Studentship Project: Annual Progress Report September 2019 to September 2020

Student Name:	Claire Hoarau	**AHDB Project Number:**	21510042
Project Title:	Potential of biopesticides and optimising the use of conventional insecticides for the control of cabbage stem flea beetle (*Psylliodes chrysocephala*)		
Lead Partner:	Certis Europe, Agrifood Charities Partnership		
Supervisor:	Tom Pope, Heather Campbell, David Chandler		
Start Date:	23rd September 2019	**End Date:**	22nd September 2022

1. Project aims and objectives

The project aims to develop sustainable approaches to the management of cabbage stem flea beetle through the use of biopesticides and other biorational products. The first step, that is currently underway, is to test potential control agents in the laboratory under controlled environment conditions, such as entomopathogenic fungi, nematodes and bacteria, as well as botanical biopesticides. The aim is to identify potential control agents that show the greatest promise for further research. The next step will be to transfer the most promising control agents (singly and combined) in semi-field and field trials. Finally, it will be necessary to test the safety of the selected control agents against non-target organisms such as pollinators, parasitoids and arthropod predators, and to evaluate the economical applicability of the selected control agents in commercial oilseed rape farms.

2. Key messages emerging from the project

Entomopathogenic nematodes are promising control agents to fight cabbage stem flea beetle, displaying encouraging results in laboratory bioassays.

3. Summary of results from the reporting year

To date, I have tested several biopesticides in a laboratory setting:

- Entomopathogenic nematodes were tested on all life stages of cabbage stem flea beetle, in pilot trials in December 2019, and in large-scale bioassays in February and June 2020. The results were encouraging and the methods will be improved for future bioassays;
- Azadirachtin was tested in December 2019 and in February 2020 on adult cabbage stem flea beetles with no promising results;
- A bacterium species was tested in March 2020 on adult cabbage stem flea beetles, results were not conclusive and will be tested again during second year;
- Entomopathogenic fungi were tested in a pilot trial in July 2020 on adult cabbage stem flea beetles, with encouraging results and methods to be improved for future bioassays.

I have also successfully maintained a population of cabbage stem flea beetles in the laboratory, captured in oilseed rape fields in July 2019, and that I could use for my bioassay during the whole year. I was also able to observe all life stages of the cabbage stem flea beetle in the laboratory, with successful reproduction of adults both on natural and artificial substrate.

4. Key issues to be addressed in the next year

No key issues are to be addressed, besides improving bioassay methods.

5. Outputs relating to the project
(events, press articles, conference posters or presentations, scientific papers):

Output	**Detail**
Poster	Work presented and discussed at the Association of Applied Biologists conference titled "Integrated Pest Management and Biological Control" (November 2019).
Presentation	Five-minute talk to fellow Harper Adams PhD students at the colloquium organised by Harper Adams University (November 2019).
Presentation	Five-minute talk to fellow AHDB PhD students at the annual AHDB Crop PhD Conference (January 2020).
Presentation	Ten-minute talk to fellow entomology PhD students at the Postgraduate Forum 2020 organized by the Royal Entomological Society (February 2020).
Research note	A research note was written by Caroline Kettlewell, technical author at Harper Adams University, in collaboration with myself. The aim of these research notes is to explain current and completed Harper Adams research to visitors, students and staff, being careful to make it accessible to non-specialists.
Press release	A press release is currently in preparation by Laura Meadows, communication officer at Harper Adams University, in collaboration with myself.

6. Partners (if applicable)

Scientific partners	Dr David Chandler and Gill Prince (University of Warwick)
Industry partners	
Government sponsor	