

P2007349: Assessment and analysis at AHDB Strategic Cereal Farms

Strategic Cereal Farm West: Work package 9 – Autumn blackgrass control

9.1 Trial background

Weed management has become an increasing challenge due to changing regulations which are reducing the number of products available to farmers, herbicide resistance, and a lack of new control methods. There is a need to develop integrated approaches which use both cultural and chemical control. A recent AHDB-BBRO and company funded review highlighted the need for integrated weed management and a wide range of non-chemical control options for weed management in a range of different crops (project number CP 182 / 1807258). This trial aims to compare different cultural weed control strategies prior to sowing (stubble management) to standard farm practice.

The Strategic Cereal Farm West trial was established to test the extent to which cultural and chemical control methods can be integrated for effective autumn weed control on a commercial farm.

Trial aim: To determine the interaction of cultivation and glyphosate application on autumn blackgrass control.

9.2 Trial design – replicated tramline trial

- Field number: 41
- Field size (hectares): 12.3
- Harvest 2020 crop: spring barley
- Harvest 2021 crop: winter wheat
- Number of treatments: 3
- Number of replications: 4
- Total number of plots: 12

The soil type map for Field 41 is shown in Figure 9.1. The proposed trial layout (Figure 9.2) has been designed to provide robust data and minimise the influence of background soil variation. The design takes account of the underlying variation within the field and aims to be achievable to implement, whilst maximising the strength of comparisons between the treatments.

Proposals should consider the trial design and propose alternatives to the trial design if appropriate to improve the power of statistical analysis. The field maps are provided as a guide and do not represent exact locations or dimensions.



Figure 9.1 Soil type in Field 41 Autumn blackgrass control trial at Strategic Cereal Farm West

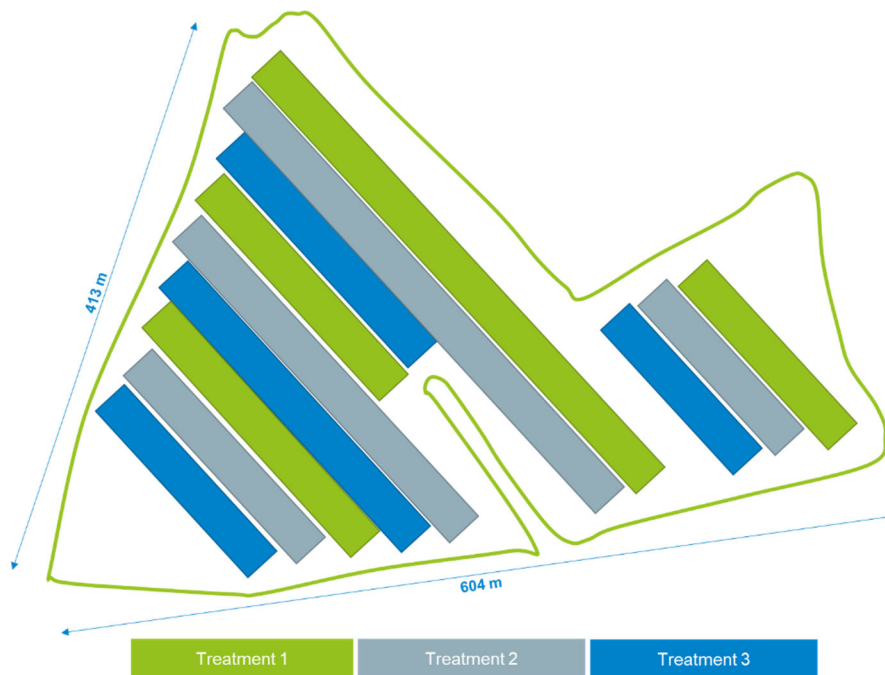


Figure 9.2 Autumn blackgrass control trial layout at Strategic Cereal Farm

West Treatments are yet to be finalised but are likely to be

- Treatment 1 – cultivation 1 + glyphosate (i.e. farm standard)
- Treatment 2 – cultivation 2 no glyphosate
- Treatment 3 – cultivation 3 no glyphosate

Post emergence, all herbicide applications will be the same across all treatments.

9.3 Assessments

In 2020, the field was assessed using the draft AHDB/BBRO soil health scorecard. We propose to re-sample the treatments using a reduced list of parameters than the full scorecard approach, but proposals should consider the aim of the trial and the trial design.

- Topsoil VESS
- Earthworms
- Penetration resistance to 50 cm
- Soil moisture 0-15 cm, 15-30 cm, 30-50 cm (to calibrate penetrometer resistance measures)
- Bulk density at 0-15 cm, 15-30 cm, 30-50 cm

The field selected for this trial has a history of blackgrass (Figure 9.3) and weed assessments should therefore focus on blackgrass, although a full range of arable weeds should be assessed as shown in Table 9.1.

Table 9.1 Timing and assessments to be completed on Autumn blackgrass control trial at Strategic Cereal Farm West

Timing and assessment	Purpose
Pre-treatment: number and growth stage in 0.1 m ² quadrat at 6 assessment points in each of the 12 tramlines, from a mix of between and within rows	To establish the base population of weeds and growth stage
Visual assessment of weed control at treatment	Provide information on what the weeder is doing to the weeds – covering, pulling up etc and what type of tillage is present in the different treatments
Post pre-emergence spray	To establish the population of weeds and growth stage
GS30: counting blackgrass weeds	To provide an indication of weeds that have died and if there is any further germination
GS61: mapping of blackgrass densities within the field from a visual assessment, counting blackgrass weeds. Proposals should also consider using aerial technology to map blackgrass densities.	Timing is when weeds are visible above the crop. Mapping densities visually will give an idea of control success.



Figure 9.3 Blackgrass map captured in summer 2018 in Field 41