

P2007349: Assessment and analysis at AHDB Strategic Cereal Farms

Strategic Cereal Farm East: Work Package 3 – Flower strips

3.1 Trial background

Previous AHDB research has found that flower strips attract a range of insects that are beneficial for pollination. Within arable crop production, margins of pollen and nectar flower can be used to increase numbers of pollen and nectar feeding insects. In 2004, AHDB published research that non-crop habitats constitute one of the most important sources of biodiversity within farmland. In many arable areas, field margins are the only major non-crop habitat, acting as the main source of beneficial species, and it has been recognised for some time that field margins can play an important role in the development of novel manipulation techniques to enhance insect predators and parasitoids.

The Strategic Cereal Farm East trial was established to test the extent to which the results found in research trials are also seen in a commercial farm system and to demonstrate the integration of flower and grass strips into a farm business.

Trial aim: To determine the impact of perennial flower and grass strips on the abundance and distribution of beneficial insect and pest populations, within the flower strip and within the arable crop.

3.2 Trial design – multiple fields

In May 2020, a seed mix (Table 3.1) was sown to establish the grass and flower strips around the edge of two fields at the Strategic Cereal Farm East, as shown in Figure 6. In early September 2020, a strip using the same seed mix will be established in one of the fields as shown. A third field has been selected as a control treatment, where no flower strips have been established. The field characteristics are provided in Table 3.2.

Table 3.1 Seed mix sown in May 2020 at Strategic Cereal Farm East

Meadow flowers		
%	Latin name	Common name
25	<i>Centaurea nigra</i>	Common Knapweed
7.5	<i>Daucus carota</i>	Wild Carrot
20	<i>Galium verum</i>	Lady's Bedstraw
2.5	<i>Leucanthemum vulgare</i>	Oxeye Daisy - (Moon Daisy)
10	<i>Malva moschata</i>	Musk Mallow
10	<i>Poterium sanguisorba</i> - (<i>Sanguisorba minor</i>)	Salad Burnet

7.5	<i>Prunella vulgaris</i>	Selfheal
7.5	<i>Ranunculus acris</i>	Meadow Buttercup
10	<i>Silene dioica</i>	Red Campion
Fine grassland mixture		
5	<i>Agrostis capillaris</i>	Common Bent
10	<i>Cynosurus cristatus</i>	Crested Dogstail
20	<i>Festuca ovina</i>	Sheep's Fescue
20	<i>Festuca rubra</i>	Slender-creeping Red-fescue
20	<i>Festuca rubra ssp. commutata</i>	Chewing's Fescue
5	<i>Phleum bertolonii</i>	Smaller Cat's-tail
20	<i>Poa pratensis</i>	Smooth-stalked Meadow-grass

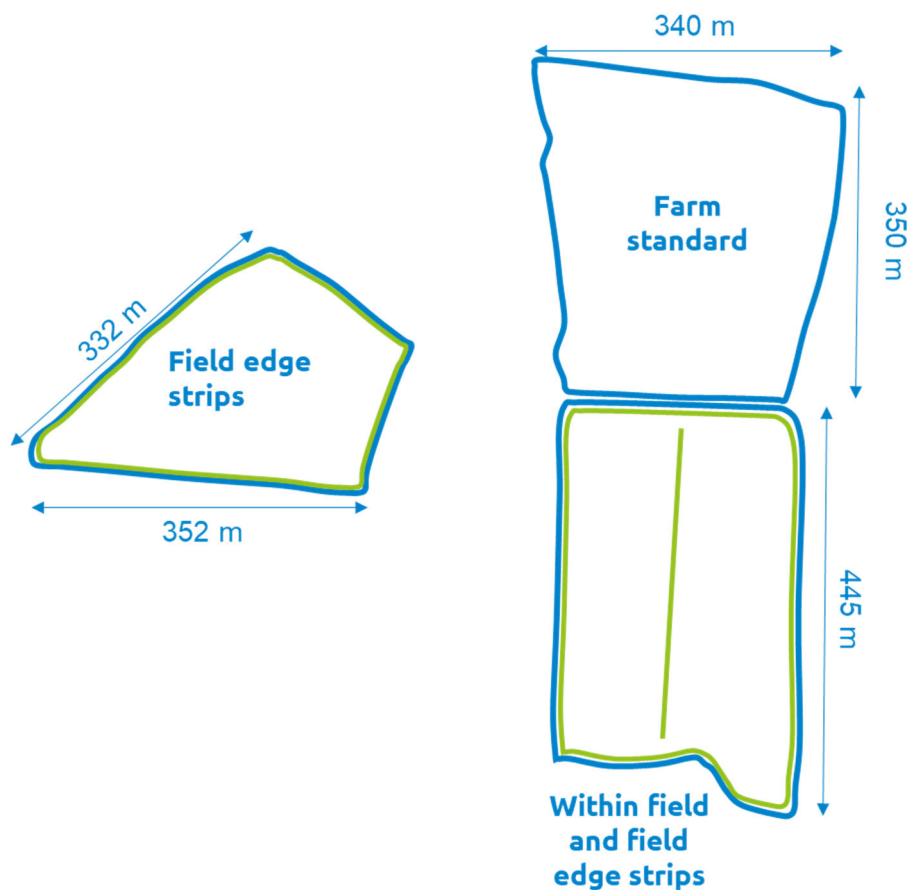


Figure 3.1 Flower strips trial layout at Strategic Cereal Farm East

Table 3.2 Treatments and field characteristics of flower strips trial at Strategic Cereal Farm East

Treatment name:	Within field and field edge strips	Farm standard	Field edge strips
Field name:	Bottom 59	Top 59	Big Guinea Row

Field size (hectares):	10.61	10.39	6.78
Soil type:	Sandy clay loam (57% sand, 20% silt, 12% clay)	Sandy loam (70% sand, 16% silt, 14% clay)	Sandy clay loam (66% sand, 15% silt, 19% clay)
Harvest 2021 crop:	Winter wheat	Winter wheat	Winter wheat

3.3 Assessments

It is difficult to draw robust conclusions from monitoring for pests and beneficials at a field scale. Therefore, proposals should design a farm scale-monitoring programme that includes the trial fields and the treatments within them.

The assessments listed below are intended as a guide, and proposals in this current call should look to build a dataset to enable benchmarking of invertebrate groups between fields and between years. In 2019, slugs and summer aphids and their natural enemies were identified as the key species to monitor.

Assessments should be completed using a sampling methodology which take account of the trial design and field characteristics, for example, variation in soil type, trial focus and are appropriate to generate robust data to complement an on-farm demonstration. Proposals should consider the aim of the Strategic Farms which is to test research in a commercial situation and provide farmers with practical ways of conducting their own on-farm testing and assessments.

Key pest species in cereals have been identified using the [AHDB Encyclopaedia of pests and natural enemies in field crops](#) and include, but are not limited to: wireworms, leatherjackets, slugs, aphids, wheat bulb fly, orange wheat blossom midge, gout fly and frit fly. Natural enemies should include predators of key pest species.

- Weeds
 - Appearance of weeds in the flower strip
 - The movement of weeds or sown species into the crop
- Pests and natural enemies, for example slug traps and pitfall traps at crop emergence and assessed 2 weeks later. Pitfall trap content identification to functional group plus common species
- Flowering strips species composition
- Yield
 - Bottom 59 (within field and field edge flower strips) arable crop yield map data analysed to determine i) whether there is any significant impact on yield adjacent to the in-field strips compared with areas further away from the strips, and ii) the field scale impact on yield of removing land from production to install in-field strips

Proposals should include time spent to develop content to produce up to three guides (weed, pests and natural enemies and flower/ grass ID), including a list of key species, their different appearances in their life cycle, where to find them and when to find them.