**Supplementary materials**

**Companion plants and straw mulch reduce cabbage stem flea beetle (*Psylliodes chrysocephala*) damage on oilseed rape**

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Table S1: Summary of experiments to test the effect of companion planting on damage caused to oilseed rape crops by cabbage stem flea beetle (*Psylliodes chrysocephala*).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Experiment 1** | **Experiment 2** | **Experiment 3** | **Experiment 4** |
| **Season** | 2018-2019 | 2019-2020 | 2020-2021 | 2020-2021 |
| **Location** | Harpenden, UK | Harpenden, UK | Harpenden, UK | Witzenhausen, Germany |
| **Sowing date** | 30/08/2018 | 19/08/2019 | 24/09/2020 | 02/09/2020 |
| **Plot size** | 12 X 12 m | 3 X 9 m | 24 X 24 m | 15 X 15 m |
| **Design** | Latin square | Randomized Complete Block Design | Latin square | Randomized Complete Block Design |
| **Replicates** | 6 | 4 | 6 | 4 |
| **Treatments** | OSR control,  OSR + Berseem clover,  OSR + turnip rape trap crop,  OSR strip crop with wheat, OSR + wheat,  OSR + white mustard | OSR control,  OSR + wheat,  OSR + barley,  OSR + rye,  OSR + oat,  OSR + straw mulch | OSR control,  OSR control with reduced herbicide,  OSR + Berseem clover,  OSR + Berseem clover and vetch,  OSR + oat,  OSR + turnip rape trap crop | OSR control,  OSR + oat,  OSR + straw mulch |
| **Legumes** | X |  | X |  |
| **Cereals** | X | X | X | X |
| **Brassica** | X |  | X |  |
| **Straw mulch** |  | X |  | X |
| **Herbicide application** | 31/10/18 - 35 g/l imazamox and 250 g/l quinmerac applied at 1 l/ha on all treatments except plots with clover and turnip rape.  26/11/18 - propyzamide (500 g/l) and aminopyralid (5.3 g /l) applied at 1.7 l/ha on all plots and target annual grasses.  29/01/19 – propyzamide (400 g/l) applied at 2.1 l/ha on all plots and targeting broadleaved weeds. | No herbicide applied as the crop was destroyed just after winter. | 11/11/20 - propaquizafop (100 g/l) applied at 0.5 l/ha on plots with oat to target annual grasses and cereal volunteers, oat included. | 19/10/20 - propaquizafop (100 g/l) applied at 1.5 l/ha on plots with oat to target annual grasses and cereal volunteers, oat included. |
| **Harvest date** | 01/08/2019 | No harvest | No harvest | 31/07/2021 |



Figure S1: Leaf area loss scale used in the field to estimate adult cabbage stem flea beetle (*Psylloides chrysocephala*) feeding damage on oilseed rape plants at different growth stages (BBCH GS 10-13, Lancashire *et al.* 1991) with small (top row) and large (bottom row) feeding hole sizes, at different proportions of leaf area loss (10-90%). Credit: Yoann Bourhis



Figure S2, Mean (± SE) percentage of oilseed rape leaf area damaged by cabbage stem flea beetles (*Psylloides chrysocephala*) per treatment per sampling date. a) Experiment 1 conducted at Rothamsted Research, UK, 2018, b) Experiment 2 conducted at Rothamsted Research, UK, 2019, c) Experiment 3 conducted at Rothamsted Research, UK, 2020, d) Experiment 4 conducted at Witzenhausen, Germay, 2020.



Figure S3, Estimated Marginal Mean (± SE) oilseed rapeplant weight (g) per treatment. Different letters indicate significant differences between treatments.a) Experiment 2 conducted at Rothamsted Research, UK, 2019, b) Experiment 3 conducted at Rothamsted Research, UK, 2020, c) Experimental trial 4 conducted at Witzenhausen, Germany, 2020.