

P2007349: Assessment and analysis at AHDB Strategic Cereal Farms

Strategic Cereal Farm Scotland: Work package 11 – Soil assessments

11.1 Background

AHDB funds an extensive programme of research and knowledge exchange on soil management. In 2017, AHDB and BBRO funded a five-year Soil Biology and Soil Health Partnership. The Partnership is a cross-sector programme of research and knowledge exchange designed to help farmers and growers maintain and improve the productivity of UK agricultural and horticultural systems, through better understanding of soil biology and soil health. You can find out more information about the Partnership online: ahdb.org.uk/soil-biology-and-soil-health-partnership

Within this Partnership, the researchers have been evaluating the use of simple tools for assessing soil health. The researchers have reviewed what could be measured and how practical it was to measure it before developing a soil health scorecard. You can find out more information about the soil health scorecard online: ahdb.org.uk/soil-health-scorecard

The Strategic Cereal Farm Scotland would like to use the soil health scorecard approach to baseline the effects of contrasting management practices on soil biology and health, in relation to plant health (WP 13). In addition to the soil health scorecard assessments listed below, the Strategic Cereal Farm Scotland would also like to gain a better understanding about the soils capacity to retain and release water.

Aim: To understand the biological, physical and chemical status of the soil.

11.2 Design

Field sites and treatments

13 fields totalling 171.5 hectares:

Field number	Area (hectares)	2019 harvest crop	2020 harvest crop	2021 harvest crop	Zone	Variety
1. Castle Park	14	Spring Oats	Spring Barley	OSR	A	Laureate
2. Tile Park	12	Wheat	Cauliflower	Winter Wheat or Winter Oats	A	
3. Fernie Knowe	6.5	Spring Beans	Winter Wheat	Cauliflower	A	Skyscraper
4. Front Bandon	6	Cauliflower	Spring Oats	Winter Wheat	A	Conway
5. Horse Park	9	Winter Oats	Spring Barley	Spring Barley	A	Laureate
6. Top Boiler Well & Top Strip	12.5	Potatoes	Winter wheat	Spring Beans	B	Revelation

7. Bottom Boiler Well & Bottom Strip	11.5	Winter Wheat	Cauliflower	Winter Wheat or Winter Oats	B	
8. Harbour Hill	10.5	Winter Wheat	Cauliflower	Winter Wheat or Winter Oats	B	
9. East Myres	24	Spring Beans	Spring Oats	Spring Barley	B	Conway
10. Inchcurr Gas bank	20	Winter Oats	Spring Barley	Kale/Summer cover crop	B	Laureate
11. Tank Wilsons March	13.5	Summer cover crop after carrots	Winter Oats	Winter Wheat	B	
12. East Bank Treaton	20	Winter Wheat	Kale/Summer cover crop	Spring Oats	B	
13. Castle Heggie	12	Cabbages	Spring Barley	Spring Oats	B	Laureate

11.3 Assessments

Proposals should include a time schedule and protocol (including number of samples and analysis) for the following assessments in accordance with standard operating procedures and to address the aim of the baselining.

Soil health scorecard:

- soil organic matter (measured as loss on ignition and dumas)
- pH
- extractable P (Morgans), K and Mg
- VESS score
- earthworms
- bulk density
- penetrometer resistance
- respiration (Solvita test, NRM)
- potentially mineralisable N
- microbial biomass C

In addition to the standard soil analysis, a comprehensive trace element assessment should be completed.

Soils capacity to retain and release water:

- Infiltration rates
- Soil moisture holding capacity