At, NEW YORK STATE 2019 PROCESSING SNAP BEAN CULTIVAR TRIAL REPORT
Large Sieve Bean – 3-4 Sieve Bean – Whole Bean

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PROCEDURE AND MATERIALS

Location: NYS Agricultural Research Farm – field 60, Geneva - soil type - Honeoye silt loam
Planting Dates: Large Sieve – 6/5, 3-4 sieve beans – 6/19, Whole type – 7/10
Row Width: 30 inches, Row length: 30 ft. **In-row Spacing**: 1 5/8 inches (6-8 plants/ft.)
Conventional Tillage **Fertilizer**: 300#/A of 15-5-10 with Zn and Mn
Herbicide: Dual post plant, Basagran, Reflex and Raptor post emergence
Planter - Two Row Monosem Vacuum Planter
Plot Size: 1 row - 4 replications (Replicated entries), 1 row – two replications (Observation entries).

The objective of this trial was to compare a number of green and wax snap bean varieties for yield and other quality characteristics. This was accomplished in cooperation with the snap bean processors in New York and Ontario Canada in an attempt to find new, higher quality, and disease resistant varieties that are adapted to our climate and soil conditions. We did not have a field day this past season due to the weather difficulties.

For both replicated and observation entries, yield of five feet per replication was obtained by pulling the plants and hand picking them. Multiple harvests were made to plot yield increase and also seed size increase. An FMC snipper and grader were used to snip and grade the harvested pods. Each replicated entry was processed (canned and frozen) for later evaluation by the processors and seedsmen. Comments from this cutting are not included in the report.

Cold and wet was the norm for planting season 2019. All plantings were delayed. The large sieve trial was poor due to cold and wet. The 3-4 sieve and whole bean trial were much better and did well. We did have a dry period but moisture was adequate and irrigation was not needed. See the weather insert at the end of the summary for a breakdown of temperatures and precipitation over the growing season.

A cutting was held for industry on November 8th.

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Table 1 - Processing Snap Bean Cultivar List

Large Sieve			**3-4 Sieve Continued**	
Venture(std)	Syngenta		Outlaw	Syngenta
CR1218	Crites		SB4738	Syngenta
Bridger	HM		SB4773	Syngenta
Jackson	Brotherton		SB4748	Syngenta
PV857	Crites		Annihilator	PureLine
Colter	HM		Dominator	PureLine
Chisolm	HM		Wav 74	PureLine
SFC-01 (B17)	Seneca/GV		Wav 56	PureLine
BEX069	Brotherton		Antigua	PureLine
Huntington (std)	Syngenta		***Wax***	
BBL156 std	PureLine		Castore	PureLine
Pismo	Syngenta		PLS 4247	PureLine
SB4707	Syngenta		Goldrush	PureLine
Silverado	Crites		DM 08-52	PureLine
524	PureLine		***Whole***	
BA1001	Seminis		Flavor Sweet (std)	HM
UW#4	PureLine		Walker	Vilmorin
Cosmo	Brotherton		Oreo (wax)	Vilmorin
3-4 Sieve			SV1286GW	Seminis
Camero	Crites		Weston	HM
BEX057	Brotherton		BSC934 (Dawson)	Brotherton
Sahara	HM		Enclave (BEX034)	Brotherton
BSC897	Brotherton		Schubert	PureLine
HMX 0164423	HM		BB 7396	PureLine
HMX0175756	HM		BB 0553	PureLine
Cabot (std)	HM		*Extra Fine*	
Colter	HM		Denver (std)	Vilmorin
Sybaris	Seminis		Surfer	Vilmorin
Affirmed (SV0579G	Seminis		Vezer	Vilmorin
Jaguar	Crites		Astute (SVGN6196)	Seminis
Venice	Crites		Loriot (SVGN1386) (wax)	Seminis
Echo	Brotherton		DX170	Brotherton

Table 2. Yield Characteristics (large bean planting date 6/5)

Cultivar	Days to Harv.	Heat units to harv.	% 2 sieve	% 3 sieve	% 4 sieve	% 5 sieve	%6 sieve	% 2-4 sieve	4 sieve sd lgth (mm)	5 sieve sd lgth (mm)	T/A	Plants per foot
Venture	56	1042	2	2	23	36	28	28	89	97	4.1	6.0
CR1218	56	1042	3	10	57	30	4	70	98	113	3.5	6.9
CR1218	58	1087	4	7	48	31	9	59	95	118	3.3	6.5
Bridger	56	1042	6	8	57	23	5	71	91	90	2.6	6.6
Bridger	58	1087	4	7	39	34	6	49	92	100	3.0	6.1
Bridger	59	1102	3	19	24	36	7	47	98	98	3.1	6.1
UW#4	56	1042	3	9	52	27	2	64	95	100	4.2	5.8
UW#4	58	1087	4	11	55	22	4	70	94	104	4.5	6.3
Jackson	56	1042	11	27	54	3	1	93	75	81	2.6	6.0
Jackson	58	1087	9	33	50	5	0	92	80	100	1.7	6.4
Jackson	59	1102	6	18	72	8	1	96	83	98	2.6	7.1
PV857	56	1042	6	12	61	18	1	79	93	93	4.6	6.1
PV857	58	1087	5	7	61	23	2	72	88	95	3.6	5.9
PV857	59	1102	4	7	59	29	2	70	93	110	4.2	5.7
Colter	56	1042	9	16	68	4	0	93	87	97	2.5	6.6
Colter	58	1087	5	7	71	14	1	82	93	106	2.9	7.1
524	57	1066	5	14	67	19	2	86	82	97	2.9	6.3
524	59	1102	4	6	61	25	7	71	95	112	4.1	6.9
524	61	1144	5	6	60	31	1	71	101	119	3.7	7.4
Chisolm	57	1066	9	13	28	19	15	50	80	80	1.7	6.2
Chisolm	60	1122	6	7	31	31	10	44	87	91	2.7	6.3
BEX069	56	1042	4	16	49	21	2	69	85	85	2.7	4.4
BEX069	58	1087	6	7	55	25	2	68	91	113	2.8	5.5
Huntington	56	1042	5	6	54	29	3	64	88	94	4.1	7.0
Huntington	58	1087	2	4	49	34	2	55	93	103	3.9	7.2
Huntington	60	1122	3	5	45	37	8	54	93	104	4.6	7.1

Table 2. Yield Characteristics continued:

Cultivar	Days to Harv.	Heat units to harv.	% 2 sieve	% 3 sieve	% 4 sieve	% 5 sieve	%6 sieve	% 2-4 sieve	4 sieve sd lgth (mm)	5 sieve sd lgth (mm)	T/A	Plants per foot
BBL156	57	1066	7	8	48	26	3	63	82	88	2.6	6.5
BBL156	60	1122	8	5	34	41	10	47	94	99	4.8	6.2
Pismo	57	1066	11	14	60	12	0	85	92	93	3.1	7.2
Pismo	59	1102	10	10	56	23	5	75	93	110	3.3	6.7
Pismo	61	1144	6	7	50	28	1	64	108	107	4.2	6.2
SB4707	57	1066	6	9	52	30	3	67	84	97	4.7	7.6
SB4707	60	1122	5	7	49	33	6	61	94	108	4.3	7.1
SFC-01	56	1042	8	10	53	20	3	70	69	81	2.7	6.7
SFC-01	58	1087	5	7	39	34	8	52	76	92	3.0	5.2
SFC-01	60	1122	6	5	44	36	10	55	87	96	3.5	5.6
Cosmo	56	1042	7	7	38	34	7	52	83	92	2.4	5.7
Cosmo	58	1087	8	8	48	22	7	64	87	93	2.4	6.2
Cosmo	60	1122	6	7	38	40	6	51	100	110	3.3	5.9
Silverado	57	1066	23	17	44	14	2	84	74	83	2.7	6.6
Silverado	60	1122	11	18	45	19	1	73	77	85	3.1	7.0
Silverado	62	1157	8	11	54	20	2	73	83	89	3.2	6.1
BA1001	57	1066	13	19	34	40	5	66	77	87	2.7	5.4
BA1001	60	1122	7	11	43	36	2	61	68	89	2.9	7.1
BA1001	62	1157	6	6	32	51	14	43	81	94	2.7	5.9

Heading explanations page 6

Column Descriptions for Tables 2, 4, and 6.

Cultivar *– Data is based on four replications for entries in the replicated study and two plots for observation entries. Harvest sample was from five feet of row.*

Seed Source *–Brotherton=Brotherton Seed Co.; Crites M.=Crites Moscow Growers; HM=Harris Moran; Pure Line Seeds; Rogers=Syngenta Seeds; Seminis=Seminis Vegetable Seeds-Processor Division; Vil. - Vilmorin*

Days to Harvest *– The number of days from planting until harvest. Multiple harvests were made.*

Degree Day Units Base 50 Degrees F. *– The number of heat degree day units from planting until harvest.*

Percentage 2 sieve *– Pods were snipped and graded after harvest. This was the percentage of 2 sieve pods.*

Percentage 3 sieve *- Pods were snipped and graded after harvest. This was the percentage of 3 sieve pods.*

Percentage 4 sieve *- Pods were snipped and graded after harvest. This was the percentage of 4 sieve pods.*

Percentage 5 sieve *- Pods were snipped and graded after harvest. This was the percentage of 5 sieve pods.*

Percentage 6 sieve *- Pods were snipped and graded after harvest. This was the percentage of 6 sieve pods.*

Percentage 2-4 sieve *– This was the sum of the 2-4 sieve percentages.*

Seed Size of the 2 sieve pods *– One seed from ten 2 sieve pods were collectively measured in millimeters as a maturity index.*

Seed Size of the 3 sieve pods *– One seed from ten 3 sieve pods were collectively measured in millimeters as a maturity index.*

Seed Size of the 4 sieve pods *– One seed from ten 4 sieve pods were collectively measured in millimeters as a maturity index.*

Seed Size of the 5 sieve pods *– One seed from ten 5 sieve pods were collectively measured in millimeters as a maturity index.*

Plant Population listed as plants per foot *– Desired population was 6-7 plants per foot.*

Yield listed as tons per acre *– The yield from the harvest sample (prior to being snipped) extrapolated to a per acre basis.*

Table 3. Plant and Pod Characteristics (Large Sieve Beans)

Cultivar	Plt Ht. (in.)	Plt. Width (in.)	Pod Color (raw) Rating	Unsnipped Pod Length (in.)	Pod Shape Rating	Pod Location Rating	Pod Straight. Rating	Plant Habit Rating
Venture(std)	12	14	LG	4-6.5	R-CR	M	3	3.0
CR1218	14	13	MG	4.5-6	R	M-H	4	3.5
Bridger	13	15	MG	4.5-5.5	R	M-H	3.5	3.5
UW#4	14	19	L-MG	4.5-5.5	R	M-H	3.5	3.0
Jackson	13	12	DG	4.5-5	R	M-H	3.5	4.0
PV857	14	12	MG	4-5.5	R	M-H	3	4.0
Colter	13	13	DG	4.5-5.5	R	M-H	4	4.0
524	15	13	MG	4.0-5.0	R	M-H	4	4.0
Chisolm	14	14	MG	4.0-5.0	R-CR	M-H	2	3.5
BEX069	13	16	L-MG	4.5-5	R-CR	M-H	3.5	3.0
Huntington	15	15	L-MG	4.0-5.0	R-CR	M-H	3.5	3.0
BBL156 std	15	14	L-MG	4.5-5	R	M-H	3.5	3.5
Pismo	14	14	MG	4.5-5	R	M-H	3.5	3.5
SB4707	13	13	MG	4-5.5	R-CR	M-H	3	3.5
SFC-01	15	17	L-MG	3.5-5	R-CR	M-H	3	4.0
Cosmo	16	16	L-MG	5.0-6.0	R	M-H	3.5	3.5
Silverado	15	16	M-DG	4.5-5.5	R-CR	M-H	2.5	3.5
BA1001	16	17	MG	4.5-5	R	M-H	3.5	3.0

Column Descriptions

Average plant height - The average plant height at harvest in inches.

Average plant canopy width - The average plant width at harvest in inches.

Pod Color Rating - DG=dark green, MG=medium green, LG=light green. (uncooked)

Unsnipped pod length - The average length of the largest pods in inches.

Pod Shape Rating - R=round, CR=creased, O=oval

Pod Location Rating - H= pods high on the plant, M=pods located in the center of the plant canopy, L=pods touching the ground

Pod Straightness Rating - 5=very straight, 3= acceptable, 1=very curved or twisted

Plant Habit Rating - 5=very erect plant, 3= acceptable, 1=totally recumbent plant

Additional Comments - Large Sieve Beans

This planting was not very uniform and results quite variable.

Venture – Old, early, large sieve standard, rough pods, good set, creased, light green, long pods, a few necks, decent yield.

CR1218 – Very similar maturity to Venture but less of the very large sieve pods, decent plant habit, round, medium green, straight pods, hint of fiber, yield on the low side.

Bridger – Some replications very poor; decent plant habit, medium green, round pods, yield not the best.

UW#4 – Acceptable plant habit, light to medium green, round pods, decent yield.

Jackson – Dark green round pods, some replications quite poor, lower yield.

PV857 – Good plant habit, medium green, round pods, nicest pod package, some insect injury, decent yield.

Colter – Also planted in the 3-4 sieve planting, good plant habit, dark green, round, straight pods, pods with aborted seeds, mottled leaf symptoms, lower yield.

524 – Good plant habit, round, straight, medium green pods, decent yield.

Chisolm – Curved medium green pods with low yield (seed size indicated harvested young but little movement after three days).

BEX069 – Lower plant population, light to medium green pods, yield on the low side.

Huntington – Industry mainseason standard, light to medium green pods, decent yield.

BBL156 – Industry standard, strings were found in several pods, decent yield.

Pismo – Medium green, round pods; decent yield.

SB4707 – Medium green, round pods; best yield in this planting.

SFC-01 – Good plant habit, light to medium green, round to creased pods; seed size at harvests indicated might have been immature, decent yield.

Silverado – Slow seed size up, curved pods, some necks, lower yield.

BA1001 – Round, medium green pods; lower yield.

Cosmo – Old variety, light to medium green, round, long pods; some necks, lower yield.

Yield looked much better for all in the field day planting but time constraints did not allow harvest.

Snap Bean Descriptions Provided by the Seed Source (Large Beans)

Venture – *Syngenta, early large sieve.*

CR1218 *– Crites, early (52 days) 5 sv, huge yield potential, long (5.5 in) straight pods medium green uniform color, moderate plant habit. 15% 3 sv, 45% 4 sv and 40%5 sv. IR for Pss.*

Bridger (HMX 4104) – *Harris Moran, 52 days to maturity, 65 % four sieve, 30% five sieve, good quality pod interiors, good yields, medium dark green, uniform, medium long, straight pods, HR for BCMV, Curly Top and Bacterial Brown spot; IR for Halo Blight.*

UW#4 *– Pure Line, five sieve, 60 day, 10% three sieve, 40% four sieve, 40% five sieve, 10% six sieve, HR for BCMV, Aph RR; Tolerant: BBS, Curly Top, WI root rot.*

Jackson *– Brotherton, 4-5 sieve size, 13.5-16.0cm bean length.*

PV 857 *– Crites, mid early (54 days) 4-5 sieve with pods sitting high on the plant. Erect plant habit. Very good heat tolerance and concentrated setting. 60% 4 sv, 40% 5 sv, 5.5 in pods, dark green. HR for BCMV/Cl; IR for Pss/Ua*

Colter *– Harris Moran; 55 days to maturity; 20% 3 sieve size, 60% 4 sieve size, 20% 5 sieve size; HR for BCMV, BCTV and Ua, IR for Pss.*

524 – *Pure Line, 57 days to maturity, 5 sieve, 20% 3 sv, 50% 4 sv and 30% 5 sv.*

Chisholm *– Harris Moran, 55 days, straight, smooth pods; medium dark green; slow seed development; upright plant, mid high pod position; 5.9 inch pod length; 20% three sieve, 45% four sieve and 35 % five sieve; HR for Bean Common Mosaic and Curly Top; IR for Halo Blight and Bacterial Brown Spot.*

BEX069 *– Brotherton, 4-5 sieve size, 14.0-15.2cm bean length.*

Huntington – *Syngenta, 56 day 5 sieve Blue Lake type, smooth straight pods, very erect plant with beans off the ground, good yielder which has demonstrated tolerance to the Midwest virus complex, IR to Bacterial Brown Spot, HR to Bean Common Mosaic, picks very clean with a good percentage of the beans without stems, leaves tend to show some bronzing at maturity with no affect to yield.*

BBL156 – *Pure Line, 56 days to maturity, 5 sieve, 10% 3 sv, 50% 4 sv and 40% 5 sv; resistant to BCMV.*

Pismo – *Syngenta, Huntington type with potentially a higher distribution of 4 sieves. Excellent yield potential and pod placement (1-2 " higher than Huntington in most environments.*

SB4707 *– Syngenta.*

Silverado – *Crites, mid-early; 57 days to maturity (Koala +1); 4-5 sieve with 70% 4 sv and 30% 5 sieve; long, straight pods that are 5.8" medium high pod placement, dark green pod color, erect plant, sets well in the heat but also seems to do well in cooler weather; HR for CL/BCMV; IR for Pss; good level of BBS resistance.*

BA1001 – *Seminis, 58 days to maturity, 20% three sieve, 30% four sieve, 50% five sieve, 5.9 inch pod length, fresh color 7; blanched color 4; plant type 5, 90% clean yield, 60% easy harvest wo ped., 5% clusters, 0% strings; S for Psp2, Xap, CO2, Ua38, Ua90, BCTV, CYVV and BGYMV; R for Ae, BCMV.*

Cosmo *– Brotherton, Large Bean, early-midseason, very long and large mid-dark pods with very slow seed development, very good pod quality and good flavor, good standing ability, 20% 4's, 50% 5's, 30% 6's, 6-7 inch pods, R for BCMV, R for CT, T for heat.*

Seminis disease descriptions – Psp=Halo Blight, Xap=Common Blight; Pss=Bacterial brown Spot; Ae=Aphanomyces, Co2=Anthracnose; Se=White Mold; Ua=Rust; Pmy=Aerial Pythium; BCMV=Bean Common Mosaic; BCTV=Beat Curly Top; BGYMV=Bean Golden Yellow Mosaic; CYVV=Clover Yellow Vein

Table 4. Yield Characteristics (3-4 sieve trial planted 6/19)

In order of maturity.

Cultivar	Days to harv.	Heat units to harv.	%2 sieve	%3 sieve	%4 sieve	%5 sieve	%2-4 sieve	3 sieve sd length (mm)	4 sieve sd length (mm)	Plants per foot	T/A
SB4738	51	1062	44	28	25	3	97	53	69	5.7	2.9
SB4738	53	1099	29	31	37	3	97	66	76	6.0	3.0
SB4738	55	1131	21	27	45	7	93	65	91	6.1	5.5
SB4738	57	1174	12	17	60	11	89	66	87	6.9	7.4
Colter	51	1062	27	24	41	8	92	58	73	6.2	3.6
Colter	53	1099	17	26	45	12	88	68	77	5.6	4.4
Colter	55	1131	17	15	42	26	74	70	89	5.3	5.0
Colter	57	1174	7	7	53	33	67	70	90	6.1	7.4
Outlaw	51	1062	12	23	55	10	90	54	63	5.1	3.3
Outlaw	52	1099	15	19	61	5	95	65	75	5.4	3.7
Outlaw	55	1131	12	12	56	19	81	63	88	5.3	6.1
Outlaw	57	1174	6	9	56	30	70	61	86	6.2	6.9
SB4773	52	1082	23	31	41	5	95	67	81	6.4	5.0
SB4773	55	1131	16	24	52	8	92	74	92	6.5	7.1
SB4773	57	1174	13	23	57	6	94	65	81	6.0	7.0
SB4748	52	1082	26	29	42	3	93	61	74	5.6	4.0
SB4748	55	1131	25	21	46	7	93	65	85	6.4	5.7
SB4748	57	1174	15	19	56	10	90	63	86	6.4	6.9
Annihilator	51	1062	19	26	32	23	67	62	67	3.3	2.1
Annihilator	52	1099	16	8	36	40	60	61	95	4.6	4.0
Annihilator	55	1131	14	10	38	38	53	62	81	4.1	6.5
Annihilator	57	1174	16	14	41	29	71	67	81	4.1	5.7
Dominator	51	1062	17	12	60	12	88	67	79	4.2	2.4
Dominator	52	1099	12	10	41	37	63	68	79	4.8	3.7
Dominator	55	1131	10	8	36	47	53	70	96	5.4	6.4
Dominator	57	1174	9	10	38	43	57	65	88	4.7	6.6
Camero	54	1114	13	15	55	17	83	64	78	6.0	5.2
Camero	56	1155	15	13	44	28	72	65	77	6.9	6.6
Camero	58	1190	15	14	42	29	71	59	76	6.3	6.3
Echo	54	1114	28	42	30	0	100	65	76	6.1	4.9
Echo	56	1155	21	35	38	6	94	66	86	7.2	6.4
Echo	58	1190	21	29	42	7	93	66	84	5.9	5.4
Sahara	54	1114	21	28	47	4	96	66	71	5.5	4.6
Sahara	56	1155	13	19	56	13	87	69	79	6.2	6.1
Sahara	58	1190	7	18	62	13	87	74	84	6.0	6.3
HMX0175756	54	1114	16	14	43	27	73	60	80	5.8	4.5
HMX0175756	56	1155	19	13	42	26	74	56	77	5.4	4.6
HMX0175756	58	1190	8	11	40	41	59	60	76	6.2	7.7
Sybaris	55	1131	12	16	40	31	69	65	73	6.0	3.9
Sybaris	57	1174	19	11	47	23	77	61	78	5.7	4.8
Sybaris	60	1229	12	14	41	33	67	61	80	5.7	8.1
Jaguar	55	1131	21	26	41	12	88	78	90	5.8	4.6
Jaguar	57	1174	21	28	43	8	92	75	87	6.3	5.0
Jaguar	60	1229	6	15	53	26	74	90	101	6.0	7.3

Table 4. Yield Characteristics (3-4 sieve) continued:

Cultivar	Days to harv.	Heat units to harv.	%2 sieve	%3 sieve	%4 sieve	%5 sieve	%2-4 sieve	3 sieve sd length (mm)	4 sieve sd length (mm)	Plants per foot	T/A
BSC897	56	1155	29	25	39	7	93	62	78	5.4	4.9
BSC897	58	1190	35	24	34	7	93	60	81	5.2	6.1
BSC897	60	1229	20	29	42	10	90	72	101	5.4	7.9
HMX0164423	55	1131	26	25	41	8	92	70	74	5.4	4.5
HMX0164423	57	1174	25	23	46	6	94	61	79	5.7	4.7
HMX0164423	60	1229	7	12	44	36	64	59	84	5.2	8.8
Cabot	56	1155	25	21	48	5	95	64	77	6.1	5.2
Cabot	58	1190	14	20	54	12	88	65	83	6.5	6.2
Cabot	60	1229	6	13	65	16	84	70	87	6.6	7.8
Affirmed	56	1155	33	28	33	6	94	63	72	5.8	5.0
Affirmed	58	1190	14	27	51	9	91	210	73	6.5	7.2
Affirmed	60	1229	5	13	64	17	83	68	83	6.1	9.2
Wav 74	56	1155	35	22	39	4	96	54	72	5.3	3.6
Wav 74	58	1190	30	24	38	7	93	58	69	6.4	5.0
Wav 74	60	1229	25	32	38	5	95	55	76	6.6	6.3
Wav 56	56	1155	50	36	9	4	96	69	84	5.2	4.1
Wav 56	58	1190	43	42	13	1	99	71	93	7.0	5.3
Wav 56	60	1229	26	48	23	3	97	94	109	7.3	6.5
Antigua	56	1155	33	20	40	7	93	57	79	5.7	3.4
Antigua	58	1190	25	29	40	7	93	60	81	6.2	4.7
Antigua	60	1229	13	25	50	13	87	61	79	6.6	6.9
BEX057	55	1131	39	26	34	1	99	67	69	5.7	3.0
BEX057	57	1174	33	33	31	3	97	61	76	5.4	3.3
BEX057	60	1229	16	23	49	12	88	60	81	6.1	6.3
BEX057	63	1292	19	24	46	11	89	68	79	6.3	7.2
BEX057	65	1340	9	19	58	14	86	72	107	6.3	7.5
Venice	58	1190	61	24	13	2	98	61	87	6.2	2.6
Venice	61	1248	50	36	13	1	99	71	85	6.5	4.9
Venice	63	1292	39	38	20	3	97	64	86	7.0	6.9
Venice	65	1340	31	41	25	4	96	83	96	6.8	7.6
Wax											
Castore	52	1082	26	41	27	5	95	79	85	5.6	3.9
Castore	55	1131	28	36	30	5	95	82	94	6.3	5.9
Castore	57	1174	27	38	30	5	95	75	88	5.9	6.6
PLS 4247	52	1082	28	31	36	5	95	58	71	5.0	2.4
PLS4247	55	1131	15	15	63	6	94	69	79	5.7	3.4
PLS4247	57	1174	14	14	59	13	87	58	81	7.0	5.8
Goldrush	52	1082	26	30	41	3	97	64	80	5.8	4.3
Goldrush	55	1131	15	18	55	11	89	75	83	7.2	6.5
Goldrush	57	1174	8	15	64	13	87	71	91	6.3	8.3
DM 08-52	55	1131	23	15	29	32	68	73	88	3.7	3.3
DM 08-52	57	1174	15	10	38	37	63	66	88	5.7	6.2

Table 5. Plant and Pod Characteristics - 3-4 sieve type

Cultivar	Plant Ht. (in.)	Plant Width (in.)	Plant Habit Rating	Pod Color (raw) Rating	Unsnipped Pod Lgth (in.)	Pod Shape Rating	Pod Location Rating	Pod Straight. Rating
SB4738	14	17	3.5	MG	5 to 6	R	M-H	3.5
Colter	15	17	3.5	MG	5.5-6	R	M-H	4.5
Outlaw	15	16	4	MG	5-5.5	R	H	4
SB4773	19	15	3	LG	4.5-5.5	R	M-H	4
SB4748	15	19	3.5	MG	5-6	R	M-H	3
Annihilator	15	19	3.5	MG	6-6.5	R	M-H	3.5
Dominator	13	21	2.5	MG	5-5.5	R	M-H	3.5
Camero	17	20	3.5	MG	5-6	R	M-H	4
Echo	14	17	3.5	LG	5.5-6	R-O	M-H	4.5
Sahara	16	18	3.5	DG	5-6	R	M-H	3
HMX0175756	16	21	3.5	MG	5.5-6	R	H	4
Sybaris	16	22	3.5	DG	5.5-6	R	M-H	3.5
Jaguar	14	15	3	DG	5.5-6	R	M-H	4
BSC897	15	17	3.5	MG	5.5-6.5	R	M-H	4
HMX 0164423	17	21	3	DG	5.5-6	R	H	4
Cabot (std)	14	17	3	MG	5-5.5	R	M-H	3.5
Affirmed	14	22	3	DG	5-5.5	R	M-H	4
Wav 74	18	20	4	LG	4.5-5.5	R	M-H	4
Wav 56	15	20	3.5	MG	4.5-5	R	M-H	4
Antigua	17	20	3.5	MG	4.5-5	R	M-H	4
BEX057	16	20	3.5	MG	5-5.5	R	H	4.5
Venice	17	21	3.5	MG	5-5.5	R	M-H	4
Wax								
Castore	14	19	3	Yellow	4-5	O	M-H	3.5
PLS 4247	16	23	3	Gold	4-5	R	M-H	3
Goldrush	17	20	3.5	Yellow	5-6	O	M-H	4
DM 08-52	18	22	3.5	Pale yellow	5.5-6	O	M-H	3

Column Descriptions

Average plant height - The average plant height at harvest in inches.

Average plant canopy width - The average plant width at harvest in inches.

Plant Habit Rating - 5=very erect plant, 3= acceptable, 1=totally recumbent plant

Pod Color Rating - D=dark green, M=medium green, L=light green. (uncooked)

Unsnipped pod length - The average length of the largest pods in inches.

Pod Shape Rating - R=round, CR=creased, O=oval

Pod Location Rating - H= pods high on the plant, M=pods located in the center of the plant canopy, L=pods touching the ground

Pod Straightness Rating - 5=very straight, 3= acceptable, 1=very curved or twisted

Additional Comments (3-4 sieve)

SB4738 – Medium green, round, long pods; very good yield.

Colter – Medium green, round, long, very straight pods; very good yield.

Outlaw – Very good plant habit, medium green, round, straight pods, high on the plant; good yield.

SB4773 – Light green, round, shorter, straight pods; very good yield.

SB4748 – Medium green, round, long pods; good yield.

Annihilator – Plant population on the lower side, medium green, very long, round pods; good yield.

Dominator – Plant population on the lower side, recumbent plant habit, medium green, round pods; good yield.

Camaro – Medium green, long, straight, round pods; good yield.

Echo – Light green, long, round to oval, very straight pods; good yield.

Sahara – Dark green, long, round pods; good yield.

HMX 0175756 – Medium green, long, round, straight pods high on the plant; very good yield.

Sybaris – Dark green, long, round pods; excellent yield.

Jaguar – Dark green, long, round, straight pods; very good yield.

BSC0897 – Medium green, long, round, straight pods; very good yield.

HMX 0164423– Dark green, long, round, straight pods high on the plant, excellent yield.

Cabot – Medium green, round pods; very good yield.

Affirmed – Dark green, round, straight pods; excellent yield.

Wav 74 – Very good plant habit, light green, round, shorter, straight pods; good yield.

Wav 56 – Medium green, round, shorter, straight pods; good yield.

Antigua – Medium green, shorter, round, straight pods; good yield.

BEX057 – Medium green, round, very straight pods high on the plant; very good yield.

Venice – Late season, medium green, round, straight pods; very good yield.

Wax

Castore – Shorter, oval, nice yellow color pods; very good yield.

PLS 4247 – Shorter, round, golden yellow pods; good yield.

Goldrush – Long, yellow, oval pods; excellent yield.

DM 08-52 – Long oval, pale yellow pods; very good yield, still young and could have been harvested later.

Snap Bean Descriptions Provided by Seed Source (3-4 Sieve type)

SB4738 – *Syngenta.*

Colter *– Harris Moran; 55 days to maturity; 20% 3 sieve size, 60% 4 sieve size, 20% 5 sieve size; HR for BCMV, BCTV and Ua, IR for Pss.*

Outlaw *– Syngenta.*

SB4773 *– Syngenta.*

SB4748 – *Syngenta.*

Annihilator – *Pure Line, 3-4 sieve, 5% 3 sv, 75% 4 sv, 20% 5 sv; resistant to BCMV and BCTV.*

Dominator – *Pure Line, 3-4 sieve, 15% 3 sv, 70% 4 sv, 15% 5 sv; resistant to BCMV and BCTV.*

Camaro PV-891 *– Crites, 53 day estimate, erect large plant habit, 4 sv (10% 3 sv, 85% 4 sv and 5% 5 sv), medium green, 5.75 inch pods, high pod placement. HR for BCMV and Cl.*

Echo (BEX138) – *Brotherton, 3-4 sieve, 14-16.5 cm pod length.*

Sahara *– Harris Moran, green bush type, early maturity (54 days), upright plant habit, mid high pod position, 5.5 inch pods, medium dark green color, 40% 3 sieve, 60% 4 sieve; HR for bean common mosaic, curly top, anthracnose, halo blight, and bacterial brown spot.*

HMX 0175756 *– Harris Moran, green bush type, early maturity (54 days), upright plant habit, mid pod position, 5.5 inch pods, medium dark green pod color, 10% 3 sieve, 70% 4 sieve, 20% 5 sieve, HR for bean common mosaic, HR for curly top, HR for halo blight,*

Sybaris – *Seminis, 57 days to maturity, 10% 2sv, 30% 3 sv, 50% 4 sv, 10% 5sv; 5.7 inch pod length, fresh color – 3, Blanched color – 3, plant type 5; 100% clean yield, 50% easy harvest wo ped., 1% clusters, 5% strings; S for Psp2, Xap, CO2, Ae, CYVV and BGYMV; IR for Ua90; R for Ua38, BCTV and BCMV.*

Jaguar (PV-905) *– Crites, 57-58days, very erect plant habit, 4 sieve, 15% 3 sv, 80% 4 sv and 5% 5 sv, dark green, 6 inch pods. HR for BCMV and CL; IR for Rust. Pods pick very easy and clean.*

BSC897 *– Brotherton, midseason maturity, 21 inch plant height; dark green, 4-6 inch pods; 20% 3 sieve, 60% 4 sieve and 20% 5 sieve; R for BCMV and AN; T for BBS and heat.*

HMX 0164494 *– Harris Moran, early maturity (54 days), medium upright plant type, mid high pod position, 14 cm pod length, medium dark pod color, 5% 3 sv, 50% 4 sv, 45% 5 sv; HR for BCMV and Psp; IR for Cl, Pss and Xap, quality pod interiors for processing, good heat set, good yields.*

Cabot – *Harris Moran, attractive, round, straight pods; high quality end product, consistent performance, 55 days to maturity, upright plant, pod position mid high, 5.5 inch pods, 25% three sieve, 60% four sieve,15% five sieve, medium dark green color, HR for Bean common mosaic, rust and common blight; IR for Curly top, Halo Blight and Bacterial Brown Spot.*

Affirmed – *Seminis, 56 days, (10% 2 sv, 30% 3 sv, 50% 4 sv and 10% 5sv), 5.8 inch pod length, 100% clean yield, 55% without ped., 1% clusters, 0% strings, S for Xap, Ua38, Ua90, Ae, CYVV and BGYMV; R for Psp2, CO2, BCTV and BCMV; improved plant, pod quality and product homogeneity.*

Snap Bean Descriptions Provided by Seed Source (3-4 Sieve type) continued:

Wav 74 *– Pure Line*

Wav 56 *– Pure Line*

Antigua *– Pure Line*

BEX057 – *Brotherton, An early 3/4 sieve with more 4's, BEX 057 has excellent yield potential, upright plant structure, and disease package, 12.5-14.4cm bean length.*

Venice *– Crites, A medium late variety with a very upright solid plant. The pods are very straight, 30% 2 sieve and 70% 3sieve; 12 cm long (-5.3 inch) and have nice very dark green color; HR for Psp, BCMV and Antracnose.*

Wax

Castore *– Pure Line*

PLS 4247 *– Pure Line*

Goldrush *– Pure Line*

DM 08-52 *– Pure Line*

Table 6. Yield Characteristics Whole Bean (Planting date 7/10)

Cultivar	Days to Harv.	Heat Units to Harv.	% 2 sieve	% 3 sieve	% 4 sieve	2 Sieve Seed Length (mm)	3 sieve seed length (mm)	Plants per Foot	T/A Harvest
Whole Beans									
Walker	57	1111	100	0	0	67		6.3	4.6
Walker	60	1145	100	0	0	87		6.8	6.0
Walker	63	1167	100	0	0	89		7.0	6.7
Flavor Sweet	58	1124	100	0	0	65		7.4	3.5
Flavor Sweet	61	1155	66	33	1	66	76	7.6	4.9
Flavor Sweet	64	1183	28	55	16	76	85	7.2	5.7
SV1286GW	58	1124	100	0	0	63		7.7	5.0
SV1286GW	61	1155	100	0	0	58		8.0	5.9
SV1286GW	64	1183	100	0	0	81		8.0	6.4
Weston	58	1124	100	0	0	77		7.4	5.2
Weston	61	1155	100	0	0	72		7.4	5.2
Weston	64	1183	100	0	0	88		8.1	5.8
BSC934 (Dawson)	58	1124	100	0	0	51		6.2	3.4
BSC934 (Dawson)	61	1155	100	0	0	52		6.5	4.9
BSC934 (Dawson)	64	1183	100	0	0	73		6.9	5.9
BB 0553	58	1124	100	0	0	62		5.9	3.8
BB 0553	61	1155	100	0	0	63		5.7	5.4
BB 0553	64	1183	100	0	0	82		6.4	6.2
Schubert	58	1124	100	0	0	65		6.8	4.5
Schubert	61	1155	100	0	0	60		6.8	5.8
Schubert	64	1183	100	0	0	86		7.3	6.6
BB 7396	58	1124	100	0	0	68		6.8	3.9
BB 7396	61	1155	100	0	0	66		7.2	4.6
BB 7396	64	1183	100	0	0	85		7.6	5.0
Enclave (BEX034)	60	1145	100	0	0	69		6.2	4.5
Enclave (BEX034)	63	1167	100	0	0	86		6.0	5.1
Enclave (BEX034)	65	1203	100	0	0	69		7.1	6.6
wax									
Oreo (wax)	57	1111	100	0	0	54		7.2	4.0
Oreo (wax)	60	1145	100	0	0	81		6.5	4.3
Oreo (wax)	63	1167	100	0	0	101		7.3	4.8

Table 6. Yield Characteristics continued:								
Cultivar	Days to Harv.	Heat Units to Harv.	% 2 sieve	% 3 sieve	% 4 sieve	2 Sieve Seed Length (mm)	Plants per Foot	T/A Harvest
Extra Fine								
DX170	57	1111	100	0	0	60	5.7	2.6
DX170	60	1145	100	0	0	65	6.7	4.2
DX170	63	1167	100	0	0	78	6.2	3.1
Denver (std)	58	1124	100	0	0	48	6.1	3.6
Denver (std)	61	1155	100	0	0	54	6.4	4.3
Denver (std)	64	1183	100	0	0	64	6.5	4.9
Surfer	58	1124	100	0	0	52	6.1	3.6
Surfer	61	1155	100	0	0	66	6.3	3.7
Surfer	64	1183	100	0	0	69	6.3	4.4
Vezer	58	1124	100	0	0	52	5.8	3.2
Vezer	61	1155	100	0	0	54	6.9	4.3
Vezer	64	1183	100	0	0	68	6.0	4.2
Astute (SVGN6196)	58	1124	100	0	0	50	6.1	3.0
Astute (SVGN6196)	61	1155	100	0	0	52	7.0	2.9
Astute (SVGN6196)	64	1183	100	0	0	67	7.2	4.6
wax								
Loriot (SVGN1386)	58	1124	100	0	0	53	5.2	2.3
Loriot (SVGN1386)	61	1155	100	0	0	57	6.3	3.5
Loriot (SVGN1386) (	64	1183	100	0	0	67	5.5	3.4

Our smallest grader is a 2 sieve. These extra fines were mostly one sieve.

Table 7. Plant and Pod Characteristics - Whole bean & Extra fine

Cultivar	Plant Ht. (in.)	Plant Width (in.)	Plant Habit Rating	Pod Color (raw) rating	Unsnipped Pod Length (in.)	Pod Shape Rating	Pod Location Rating	Pod Straight. Rating
Whole								
Walker	15	16	4	MG	5-5.5	R	H	5
Flavor Sweet	17	16	4.5	MG	4.25-4.75	R	M-H	4.5
SV1286GW	12	14	4	MG	5.25-5.75	R-O	M-H	4
Weston	19	16	4.5	M-DG	4.5-5	R	H	4.5
BSC934	21	16	5	M-DG	4.5-5	R	H	4.5
BB 0553	18	17	4.5	M-DG	4.75-5.25	R-O	H	5
Schubert	17	15	4.5	M-DG	5.5-6.5	R	H	4.5
BB 7396	18	18	4	DG	4.75-5.25	R-O	H	5
Enclave	15	14	4	M-DG	4.5-5.25	R	H	4.5
Oreo (wax)	16	16	4	GY	4-4.5	R	H	4.5
Extra Fine								
DX170	17	16	4.5	MG	4.75-5.25	R	M-H	4
Denver	17	15	5	M-DG	4.25-4.75	R	H	4.5
Surfer	15	14	5	MG	4.5-5	R-O	H	4
Vezer	17	16	4.5	MG	4.5-5	R	M-H	4.5
Astute	18	16	4.5	MG	4.75-5	R	H	4.5
Loriot (wax)	13	14	4	Y	4.75-5.5	R-O	M-H	4.5

Column Descriptions

Average plant height - The average plant height at harvest in inches.

Average plant canopy width - The average plant width at harvest in inches.

Plant Habit Rating - 5=very erect plant, 3= acceptable, 1=totally recumbent plant
Habit was done one week after harvest.)

Pod Color Rating - DG=dark green, MG=medium green, LG=light green. (uncooked)
ght yellow, Y=Yellow, GY=golden yellow

Unsnipped pod length - The average length of the largest pods in inches.

Pod Shape Rating - R=round, CR=creased, O=oval

Pod Location Rating - H= pods high on the plant, M=pods located in the center of the plant canopy, L=pods touching the ground

Pod Straightness Rating - 5=very straight, 3= acceptable, 1=very curved or twisted

Additional Comments - Whole Bean

Walker – Very good plant habit; medium green, round, long, very straight pods high on the plant; excellent yield.

Flavor Sweet – Very good to excellent plant habit; medium green, round, very straight pods; very good yield.

SV1286GW – Very good plant habit; medium green, long, round, straight pods; excellent yield.

Weston – Very good to excellent plant habit; medium to dark green, round, very straight pods high on the plant; very good yield.

BSC934 – Excellent plant habit; medium to dark green, round, very straight pods high on the plant; very good yield.

BB 0553 – Very good to excellent plant habit; medium to dark green, round to oval, very straight pods high on the plant; excellent yield.

Schubert – Very good to excellent plant habit; medium to dark green, long, round, very straight pods high on the plant; excellent yield.

BB 7396 – Very good plant habit; dark green, round to oval, very straight pods high on the plant; good yield.

Enclave (BEX034) – Very good plant habit; medium to dark green, round, very straight pods high on the plant; excellent yield.

Oreo (wax) – Very good plant habit; golden yellow, round to oval, very straight pods high on the plant; good yield.

Extra Fine

DX170 – Very good to excellent plant habit; medium green, round, straight pods; decent yield.

Denver – Excellent plant habit; medium to dark green, round, very straight pods high on the plant; good yield.

Surfer – Excellent plant habit; medium green, round to oval, straight pods high on the plant; good yield.

Vezer – Very good to excellent plant habit; medium green, round, very straight pods; good yield.

Astute (SVGN6196) – Very good to excellent plant habit; medium green, round, very straight pods high on the plant; good yield.

Loriot (SVGN1386) (wax) – Very good plant habit; short plants; yellow, round, straight pods; decent yield.

Descriptions Provided by the Seed Source - Whole Beans

Walker *– Vilmorin.*

Flavor Sweet – *Harris Moran, 55 days to maturity, upright plant, strong emergence vigor, pod position – mid high, 5 inch pod length, 85% 3 sieve, 15% 4 sieve, medium green pod color, good plant vigor, good quality straight pods, HR for BCMV 1, CI and Psp.*

SV1286GF *– Seminis, 57 days, (70% 2 sv, 30% 3 sv), 4.8 inch pod length, fresh color – 4; blanched color – 5, plant type 2; 100% clean yield, 65% without ped., 1% clusters, 0% strings, S for Xap, Ua90, Ae, CYVV and BGYMV; R for Psp2, Ua38, CO2 and BCMV; improved plant type, very flexible, smaller sieve size than Cadillac.*

Weston (HMX4129) *– Harris Moran, 58 days to maturity, whole bean type, 80 % sieve 3, good quality pod interiors, medium green color, uniform, medium long, straight pods 13.5 cm long, HR for BCMV, Curly Top, Halo Blight and Common Blight; IR for anthracnose.*

BSC934 *– Brotherton, 1-2 sieve size, 11.0-11.5cm bean length.*

BB 0553 *– Pure Line.*

Schubert *– Pure Line.*

BB 7396 *– Pure Line.*

Enclave (BEX034) *– Brotherton, 2-3 sieve size, 11.3-12.0cm bean length.*

Oreo *– Vilmorin, wax.*

Extra Fine

DX170 *– Brotherton, DX 170 is an early mid season, 2 sieve, extra fine bean. DX 170 has a good disease package and shows tolerance to BCMV. A recent introduction from Brotherton Seed, DX 170 is high yielding and a good fit in the extra fine segment.*

Denver *- Vilmorin, semi early, 10.5-11 cm pod length, whole bean sieve 1-2, very productive and excellent pod quality, upright vigorous plant, HR for BCMV, Psp, Xap and Anthracnose.*

Surfer *– Vilmorin, semi early, 11.5 cm pod length, whole bean sieve 1-2 with dominant sieve 1, very productive, upright habit, HR for BCMV, Psp and Anthracnose; Ir for Xap.*

Vezer *– Vilmorin.*

Astute (SVGN6196) *– Seminis, 55 days, (70% 1 sv, 30% 2 sv), 4.8 inch pod length, fresh color – 6; blanched color – 4; 100% clean yield; 65% without ped., 1% clusters, 0 % strings; S for Xap, Ua90, Ae, CYVV and BGYMV; R for Ua38, Psp2, CO2, BCTV and BCMV; improved plant type, more suitable for clay soils.*

Loriot (SVGN1386) *– Seminis.*

Table 8. 2019 Weather summary for Geneva NY.

Day	Max. Temp.	Min. Temp.	Mean Temp.	Precip.	Acc Precip.	Degree Days Base 50	acc dd units base 50
5/8/19	54	40	47	0.21	0.21	0	0
5/9/19	53	40	46.5	0	0.21	0	0
5/10/19	66	44	55	0.44	0.65	5	5
5/11/19	71	40	55.5	0.24	0.89	5.5	10.5
5/12/19	55	42	48.5	0.09	0.98	0	10.5
5/13/19	43	40	41.5	0.62	1.6	0	10.5
5/14/19	44	40	42	0.52	2.12	0	10.5
5/15/19	46	39	42.5	0.1	2.22	0	10.5
5/16/19	67	43	55	0.08	2.3	5	15.5
5/17/19	63	47	55	0.02	2.32	5	20.5
5/18/19	69	43	56	0	2.32	6	26.5
5/19/19	65	50	57.5	0.28	2.6	7.5	34
5/20/19	85	61	73	0.17	2.77	23	57
5/21/19	71	42	56.5	0.04	2.81	6.5	63.5
5/22/19	61	44	52.5	0	2.81	2.5	66
5/23/19	65	50	57.5	0.01	2.82	7.5	73.5
5/24/19	78	53	65.5	0	2.82	15.5	89
5/25/19	65	46	55.5	0	2.82	5.5	94.5
5/26/19	76	52	64	0.79	3.61	14	108.5
5/27/19	78	53	65.5	0	3.61	15.5	124
5/28/19	73	54	63.5	0.04	3.65	13.5	137.5
5/29/19	68	49	58.5	0.22	3.87	8.5	146
5/30/19	59	50	54.5	0.02	3.89	4.5	150.5
5/31/19	68	53	60.5	0.54	4.43	10.5	161
6/1/19	69	52	60.5	0	4.43	10.5	171.5
6/2/19	78	56	67	0.14	4.57	17	188.5
6/3/19	64	45	54.5	0.04	4.61	4.5	193
6/4/19	61	45	53	0	4.61	3	196
6/5/19	67	53	60	0	4.61	10	206
6/6/19	77	55	66	0.36	4.97	16	222
6/7/19	70	48	59	0	4.97	9	231
6/8/19	75	49	62	0	4.97	12	243
6/9/19	76	52	64	0	4.97	14	257
6/10/19	80	52	66	0	4.97	16	273
6/11/19	69	54	61.5	0.61	5.58	11.5	284.5
6/12/19	69	45	57	0	5.58	7	291.5
6/13/19	73	58	65.5	0	5.58	15.5	307
6/14/19	62	52	57	0.47	6.05	7	314
6/15/19	68	53	60.5	0	6.05	10.5	324.5
6/16/19	73	56	64.5	0.33	6.38	14.5	339
6/17/19	59	48	53.5	0.34	6.72	3.5	342.5
6/18/19	71	53	62	0	6.72	12	354.5
6/19/19	77	57	67	0	6.72	17	371.5
6/20/19	80	63	71.5	0.58	7.3	21.5	393
6/21/19	68	57	62.5	0.91	8.21	12.5	405.5

Day	Max. Temp.	Min. Temp.	Mean Temp.	Precip.	Acc Precip.	Degree Days Base 50	acc dd units base 50
6/22/19	72	55	63.5	0.01	8.22	13.5	419
6/23/19	73	58	65.5	0	8.22	15.5	434.5
6/24/19	78	55	66.5	0	8.22	16.5	451
6/25/19	76	62	69	0.67	8.89	19	470
6/26/19	79	58	68.5	0	8.89	18.5	488.5
6/27/19	83	62	72.5	0	8.89	22.5	511
6/28/19	82	60	71	0	8.89	21	532
6/29/19	85	66	75.5	0	8.89	25.5	557.5
6/30/19	81	63	72	0	8.89	22	579.5
7/1/19	70	54	62	0	8.89	12	591.5
7/2/19	79	61	70	0	8.89	20	611.5
7/3/19	77	62	69.5	0	8.89	19.5	631
7/4/19	83	62	72.5	0	8.89	22.5	653.5
7/5/19	88	70	79	0	8.89	29	682.5
7/6/19	88	68	78	0.75	9.64	28	710.5
7/7/19	82	63	72.5	0.5	10.14	22.5	733
7/8/19	74	55	64.5	0.06	10.2	14.5	747.5
7/9/19	77	53	65	0	10.2	15	762.5
7/10/19	80	60	70	0	10.2	20	782.5
7/11/19	87	69	78	0	10.2	28	810.5
7/12/19	83	62	72.5	0	10.2	22.5	833
7/13/19	83	60	71.5	0	10.2	21.5	854.5
7/14/19	84	66	75	0	10.2	25	879.5
7/15/19	77	61	69	0	10.2	19	898.5
7/16/19	80	63	71.5	0	10.2	21.5	920
7/17/19	89	64	76.5	0.1	10.3	26.5	946.5
7/18/19	76	66	71	0.27	10.57	21	967.5
7/19/19	83	66	74.5	0	10.57	24.5	992
7/20/19	88	73	80.5	0	10.57	30.5	1022.5
7/21/19	91	74	82.5	0	10.57	32.5	1055
7/22/19	82	64	73	0	10.57	23	1078
7/23/19	66	61	63.5	0.9	11.47	13.5	1091.5
7/24/19	75	59	67	0.02	11.49	17	1108.5
7/25/19	74	58	66	0.03	11.52	16	1124.5
7/26/19	79	58	68.5	0	11.52	18.5	1143
7/27/19	82	61	71.5	0	11.52	21.5	1164.5
7/28/19	85	66	75.5	0	11.52	25.5	1190
7/29/19	81	63	72	0	11.52	22	1212
7/30/19	88	64	76	0	11.52	26	1238
7/31/19	84	64	74	0.24	11.76	24	1262
8/1/19	80	61	70.5	0	11.76	20.5	1282.5
8/2/19	78	53	65.5	0	11.76	15.5	1298
8/3/19	80	60	70	0	11.76	20	1318
8/4/19	82	62	72	0	11.76	22	1340
8/5/19	75	51	63	0	11.76	13	1353
8/6/19	80	59	69.5	0	11.76	19.5	1372.5

Day	Max. Temp.	Min. Temp.	Mean Temp.	Precip.	Acc Precip.	Degree Days Base 50	acc dd units base 50
8/7/19	87	65	76	0.4	12.16	26	1398.5
8/8/19	73	63	68	0.52	12.68	18	1416.5
8/9/19	80	60	70	0.36	13.04	20	1436.5
8/10/19	75	59	67	0	13.04	17	1453.5
8/11/19	73	56	64.5	0	13.04	14.5	1468
8/12/19	77	58	67.5	0	13.04	17.5	1485.5
8/13/19	81	66	73.5	0.18	13.22	23.5	1509
8/14/19	79	60	69.5	0.22	13.44	19.5	1528.5
8/15/19	76	56	66	0.03	13.47	16	1544.5
8/16/19	76	61	68.5	0.02	13.49	18.5	1563
8/17/19	80	61	70.5	0.5	13.99	20.5	1583.5
8/18/19	76	61	68.5	1.23	15.22	18.5	1602
8/19/19	82	65	73.5	1.76	16.98	23.5	1625.5
8/20/19	81	61	71	0	16.98	21	1646.5
8/21/19	81	66	73.5	0.2	17.18	23.5	1670
8/22/19	82	66	74	0.05	17.23	24	1694
8/23/19	72	56	64	0	17.23	14	1708
8/24/19	70	52	61	0	17.23	11	1719
8/25/19	64	51	57.5	0.01	17.24	7.5	1726.5
8/26/19	73	54	63.5	0.01	17.25	13.5	1740
8/27/19	72	58	65	0	17.25	15	1755
8/28/19	73	61	67	0.22	17.47	17	1772
8/29/19	73	55	64	0.11	17.58	14	1786
8/30/19	73	56	64.5	0	17.58	14.5	1800.5
8/31/19	75	52	63.5	0	17.58	13.5	1814
9/1/19	69	51	60	0	17.58	10	1824
9/2/19	74	58	66	0.7	18.28	16	1840
9/3/19	71	59	65	0.13	18.41	15	1855
9/4/19	75	61	68	0.25	18.66	18	1873
9/5/19	75	52	63.5	0.01	18.67	13.5	1886.5
9/6/19	70	49	59.5	0.01	18.68	9.5	1896
9/7/19	71	51	61	0.03	18.71	11	1907
9/8/19	67	54	60.5	0.11	18.82	10.5	1917.5
9/9/19	66	46	56	0.02	18.84	6	1923.5
9/10/19	65	47	56	0.02	18.86	6	1929.5
9/11/19	81	50	65.5	0.21	19.07	15.5	1945
9/12/19	82	58	70	0.05	19.12	20	1965
9/13/19	63	50	56.5	0	19.12	6.5	1971.5
9/14/19	66	51	58.5	0.15	19.27	8.5	1980
9/15/19	75	53	64	0.01	19.28	14	1994
9/16/19	73	57	65	0.17	19.45	15	2009
9/17/19	68	47	57.5	0	19.45	7.5	2016.5
9/18/19	69	45	57	0	19.45	7	2023.5
9/19/19	69	46	57.5	0	19.45	7.5	2031
9/20/19	69	48	58.5	0	19.45	8.5	2039.5