

Long Island Heat Tolerant Broccoli and Cauliflower Variety Trial

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Cool-season crops like broccoli and cauliflower cannot thrive under prolonged periods of warm weather so there is typically a lapse in production during the summer months. Retail and wholesale market opportunities are available for summer-grown broccoli and cauliflower here on Long Island and elsewhere if varieties that minimize heat-induced disorders are identified. Common heat and weather induced disorders include bract development (development of small green leaves in the head) uneven head development, riciness, bolting and brown/purple beads. Plant breeders are developing and have recently released several new broccoli and cauliflower varieties with improved heat tolerance over the more traditional varieties grown. The goal of the trial is to evaluate the performance of heat tolerant broccoli and cauliflower varieties for yield and quality and identify the top varieties that growers should consider to ensure quality heads all season long and expand market opportunities.

Two trials were established at the Long Island Horticulture Research and Extension Center in Riverhead, NY in a Haven loam soil; one broccoli and one cauliflower. Eleven heat tolerant broccoli varieties and 8 heat tolerant cauliflower varieties were grown during the summer months and evaluated for yield and crop quality. Each experiment was arranged as a randomized complete block design with four replications. Broccoli and cauliflower transplants were started in the greenhouse on May 22 and were seeded into 128-cell trays. Transplants were fertigated weekly as soon as the first true leaves appeared. Broccoli and cauliflower transplants were field set by hand on June 24. Treatment plots for each were 1 row wide by 20 ft long. Rows were spaced on 34" centers and plants were spaced 18" apart within the row. Fertilizer was broadcast applied and incorporated prior to field planting at a rate of 1000 lbs/A using an 11-11-15 commercial fertilizer blend in which 75% of the total N was in the form of controlled release fertilizer as ESN (44-0-0). Weeds and insects were managed according to Cornell Guidelines. Fungicides were used on a limited basis. Overhead irrigation was used to supplement rainfall amounts to equal 1" of water per week. Broccoli plots were harvested on August 15, 20, 29 and September 4 as plants reach maturity. Cauliflower plots were harvested on August 29, September 4, 10, 19 and 25 as they reached maturity. Data on yield and crop quality were recorded and analyzed. Unmarketable heads were mainly due to heat induced disorders and disease. The months of July and August were both very warm with rain events occurring sporadically and sometimes heavy (Appendix A) leading to increased levels of disease, head rot and heat induced stress disorders.

High disease incidence coupled with hot growing conditions resulted in a low number of marketable heads per plot in both the broccoli and cauliflower trial. In the broccoli trial, the varieties Eastern Magic and Emerald Star did not yield any marketable heads and the varieties Abrams, Millennium and SBC6317 only 1 head/plot. Under these adverse conditions, although yields were low, it was easy to determine which varieties showed the most promise for summer production. The two top broccoli varieties for summer production on LI were Eastern Crown (Sakata) and SVBL2062 (Seminis). These two varieties had the greatest number of marketable heads/plot and overall crop quality rated highest with a score of 8 out of 9. The varieties Imperial, Emerald Crown and Lieutenant should also be considered for summer production as marketable yields did not significantly differ from Eastern Crown and SVBL2062 but were significantly greater than the other varieties evaluated. In the cauliflower trial, the top performing varieties for summer production on LI were Bermeo and Fujiyama. They had the greatest

number of marketable heads/plot while the varieties Aquarius, Freedom, and Minuteman would not be viable options as these varieties did not produce any marketable heads/plot.

Table 1. Yield and crop quality of heat tolerant broccoli varieties grown in Riverhead, NY- 2019

Variety	Seed Source	Marketable Yield ¹		Head Dome	Bead Size	Head Color	Crop Quality ²
		heads/plot	lbs/plot				
Imperial	Sakata	3	4.0	Flat	S-L	B-G	7
Abrams	Seedway	1	1.4	Flat-Slight	S-M	G-B	7
Asteroid	Harris	3	2.9	Flat	S-L	B-G	7
Eastern Crown	Sakata	4	6.5	High	S-L	G-B	8
Eastern Magic	Sakata	0	0.0	*	*	*	*
Emerald Crown	Sakata	3	4.2	Slight	S-M	B-G	6
Emerald Star	Seedway	0	0.0	*	*	*	*
Lieutenant	Seminis	3	3.8	Slight-High	S-M	G	7
Millenium	Sakata	1	0.8	High	M	G	8
SBC6317	Atlee	1	1.5	High	M	G-B	7
SVBL2062	Seminis	4	5.2	Slight	M	B-G	8
<i>Fisher's Protected LSD (0.05)</i>		<i>(2)</i>	<i>(3.3)</i>				

¹ A total of 13 plants per plot, rows spaced on 34" centers and plants 18" apart within the row.

² Rating scale of 1-9; 1= extremely poor, 9= excellent.