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Green Bean Variety Evaluation, 2017

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Green beans are popular at most retail markets across the state. In recent years a number of darker green bean varieties have been developed. These are often preferred by consumers. Nineteen newer, disease resistant green bean, and a few older standard varieties, as well as one purple variety were evaluated in this trial.

Materials and Methods

Varieties were planted in a field of Maury silt loam soil on 31 May at the University of Kentucky Horticultural Research Farm in Lexington. Approximately 120 seeds per variety were planted in 20-foot-long plots in rows that were 28 inches apart. Each treatment (variety) was replicated four times in a randomized complete block design. Fifty pounds of actual nitrogen as urea was incorporated prior to planting. Dual II Magnum at 1.5 pt. per acre preemergence herbicide was applied one day after planting. No fungicides or insecticides were applied to the plot. The plot was drip-irrigated as needed. Plants were harvested by hand six times over a two–and-a-half-week period on 21, 25, 28, 31 July, and 3 and 7 August.

Small quantities of all varieties were harvested the afternoon of 6 August for taste evaluations. That evening approximately four ounces of each variety were cooked uncovered at a medium temperature setting in 2 cups of water for 10-15 minutes until tender. Beans were allowed to cool to room temperature, and then placed in sealable plastic bags, and refrigerated. On the morning of 7 August, the beans were placed on paper plates and five individuals (two males and three females) that liked green beans evaluated the samples for visual appeal, taste and texture.

Results and Discussion

The 2017 growing season was abnormally wet and cool. Most plants showed some injury from the preemergence herbicide but grew out of this. Only a few seeds of the Inspiration variety came up. It is suspected that this variety may have been more susceptible to Dual II Magnum herbicide injury than other varieties as a germination test conducted with seeds wrapped in a wet paper towel showed 60 percent germination.

Harvest began when the earliest maturing varieties were ready to harvest. Yields and plant and bean characteristics are in Tables 1 and 2. Visual and cooked taste ratings are in Table 3. It was difficult in this study to select one or two top varieties that performed the best for all the characteristics evaluated. Varieties were selected because of their disease resistance and most have resistance to bean common mosaic virus. Some have extensive disease resistance packages and growers should consider these varieties if there is a history of a particular disease or diseases on their farm.

Jade II and **Achiever** were two very dark green, glossy beans that had higher total yields and fairly high yields on one harvest date. Jade II had straight, six-inch long beans rated highly for cooked taste and texture, but had a lower cooked visual appeal rating. Achiever was a very uniform bean and had a medium rating for cooked taste and texture. **BA 0958** is another

attractive, slightly glossy, dark green, round bean with a lower yield, but rated very highly for pod straightness, uniformity and both raw- and cooked visual appeal, taste and texture.

Colter, Opportune and **Momentum** green beans were lighter green and yielded well. Colter beans were slim, uniform and highly rated for raw visual appeal and cooked taste, visual appeal and texture. The Opportune variety held its beans up off the ground well, beans retained their stems well during picking, and it had one of the highest cooked taste ratings. Momentum was one of the highest yielding green beans and was also one of the highest yielding on one harvest date. Its beans were attractive, slightly glossy, but rated fairly low for taste when cooked.

Furano, a light green colored, flat bean was one of the highest yielding in the trial. It performed slightly better than the other flat green bean, Greencrop. Beans were very straight, retained their stems well at harvest and were rated highly for raw visual appeal and rated midway with respect to the other varieties for cooked visual appeal, taste and texture.

Amethyst, the only purple bean in the trial, had a very high total yield and one-time harvest yield. Beans were very straight and rated very highly for raw visual appeal as well as cooked visual appeal, taste and texture. This purple bean turns olive green when cooked and the cooking water turns lime green. The purple coloring on the fresh beans is not uniform over the entire bean and there are grayish green areas, mostly on the side of the bean with less sunlight exposure.

The **Orient** green bean is notable in that it was one of the highest rated varieties for visual appeal, taste and texture when cooked. It has attractive, slim, short, very straight, uniform, light green beans, but lower yields. It has an extensive disease resistance package and is a specialty market item that may be attractive to restaurants because the beans can be served whole.

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Table 1. Days to harvest, yields, and disease resistances.

Variety	Seed Source	Days to Harvest[1]	Total Yield 6 Harvests (bu/A)[2]	Largest Yield 1 Harvest (bu/A)[2,3]	Largest Yield Harvest (Date)	Disease Resistance (1-5)[4]
Furano	ST	54	785 a	284 abc	7/25	HR: BCMV
Amethyst	JS	56	711 ab	239 bc	8/11	R: BCMV
Greencrop	SW	52	697 abc	284 abc	7/29	R: BCMV
Momentum	SY	56	691 abc	354 a	7/28	HR: BCMV
Caprice	SW	56	654 bcd	198 cd	7/29	HR: BCMV, HB, Xap; IR: BBS
Achiever	SW	53	632 bcde	337 ab	7/25	IR: whiteflies
Jade II	BL	60	610 bcde	249 bc	7/25	HR: BCMV; IR: Rust
Colter	CF	53	582 cdef	218 cd	7/26	HR: BCMV, BCTV, Rust
Opportune	SY	56	557 def	207 cd	7/28	HR: BCMV
Cosmos	JS	56	551 defg	202 cd	7/31	HR: BCMV, BCTV; IR: BBS
Bowie	SW	54	543 efgh	282 abc	7/28	HR: BCMV, BCTV, HB, BBS; IR: Xap
Bronco	HO	53	543 efgh	206 cd	7/28	IR: BCMV
Sybaris	ST	56	530 efgh	187 cd	7/28	HR: BCMV; IR: Rust 90
Ambition	CF	54	519 efgh	217 cd	7/29	R: BCMV; IR: whiteflies
BA 0958	ST	53	510 efgh	241 bc	7/29	R: BCMV; IR: BBS, root rot
Annihilator	CF	54	462 fgh	197 cd	7/27	R: BCMV, BCTV
Orient	JS	55	427 gh	229 c	7/30	HR: BCMV, HB; IR: BBS, BCTV
Serengeti	SY	55	418 h	201 cd	7/31	HR: BCMV
Slenderette	HO	53	233 i	114 d	8/4	BCMV, BCTV, BPMV

[1]Days to harvest as reported by seed companies.
[2]Means in the same column followed by the same letters are not significantly different (Waller-Duncan multiple range test LSD P = 0.05).
[3]Highest yield obtained on one harvest date.
[4]Disease resistance from seed company catalogues: HR = high resistance; R = resistance; IR = intermediate resistance; BPMV = pod mottle virus; BCMV = common mosaic virus; BCTV = beet curly top virus; HB = halo blight; Xap = common bacterial blight; BBS = bacterial brown spot; Rust = common rust.

Table 2. Plant and bean characteristics.

Variety	Plant Height (in.)	Plant Width (in.)	Plant Habit (1-5)[1]	Pod Position (1-5)[2]	Pod Color (1-5)[3]	Straight-ness (1-5)[4]	Pod Length (in.)	Pod Uni-formity (1-5)[5]	Beans with stems (%)[6]	Comments
Furano	21	29	2.3	2.0	2.0	4.0	5.1	3.7	93	Attractive, flat bean
Amethyst	19	24	4.5	1.5	-[7]	4.2	5.3	3.9	73	Pod color not uniform, purple with gray areas
Greencrop	22	30	2.4	1.8	2.0	3.3	7.3	3.6	88	Attractive, flat, lt green pod
Momentum	19	25	3.4	2.4	3.4	3.7	5.6	3.9	75	Attractive, uniform, slim, slightly glossy
Caprice	20	24	3.5	3.0	3.0	3.5	5.8	3.9	80	Attractive, slightly glossy
Achiever	16	21	4.0	2.0	4.0	4.2	5.5	4.1	78	Attractive, slightly glossy
Jade II	17	24	3.9	2.1	4.0	3.6	6.0	3.7	73	Attractive, slim, glossy
Colter	17	22	4.1	2.5	3.1	3.9	5.5	3.9	88	Slim bean
Opportune	18	22	2.8	2.6	3.1	3.6	5.6	3.6	98	Attractive, slim, glossy
Cosmos	18	25	3.3	1.9	2.9	3.0	5.5	3.2	60	Light colored, beans curled
Bowie	20	23	3.8	2.9	3.7	3.9	5.0	4.0	70	Attractive, uniform, slightly glossy, breaks easily during harvest
Bronco	18	24	3.5	2.1	3.0	3.7	5.0	4.0	97	Attractive, slim, picks easily
Sybaris	18	21	4.1	1.8	4.0	3.5	5.5	3.6	85	Slim, slightly glossy
Ambition	17	20	4.0	2.6	4.0	4.1	5.5	4.0	88	Very attractive, uniform, slim, slightly glossy
BA 0958	19	24	3.8	2.9	4.0	4.0	5.7	4.3	85	Attractive, slightly glossy
Annihilator	16	21	4.3	2.0	3.4	3.5	5.5	3.4	63	Not glossy
Orient	17	20	3.9	2.3	2.9	4.3	4.0	4.3	85	Attractive, short bean, harvests easily, specialty market
Serengeti	18	24	3.0	2.6	3.0	4.3	6.0	4.1	65	Attractive, straight, slim
Slenderette	17	22	3.5	2.1	2.9	3.9	4.6	3.7	95	Attractive, light green

[1]Plant habit: 1 = prone; 3 = moderate; 5 = erect.
[2]Pod position: 1 = all pods on ground; 3 = just off ground; 5 = high.
[3]Pod color: 1 = light; 3 = medium; 5 = dark green.
[4]Pod straightness: 1 = J curve; 5 = straight.
[5]Pod uniformity; 1 = poor; 3 = average; 5 = excellent.
[6]Percent of beans with stems still attached after picking, determined from a random sample of 10 beans.
[7]Purple pods.

Table 3. Visual and taste ratings for fresh green beans.

Variety	Visual Appeal RAW (1-5)[1,2]	Visual Appeal COOKED (1-5)[1,2]	Taste COOKED (1-5)[1,2]	Texture COOKED (1-5)[1,2]	Sum of All Ratings	Cooked Color
Orient	3.8	4.1	3.6	4.2	15.7	Uniform dk green
BA 0958	4	4.0	3.6	4.0	15.6	Dk green
Bowie	3.9	3.9	3.5	4.0	15.3	Uniform dk green
Opportune	4.2	3.6	4.1	3.4	15.3	Lt-dk green, variable
Amethyst	3.6	3.7	3.7	4.2	15.2	Olive green
Colter	3.8	4.3	3.6	3.4	15.1	Dk green
Cosmos	3.7	3.9	3.3	4.0	14.9	Lt-dk green, variable
Ambition	3.9	3.5	3.6	3.8	14.8	Dk green
Slenderette	3.9	3.4	3.6	3.8	14.7	Lt green
Annihilator	3.3	4.3	3.6	3.4	14.6	Dk green
Achiever	4	4.1	3.1	3.4	14.6	Dk green
Sybaris	3.6	3.6	3.1	3.6	13.9	Dk green
Furano	3.8	3.3	3.3	3.4	13.8	Lt green
Jade II	3.2	2.9	3.8	3.8	13.7	Very dk green
Serengeti	3	3.7	3.1	3.6	13.4	Lt-dk green variable
Momentum	3.4	3.5	2.8	3.7	13.4	Variable color
Caprice	4	3.3	2.5	2.8	12.6	Lt green
Bronco	3.3	3.0	2.3	3.8	12.4	Lt green, firm
Greencrop	2.9	3.0	2.9	2.4	11.2	Lt green, variable

[1]Rating 1 = poor; 5 = excellent.
[2]Participants = 5 (2 males, 3 females); All liked green beans.