

# A participatory methodology for large scale field trials in the UK

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**Abstract – Farmer participation was essential in developing a uniquely useful set of wheat variety trials data on a wide range of organic farms over two years. Although the trials were successful, it became clear that some of the participating farmers felt there were some limitations in the process. These included a lack of ownership in the project and a concern for more researcher help. It was clear that a greater time investment was needed at the start of the project to help with farmer understanding and ownership. Despite the negative comments, farmers appreciated their involvement, particularly in contrasting their own views and information with that from the wider scene. Farmer participation is essential for systems-level research and this project helped to develop a small core of trained farmers and researchers<sup>1</sup>.**

## INTRODUCTION

Standard research-led variety trials can be helpful to farmers for indicating the most appropriate varieties to grow. However, such an approach is limited in relation to performance on individual farms, particularly in organic farming. This is partly because of the inappropriateness of currently available varieties and partly because of the wide range of crop variation under organic conditions. One solution is to extend significantly the range of trial sites, but this is beyond the resources of the current research system. For this reason, a farmer-participatory method was developed, to not only reduce the resource burden but also to develop a better understanding of variety testing with farmers. The project was designed also to determine the risks associated with saving seed on organic farms.

Farmer participation in agricultural research and development is now used extensively throughout the world to help define and resolve the research needs of farmers. Such approaches have proved useful in solving problems in complex and diverse farming systems, characteristics typical of organic farming. However, there is limited experience of participatory farming methods within the United Kingdom, in contrast to the extensive work carried out in developing nations (e.g. Okali et al, 1994). Close collaboration between industry and research in the UK has been recognised as important to address some of the demands within agricultural systems (Anon, 2002).

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## METHODS

The project was advertised at farm events to promote participation, as well as by using existing farmer contacts of EFRC. At project initiation, participating farmers were contacted with a letter detailing the project methods, aims and objectives. During the growing season systems factors were determined from the farmers using both telephone and questionnaires. The farmers were interviewed in July or August (prior to harvest) each year to assess their views of the trial, own experimental activities, and learning methods. Dissemination of results was achieved with quarterly newsletters, presentations at two farm open days per year, magazine articles (EFRC publication) and telephone contact.

Seed (25 kg) of the UK bread-making winter wheat varieties Hereward, Solstice, Xi19 and their mixture (1:1:1) was distributed to each of 15 (2003/04) and 18 (2004/05) UK farmers. Farms were scattered between the South East and South West of England; most farmers participated in both years, however not all sites were the same and different fields were used between years. Farmers drilled the seed in large plots (average 125 sq. m.) using their standard methodology within a field containing wheat.

Prior to harvest, at growth stage 93 (Zadoks et al., 1974), researchers made four assessments on each variety, for weed incidence, crop height and ear number. Wheat ears were taken from 1 m<sup>2</sup> within each plot and threshed to give grain yield, thousand grain weight and specific weight. The protein, Hagberg Falling Number and level of seed borne disease were assessed in the laboratory.

## RESULTS

In both years, variation among the varieties proved much smaller than the variation among sites and years. In other words, the trials confirmed, on a large scale, that the genetic variation available among a small sample of modern wheat varieties is inadequate for the variability among organic farming systems. Interestingly, all varieties proved similarly plastic in their environmental response in that, in 2003-4, the trials grouped into short, high yielding in the west and tall, low yielding in the east. This tended to the reverse in 2004-5, but, again, all varieties and the mixture responded in the same way.

### *Farmers' views*

a) Some farmers valued the variety performance data and the effects of variability, which required data from many trials under different conditions. Indeed, some pointed out that even the extended

trial set that was used did not cover adequately the wide range of variables that can be expected. This underlines the need for greater and more relevant genetic variability within and between crops.

b) Farmers were requested to assess the trial plots for establishment, early and late ground cover, disease cover, the number of ears, size of ears, and straw length plus criteria of their own choosing. However, in all but one case there was a reticence to complete these assessments: farmers felt the need for greater researcher-led assistance (full sets of field assessments were carried out by researchers prior to harvest). Concern for more researcher involvement raises the questions of the understanding by farmers of the participatory approach (or of the ability of the researchers to explain it) and of the level of ownership of the project by the farmers.

It was clear in relation to this project that the 'balance of power' between farmers and researchers favoured the researchers. However, an imbalance in one direction or the other is inevitable and dependent on the nature of the project. For example, in a sister project on weed control in organic farming systems, also DEFRA-funded, it was clear that for some aspects, the project was much more dependent on farmer rather than research inputs.

c) A number of farmers appreciated the detailed comparisons of the varieties in that it helped them to recognise the difficulty of trying to reconcile the appearance of varieties in the field with their final performance. This was a valuable lesson in relation to interpretation of farmer's own trials. The overall variability also helped farmers to appreciate the problems involved in trying to incorporate further new varieties into successive trials.

#### *Researchers' views*

The field data revealed the value of the diverse range of trial sites, demonstrating the genotypic limitations of current winter wheat varieties in organic systems. The large number of seed samples from the different farming systems, also demonstrated that there can be a threat from seed-borne diseases on organic farms, but it is limited. The major conclusions derived from this project would not have been possible without farmer participation.

The researchers became increasingly aware, throughout the project, of the importance of the investment of time into the participatory approach at all stages (see Methods). The timing of the interactions between researchers and farmers was vital; interviews must take place if possible when the workload is at a minimum. Also, the 'open' interview technique is easily disabled by interruptions. A number of farmers requested previous year's trial results prior to drilling in the subsequent year; a rapid turnaround of trial data is necessary to ensure the information is of greatest value to the grower.

#### CONCLUSIONS

The participation of farmers in agricultural research ensures that the outputs are of direct relevance to farmers. The level of participation can vary however (Biggs, 1995) depending upon the research objectives, and partner expectations. Often, there will be

a positive correlation between system level and the need for, and value of, farmer participation.

New and valuable information was produced that could not have been produced in any other way and both researchers and farmers valued the information on winter wheat variety performance under a range of organic farming systems. For the individual farmers, the data provided a reference for their own farming systems. Innate curiosity about the abilities of others has been described before as a driving factor for benchmarking in agriculture (Kragten & de Snoo, 2003).

This project used one possible method for participatory research, and provided some valuable insights for future trial designs. Interviews with farmers were designed to be open discussions and also explored the farmer's own experiments and activities. By necessity, these interviews were carried out at harvest, and were thus limited by other time demands on the farmers. Better feedback could have been achieved at farmer meetings and field days. The farmers who were interviewed generally considered informal discussions at farm walks and research institutions, as the most useful. However, the turnout for events advertising this research project and related work was poor.

The project also failed to engender a sense of ownership with most of the farmers, clearly demonstrated by the disappointment in the relative contribution of researchers and the desire to have a 'standard' trial design at each site.

The solution is firstly, to spend more time in introducing the project and its objectives and in discussing and developing the trial design. Secondly, it is important to recognise and recruit farmers, and researchers, who have a high willingness and ability to participate. Initial meetings should ensure that a common understanding is reached between farmers and social and field scientists. The meeting should take place at an off-peak time of year, and include inducements such as other presentations. However, the project did develop a useful set of working relationships (farmer-researcher; farmer-farmer and researcher-researcher) which should be exploited in further project development.

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