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Category: Research: Project Summary
Key words: oats, organic, conventional, poultry feed, quality

Project Title: **The incorporation of important traits underlying sustainable development of the oat crop through combining 'conventional' phenotypic selection with molecular marker technologies**

Short Title: OatLINK

Project Code: OatLINK

Website: http://www.iger.bbsrc.ac.uk/oatlink/

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Project Partners:

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British Poultry Council: Peter Bradnock
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Start Date: April 2004

End Date: April 2009

Funder: Sustainable arable LINK project (Defra)

Key Words: oats, organic, conventional, poultry feed, quality, LINK, Defra

EFRC Programme: Cereals

Project Aim: Investment from Industry and Government is needed to incorporate important traits underlying sustainable development of the oat crop through combining conventional phenotypic selection and molecular marker technologies, in order to allow more effective selection for key traits within the context of a real breeding programme and diverse production systems.

Abstract of Research: This proposal seeks to maintain and increase the value of oats as a profitable component of conventional and organic production for human and livestock consumption. A LINK project will capitalise on a range of previous separate contracts with DEFRA, HGCA, Semundo and BOBMA. The previous work, which in the past has almost wholly used conventional selection, has collectively brought about significant advances which have opened doors to the greater acceptability of oats. New varieties have made oat growing easier and more profitable, and are largely responsible for the average national yield of oats being above that of barley in recent years. We need to build on these advances, through scientific approaches and shared investment through LINK combining the various, yet synergistic, industrial interests to exploit the real opportunities for oats as a crop, while focussing genetic improvement on differentiated quality markets. Following lengthy discussions of industrial needs, a meeting of the consortium chaired by HGCA produced strong industrially-focussed requirements.

Although conventional farmers, organic farmers, millers and poultry producers have different aims, there is also much in common in terms of the need for economic competitiveness, good agronomic and disease characteristics and the sharing of molecular markers. Therefore, the objectives of developing marker-assisted selection and using it and phenotypic selection to develop and test oats for the milling and poultry industry have been brought together in a single albeit large LINK project with strong industry pull rather than splitting the work into two or more projects. The real investment in the development of the oat crop is still much less than that reported for a single wheat breeding programme, namely £3.3m per year by CPB Twyford. Ideally, the project would include go from laboratory to digestive system but this would make it horrendously large and expensive. There is a small amount of work on identifying markers for high beta-glucans. From the consumer viewpoint, the thrust of the project is to meet the needs of sustainable agriculture and to produce safe food.

Objectives:

1. To develop new molecular markers, UK mapping populations and contrasting bulk segregants for use in marker-assisted selection (MAS) of important traits.
2. Identify, incorporate, select and evaluate important traits for sustainable production and human consumption.
3. To identify, incorporate, select and evaluate important traits for sustainable production and premium livestock feed.
4. To identify, incorporate, select and evaluate important traits for organic production.

The main effort will be on winter oats, with some attention to spring oats in view of the continuing interest in this crop in terms of cultivation in less favoured areas of Britain, including Scotland, and for feeding livestock particularly in organic systems with positive effects on avian and rare weed biodiversity in grassland-dominated areas.

Expected Benefits:

- the identification of new lodging, disease resistant milling quality husked oats protecting and enhancing oats' image and markets.
- the entry of oats into least-cost formulated poultry diets resulting from the identification of molecular markers for added-value traits for sustainable production and premium livestock feed.
- a profitable and sustainable break crop meeting the needs of farmers, industry and society, in arable, mixed farming and organic systems
- Taking the oat area from 100,000 to 400,000 ha.
- The identification of oat varieties that meet the requirements of organic production.
- Meeting the special needs of Scottish farmers and millers

Output:

- Pepler, S., Hinchsliffe, K., Valentine, J., Cowan, S. and Cark, M. (2005)Working Together for Organic Oats. Poster at 'Cereals 2005, Cambridgeshire, UK, 15-16 June 2005.