

Studentship Project: Annual Progress Report 10/2018 to 10/2019

Student Name:	Jessica Hughes	AHDB Project Number:	21120064
Project Title:	Genetics of the interaction between rapeseed and the cabbage stem flea beetle		
Lead Partner:	John Innes Centre		
Supervisor:	Steven Penfield		
Start Date:	01/10/2017	End Date:	30/09/2021

1. Project aims and objectives

To identify biological and genetic traits that confer resistance to adult and larval cabbage stem flea beetle within oilseed rape, to aid development of a more targeted pest management approach.

2. Key messages emerging from the project

There is significant variation in feeding preferences of the adult cabbage stem flea beetle (CSFB) in *Brassica napus*, with particular lines repeatedly demonstrating strong or weak palatability. Some of these differences appear to be maintained in the field.

There is significant variation in plant damage from CSFB larval infestation between *Brassica napus*, *Brassica juncea* and *Sinapis alba*.

Adult emergence from soil is recorded to significantly vary between two commercial *Brassica napus* lines and varies between *Brassica napus* lines from a diversity set.

Confirmation of a beneficial wasp species which parasitises adult CSFB.

3. Summary of results from the reporting year

From adult CSFB feeding assays, provisional candidate genes have been identified and are being explored in more detail.

A field trial near Norwich was heavily hit with CSFB damage. However, lines identified as least palatable in the laboratory appear to also have increased resistance in the field.

Egg inoculation experiments are ongoing but initial results indicate differences in adult emergence between lines of the *Brassica napus* diversity set.

The results described in this summary report are interim and relate to one year. In all cases, the reports refer to projects that extend over a number of years.

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4. Key issues to be addressed in the next year

Adult CSFB assays of F1 and F2 material from crossed *Brassica napus* diversity set lines will be conducted to identify any genes involved in palatability. Additionally, testing will be done to see if beetles will eat *Arabidopsis thaliana*.

The field trial is ongoing and data are being collected from images of sampled material. However, with the amount of damage, it is unlikely the trial will last through the winter. If it does survive, plots will be monitored for larval invasion and damage.

The egg inoculation experiment is ongoing and will continue for the next year. Once a sufficient numbers of lines have been screened, extremes will be identified and tested further.

5. Outputs relating to the project

(events, press articles, conference posters or presentations, scientific papers):

Output	Detail
Poster presentation	Poster presented at John Innes Centre Annual Science Meeting
Poster presentation	Poster presented at BCPC annual conference
Oral presentation	Oral presentation for departmental seminar series at JIC
Oral presentation	Oral presentation for Breeders Day at JIC
Oral Presentation	Oral presentation at Royal Entomological Society Postgraduate Conference
Event	Communication with growers at Morley Innovation Day

6. Partners (if applicable)

Scientific partners	John Innes Centre, AHDB
Industry partners	Elsoms
Government sponsor	