



## MARITIME ORGANIC SEED TRIALS: BROCCOLI

Interim Research Report E2007-32

### BACKGROUND

The organic seed sector is growing, and every year new cultivars are being released for vegetable crops. Certified organic farmers are required to use organically grown seed when it is available for the crop they are growing. However, organic seed has not been available for many of the favourite cultivars grown by Maritime market gardeners and commercial growers. This year, in collaboration with four Maritime organic farmers, the Organic Agriculture Centre of Canada started a two year research program to explore the current state of organic seed for two vegetable crops. The goal of this project was to evaluate existing and novel cultivars of organically grown carrot seeds to identify the best currently available cultivars for organic production.

### WHAT WAS DONE

The organic broccoli seed trial was conducted at four farms (two in NS and one each in NB and PEI) and at the Brookside Organic Research Site in Truro, NS. Only three sites were used in this analysis; pest damage and crop losses at the other two sites were very high.



Mature broccoli heads (cv. Early Dividend ) were harvested and assessed (R. Beavers)

All cultivars were tested in both a summer (transplanted mid-June) and fall (transplanted mid-July) planting. Seven organically produced broccoli cultivars were seeded at each site, with two conventional cultivars as a standard for comparison (Table 1).

The broccoli seedlings were grown in organic potting mix at the NSAC Greenhouse. Trials were planted and harvested by OACC technicians, and maintained (bed preparation, weeding, pest control) by the farmers at each site. Cultivars were planted in a random order in 5-m long rows. Twenty seedlings per cultivar were planted. Plant spacing varied between sites from 2.4 to 3.6 plants m<sup>-2</sup> to reflect grower practice.

Time and travel constraints meant that it was not possible to harvest all 20 heads at their peak of maturity or determine the marketable yield for all cultivar. Each site was visited 2 – 5 times at harvest and ten mature heads per cultivar were hand-harvested, cutting at 8-in. length.

Table 1. Organically produced and non-organic standard broccoli cultivars tested in this trial	
Cultivar	Characteristics
<i>Non-Organic Standards</i>	
Early Dividend <sup>1</sup>	Early F1 (45 d from transplanting)
Arcadia <sup>1</sup>	Late F1 (69 d from transplanting)
<i>Organically Produced Seed</i>	
Belstar <sup>1</sup>	Midseason F1 (66 d from transplanting)
Calabrese sprouting <sup>2</sup>	Midseason OP (~60 d from transplanting)
De Cicco <sup>3</sup>	Early OP (48 d from transplanting)
Green Goliath <sup>5</sup>	Midseason OP (58 d from transplanting)
Nutribud <sup>1</sup>	Midseason OP (~60 d from transplanting)
Purple sprouting <sup>5</sup>	Late OP
Waltham 29 <sup>4</sup>	Late OP (~75 d from transplanting)

<sup>1</sup>Vesey's Seeds (PE)

<sup>2</sup>Agrestal Organic Heritage Seeds (ON)

<sup>3</sup>Johnny's Selected Seeds (ME)

<sup>4</sup>William Dam Seeds (ON)

<sup>5</sup>Stellar Seeds (BC)

**Table 2. Yield and head characteristics of broccoli varieties from three sites, 2006**

SUMMER	Yield (t ha <sup>-1</sup> )	Head Size (g)	Head Diameter (cm)	Stem Diameter (cm)
Early Div. F1	9.5	223	10.5	3.5
Arcadia F1	10.7	333	12.3	3.8
Belstar F1	11.1	350	11.2	4.0
Calabrese GS	5.5	166	9.4	2.9
Decicco	4.4	139	7.8	2.7
Green Goliath	7.2	232	10.4	3.5
Nutribud	6.7	213	10.5	3.7
Waltham 29	3.4	103	6.9	2.3
<i>Average</i>	<i>7.3</i>	<i>220</i>	<i>9.9</i>	<i>3.3</i>
FALL				
Early Div. F1	10.5	371	13.4	3.8
Arcadia F1	11.2	359	12.3	3.8
Belstar F1	10.6	348	10.4	4.1
Calabrese GS	7.3	226	9.5	3.3
Decicco	6.0	189	9.1	3.0
Green Goliath	10.9	341	11.6	3.6
Nutribud	8.5	267	11.3	3.1
Waltham 29	3.4	109	6.6	2.9
<i>Average</i>	<i>8.5</i>	<i>276</i>	<i>10.5</i>	<i>3.4</i>

Harvest sections were selected based on maturity, avoiding edges. Head weight and the circumference of the crown and stem were determined. A subsample of five heads was used to assess appearance on a qualitative scale for bud size, evenness, colour, and head shape. Statistical analysis has not been completed, but preliminary data are presented.

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## CREDITS

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## PRELIMINARY RESULTS

The conventional hybrid Early Dividend had decent yield (9.5-10.5 t ha<sup>-1</sup>) with large heads of 10-13 cm diameter. The semi-dome shape heads had small, even buds, and were a medium green colour. The conventional hybrid Arcadia was high yielding (10.7-11.2 t ha<sup>-1</sup>), with large heads of 12 cm diameter and thicker stem. The heads were dome-shaped which is preferred for fall production as water will not pool on head and rot is reduced. Heads had small, even buds of a blue-green colour.

Compared to these conventional standard cultivars, the organic seed cultivars Belstar F1, Nutribud, and Green Goliath performed reasonably well. Belstar is a hybrid organic broccoli seed that had high yield comparable to Arcadia, with tight, even buds and a dome shaped head. It is a blue green colour and the stem is very thick. Green Goliath is a popular open pollinated cultivar that had medium-high yields of large heads, but appeared less uniform in terms of maturity. Heads were a semi-dome shape, with some rot in the fall. Nutribud is an open-pollinated cultivar that was bred for nutritional value. It produced average yield of smaller heads, with slightly larger bud size and skinnier stems.

The other cultivars tested were open pollinated, sprouting broccoli varieties. They were generally lower yielding and produced smaller heads than the others. Bud sizes were larger and maturity was less consistent, but they produced abundant side shoots. They might be good choices for producers who prefer smaller heads for bunching or side shoot harvests. Of the three, Calabrese Green Sprouting had the highest yield and largest head size. The cultivar Purple Sprouting never produced a head; it is popular in BC and the UK as a fall-planted crop.

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