

## **Leg LINK Project**

*Using legume-based mixtures to enhance the nitrogen use efficiency and economic viability of cropping systems*

### ***Abstract***

Many successful low-input and organic farming systems rely on a legume-based fertility-building ley phase as an alternative to mineral N applications, and there is increasing interest in applying these systems more widely. Incorporation into soil is the first stage in making the accumulated fertility within the residues of the legume(s) and grasses available to the following crop. However, significant N losses occur post-incorporation; a result of the lack of synchrony between the flush of N released and the N demands of the subsequent crop. The rate, timing and quantity of N release from the plant residues are partly driven by the residue composition. As this depends on the species present in the ley phase, there is limited potential to manipulate the residue composition of the commonly-used rye grass/white clover mixtures. However, exploiting the variation in residue composition by using a complex mixture containing a large and diverse range of species offers greater opportunities to influence residue inputs, potentially reducing N losses and increasing productivity of the following crop. In addition, species-rich mixtures may have increased quantity and stability of biomass production, reduced N losses and other important benefits.

This major new project explores how the exploitation of plant facilitation may improve the efficiency and stability of resource use within temperate arable farming systems.

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