

Projects on Industrial Uses of Wheat (non food)

These projects are funded through the Defra Agro Industrial Materials R&D Programme and include:

- Fully funded Defra projects
- Projects co-funded by industry (namely through LINK)

The projects

- Were selected in open competition or applied for LINK grants (CIMNFC, STI, SA).
- Must be market driven, and demonstrate industrial pull.
- Focus primarily on development and improvement of materials and processes, not the crop.
- Tend to consider wheat as a commodity, and exploit alternative uses for both the **grain** and the **straw**.

Uses of Straw

- **Conventional uses include straw bales, pressed straw panels and thatch in construction.**
- **Current projects include:**
 - **Strawfrac**
 - **Fibre Packaging**
 - **(Minimills)**

Strawfrac

LK0806 - The sequential extraction of value added products from wheat straw

Start date: 10/01/2000 End date: 31/10/2003

Objective: to develop a process that would sequentially extract the straw components by increasing the stringency of the extraction conditions.

Contact: BioComposites Centre



Fibre Packaging

LK0818 - Novel Processing of Cereal Straws for Fibre Packaging Materials

Start date: 01/10/2003 End date: 30/09/2006

Objective: To address the key issues that restrict industrial utilisation of straw fibre composites in moulded packaging by:

- developing a novel extrusion steam explosion (ESE) technology.
- developing a new gel-moulding process and modifying existing bioplastics with straw fibre.
- Performing a life cycle analysis (LCA).

Contact: Brunel University



Uses of Grain

Starch is a main component in the wheat grain, and at the centre of the industrial applications targeted by ongoing projects. These include:

- Green grain
- Biodegradable foams
- Modified starch

GreenGrain

LK0959 - Genetic Reduction of Energy use and Emissions of Nitrogen in cereal production

Start date: 01/07/2004 End date: 30/06/2009

Objective: To enable development of high-energy wheat varieties with enhanced value for distilling (bioethanol and potable alcohol production) and non-ruminant feeding, and with reduced input requirements, especially of fertiliser N.

Contact: ADAS



Biodegradable foams

LK0819 - Biodegradable foams based on wheat flour - from materials processing to modelling and design for packaging

Start date: 01/03/2004 End date: 28/02/2007

Objective: to develop processing technologies and a model for foams based on wheat flour in order to assist packaging design and facilitate more widespread exploitation of the new materials to replace less environmentally friendly and less sustainable oil-based polymer foams.

Contact: Brunel University



Modified Starch

NF0608 - Modified starch containing silane moieties

Start date: 01/11/2004 End date: 31/10/2005

Objective: to develop environmentally friendly technology for production of silylated starches and to develop the use of silylated starches in paper, paint, and other composites.

These chemically modified starches have properties that make them particularly suitable as fillers in polymers. They can be used in: tyres, paints, paper, foam packaging, lightweight concrete, etc

Contact: BioComposites Centre

Issues to remember

- There are many possible non food uses for wheat, and industry uptake is at an embryonic stage.
- The viability of each possible use depends on the feedstock, and comparative performance with existing alternatives.
- The requirement for wheat specially suited to specific industrial uses will arise when viable supply chain are established.