

Cereal varieties for organic production: developing a participatory approach to seed production and varietal selection

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Collaborators: IOR-Elm Farm Research Centre HDRA, NIAB, Kingston University, Middlesex University
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Overall Aim

To develop a robust system for identifying, testing, multiplying and marketing cereal varieties, lines, mixtures and populations best suited to organic production in different parts of the country.

Abstract of Research

Participative approaches to agricultural research and development are now extensively used throughout the world to help define and address the practical research needs of farmers. They have proved useful in solving practical problems in complex and diverse farming systems, characteristics typical of organic farming systems.

This project aims to build on past experience and develop appropriate participatory methodologies that involve farmers and specialist researchers, seed suppliers and arable marketing cooperatives working in partnership on varietal performance and seed quality research. This is an issue that has been identified by ongoing participation in Elm Farm Research Centre's farmers groups. Farmers will be involved in developing the methodology of the trials, establishing the measurement criteria, running the trials and evaluating both the trails and the methodology. The research process will be closely monitored throughout and the methodologies developed will be disseminated at the end to farmers, research scientists and agricultural students. This project will build on the existing relationships with farmer groups built up by Elm Farm Research Centre over many years.

A key constraint identified by organic farmers is the lack of information relating to varietal performance under local organic conditions. Farmers must seek information from a range of alternative sources including their own past experiences and experiments, experiences of neighbouring farmers and advice from agronomists, seed suppliers and grain merchants. However, it is likely that this informal approach could be much improved by integrating the information and needs of all those involved in variety production and use, for example, farmers, scientists, seed suppliers, grain merchants and processors.

A further linked constraint identified by organic farmers is that of quality organic seed production. In non-organic systems seed of many crops is treated prophylactically with agrochemical products regardless of the health status of the seed, and the risks that various levels of infection might pose. Increasingly, this practice is becoming less tenable, and a combination of seed health testing and treatment according to test result, is becoming more common. Even so, this approach is usually confined to the generation of seed used for crop production, and multiplication generations are still treated. In the case of some cereal diseases, there are sound biological reasons for doing this, since the pathogens involved are highly adapted seed-borne fungi that can increase rapidly with each successive seed generation. For organic production, the removal of the derogation allowing the use of non-organic seed from January 2004 means that a minimum of two generations of seed cannot be treated with conventional products.

Objectives

1. Develop a participatory research and development methodology for UK organic farmers using variety trialling and the management of seed-borne disease as examples.
2. Collect information on the range of cereal varieties currently grown by organic farmers to help identify the major priorities and constraints among the varieties available.
3. Establish a pilot programme of cereal variety trials with organic farmers on organic farms using the methodology developed by Objective 1.
4. To obtain information on which seed-borne diseases, including ergot, may cause problems in the organic seed production chain of wheat, barley, oats and triticale, and to examine any relationship between organic husbandry conditions (seed rate, sowing date, rotation etc.) and incidence/severity of disease.
5. Determine whether cultivars with good potential for organic production are resistant to one or more of the seed-borne disease problems.
6. Working with farmers (Objective 1), review and identify a range of organically acceptable seed treatments and processes, considering both chemical and physical methods, and test these under organic conditions to determine efficacy.
7. Formulate a code of best practice for the production of certified organic seed, and for the processing of seed on organic farms.
8. To evaluate the participatory research and development approach throughout the entire research process and produce guidelines and materials for best practice. Data will be collected throughout the duration of the project.

Project Progress

Approximately 80 seed samples, supplied by the Organic Seed Producers Company Ltd., have been tested by NIAB for the incidence and severity of seed borne disease. This, together with agronomic information supplied by the farmers, has allow an analysis of disease incidence and agronomic practices.

A literature has been completed that identifies a range of organically acceptable seed treatments comprising physical (e.g. hot air, hot water), chemical (e.g. acetic acid, mustard oil) and biological (e.g. *Pseudomonas chlororaphis*) techniques.

Trials of quality winter wheat varieties and mixtures are being undertaken by 19 organic farmers in the south and east of England. The trials are in the processes of being assessed and the information will be used to produce robust scientific information on the performance of these varieties under a range of different conditions.

The whole process of the development of these participatory methods have been investigated by the social science partners. A report of their findings with recommendation on how the process could be improved has been produced and is currently being studies and analysed by the project leader.

Three farmer events have been held in this year, two during the summer of 2004 with a third planned for late September to present the information on the project to the farmers and to plan the 2004/05 season.

Expected Benefits

- There will be a number of beneficiaries of findings from this project. Research funders will be provided with a research and development approach that potentially offers rapid solutions for complex practical problems. Farmers will also benefit, as the approaches developed will provide a means for working with and influencing agricultural researchers. Also, the results and findings from the project will address their concerns regarding varietal selection and the production of quality organic seed on-farm.