

VEGETABLE VARIETIES FOR ORGANIC PRODUCTION

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Vegetable variety trialling provides potentially valuable information that allows growers to select varieties suitable for their production needs and market outlets. Many old and new vegetable varieties are offered for sale in each season and consequently growers need advice on varietal characteristics and performance in order to choose the most suitable ones. Before choosing, growers should decide which varietal characteristics are appropriate for their marketing strategy. They should also identify what pest, disease or growing problems might be encountered within their particular location and production system. They then need to match these requirements with information on varieties in order to choose the ones that will enable them to meet customer specifications, provide the necessary quality characteristics, and be resistant to troublesome pests or diseases.



Dr Gareth Davies, with growers at an HDRA lettuce open day

Currently the main source of varietal information is through seed catalogues, based on information from seed company testing programmes, and through various national testing schemes, normally based on information obtained through trials carried out under the auspices of the National Institute of Agricultural Botany (NIAB). Variety testing trials are normally carried out on research stations or on larger

commercial farms using replicated field trials that provide statistically analysable information on performance. They are often carried out at different sites or in different seasons to get a measure of the reliability of the data and of the adaptability of the variety. General dissemination of trial results is through the trade press, in booklets, in fact-sheets, at open days and by communication between growers.

This system plays a valuable part in helping growers make varietal choices in both conventional and organic growing systems. However, organic farming systems arguably represent a more diverse range of growing environments that might not be adequately represented in the current trials programmes. For instance, varieties adapted to labour-intensive diverse planting regimes, typically selling into farm shops or box schemes, might not be the same as those suitable for large scale production, typically sold through supermarkets. Organic growers also often value varieties for a range of characteristics that are not so important in conventional systems and often difficult to quantify in large field scale trials. For example, varietal vigour may be important to organic growers where nitrogen (N) availability is limited. A good root system to access available nutrients can also be important, as can a dense closed canopy with good weed smothering abilities. Pest and/or disease resistance is often important in organic systems where no preventative or curative sprays are permissible or available. Taste and other similar qualities are also very important to organic consumers, and these might not be adequately assessed in large field scale trials. For these reasons organic growers might also need to rely on testing varieties in their own growing

systems as well as using the results from the more conventional testing programmes. Finding out from other organic growers how varieties have performed can also be important.

A dedicated organic vegetable variety testing system has been operating for some years at HDRA in collaboration with NIAB. The original aims of the programme were to evaluate the performance of vegetable varieties under organic conditions (especially for quality, disease resistance and yield) and to



Organic celery variety trials at Hunterpac Produce, Lancs

determine if the characteristics of those that performed best under organic conditions differed substantially from those best suited to conventional production systems. Results indicate that sufficient differences exist to make dedicated organic trials necessary, at least for some key species such as potatoes, carrots and brassicas.

Since 1991 a wide range of species and types have been trialled under organic conditions. These include brassicas (broccoli, brussels sprouts, cabbage and cauliflower), carrots, leeks, lettuce, onions, oriental vegetables, parsnips, potatoes and swedes. The programme has now moved on to evaluate new species and to concentrate on particular aspects of production problems. For instance, current trials are looking at slug resistance in a range of potato varieties as well as celery varieties suitable for organic production and trials on carrots, leeks and lettuce. More detailed results and recommendations arising from this work are available from the information sources given at the end of this article. Some of the highlights of the work and desirable varietal characteristics are outlined below for selected crop types.

Carrot varieties: carrots have been trialled over the past decade or so. Although grown in diverse systems successful varieties usually share a need for good early vigour to emerge quickly and out-compete weeds. A vigorous canopy is also often desirable to suppress weed growth. They might also need to show rapid bulking if late sowing is used to avoid first generation carrot fly attack. Cavity spot and carrot fly are the principle disease and pest respectively of carrot and some more tolerant varieties exist, although no complete resistance is available. In trials internal greening appeared more frequently in organic trials and this might need to be considered, as will susceptibility to fanging and misshapen roots which has also been commonly observed in organic trials.

Varieties can be grouped according to maturity: first early (sown in October under cover for harvest in May), second early (sown in Jan or Feb for harvest in June/July), early maincrop (sown May for harvest in September to November) and Maincrop (sown May for harvest November onwards). Second earlies and early maincrop are often sown in organic systems to avoid carrot fly in which case Nantes varieties are often used. Other types include Chantenay, Berlicum and Autumn King types. Nantes types are more susceptible to *Alternaria* (leaf spot) and Chantenay more resistant. Autumn King varieties tend to more resistant to Motley Dwarf Virus. Nantes can be grown for prepacking and fresh market, Chantenay for fresh market and processing while Autumn King are mainly used for the fresh market.

Lettuce varieties: a large number of lettuce varieties are available as organic seed and although lettuce trialling has been carried out since 1991 only a limited number of the total number available have been tested. All types of lettuce have been trialled including

crisphead, butterhead, cos and leaf types. Important varietal characteristics for successful organic lettuce are vigour and disease resistance, mainly to downy mildew. Fortunately there is a wide range of genetic resistance available in lettuce varieties including downy mildew resistance, aphid resistance (both root and leaf) and LMV resistance. Many of the varieties available are continental types, such as butterhead and Batavian lettuce. Little gem (cos) types are often popular with organic growers. Crisphead varieties have often had difficulty achieving head weights under organic conditions. Due to the wide range of varieties available as organic seed it is likely that growers will have to experiment with a range of varieties and types to find those best suited to their own production systems and markets although the information available from the variety testing programme will certainly help make the initial selections.



Organic lettuce trials at HDRA near Coventry

Leeks: in general, the requirements of organic leek growers match those of conventional growers. The main problems encountered in trialling have been weed control and rust infection. A range of varieties is available to suit different markets, so these should be identified before selecting the variety. Optimum production periods may also vary between varieties depending on the time of harvesting (autumn or spring periods) and this should also be taken into account. Open-pollinated (OP) varieties have been traditionally used by organic growers but current work is comparing hybrid to OP varieties in organic systems. No varieties immune to rust have been identified but some appear less susceptible than others. Although varieties with spreading foliage might offer better weed smother, organic growers might prefer more erect varieties that allow more frequent mechanical weeding without damaging the plants.

Potatoes: are an important crop for many organic growers. Soil-borne disease can be troublesome in organic systems and its management should be an important consideration in crop management programmes. Good, disease-free seed is also important for crop establishment and yield, and chitting is often to be recommended. Selection for potato varieties should include rapid establishment, good ground cover for weed suppression and early tuber bulking and good resistance to pests and especially diseases, of which the most serious is blight.

Further information on the NIAB/HDRA organic vegetable variety programme:

- NIAB produce the Organic Vegetable Handbook, Vegetable Variety Handbook and Potato Variety Handbook. Contact NIAB: 01223 276381 www.niab.com
- Varietal trial fact-sheets. Available from HDC: www.hdc.org.uk or NIAB.
- Open days. Enquire HDRA www.hdra.org.uk/research or NIAB
- Soil Association Producer Guides: www.soilassociation.org
- Organic seed availability at www.organicXseeds.com