

# Organic cereal variety and mixtures trials

**Funder:** Sheepdrove Trust  
**Lead Organisation:** IOR-Elm Farm Research Centre  
**Start Date & Duration:** October 2002; 60 months

## Overall Aim

To improve the productivity and stability of organic cereal production by identifying cereal varieties and variety mixtures that demonstrate the best adaptation to organic farming systems.

## Abstract of Research

A major limitation for organic producers in the UK is the lack of information on the relative performance of modern crop varieties grown under organic farm conditions. To address this, a number of organic cereal variety trials were established on organic farms in the south and east of England. The aim is to determine the relative performance of leading cereal varieties grown under organic conditions and to provide background information for potential breeding programmes. Additionally, it is well established that mixtures of cereal varieties grown in the field can have positive benefits over pure stands in terms of disease and pest restriction and buffering against variation in environmental conditions. Therefore, mixtures of selected varieties have been included within the trials to quantify this benefit.

## Objectives

1. To determine whether the relative performance of leading cereal varieties grown under organic conditions correlates with their relative performance under non-organic conditions.
2. To determine whether mixtures of selected varieties offer greater benefits in terms of disease and pest resistance compared with growing pure stands alone.

## Project Progress

The project has now entered its fifth year of variety and mixtures trials. The results to date have confirmed the advantages of variety mixtures such that weeds, pests and diseases are suppressed to a greater extent than is observed in the pure variety stands, whilst grain yield and quality is generally improved and, more importantly, shows greater stability between seasons. In terms of the performance of single varieties, some appear to do consistently well (e.g. biscuit wheat variety Claire), whilst others are much more variable (e.g. bread making variety Malacca). The considerable underlying variation that occurs on organic farms often means that the ranked order of variety performance can vary considerably between replicates in an individual experiment. This is reflected in relatively high coefficients of variation and lack of statistically significant differences between varieties. Therefore, the trials serve to screen out consistently poor varieties and highlight particularly good ones, but cannot discriminate between those showing a more intermediate response.

## Expected Benefits

- The project will provide farmers with detailed information that will assist them in selecting the most appropriate cereal varieties to grow in their systems.
- Through the inclusion of variety mixtures in the trials, it should be possible to demonstrate a number of key advantages that mixtures have compared with growing single varieties in terms of improved grain yield and quality and restriction of weeds, pests and diseases. If this is successful, it will provide farmers with a cost effective means of overcoming a number of their agronomic constraints and should increase productivity.

## Project Output

Welsh JP, Wolfe MS. 2002. The performance of variety mixtures and the potential for population breeding in organic farming systems. *Proceedings of the ECO-PB Symposium: Organic seed production & plant Breeding – strategies, problems and perspectives*, Berlin. In Press.

Welsh JP, Wolfe MS and Pearce BD. 2002. The performance of cereal varieties under organic systems in on-farm trials in England. In: *Proceedings of the 14<sup>th</sup> IFOAM World Congress*, Canada. In Press.

Welsh JP. 2002. Cereals Research. *EFRC Bulletin Special Edition*, June 2002.

Welsh JP & Phillips SL. 2002. The Variety of Varieties. *EFRC Bulletin* **64**: 9-13.