

Annual Project Report

01/10 2017 to 30/09 2018

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|-----------------------|---------------------------------------------------------------------------------|-----------------|-------------------|
| Project title | Genetic basis of winter oilseed rape resistance to the cabbage stem flea beetle | | |
| Project number | 21120064 | | |
| Start date | 1 October 2017 | End date | 30 September 2021 |

Project aim 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 more targeted pest management approach.

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
- 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 *Brassica napus* lines.
- Confirmation of a beneficial wasp species that parasitises adult CSFB

Summary of results from the reporting year

Variation in larval damage identified between *Brassica napus*/*Brassica juncea* and *Sinapis alba*:

- Egg inoculation pilot experiment re-affirms published reports of *Sinapis alba* resistance to CSFB herbivory.

Variation in adult emergence identified between two genotypes of *Brassica napus*:

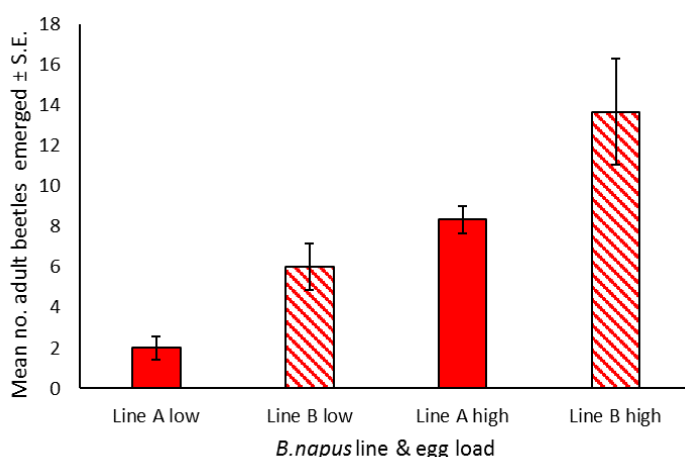


Figure 1: Mean number of adults emerged from soil of two *B.napus* lines, with either low (10) or high (20) egg load.

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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- At low egg load, significantly fewer adults emerge from pots containing *Brassica napus* line A compared with line B. At higher egg load, there is still significant variation between the lines, but the effect is reduced.
- Egg inoculation pilot experiment confirms this is a suitable methodology for assessing larval success.

Adult CSFB feeding preferences within *Brassica napus* identified using choice chamber analyses:

- Analysing current data from 98 lines of the Brassica Fixed Foundation Set (DFFS) reveals potential adult feeding preference.
- Further choice chamber screening of two lines of interest from the DFFS confirms significant preference for line 50 and distaste for line 60 (figure 2a & 2b).
- Notably, even when beetles are offered only line 60, they still consume significantly less than when they are offered only line 50 (figure 2a).
- When offered lines 50 and 60 in conjunction, differences in feeding remain significant but become more similar (figure 2b), indicating that nearby plants may influence feeding preferences.

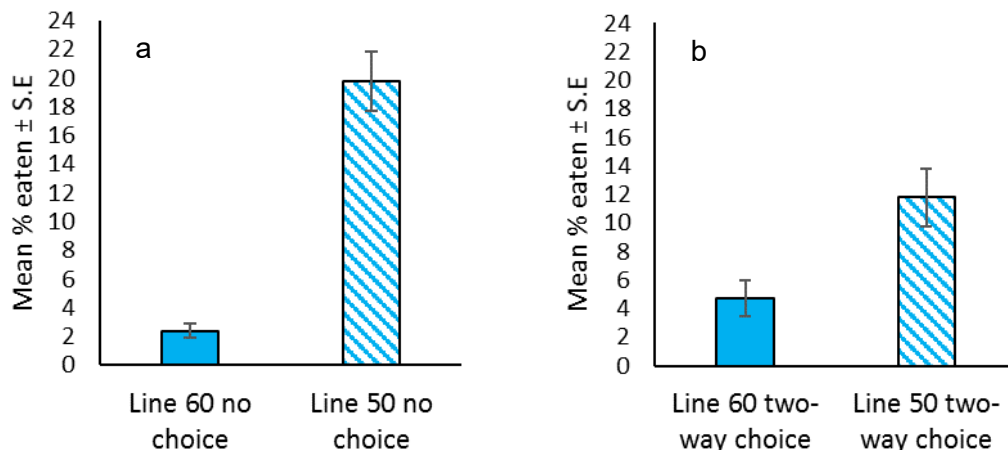


Figure 2: Mean feeding damage from adult CSFB to cotyledons of two *B.napus* lines when either offered a) either line 50 or 60 only, or b) both lines 50 and 60 simultaneously.

Key issues to be addressed in the next year

Identifying genes of interest from transcriptomic analyses.

Assess palatability of other *Brassica napus* lines from the DFFS to adult CSFB, using choice chamber analyses.

Assess variability in larval damage and adult emergence of other *Brassica napus* lines from the DFFS, using the successfully piloted egg inoculation method.

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| Lead partner | Jessica Hughes, John Innes Centre |
| Scientific partners | |
| Industry partners | Elsoms, Hutchinsons |
| Government sponsor | |

| Has your project featured in any of the following in the last year? | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| Events | Press articles |
| Morley Innovation Day – Public engagement Science Innovation Showcase at JIC – Public engagement Visit to JIC by the Flying Farmers – Presentation Youth STEMM Conference at JIC – Public engagement The Cut: Science Café, “Building Brilliant Brassicas” – Presentation Hutchinsons Winter Technical Farmer Conference – public engagement | |
| Conference presentations, papers or posters | Scientific papers |
| AHDB Crops PhD Studentship Conference 2017 - Presentation 3rd BCPC Pests and Beneficials Annual Review - Poster | Identification of a Novel Parasitoid Targeting the Adult Cabbage Stem Flea Beetle, <i>Psylliodes chrysocephala</i> , in prep. |
| Other | |
| | |

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