

## P2007349: Assessment and analysis at AHDB Strategic Cereal Farms

### Strategic Cereal Farm East: Work Package 1 - Managed lower inputs

#### 1.1. Trial background

Disease management in cereal crops is a challenge, especially with the withdrawal of active ingredients and the development of fungicide resistance. New products and active ingredients continue to be introduced by the plant protection industry, but the frequency of these is diminishing. Through the [fungicide performance programme](#), AHDB funds research to provide farmers and agronomists with independent information on the efficacy of established and new fungicide active ingredients and products. Another tool that is extremely valuable to the arable industry is the [Recommended Lists \(RL\)](#). The RL provides information that helps farmers and agronomists to select the most appropriate varieties to grow on their farm, based on yield and quality performance, agronomic features and market options.

The fungicide performance research and RL provides a robust evidence base for disease management and variety performance from a series of replicated plot trials. This information is valuable to growers but the opportunity with the Strategic Cereal Farm is to see how the outcomes of this research can be integrated into a commercial farming system. The Strategic Cereal Farm East trial was established to test the extent to which the outcomes found in the research trials are also seen in a commercial farm system, specifically the cost benefit of different agronomy programmes and the role of genetic potential of varieties for disease management on-farm.

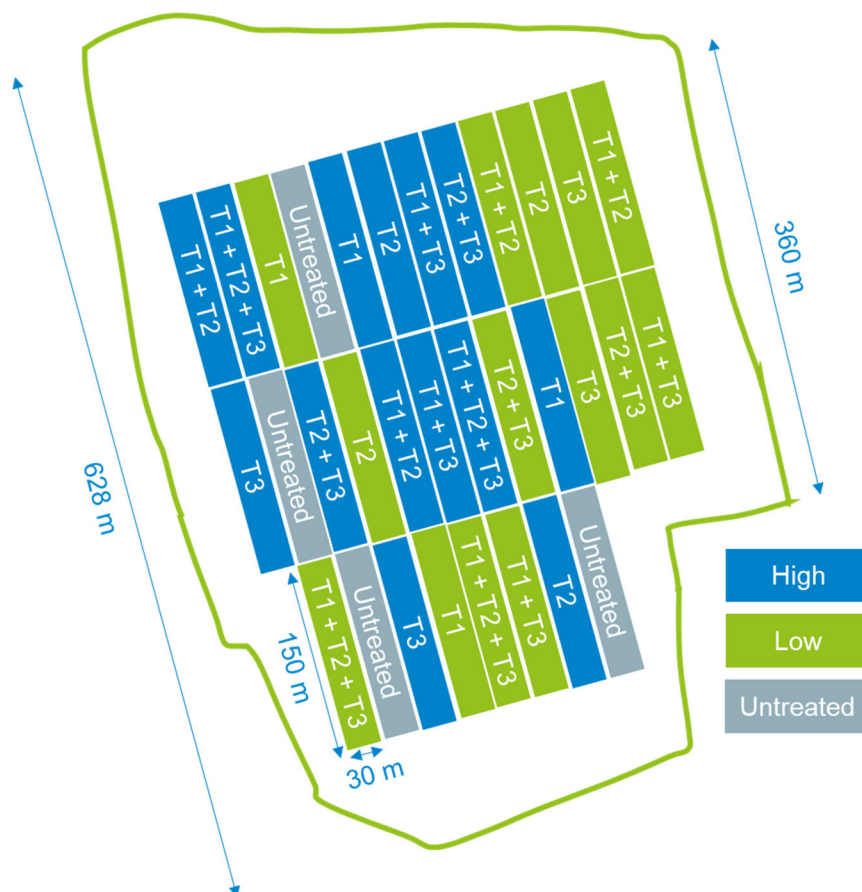
In 2018-2019 the Strategic Cereal Farm East investigated the impact of fungicide inputs on five winter wheat varieties: Siskin, Shabras, Graham, Santiago and Silverstone. The trial results, which are available [online](#), showed that growing more resistant varieties with low fungicide inputs gave the best net margin. However, this was a single year with moderate disease pressure and therefore the trial has been repeated for harvest 2020.

The Strategic Cereal Farm East would like to develop a trial for harvest 2021 to investigate the effect of application timing at two input levels, high and low, in a single variety. AHDB has previously funded research trials on fungicide doses in sequences and mixtures for winter wheat ([Project code: PR439](#)). This work was completed in 2009, and investigated the effects of using a sequence of two sprays or a mixture of two or more products to develop effective programmes. Work at [NIAB TAG](#) continues to record and monitor yield responses to each of the component spray timings within a fungicide programme. The Strategic Cereal Farm East trial has been developed to investigate the disease control and yield responses to each of the component spray timings and to evaluate the impact on cost of production.

**Trial aim:** To determine the effect of fungicide applications timings on disease control, yield response and cost of production under high, low and untreated agronomy strategies.

## 1.2. Trial design – replicated plot trial

The trial layout provided in Figure 1.1 is provided as a guide does not represent the exact location or dimensions of the trial. Treatments have been allocated to plots using a random number generator.



**Figure 1.1 Managed Lower Input trial layout at Strategic Cereal Farm East**

- Field name: Home Lodge
- Field size (hectares): 25.15
- Soil type: Sandy clay loam
- Harvest 2021 crop: Winter wheat
- Number of treatments: 16
- Number of replications: 2
- Total number of plots: 32

## 1.3. Assessments

Growth stage, NDVI and GAI should be assessed at the following growth stages:

- Crop emergence (GS10)
- Start of stem extension (GS30, T0)

- Stem extension (GS31-33, T1)
- Flag leaf emerged (GS39, T2)
- Flowering (GS61-65, T3)
- Milk development (GS71)
- Harvest

Plot yield data should be collected.

Disease assessments should be completed at the relevant timings shown in Table 1.1.

**Table 1.1 Disease assessments and timings for Managed Lower Inputs trial at Strategic Cereal Farm East**

|                             |  |
|-----------------------------|--|
| At or slightly before GS 31 | Record foliar disease if moderate infections (around 5%) occur in any plot.  |
| GS 31-55                    | An assessment of foliar disease is required if moderate infections (around 5% in untreated plots or 2% in treated plots) develop in any plot. Once infection reaches 5% assessments should be done at least every two weeks, depending on crop and disease progression. Stem disease should be assessed.   |
| GS 55-80                    | Assess all foliar diseases that reach 5% infection in any one plot during this period. Once 5% is reached, aim to assess the trial every two weeks, or frequently enough so that meaningful disease scores can be obtained i.e. the progression of the disease from one assessment to another can be tracked. This may mean visiting the trial more than every 2 weeks, or less than every 2 weeks. It may be appropriate to assess different diseases at different stages within this period (e.g. mildew might be better assessed relatively early and brown rust late). Stem and ear diseases should be assessed. |

When assessing diseases, also record the percentage green leaf area (GREEN LEAF AREA%) remaining on the leaves being assessed. If disease levels are too low for an assessment, please record this in the trial diary.

The successful contractor will be required to provide monthly trials diaries to AHDB. During the period of disease assessment, the successful contractor will be required to provide trials diaries following each assessment.