

Strategic Farm East Baselineing 2017-2018

The first year of the Strategic Farm project, known as the baselining year, aims to determine the starting point of a number of indicators within the farmed environment before any changes are investigated and evaluated. The baselining activities completed at the Strategic Farm East September 2017 – September 2018 are shown in the table below.

Baselining assessment	Why should I measure it?
Weather station	To provide information on, but not limited to: wind speed, rainfall, temperature, humidity, solar irradiance and soil moisture. The data received from the weather station can provide useful information on crop performance and soil conditions for cultivations and drilling.
Soil nutrient analysis	Includes: P, K, Mg, pH, copper, boron, iron, zinc, organic matter, sodium, calcium, molybdenum, estimated cation exchange capacity, bulk density (disturbed soil), chloride (water soluble), available cobalt, organic carbon (by DUMAS method), soil buffer pH and total P, K, Mg and calcium, total Sodium, total sulphur, textural classification of soil and CO2 burst for bacterial activity. Good nutrient management is an important aspect of maintaining an efficient and profitable farm business and reducing environmental impacts. Baselining and monitoring soil nutrients should be part of balanced long-term approach to building a sustainable agricultural system ¹
Soil biology	Includes: includes total bacteria, total fungi, active bacteria, active fungi, hyphal diameter and ratios, protozoa (flagellates, amoebae, and ciliates). Soil physics, chemistry and biology are interlinked and all play a role in maintaining productive agricultural systems. While physical and chemical properties of soil are relatively well understood, the same is not necessarily true for soil biology ²
Earthworms	Earthworms benefit agriculture by providing several ecosystem services. Improvements in the activity rather than biomass of soil organisms, through the addition of organic matter amendments, is responsible for shaping improvements in soil structure ³
Electrical conductivity scanning	Mapping variation in the apparent electrical conductivity of the soil can be used to define more accurately the boundaries between different soil textures, provided that the soils are mapped at field capacity, and soil pits are dug or cores taken to verify the differences in soil properties. Electrical conductivity is primarily a function of soil moisture and clay content ⁴
Water sampling	Efficient nutrient use ensures maximum benefit is given to the plant and excellent water quality in the catchment. Nitrate leaching losses depend on several factors including crop type, sowing date, soil type, soil structure and the amount of excess winter rainfall (drainage). Drain water sampling allows you to monitor the impact of management practices on water quality. For example, cover crops can be grown to enhance environmental management (including reducing nitrate leaching) ⁵
Physical structure	To achieve optimum economic yields, crops have to acquire sufficient nutrients and water from the soil via the roots. It is important to maintain good soil structure so

	that root growth is not adversely affected by poor physical soil conditions, such as compaction. Improving nutrient availability from well-structured biologically active soils makes better use of resources and economic sense. Developing and maintaining a good soil structure depends greatly on good soil management, including cultivation at appropriate times and depths and minimising traffic over the soil when it is too wet ¹
Crop biomass monitoring	Objective crop measurements are vital to support improved management by assessing crop progress and final performance and comparing to benchmarks or targets ⁶
Black-grass mapping	Knowing your weed burden in a field can aid in the planning of precision weed control and the development of integrated management practices, including the use of several non-chemical methods in combination with herbicides. There is no “blueprint” but measuring and monitoring your population will allow you to tailor approaches to the weed pressure in each individual field ⁷
LEAF Sustainability Review	To fully review practices and management, as well as understand and benchmark your farm performance in nine areas of integrated farm management: 1) organisation and planning, 2) soil management and fertility, 3) crop health and protection, 4) pollution control and by-product management, 5) animal husbandry, 6) energy efficiency, 7) water management, 8) landscape and nature conservation, 9) community engagement ⁸

...Further reading

1. Nutrient Management Guide (RB209)
2. Project number 91140002 Soil Biology and Soil Health Partnership
3. Project report number 576 Improvement of soil structure and crop yield by adding organic matter to soil
4. Research review number 71 An up-to-date cost/benefit analysis of precision farming techniques to guide growers of cereals and oilseeds
5. Research review number 91 Use of autumn nitrogen in no-till farming systems
6. AHDB Wheat growth guide
7. Information Sheet 30 Black-grass: solutions to the problem
8. Linking Environment And Farming

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For more information on this work, including the providers of the assessments completed at the Strategic Farm East, please contact Emily Smith, Knowledge Transfer Manager Arable, T: 07790 948 248, E: emily.smith@ahdb.org.uk

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