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## Variety trials of broccoli in organic farms

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### Abstract

There has been demand in variety trials since official experiments ceased in Finland at the beginning of the 1990-century. After since the variety testing has been done by farmers themselves or in different projects in connection with developing rural areas. One aim of the general project during years 2004-2006 is to unify variety testing practices in Finland. The aim of the organic variety trials on year 2004 was to find good varieties for organic broccoli production and varieties which stand covering cloths as long as possible nearly until harvest.

The organic broccoli farm trials went well and the randomisation could be done as in experimental farms. Good varieties for organic broccoli production could be selected among varieties. Some different growing seasons in addition to year 2004 is still needed. In the farm trials need of research personnel to do planting, harvest and observing was necessary to get strict results. The first years experience is supportive to continue variety and covering cloth timing farm trials in Finland. The unifying practises with all different project cooperative partners sound promising as well.

**Keywords:** variety trial, broccoli, organic farming

### Introduction

Interest toward vegetable variety trials has been big among Finnish farmers because the growing conditions in Finland are different from middle Europe or south Scandinavia. Vegetable variety trials ceased in Finland officially 15 years ago. After since varieties has been tested by farmers themselves or as a part of different projects to develop rural areas. In the projects the information got, has been utilized only by project members and the results has been written for financiers. Some of the results have published in trade papers. In this project one of the aims is to collect different projects working with field vegetable variety trials from different areas of Finland together and unify practices. In the variety trials the example species are carrots for storing, iceberg lettuce and broccoli. The base elements to unifying are old official trial guidelines and Danish practical field trial convention discussed with Gitte Kjedsen Bjørn on summer 2004. Very important have also been discussions with Finnish advisers and farmers.

The aim of the organic variety trials was to find good varieties for organic broccoli production and varieties which stands covering cloths as long as possible until harvest.

### Materials and methods

The growing work was done in two organic farms on 2004 in southern Finland about 115 km from Helsinki north. The farmers had their own habits to farm in the limits of organic farming rules and the research adapted to them. The tested varieties were ‘Alborada’ (Bejo Zaden, standard), ‘Lucky’ (Bejo Zaden), ‘Surveyor’ (Bejo Zaden), ‘Monaco’ (Syngenta Seeds),

'Montop' (Syngenta Seeds), 'Monterey' ( Syngenta Seeds), 'Thriathlon' ( Sakata Seeds), 'Milady' (Seminis) and 'Iron' (Seminis). The seedling was grown in MTT Horticulture research greenhouses for three and half weeks. The seeds were untreated conventionally produced seeds because there were not available organically produced seeds from broccoli for professional vegetable growers. The special licence for the use of conventional seeds was given by the states authority.

The field experiments were conducted on Vehnämäki organic farm in Hauho and Lepaa koulutila in Häme polytechnic University of Applied Sciences, Horticulture Lepaa, Hattula. In Hauho the soil type was fine sand rich in organic matter and pH 6.8. In Hattula soil type was loam clay rich in organic matter and pH 6.9. The fertiliser was composted broiler manure. Total nitrogen added was 170 kg N per hectare before planting. The plant spacing was 50 cm between and 40 cm within the rows in four replicates. There was two planting times (two experiments) because some of the seeds were delayed. Planting was made in Hauho on 1 June and 22 June and, in Hattula 2 and 18 to 21 June. Covering cloth was used in Hauho from 1 June to 9 July and in Hattula 2 June to 6 July. The plant protection was made with covering cloth and Chinese cabbage as a trap-crop. Irrigation was made if needed in Hattula, because the clubroot disease attacked in the end of cultivation. Weeding was made by harrowing and had. Harvest was done by hand from first experiment in Hauho on 21 July to 4 August, Hattula 23 July to 5 August and experiment two in Hauho 16 to 30 August, in Hattula 17 to 20 August. The yield was weighted and quality of broccoli head was observed.

## **Results and discussion**

The weather in Finland was rainy and rather cold during the growing season. Broccoli grew well. The growing time was 51 to 63 days from planting. The earliest was 'Montop' and then came 'Lucky' (55 days). In the second experiment 'Alborada' had 63 days growing time and the others had 60 days in both experiments. The growth was very uniform and the harvest could be done at once or some varieties twice. The quantity and quality was good except some variety had 'cat eyes' or holes in the stem. The broccoli heads were convex, compact, dark green and the buds were small. 'Lucky' had 'cat eyes', the colour of head was spotted. 'Triathlon' had some 'cat eyes' also, but not as much as 'Lucky'. 'Surveyor' had biggest buds and the weight of head was big. 'Alborada' had a lot of lateral shoots. The stem was good in 'Alborada', 'Monterey', 'Iron', 'Lucky', 'Milady' and 'Montop'. In Hattula there were no holes in stems at all in 'Alborada' and in Hauho only some was observed. There were big holes in the 'Triathlon', 'Monaco' and 'Surveyor' stems and that is why their quality was poorer than others.

Total yield of broccoli (Figures 1 and 2) 'Alborada', 'Monaco' and 'Triathlon' in first experiment, was in Hauho more than 18 t/ha and in Hattula more than 12 t/ha. In the second experiment the yield were lower due the late planting time. The covering cloth kept warm near the growth and the small climate was favourable to broccoli. The cloth was taken off because of weeding but in Aaland they used the cloth until the end of growing. They had a cooperation organic broccoli variety trial in Aaland experimental station.

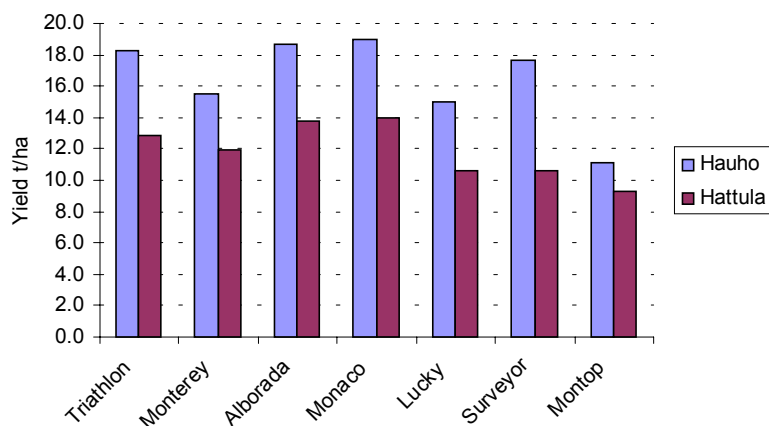


Figure 1. Total yield (t/ha) of broccoli in organic variety trials in Hauho and Hattula Finland in experiment 1 planted on 1 to 3 June 2004.

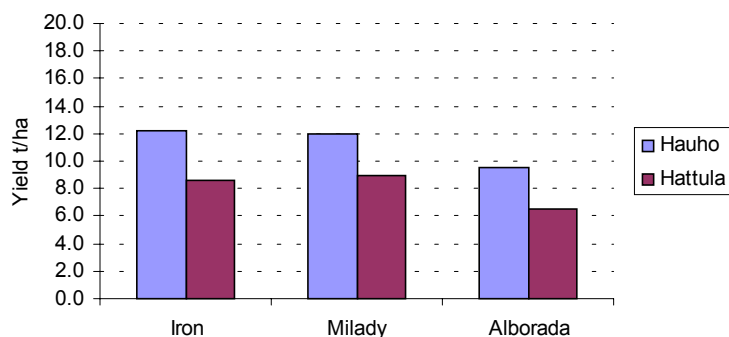


Figure 2. Total yield (t/ha) of broccoli in organic variety trials in Hauho and Hattula Finland in experiment 2 planted on 18 to 22 June 2004.

## Conclusions

The organic broccoli farm trials went well and the randomisation could be done as in experimental farms. Good varieties for organic broccoli production could be selected among varieties. Different growing seasons is still needed to get reliable results. In the farm trials need of research personnel to do planting, harvest and observing was necessary to get strict results. The first years experience is supportive to continue variety farm trials in Finland. The unifying practises with all different project cooperative partners sound promising as well.

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