

Annual Project Report July 2021 to June 2022

Project title	Reducing the impact of cabbage stem flea beetle on oilseed rape in the UK		
Project number	21120185		
Start date	30/07/2020	End date	30/07/2023

Project aim and objectives

WP1: Minimise the impact of CSFB through improved understanding of pest phenology and biology.

- 1.1 Determine the factors that govern adult CSFB migration activity.
- 1.2 Determine the effect of temperature on egg laying, egg and larval development, and larval movement.
- 1.3 Determine the impact of larval number on plant growth.
- 1.4 Determine the impact of larval invasion date/crop stage at invasion on plant growth.
- 1.5 Determine the effect of stem width on the impact of larvae on yield.
- 1.6 Determine adult preference for crop stages.
- 1.7 Determine the relationship between adult numbers and adult feeding damage.
- 1.8 Determine the relationship between larval scars and larval number.
- 1.9 Disseminate findings to the industry.

WP2: Minimise the impact of CSFB through testing and validation of on-farm control approaches.

- 2.1 Identify alternative control approaches for CSFB.
- 2.2 Coordinate Farm Innovation Groups to investigate CSFB methods.
- 2.3 Disseminate findings to the industry.

Key messages emerging from the project

- CSFB migration in 2021 occurred at a similar time to 2020 but numbers of adult CSFB were lower in most areas.
- Controlled environment (CE) experiments indicate that a range of factors affect egg hatch, but that temperature and moisture are the predominant influences.
- Field trials investigating non-chemical control methods demonstrate that sow date is critical for determining CSFB pressure (both from adults and larvae), and that other management strategies ought to be selected based on the chosen sow date.
- Late sowing does have increased risks due to changes in weather, but trial results demonstrate that yields can be significantly higher than crops drilled at more traditional dates.
- Other field trials show significant reductions in pest damage and/or incidence when using companion crops, applying organic amendments, leaving long stubble and using low intensity cultivation methods.

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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Summary of results from the reporting year

- CSFB migration was monitored at 9 sites across England. Numbers of adult CSFB varied across England, with numbers in Cambridgeshire notably higher than other areas. Peak migration was slightly later than 2020. Overall CSFB numbers and feeding damage was lower in many areas in 2021 than 2020.
- CE experiments found that moisture is essential for egg hatch. Data also suggests that temperature changes, substrate and root exudates affect egg hatch.
- Analysis of yield data from year 1 trials show that in the drill date trial, the crop drilled on 15 September yielded approx. 1.5 t/ha greater than that drilled on 26 August.
- Plot/line trials (14+) investigated alternative control approaches. Significant reductions in CSFB damage and incidence were seen with the use of companion crops, long stubble, organic amendments and low intensity cultivation methods.

Key issues to be addressed in the next year

- Determine the effect of larval feeding, time of larval invasion and crop condition on crop development and yield loss in pot trials.
- Monitor adult CSFB migration across England, then analyse the data to identify factors that influence migration dynamics.
- Carry out choice experiments to determine adult CSFB feeding preferences.
- Analyse datasets to identify relationships between adult CSFB number and feeding damage, and larval scarring and larval numbers.
- Investigate varietal tolerance/resistance to CSFB in four plot trials.
- Investigate the benefit of stacking non-chemical interventions for efficacy and reliability of IPM methods for CSFB. This will involve different combinations of stacked interventions (e.g. using low intensity cultivations, varieties with strong autumn vigour and drilling a companion crop in a late drilled field) in five different tramline trials and a plot trial.

Lead partner	ADAS
Scientific partners	Harper Adams University
Industry partners	BASF, Bayer, DSV, Elsoms, Frontier, Innovative Farmers, KWS, Limagrain, Syngenta, Tuckwells, United Oilseeds, YARA
Government sponsor	n/a

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Has your project featured in any of the following in the last year?	
Events	Press articles
Strategic Farm West webinar – 4 June 2021 Championing OSR' BASF webinar – 24 June 2021 'Cabbage stem flea beetle: working with the enemy', AHDB webinar – 7 July 2021 'Cabbage Stem Flea Beetle monitoring 2021', ADAS Farming Association conference - 18 November 2021 'Reducing the impact of CSFB', Agronomists' Conference – 7 December 2021 'Reducing the impact of CSFB', UOM/AHDB Oilseed rape conference – 23 February 2022 NIAB OSR Open Day – 24 May 2022	'CSFB IPM' in Crop Action – 17 June 2021 AHDB IPM hub and CSFB IPM web page contributions – summer 2021 'Hope for OSR as industry tackles challenges together' BASF press release – July 2021 'Considerations for OSR establishment' in Crop Action – 15 July 2021 'CSFB IPM' in Crop Action – 29 July 2021 'Battling the Beetle' in Growing Break Crops (United Oilseeds) - autumn 2021 'New advice from trials to combat flea beetle in OSR' in Farmers Weekly – 17 January 2022 'Battling against cabbage stem flea beetle' Research in Action, Arable Farming – February 2022 'Companion advantage for oilseed rape' in Bayer Crop Focus – April 2022
Conference presentations, papers or posters	Scientific papers
'Refining IPM strategies for CSFB by sowing date', AAB conference 'Crop production with reduced pesticide and fertiliser inputs to reduce carbon footprints' - 14 October 2021	
Other	
CSFB migration data provided to AHDB and disseminated via website – weekly autumn 2021	

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