

# **Performance of Fresh Market Snap Bean Cultivars, Plateau Experiment Station, 2000**

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## **Interpretative Summary**

Most cultivars performed reasonably well in the trial, and had widely varying characteristics. 'Capicorn', 'Hialeah', 'SSC 1207', and 'SSC 1208' were among the most productive cultivars and appeared to have desirable plant and pod characteristics needed for fresh market snap bean cultivars.

## **Introduction**

The snap bean is the largest acreage vegetable crop grown in Tennessee with an annual production in the 10 to 12 thousand acre range. Most of the fresh market production is on the Cumberland plateau and surrounding valley areas. 'Hialeah' has been the predominate cultivar grown in recent years, although several other cultivars are available and are recommended for production in Tennessee. Seedsmen have continued to develop new lines, and evaluation of these lines under local conditions is needed to evaluate their performance. An experiment was conducted at the Plateau Experiment Station at Crossville, TN in 2000 to evaluate performance of 17 snap bean cultivars, primarily for fresh market usage.

## **Materials and Methods**

The site was prepared for planting using conventional tillage in late April. Fertilizer was broadcast at 300 lb/A of 15-15-15 before final disking on May 5. Plots were direct seeded on May 5. Plot size was two rows, 20 ft long and each row was seeded with 160 seeds using a mechanical cone type planter. Rows were spaced 30 inches apart. Experimental plot design was a randomized complete block with four replications. Metolachlor (Dual II) was applied at 2 lb ai/A for weed control on May 5. Overhead irrigation was used to apply an inch of water on June 14. Chlorothalonil (Bravo) at 1.5 lb ai/A and Esfenvalerate (Asana) at 0.05 lb ai/A were applied for disease and insect control on June 23. All cultivars were mechanically harvested on July 5 using a one row Pixall harvester.

Plant characteristics determined before harvest were plant height, width and lodging. Pod height above ground was measured before harvest. Yields were recorded at harvest. A two pound sample of harvested pods was selected from each plot. Clusters were counted in the sample. The sample was separated into trash, broken pods, rotten pods, less than No.2 sieve size, No.2-No.4 sieve size, and No.5 sieve size and up. An 85 gram sample of No. 4 sieve pods was measured for firmness using a Food Texture Machine. Twenty-five No. 4 sieve pods were selected and measured for length, and rated for shape, curvature, smoothness, and color. Ratings were made on a 1 to 5 scale.

A rating of 5 indicated round pods, straight pods, smooth pods, and dark colored pods. All data were analyzed by analysis of variance procedures, and cultivar means were separated by Duncan's multiple range tests at the 0.05 level of probability.

### Results and Discussion

'Mercury' was among cultivars with the tallest plants (Table 1). Plant height was in the 15 to 16 inch range which indicates moderate plant growth. Height was adequate for acceptable machine harvest. Plants of 'Mirada' had a greater width than plants of 'Carlo' and 'SB 4222'. 'Bronco' and 'Hialeah' had more lodging than 'Rhapsody' and 'SSC 1208'. Lodging ratings were generally very low, and lodging did not present a problem in harvest. 'Carlo' and 'SB 4222' set pods very high above the ground while 'Benchmark' and 'Mirada' set pods closer to the ground. 'Capicorn', 'SSC 1208', and 'Horto' produced higher yields than 'Carlo'. Stand counts were not taken, but observations indicated that 'Carlo' had a poor stand which accounts for the low yield.

'Savannah' produced more pod clusters than 'Benchmark' and 'Mirada' (Table 2). A cluster consisted of 2 or more pods joined with a piece of stem or a piece of plant stem over an inch long attached to the pod stem. Trash levels were relatively low for all cultivars. 'Savannah' and 'SSC 1202' were among cultivars that had the highest percentage of trash in the mechanically harvested pods. Pods of 'HM 5991' broke severely during harvest. 'Rhapsody' was among cultivars with little pod breakage. 'HM 5991' had more small pods (< No.2 sieve) than all other cultivars. This cultivar was several days later in maturity than the other cultivars. 'Horto' had a high percentage of pods in the No. 2 to No.4 sieve range. 'Mercury' produced a high percentage of pods in the No.5 and over sieve size.

Pods of 'Hialeah' were longer than pods of all cultivars except 'Benchmark' and 'Festina' (Table 3). Relatively long pods are usually preferred for fresh market snap beans. Pods of 'Horto' were very firm and were in the firmness range of being tough. 'Capicorn' and 'HM 5991' were among cultivars with the least firmness. Pods of 'Horto' were relatively flat, and pods of the other cultivars were round. 'Benchmark', 'Bronco', and 'Stallion' were among cultivars with the straightest pods. Pods of 'SSC 1202' were relatively smooth while pods of 'Horto' were rather rough and bumpy. 'Bronco', 'HM 5991', 'Savannah', and 'SSC 1207' were among cultivars with the darkest pod color.

Table 1. Plant characteristics, yield, and seed source of fresh market snap bean cultivars evaluated at The University of Tennessee Plateau Experiment Station at Crossville, 2000.

	Plant height - inches	Plant width - inches	Plant lodging - %	Pod height above ground - in.	Yield- bu/A	Seed source
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Cultivar						
Benchmark	15.0 b <sup>2</sup>	16.2 abc	4.0 ab	1.50 d	117 ab	Novartis
Bronco	15.0 b	17.5 abc	5.0 a	2.25 cd	112 ab	Asgrow
Capicorn	14.8 b	18.2 ab	2.5 ab	2.50 bcd	167 a	Novartis
Carlo	15.8 ab	14.2 c	0.0 b	4.00 a	86 b	Asgrow
Festina	15.5 ab	18.5 ab	2.5 ab	2.25 cd	100 ab	Asgrow
Hialeah (ck)	16.0 ab	17.8 ab	5.0 a	2.75 abcd	153 ab	Harris Moran
HM 5991	15.2 b	16.8 abc	3.8 ab	3.50 abc	111 ab	Harris Moran
Mercury	17.5 a	17.5 abc	2.5 ab	3.50 abc	138 ab	Novartis
Mirada	15.2 b	19.5 a	3.0 ab	1.50 d	138 ab	Novartis
Rhapsody	15.0 b	18.2 ab	5.5 a	2.50 bcd	120 ab	Harris Moran
Savannah	15.0 b	18.0 ab	3.0 ab	2.50 bcd	153 ab	Harris Moran
SB 4222	15.8 ab	15.2 bc	0.0 b	4.00 a	96 ab	Novartis
SSC 1207	14.8 b	18.0 ab	3.8 ab	2.50 bcd	136 ab	Shamrock
SSC 1208	15.5 ab	18.0 ab	5.0 a	2.75 a-d	160 a	Shamrock
SSC 1202	15.5 ab	18.0 ab	3.8 ab	3.50 abc	119 ab	Shamrock
Stallion	15.0 b	17.2 abc	3.8 ab	2.50 bcd	130 ab	Asgrow
Horto	16.2 ab	18.8 ab	2.5 ab	2.50 bcd	162 a	Seedway

<sup>2</sup> Means within columns followed by the same letter are not significantly different at the 0.05 level of probability, Duncan's multiple range tests.

Table 2. Pod characteristics of harvested fresh market snap bean cultivars evaluated at The University of Tennessee Plateau Experiment Station at Crossville, 2000.

Cultivar	Clusters - no./lb	Trash - %	Broken pods - %	Rotten pods- %	< 2 sieve pods -%	2-4 sieve pods - %	5 + up sieve pods - %
Benchmark	0.5 c	0.9 de	9.9 bcd	0.0 b	3.7 bc	69.2 b-e	15.6 bcd
Bronco	4.5 abc	0.00 e	9.2 be	0.0 b	3.8 bc	82.4 abc	4.2 de
Capicorn	5.0 abc	2.0 ab	4.9 de	0.0 b	3.2 bc	63.2 de	26.2 ab
Carlo	1.5 abc	1.6 ab	5.9 b-e	0.0 b	5.5 b	85.4 ab	1.6 de
Festina	3.2 abc	1.8 abc	9.3 b-e	0.0 b	2.7 bc	76.4 a-d	9.8 cde
Hialeah (ck)	5.5 abc	2.1 ab	6.8 b-e	0.0 b	2.0 bc	74.9 a-d	14.7 cde
HM 5991	2.0 abc	1.7 abc	16.6 a	0.0 b	11.9 a	69.6 b-e	0.0 e
Mercury	5.75 ab	1.2 bcd	6.2 b-e	0.0 b	2.9 bc	57.9 e	30.2 a
Mirada	1.0 bc	1.6 abc	6.1 b-e	0.0 b	2.1 bc	85.8 ab	4.4 de
Rhapsody	5.2 abc	2.1 ab	4.0 e	0.0 b	2.6 bc	67.2 cde	23.8 abc
Savannah	6.5 a	2.7 a	11.2 b	0.0 b	3.3 bc	83.8 abc	0.8 e
SB 4222	3.2 abc	1.1 bcd	7.4 b-e	0.7 a	4.1 bc	78.9 abcd	8.0 de
SSC 1207	4.5 abc	2.3 ab	8.8 b-e	0.0 b	5.1 b	83.1 abc	1.0 de
SSC 1208	5.0 abc	1.1 bcd	5.3 cde	0.0 b	3.0 bc	83.1 abc	7.8 de
SSC 1202	6.0 ab	2.5 a	7.1 b-e	0.0 b	4.3 bc	83.5 abc	1.6 de
Stallion	5.0 abc	0.8 cde	7.9 b-e	0.0 b	2.5 bc	80.2 abc	7.8 de
Horto	6.0 ab	2.3 ab	6.1 b-e	0.0 b	1.3 c	90.8 a	0.0 e

<sup>z</sup> Means within a column followed by the same letter are not significantly different at the

0.05 level of probability, Duncan's multiple range tests.

Table 3. Pod quality characteristics of fresh market snap bean cultivars evaluated at The University of Tennessee Plateau Experiment Station at Crossville, 2000.

Cultivar	Pod length - inches	Pod firmness	Pod shape rating <sup>x</sup>	Pod curvature rating <sup>x</sup>	Pod smoothness rating <sup>x</sup>	Pod color rating <sup>x</sup>
Benchmark	5.6 ab	1025 jh	5.0 a	4.4 a	4.2 bcd	4.6 bc
Bronco	4.9 ef	1011 gh	4.5 a	4.5 a	4.3 cd	4.8 a
Capicorn	5.3 cd	978 h	5.0 a	3.9 d	4.4 ac	4.4 de
Carlo	5.3 bc	1105 c-f	5.0 a	4.0 bcd	4.3 bcd	4.5 cd
Festina	5.6 ab	1112 cde	4.5 a	4.0 bcd	4.3 a-d	4.7 ab
Hialeah (ck)	5.8 a	1235 b	5.0 a	4.3 abc	4.1 d	4.0 f
HM 5991	4.5 hi	977 h	5.0 a	4.4 ab	4.4 abc	4.8 a
Mercury	5.2 cde	1105 c-f	5.0 a	4.0 bcd	4.4 abc	4.0 f
Mirada	5.3 bc	1171 bc	5.0 a	4.3 a-d	4.3 a-d	4.3 de
Rhapsody	5.4 bc	1132 cde	5.0 a	4.3 abc	4.2 cd	4.4 de
Savannah	4.2 i	1005 gh	5.0 a	4.2 a-d	4.2 cd	4.8 a
SB 4222	5.3 bc	1064 efg	5.0 a	4.0 cd	4.3 a-d	4.7 ab
SSC 1207	5.0 def	1104 c-f	5.0 a	4.3 ab	4.3 a-d	4.8 a
SSC 1208	4.5 ghi	1033 fgh	5.0 a	4.3 a-d	4.4 abc	4.7 ab
SSC 1202	4.8 fg	1144 cd	5.0 a	4.1 a-d	4.6 a	4.2 e

Stallion	5.2 cde	1077 d-g	5.0 a	4.4 a	4.5 ab	4.3 de
Horto	5.2 cde	1484 a	2.0 b	4.2 a-d	3.2 e	3.0 g

<sup>x</sup> Ratings on a scale of 1 to 5; 1 = flat pods, curved pods, rough pods, or light colored pods.

<sup>z</sup> Means within a column followed by the same letter are not significantly different at the 0.05 level of probability, Duncan's multiple range tests.

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