

Final Project Report

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Project title

Varieties of field vegetables and potatoes for organic production and marketing

MAFF project code

OF 0142

Contractor organisation and location

NIAB
Huntingdon Road
Cambridge
CB3 0LE

Total MAFF project costs

£ 123991

Project start date

01/06/97

Project end date

01/03/01

Executive summary (maximum 2 sides A4)

Executive Summary

Varieties of six vegetable crops and potatoes were evaluated in organic situations grown in replicated field trials on UKROFS approved organic sites. In most cases the results differed from those which would have been obtained in conventional trials as there was no chemical protection against pests and diseases and lower levels of available nutrients. Organic seed was used where available and a comparison made of the performance of this against conventional undressed seed.

Scientific report (maximum 20 sides A4)

Organic growing of vegetables and potatoes imposes severe restrictions on the treatments which growers can apply to crops to maximise yield and maintain quality. Hence choice of variety is more critical in organic situations than for conventional crops where problems can be solved at a later date by application of pesticides or fertilisers. Varieties are needed that can respond to the sometimes sub optimum conditions that are imposed by the restrictions of organic systems and identification of these are not always evident from trials under conventional conditions. Shelf life of organically grown varieties was also tested.

The objectives of the work were to investigate the suitability of selected varieties of vegetables and potatoes for organic production

Organic seed was used where it was available. When it was not available untreated seed of varieties for which seed is currently being produced organically or varieties which might have characters considered useful for organic growers were used. The selection of varieties was based on advice from a steering group of organic growers and seed producers.

All trials were grown on UKROFS approved sites usually within commercial organic crops. Crops were grown at two sites per year. Over years data is being combined to allow appropriate advisory guidelines to be produced.

Shelf life was tested in chill cabinet or ambient "supermarket" conditions depending on the normal marketing regimes for each crop

Results

- a) **Lettuce** Trials were grown in 1997, 1998 and 1999. A wide range of lettuce types have been trialled including Little Gem, Cos, Butterhead, Crisphead, Batavian and four Leaf types. Most types of lettuce were relatively easy to grow, as the crop is not in the ground for long. Crisp types were most difficult to grow for "Iceberg" presentation, as target head weights are hard to obtain consistently due to lower fertility status of the soils. We achieved 400g in 5 out of 6 trials and 500g twice. Little Gem types are relatively more important to organic growers and Attico a Little Gem type with good downy mildew resistance did well in these trials. There are more genetic resistances to pest and disease available in lettuce varieties than most vegetable crops. Varieties screened differed in tolerance to Root Aphid, Downy Mildew and LMV. One site was on a commercial farm that used Mypex mulch on their crops. This was very successful in preventing weed competition and minimising pest problems. The HDRA trials were planted into bare earth and suffered from slug, Botrytis and rabbit damage at various stages. Organic seed began to be available in 1998 and six varieties were grown from organic seed in 1999. On one occasion emergence and growth from organic seed was inferior to conventional seed. Shelf life was usually good and did not seem to differ from conventional products.
- b) **Oriental vegetables** Trials were grown in 1997, 1998 and 1999. These crops are normally grown in polythene tunnels and these trials attempted outdoor production. A range of mainly brassica types were grown. Most species grew quickly but bolting, flea beetle, Alternaria and powdery mildew were major problems outdoors. Covers and mulches helped with pest protection. Mizuna, Tat Soi and Pak Choi types produced the best results. Chinese Broccoli and flowering Chinese cabbage types were not successful as fertility was too limiting. No organic seed was available. Shelf life varied greatly amongst the differing products e.g. Pak Choi was very good but thin leafed mustards were poor especially when affected with Alternaria or powdery mildew.

- c) **Broccoli** Trials were grown in 1997, 1998 and 1999. Organic conditions seemed to have the following general effects on varieties: Bud colour was paler and more blue-grey, varieties with dark green bud colour would therefore be safest. Vigour was reduced so the more vigorous varieties did better. Maturity was extended with long lengths of cut, a smaller number of varieties and or planting times compared with conventional conditions could provide continuity. Achieving heavy crown weights was difficult due to limitations in fertility. Marathon which is the leading variety for conventional growing was out performed by Green Belt, Decathlon and Triathlon. No organic seed was available. Shelf life was satisfactory especially when wrapped.
- d) **Early Carrots** Trials were grown in 1998, 1999 and 2000. A great deal of information has been learnt about growing maincrop organic carrots from previous work. One of the most important strategies is the avoidance of carrot fly and in maincrop production this is usually achieved by late sowing after the first generation of carrot fly has passed. This is not possible for early production so fleece or mesh covering is necessary for prevention of damage. Time of covering was an issue as it relates to earliness, pest and weed control. In 1999 carrots were successfully harvested in June. Hybrid varieties dominated and none of those available as organic seed performed well. Larger rooted varieties like Gringo, Sirius and Bangor could be added to varieties which dominate conventionally. Shelf life was usually good.
- e) **Parsnips** Trials were grown in 1998, 1999 and 2000. Early vigour and carrot fly were the main issues. Good early vigour allows the crop to keep ahead of weed competition. Carrot fly could prove difficult to control in the future as the crop is slow growing so later planting reduced yields and covers have to be in place for a long season. Hybrids performed best together with larger varieties like White Spear. A larger range of hybrid varieties is becoming available at present. No organic seed was available. Shelf life was affected by the incidence of carrot fly damage.
- f) **Onions** Trials were grown in 1998, 1999 and 2000. A great deal has been learnt about the techniques of growing organic onions from both sets and modules. These methods of establishing the trial are necessary to keep the crop ahead of weed competition. Downy mildew was a severe problem in 2 of the test years and at present there is virtually no successful organic control strategy available. Sets usually performed better than modules in these trials. Produce from all trials was stored in ambient conditions and Stamford was consistently good against early sprouting. Sets often had high levels of rotting. No organic seed was available but some organic sets were used.
- g) **Potatoes** Many varieties are being made available as organic seed which were not suitable for organic production. Stage of haulm removal and physiological age of seed were issues that need attention. Performance on organic sites had often spoiled by non-varietal factors and many growers prefer to use the P & D data from conventional trials. Many new varieties, with claims for suitability for organic production, were tested and proved to be unsuitable due to a range of deficiencies, particularly blight susceptibility.

Currently a very important development which affects this work is the requirement for organic growers to use organically produced seed where it is available. A derogation allows the use of conventional seed where suitable varieties are not available organically. This derogation expires at the end of December 2003 and it may not be renewed unless there are proven shortages. The implications of this are:

- a) there is an urgent need to test what organic seed is currently available as much of it has not been evaluated in any trials
- b) there is an ongoing need to identify varieties that would be useful in organic systems so that organic seed can be produced.

This project provides information to fill both these gaps.

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Technology Transfer

a) events

A successful open day was held each autumn at Ryton Gardens with over 100 attending. Organic produce was also demonstrated at some of NIAB vegetable open days. These were fully covered in The Grower, The Vegetable Farmer and the Farmers Weekly. The Ryton open day was covered in The New Farmer and Grower. A number of presentations were given to potato growers at British Potato Council sponsored grower meetings.

b) reports and publications

Each trial was fully written up in the NIAB one year result series. These are available to NIAB subscribers at the NIAB website at www.niab.com

NIAB
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