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## Brassica Variety Trials 2012

Rebecca Brown

University of Rhode Island, brownreb@uri.edu

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BRASSICA VARIETY TRIALS 2012

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## Brassica Variety Trials, 2012

Rebecca Brown

*Department of Plant Sciences and Entomology  
University of Rhode Island  
Kingston, Rhode Island*

### Spring Cauliflower

Ten cauliflower varieties were trialed in the spring of 2012. Seed was started in the greenhouse on March 30 and seedlings were transplanted to the field on April 29. The harvest period was from June 22 to July 16. Plants were generally disease-free. Cross-striped cabbage worm (Genus species) was the only major insect problem. Parameters measured were: number of heads harvested, head size, and number of culls. Heads were culled due to rot, poor blanching, and extremely small size (buttoning). Some plants failed to head, which is reflected in “percent harvest. “

The two top performers, ‘Apex’ and ‘Denali’, were both late cultivars, peaking on July 16. ‘Apex’ had no culls but only 81% of plants produced heads. ‘Denali’ had 5% culls and 96% of plant produced heads. Denali had excellent cover, resulting in beautiful white heads. The earlier varieties usually had a higher percentage of culls. ‘Fremont’ was the best of the early varieties, with 14% culls, 95% producing, with the majority of the heads maturing between June 26 and July 2. Later heads tended to be cream-colored due to poor leaf cover. ‘Bishop’ was the best mid-season variety, maturing July 2-9. It was similar to ‘Fremont’ with 13% culls and 93% producing, but had better color. ‘Accent’ was a mid-late variety that began harvest July 2 like ‘Bishop’ but continued until July 16; it had only 8% culls and good color. ‘Flamenco’ spanned all three harvest windows with peaks on July 2 and 12. The cull percentage was 13%, and 91% of the plants headed. ‘Flamenco’ had the largest heads, averaging 2.4 lbs, and they tended to be cream-colored rather than truly white, especially later in the season.

Two varieties had excellent germination, growth rate, and heading percentage but produced very poor quality heads. ‘Cheddar’ performed very poorly, with 92% cull heads. Most of the heads rotted from the core outwards and the foliage showed symptoms of *Xanthomonas* blight. None of the other varieties developed similar symptoms, suggesting that the seed may have been infected. Another early variety, ‘Edith’, had 25% culls, mostly due to poor blanching. Both ‘Cheddar’ and ‘Edith’ also had smaller heads than the other varieties, weighing in at 1.2 and 1.7 pounds, respectively. The variety ‘Absolute’ was generally poor, exhibiting problems with germination, head production, and quality.

### Fall Broccoli

The broccoli trial was seeded in the greenhouse on June 13 and transplanted into the field July 22. We also direct-seeded 20 feet of row per variety on June 15 to test establishment from seed. 2012 was a bad summer for both flea beetle and cross-striped cabbage worm, and the plants were under significant

pressure from the time they left the greenhouse. The first spray of Dipel for cross-striped cabbage worm was applied when the transplants were still in the seedling flats, followed by a second application on July 24 along with Pyganic and Surround against the flea beetles. Insect pressure continued and in mid-August we also began seeing, and spraying for, *Alternaria* leafspot. Harvest began September 20 and continued until November 12. The insects were mostly under control before harvest began, but *Alternaria* continued to plague the trial with large numbers of heads culled for head rot in the most susceptible varieties.

Data was collected on total yield, percent culls, *Alternaria* damage, plant size, head characteristics, and uniformity (tables 2 and 3). Yield numbers are standardized to 42 plants per variety (3 plots of 14 plants); the actual number of plants per variety varied significantly due to losses caused by the woodchucks who mistook the hardening-off area for a salad bar. We salvaged as many transplants as possible, but some failed to produce heads. This is represented by the percent heading value.

Green Magic was the best performing variety overall, with 97% of the plants producing harvestable heads, and 97% of the heads being marketable. The medium-large plants were vigorous, and had moderate levels of *Alternaria* damage to the foliage but very little head rot. The heads had short stems, and were strongly segmented with some unevenness of floret height. Green Magic is a relatively early variety; harvest began on September 27 and continued for a month with a peak on October 6.

Other varieties with good levels of marketable heads were the experimental 0788, Emerald Isle, Diplomat, and Lieutenant. All had 81-82% marketable heads. Emerald Isle and 0788 had very little head rot, with most of the culls being tiny heads. Experimental 0788 is a mid-season variety, maturing in October, with short stalks, good tolerance to *Alternaria* and cabbage worm, and 87% of plants producing heads. Emerald Isle is a late-season variety, with peak harvest from October 20 – 26. The heads exhibited a pronounced purpling and the variety suffered significant cabbage worm damage, resulting in only 77% of plants producing harvestable heads. Diplomat is a strong mid-season variety with smooth, bright green heads and good tolerance to *Alternaria* leafspot. Heads are on the small side, although the plants are large, but 92% of the plants produced harvestable heads. Lieutenant is an early variety that gives consistently good performance despite severe cabbage worm damage and moderate levels of foliar *Alternaria*.

The experimental variety 8006 was the prettiest broccoli in the trial. It showed excellent establishment from seed, and produced large, uniform plants with good tolerance to *Alternaria* on the foliage. Percent heads harvested and percent marketable yield were decent – 77% and 73%, respectively. 8006 is a late variety, with first harvest on October 26. The unmarketable heads came primarily from the last harvest on November 12 and were culled for head rot and frost damage.

Some varieties were very disappointing. Santee grew beautifully, but never headed, suggesting that it is sensitive to photoperiod and not suited to fall production in New England. Batavia, Paradiso, Green Gold, Amero, and Fiesta had greater than 50% head rot. Batavia and Paradiso also had significant levels of foliar *Alternaria*, but Green Gold and Fiesta had relatively healthy foliage. Bay Meadows, Amadeus, and the experimental variety 9055 combined high percentages of tiny florets with moderate levels of

head rot to have less than 50% marketable heads. Castle Dome produced only 21% marketable heads. The variety is very susceptible to *Alternaria*, with stem rot as well as head rot and leaf spot. The heads that didn't rot had many dead terminal florets, creating an ugly, rough appearance. This variety exhibited similar problems in our 2011 trial.

### **Brussels Sprouts**

In 2012 we trialed six Brussels sprouts varieties. Doric, Dimitri, and Nautic are F1 hybrid green sprout varieties. Roodnerf is an open-pollinated green sprout; Falstaff is an open-pollinated purple sprout. Flower Sprouts are a new variety that produces miniature kale-like clusters on the stem rather than traditional sprouts. The Brussels sprouts were started in the greenhouse on March 30 and transplanted to the field on April 29, with the exception of Flower Sprouts which was seeded April 26 and transplanted in late May. The plants were topped September 20. Harvest began after the first frost in mid-October and accelerated after the first hard freeze in November. No harvest data was collected.

The major pest problem in the Brussels sprouts was *Alternaria*, which developed in mid-August and destroyed most of the lower sprouts. We were unable to eliminate the *Alternaria* despite repeated fungicide applications. Other problems included *Xanthomonas* infection which damaged Roodnerf and Falstaff, cross-striped cabbage worm damage on the leaves, and stem boring by an unknown insect that led to severe lodging in some varieties. Cabbage aphids were also abundant, although they were partially controlled by the spreader-sticker in the fungicide.

Doric (from High Mowing Seeds) and Dimitri (from Bejo) were the best of the six varieties. They had less lodging than the other varieties, and developed nice, large sprouts. While they were not resistant to *Alternaria*, the two outside rows produced at least 50% useable sprouts, and the inside row at least 25%. Dimitri in particular had very even development of sprouts along the length of the stem. Doric and Dimitri were the only varieties that were worth harvesting. Nautic (from both High Mowing Seeds and Bejo) was more susceptible to both *Alternaria* and lodging than the other F1 hybrid varieties. The outside rows produced only 25% useable sprouts, and the inside row produced none.

Falstaff and Roodnerf, both from Fedco, were extremely disappointing. Both varieties had poor germination, resulting in only 2/3 as many transplants as the other varieties. Symptoms of *Xanthomonas* blight developed on individual plants in June, probably seed-borne. We were able to keep the *Xanthomonas* from spreading to the trial as a whole by spraying Kocide and Regalia, but by mid-August many Roodnerf and Falstaff plants were weak or had died. Falstaff had less damage from *Alternaria* than the green varieties, but approximately half the plants showed signs of tipburn on the upper leaves. Roodnerf was severely damaged by *Alternaria*. By mid-October most of the Falstaff and Roodnerf plants were either dead or fully lodged, and the remaining plants had sprouts that were too small to be worth harvesting.

Flower Sprouts, an experimental variety from Johnny's, was disappointing as a vegetable but has real potential as an ornamental. The plants segregated widely for color, size, degree of apical dominance, and leaf shape, with some resembling Brussels sprouts and others looking like shrubs. Color varied from deep purple to green with magenta petioles and many plants had ruffled leaves. Height ranged

from 2-4 feet when the plants were topped in late September. Flower Sprouts had less *Alternaria* and less worm damage than the regular Brussels sprouts, but were severely infested with aphids. Maturity was highly variable, with some plants having ruptured their sprouts and formed side branches by mid-August and others still not large enough to harvest in mid-October. Prior to frost the Flower Sprouts had an extremely strong mustardy kale flavor, much stronger than the Brussels sprouts. Attendees at the August twilight meeting found it objectionable. The leafy sprouts were completely frost-burned and wilted after the first freeze that was hard enough to sweeten the Brussels sprouts. Flower Sprouts may have limited market as a garnish, but it has real potential as a back-of-the-border plant for annual beds, perhaps combined with New England aster, Rudbeckia, and chrysanthemums.

**Table 1. Cauliflower trial data**

Entry	Source	Head Size (lbs)	% Harvest	% Culls	1st Hvst	Peak	Last Hvst	Comments
<b>Absolute</b>	Harris	2.2	72	21	26-Jun	7/2 and 7/9	9-Jul	poor germination and stand
<b>Accent</b>	Harris	1.9	93	8	2-Jul	7/9 - 7/12	16-Jul	poor cover on larger heads
<b>Altamira</b>	Bejo	2.3	84	6	2-Jul	7/5 - 7/12	12-Jul	very poor germination
<b>Apex</b>	Harris	2.2	81	0	9-Jul	16-Jul	16-Jul	mediocre transplant establishment
<b>Bishop</b>	Johnny's	2.1	93	13	22-Jun	7/2 - 7/9	16-Jul	extended harvest
<b>Cheddar</b>	Johnny's	1.2	100	92	22-Jun	9-Jul	16-Jul	most heads rotted!
<b>Denali</b>	Johnny's	2.0	96	5	2-Jul	16-Jul	16-Jul	excellent cover
<b>Edith</b>	High Mowing	1.7	100	25	26-Jun	2-Jul	5-Jul	poor blanching, rot and slugs
<b>Flamenco</b>	Bejo	2.4	91	13	22-Jun	7/2 and 7/12	16-Jul	creamy color
<b>Fremont</b>	Johnny's	1.9	95	14	22-Jun	6/26 - 7/2	16-Jul	creamy color; poor germination

**Table 2: Broccoli trial plant data**

Variety	Source	Estab. <sup>a</sup>	Plant Size	Uniformity	Alternaria <sup>b</sup>	% Hvstd <sup>c</sup>	Plot Notes
0788	Siegers	42.2	small-medium	variable	4.3	87	little worm damage
7539 SBC	Siegers	15.6	medium	uniform	4.0	71	little worm damage
7540 SBC	Siegers	57.8	small	variable	4.0	63	
8006	Siegers	97.8	large	uniform	4.3	77	large leaves
9055	Siegers	22.2	small	variable	4.0	50	little worm damage
Amadeus	JSS	40.0	large	variable	2.0	86	
Amero	Siegers		small	uniform	3.3	58	
Arcadia	Seedway		medium	uniform	3.0	89	vigorous plants
Batavia	HM, Bejo	33.3	medium-large	variable	2.0	98	lots of worm damage
Bay Meadows	Siegers, JSS	24.4		highly variable	1.0	61	severe worm damage
Belstar	HM, Bejo, JSS	31.1	medium	uniform	2.7	80	
Blue Wind	JSS	31.1	medium	uniform	2.3	90	
Castle Dome	Siegers	46.7	small	variable	2.0	79	severe worm damage
Diplomat	Seedway, Siegers		large	uniform	4.0	92	
Emerald Crown	Siegers	26.7	small	uniform	3.0	82	little worm damage
Emerald Isle	Siegers	44.4	medium-large	variable	3.7	77	lots of worm damage
Fiesta	HM	37.8	medium-large	uniform	4.0	65	
Green Gold	Siegers	31.1	medium	uniform	4.7	78	large leaves
Green Magic	JSS	31.1	medium-large	variable	3.3	97	vigorous plants
Greenbelt	Siegers		medium	variable	2.3	71	
Gypsy	Harris	37.8		highly variable	2.5	83	severe worm damage
Hot Bro	Siegers			highly variable	1.7	76	
Imperial	Siegers	48.9		highly variable	2.3	80	
Lieutenant	Siegers	17.8	medium-large	variable	3.0	88	severe worm damage
Paradiso	Siegers	40.0	large	uniform	1.7	79	
Santee	Bejo	2.2	small	variable	2.0	0	
TX-1	Siegers		medium	uniform	3.7	82	large leaves

<sup>a</sup> Establishment reflects the % seedling emergence of seed planted in the field. Plots consisted of 2 10' rows seeded with a Jang JP-1 seeder at 4" spacing.

<sup>b</sup> Alternaria infection was rated on a scale of 0-5 where 5 indicates healthy plants. Rating was done prior to first harvest and is based on foliar symptoms.

<sup>c</sup> Percentage of the plants of each variety that produced harvestable heads. Some plants failed to head before the first killing frost; others produced only side branches

Table 3: Broccoli trial harvest data

Variety	Head No. <sup>a</sup>	Head Size (kg)	% Marketable <sup>b</sup>	% Head Rot	% Tiny	Head Quality Notes	First Hvst	Peak Harvest	Last Hvst
<b>0788</b>	37	0.15	82	2.9	11.8	short stalks	6-Oct	20-Oct	2-Nov
<b>7539 SBC</b>	30	0.19	55	45.5	0.0	smooth domes	20-Oct	10/20 and 11/2	2-Nov
<b>7540 SBC</b>	27	0.11	63	26.3	10.5	nice	26-Oct	2-Nov	12-Nov
<b>8006</b>	32	0.18	73	13.3	0.0	short stalks; beautiful heads	26-Oct	2-Nov	12-Nov
<b>9055</b>	21	0.14	46	30.8	23.1		2-Nov	2-Nov	12-Nov
<b>Amadeus</b>	36	0.11	36	38.9	25.0	dark green; heads exerted and segmented; leaves in heads	6-Oct	20-Oct	26-Oct
<b>Amero</b>	24	0.12	44	56.0	0.0	purple-green	26-Oct	2-Nov	12-Nov
<b>Arcadia</b>	37	0.09	51	20.5	17.9	segmented and leafy	20-Oct	10/20 - 10/26	2-Nov
<b>Batavia</b>	41	0.14	15	73.2	9.8	short stalks; heads segmented and rough; highly variable size	6-Oct	20-Oct	2-Nov
<b>Bay Meadows</b>	26	0.07	37	14.8	48.1	smooth dome; somewhat leafy	13-Oct	20-Oct	2-Nov
<b>Belstar</b>	34	0.10	55	45.5	0.0		20-Oct	10/26 - 11/2	12-Nov
<b>Blue Wind</b>	38	0.11	36	25.0	0.0	yellow florets; segmented, rough and uneven	20-Sep	30-Sep	13-Oct
<b>Castle Dome</b>	33	0.14	21	44.1	0.0	rough, uneven color, ugly	20-Sep	27-Sep	13-Oct
<b>Diplomat</b>	39	0.10	81	8.3	5.6	bright green; smooth dome	6-Oct	20-Oct	2-Nov
<b>Emerald Crown</b>	35	0.13	70	13.5	16.2	some leaves in heads	13-Oct	20-Oct	2-Nov
<b>Emerald Isle</b>	32	0.10	82	3.0	15.2	pronounced purpling	20-Oct	10/20 - 10/26	12-Nov
<b>Fiesta</b>	27	0.11	38	54.2	8.3	slightly segmented	20-Oct	2-Nov	2-Nov
<b>Green Gold</b>	33	0.14	23	64.5	12.9		20-Oct	10/26 - 11/2	2-Nov
<b>Green Magic</b>	41	0.15	97	2.7	0.0	short stems; segmented and uneven	27-Sep	6-Oct	26-Oct
<b>Greenbelt</b>	30	0.10	48	44.0	8.0	purple over yellow-green; segmented	20-Oct	10/20 and 11/2	2-Nov
<b>Gypsy</b>	35	0.14	67	30.3	3.0	long stalks; variable	13-Oct	20-Oct	26-Oct
<b>Hot Bro</b>	32	0.08	52	29.0	19.4	dark green; long stems; flat, leafy heads	13-Oct	20-Oct	26-Oct
<b>Imperial</b>	33	0.12	43	40.0	17.1	smooth	20-Oct	10/20 - 11/2	2-Nov
<b>Lieutenant</b>	37	0.13	81	16.7	2.8	uneven floret size	30-Sep	6-Oct	26-Oct
<b>Paradiso</b>	33	0.13	30	67.6	2.7	domed and segmented	20-Oct	10/20 - 10/26	2-Nov
<b>Santee</b>	0					no heads			
<b>TX-1</b>	35	0.10	76	8.1	16.2	large buds	30-Sep	10/6 - 10/13	20-Oct

<sup>a</sup> Head number has been adjusted to a base of 42 plants per variety.

<sup>b</sup> Heads were culled due to head rot caused by *Alternaria*, unmarketably small size, and extremely rough or ugly head



THE BACTERIAL INFECTION OF FRESH EGGS

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BULLETIN 164

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Agricultural Experiment Station

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