



Suction-trap network sites

## Cereal Aphids Forecast 2019

The 55 years of aphid data from our suction-trap network, combined with the equivalent run of weather data available from the Met Office and others, makes it possible to establish relationships between weather and the timing of the start of aphid flights and aphid abundance in spring and early summer. The best predictor is the mean temperature in January and February, and confidence is greatest for those aphid species which pass the winter in the active stages rather than as eggs. This is because active stages are susceptible to low winter temperatures but can take advantage of warm conditions, whereas eggs are very cold hardy and in diapause, so don't respond to warm conditions in mid-winter. Bird cherry-oat aphid (*Rhopalosiphum padi*) and Rose-grain aphid (*Metopolophium dirhodum*) can overwinter by either method, with the proportion overwintering in the active stages increasing towards the south. Grain aphid (*Sitobion avenae*) overwinters mainly in the active stages. Note, some aphids will have overwintered in autumn-sown cereal crops and hence be present even before aphid flight begins.

	Monthly mean temp °C		Mean
	Jan	Feb	Jan-Feb
Dundee (D)	2.82	5.17	4.00
Gogarbank (G)	3.81	6.28	5.05
Ayr (Ay)	4.34	6.79	5.56
Newcastle (N)	4.81	6.61	5.71
Preston (P)	3.95	7.10	5.53
Kirton II (K)	4.13	6.87	5.50
Broom's Barn (BB)	3.62	7.11	5.37
Wellesbourne (We)	3.78	6.36	5.07
Hereford (H)	4.34	6.70	5.52
Rothamsted (RT)	3.41	6.21	4.81
Writtle (Wr)	3.89	6.27	5.08
Silwood (SP)	4.24	6.43	5.34
Wye (W)	4.53	7.19	5.86
Starcross (SX)	4.84	7.20	6.02

In a reversal of last year's cold weather event, unseasonably warm weather at the end of February this year has pushed winter temperatures up by around 1°C above the 30-year average temperature throughout most of Britain suggesting that first aphid flight may be about 2 weeks early. The forecasts are based on the mean temperature in January and February, because over the last 55 years this has shown the strongest correlation with the timing and size of aphid migrations. The temperatures in January and February appear to reset aphid activity each year with temperatures in November/December or March/April having little apparent impact.

**The general message is that, if spring does not throw any abnormal conditions at us, aphids will be flying around 2 weeks earlier than they would be expected to historically.**

[N.B. Although there have been some rather early actual dates of first aphid arrival this year, the influx of other migrant insect groups was observed in mid to late February. Therefore, the possibility of the unusual high-pressure weather system moving up from southern Europe in late February and pushing some of these aphids to Britain cannot be ruled out.]

The tables give the following information for *Rhopalosiphum padi* (Bird cherry–oat aphid), *Sitobion avenae* (Grain aphid) and *Metopolophium dirhodum* (Rose–grain aphid):

- i) The actual first arrival date if caught before and including the 03/03/2019.
- ii) The predicted date range of first capture at the listed sites, together with the position of this year's prediction out of all years of trap operation (e.g. =20/50 = tied 20<sup>nd</sup> earliest out of 50 years).
- iii) the predicted numbers caught by 1st July, together with the position of this year's prediction out of all years of trap operation (e.g. =19/49 = tied 19<sup>rd</sup> largest number out of 49 years).

By no means is all the variability in the aphid data is captured by winter temperature and the actual dates should be seen as approximate.

Bird cherry–oat aphid ( <i>Rhopalosiphum padi</i> )						
Site	1st Capture in suction trap			Numbers to 1st July		
	Actual date of first arrival 2019	Prediction date range (75% Confidence limits)	Ranking	Predicted	75% Confidence limits	Ranking
Dundee	-	(28 April - 9 June)	20/50	40	(3 - 400)	19/49
Gogarbank	-	(25 April - 28 May)	=17/51	69	(13 - 353)	19/51
Ayr	-	(19 April - 27 May)	11/41	40	(10 - 159)	12/38
Newcastle	-	(18 April - 1 June)	15/51	59	(9 - 343)	14/50
Preston	-	(28 March - 11 May)	11/44	104	(22 - 472)	6/44
Kirton	21 February	(9 March - 26 April)	7/40	419	(95 - 1834)	10/40
Broom's Barn	-	(30 March - 8 May)	15/52	273	(58 - 1278)	16/52
Wellesbourne	-	(4 March - 15 May)	4/15	22	(4 - 97)	5/12
Hereford	-	(21 February - 31 May)	14/48	105	(16 - 667)	15/48
Rothamsted	18 February	(13 April - 13 May)	18/52	113	(25 - 509)	19/52
Writtle	-	(19 March - 18 May)	11/45	210	(46 - 937)	20/45
Silwood Park	-	(18 March - 14 May)	=12/41	191	(48 - 745)	11/39
Wye	-	(4 March - 9 May)	16/51	240	(63 - 912)	11/49
Starcross	4 February	(4 February - 30 April)	16/50	388	(87 - 1721)	16/48

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Grain aphid ( <i>Sitobion avenae</i> )						
Site	1st Capture in suction trap			Numbers to 1st July		
	Actual date of first arrival 2019	Prediction date range (75% Confidence limits)	Ranking	Predicted	75% Confidence limits	Ranking
Dundee	-	(13 May - 20 June)	23/50	19	(2 - 114)	=19/49
Gogarbank	-	(29 April - 9 June)	=17/51	37	(7 - 177)	15/51
Ayr	-	(1 May - 7 June)	=9/41	23	(4 - 112)	11/38
Newcastle	-	(30 April - 2 June)	9/51	50	(10 - 245)	10/50
Preston	-	(21 April - 19 May)	9/44	194	(38 - 973)	9/44
Kirton	-	(13 April - 16 May)	=8/40	134	(17 - 1016)	=18/40
Broom's Barn	-	(15 April - 15 May)	=12/52	212	(28 - 1532)	19/52
Wellesbourne	-	(25 February - 10 June)	7/14	14	(6 - 29)	4/11
Hereford	-	(13 April - 17 May)	=11/48	209	(32 - 1352)	19/48
Rothamsted	-	(16 April - 20 May)	17/52	134	(21 - 818)	23/52
Writtle	25 February	(4 April - 19 May)	14/45	179	(24 - 1287)	22/45
Silwood Park	-	(15 April - 16 May)	10/40	243	(34 - 1711)	15/38
Wye	-	(6 April - 18 May)	13/50	217	(35 - 1328)	22/49
Starcross	-	(18 March - 13 May)	=11/50	244	(54 - 1097)	17/48

Rose - grain aphid ( <i>Metopolophium dirhodum</i> )						
Site	1st Capture in suction trap			Numbers to 1st July		
	Actual date of first arrival 2019	Prediction date range (75% Confidence limits)	Ranking	Predicted	75% Confidence limits	Ranking
Dundee	-	(7 May - 23 June)	=21/50	23	(2 - 209)	26/49
Gogarbank	-	(22 April - 10 June)	=17/51	47	(7 - 298)	16/51
Ayr	-	(16 April - 3 June)	11/39	24	(7 - 73)	=10/37
Newcastle	-	(29 April - 8 June)	12/51	34	(7 - 156)	=11/50
Preston	-	(31 March - 16 May)	=12/45	144	(33 - 608)	15/44
Kirton	-	(6 April - 20 May)	10/40	183	(20 - 1593)	14/40
Broom's Barn	-	(26 March - 5 June)	11/52	237	(39 - 1404)	19/52
Wellesbourne	-	(30 March - 24 May)	8/15	29	(6 - 134)	5/11
Hereford	-	(18 April - 1 June)	=19/48	143	(22 - 902)	18/48
Rothamsted	-	(11 April - 25 May)	17/52	95	(17 - 530)	23/52
Writtle	-	(12 March - 20 May)	=16/45	174	(35 - 856)	19/45
Silwood Park	-	(25 March - 12 May)	9/41	67	(17 - 258)	18/39
Wye	-	(23 March - 24 May)	=11/50	97	(19 - 468)	20/49
Starcross	-	(17 February - 6 May)	13/49	193	(47 - 776)	21/48

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## Further information

Please send information on crop aphids to: [alex.greenslade@rothamsted.ac.uk](mailto:alex.greenslade@rothamsted.ac.uk)

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