	44	28	8	80	
13-Aug-18	A0	7.4	7	4	4	12	7	3	22	
13-Aug-18	A0	7.4	7	4	5	51	30	1	82	
13-Aug-18	A0	7.5	7	5	1	18	7	0	25	24
13-Aug-18	A0	7.5	7	5	2	24	12	1	37	
13-Aug-18	A0	7.5	7	5	3	12	1	0	13	
13-Aug-18	A0	7.5	7	5	4	24	11	0	35	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
13-Aug-18	A0	7.5	7	5	5	5	5	0	10	
13-Aug-18	A0	7.6	7	6	1	25	2	0	27	23.2
13-Aug-18	A0	7.6	7	6	2	8	3	0	11	
13-Aug-18	A0	7.6	7	6	3	3	2	0	5	
13-Aug-18	A0	7.6	7	6	4	5	0	0	5	
13-Aug-18	A0	7.6	7	6	5	55	9	4	68	
13-Aug-18	A0	8.1	8	1	1	9	5	0	14	14
13-Aug-18	A0	8.1	8	1	2	2	4	0	6	
13-Aug-18	A0	8.1	8	1	3	18	6	1	25	
13-Aug-18	A0	8.1	8	1	4	8	4	0	12	
13-Aug-18	A0	8.1	8	1	5	13	0	0	13	
13-Aug-18	A0	8.2	8	2	1	63	16	9	88	44.2
13-Aug-18	A0	8.2	8	2	2	18	8	2	28	
13-Aug-18	A0	8.2	8	2	3	25	9	3	37	
13-Aug-18	A0	8.2	8	2	4	15	11	2	28	
13-Aug-18	A0	8.2	8	2	5	28	6	6	40	
13-Aug-18	A0	8.3	8	3	1	11	3	0	14	9.8
13-Aug-18	A0	8.3	8	3	2	4	5	0	9	
13-Aug-18	A0	8.3	8	3	3	3	6	0	9	
13-Aug-18	A0	8.3	8	3	4	3	1	0	4	
13-Aug-18	A0	8.3	8	3	5	7	6	0	13	
13-Aug-18	A0	8.4	8	4	1	7	5	1	13	19.4
13-Aug-18	A0	8.4	8	4	2	11	9	8	28	
13-Aug-18	A0	8.4	8	4	3	7	6	5	18	
13-Aug-18	A0	8.4	8	4	4	8	2	2	12	
13-Aug-18	A0	8.4	8	4	5	15	8	3	26	
13-Aug-18	A0	8.5	8	5	1	7	3	2	12	18
13-Aug-18	A0	8.5	8	5	2	25	8	3	36	
13-Aug-18	A0	8.5	8	5	3	16	4	1	21	
13-Aug-18	A0	8.5	8	5	4	6	5	0	11	
13-Aug-18	A0	8.5	8	5	5	6	2	2	10	
13-Aug-18	A0	8.6	8	6	1	16	10	1	27	23.6
13-Aug-18	A0	8.6	8	6	2	11	3	0	14	
13-Aug-18	A0	8.6	8	6	3	19	6	2	27	
13-Aug-18	A0	8.6	8	6	4	28	6	6	40	
13-Aug-18	A0	8.6	8	6	5	7	2	1	10	
16-Aug-18	A1	1.1	1	1	1	26	12	0	38	25.6
16-Aug-18	A1	1.1	1	1	2	18	4	0	22	
16-Aug-18	A1	1.1	1	1	3	28	5	0	33	
16-Aug-18	A1	1.1	1	1	4	4	3	0	7	
16-Aug-18	A1	1.1	1	1	5	23	4	1	28	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
16-Aug-18	A1	1.2	1	2	1	31	11	1	43	57
16-Aug-18	A1	1.2	1	2	2	42	14	1	57	
16-Aug-18	A1	1.2	1	2	3	45	29	1	75	
16-Aug-18	A1	1.2	1	2	4	44	21	2	67	
16-Aug-18	A1	1.2	1	2	5	30	12	1	43	
16-Aug-18	A1	1.3	1	3	1	17	6	0	23	21.4
16-Aug-18	A1	1.3	1	3	2	14	3	0	17	
16-Aug-18	A1	1.3	1	3	3	20	3	0	23	
16-Aug-18	A1	1.3	1	3	4	18	7	0	25	
16-Aug-18	A1	1.3	1	3	5	12	7	0	19	
16-Aug-18	A1	1.4	1	4	1	21	14	1	36	35.8
16-Aug-18	A1	1.4	1	4	2	30	14	2	46	
16-Aug-18	A1	1.4	1	4	3	12	8	1	21	
16-Aug-18	A1	1.4	1	4	4	11	7	1	19	
16-Aug-18	A1	1.4	1	4	5	36	19	2	57	
16-Aug-18	A1	1.5	1	5	1	17	5	0	22	27.8
16-Aug-18	A1	1.5	1	5	2	31	5	0	36	
16-Aug-18	A1	1.5	1	5	3	25	6	0	31	
16-Aug-18	A1	1.5	1	5	4	20	3	0	23	
16-Aug-18	A1	1.5	1	5	5	21	4	2	27	
16-Aug-18	A1	1.6	1	6	1	2	3	2	7	10.6
16-Aug-18	A1	1.6	1	6	2	8	3	0	11	
16-Aug-18	A1	1.6	1	6	3	0	0	1	1	
16-Aug-18	A1	1.6	1	6	4	6	4	4	14	
16-Aug-18	A1	1.6	1	6	5	13	2	5	20	
16-Aug-18	A1	2.1	2	1	1	39	8	1	48	28
16-Aug-18	A1	2.1	2	1	2	11	3	1	15	
16-Aug-18	A1	2.1	2	1	3	30	17	0	47	
16-Aug-18	A1	2.1	2	1	4	12	6	0	18	
16-Aug-18	A1	2.1	2	1	5	10	2	0	12	
16-Aug-18	A1	2.2	2	2	1	72	1	1	74	65
16-Aug-18	A1	2.2	2	2	2	34	3	0	37	
16-Aug-18	A1	2.2	2	2	3	90	15	0	105	
16-Aug-18	A1	2.2	2	2	4	64	2	0	66	
16-Aug-18	A1	2.2	2	2	5	40	3	0	43	
16-Aug-18	A1	2.3	2	3	1	40	6	1	47	29
16-Aug-18	A1	2.3	2	3	2	19	7	0	26	
16-Aug-18	A1	2.3	2	3	3	21	5	0	26	
16-Aug-18	A1	2.3	2	3	4	20	3	1	24	
16-Aug-18	A1	2.3	2	3	5	17	5	0	22	
16-Aug-18	A1	2.4	2	4	1	41	7	0	48	28.4

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
16-Aug-18	A1	2.4	2	4	2	18	10	1	29	
16-Aug-18	A1	2.4	2	4	3	14	8	1	23	
16-Aug-18	A1	2.4	2	4	4	5	0	0	5	
16-Aug-18	A1	2.4	2	4	5	30	6	1	37	
16-Aug-18	A1	2.5	2	5	1	3	3	0	6	9.6
16-Aug-18	A1	2.5	2	5	2	9	7	0	16	
16-Aug-18	A1	2.5	2	5	3	3	3	0	6	
16-Aug-18	A1	2.5	2	5	4	12	4	0	16	
16-Aug-18	A1	2.5	2	5	5	2	2	0	4	
16-Aug-18	A1	2.6	2	6	1	9	1	0	10	12.6
16-Aug-18	A1	2.6	2	6	2	5	4	0	9	
16-Aug-18	A1	2.6	2	6	3	10	21	1	32	
16-Aug-18	A1	2.6	2	6	4	1	3	0	4	
16-Aug-18	A1	2.6	2	6	5	5	3	0	8	
16-Aug-18	A1	3.1	3	1	1	4	0	0	4	4.4
16-Aug-18	A1	3.1	3	1	2	0	0	0	0	
16-Aug-18	A1	3.1	3	1	3	11	1	0	12	
16-Aug-18	A1	3.1	3	1	4	5	0	0	5	
16-Aug-18	A1	3.1	3	1	5	1	0	0	1	
16-Aug-18	A1	3.2	3	2	1	1	0	0	1	0.4
16-Aug-18	A1	3.2	3	2	2	0	0	0	0	
16-Aug-18	A1	3.2	3	2	3	0	0	0	0	
16-Aug-18	A1	3.2	3	2	4	0	0	0	0	
16-Aug-18	A1	3.2	3	2	5	1	0	0	1	
16-Aug-18	A1	3.3	3	3	1	2	0	0	2	1.6
16-Aug-18	A1	3.3	3	3	2	0	0	0	0	
16-Aug-18	A1	3.3	3	3	3	0	4	0	4	
16-Aug-18	A1	3.3	3	3	4	1	0	0	1	
16-Aug-18	A1	3.3	3	3	5	0	0	1	1	
16-Aug-18	A1	3.4	3	4	1	10	5	1	16	8.8
16-Aug-18	A1	3.4	3	4	2	12	1	0	13	
16-Aug-18	A1	3.4	3	4	3	8	4	1	13	
16-Aug-18	A1	3.4	3	4	4	0	0	0	0	
16-Aug-18	A1	3.4	3	4	5	1	0	1	2	
16-Aug-18	A1	3.5	3	5	1	0	0	0	0	2
16-Aug-18	A1	3.5	3	5	2	9	0	0	9	
16-Aug-18	A1	3.5	3	5	3	0	0	1	1	
16-Aug-18	A1	3.5	3	5	4	0	0	0	0	
16-Aug-18	A1	3.5	3	5	5	0	0	0	0	
16-Aug-18	A1	3.6	3	6	1	1	0	0	1	0.2
16-Aug-18	A1	3.6	3	6	2	0	0	0	0	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
16-Aug-18	A1	3.6	3	6	3	0	0	0	0	
16-Aug-18	A1	3.6	3	6	4	0	0	0	0	
16-Aug-18	A1	3.6	3	6	5	0	0	0	0	
16-Aug-18	A1	4.1	4	1	1	5	3	0	8	2.2
16-Aug-18	A1	4.1	4	1	2	1	0	0	1	
16-Aug-18	A1	4.1	4	1	3	2	0	0	2	
16-Aug-18	A1	4.1	4	1	4	0	0	0	0	
16-Aug-18	A1	4.1	4	1	5	0	0	0	0	
16-Aug-18	A1	4.2	4	2	1	19	0	0	19	25.2
16-Aug-18	A1	4.2	4	2	2	5	2	0	7	
16-Aug-18	A1	4.2	4	2	3	8	6	0	14	
16-Aug-18	A1	4.2	4	2	4	42	3	0	45	
16-Aug-18	A1	4.2	4	2	5	40	1	0	41	
16-Aug-18	A1	4.3	4	3	1	4	3	0	7	29.2
16-Aug-18	A1	4.3	4	3	2	18	4	0	22	
16-Aug-18	A1	4.3	4	3	3	9	3	0	12	
16-Aug-18	A1	4.3	4	3	4	71	24	1	96	
16-Aug-18	A1	4.3	4	3	5	5	4	0	9	
16-Aug-18	A1	4.4	4	4	1	19	1	2	22	12.8
16-Aug-18	A1	4.4	4	4	2	18	8	0	26	
16-Aug-18	A1	4.4	4	4	3	0	2	0	2	
16-Aug-18	A1	4.4	4	4	4	5	3	0	8	
16-Aug-18	A1	4.4	4	4	5	3	3	0	6	
16-Aug-18	A1	4.5	4	5	1	3	3	3	9	6
16-Aug-18	A1	4.5	4	5	2	3	2	0	5	
16-Aug-18	A1	4.5	4	5	3	6	3	0	9	
16-Aug-18	A1	4.5	4	5	4	4	3	0	7	
16-Aug-18	A1	4.5	4	5	5	0	0	0	0	
16-Aug-18	A1	4.6	4	6	1	16	7	0	23	21.6
16-Aug-18	A1	4.6	4	6	2	3	4	1	8	
16-Aug-18	A1	4.6	4	6	3	7	5	0	12	
16-Aug-18	A1	4.6	4	6	4	13	6	0	19	
16-Aug-18	A1	4.6	4	6	5	36	9	1	46	
16-Aug-18	A1	5.1	5	1	1	10	6	0	16	12
16-Aug-18	A1	5.1	5	1	2	11	8	0	19	
16-Aug-18	A1	5.1	5	1	3	12	2	0	14	
16-Aug-18	A1	5.1	5	1	4	6	3	0	9	
16-Aug-18	A1	5.1	5	1	5	0	2	0	2	
16-Aug-18	A1	5.2	5	2	1	2	2	1	5	38.6
16-Aug-18	A1	5.2	5	2	2	4	3	1	8	
16-Aug-18	A1	5.2	5	2	3	61	33	0	94	
16-Aug-18	A1	5.2	5	2	4	26	8	2	36	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
16-Aug-18	A1	5.2	5	2	5	37	12	1	50	
16-Aug-18	A1	5.3	5	3	1	17	3	0	20	12.4
16-Aug-18	A1	5.3	5	3	2	4	0	0	4	
16-Aug-18	A1	5.3	5	3	3	12	5	0	17	
16-Aug-18	A1	5.3	5	3	4	13	3	0	16	
16-Aug-18	A1	5.3	5	3	5	3	2	0	5	
16-Aug-18	A1	5.4	5	4	1	2	3	0	5	8.4
16-Aug-18	A1	5.4	5	4	2	8	3	1	12	
16-Aug-18	A1	5.4	5	4	3	0	0	0	0	
16-Aug-18	A1	5.4	5	4	4	6	4	0	10	
16-Aug-18	A1	5.4	5	4	5	13	2	0	15	
16-Aug-18	A1	5.5	5	5	1	3	1	0	4	3.2
16-Aug-18	A1	5.5	5	5	2	0	0	0	0	
16-Aug-18	A1	5.5	5	5	3	0	0	0	0	
16-Aug-18	A1	5.5	5	5	4	6	2	0	8	
16-Aug-18	A1	5.5	5	5	5	3	1	0	4	
16-Aug-18	A1	5.6	5	6	1	1	0	0	1	3.8
16-Aug-18	A1	5.6	5	6	2	0	0	0	0	
16-Aug-18	A1	5.6	5	6	3	0	0	0	0	
16-Aug-18	A1	5.6	5	6	4	3	0	1	4	
16-Aug-18	A1	5.6	5	6	5	13	1	0	14	
16-Aug-18	A1	6.1	6	1	1	12	2	0	14	9
16-Aug-18	A1	6.1	6	1	2	7	2	0	9	
16-Aug-18	A1	6.1	6	1	3	0	0	0	0	
16-Aug-18	A1	6.1	6	1	4	17	5	0	22	
16-Aug-18	A1	6.1	6	1	5	0	0	0	0	
16-Aug-18	A1	6.2	6	2	1	27	18	1	46	22.6
16-Aug-18	A1	6.2	6	2	2	11	4	0	15	
16-Aug-18	A1	6.2	6	2	3	13	9	0	22	
16-Aug-18	A1	6.2	6	2	4	9	6	0	15	
16-Aug-18	A1	6.2	6	2	5	6	8	1	15	
16-Aug-18	A1	6.3	6	3	1	26	7	2	35	30.4
16-Aug-18	A1	6.3	6	3	2	6	4	3	13	
16-Aug-18	A1	6.3	6	3	3	27	8	4	39	
16-Aug-18	A1	6.3	6	3	4	43	12	2	57	
16-Aug-18	A1	6.3	6	3	5	5	3	0	8	
16-Aug-18	A1	6.4	6	4	1	11	5	2	18	23.2
16-Aug-18	A1	6.4	6	4	2	15	7	1	23	
16-Aug-18	A1	6.4	6	4	3	10	6	3	19	
16-Aug-18	A1	6.4	6	4	4	11	10	2	23	
16-Aug-18	A1	6.4	6	4	5	18	12	3	33	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
16-Aug-18	A1	6.5	6	5	1	30	5	0	35	14.6
16-Aug-18	A1	6.5	6	5	2	1	1	0	2	
16-Aug-18	A1	6.5	6	5	3	1	1	0	2	
16-Aug-18	A1	6.5	6	5	4	6	2	0	8	
16-Aug-18	A1	6.5	6	5	5	15	11	0	26	
16-Aug-18	A1	6.6	6	6	1	5	0	1	6	13.4
16-Aug-18	A1	6.6	6	6	2	10	3	0	13	
16-Aug-18	A1	6.6	6	6	3	9	1	1	11	
16-Aug-18	A1	6.6	6	6	4	18	8	0	26	
16-Aug-18	A1	6.6	6	6	5	9	1	1	11	
16-Aug-18	A1	7.1	7	1	1	20	9	2	31	12.8
16-Aug-18	A1	7.1	7	1	2	13	4	0	17	
16-Aug-18	A1	7.1	7	1	3	2	1	1	4	
16-Aug-18	A1	7.1	7	1	4	7	1	0	8	
16-Aug-18	A1	7.1	7	1	5	4	0	0	4	
16-Aug-18	A1	7.2	7	2	1	44	15	2	61	44.6
16-Aug-18	A1	7.2	7	2	2	45	11	1	57	
16-Aug-18	A1	7.2	7	2	3	27	9	1	37	
16-Aug-18	A1	7.2	7	2	4	48	12	0	60	
16-Aug-18	A1	7.2	7	2	5	5	2	1	8	
16-Aug-18	A1	7.3	7	3	1	11	5	0	16	7.6
16-Aug-18	A1	7.3	7	3	2	1	1	0	2	
16-Aug-18	A1	7.3	7	3	3	2	1	0	3	
16-Aug-18	A1	7.3	7	3	4	7	4	0	11	
16-Aug-18	A1	7.3	7	3	5	3	3	0	6	
16-Aug-18	A1	7.4	7	4	1	52	8	0	60	60.8
16-Aug-18	A1	7.4	7	4	2	77	12	2	91	
16-Aug-18	A1	7.4	7	4	3	50	10	2	62	
16-Aug-18	A1	7.4	7	4	4	26	7	6	39	
16-Aug-18	A1	7.4	7	4	5	35	16	1	52	
16-Aug-18	A1	7.5	7	5	1	6	0	0	6	10
16-Aug-18	A1	7.5	7	5	2	4	3	0	7	
16-Aug-18	A1	7.5	7	5	3	10	2	0	12	
16-Aug-18	A1	7.5	7	5	4	15	7	0	22	
16-Aug-18	A1	7.5	7	5	5	3	0	0	3	
16-Aug-18	A1	7.6	7	6	1	11	1	0	12	24.2
16-Aug-18	A1	7.6	7	6	2	10	6	0	16	
16-Aug-18	A1	7.6	7	6	3	12	5	0	17	
16-Aug-18	A1	7.6	7	6	4	21	8	0	29	
16-Aug-18	A1	7.6	7	6	5	47	0	0	47	
16-Aug-18	A1	8.1	8	1	1	6	4	0	10	10.4

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
16-Aug-18	A1	8.1	8	1	2	2	1	0	3	
16-Aug-18	A1	8.1	8	1	3	19	10	0	29	
16-Aug-18	A1	8.1	8	1	4	0	4	0	4	
16-Aug-18	A1	8.1	8	1	5	4	2	0	6	
16-Aug-18	A1	8.2	8	2	1	61	28	4	93	47
16-Aug-18	A1	8.2	8	2	2	25	14	1	40	
16-Aug-18	A1	8.2	8	2	3	21	10	2	33	
16-Aug-18	A1	8.2	8	2	4	19	12	3	34	
16-Aug-18	A1	8.2	8	2	5	23	9	3	35	
16-Aug-18	A1	8.3	8	3	1	4	2	0	6	12.8
16-Aug-18	A1	8.3	8	3	2	5	3	0	8	
16-Aug-18	A1	8.3	8	3	3	9	6	0	15	
16-Aug-18	A1	8.3	8	3	4	8	2	0	10	
16-Aug-18	A1	8.3	8	3	5	20	5	0	25	
16-Aug-18	A1	8.4	8	4	1	18	5	0	23	22.2
16-Aug-18	A1	8.4	8	4	2	12	5	0	17	
16-Aug-18	A1	8.4	8	4	3	18	5	1	24	
16-Aug-18	A1	8.4	8	4	4	20	5	1	26	
16-Aug-18	A1	8.4	8	4	5	18	2	1	21	
16-Aug-18	A1	8.5	8	5	1	8	1	2	11	22
16-Aug-18	A1	8.5	8	5	2	15	10	1	26	
16-Aug-18	A1	8.5	8	5	3	13	13	1	27	
16-Aug-18	A1	8.5	8	5	4	24	11	2	37	
16-Aug-18	A1	8.5	8	5	5	5	2	2	9	
16-Aug-18	A1	8.6	8	6	1	23	13	0	36	24.6
16-Aug-18	A1	8.6	8	6	2	13	8	3	24	
16-Aug-18	A1	8.6	8	6	3	6	12	1	19	
16-Aug-18	A1	8.6	8	6	4	8	7	0	15	
16-Aug-18	A1	8.6	8	6	5	14	11	4	29	
20-Aug-18	B1	1.1	1	1	1	26	7	0	33	33.6
20-Aug-18	B1	1.1	1	1	2	17	3	0	20	
20-Aug-18	B1	1.1	1	1	3	21	11	0	32	
20-Aug-18	B1	1.1	1	1	4	22	6	0	28	
20-Aug-18	B1	1.1	1	1	5	44	11	0	55	
20-Aug-18	B1	1.2	1	2	1	53	11	0	64	79.6
20-Aug-18	B1	1.2	1	2	2	55	22	1	78	
20-Aug-18	B1	1.2	1	2	3	40	28	0	68	
20-Aug-18	B1	1.2	1	2	4	77	33	2	112	
20-Aug-18	B1	1.2	1	2	5	55	19	2	76	
20-Aug-18	B1	1.3	1	3	1	14	6	0	20	21.2
20-Aug-18	B1	1.3	1	3	2	4	8	0	12	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
20-Aug-18	B1	1.3	1	3	3	14	11	0	25	
20-Aug-18	B1	1.3	1	3	4	20	8	0	28	
20-Aug-18	B1	1.3	1	3	5	15	6	0	21	
20-Aug-18	B1	1.4	1	4	1	39	11	1	51	53.6
20-Aug-18	B1	1.4	1	4	2	45	21	2	68	
20-Aug-18	B1	1.4	1	4	3	26	12	2	40	
20-Aug-18	B1	1.4	1	4	4	30	25	0	55	
20-Aug-18	B1	1.4	1	4	5	30	24	0	54	
20-Aug-18	B1	1.5	1	5	1	12	4	0	16	18.8
20-Aug-18	B1	1.5	1	5	2	5	0	0	5	
20-Aug-18	B1	1.5	1	5	3	24	18	0	42	
20-Aug-18	B1	1.5	1	5	4	4	2	0	6	
20-Aug-18	B1	1.5	1	5	5	17	8	0	25	
20-Aug-18	B1	1.6	1	6	1	14	1	1	16	10.8
20-Aug-18	B1	1.6	1	6	2	2	0	0	2	
20-Aug-18	B1	1.6	1	6	3	10	1	0	11	
20-Aug-18	B1	1.6	1	6	4	3	4	0	7	
20-Aug-18	B1	1.6	1	6	5	10	8	0	18	
20-Aug-18	B1	2.1	2	1	1	45	28	1	74	46.4
20-Aug-18	B1	2.1	2	1	2	37	17	1	55	
20-Aug-18	B1	2.1	2	1	3	44	20	0	64	
20-Aug-18	B1	2.1	2	1	4	15	5	1	21	
20-Aug-18	B1	2.1	2	1	5	8	9	1	18	
20-Aug-18	B1	2.2	2	2	1	7	8	0	15	20
20-Aug-18	B1	2.2	2	2	2	8	3	0	11	
20-Aug-18	B1	2.2	2	2	3	37	5	0	42	
20-Aug-18	B1	2.2	2	2	4	14	8	0	22	
20-Aug-18	B1	2.2	2	2	5	4	6	0	10	
20-Aug-18	B1	2.3	2	3	1	10	3	0	13	18
20-Aug-18	B1	2.3	2	3	2	7	6	0	13	
20-Aug-18	B1	2.3	2	3	3	22	12	1	35	
20-Aug-18	B1	2.3	2	3	4	8	1	0	9	
20-Aug-18	B1	2.3	2	3	5	11	9	0	20	
20-Aug-18	B1	2.4	2	4	1	4	5	0	9	11.6
20-Aug-18	B1	2.4	2	4	2	2	0	0	2	
20-Aug-18	B1	2.4	2	4	3	13	8	0	21	
20-Aug-18	B1	2.4	2	4	4	8	7	1	16	
20-Aug-18	B1	2.4	2	4	5	5	5	0	10	
20-Aug-18	B1	2.5	2	5	1	1	0	0	1	6.4
20-Aug-18	B1	2.5	2	5	2	16	2	0	18	
20-Aug-18	B1	2.5	2	5	3	1	1	0	2	
20-Aug-18	B1	2.5	2	5	4	4	5	0	9	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
20-Aug-18	B1	2.5	2	5	5	1	1	0	2	
20-Aug-18	B1	2.6	2	6	1	5	4	0	9	18.4
20-Aug-18	B1	2.6	2	6	2	14	2	0	16	
20-Aug-18	B1	2.6	2	6	3	30	11	2	43	
20-Aug-18	B1	2.6	2	6	4	6	1	0	7	
20-Aug-18	B1	2.6	2	6	5	13	4	0	17	
20-Aug-18	B1	3.1	3	1	1	0	0	0	0	0
20-Aug-18	B1	3.1	3	1	2	0	0	0	0	
20-Aug-18	B1	3.1	3	1	3	0	0	0	0	
20-Aug-18	B1	3.1	3	1	4	0	0	0	0	
20-Aug-18	B1	3.1	3	1	5	0	0	0	0	
20-Aug-18	B1	3.2	3	2	1	0	0	0	0	0
20-Aug-18	B1	3.2	3	2	2	0	0	0	0	
20-Aug-18	B1	3.2	3	2	3	0	0	0	0	
20-Aug-18	B1	3.2	3	2	4	0	0	0	0	
20-Aug-18	B1	3.2	3	2	5	0	0	0	0	
20-Aug-18	B1	3.3	3	3	1	0	0	0	0	0.2
20-Aug-18	B1	3.3	3	3	2	0	0	0	0	
20-Aug-18	B1	3.3	3	3	3	0	0	0	0	
20-Aug-18	B1	3.3	3	3	4	1	0	0	1	
20-Aug-18	B1	3.3	3	3	5	0	0	0	0	
20-Aug-18	B1	3.4	3	4	1	2	0	0	2	0.8
20-Aug-18	B1	3.4	3	4	2	0	0	0	0	
20-Aug-18	B1	3.4	3	4	3	2	0	0	2	
20-Aug-18	B1	3.4	3	4	4	0	0	0	0	
20-Aug-18	B1	3.4	3	4	5	0	0	0	0	
20-Aug-18	B1	3.5	3	5	1	0	0	0	0	0
20-Aug-18	B1	3.5	3	5	2	0	0	0	0	
20-Aug-18	B1	3.5	3	5	3	0	0	0	0	
20-Aug-18	B1	3.5	3	5	4	0	0	0	0	
20-Aug-18	B1	3.5	3	5	5	0	0	0	0	
20-Aug-18	B1	3.6	3	6	1	0	0	0	0	0
20-Aug-18	B1	3.6	3	6	2	0	0	0	0	
20-Aug-18	B1	3.6	3	6	3	0	0	0	0	
20-Aug-18	B1	3.6	3	6	4	0	0	0	0	
20-Aug-18	B1	3.6	3	6	5	0	0	0	0	
20-Aug-18	B1	4.1	4	1	1	9	8	0	17	4.4
20-Aug-18	B1	4.1	4	1	2	0	0	0	0	
20-Aug-18	B1	4.1	4	1	3	2	2	0	4	
20-Aug-18	B1	4.1	4	1	4	1	0	0	1	
20-Aug-18	B1	4.1	4	1	5	0	0	0	0	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
20-Aug-18	B1	4.2	4	2	1	7	0	0	7	7.6
20-Aug-18	B1	4.2	4	2	2	1	0	0	1	
20-Aug-18	B1	4.2	4	2	3	4	1	0	5	
20-Aug-18	B1	4.2	4	2	4	12	2	0	14	
20-Aug-18	B1	4.2	4	2	5	7	4	0	11	
20-Aug-18	B1	4.3	4	3	1	0	0	0	0	11.8
20-Aug-18	B1	4.3	4	3	2	20	4	0	24	
20-Aug-18	B1	4.3	4	3	3	12	4	0	16	
20-Aug-18	B1	4.3	4	3	4	13	1	0	14	
20-Aug-18	B1	4.3	4	3	5	5	0	0	5	
20-Aug-18	B1	4.4	4	4	1	1	1	1	3	4.4
20-Aug-18	B1	4.4	4	4	2	0	0	0	0	
20-Aug-18	B1	4.4	4	4	3	7	1	0	8	
20-Aug-18	B1	4.4	4	4	4	2	2	0	4	
20-Aug-18	B1	4.4	4	4	5	4	3	0	7	
20-Aug-18	B1	4.5	4	5	1	9	2	1	12	10.2
20-Aug-18	B1	4.5	4	5	2	13	2	0	15	
20-Aug-18	B1	4.5	4	5	3	13	3	0	16	
20-Aug-18	B1	4.5	4	5	4	2	2	0	4	
20-Aug-18	B1	4.5	4	5	5	4	0	0	4	
20-Aug-18	B1	4.6	4	6	1	14	8	0	22	14
20-Aug-18	B1	4.6	4	6	2	15	4	0	19	
20-Aug-18	B1	4.6	4	6	3	6	3	0	9	
20-Aug-18	B1	4.6	4	6	4	5	7	0	12	
20-Aug-18	B1	4.6	4	6	5	3	5	0	8	
20-Aug-18	B1	5.1	5	1	1	0	0	0	0	0.6
20-Aug-18	B1	5.1	5	1	2	0	0	0	0	
20-Aug-18	B1	5.1	5	1	3	0	0	0	0	
20-Aug-18	B1	5.1	5	1	4	1	0	0	1	
20-Aug-18	B1	5.1	5	1	5	0	2	0	2	
20-Aug-18	B1	5.2	5	2	1	1	0	0	1	0.8
20-Aug-18	B1	5.2	5	2	2	0	0	0	0	
20-Aug-18	B1	5.2	5	2	3	1	1	0	2	
20-Aug-18	B1	5.2	5	2	4	1	0	0	1	
20-Aug-18	B1	5.2	5	2	5	0	0	0	0	
20-Aug-18	B1	5.3	5	3	1	0	0	0	0	0
20-Aug-18	B1	5.3	5	3	2	0	0	0	0	
20-Aug-18	B1	5.3	5	3	3	0	0	0	0	
20-Aug-18	B1	5.3	5	3	4	0	0	0	0	
20-Aug-18	B1	5.3	5	3	5	0	0	0	0	
20-Aug-18	B1	5.4	5	4	1	0	0	0	0	0.6

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
20-Aug-18	B1	5.4	5	4	2	1	1	0	2	
20-Aug-18	B1	5.4	5	4	3	1	0	0	1	
20-Aug-18	B1	5.4	5	4	4	0	0	0	0	
20-Aug-18	B1	5.4	5	4	5	0	0	0	0	
20-Aug-18	B1	5.5	5	5	1	0	0	0	0	0
20-Aug-18	B1	5.5	5	5	2	0	0	0	0	
20-Aug-18	B1	5.5	5	5	3	0	0	0	0	
20-Aug-18	B1	5.5	5	5	4	0	0	0	0	
20-Aug-18	B1	5.5	5	5	5	0	0	0	0	
20-Aug-18	B1	5.6	5	6	1	0	0	0	0	0
20-Aug-18	B1	5.6	5	6	2	0	0	0	0	
20-Aug-18	B1	5.6	5	6	3	0	0	0	0	
20-Aug-18	B1	5.6	5	6	4	0	0	0	0	
20-Aug-18	B1	5.6	5	6	5	0	0	0	0	
20-Aug-18	B1	6.1	6	1	1	8	3	0	11	9
20-Aug-18	B1	6.1	6	1	2	11	1	0	12	
20-Aug-18	B1	6.1	6	1	3	4	1	0	5	
20-Aug-18	B1	6.1	6	1	4	10	2	0	12	
20-Aug-18	B1	6.1	6	1	5	2	3	0	5	
20-Aug-18	B1	6.2	6	2	1	24	16	1	41	29.6
20-Aug-18	B1	6.2	6	2	2	15	9	0	24	
20-Aug-18	B1	6.2	6	2	3	14	15	1	30	
20-Aug-18	B1	6.2	6	2	4	17	4	1	22	
20-Aug-18	B1	6.2	6	2	5	20	11	0	31	
20-Aug-18	B1	6.3	6	3	1	40	7	1	48	32.2
20-Aug-18	B1	6.3	6	3	2	13	4	1	18	
20-Aug-18	B1	6.3	6	3	3	16	13	0	29	
20-Aug-18	B1	6.3	6	3	4	43	13	1	57	
20-Aug-18	B1	6.3	6	3	5	5	3	1	9	
20-Aug-18	B1	6.4	6	4	1	18	3	1	22	33.6
20-Aug-18	B1	6.4	6	4	2	31	7	1	39	
20-Aug-18	B1	6.4	6	4	3	30	10	0	40	
20-Aug-18	B1	6.4	6	4	4	19	11	0	30	
20-Aug-18	B1	6.4	6	4	5	32	5	0	37	
20-Aug-18	B1	6.5	6	5	1	20	2	0	22	25.8
20-Aug-18	B1	6.5	6	5	2	30	11	0	41	
20-Aug-18	B1	6.5	6	5	3	7	3	0	10	
20-Aug-18	B1	6.5	6	5	4	4	1	0	5	
20-Aug-18	B1	6.5	6	5	5	41	10	0	51	
20-Aug-18	B1	6.6	6	6	1	1	0	0	1	5.2
20-Aug-18	B1	6.6	6	6	2	13	1	0	14	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
20-Aug-18	B1	6.6	6	6	3	4	3	0	7	
20-Aug-18	B1	6.6	6	6	4	4	0	0	4	
20-Aug-18	B1	6.6	6	6	5	0	0	0	0	
20-Aug-18	B1	7.1	7	1	1	24	8	0	32	24.8
20-Aug-18	B1	7.1	7	1	2	14	2	0	16	
20-Aug-18	B1	7.1	7	1	3	36	3	0	39	
20-Aug-18	B1	7.1	7	1	4	32	4	0	36	
20-Aug-18	B1	7.1	7	1	5	0	1	0	1	
20-Aug-18	B1	7.2	7	2	1	38	18	0	56	50.2
20-Aug-18	B1	7.2	7	2	2	47	28	0	75	
20-Aug-18	B1	7.2	7	2	3	21	10	0	31	
20-Aug-18	B1	7.2	7	2	4	46	36	0	82	
20-Aug-18	B1	7.2	7	2	5	4	3	0	7	
20-Aug-18	B1	7.3	7	3	1	9	3	0	12	4
20-Aug-18	B1	7.3	7	3	2	4	0	0	4	
20-Aug-18	B1	7.3	7	3	3	2	0	0	2	
20-Aug-18	B1	7.3	7	3	4	2	0	0	2	
20-Aug-18	B1	7.3	7	3	5	0	0	0	0	
20-Aug-18	B1	7.4	7	4	1	21	2	0	23	78
20-Aug-18	B1	7.4	7	4	2	85	9	0	94	
20-Aug-18	B1	7.4	7	4	3	80	4	0	84	
20-Aug-18	B1	7.4	7	4	4	48	10	0	58	
20-Aug-18	B1	7.4	7	4	5	121	10	0	131	
20-Aug-18	B1	7.5	7	5	1	10	1	0	11	14.2
20-Aug-18	B1	7.5	7	5	2	9	4	0	13	
20-Aug-18	B1	7.5	7	5	3	3	2	0	5	
20-Aug-18	B1	7.5	7	5	4	23	15	0	38	
20-Aug-18	B1	7.5	7	5	5	2	1	1	4	
20-Aug-18	B1	7.6	7	6	1	20	8	0	28	18.8
20-Aug-18	B1	7.6	7	6	2	2	3	0	5	
20-Aug-18	B1	7.6	7	6	3	8	1	0	9	
20-Aug-18	B1	7.6	7	6	4	12	1	1	14	
20-Aug-18	B1	7.6	7	6	5	25	12	1	38	
20-Aug-18	B1	8.1	8	1	1	6	3	0	9	13.8
20-Aug-18	B1	8.1	8	1	2	7	1	0	8	
20-Aug-18	B1	8.1	8	1	3	4	4	0	8	
20-Aug-18	B1	8.1	8	1	4	3	4	0	7	
20-Aug-18	B1	8.1	8	1	5	26	11	0	37	
20-Aug-18	B1	8.2	8	2	1	77	24	1	102	54.2
20-Aug-18	B1	8.2	8	2	2	33	10	2	45	
20-Aug-18	B1	8.2	8	2	3	38	5	3	46	
20-Aug-18	B1	8.2	8	2	4	12	12	2	26	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
20-Aug-18	B1	8.2	8	2	5	31	20	1	52	
20-Aug-18	B1	8.3	8	3	1	14	3	0	17	20.2
20-Aug-18	B1	8.3	8	3	2	14	1	0	15	
20-Aug-18	B1	8.3	8	3	3	11	4	0	15	
20-Aug-18	B1	8.3	8	3	4	17	6	0	23	
20-Aug-18	B1	8.3	8	3	5	25	6	0	31	
20-Aug-18	B1	8.4	8	4	1	12	5	0	17	19.8
20-Aug-18	B1	8.4	8	4	2	5	4	0	9	
20-Aug-18	B1	8.4	8	4	3	9	9	0	18	
20-Aug-18	B1	8.4	8	4	4	28	15	0	43	
20-Aug-18	B1	8.4	8	4	5	8	4	0	12	
20-Aug-18	B1	8.5	8	5	1	18	8	0	26	13.2
20-Aug-18	B1	8.5	8	5	2	16	7	0	23	
20-Aug-18	B1	8.5	8	5	3	4	2	0	6	
20-Aug-18	B1	8.5	8	5	4	2	4	0	6	
20-Aug-18	B1	8.5	8	5	5	3	2	0	5	
20-Aug-18	B1	8.6	8	6	1	28	12	0	40	32.8
20-Aug-18	B1	8.6	8	6	2	28	11	0	39	
20-Aug-18	B1	8.6	8	6	3	49	8	1	58	
20-Aug-18	B1	8.6	8	6	4	11	8	0	19	
20-Aug-18	B1	8.6	8	6	5	5	3	0	8	
24-Aug-18	C1	1.1	1	1	1	18	18	0	36	29.8
24-Aug-18	C1	1.1	1	1	2	3	3	1	7	
24-Aug-18	C1	1.1	1	1	3	45	11	1	57	
24-Aug-18	C1	1.1	1	1	4	8	6	0	14	
24-Aug-18	C1	1.1	1	1	5	16	18	1	35	
24-Aug-18	C1	1.2	1	2	1	45	22	0	67	111
24-Aug-18	C1	1.2	1	2	2	82	30	2	114	
24-Aug-18	C1	1.2	1	2	3	66	22	0	88	
24-Aug-18	C1	1.2	1	2	4	140	27	0	167	
24-Aug-18	C1	1.2	1	2	5	74	44	1	119	
24-Aug-18	C1	1.3	1	3	1	5	3	0	8	22.8
24-Aug-18	C1	1.3	1	3	2	19	6	0	25	
24-Aug-18	C1	1.3	1	3	3	18	13	0	31	
24-Aug-18	C1	1.3	1	3	4	6	5	0	11	
24-Aug-18	C1	1.3	1	3	5	28	11	0	39	
24-Aug-18	C1	1.4	1	4	1	70	21	1	92	103.6
24-Aug-18	C1	1.4	1	4	2	83	28	1	112	
24-Aug-18	C1	1.4	1	4	3	62	22	0	84	
24-Aug-18	C1	1.4	1	4	4	74	28	0	102	
24-Aug-18	C1	1.4	1	4	5	101	26	1	128	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
24-Aug-18	C1	1.5	1	5	1	2	2	0	4	5
24-Aug-18	C1	1.5	1	5	2	8	3	0	11	
24-Aug-18	C1	1.5	1	5	3	2	2	0	4	
24-Aug-18	C1	1.5	1	5	4	0	1	0	1	
24-Aug-18	C1	1.5	1	5	5	0	5	0	5	
24-Aug-18	C1	1.6	1	6	1	3	0	0	3	3.6
24-Aug-18	C1	1.6	1	6	2	0	0	0	0	
24-Aug-18	C1	1.6	1	6	3	3	0	0	3	
24-Aug-18	C1	1.6	1	6	4	0	0	0	0	
24-Aug-18	C1	1.6	1	6	5	9	3	0	12	
24-Aug-18	C1	2.1	2	1	1	24	11	0	35	122.8
24-Aug-18	C1	2.1	2	1	2	5	3	0	8	
24-Aug-18	C1	2.1	2	1	3	86	80	0	166	
24-Aug-18	C1	2.1	2	1	4	89	33	2	124	
24-Aug-18	C1	2.1	2	1	5	224	50	7	281	
24-Aug-18	C1	2.2	2	2	1	16	3	0	19	25
24-Aug-18	C1	2.2	2	2	2	19	5	0	24	
24-Aug-18	C1	2.2	2	2	3	30	11	0	41	
24-Aug-18	C1	2.2	2	2	4	15	4	0	19	
24-Aug-18	C1	2.2	2	2	5	14	8	0	22	
24-Aug-18	C1	2.3	2	3	1	11	1	0	12	9
24-Aug-18	C1	2.3	2	3	2	1	0	0	1	
24-Aug-18	C1	2.3	2	3	3	3	16	0	19	
24-Aug-18	C1	2.3	2	3	4	3	4	0	7	
24-Aug-18	C1	2.3	2	3	5	4	2	0	6	
24-Aug-18	C1	2.4	2	4	1	31	13	0	44	18
24-Aug-18	C1	2.4	2	4	2	1	0	0	1	
24-Aug-18	C1	2.4	2	4	3	18	4	0	22	
24-Aug-18	C1	2.4	2	4	4	11	1	0	12	
24-Aug-18	C1	2.4	2	4	5	8	3	0	11	
24-Aug-18	C1	2.5	2	5	1	9	4	0	13	14.2
24-Aug-18	C1	2.5	2	5	2	18	12	0	30	
24-Aug-18	C1	2.5	2	5	3	9	9	1	19	
24-Aug-18	C1	2.5	2	5	4	5	4	0	9	
24-Aug-18	C1	2.5	2	5	5	0	0	0	0	
24-Aug-18	C1	2.6	2	6	1	32	9	0	41	44.6
24-Aug-18	C1	2.6	2	6	2	28	5	0	33	
24-Aug-18	C1	2.6	2	6	3	54	27	0	81	
24-Aug-18	C1	2.6	2	6	4	11	6	1	18	
24-Aug-18	C1	2.6	2	6	5	13	36	1	50	
24-Aug-18	C1	3.1	3	1	1	0	0	0	0	0.8

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
24-Aug-18	C1	3.1	3	1	2	0	0	0	0	
24-Aug-18	C1	3.1	3	1	3	3	1	0	4	
24-Aug-18	C1	3.1	3	1	4	0	0	0	0	
24-Aug-18	C1	3.1	3	1	5	0	0	0	0	
24-Aug-18	C1	3.2	3	2	1	0	0	0	0	1
24-Aug-18	C1	3.2	3	2	2	0	0	0	0	
24-Aug-18	C1	3.2	3	2	3	0	0	0	0	
24-Aug-18	C1	3.2	3	2	4	0	0	0	0	
24-Aug-18	C1	3.2	3	2	5	0	5	0	5	
24-Aug-18	C1	3.3	3	3	1	0	0	0	0	0
24-Aug-18	C1	3.3	3	3	2	0	0	0	0	
24-Aug-18	C1	3.3	3	3	3	0	0	0	0	
24-Aug-18	C1	3.3	3	3	4	0	0	0	0	
24-Aug-18	C1	3.3	3	3	5	0	0	0	0	
24-Aug-18	C1	3.4	3	4	1	0	0	0	0	0
24-Aug-18	C1	3.4	3	4	2	0	0	0	0	
24-Aug-18	C1	3.4	3	4	3	0	0	0	0	
24-Aug-18	C1	3.4	3	4	4	0	0	0	0	
24-Aug-18	C1	3.4	3	4	5	0	0	0	0	
24-Aug-18	C1	3.5	3	5	1	0	0	0	0	0
24-Aug-18	C1	3.5	3	5	2	0	0	0	0	
24-Aug-18	C1	3.5	3	5	3	0	0	0	0	
24-Aug-18	C1	3.5	3	5	4	0	0	0	0	
24-Aug-18	C1	3.5	3	5	5	0	0	0	0	
24-Aug-18	C1	3.6	3	6	1	0	0	0	0	0
24-Aug-18	C1	3.6	3	6	2	0	0	0	0	
24-Aug-18	C1	3.6	3	6	3	0	0	0	0	
24-Aug-18	C1	3.6	3	6	4	0	0	0	0	
24-Aug-18	C1	3.6	3	6	5	0	0	0	0	
24-Aug-18	C1	4.1	4	1	1	0	0	0	0	0
24-Aug-18	C1	4.1	4	1	2	0	0	0	0	
24-Aug-18	C1	4.1	4	1	3	0	0	0	0	
24-Aug-18	C1	4.1	4	1	4	0	0	0	0	
24-Aug-18	C1	4.1	4	1	5	0	0	0	0	
24-Aug-18	C1	4.2	4	2	1	0	0	0	0	0
24-Aug-18	C1	4.2	4	2	2	0	0	0	0	
24-Aug-18	C1	4.2	4	2	3	0	0	0	0	
24-Aug-18	C1	4.2	4	2	4	0	0	0	0	
24-Aug-18	C1	4.2	4	2	5	0	0	0	0	
24-Aug-18	C1	4.3	4	3	1	0	0	0	0	6.8
24-Aug-18	C1	4.3	4	3	2	23	4	0	27	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
24-Aug-18	C1	4.3	4	3	3	4	1	0	5	
24-Aug-18	C1	4.3	4	3	4	0	2	0	2	
24-Aug-18	C1	4.3	4	3	5	0	0	0	0	
24-Aug-18	C1	4.4	4	4	1	6	1	0	7	7.4
24-Aug-18	C1	4.4	4	4	2	3	0	0	3	
24-Aug-18	C1	4.4	4	4	3	14	2	0	16	
24-Aug-18	C1	4.4	4	4	4	6	5	0	11	
24-Aug-18	C1	4.4	4	4	5	0	0	0	0	
24-Aug-18	C1	4.5	4	5	1	0	2	0	2	3.2
24-Aug-18	C1	4.5	4	5	2	0	0	0	0	
24-Aug-18	C1	4.5	4	5	3	8	1	0	9	
24-Aug-18	C1	4.5	4	5	4	1	1	0	2	
24-Aug-18	C1	4.5	4	5	5	3	0	0	3	
24-Aug-18	C1	4.6	4	6	1	43	20	0	63	20.4
24-Aug-18	C1	4.6	4	6	2	10	2	0	12	
24-Aug-18	C1	4.6	4	6	3	0	0	0	0	
24-Aug-18	C1	4.6	4	6	4	5	8	0	13	
24-Aug-18	C1	4.6	4	6	5	11	2	1	14	
24-Aug-18	C1	5.1	5	1	1	0	0	0	0	0
24-Aug-18	C1	5.1	5	1	2	0	0	0	0	
24-Aug-18	C1	5.1	5	1	3	0	0	0	0	
24-Aug-18	C1	5.1	5	1	4	0	0	0	0	
24-Aug-18	C1	5.1	5	1	5	0	0	0	0	
24-Aug-18	C1	5.2	5	2	1	0	0	0	0	0.2
24-Aug-18	C1	5.2	5	2	2	0	0	0	0	
24-Aug-18	C1	5.2	5	2	3	1	0	0	1	
24-Aug-18	C1	5.2	5	2	4	0	0	0	0	
24-Aug-18	C1	5.2	5	2	5	0	0	0	0	
24-Aug-18	C1	5.3	5	3	1	0	0	0	0	0
24-Aug-18	C1	5.3	5	3	2	0	0	0	0	
24-Aug-18	C1	5.3	5	3	3	0	0	0	0	
24-Aug-18	C1	5.3	5	3	4	0	0	0	0	
24-Aug-18	C1	5.3	5	3	5	0	0	0	0	
24-Aug-18	C1	5.4	5	4	1	0	0	0	0	0
24-Aug-18	C1	5.4	5	4	2	0	0	0	0	
24-Aug-18	C1	5.4	5	4	3	0	0	0	0	
24-Aug-18	C1	5.4	5	4	4	0	0	0	0	
24-Aug-18	C1	5.4	5	4	5	0	0	0	0	
24-Aug-18	C1	5.5	5	5	1	0	0	0	0	0
24-Aug-18	C1	5.5	5	5	2	0	0	0	0	
24-Aug-18	C1	5.5	5	5	3	0	0	0	0	
24-Aug-18	C1	5.5	5	5	4	0	0	0	0	

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
24-Aug-18	C1	5.5	5	5	5	0	0	0	0	
24-Aug-18	C1	5.6	5	6	1	0	0	0	0	0
24-Aug-18	C1	5.6	5	6	2	0	0	0	0	
24-Aug-18	C1	5.6	5	6	3	0	0	0	0	
24-Aug-18	C1	5.6	5	6	4	0	0	0	0	
24-Aug-18	C1	5.6	5	6	5	0	0	0	0	
24-Aug-18	C1	6.1	6	1	1	0	0	0	0	3.2
24-Aug-18	C1	6.1	6	1	2	0	0	0	0	
24-Aug-18	C1	6.1	6	1	3	3	1	0	4	
24-Aug-18	C1	6.1	6	1	4	0	0	0	0	
24-Aug-18	C1	6.1	6	1	5	11	1	0	12	
24-Aug-18	C1	6.2	6	2	1	99	33	0	132	65.2
24-Aug-18	C1	6.2	6	2	2	42	15	0	57	
24-Aug-18	C1	6.2	6	2	3	28	7	1	36	
24-Aug-18	C1	6.2	6	2	4	52	14	0	66	
24-Aug-18	C1	6.2	6	2	5	20	15	0	35	
24-Aug-18	C1	6.3	6	3	1	59	13	0	72	98.4
24-Aug-18	C1	6.3	6	3	2	57	17	1	75	
24-Aug-18	C1	6.3	6	3	3	108	39	1	148	
24-Aug-18	C1	6.3	6	3	4	37	18	0	55	
24-Aug-18	C1	6.3	6	3	5	109	33	0	142	
24-Aug-18	C1	6.4	6	4	1	93	22	0	115	70
24-Aug-18	C1	6.4	6	4	2	43	15	0	58	
24-Aug-18	C1	6.4	6	4	3	30	19	0	49	
24-Aug-18	C1	6.4	6	4	4	37	18	0	55	
24-Aug-18	C1	6.4	6	4	5	54	18	1	73	
24-Aug-18	C1	6.5	6	5	1	1	3	0	4	26.2
24-Aug-18	C1	6.5	6	5	2	19	7	0	26	
24-Aug-18	C1	6.5	6	5	3	1	7	0	8	
24-Aug-18	C1	6.5	6	5	4	12	1	0	13	
24-Aug-18	C1	6.5	6	5	5	60	20	0	80	
24-Aug-18	C1	6.6	6	6	1	1	0	0	1	16.6
24-Aug-18	C1	6.6	6	6	2	22	3	0	25	
24-Aug-18	C1	6.6	6	6	3	46	4	0	50	
24-Aug-18	C1	6.6	6	6	4	5	0	0	5	
24-Aug-18	C1	6.6	6	6	5	2	0	0	2	
24-Aug-18	C1	7.1	7	1	1	0	1	0	1	6.8
24-Aug-18	C1	7.1	7	1	2	0	1	0	1	
24-Aug-18	C1	7.1	7	1	3	15	3	1	19	
24-Aug-18	C1	7.1	7	1	4	5	3	0	8	
24-Aug-18	C1	7.1	7	1	5	4	1	0	5	

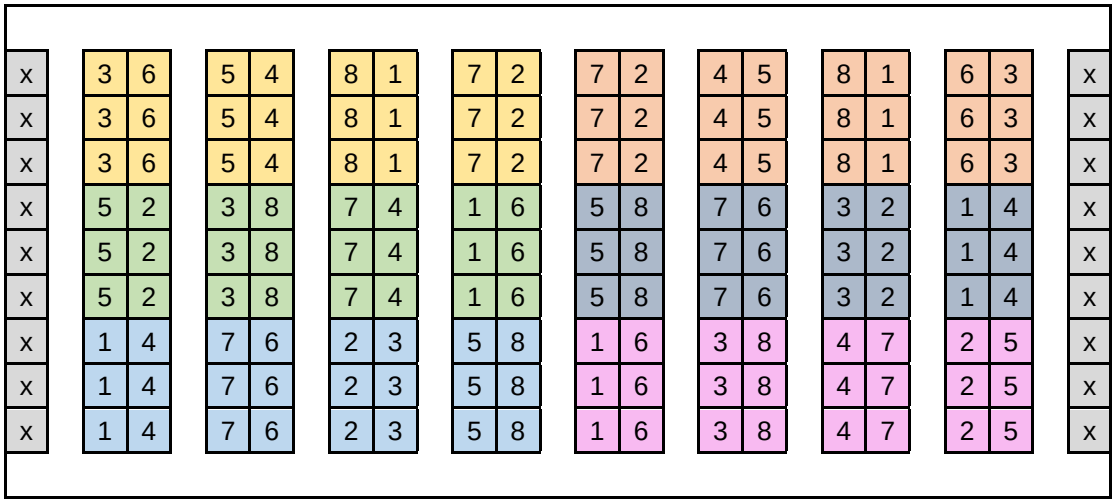
Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
24-Aug-18	C1	7.2	7	2	1	28	4	0	32	135.6
24-Aug-18	C1	7.2	7	2	2	124	40	1	165	
24-Aug-18	C1	7.2	7	2	3	122	36	2	160	
24-Aug-18	C1	7.2	7	2	4	85	29	1	115	
24-Aug-18	C1	7.2	7	2	5	157	47	2	206	
24-Aug-18	C1	7.3	7	3	1	31	11	0	42	10.8
24-Aug-18	C1	7.3	7	3	2	1	1	0	2	
24-Aug-18	C1	7.3	7	3	3	1	1	0	2	
24-Aug-18	C1	7.3	7	3	4	0	1	0	1	
24-Aug-18	C1	7.3	7	3	5	5	2	0	7	
24-Aug-18	C1	7.4	7	4	1	7	2	0	9	46.8
24-Aug-18	C1	7.4	7	4	2	26	7	0	33	
24-Aug-18	C1	7.4	7	4	3	48	5	0	53	
24-Aug-18	C1	7.4	7	4	4	51	9	0	60	
24-Aug-18	C1	7.4	7	4	5	63	16	0	79	
24-Aug-18	C1	7.5	7	5	1	0	0	0	0	15
24-Aug-18	C1	7.5	7	5	2	7	0	0	7	
24-Aug-18	C1	7.5	7	5	3	12	0	0	12	
24-Aug-18	C1	7.5	7	5	4	40	3	0	43	
24-Aug-18	C1	7.5	7	5	5	10	2	1	13	
24-Aug-18	C1	7.6	7	6	1	13	3	0	16	9.6
24-Aug-18	C1	7.6	7	6	2	0	0	0	0	
24-Aug-18	C1	7.6	7	6	3	2	1	0	3	
24-Aug-18	C1	7.6	7	6	4	15	3	0	18	
24-Aug-18	C1	7.6	7	6	5	10	1	0	11	
24-Aug-18	C1	8.1	8	1	1	8	5	1	14	20.2
24-Aug-18	C1	8.1	8	1	2	9	7	0	16	
24-Aug-18	C1	8.1	8	1	3	13	10	0	23	
24-Aug-18	C1	8.1	8	1	4	11	5	0	16	
24-Aug-18	C1	8.1	8	1	5	18	14	0	32	
24-Aug-18	C1	8.2	8	2	1	65	74	3	142	86.4
24-Aug-18	C1	8.2	8	2	2	36	20	0	56	
24-Aug-18	C1	8.2	8	2	3	56	38	0	94	
24-Aug-18	C1	8.2	8	2	4	30	27	0	57	
24-Aug-18	C1	8.2	8	2	5	54	29	0	83	
24-Aug-18	C1	8.3	8	3	1	18	13	0	31	34
24-Aug-18	C1	8.3	8	3	2	8	10	0	18	
24-Aug-18	C1	8.3	8	3	3	20	14	0	34	
24-Aug-18	C1	8.3	8	3	4	21	13	0	34	
24-Aug-18	C1	8.3	8	3	5	29	24	0	53	
24-Aug-18	C1	8.4	8	4	1	5	6	0	11	17.2

Date	Assess. code	Plot	Treatment	Replicate	Plant n.	N. nymphs	N. adults	N. alates	Total n. aphids	Plot mean
24-Aug-18	C1	8.4	8	4	2	4	1	0	5	
24-Aug-18	C1	8.4	8	4	3	12	10	0	22	
24-Aug-18	C1	8.4	8	4	4	24	11	0	35	
24-Aug-18	C1	8.4	8	4	5	4	9	0	13	
24-Aug-18	C1	8.5	8	5	1	0	0	0	0	12.8
24-Aug-18	C1	8.5	8	5	2	0	1	0	1	
24-Aug-18	C1	8.5	8	5	3	6	5	0	11	
24-Aug-18	C1	8.5	8	5	4	2	14	0	16	
24-Aug-18	C1	8.5	8	5	5	26	10	0	36	
24-Aug-18	C1	8.6	8	6	1	27	9	0	36	32.2
24-Aug-18	C1	8.6	8	6	2	20	9	2	31	
24-Aug-18	C1	8.6	8	6	3	50	26	0	76	
24-Aug-18	C1	8.6	8	6	4	4	6	0	10	
24-Aug-18	C1	8.6	8	6	5	6	2	0	8	

f. Trial design

Trial layout

Each square represents a single rockwool slab containing 3 pepper plants. Numbers indicate plot treatments. Replicate blocks are shaded different colours. Grey shaded squares containing an ‘x’ indicate buffer plant rows. Rows were separated either by concrete walkways or fleece divides. The central five plants in each plot were assessed, leaving four treated buffer plants between each plot to mitigate any impact of spray drift across treatments.



g. STC Tomato Main Feed (EC 3.3, pH5.5) Recipe

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111 Copandale Road
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East Yorkshire
HU17 7BN

Feed Recipe

STC Tomato – Main Feed 3.3 EC

Date: 16 February 2017

Tank A		750	litres
			kg
Potassium Nitrate			25
Calcium Nitrate			75
Pure Calcium Nitrate			0
Calcium Chloride			0
Potassium Chloride			20
Ammonium Nitrate		upto<	2
Iron [FeDP]	%	7	2.8
			litres
Nitric Acid			1
Iron [liquid]	%	7	0
Dilution Rate			150
Tank Size			750

Tank B		750	litres
			kg
Potassium Nitrate			0
Magnesium Sulphate			70
Mono Potassium Phosphate			24
Magnesium Nitrate			0
Potassium Chloride			50
Phosphoric Acid		litres	0
Nitric Acid		litres	0
			gram
Manganese Sulphate	%	32	400
Borax			320
Solubor			0
Copper Sulphate	%	25	100
Zinc Sulphate	%	24	400
Sodium Molybdate			15

	molar	Feed	Water	← ppm
Conductivity (25C)	↓	3329	607	← **Mains water** 0 100
Nitrate N	10.9	153	5.4	NRM 25/05/16
Ammonium N	0.8	12	0	
Phosphorus	1.6	50	0.9	
Potassium	11.8	460	3.8	
Magnesium	3.1	76	14.1	
Calcium	5.0	201	74.8	
Sulphur	3.4	107	26.6	
Sodium	1.3	29	19.5	
Chloride	23.8	333	34.5	
Iron	31.2	1.74	0.1	
Manganese	20.9	1.15	0.01	
Boron	30.8	0.33	0.02	
Copper	3.5	0.22	0	
Zinc	14.0	0.91	0.06	
Molybdenum	0.6	0.05		
Bicarbonate		104	196	

Ratios	
K:N	2.79
K:Ca	2.28
K:Mg	6.03

Potassium Chloride	312	ppm K
Calcium Chloride	0	ppm Ca

16 February 2017

Supplied strictly E & O E

1/02/17

STC - Tomato Feed
Main feed

FACTS CERTIFICATION

BASIS

VEGETABLE CONSULTANTS ASSOCIATION

Certificate of

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

This certifies that

Stockbridge Technology Centre

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
Biologicals and Semiochemicals
Stored Crops

Date of issue: **19 July 2016**
Effective date: **1 April 2016**
Expiry date: **31 March 2021**

Signature *Authorised signatory*

Certification Number
ORETO 372

HSE
Chemicals Regulation Division

Department of Agriculture and Rural Development