



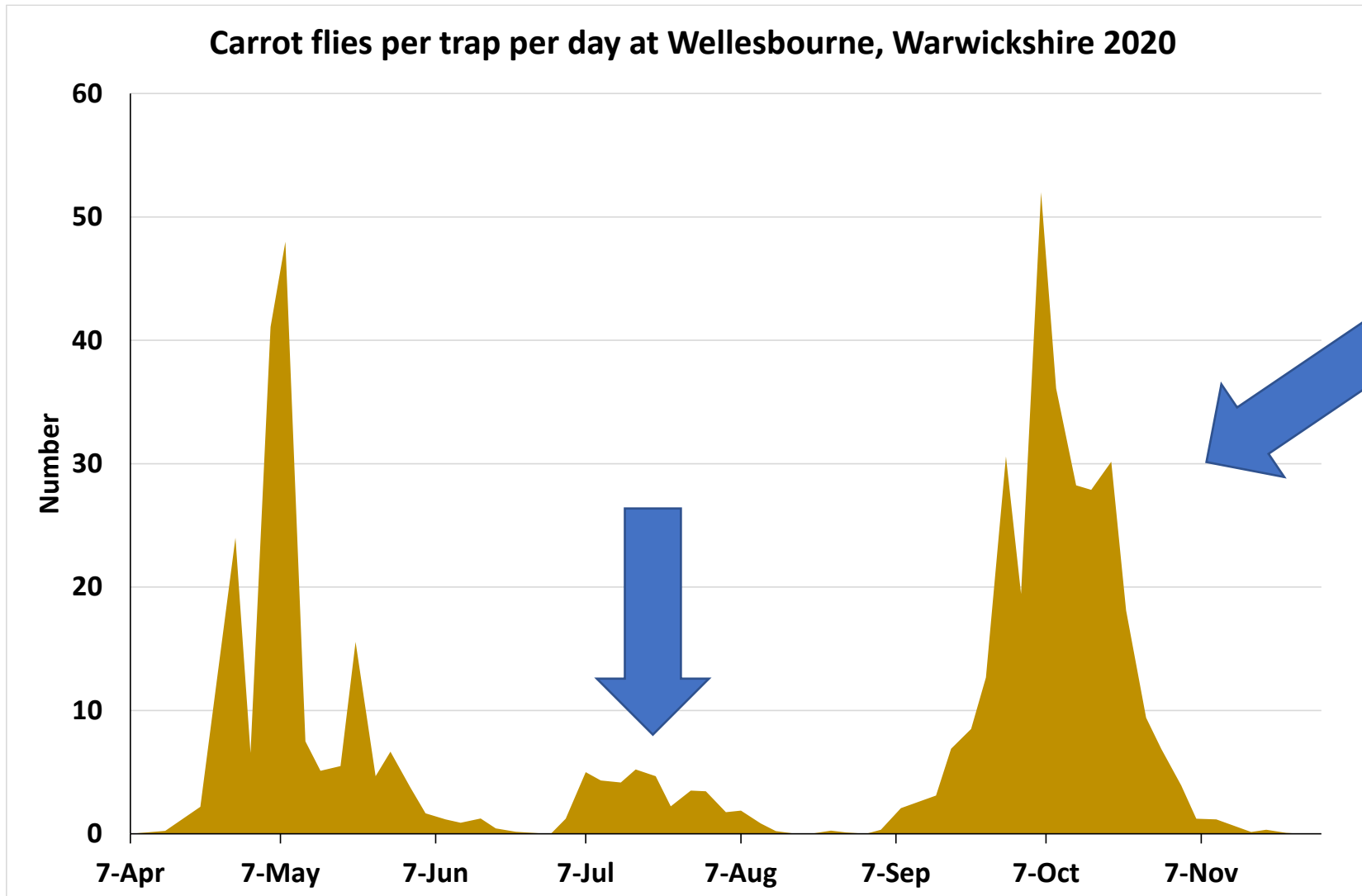
Pests of carrot with a focus on aphids and virus

Rosemary Collier

Pest insects in carrot

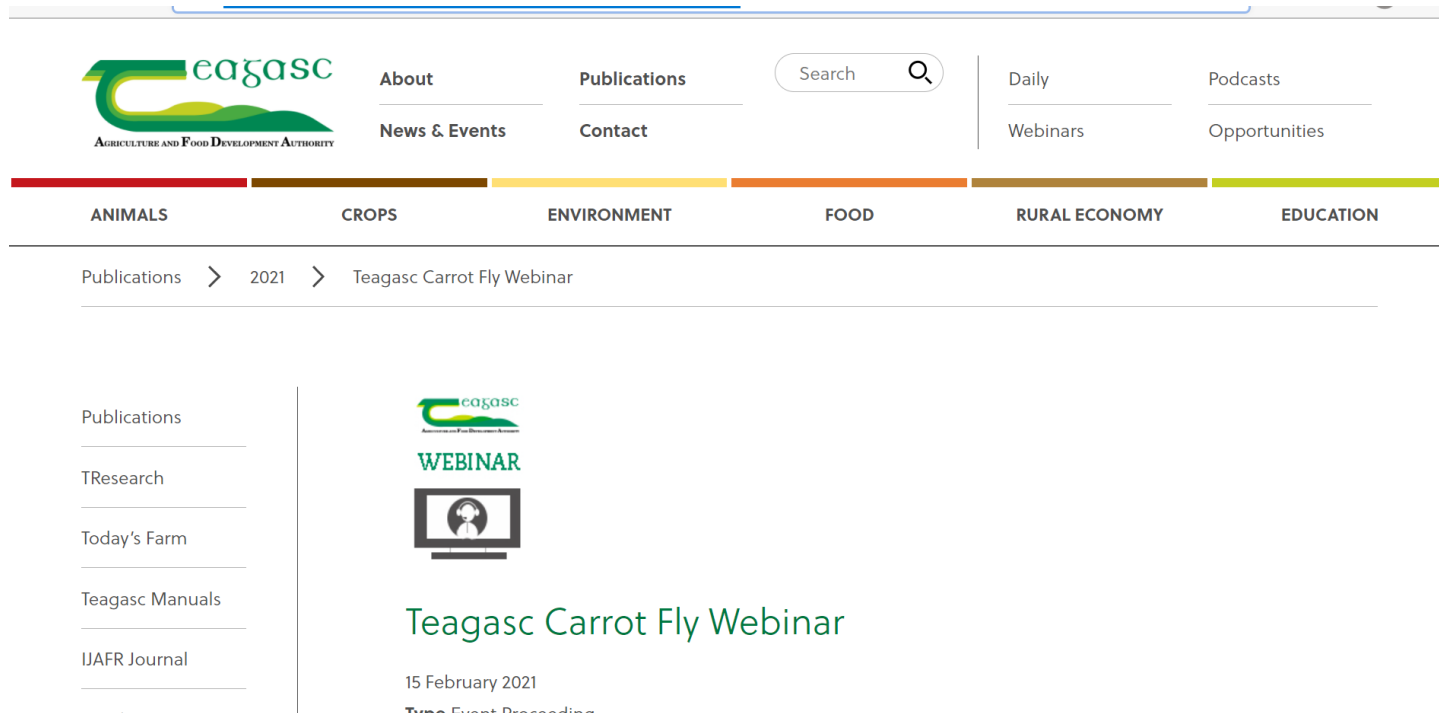
- Carrot fly
- Aphids – virus
- Cutworms – turnip moth
- Some control methods will assist with management of all of these – but timing is key





- Climate change UK?
- Will late second/third generation egg-laying become more important?
- 20 years ago, last 'new' larvae of the year were found at end of September

[2021 - Teagasc Carrot Fly Webinar - Teagasc | Agriculture and Food Development Authority](#) – presentations by Rosemary Collier and Colin Noble





Aphids and virus -2020

- Large numbers of willow-carrot aphid and peach-potato aphid
- Wet 2019 autumn and winter resulted in very large areas unharvested and unstrawed carrots leading into the spring - possible reservoir for aphids overwintering on carrot
- 2nd year without neonicotinoid seed treatment
- Worse virus year in some regions since 2015
- Yield reductions of up to 30% because of virus

Howard Hinds for AHDB aphids event

Four species of aphid infest carrot

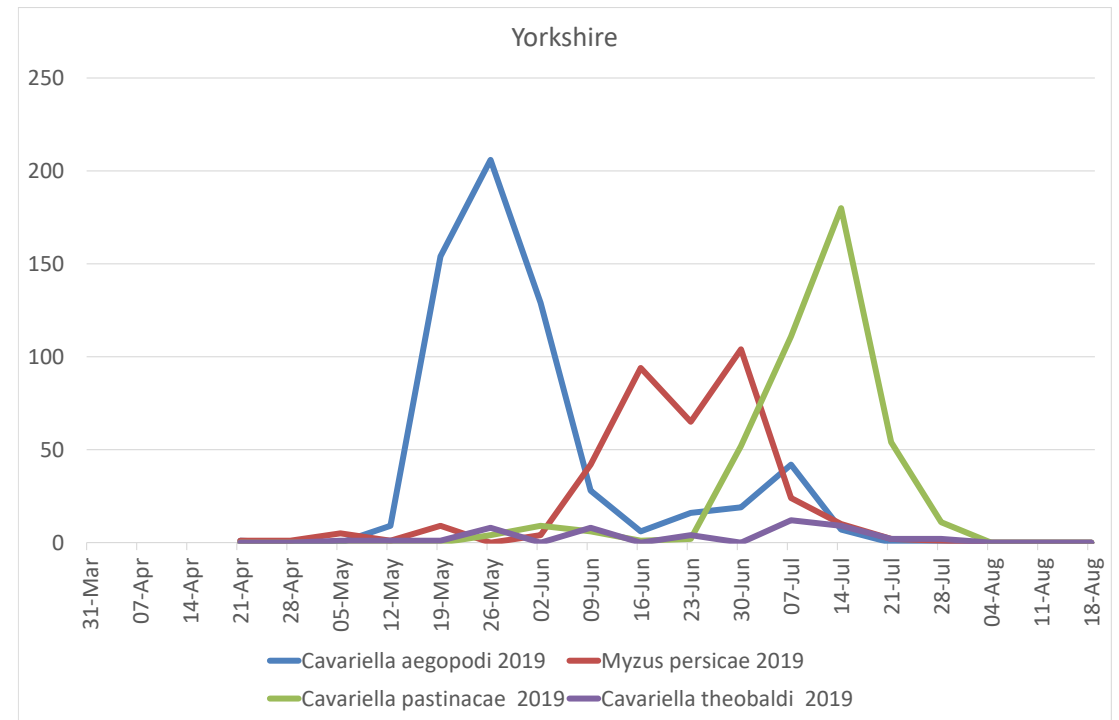
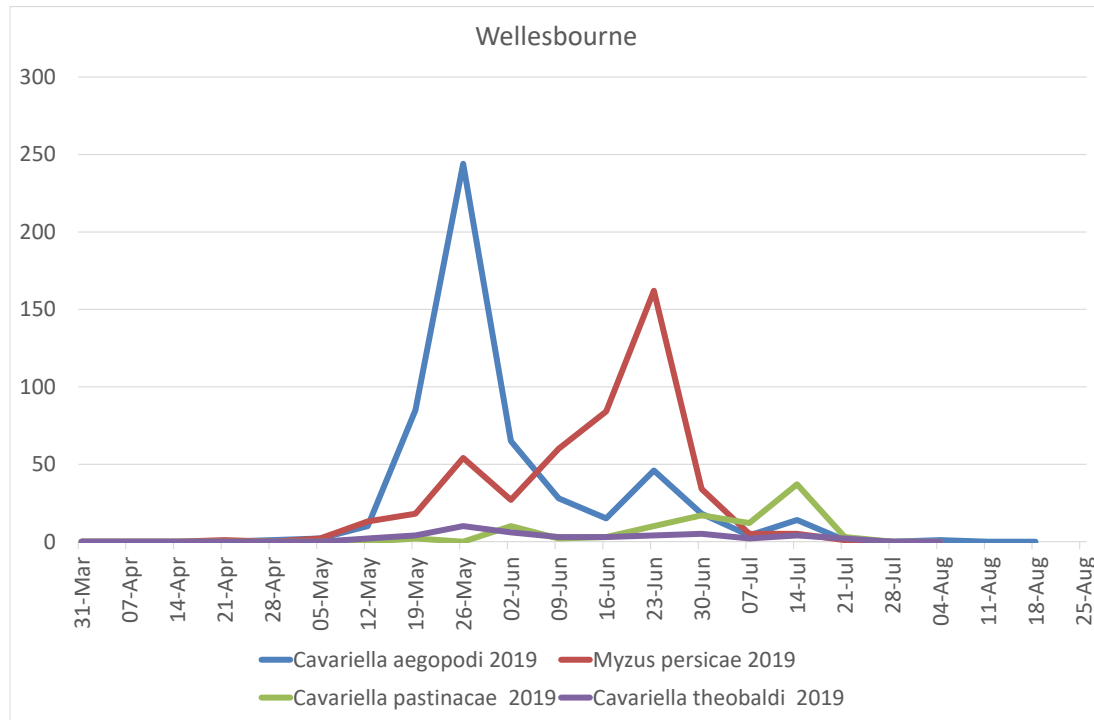
Suction trap captures



ROTHAMSTED
RESEARCH



WARWICK
SCHOOL OF LIFE SCIENCES



C. aegopodii – willow-carrot aphid
C. theobaldi – willow-parsnip aphid

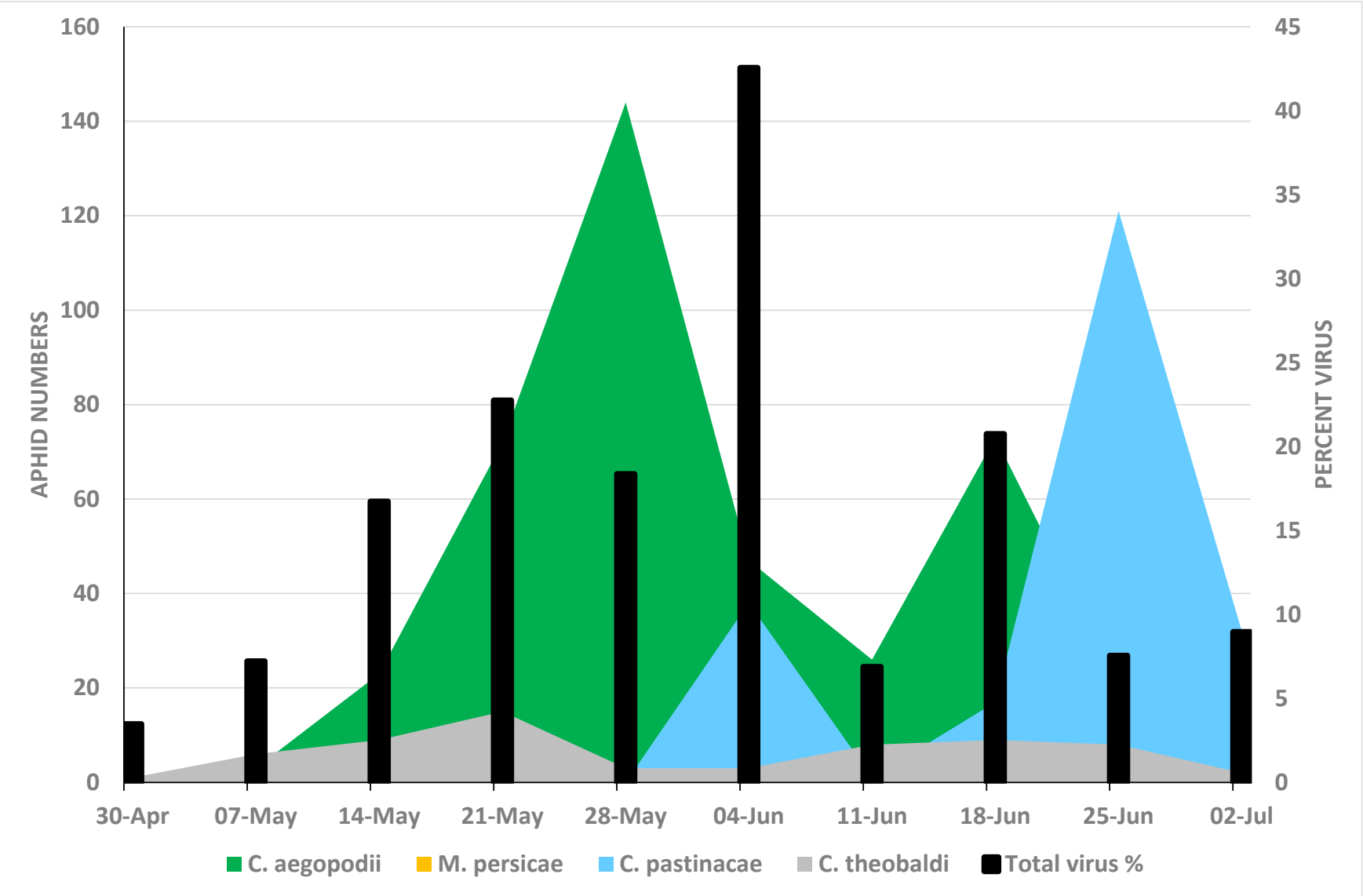
C. pastinacae – willow-umbellifer aphid
M. persicae – peach-potato aphid



AHDB Project FV 460 - Investigating the timing of transmission of carrot viruses to improve management strategies – led by Adrian Fox

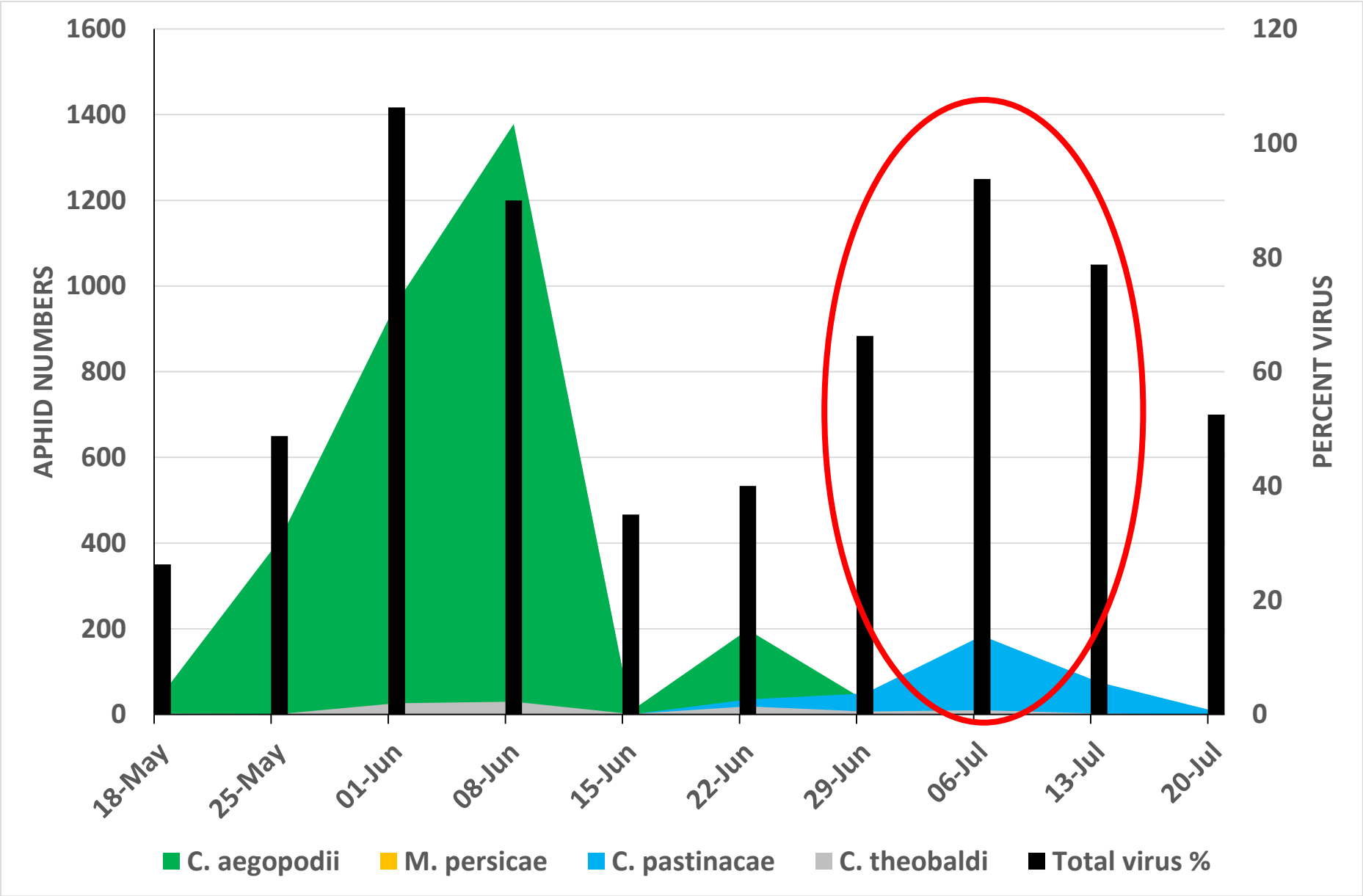
- When is virus transmitted to carrot crops?
- Which species of aphid is the main vector?
- Can the peak time of virus transmission be predicted?
- Can treatment programmes be targeted?

2019 Wellesbourne – Year 1 of FV 460



Mainly carrot red leaf virus (CtRLV) – small amount of yellow leaf virus (CVLV)

2021 Wellesbourne – Year 2 of FV 460



Conclusions – FV 460 field trials 2019 and 2021

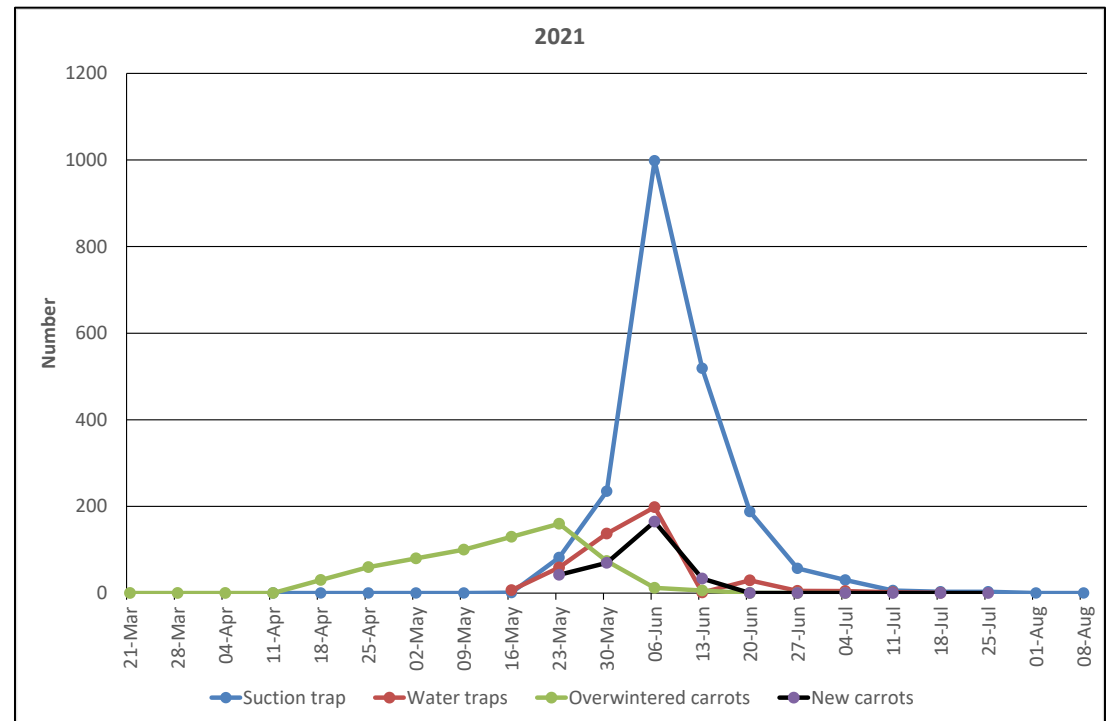
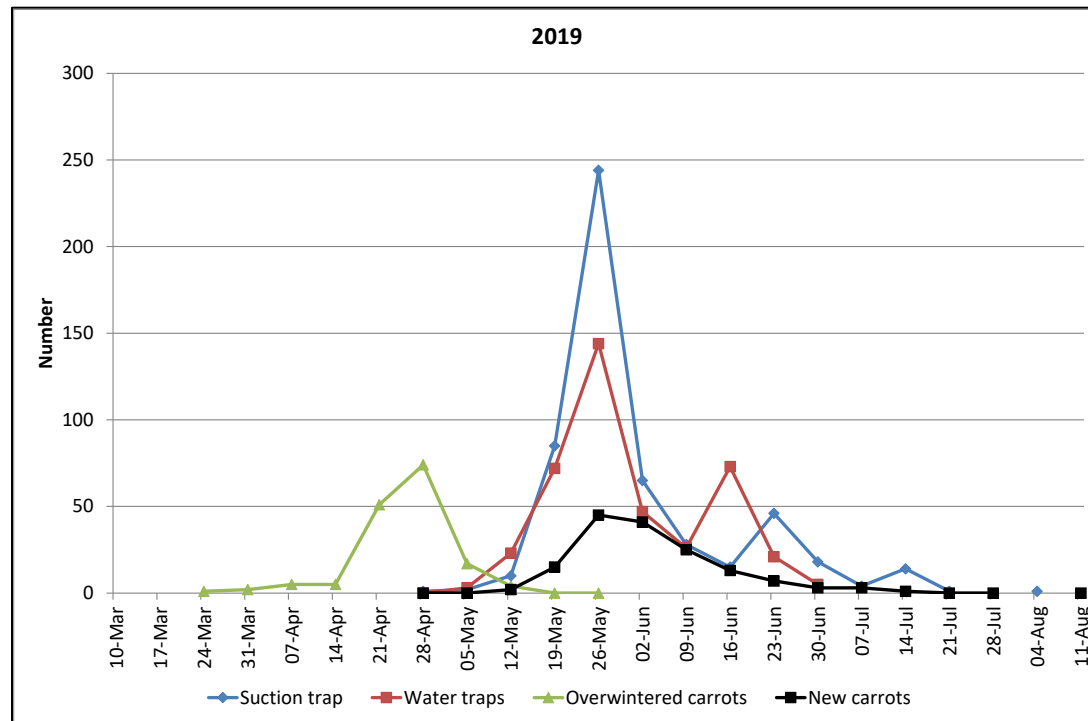
- Minimal virus transmission at York site (data not presented here)
 - Difficult to draw any conclusions
- Greater virus transmission and aphid numbers at Wellesbourne in 2021 than 2019
 - As in 2019, virus transmission at Wellesbourne in 2021 tracked aphid numbers well for first half of the trial
 - Majority of first aphid peak was *C. aegopodii*
 - From late June aphid numbers appeared to fall, but virus transmission had a second peak
 - Second peak may be related to *C. pastinacae*



Field trial 2022 - Wellesbourne

- Insecticide programmes – developed with BCGA members
 - Assessment of plots for virus symptoms
 - Leaf samples to assess virus
 - Monitoring aphids
-
- Winter has been quite warm – at this point the main impact is on aphids that overwinter in active stages – *Myzus persicae* and some willow-carrot aphid
 - Spring temperatures will determine when willow-carrot aphids that have overwintered as eggs on willow move into crops – day-degree forecast

Willow-carrot aphid – monitoring: suction trap, water traps, plants



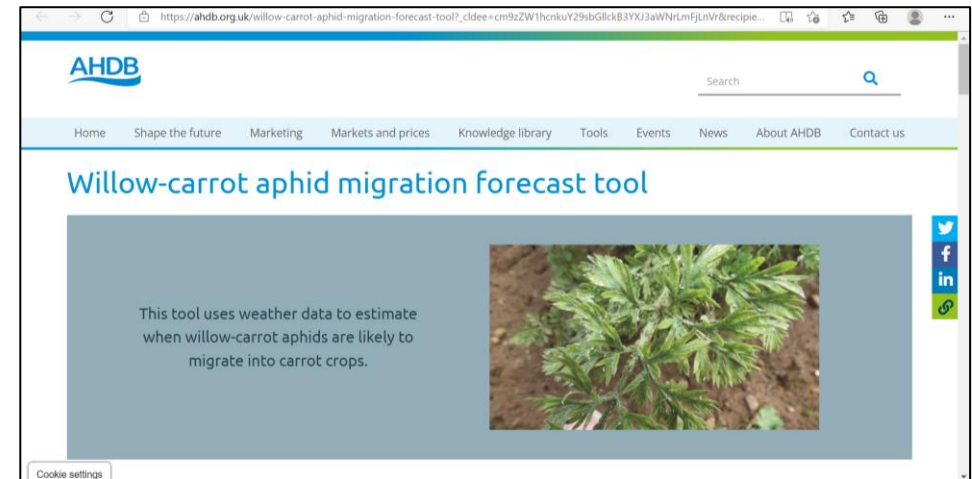
Day-degree predictions for start: 23 April 2019 and 9 May 2021

Aphid forecasting 2021

WARWICK

SCHOOL OF LIFE SCIENCES

- *C. aegopodii* – day-degree forecast works pretty well
- *M. persicae* – Rothamsted long range forecast



[Willow-carrot aphid migration forecast tool | AHDB \(ahdbdigital.org.uk\)](https://ahdbdigital.org.uk/willow-carrot-aphid-migration-forecast-tool/)

The general message is that, if spring does not throw any abnormal conditions at us, aphids will be flying around 3 weeks earlier in Scotland and 2 weeks earlier over much of England (except a couple of sites in the south) compared with when they would be expected to historically. [Aphid Forecast](#) | [Insect Survey](#)



Lingering question - where does the virus spend the winter?

- Virus overwinters in wild host plants and is picked up in spring by winged aphids from willow?
- Virus overwinters in aphids? i.e. those that overwinter as adults and nymphs on herbaceous hosts rather than as eggs on willow?
- Virus overwinters in carrot crops and is then picked up by aphids that have also overwintered on those crops or from those that have overwintered on willow?



Thank you!

- AHDB
- British Carrot Growers' Association, growers and agronomists
- Adrian Fox and colleagues at Fera
- Rothamsted Insect Survey
- Andrew Jukes and Marian Elliott
- Other colleagues at Warwick

