

# **Performance of Fresh market Snap Bean Cultivars, Plateau Experiment Station, 2002**

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## **Interpretative Summary**

'Grenoble' and 'SB 4223' were among the best producing varieties in this trial. They also had several desirable characteristics for a fresh snap bean market.

## **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 cultivars 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 2002 to evaluate performance of 15 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 15. Plots were direct seeded on May 23. Plot size was two rows, 20 ft long and each row was seeded with 160 seeds using a mechanical cone type planter. Ridomil Gold was applied in furrow at 0.75 lb/1000 linear ft at planting. Rows were spaced 30 inches apart. Experimental plot design was a randomized complete block with four replications. EPTC (Eptam) was applied at 3 lb ai/A for weed control on May 23. 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 21 and July 12. All cultivars were mechanically harvested on July 23 using a two-row Chisholm Ryder harvester.

Plant characteristics determined before harvest were plant height, width and lodging. 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, and more than No. 2 sieve. An 85-gram sample of No. 4 sieve pods was measured for firmness using a Food Texture Machine. Fifteen 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

'Hurricane' was among cultivars with the tallest plants (Table 1). Plant height for most of the cultivars was in the 15 to 16 inch range which indicates moderate plant growth. Height was adequate for acceptable machine harvest. Plants of 'HMX 0103' had a greater width than plants of any other cultivar. 'Carlo', 'HMX 0103', and 'HMX 0104' had more lodging than the other cultivars tested. Lodging ratings varied among cultivars, and lodging did not present a problem in harvest. 'Grenoble' and 'SB 4223' were among varieties that produced higher yields.

'Shade' and 'Carlo' were among cultivars that produced more pod clusters (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. 'EX08190478' and 'HM5991' were the cultivars that had the highest percentage of trash in the mechanically harvested pods. Pods of 'HMX 0103' and 'HMX 0104' were among the cultivars with higher numbers of broken pods harvested. 'Capricorn' 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. 'Capricorn' and 'Shade' were among cultivars with a higher percentage of mature pods.

Pods of 'Hialeah' and 'Capricorn' were among varieties longer pod length (Table 3). Relatively long pods are usually preferred for fresh market snap beans. Pods of most of the varieties tested approached the range of being tough. 'Festina', 'EX08190478' and 'EX8104389' were among cultivars with the least firmness. Pods of 'Festina' and 'HMX 0104' were relatively flat, and pods of the other cultivars were round. Pod curvature was not significantly different between cultivars. Pods of 'Festina', 'EX8104389' and 'HMX0103' were among cultivars with relatively smooth pods. 'EX08190478' and 'HM 5991' 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, 2002.

Cultivar	Plant height - inches	Plant width - inches	Plant lodging( %)	Yield-bu/A	Seed source
Bronco	13.00 d <sup>2</sup>	15.00 d	80 b	79.86 d	Seminis

Carlo	16.00 a	18.00 b	100 a	151.86 abcd	Seminis
EX08190478	16.00 a	13.16 f	0 h	89.54 cd	Seminis
EX8104389	12.00 e	16.16 c	10 f	105.27 bcd	Seminis
EX8100518	13.25 d	15.00 d	70 c	91.36 cd	Seminis
Festina	12.16 e	13.00 f	50 d	96.80 cd	Seminis
Grenoble	11.00f	10.00 i	50 d	217.20 a	Rupp
HM 5991	14.00 c	11.00 h	0 h	121.00 bcd	Harris Moran
HMX 0103	14.25 c	20.00 a	100 a	144.60 abcd	Harris Moran
Hialeah	16.00 a	12.00 g	5 g	122.82 bcd	Harris Moran
HMX 0104	15.00 b	18.00 b	100 a	175.45 abc	Harris Moran
Hurricane	16.00 a	14.00 e	20 e	129.47 bcd	Seminis
SB4223	10.00 g	9.00 j	10 f	220.22 a	Siegers
Capricorn	12.00 e	9.00 j	0 h	169.40 abc	Rupp
Shade	10.00 g	8.00 k	0 h	191.18 ab	Harris Moran

<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, 2002.

Cultivar	Clusters - no./lb	Trash (%)	Broken pods (%)	Rotten pods (%)	Immature pods (%)	Market pods (%)
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Bronco	4.00 ab <sup>z</sup>	8.75 b	11.25 b	6.25 a	13.75 bcd	58.75 ab
Carlo	7.50 ab	5.00 b	17.50 ab	5.00 a	11.25 cdef	61.25 ab
EX08190478	4.00 ab	16.25 a	11.25 b	2.75 a	15.00 bc	57.25 ab
EX8104389	1.25 b	6.25 b	10.00 b	5.00 a	18.75 b	60.00 ab
EX8100518	8.50 ab	7.50 b	15.00 ab	5.00 a	15.00 bc	57.50 ab
Festina	1.75 b	7.50 b	15.00 ab	6.25 a	3.75 bcd	57.50 ab
Grenoble	6.00 ab	5.00 b	15.00 ab	11.25 a	6.25ef	62.50 ab
HM 5991	3.75 ab	13.75 a	17.50 ab	5.00 a	27.50 a	36.25 c
HMX 0103	7.75 ab	6.25 b	22.50 a	8.75 a	12.50 bcde	50.00 b
Hialeah	2.00 b	7.50 b	10.00 b	4.00 a	11.25 cdef	67.25 a
HMX 0104	3.00 ab	5.00 b	18.75 ab	7.50 a	11.25 cdef	57.50 ab
Hurricane	6.50 ab	7.50 b	9.00 b	6.25a	12.50 bcde	64.75 ab
SB4223	7.50 ab	5.00 b	11.25 b	11.25 a	5.00 f	67.50 a
Capricorn	7.00 ab	4.25 b	8.75 b	8.75 a	6.25 ef	72.00 a
Shade	9.75 a	6.25 b	10.00 b	6.25 a	7.50 ef	70.00 a

<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, 2002.

Cultivar	Pod length - inches	Pod firmness <sup>y</sup>	Pod shape rating <sup>x</sup>	Pod curvature rating <sup>x</sup>	Pod smoothness rating <sup>x</sup>	Pod color rating <sup>x</sup>
Bronco	4.95 de <sup>z</sup>	1127 cdef	3.25 bc	2.75 a	3.75 ab	3.00 bcd
Carlo	5.50 abcd	1248 ab	3.75 ab	3.00 a	3.00 ab	2.75 cd
EX08190478	6.00 ab	1079 f	3.00 bc	3.25 a	3.75 ab	4.00 ab
EX8104389	4.95 de	1056 f	3.50 abc	3.00 a	4.00 a	3.75 abc
EX8100518	5.38 bcde	1127 cdef	3.00 bc	2.50 a	3.50 ab	3.00 bcd
Festina	5.25 bcde	1076 f	2.50 c	3.00 a	4.25 a	3.50 abcd
Grenoble	5.38 bcde	1099 e	3.25 bc	3.00 a	3.00 ab	3.75 abc
HM 5991	4.68 e	1119 cdef	3.50 abc	3.50 a	3.50 ab	4.25 a
HMX 0103	5.75 abcd	1107 def	3.25 bc	2.75 a	4.00 a	3.00 bcd
Hialeah	6.25 a	1184 bcde	3.50 abc	3.00 a	3.75 ab	2.75 cd
HMX 0104	5.63 abcd	1198 abcd	2.50 c	2.75 a	3.50 ab	2.50 d
Hurricane	5.88 abc	1276 ab	3.50 abc	3.00 a	3.50 ab	3.00 cd
SB4223	5.70 abcd	1287 a	4.50 a	2.75 a	2.50 b	3.25 abcd
Capricorn	6.05 ab	1205 abc	3.25 bc	3.00 a	2.25 ab	2.75 cd
Shade	5.15 cde	1264 ab	3.75 ab	3.25 a	3.00 ab	3.00 bcd

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

<sup>y</sup> Firmness determined using TG4C Texture Gage.

<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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