

## Approaches to cultivation research

This is a long term study looking at cultivation approaches and exploring the interaction between cultivation intensity and cover crop use. The research uses a single rotation – based on winter wheat with spring sown break crops – in a fully replicated experiment on large plots using commercial machinery.

The study compares four levels of cultivation intensity; plough, shallow non-inversion (ca.  $\leq 10$  cm), deep non-inversion (ca. 20 cm) and a managed regime (decision decided annually based on prevailing conditions and soil measurements). Each of these approaches is repeated with and without the presence of a brassica cover crop ahead of spring sown crops.

Relative yield return indicates that the plough tillage approach results in increased yields compared to other cultivation approaches whilst the highest margins are associated with the deep tillage approach. In winter wheat recent findings have demonstrated improvements in performance, yield and margin associated with cover crop use in the rotation, notably where used in conjunction with shallow tillage approaches.



National Agronomy Centre

## NEW FARMING SYSTEMS

### Further information

For further information on the NEW FARMING SYSTEMS Project please go to the NIAB website ([www.niab.com](http://www.niab.com)) alternatively email [nac@niab.com](mailto:nac@niab.com) or call 01953 713200.

### The NEW FARMING SYSTEMS Project is

managed by NIAB TAG in conjunction with an independent advisory group and supported by The Morley Agricultural Foundation and The JC Mann Trust. The NFS project also contributes to a range of other research programmes, including the HGCA-AHDB funded Soils Platforms Project.



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## NEW FARMING SYSTEMS

### Bio-sustainable systems for conventional arable cropping

The New Farming Systems (NFS) project is a series of experiments and system demonstrations.

The project aims to explore ways of improving the sustainability, stability and output of conventional arable farming systems. The research is being undertaken on a sandy loam soil at Morley in Norfolk.



## NEW FARMING SYSTEMS (NFS) Project

The project began in 2007 and delivers several ongoing, large-scale fully replicated, rotation projects focusing on improving sustainability, resilience and output. The main research themes are:

1. Fertility building and cover crops: the evaluation of the potential fertility building benefits of cover crops and/or legume bi-crops within rotation systems;
2. Soil amendments: determining the value of amendments to soils and rotation systems;
3. Cultivations: examining cultivation suitability within defined approaches. *(Separate fliers are available on each research theme)*

Two additional studies began in 2011:

- **MORE (Manure and Organic Replacements Experiment):** looking at a wider range of soil amendment approaches and comparing these to the use of bagged nutrients;
- **LESS (Low Energy Sustainable Systems):** a field scale demonstration study putting some of the elements of the individual replicated studies into practice.

The NFS project also includes a range of other associated experiments and some shorter studies. Our research has mainly assessed the impact of crop management and rotation systems on crop yields and margins, and the physical structure, water and nutrient status of the soil.



### Fertility building and cover crops

This is a long-term rotational systems experiment examining how novel approaches to cover cropping might contribute to fertility building in arable systems. It contains three crop rotation approaches, based around winter wheat with differing break crop approaches, three nitrogen (N) regimes and four cover crop management systems.

The cover crop management approaches specifically explore the use of long term clover bi-crops, as well as brassica and legume mix based cover crops, sown ahead of spring sown crops in the rotations.

Recent findings have demonstrated improvements in soil structure, e.g. reduced bulk density and improved water infiltration rates, and improved yield and margin over nitrogen responses associated with specific cover crop approaches.

### Soil amendments

This NFS project examines the use of green waste compost in three rotation approaches, based around winter wheat and spring sown break crops, with or without the use of a brassica cover crop ahead of the spring cropping, and a third approach based on continuous wheat.

The experiment is a factorial design, with four replicates, that received annual additions of green waste compost (ca. 35 t/ha) over a four year period between 2007/08 and 2010/11. Recent findings have demonstrated greater water infiltration rates and soil nutrient/organic matter levels associated with the use of compost and yield improvements from specific approaches.

