



# PGRO Final Report APHIDS ON SPRING BEANS SLOT TRIALS 2022

Determining the efficacy of a confidential insecticide on the control of aphids in spring beans.

Project title	Determining the efficacy of an insecticide on the control of aphids in spring beans.
Sponsor project reference	
Country / Region / EPPO zone	United Kingdom EPPO Maritime zone
Target crop	Spring beans ( <i>Vicia faba</i> )
Target pest	Pea aphid ( <i>Acyrtosiphon pisum</i> ), black bean aphid ( <i>Aphis fabae</i> )
Experimental permit reference	
GEP	Yes
Report author	Dina Gomez
Date issued	October 2022
Trial year	2022
Trials by	PGRO Research Ltd Great North Road Thornhaugh Cambridgeshire PE8 6HJ United Kingdom
Sponsor	Several

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## Declarations

We the undersigned hereby declare that the report submitted constitutes the Final Report of the study above and that all data reported here represent a true and accurate record of the results obtained. Every reasonable effort was made to ensure that disease, insect, weed pressures and crop husbandry were as relevant to the trial aims as possible.



Dina Gomez,  
Technical Officer

## Objectives

To determine,

- the effect of one insecticide on the control of aphids in spring beans.
- how the efficacy of the confidential product compared against the standard treatments Decis Protech, Stealth, Teppeki and Aphox.

## Summary

- None of the treatments showed significant reduction of number of aphids per plant after T1 and T2 treatment applications in this trial.
- The weather in 2022 led to low numbers of aphids throughout most of the season in spring beans.

## Test items and treatments

**Table 1.** Test items

Name	Active(s)	Conc.	Formulation	Batch/lot	MAPP
Decis Protech	deltamethrin	15 g/l	WE	na	16160
Stealth	lambda-cyhalothrin	100 g/l	SC	na	14551
Aphox	pirimicarb	500 g/kg	WG	na	18562
Teppeki	flonicamid	500 g/kg	WG	8309-01	12402

**Table 2.** Treatment list

Trt	Description	Rate(s)	Ai(s)	Timing
1	Control, Untreated	n/a	n/a	n/a
2	T1Decis Protech T2Aphox	0.5 l fb 280 g	15 g fb 140 g	T1 + T2
3	T1Stealth T2Aphox	0.075 l fb 280 g	7.5 g fb 140 g	T1 + T2
4	T1Teppeki T2Aphox	140 g fb 280 g	70 g fb 140 g	T1 + T2

**Table 3.** Description of application timings

Timing	Growth stage or description of timing	BBCH
T1	4 to 5 pair of leaves unfolded	14-15
T2	Full flowering	65

## Methods

**Trial design** - Plots measured 18 m<sup>2</sup> (1.8x10 m) and were arranged in a randomised complete block layout with four replications according to EPPO guideline PP1/152(4).

**Sprayer details** - Treatments were applied using a hand operated compressed air boom sprayer with a width of two meters. Lurmark 02F110 nozzles were used, operating at a pressure of 2 bar for a fine/medium droplet quality. Spray volumes were 200 l/ha.

**Assessments** - Aphids were assessed as number of aphids per plant on a sample of 20 plants per plot (based on EPPO guidelines PP1/229(1)). Assessments were carried out prior to T1 and T2, as well as 2, 6 and 13 days after T1 application, and 7 and 25 days after T2 application. Phytotoxicity was scored 2 days after T1 application and 7 days after T2 application. For the phytotoxicity evaluation, a scale from 0 to 10 was used, where 10 = No phytotoxicity and 0 denoted dead crop according to EPPO guideline PP1/135(4).

**Harvest** – the trial was harvested using a Wintersteiger plot combine harvester on 25<sup>th</sup> July 2022.

**Analysis** – data were analysed using Analysis of Variance in R Studio.

**Met data** – meteorological data were recorded at Stubton throughout the growing season (Appendix).

**Table 4.** Trials diary

Activity	Timing	BBCH	Date
Applications	T1	14-15	18-May
	T2	65	13-Jun
Assessments	A1	14-15	18-May
	A2 (+ phyto)	15-16	20-May
	A3	51-53	24-May
	A4	54-57	31-May
	A5	65	13-Jun
	A6 (+phyto)	69	20-Jun
	A7	71-72	08-Jul

## Trial site

**Table 5.** Site details for Stubton trial 2022

Test site information	
Town	Stubton
Postcode	NG23 5JH
N	52°59'20.16"
W	0°49'52.53"
Site description	Low weed pressure, mid-field.
Soil analysis	pH: 7.6; P: index 1, K: index 1, Mg: index 2; OM: 4.7%(LOI); Sand: 60%, Silt: 18%. Clay: 22%
Crop	Spring beans ( <i>Vicia faba</i> )
Variety	Lynx
Drill date	17 March 2022
Inputs	Nirvana (4.4 l/ha) pre-emergence (30-Mar)



**a**



**b**

**Figure 1.** a. Evaluation plot. b. *Aphis fabae* on beans.

## Results

None of the products tested in this trial show any signs of precipitation and mixed well in water, when preparing the solution for the spraying.

Aphid numbers recorded in spring beans at Stubton in 2022 were very low.

The number of aphids per plant recorded in untreated plots, prior to T1 application was zero (Table 6).

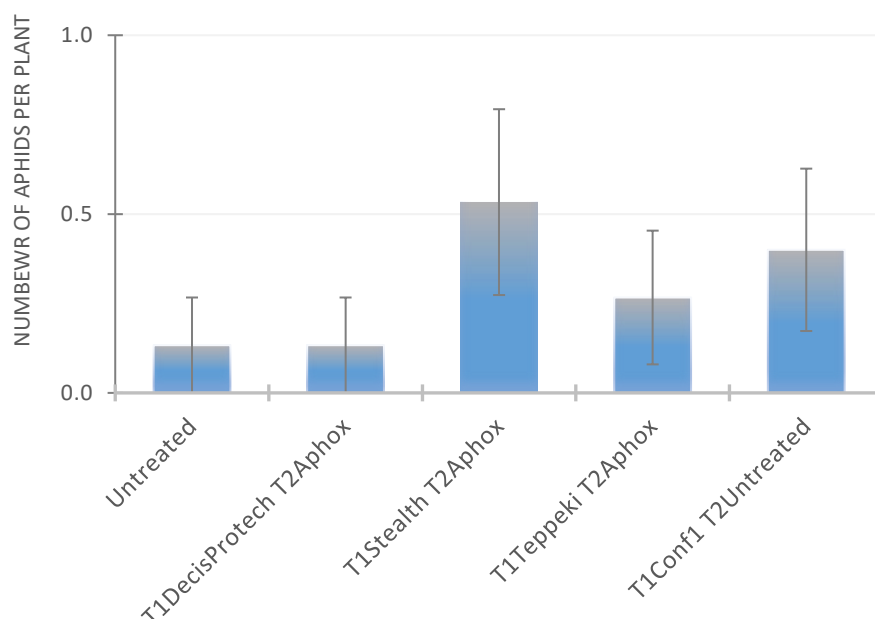
There was no significant effect of any of the treatments after T1 and T2 applications. The number of aphids was very low in A1 to A4.

Results from the final assessment on 8<sup>th</sup> July were discarded due to low numbers and missing data.

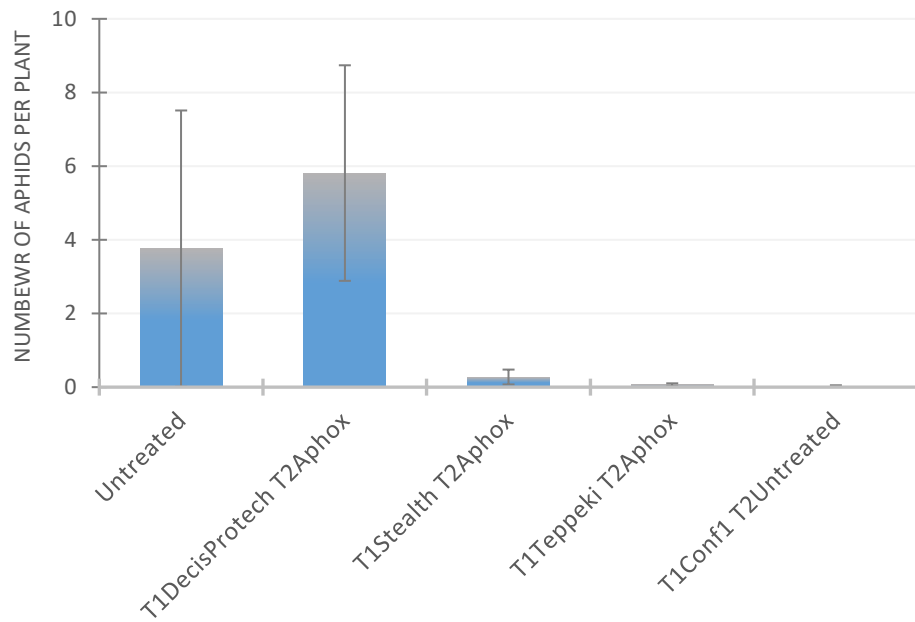
**Table 6.** Mean number of aphids per plant at all assessment timings.

Treatment	<i>Aphis fabae</i>					
	18-May A1	20-May A2	24-May A3	31-May A4	13-Jun A5	20-Jun A6
1. Control, Untreated	0	0.13	0.0	0.01	3.76	6.05
2. T1Decis ProTech T2Aphox		0.13	0.0	0.00	5.81	5.05
3. T1Stealth T2Aphox		0.53	0.0	0.00	0.28	2.20
4. T1Teppeki T2Aphox		0.27	0.0	0.05	0.06	0.94
5. T1Conf1 T2Untreated		0.40	0.0	0.00	0.03	1.44
f-value		0.797	-	0.876	1.552	1.285
p-value		0.528 ns	-	0.478 ns	0.186 ns	0.275 ns

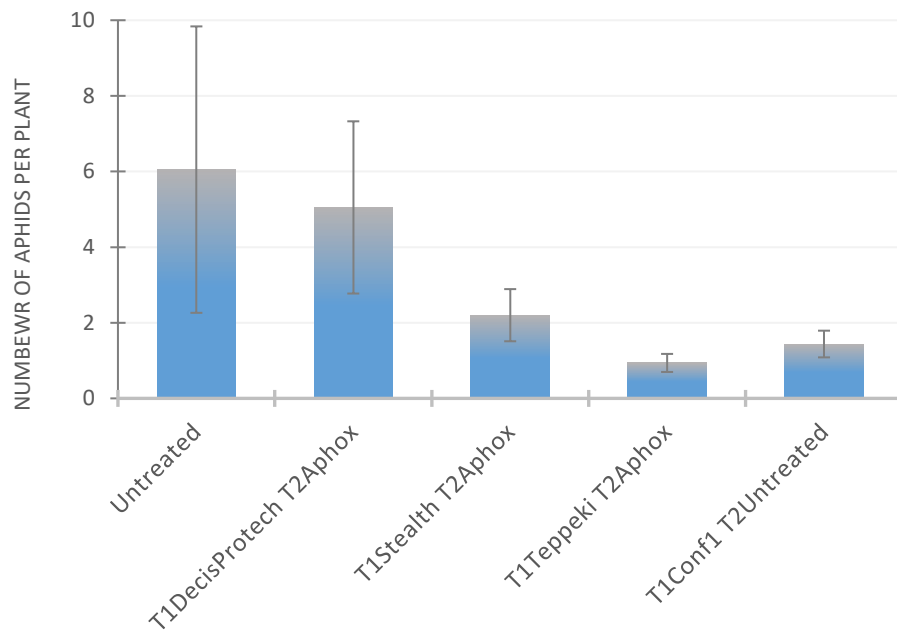
\*ns= not significant



**Figure 2.** Mean number of *A. fabae* per plant at A2 on 20<sup>th</sup> May 2022 at Stubton.



**Figure 3.** Mean number of *A. fabae* per plant at A5 on 13<sup>th</sup> June 2022 at Stubton.



**Figure 4.** Mean number of *A. fabae* per plant at A6 on 20<sup>th</sup> June 2022 at Stubton.



## Phytotoxicity

No phytotoxic symptoms were observed in any of the treatments in this trial (Table 7).

**Table 7.** Mean phytotoxicity after T1 and T2 applications. 10 = no phytotoxicity 0 = dead plant

Treatment	20-May	16-Jun
1. Control, Untreated	10.0	10.0
2. T1Decis Protech T2Aphox	10.0	10.0
3. T1Stealth T2Aphox	10.0	10.0
4. T1Teppeki T2Aphox	10.0	10.0
5. T1Conf1 T2Untreated	10.0	10.0

## Yield:

There were no significant differences in yield (t/ha) at 15% moisture content between any of the treatments (Table 8).

**Table 8.** Mean yield (t/ha) at 15% moisture content.

Treatment	Mean yield (t/ha)
1. Control, Untreated	3.62
2. T1Decis Protech T2Aphox	3.67
3. T1Stealth T2Aphox	3.56
4. T1Teppeki T2Aphox	3.63
5. T1Conf1 T2Untreated	3.51
f-value	0.565
p-value	0.692 ns

## Discussion

This trial was performed in spring beans, variety Lynx (PGRO descriptive list 2022), to evaluate the efficacy of a confidential product on the control of aphids.

The weather in 2022 led to low numbers of aphids throughout most of the season in spring beans; 2022 had dry May and July months compared to 2021 and higher temperatures (average °C) from April onwards in 2022 contrasted with the 2021 season (Appendix).

There were no significant differences between treatments in spring beans at any of the assessments at Stubton in 2022.

No phytotoxicity or any unusual events were recorded in this trial. All products appeared to be crop safe.

There were no significant differences in yield between any of the treatments, possibly due to the low numbers of aphids observed in this trial and the short life cycle of the crop this season. The conditions in July were a combination of high mean maximum temperature 25.9 °C, low mean accumulated precipitation 17.2 mm and low mean relative humidity 77.8%, that prompted very rapid crop senescence (Appendix).

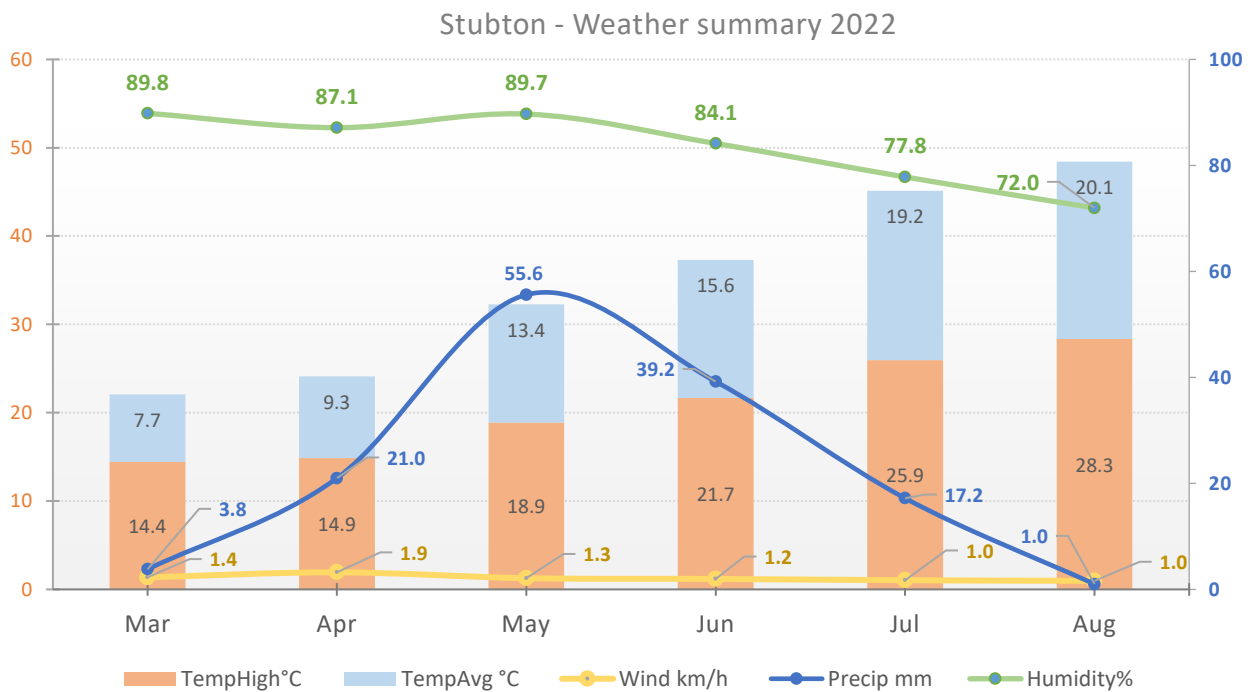
## Appendix

Weather data Stubton 2022					
Date	Temperature		Humidity	Wind Speed	Precipitation Accum.
	High °C	Avg °C	Avg %	Avg km/h	Sum mm
17-Mar	13.14	7.53	96.42	1.8	0
18-Mar	15.49	7.96	96.74	1	0.2
19-Mar	14.59	8.17	91.49	3	0
20-Mar	10.72	5.68	89.16	1.9	0
21-Mar	13.07	5.61	84.65	0.9	0.2
22-Mar	18.38	11.14	88.22	1.6	0
23-Mar	19.34	10.71	82.52	0.6	0
24-Mar	18.18	10.32	73.45	0.7	0
25-Mar	18.42	9.18	76.7	0.4	0
26-Mar	18.2	8.78	85.13	1	0
27-Mar	14.7	8.04	99.71	1.3	0
28-Mar	16.68	8.97	87.59	0.6	0
29-Mar	10.15	6.16	99.8	1.4	0
30-Mar	8.52	4.56	99.78	1.7	1.6
31-Mar	6.9	2.15	96.05	2.6	1.8
01-Apr	7.75	2.78	99.56	1.7	3.6
02-Apr	8.67	2.21	93.96	0.7	1.2
03-Apr	11.35	4.09	82.85	1.2	0.2
04-Apr	13.55	9.98	99.01	2.9	5.8
05-Apr	13.69	11.45	95.52	2.5	0
06-Apr	14.32	10.69	95.75	3.5	1.2
07-Apr	10.79	6.85	99.67	3.4	5.6
08-Apr	11.46	5.26	85.62	1.3	0.2
09-Apr	11.45	4.75	80.73	1.4	0.2
10-Apr	13.09	6.53	75.65	0.8	0
11-Apr	16.06	10.42	70.18	3	0
12-Apr	19.94	12.61	94.91	1.2	1.2
13-Apr	17.6	12.39	98.09	1.5	1.6
14-Apr	17.29	10.48	93.77	0.6	0.2
15-Apr	20.87	14.3	86.15	1.1	0
16-Apr	20.58	13.6	85.56	2	0
17-Apr	19.65	12.88	74.89	1.8	0
18-Apr	16.88	11.92	80.06	1.1	0
19-Apr	16.82	10.42	94.26	1.4	0
20-Apr	16.7	10.55	76.72	2.3	0
21-Apr	17.92	10.29	80.72	2.6	0
22-Apr	16.4	10.87	81.2	4	0
23-Apr	15.83	10.75	93.03	4.3	0
24-Apr	16.1	10.81	81.84	3.8	0
25-Apr	13.79	8.38	91.35	1.8	0
26-Apr	14.98	8.13	87.62	1.4	0

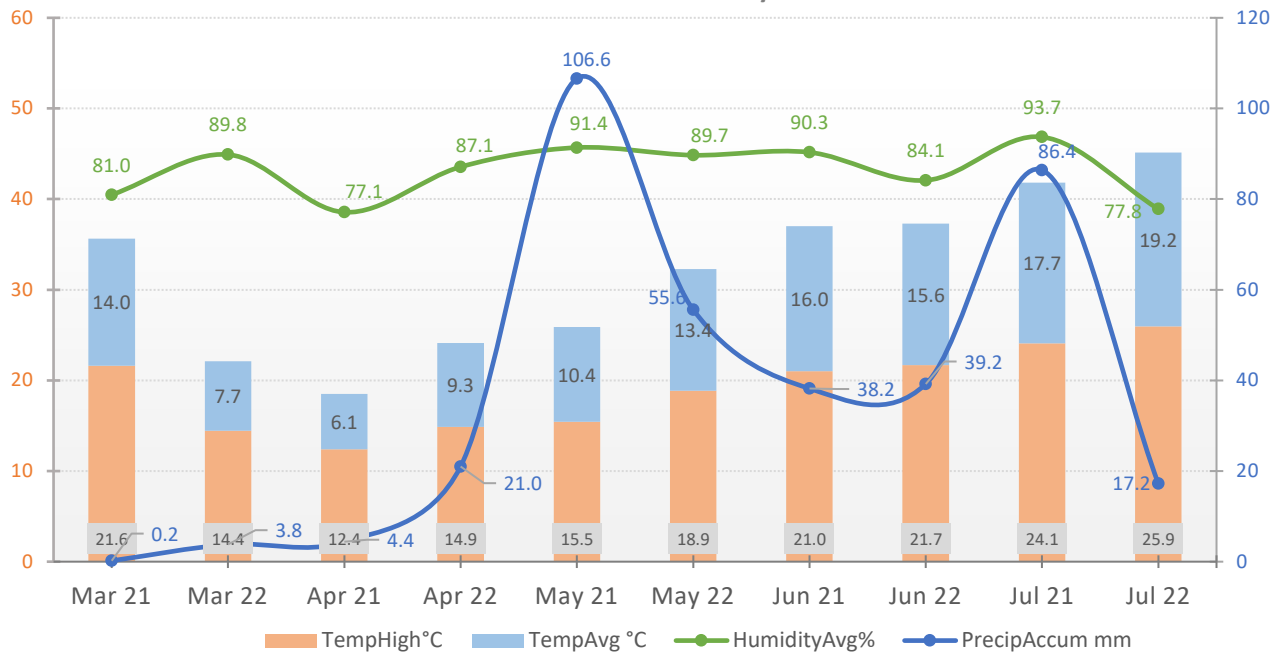
Weather data Stubton 2022					
Date	Temperature		Humidity	Wind Speed	Precipitation Accum.
	High °C	Avg °C	Avg %	Avg km/h	Sum mm
27-Apr	10.6	7.63	81.99	1.4	0
28-Apr	9.96	8.08	99.49	1.6	0
29-Apr	13.11	8.54	79.98	1.1	0
30-Apr	18.38	10.02	73.31	0.6	0
01-May	14.06	11.52	99.87	0.6	0
02-May	16.72	12.41	93.68	0.7	0.4
03-May	13.62	10.57	99.85	0.8	2.6
04-May	17.44	11.77	99.82	1.1	3.6
05-May	20.85	13.17	85.32	0.5	0
06-May	19.16	13.41	93.24	1.1	3.2
07-May	17.74	12.99	99.66	1.5	1
08-May	17.89	11.96	86.21	1.2	0
09-May	20.42	14.58	78.16	2	0
10-May	20.7	16.26	74.25	2.2	0
11-May	16.25	12.31	96.35	1.7	8.6
12-May	17.08	11.89	82.03	1.5	0
13-May	20.17	14.49	80.05	2.1	0
14-May	22.9	15.66	76.83	0.8	0
15-May	21.44	14.96	95.82	2.2	0.6
16-May	23.22	16.23	95.11	1.7	4.6
17-May	24.12	17.79	84.64	1.7	0.6
18-May	21.25	15.86	85.05	1.4	9.8
19-May	20.53	14.91	87.24	0.6	0
20-May	18.11	13.81	94.81	1.2	0.4
21-May	19.19	13.7	88.91	1.1	0
22-May	22.02	15.61	87.39	1.2	0
23-May	18.69	14.49	91.24	0.6	4.6
24-May	18.29	12.78	87.42	1	2
25-May	19.39	13.44	91.9	1.8	0
26-May	19.89	13.92	99.28	1.7	2
27-May	17.99	13.09	74.85	1.6	0.2
28-May	17.65	11.22	83.58	1	0
29-May	16.39	10.19	89.68	1.3	0
30-May	15.8	9.84	98.41	0.9	3.2
31-May	16.14	10.51	99.78	0.6	8.2
01-Jun	18.8	11.3	96.95	0.5	2.4
02-Jun	19.84	13.08	81.5	0.7	0.2
03-Jun	19.78	13.82	93.09	2	0
04-Jun	15.25	12.19	99.88	2.8	0
05-Jun	11.34	10.43	99.73	1.6	19.8
06-Jun	14.35	11.6	99.77	0.6	3.4
07-Jun	21.68	14.23	90.08	0.7	0

Weather data Stubton 2022					
Date	Temperature		Humidity	Wind Speed	Precipitation Accum.
	High °C	Avg °C	Avg %	Avg km/h	Sum mm
08-Jun	21.4	16.18	94.46	1.2	3.4
09-Jun	19.89	14.81	91.62	1.5	0.2
10-Jun	22.35	17.02	80.46	1.9	0
11-Jun	21.92	15.99	82.81	2	0.6
12-Jun	21.2	14.98	75.84	1.3	0
13-Jun	18.66	14.36	85.74	0.7	0
14-Jun	23.94	16.34	80.27	0.5	0
15-Jun	27.51	17.45	80.3	0.3	0
16-Jun	26.98	19.11	74.95	0.4	0
17-Jun	31.03	23.18	69.44	1.4	0
18-Jun	16.93	13.86	99.78	0.4	7
19-Jun	19.91	13.19	90.82	0.7	0.2
20-Jun	21.73	14.76	81.55	0.7	0
21-Jun	25.51	17.98	69.48	0.5	0
22-Jun	27.96	19.67	75.51	0.3	0
23-Jun	24.98	19.08	76.24	0.6	0
24-Jun	23.17	17.26	90.87	1.3	0
25-Jun	22.45	16.86	71.49	2.4	0
26-Jun	22.74	16.36	69.55	2.6	0
27-Jun	21.45	14.68	81.93	1.5	0.6
28-Jun	22.6	15.8	73.84	2.1	0
29-Jun	23.8	17.42	80.39	1.6	1.4
30-Jun	21.15	15.73	85.73	0.7	0
01-Jul	22.03	15.25	85.93	1.1	0
02-Jul	19.8	14.61	99.06	1.8	2.8
03-Jul	22.21	14.96	88.95	0.8	0
04-Jul	21.95	14.89	79.25	1.1	0
05-Jul	22.47	15.61	78.28	0.9	0
06-Jul	23.06	17.26	93.19	1.3	0
07-Jul	26.42	19.05	79.04	0.9	0
08-Jul	28.64	19.87	74.75	0.8	0
09-Jul	26.93	19.55	73.32	0.7	0
10-Jul	30.07	20.43	68.86	0.6	0
11-Jul	31.68	22.39	67.24	0.4	0
12-Jul	27.7	22.71	72.19	0.5	0
13-Jul	26.95	19.98	67.87	0.6	0
14-Jul	22.88	15.77	78.77	0.6	0.2
15-Jul	24.78	16.71	79.16	1	0
16-Jul	27.79	18.46	70.65	0.3	0
17-Jul	31.1	22.48	60.14	1	0
18-Jul	36.67	27.07	41.27	0.7	0
19-Jul	40.78	29.32	42.76	1.2	0

Weather data Stubton 2022					
Date	Temperature		Humidity	Wind Speed	Precipitation Accum.
	High °C	Avg °C	Avg %	Avg km/h	Sum mm
20-Jul	28.21	23.09	74.16	1.3	0
21-Jul	21.24	18.74	84.11	1	0
22-Jul	21.05	16.81	91.45	1.1	0.6
23-Jul	25.8	20.22	78.92	1.7	0
24-Jul	28.11	21.94	84.77	3.1	0.4
25-Jul	23.65	18.66	89.04	1.8	0.4
26-Jul	21.78	16.06	84.08	0.6	0.2
27-Jul	22.82	17.48	77.2	1.2	0.4
28-Jul	24.42	17.66	74.5	1.1	3.2
29-Jul	24.72	18.46	77.73	0.9	0
30-Jul	25.39	19.75	96	1	0.4
31-Jul	23.28	19.34	99.48	1.1	8.6
01-Aug	26.27	19.73	69.45	0.7	0
02-Aug	28.12	22.49	91.09	2.5	1
03-Aug	27.87	21.76	80.57	1.6	0
04-Aug	24.68	17.26	72.92	0.8	0
05-Aug	22.55	15.05	72.41	0.8	0
06-Aug	24.1	15.71	72.28	0.6	0



Stubton - weather summary 2021 and 2022





# Certificate of

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

*This certifies that*

**PGRO Research Ltd**

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Regulation (EC) 1107/2009 for efficacy testing.

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Biologicals and Semiochemicals**

Date of issue: 9 January 2018  
Effective date: 1 January 2018  
Expiry date: 31 December 2022

Signature

*Authorised signatory*

Certification Number

ORETO 384



Chemicals Regulation Division



Department of  
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Rural Development**