

Snap Bean Variety Trials in East-Central Puerto Rico

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INTRODUCTION

Snap beans are one of the most valuable crops grown by home and market gardeners and by truck farmers for shipment and canning.

The use of improved varieties may contribute to raising the production and, at the same time, consumption can be stimulated because of the better quality of the new varieties tested. Before recommending new varieties these should be properly tested to evaluate their quality and adaptability to the area. So trials of commercial varieties and breeding lines are conducted under various soil and climatic conditions.

This paper reports the results of two such trials.

POLE BEANS

MATERIALS AND METHODS

Five varieties (1)² of pole beans, namely Florigreen, Kentucky 191, Blue Lake 92, Blue Lake 228, and Blue Lake 231, were tested at the Gurabo Substation farm in east-central Puerto Rico, following a 5 x 5 latin-square design. Each plot consisted of two rows 20 feet long and 4 feet apart with 10 hills 2 feet apart per row and 2 plants per hill. A 9-10-5 fertilizer was applied at the rate of 800 pounds per acre (2) at planting time. The beans were planted on November 25, 1959.

The varieties tested are commercially grown in the United States and are considered high yielders of excellent quality, with good processing appearance and flavor.

The pods were harvested at the best edible stage. All varieties were harvested 12 times except Blue Lake 92 with only 10 pickings.

EXPERIMENTAL RESULTS AND DISCUSSION

The results obtained in the pole-bean variety trial are presented in tables 1 and 2.

Florigreen (3) outyielded Kentucky 191 significantly at the 1-percent level. There were no significant differences in yield between varieties Florigreen, Blue Lake 228, Blue Lake 92, and Blue Lake 231. Florigreen with a production of 4.30 tons of green beans per acre ranked first among the pole

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² Italic numbers in parentheses refer to Literature Cited, pp. 217-8.

beans tested. This production was much higher than that obtained at the Lajas Substation, which was 2.74 tons per acre (4). Beside being the highest in yield Florigreen was highly resistant to bean rust and mosaic, two of the worst diseases of beans. Judging from the results of this trial, this variety seems to be very well adapted to east-central Puerto Rico.

TABLE 1.—*Harvesting dates and maturity at harvest of 5 pole-bean varieties, blooming on Dec. 28, 1959 at the Gurabo Substation, planted Nov. 25, 1959*

Variety	Harvesting dates	Days of maturity at first harvest
Florigreen	Jan. 14, 15, 18, 21, 22, 25, 28 Feb. 1, 4, 8, 12, 15	50
Blue Lake 228	Jan. 18, 21, 22, 25, 28 Feb. 1, 4, 8, 12, 15	54
Blue Lake 92	Jan. 14, 15, 18, 21, 22, 25, 28 Feb. 1, 4, 8, 12, 15	50
Blue Lake 231	Jan. 14, 15, 18, 21, 22, 25, 28 Feb. 1, 4, 8, 12, 15	50
Kentucky 231	Jan. 14, 15, 18, 21, 22, 25, 28 Feb. 1, 4, 8, 12, 15	50

TABLE 2.—*Total and mean yields of 5 pole-bean varieties at the Gurabo Substation, planted Nov. 25, 1959*

Variety	Total yield	Mean yield per plot	Calculated production per acre
	<i>Lb.</i>	<i>Lb.</i>	<i>T./A.</i>
Florigreen	157.91	31.58	4.30
Blue Lake 228	113.95	26.79	3.65
Blue Lake 92	125.20	25.04	3.41
Blue Lake 231	95.27	19.05	2.59
Kentucky 191	91.58	18.31	2.49

As in the Lajas trial, variety Kentucky 191 yielded less at Gurabo too. Moreover, it was severely attacked by bean mosaic, which susceptibility makes it undesirable for commercial production in Puerto Rico.

The standard error and least differences required for significance between mean yields in table 2 are shown in the following tabulation:

<i>Item</i>	<i>5 percent</i>	<i>1 percent</i>
Difference between highest and lowest	7.89	10.22
Difference between highest and 2nd lowest	7.35	9.62
Difference between highest and 3d lowest	6.59	8.82
Difference between highest and 4th lowest	5.39	7.56
Standard error 1.75 with 4 d.f.		

BUSH BEANS

MATERIALS AND METHODS

On February 9, 1961 an experiment using eight breeding lines received from the Southeastern Vegetable Breeding Laboratory at Charleston, S.C., and two commercial varieties of bush snapbeans was planted at the Gurabo Substation farm. The breeding lines (5) planted were: B2971-1-1, B3370, B3095-3, B3489, B3125 x 5-2, B2567-1, B3365, and B3076. The commercial varieties tested were Wade (1) and Top Crop (1).

The experimental design used was a randomized block with 4 replicates. Each plot consisted of 2 rows 20 feet long and 3 feet apart with 40 plants per row spaced 6 inches apart, equivalent to 80 plants per plot. A 9-10-5 fertilizer was applied at the planting time, at the rate of 800 pounds per acre.

The pods were picked at their best edible stage until the harvesting of the crop was completed. Pickings were made at intervals of 3 to 5 days, more or less. All varieties were harvested six times except B2971-1-1, B3095-3, and B3076 with only five pickings.

EXPERIMENTAL RESULTS AND DISCUSSION

The results obtained in this bush snap bean variety trial are shown in tables 3 and 4.

Line B2971-1-1 outyielded Wade and B3076 significantly at the 1-percent level. There were no significant differences between the rest of the breeding lines and varieties tested. The production of line B2971-1-1, 4.05 tons of green beans per acre, is very high for a bush bean here in Puerto Rico. This line outyielded two very important commercial varieties, Top Crop and Wade, which ranked first and second in an experiment at the Lajas Substation, with a production of 3.86 and 3.34 tons (4) of green beans per acre, respectively. Line 2971-1-1 also showed some degree of resistance to bean mosaic and rust, and its pod appearance and quality were very good.

The standard error and least differences required for significance between means yields in table 4 are shown in the following tabulation:

TABLE 3.—*Harvesting dates and maturity at harvest of 10 bush snap bean varieties and breeding lines at the Gurabo Substation, planted Feb. 9, 1961*

Variety	Blooming dates (1961)	Harvesting dates	Days of maturity at first harvest
B2971-1-1	Mar. 13	Mar. 28 Apr. 4, 7, 12, 18	47
B3370	Mar. 10	Mar. 25, 28 Apr. 4, 7, 12, 18	44
B3095-3	Mar. 13	Mar. 28 Apr. 4, 7, 12, 18	47
B3489	Mar. 10	Mar. 25, 28 Apr. 4, 7, 12, 18	44
B3125 × 5-2	Mar. 10	Mar. 25, 28 Apr. 4, 7, 12, 18	44
B2567-1	Mar. 10	Mar. 25, 28 Apr. 4, 7, 12, 18	44
Top Crop	Mar. 10	Mar. 25, 28 Apr. 4, 7, 12, 18	44
B3365	Mar. 10	Mar. 25, 28 Apr. 4, 7, 12, 18	44
Wade	Mar. 10	Mar. 25, 28 Apr. 4, 7, 12, 18	44
B3076	Mar. 13	Mar. 28 Apr. 4, 7, 12, 18	47

TABLE 4.—*Total and mean yields of 10 snap bean varieties and breeding lines at the Gurabo Substation, planted Feb. 9, 1961*

Variety	Total yield	Mean yield per plot	Calculated production
	Oz.	Oz.	T./A.
B2971-1-1	1,431	357.75	4.058
B3370	1,155	288.75	3.275
B3095-3	1,076	269.00	3.051
B3489	968	242.00	2.745
B3125 × 5-2	966	241.50	2.739
B2567-1	934	233.50	2.648
Top Crop	880	220.00	2.495
B3365	872	218.00	2.472
Wade	691	172.75	1.959
B3076	686	171.50	1.945

<i>Item</i>	<i>5 percent</i>	<i>1 percent</i>
Difference between highest and lowest	117.89	141.16
Difference between highest and 2nd lowest	115.26	138.50
Difference between highest and 3d lowest	112.21	135.59
Difference between highest and 4th lowest	108.82	132.23
Difference between highest and 5th lowest	104.84	128.25
Difference between highest and 6th lowest	100.13	123.54
Difference between highest and 7th lowest	93.60	117.37
Difference between highest and 8th lowest	84.78	108.69
Difference between highest and 9th lowest	72.21	94.92
Standard error 24.2056 with 9 d.f		

SUMMARY

Two snap bean variety trials were planted at the Gurabo Substation farm in east-central Puerto Rico. In the first trial five pole-bean varieties were tested. The varieties used were: Florigreen, Blue Lake 92, Blue Lake 228, Blue Lake 231, and Kentucky 191. Of these varieties Florigreen had the highest yield with a production of 4.30 tons of green beans per acre. It also showed high resistance to bean rust and mosaic, two of the worst diseases of beans.

In the second trial eight lines and two commercial bush varieties were tested. They are B2971-1-1, B3370, B3095-3, B3489, B3365, B3125 x 5-2, B2567-1, B3076, Wade, and Top Crop. In this trial line B2971-1-1 produced the best yield with a production of 4.05 tons of green beans per acre, which is very high for bush beans in Puerto Rico.

RESUMEN

En la Subestación de Gurabo se llevaron a cabo dos experimentos comparativos con habichuelas tiernas.

En uno de los experimentos se sembraron cinco variedades trepadoras, a saber: Florigreen, Blue Lake 92, Blue Lake 228, Blue Lake 231 y Kentucky 191. Entre éstas, la Florigreen fue superior tanto por su alta producción (4.30 T./A.), como por su alta resistencia al mosaico y a la roya de la habichuela.

En otro experimento se probaron 10 líneas y variedades de habichuelas tiernas arbustivas. Estas fueron B2971-1-1, B3370, B3095-3, B3489, B3125 x 5-2, B2567-1, B3365, B3076, Wade y Top Crop. La línea B2971-1-1 fue superior, pues produjo 4.05 toneladas de habichuelas tiernas por cuerda, lo que se considera es una producción sobre lo normal para Puerto Rico.

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