

Innovation in organic vegetable growing

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Summary

Innovation is essential to allow organic vegetable growers to continue to develop in response to a changing market and environment. This paper examines uptake of innovations amongst a group of organic vegetable growers over a period of three years. The study revealed that innovations in a wide range of disciplines were carried out and that both small and large farms were active in pioneering innovations. The drivers behind innovation and the various factors influencing uptake and implementation were varied and complex and are discussed here.

Key Words: Organic, vegetable, innovation, participatory, network

Introduction

All businesses and farms need to innovate in order to keep moving forward and survive. A previous study (Firth *et al.*, 2004) identified that many organic growers are particularly innovative and that for the industry to move forward, further work was required in order to 'capture', evaluate and disseminate these innovations to a wider audience. A network of ten organic vegetable growers was set up as part of a DEFRA funded project (Sustainable Organic Vegetable Systems Network) with the aim of evaluating innovations through participatory trials with the farmers. Such an approach has been successful in other farming networks (Sukkel *et al.*, 2006) and is thought to be particularly applicable to organic vegetable growing as many of the answers to problems require in-depth knowledge of the specific farm systems and therefore the growers themselves are likely to develop the most appropriate solutions. This work presents an evaluation of the innovations carried out by the group described previously.

Methodology and Approaches

A number of key activities were carried out to address the aim of the project:

1. A farm development needs analysis was carried out amongst the growers. Needs were prioritised within the group.
2. Innovations already carried out by growers were evaluated through observation and semi structured interview.
3. Key innovations were trialled by growers in areas that were prioritised in the needs analysis.
4. Information was disseminated through open days, leaflets and websites

Farm development needs analysis

Growers identified needs across a wide area including soil fertility, control of pests, weeds and

diseases, marketing and growing new crops. However common key themes emerged which were popular amongst the growers. These were: use of green waste compost, use of green manures, using companion plants for pest control, selling to alternative markets and providing price information for organic vegetable growers. Growers expressed the need for further information on these topics in a ‘digestible form’, in the form of leaflets, websites and open days.

Evaluation of innovations already carried out by growers

A key aim was to capture innovations already carried out by growers and document them more fully. Innovation took place in a wide range of subject areas and these are summarised along with key needs, drivers and outcomes in Table 1. This showed that the drivers for carrying out innovations were varied and complex. An interesting observation was that both small-scale growers and larger growers were active in carrying out innovations and some of the small farms demonstrated some of the most innovative and sometimes greater risk taking behaviour.

Table 1. *Summary of innovations carried out by growers*

Subject area	Key needs	Key drivers	Outcomes
Growing new varieties	More local information through participative trials	Current varieties unsatisfactory; keep ahead of the market; forced through lack of availability	New varieties constantly tried and tested
Growing new crops	More information on rotational planning and growing crops	Market demand, ‘wanted a challenge’	Increased diversity of crops on most farms
Marketing	More information on current farm gate prices	Change in market demand, current market channels (packers) becoming financially unviable. Lack of price information	Supplying to new channels: farm shop, box schemes, public procurement; setting up price exchange group
Pest control	More information on these techniques	Need for more cost effective measures against pests	New measures tried: attractant strips, sacrificial crops, companion plants
Weed control	More information on setting up weeding machinery	Need for more cost effective weed control measures	Developed new weeding machinery, new planting techniques (sweetcorn sown in modules)
Soil fertility	More information on use of green waste compost, fertility building crops and green manures	Increased difficulty in sourcing local animal manure	Tried green waste compost, new fertility building crops

Observations amongst growers showed that the way in which innovations were adopted could be put into one of the following categories:

1. ‘Reactive innovations’ were adopted rapidly with no form of evaluation first. The drivers were often a disastrous performance in one season, or a change in circumstances forcing an innovation to be adopted rapidly.
2. ‘Development innovations’ were characterised by some form of evaluation before they were put into commercial practice. The main drivers for these were the need to improve current practice to stay ahead of the market.
3. ‘Exploratory innovations’ were new practices tried out of curiosity or because the grower felt he needed a challenge.

Some examples observed amongst the growers are presented to illustrate the way in which innovations were taken up. Growing new varieties was an innovation that was carried out by all growers during the monitoring period and showed examples of ‘development’ and ‘reactive’ innovation. Many growers carried out ‘development’ innovation in order to improve the varieties that were grown. These were carried out in the form of small variety trials. The extent of these

varied from ‘sticking a few plants in the corner of a field to see how they do’ to full scale field trials. Examples of larger scale field trials were observed on both smaller and larger farms, and attitude of the farmer was important in determining how an innovation was adopted.

‘Reactive innovation’ was observed frequently amongst growers in adopting new varieties. Again attitude of the grower was important. More impulsive growers would switch varieties wholesale following the poor performance of one variety in a certain season. Often, this change was initiated by the grower feeling the need to change something in response to the poor performance. The other driver observed for ‘reactive innovation’, which was particularly common to organic systems, was lack of availability of varieties, due to none being available as non-chemically treated seed.

Examples of ‘exploratory innovation’ were less common. One grower on one of the smaller farms grew organic asparagus for the first time. This constituted a considerable risk as it is a crop that is difficult to grow organically and requires a two-year lead in period before any produce can be sold. Although it was driven partly by the fact that there was a market demand, the grower stated that his primary reason for growing it was ‘he wanted a challenge’. On this particular farm, the grower had the fewest technical problems with vegetable growing amongst the group of growers surveyed. It is therefore likely that this particular grower felt the additional need for a challenge in order to gain job satisfaction.

Trialling innovations with growers

The outcomes of three innovations trialled with farmers are discussed briefly below. A dual approach was taken with participatory farmer trials set up to evaluate the practical aspects and more conventional trials evaluating the details at the field station at Ryton.

Evaluating module sown companion plants against cabbage root fly

The idea of using module sown companion plants against cabbage root fly came from a plant raiser, who used theory based on work carried out on insect behaviour by Finch and Collier (2003). The effectiveness of the technique was evaluated in a replicated trial at the field station at Ryton and the practicalities were evaluated on four commercial farms. The replicated trial revealed that the method showed great potential as egg laying by the pest was decreased by up to 48%. However participatory farm trials showed that in commercial practice, companion plants were vulnerable to damage by the steerage hoe. Further work is now being done in another project to refine this technique. Full details are published in Rosenfeld *et al.* (2006).

Using attractant plants to increase numbers of beneficial insects in crops

This was driven by the need to find methods of controlling pests without using interventionist measures such as soaps, which can adversely affect predator populations. Detailed trials at Ryton and amongst 179 HDRA members recorded insect visitations and showed that although phacelia was easy to manage and flowered for a long time, other species (corn marigold, coriander and fennel) were more effective at attracting beneficial insects during their flowering period. Growers on commercial farms also reported that strips of umbelliferous species were highly effective at attracting beneficial insects. Further details are in Sievwright *et al.* (2006).

Price exchange group

In 2005 a system of exchanging prices amongst the network growers was set up as a pilot study. This was in response to some growers, particularly those on smaller farms, not having sufficient information as guidelines for setting prices. Growers emailed, faxed or phoned in their prices on a fixed day and these were collated and averages and ranges were sent out the following day. Prices of organic vegetables in supermarkets and wholesalers were also presented to provide a comparison. The exercise was extremely popular with all growers in the group expressing their wish for the group to continue beyond the project. Key outcomes would be to allow growers to track price trends, set production budgets and benchmark the prices they obtain.

Dissemination activities

A number of dissemination activities were carried out to satisfy the need for more information in a digestible form. Open days were carried out on a wide range of subjects and information on innovations was also put on a website (www.organicveg.org.uk). It was noted that most farms were willing to share knowledge on innovation. The only exceptions were situations where a few large farms dominated the market for a crop, so that information that gave a farm the competitive edge was considered highly sensitive.

Discussion

The study revealed that uptake of innovations was governed by numerous factors. Adoption of innovations have often been described using an innovation / diffusion model where ‘pioneer’ farms adopt a technique first and this is then taken up by other growers in the community (‘early’ and ‘late’ adopters) (Padel, 2001). Even within this small group of organic growers, a diverse range of attitudes to innovations were observed with growers displaying the characteristics of pioneers, early and late adopters. Interestingly, farm size did not appear to be a highly important factor as both large farms and small farms were active in taking up innovations, with some of the small farms showing some of the most pioneering, risk-taking behaviour. This is contrary to work by Rogers (1983) who suggested that larger farms may be more active in taking up innovations. The extent to which innovations may diffuse into the community may be limited by a number of factors. In many areas of the UK, organic farms are still relatively isolated and the geographical spread may be a hindrance to diffusion of information. Also the small size of the market means that often, only a few large farms dominate the packing market for some crops. This makes the market far more competitive than the conventional market and diffusion of information through knowledge sharing may be less likely to happen in this circumstance.

Similar networks in other countries have adopted a participatory approach in order to promote innovation (Sukkel *et al.*, 2006). The BIOM network has operated with over 40 farms in the Netherlands and has been successful in promoting a number of innovations. The participatory approach to trialling innovations showed a number of strengths and weaknesses. Its key strengths were: it was more relevant to real farm situations; it incorporated farmer and local knowledge; information reached the farmer directly. Its main weakness was that it was less easy to control and less detailed measurements could be taken. Consequently, for a number of trials, it was found that a dual approach using both a controlled replicated trial and participatory trials with growers was a highly effective method of evaluating innovations.

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