

NEW YORK STATE 2022 PROCESSING SNAP BEAN CULTIVAR TRIAL REPORT

(Large Sieve – 3/4 Sieve – Whole/Extra-Fine)

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PROCEDURES AND MATERIALS:

Location: Cornell AgriTech (Research North) – Geneva NY
Soil Type: Honeoye silt loam
Planting Dates: Large Sieve – 5/20; 3-4 sieve beans – 6/6; Whole/Fine – 7/8
Row Width: 30 inches, Row length: 30 ft.
In-row Spacing: 1 5/8 inches (6-8 plants/ft.)
Fertilizer: 300#/A of 15-5-10 with Zn and Mn
Tillage: Conventional
Herbicide: Dual post plant, Assure post emergence
Planter – Two Row Monosem Vacuum Planter
Plot Size: 1 row – 4 replications (Replicated entries)

Objectives and Season Summary:

The objective of this trial was to compare various 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, as well as seed companies, in an attempt to find new, higher quality, and disease resistant varieties that are adapted to our climate and soil conditions. A field day was held for processors and seed companies to view varieties in the field.

For replicated entries, yield of five feet per replication was obtained by pulling the plants and hand picking them. Multiple harvests were made to evaluate 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 for later evaluation by the processors and seed company representatives at our programs annual cutting event.

The **large sieve bean trial** was planted on May 20th with relatively good field conditions. Emergence was satisfactory. June was relatively cool and wet. In July, the trial experienced consistent droughty conditions. The large sieve trial had consistent and decent yields but was slow to size up likely because of the cool June weather and then droughty July weather. **The 3-4 sieve trial** was planted on June 6th and the field conditions and emergence were also satisfactory. Similar to the large sieve trial, the 3-4 sieve trial experienced wet conditions in the first half of its life cycle and droughty conditions in the second half. Yields in the 3-4 sieve trial were relatively consistent but smaller than the large sieve trial, and similarly slow to size up. **The whole/extra-fine bean trial** was planted on July 8th with decent soil conditions. The whole/extra-fine bean trial experienced droughty conditions over the span of the trial. We were forced to irrigate this trial twice because of the lack of precipitation in July and August. Yields from this trial were inconsistent with some varieties recording good yields and others poor. Overall, the droughty July and August weather was the biggest environmental impact on all three trials in 2022 and made it difficult to allow the beans to size up before becoming spongy. See the weather insert at the end of the summary for a breakdown of temperatures and precipitation over the growing season.

A vegetable “cutting”, was held on November 1st, where frozen peas, snap beans, and sweet corn were put on display for processors and seed companies to evaluate. Large and 3-4 sieve snap beans were canned and put on display. Our vegetable cutting is the final step of our program’s evaluation. We evaluate the horticultural characteristics in the field and in raw products, but our vegetable cutting takes us all the way to quality evaluation on the plate.

Table 1: Processing Snap Bean Cultivar List

Large Sieve

Variety	Company
Bridger	Harris Moran
RR2006	Pure Line
Pismo	Syngenta
Fraser	Harris Moran
GVSB17	Gallatin Valley
RR2015	Pure Line
Bruce (524)	Pure Line
Huntington	Syngenta
GVS1720	Gallatin Valley
GVSB59	Gallatin Valley
Macallan	Syngenta
GVSB94	Gallatin Valley

3 to 4 Sieve

Variety	Company
Prevail	Syngenta
HM4423	Harris Moran
Byrd (5722)	Harris Moran
Peary (7711)	Harris Moran
Thompson	Syngenta
Cabot	Harris Moran
SVGG2097	Seminis
Affirmed	Seminis
SVGF2123	Seminis
BEX100	Brotherton
BEX069	Brotherton
World Cup	Brotherton
Bex174	Brotherton

Whole to Extra Fine

Variety	Company
SV1162GN	Seminis
Flavor Sweet	Harris Moran
PV987	Crites
Takounya	Seminis
Astute	Seminis
Bass	Harris Moran
SVGG2106	Seminis
RR4005	Pure Line
PV942	Crites
PV957	Crites
RR4050	Pure Line
RR4040	Pure Line
Contada	Pure Line
Mustang	Crites
BEX041	Brotherton
BEX089	Brotherton
BEX179	Brotherton

Column Descriptions for Tables 2, 4, and 6.

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

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

GDD to Harvest (base 50°F) – The number of growing degree days (GDD) base 50°F 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 1 sieve pods – One seed from ten 1 sieve pods were collectively measured in millimeters as a maturity index.

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.

Tons/Acre – The yield from the harvest sample (prior to being snipped) extrapolated to a per acre basis.

Plants/Foot– Plants per foot recorded from harvest samples. Desired population was 6-8 plants per foot.

Table 2: Large Sieve Yield Characteristics (plant date 5/20)

Cultivar	Days to Harvest	GDD to Harvest (base 50°F)	% 2 Sieve	% 3 Sieve	% 4 Sieve	% 5 Sieve	% 6 Sieve	% 2-4 Sieve	4 Sieve Sd. Length (mm)	5 Sieve Sd. Length (mm)	Tons/Acre	Plants/Foot
GVSb59	63	1149	14	14	32	32	8	60	95	113	5.9	6.8
GVSb59	68	1266	3	13	63	17	4	79	120	132	5.3	7.2
Bridger	62	1120	16	16	49	19	0	81	78	90.7	4.7	7.7
Bridger	64	1176	7	10	55	28	0	72	102	114	3.6	7.3
Pismo	62	1120	24	25	42	9	0	91	80	94	5	7.9
Pismo	64	1176	20	18	48	14	0	86	90	109	4.2	7.5
GVS1720	63	1149	13	14	22	27	24	49	86	101	6.1	7.5
GVS1720	68	1266	3	3	23	48	23	29	107	119	4.9	8
RR2006	62	1120	14	14	38	30	4	66	77	89	4.1	7.4
RR2006	64	1176	8	10	47	32	3	65	83	98	4.2	6.3
Macallan	64	1176	10	13	61	15	1	84	84	97	5.3	7.2
Macallan	68	1266	7	13	71	9	0	91	105	123	4.6	7.8
Fraser	63	1149	16	17	27	25	15	60	83	99	4.9	6.3
Fraser	68	1266	5	12	48	31	4	65	98	110	3.8	6.8
Huntington	63	1149	17	17	31	25	10	65	82	94	5.4	6.1
Huntington	68	1266	6	9	56	27	2	71	98	116	4.3	7.6
Bruce	62	1120	24	29	42	5	0	95	81	82	5.1	6.7
Bruce	67	1250	28	30	41	1	0	99	96	-	3.7	7.3
GVSb17	63	1149	21	23	38	18	0	82	80	90	4.4	6.7
GVSb17	67	1250	8	34	50	8	0	92	83	106	3.5	7.6
GVSb94	64	1176	12	23	50	13	2	85	81	86	4.5	6.9
GVSb94	67	1250	8	30	61	1	0	99	92	101	4.3	7.1
RR2015	63	1149	21	28	37	14	0	86	75	82	5.2	7.3
RR2015	67	1250	11	22	61	6	0	94	88	92	4.3	7.5

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

Cultivar	Plant Height (in)	Plant Width (in)	Raw Pod Color Rating	Un-snipped Pod Length (in)	Pod Shape	Pod Straight. Rating	Pod Location	Plant Habit Rating
Bridger	13~16	11~13	M-L	5~5.5	R-O M-C	3.5	L-H	4.5
RR2006	13~16	12~15	M-L	4~5	R-O M-C	3.5	M-H	4
Pismo	15~18	13~16	L	4.5~5.25	R L-C	4	M-H	3.5
Fraser	13~16	11~13	M	4.5~5.75	R L-C	3.5	H	4.5
GVS17	13~16	11~14	L-M	4~5	R-F L-C	3.5	M-H	4
RR2015	13~17	11~14	M-L	5~5.5	R M-C	4.5	M-H	3-3.5
Bruce	13~16	11~15	M-L	4~5	R L-C	3.5-4	L-H	3.5-4
Huntington	13~17	11~15	L-M	4.25~5	R-O L-C	3-3.5	L-H	3.5
GVS1720	12~16	12~15	M-L	4.5~5.25	R-O L-C	3.5-4	M-H	3
GVS159	14~18	13~15	M-L	4.25~5	R-O M-C	3.5	L-H	3-3.5
Macallan	14~17	13~15	L-M	4.5~5.25	R M-C	3.5-4	M-H	3.5-4
GVS194	15~18	13~15	M-L	5~6	R-O M-C	4	M-H	4

Table 3 Column Descriptions:

Plant Height - Height measurements taken from each replication and a range recorded in inches

Plant Width - Width measurements taken from each replication and a range recorded in inches

Raw Pod Color Rating - L = light green, M = medium green, D = dark green

Un-snipped Pod Length - Pods from each replication measured and a range recorded in inches

Pod Shape - R= Round, O=Oval, F=Flat,

L-C=Light Crease, M-C=Medium Crease, H-C=Heavy Crease

Pod Location - L=Pods close to or touching the ground, M=Pods located in middle of the plant, H=Pods located high on the plant

Pod Straight. Rating - Straightness of pods were visually evaluated from each replication

1=extremely curved/disfigured, 3=acceptable, 5=extremely uniform and straight

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

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

Bridger – Harris Moran, 52 days to maturity. 5% 3 sieve, 65% 4 sieve, and 30% 5 sieve. HR – BCMV and BCTV. IR – Pss and Psp.

RR2006 – Pure Line, 54 days to maturity. 10% 2 sieve, 10% 3 sieve, 60% 4 sieve, and 20% 5 sieve.

Pismo – Syngenta, 55 days to maturity. 15% 1,2,3 sieves, 35% 4 sieve, and 50% 5 sieve. Resistant to BCMV and Pss.

Fraser – Harris Moran, 55 days 5 sieve bean variety with dark green pods (5.8in) with dense sturdy flesh for processing and an upright plant habit. 10% 3 sieve, 45% 4 sieve and 45% 5 sieve. Good disease package: HR – BCMV, BCTV and PSP, IR – Pss.

GVSBI7 – Gallatin Valley, 54-55 days to maturity. 12 % 2 sieve, 18% 3 sieve, 49% 4 sieve, and 19% 5 sieve. Resistant to BBS.

RR2015 – Pure Line, 56 days to maturity. 10% 2 sieve, 15% 3 sieve, 60% 4 sieve, and 15% 5 sieve.

Bruce (524) – Pure Line, 56 days to maturity. 10% 2 sieve, 30% 3 sieve, 50% 4 sieve and 10% 5 sieve.

Huntington – Syngenta, 56 days to maturity. 15% 1,2,3 sieves, 30% 4 sieve and 55% 5 sieve. HR – BCMV. IR – Pss.

GVSBI720 – Gallatin Valley, 56-57 days to maturity. 15% 3 sieve, 35% 4 sieve, and 36% 5 sieve. Resistance to BBS.

GVSBI59 – Gallatin Valley, 56-57 days to maturity. 14% 2 sieve, 18% 3 sieve, 55 % 4 sieve, and 12% 5 sieve.

Macallan – Syngenta, 57 days to maturity. 10% 4 sieve and 90% 5 sieve. New, high yielding variety, with an upright bush and smooth straight pods. Resistant to BCMV and Pss.

GVSBI94 – Gallatin Valley, 57-58 days to maturity. 15% 3 sieve, 35% 4 sieve, and 36% 5 sieve. Resistance to BBS.

Table 4: 3 to 4 Sieve Yield Characteristics (plant date 6/6)

Cultivar	Days to Harvest	GDD to Harvest (base 50°F)	% 2 Sieve	% 3 Sieve	% 4 Sieve	% 5 Sieve	% 6 Sieve	% 2-4 Sieve	3 Sieve Sd. Length (mm)	4 Sieve Sd. Length (mm)	Tons/Acre	Plants/Foot
Thompson	57	1127	14	27	58	1	0	99	82	101	3.8	7.1
Thompson	60	1199	6	25	68	1	0	99	103	130	3.6	6.7
BEX069	58	1148	8	21	68	3	0	97	82	107	3.8	5.2
BEX069	60	1199	7	19	67	7	0	93	97	120	3.8	6.1
Byrd	54	1067	12	23	60	5	0	95	55	71	5.3	6.7
Byrd	58	1148	5	14	70	11	0	89	74	99	5.6	6.2
Prevail	54	1067	36	34	28	2	0	98	62	69	3.7	6.2
Prevail	59	1171	10	22	66	2	0	98	88	98	5.0	6.6
HM4423	54	1067	53	30	17	0	0	100	63	71	2.5	6.6
HM4423	59	1171	11	28	60	1	0	99	89	102	4.1	6.5
Peary	57	1127	11	22	55	9	3	88	74	91	3.8	6.9
Peary	59	1171	4	12	63	20	1	79	90	103	4.1	7.2
Cabot	57	1127	15	30	52	3	0	97	72	81	4.3	6.5
Cabot	59	1171	9	24	65	2	0	98	93	101	4.8	7.2
SVGG2097	57	1127	23	43	34	0	0	100	79	93	4.2	7.0
SVGG2097	59	1171	15	38	47	0	0	100	89	99	4.6	7.3
SVGF2123	57	1127	16	32	49	3	0	97	69	81	4.5	7.1
SVGF2123	59	1171	12	30	55	3	0	97	79	96	4.2	7.1
BEX174	58	1148	10	30	57	3	0	97	79	97	3.9	6.9
BEX174	59	1171	9	23	63	5	0	95	85	105	5.2	6.9
BEX100	57	1127	30	47	22	1	0	99	90	94	3.4	6.5
BEX100	60	1199	12	41	46	1	0	99	94	106	3.6	6.1
World Cup	58	1148	7	12	65	16	0	84	75	88	4.0	5.0
World Cup	60	1199	6	15	68	11	0	89	85	99	3.8	6.1
Affirmed	57	1127	39	37	24	0	0	100	61	65	3.0	6.4
Affirmed	61	1227	20	34	45	1	0	99	80	85	4.0	6.5

Table 5: Plant and Pod Characteristics (3 to 4 Sieve)

Cultivar	Plant Height (in)	Plant Width (in)	Un-snipped Pod Length (in)	Raw Pod Color Rating	Pod Shape Rating	Pod Straight. Rating	Pod Location Rating	Plant Habit Rating
Prevail	15~17	14~16	4.5~5.0	M-D	R-O L-C	4	M-H	3.5
HM4423	15~18	13~15	4.5~5.0	D	R-O L-C	3.5-4	M-H	4
Byrd	14~16	14~15	4.0~5.0	L-M	R-O M-C	4	M-H	4
Peary	13~14	12~14	3.75-4.5	M	R-O L-C	3.5	M-H	3.5
Thompson	13~15	13~14	4.0-4.75	L-M	R-O L-C	3.5	L-H	3.5
Cabot	14~16	12~14	4.0~5.0	M-D	R-O L-C	3.5	M-H	3.5
SVGG2097	13~15	13~14	4.5~5.0	M-D	R L-C	3.5	M-H	3.5
Affirmed	14~16	14~15	4.5~5.5	M-D	R L-C	3.5	M-H	3.5
SVGF2123	13~16	13~15	4.5~5.25	M-D	R-O L-C	4	M-H	3
BEX100	15~17	13~15	4.5~5.0	M-D	R L-C	3.5	L-H	3
BEX069	13~15	12~15	4.5~5.5	M	R L-C	3.5	M-H	3
World Cup	13~16	13~14	4.25~5.25	M-D	R M-C	4	M-H	4
BEX174	13~15	13~15	5.0~6.0	M-D	R-O L-C	3.5	M-H	3

Table 5 Column Descriptions

Plant Height - Height measurements taken from each replication and a range recorded in inches

Plant Width -Canopy width measurements taken from each rep. and a range recorded in inches

Raw Pod Color Rating - L = light green, M = medium green, D = dark green

Un-snipped Pod Length - Pods from each replication measured and a range recorded in inches

Pod Shape - R= Round, O=Oval, F=Flat

L-C=Light Crease, M-C=Medium Crease, H-C=Heavy Crease

Pod Location - L=Pods close to or touching the ground, M=Pods located in middle of the plant, H=Pods located high on the plant

Pod Straight. Rating - Straightness of pods were visually evaluated from each replication

1=extremely curved/disfigured, 3=acceptable, 5=extremely uniform and straight

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

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

Prevail – Syngenta, 54 days to maturity. 80% 4 sieve and 20% 5 sieve. Nice 4-sieve bean with a darker pod color. Known for its stress tolerance and a concentrated set. Resistant to BCMV and BCTV.

HM4423 – Harris Moran, 54-day variety. Attractive dark green pods for freezing. 30% 3 sieve, 60% 4 sieve and 10% 5 sieve. HR – BCMV, Cl, and PSP, IR – Pss.

Byrd (5722) – Harris Moran, 54 days, light green pods with upright plant structure and consistent yields across multiple environments. 10% 3 sieve, 65% 4 sieve, and 25% 5 sieve. Strong disease package: HR – BCMV, BCTV and PSP, IR – Pss.

Peary (7711) – Harris Moran, 55-day variety with medium dark green pod color. Solid pod interiors. 25% 3 sieve, 60% 4 sieve and 15% 5 sieve. HR- BCMV and BCTV, IR – Pss.

Thompson – Syngenta, 55 days to maturity. 5% 1,2,3 sieves, 60% 4 sieve, and 35% 5 sieve. Exciting new 4-sieve bean that performs well under challenging conditions. Strong disease package, upright bush, and high yield potential. Resistant to BCMC and Pss.

Cabot – Harris Moran, 55 days to maturity. 25% 3 sieve, 60% 4 sieve and 15% 5 sieve. HR – BCMV, Ua and Xap. IR – BCTV, Psp, and Pss.

SVGG2097 – Seminis, 56 days to maturity. 15% 3 sieve, 65% 4 sieve, and 20% 5 sieve. Disease package pending verification.

Affirmed – Seminis, 56 days to maturity. 10% 2 sieve, 30% 3 sieve, 50% 4 sieve, and 10% 5 sieve. HR – BCMV. IR – Ua:90.

SVGF2123 – Seminis, 57 days to maturity. 10% 2 sieve, 30% 3 sieve, 50% 4 sieve, and 10% 6 sieve. Disease package pending verification.

BEX100 – Brotherton, 66 days to maturity, 3 to 4 sieve bean. BCMV:R, BBS:T, Rust:R.

BEX069 – Brotherton, 66 days to maturity, 3 to 4 sieve bean. BCMV:R, BBS:T, Rust:R.

World Cup – Brotherton, 66 days to maturity, 3 to 4 sieve bean. BCMV:R, BBS:T, Beet Curly Top Virus:R, Rust:R.

BEX174 – Brotherton, 69 days to maturity, 3 to 4 sieve bean. BCMV:R, BBS:T, Rust:R.

Table 6: Whole/Extra-Fine Bean Yield Characteristics (plant date 07/08)

Cultivar	Days to Harvest	GDD to Harvest (base 50°F)	% 1 Sieve	% 2 Sieve	% 3 Sieve	% 4 Sieve	% 5 Sieve	% 1-3 Sieve	1 Sieve Sd. Length (mm)	2 Sieve Sd. Length (mm)	3 Sieve Sd. Length (mm)	Tons/Acre	Plants/Foot
SV1162GN	53	1177	83	17	0	0	0	100	68	-	-	4.3	7.2
SV1162GN	57	1244	81	19	0	0	0	100	73	-	-	4.4	7.5
PV987	53	1177	0	53	35	12	0	88	-	70	81	5.3	7.5
PV987	57	1244	0	41	47	12	0	88	-	78	85	6.0	7.5
Takounya	53	1177	88	12	0	0	0	100	61	-	-	3.5	7.9
Takounya	57	1244	85	15	0	0	0	100	70	-	-	4.3	7.5
Astute	53	1177	78	20	2	0	0	100	68	-	-	3.2	7.7
Astute	58	1266	77	23	0	0	0	100	82	-	-	4.2	7.3
Flavor Sweet	53	1177	0	40	36	24	0	76	-	61	73	4.0	6.9
Flavor Sweet	55	1217	0	37	36	27	0	73	-	62	84	5.2	6.7
Bass	53	1177	0	36	32	32	0	68	-	60	76	3.4	5.7
Bass	55	1217	0	24	39	36	1	63	-	67	83	6.5	6.7
SVGG2106	54	1197	8	61	31	0	0	100	-	66	71	5.6	7.3
SVGG2106	58	1266	36	45	19	0	0	100	-	66	85	6.4	6.9
PV942	54	1197	43	42	14	1	0	99	57	73	-	3.4	7.2
PV942	59	1283	36	36	26	2	0	98	70	74	-	5.3	6.9
PV957	54	1197	60	27	13	0	0	100	69	77	-	4.9	7.7
PV957	59	1283	48	32	18	2	0	98	70	77	-	5.2	6.8
Mustang	55	1217	47	49	4	0	0	100	54	68	-	4.3	8.0
RR4005	54	1197	92	8	0	0	0	100	47	61	-	2.5	7.4
RR4005	56	1229	95	5	0	0	0	100	63	69	-	3.6	7.4

Table 6 Continued: Whole/Fine Bean Yield Characteristics (plant date 07/08)

Cultivar	Days to Harvest	GDD to Harvest (base 50°F)	% 1 Sieve	% 2 Sieve	% 3 Sieve	% 4 Sieve	% 5 Sieve	% 1-3 Sieve	1 Sieve Sd. Length (mm)	2 Sieve Sd. Length (mm)	3 Sieve Sd. Length (mm)	Tons/Acre	Plants/Foot
RR4050	54	1197	70	27	3	0	0	100	47	55	-	2.1	7.2
RR4050	56	1229	48	46	6	0	0	100	48	57	-	2.5	7.2
RR4040	54	1197	88	12	0	0	0	100	45	56	-	2.0	7.2
RR4040	56	1229	89	11	0	0	0	100	55	60	-	2.1	7.4
BEX089	56	1229	0	23	46	31	0	69	-	57	70	5.5	7.5
BEX089	59	1283	0	31	41	28	0	72	-	60	75	4.9	6.5
Contada	55	1217	0	73	23	4	0	96	-	60	63	4.6	7.0
Contada	57	1244	0	68	28	4	0	96	-	60	73	5.5	6.9
BEX041	55	1217	75	25	0	0	0	100	55	-	-	3.1	6.9
BEX041	57	1244	73	27	0	0	0	100	65	-	-	4.1	7.2
BEX179	56	1229	0	58	27	15	0	85	-	55	62	3.0	6.0
BEX179	59	1283	0	31	41	28	0	72	-	55	64	5.5	6.1

Table 7: Plant and Pod Characteristics (Whole to Extra Fine)

Cultivar	Plant Height (in)	Plant Width (in)	Un-snipped Pod Length (in)	Raw Pod Color Rating	Pod Shape Rating	Pod Straight. Rating	Pod Location Rating	Plant Habit Rating
SV1162GN	13~14	12~13	4.50~5.25	M	R M-C	4	M-H	4.5
Flavor Sweet	16~20	15~16	3.0~4.0	M	R-O M-C	3.5	L-H	3.5
PV987	13~14	11~13	4.0~4.75	M-D	R-O L-C	3.5	M-H	4
Takounya	13~16	13~15	4.0~4.75	L-M	R-O L-C	4	M-H	3.5
Astute	13~16	13~15	4.0~4.75	M	R L-C	4	M-H	3.5
Bass	13~16	13~15	3.25~4.0	L-M	R-O M-C	4	L-H	4
SVGG2106	14~16	13~15	4.0~4.5	M-D	R-O M-C	4	L-H	3.5
RR4005	13~14	11~13	3.75~4.5	M	R-O L-C	3.5	M-H	3.5
PV942	17~21	14~16	4.0~4.5	M	R-O M-C	3.5	L-H	3.5
PV957	13~14	12~13	3.75~4.0	M	R-O M-C	3.5	L-H	4
RR4050	12~14	12~13	3.5~4.5	M-D	R L-C	4	L-H	4
RR4040	13~15	12~14	3.75~4.25	L-M	R-O L-C	4	L-H	3.5
Contada	13~14	12~14	4.0~4.75	M	R-O M-C	4	M-H	4
Mustang	14~17	14~16	4.0~5.0	M	R-O L-C	4	M-H	3.5
BEX041	15~17	14~16	4.0~5.0	L-M	R-O L-C	4.5	L-H	3.5
BEX089	14~16	12~15	4.0~4.5	M	R-O M-C	4	M-H	3.5
BEX179	12~16	13~15	4.0~4.75	M-D	R-O L-C	4	L-H	3.5

*Table 7 Column Descriptions same as Table 5 on page 9

Descriptions Provided by the Seed Source - Whole Beans/ Extra Fine

SV1162GN – *Seminis*, 54 days to maturity. 65% 1 sieve and 35% 2 sieve. HR – BCMV, PSP:2, Cl:55.

Flavor Sweet – *Harris Moran*, 55 days to maturity, 85% 3 sieve and 15% 4 sieve. HR – BCMV, Cl, and Psp.

PV987 – *Crites*, 54 days to maturity. 70% 2 sieve and 30% 3 sieve.

Takounya – *Seminis*, 55 days to maturity. 30% 1 sieve and 70% 2 sieve. HR – BCMV, PSP:2, Cl:55.

Astute – *Seminis*, 55 days to maturity. 70% 1 sieve and 30% 2 sieve. HR – BCMV, PSP:2, Cl:17, 23/Ua38.

Bass – *Harris Moran*, 56-day variety with medium dark green pod color. Similar sieve size to *Flavor Sweet* but extra pod length (4.3in). Improved disease package compared to *Flavor Sweet*. 85% 3 sieve and 15% 4 sieve. HR – BCMV, BCTV, Cl, and PSP.

IR – Pss.

SVGG2106 – *Seminis*, 56 days to maturity. 70% 3 sieve and 30% 4 sieve. Disease package pending verification.

RR4005 – *Pure Line*, 56 days to maturity. Predominately 1 and 2 sieve beans.

PV942 – *Crites*, 57 days to maturity. 80% 2 sieve and 20% 3 sieve.

PV957 – *Crites*, 58 days to maturity. 90% 2 sieve and 10% 3 sieve.

RR4050 – *Pure Line*, 58 days to maturity. Predominately 2 and 3 sieve beans.

RR4040 – *Pure Line*, 58 days to maturity. Predominately 1 and 2 sieve beans.

Contada – *Pure Line*, 58 days to maturity. 75% 2 sieve, 20% 3 sieve, and 5% 4 sieve.

Mustang – *Crites*, 59 days to maturity. 5% 1 sieve and 95% 2 sieve.

BEX041 – *Brotherton*, 70 days to maturity, 1 to 2 sieve beans. BCMV:R, BBS:T, Rust:R.

BEX089 – *Brotherton*, 72 days to maturity, whole sieve bean. BCMV:R, BBS:T, Rust:R.

BEX179 – *Brotherton*, 72 days to maturity, whole sieve bean. BCMV:R, BBS:T, Rust:R.

Table 8 - Large Sieve Weather Data

Date	Avg. Air Temp. (°F)	Max Air Temp. (°F)	Min. Air Temp. (°F)	Precipitation (inches)	Accumulated Precipitation (inches)	GDD Base 50°F	Accumulated GDD Base 50°F
5/20/22	65.8	80.8	50.9	0.04	0.04	16	16
5/21/22	77.5	90.5	64.4	0.19	0.23	27	43
5/22/22	65.8	79.3	52.3	0.03	0.26	15	59
5/23/22	54.3	61.9	46.8	0.00	0.26	4	62
5/24/22	56.9	72.3	41.5	0.00	0.26	7	69
5/25/22	61.1	74.8	47.5	0.00	0.26	11	80
5/26/22	71.8	81.9	61.7	0.00	0.26	22	102
5/27/22	66.0	70.5	61.5	0.90	1.16	15	117
5/28/22	60.7	67.8	53.6	0.16	1.32	11	128
5/29/22	65.6	77.4	53.8	0.00	1.32	16	143
5/30/22	72.3	87.8	56.7	0.00	1.32	22	166
5/31/22	76.8	88.9	64.6	0.00	1.32	27	192
6/1/22	72.8	78.3	67.3	0.56	1.88	23	215
6/2/22	66.8	74.7	58.8	0.08	1.96	17	232
6/3/22	65.0	75.7	54.3	0.00	1.96	15	247
6/4/22	59.5	68.0	51.1	0.00	1.96	10	257
6/5/22	61.5	75.7	47.3	0.00	1.96	12	268
6/6/22	69.0	79.3	58.8	0.00	1.96	19	287
6/7/22	66.1	71.2	61.0	0.32	2.28	15	302
6/8/22	64.2	72.9	55.4	0.02	2.30	14	316
6/9/22	60.8	66.2	55.4	0.65	2.95	11	327
6/10/22	63.6	72.0	55.2	0.10	3.05	14	341
6/11/22	62.7	73.6	51.8	0.00	3.05	13	354
6/12/22	66.0	72.9	59.0	0.33	3.38	16	369
6/13/22	64.5	73.0	56.1	0.13	3.51	14	384
6/14/22	65.9	76.6	55.2	0.00	3.51	16	400
6/15/22	69.9	84.4	55.4	0.00	3.51	20	419
6/16/22	77.9	85.6	70.2	0.61	4.12	28	447
6/17/22	70.1	77.9	62.2	0.15	4.27	20	467
6/18/22	57.5	64.4	50.5	0.08	4.35	7	475
6/19/22	58.2	66.7	49.6	0.00	4.35	8	483
6/20/22	64.8	76.5	53.2	0.00	4.35	15	498
6/21/22	72.8	89.6	56.1	0.00	4.35	23	521
6/22/22	78.0	88.9	67.1	0.70	5.05	28	549
6/23/22	69.3	78.4	60.3	0.01	5.06	19	568
6/24/22	70.3	82.0	58.6	0.00	5.06	20	588
6/25/22	71.9	87.1	56.7	0.00	5.06	22	610

Table 8 Continued - Large Sieve Weather Data

Date	Avg. Air Temp. (°F)	Max Air Temp. (°F)	Min. Air Temp. (°F)	Precipitation (inches)	Accumulated Precipitation (inches)	GDD Base 50°F	Accumulated GDD Base 50°F
6/26/22	77.5	87.6	67.5	0.79	5.85	28	638
6/27/22	66.7	74.1	59.2	0.06	5.91	15	653
6/28/22	63.4	73.2	53.6	0.00	5.91	13	666
6/29/22	64.6	75.2	54.0	0.00	5.91	15	681
6/30/22	69.0	83.1	55.0	0.00	5.91	19	700
7/1/22	78.2	88.3	68.0	0.00	5.91	28	728
7/2/22	73.8	81.9	65.8	0.06	5.97	24	752
7/3/22	67.7	75.9	59.4	0.00	5.97	18	770
7/4/22	66.9	81.1	52.7	0.00	5.97	17	787
7/5/22	71.6	75.7	67.5	0.00	5.97	22	808
7/6/22	66.8	73.0	60.6	0.00	5.97	15	823
7/7/22	68.0	81.1	54.9	0.00	5.97	18	841
7/8/22	69.5	79.7	59.2	0.00	5.97	19	861
7/9/22	64.3	72.7	55.9	0.00	5.97	14	875
7/10/22	64.0	79.3	48.6	0.00	5.97	14	889
7/11/22	72.2	89.1	55.2	0.00	5.97	22	911
7/12/22	75.7	85.3	66.0	0.01	5.98	25	936
7/13/22	70.0	78.8	61.3	0.02	6.00	20	956
7/14/22	66.9	76.8	57.0	0.00	6.00	16	972
7/15/22	67.9	82.4	53.4	0.00	6.00	18	990
7/16/22	71.5	84.7	58.3	0.00	6.00	22	1012
7/17/22	72.9	87.3	58.5	0.03	6.03	23	1035
7/18/22	74.5	82.0	66.9	0.14	6.17	24	1059
7/19/22	78.5	88.0	68.9	0.06	6.23	28	1087
7/20/22	82.8	91.2	74.5	0.05	6.28	33	1120
7/21/22	79.4	84.7	74.1	0.00	6.28	29	1149
7/22/22	77.1	88.5	65.7	0.00	6.28	27	1176
7/23/22	77.9	91.0	64.8	0.00	6.28	28	1204
7/24/22	75.8	85.8	65.7	0.22	6.50	26	1230
7/25/22	70.3	76.8	63.9	0.05	6.55	20	1250
7/26/22	66.5	76.5	56.5	0.05	6.60	17	1266

Table 9 - 3 to 4 Sieve Weather Data

Date	Avg. Air Temp. (°F)	Max Air Temp. (°F)	Min. Air Temp. (°F)	Precipitation (inches)	Accumulated Precipitation (inches)	GDD Base 50°F	Accumulated GDD Base 50°F
6/6/22	69.0	79.3	58.8	0.00	0.00	19	19
6/7/22	66.1	71.2	61.0	0.32	0.32	15	34
6/8/22	64.2	72.9	55.4	0.02	0.34	14	48
6/9/22	60.8	66.2	55.4	0.65	0.99	11	59
6/10/22	63.6	72.0	55.2	0.10	1.09	14	73
6/11/22	62.7	73.6	51.8	0.00	1.09	13	85
6/12/22	66.0	72.9	59.0	0.33	1.42	16	101
6/13/22	64.5	73.0	56.1	0.13	1.55	14	116
6/14/22	65.9	76.6	55.2	0.00	1.55	16	132
6/15/22	69.9	84.4	55.4	0.00	1.55	20	151
6/16/22	77.9	85.6	70.2	0.61	2.16	28	179
6/17/22	70.1	77.9	62.2	0.15	2.31	20	199
6/18/22	57.5	64.4	50.5	0.08	2.39	7	207
6/19/22	58.2	66.7	49.6	0.00	2.39	8	215
6/20/22	64.8	76.5	53.2	0.00	2.39	15	230
6/21/22	72.8	89.6	56.1	0.00	2.39	23	253
6/22/22	78.0	88.9	67.1	0.70	3.09	28	281
6/23/22	69.3	78.4	60.3	0.01	3.10	19	300
6/24/22	70.3	82.0	58.6	0.00	3.10	20	320
6/25/22	71.9	87.1	56.7	0.00	3.10	22	342
6/26/22	77.5	87.6	67.5	0.79	3.89	28	370
6/27/22	66.7	74.1	59.2	0.06	3.95	15	385
6/28/22	63.4	73.2	53.6	0.00	3.95	13	398
6/29/22	64.6	75.2	54.0	0.00	3.95	15	413
6/30/22	69.0	83.1	55.0	0.00	3.95	19	432
7/1/22	78.2	88.3	68.0	0.00	3.95	28	460
7/2/22	73.8	81.9	65.8	0.06	4.01	24	484
7/3/22	67.7	75.9	59.4	0.00	4.01	18	502
7/4/22	66.9	81.1	52.7	0.00	4.01	17	519
7/5/22	71.6	75.7	67.5	0.00	4.01	22	540
7/6/22	66.8	73.0	60.6	0.00	4.01	15	555
7/7/22	68.0	81.1	54.9	0.00	4.01	18	573
7/8/22	69.5	79.7	59.2	0.00	4.01	19	593
7/9/22	64.3	72.7	55.9	0.00	4.01	14	607
7/10/22	64.0	79.3	48.6	0.00	4.01	14	621
7/11/22	72.2	89.1	55.2	0.00	4.01	22	643

Table 9 Continued - 3 to 4 Sieve Weather Data

Date	Avg. Air Temp. (°F)	Max Air Temp. (°F)	Min. Air Temp. (°F)	Precipitation (inches)	Accumulated Precipitation (inches)	GDD Base 50°F	Accumulated GDD Base 50°F
7/12/22	75.7	85.3	66.0	0.01	4.02	25	668
7/13/22	70.0	78.8	61.3	0.02	4.04	20	688
7/14/22	66.9	76.8	57.0	0.00	4.04	16	704
7/15/22	67.9	82.4	53.4	0.00	4.04	18	722
7/16/22	71.5	84.7	58.3	0.00	4.04	22	744
7/17/22	72.9	87.3	58.5	0.03	4.07	23	766
7/18/22	74.5	82.0	66.9	0.14	4.21	24	791
7/19/22	78.5	88.0	68.9	0.06	4.27	28	819
7/20/22	82.8	91.2	74.5	0.05	4.32	33	852
7/21/22	79.4	84.7	74.1	0.00	4.32	29	881
7/22/22	77.1	88.5	65.7	0.00	4.32	27	908
7/23/22	77.9	91.0	64.8	0.00	4.32	28	936
7/24/22	75.8	85.8	65.7	0.22	4.54	26	962
7/25/22	70.3	76.8	63.9	0.05	4.59	20	982
7/26/22	66.5	76.5	56.5	0.05	4.64	17	998
7/27/22	70.8	82.9	58.8	0.03	4.67	21	1019
7/28/22	74.6	82.2	66.9	0.02	4.69	25	1044
7/29/22	73.4	81.0	65.8	0.00	4.69	23	1067
7/30/22	69.0	76.8	61.3	0.00	4.69	19	1086
7/31/22	68.0	79.0	57.0	0.00	4.69	18	1104
8/1/22	73.3	85.6	61.0	0.00	4.69	23	1127
8/2/22	71.3	79.7	62.8	0.00	4.69	21	1148
8/3/22	73.0	88.0	58.1	0.00	4.69	23	1171
8/4/22	78.2	84.0	72.3	0.00	4.69	28	1199
8/5/22	77.3	86.2	68.5	0.00	4.69	27	1227

Table 10 - Whole to Extra Fine Sieve Weather Data

Date	Avg. Air Temp. (°F)	Max Air Temp. (°F)	Min. Air Temp. (°F)	Precipitation (inches)	Accumulated Precipitation (inches)	GDD Base 50°F	Accumulated GDD Base 50°F
7/8/22	69.5	79.7	59.2	0.00	0.00	19	19
7/9/22	64.3	72.7	55.9	0.00	0.00	14	33
7/10/22	64.0	79.3	48.6	0.00	0.00	14	47
7/11/22	72.2	89.1	55.2	0.00	0.00	22	69
7/12/22	75.7	85.3	66.0	0.01	0.01	25	95
7/13/22	70.0	78.8	61.3	0.02	0.03	20	115
7/14/22	66.9	76.8	57.0	0.00	0.03	16	131
7/15/22	67.9	82.4	53.4	0.00	0.03	18	149
7/16/22	71.5	84.7	58.3	0.00	0.03	22	170
7/17/22	72.9	87.3	58.5	0.03	0.06	23	193
7/18/22	74.5	82.0	66.9	0.14	0.20	24	218
7/19/22	78.5	88.0	68.9	0.06	0.26	28	246
7/20/22	82.8	91.2	74.5	0.05	0.31	33	279
7/21/22	79.4	84.7	74.1	0.00	0.31	29	307
7/22/22	77.1	88.5	65.7	0.00	0.31	27	335
7/23/22	77.9	91.0	64.8	0.00	0.31	28	362
7/24/22	75.8	85.8	65.7	0.22	0.53	26	388
7/25/22	70.3	76.8	63.9	0.05	0.58	20	408
7/26/22	66.5	76.5	56.5	0.05	0.63	17	425
7/27/22	70.8	82.9	58.8	0.03	0.66	21	446
7/28/22	74.6	82.2	66.9	0.02	0.68	25	470
7/29/22	73.4	81.0	65.8	0.00	0.68	23	494
7/30/22	69.0	76.8	61.3	0.00	0.68	19	513
7/31/22	68.0	79.0	57.0	0.00	0.68	18	531
8/1/22	73.3	85.6	61.0	0.00	0.68	23	554
8/2/22	71.3	79.7	62.8	0.00	0.68	21	575
8/3/22	73.0	88.0	58.1	0.00	0.68	23	598
8/4/22	78.2	84.0	72.3	0.00	0.68	28	626
8/5/22	77.3	86.2	68.5	0.00	0.68	27	653
8/6/22	77.0	86.9	67.1	0.01	0.69	27	680
8/7/22	81.6	90.7	72.5	0.00	0.69	32	712
8/8/22	82.2	91.4	73.0	0.11	0.80	32	744
8/9/22	70.3	77.5	63.0	0.06	0.86	20	764
8/10/22	70.2	79.5	60.8	0.00	0.86	20	784
8/11/22	70.2	79.0	61.3	0.00	0.86	20	805
8/12/22	66.2	75.2	57.2	0.00	0.86	16	821

Table 10 Continued - Whole to Extra Fine Sieve Weather Data

Date	Avg. Air Temp. (°F)	Max Air Temp. (°F)	Min. Air Temp. (°F)	Precipitation (inches)	Accumulated Precipitation (inches)	GDD Base 50°F	Accumulated GDD Base 50°F
8/13/22	65.1	77.9	52.2	0.00	0.86	15	836
8/14/22	65.8	81.7	49.8	0.00	0.86	16	852
8/15/22	68.9	81.3	56.5	0.01	0.87	19	870
8/16/22	70.6	81.5	59.7	0.45	1.32	21	891
8/17/22	69.0	78.6	59.4	0.00	1.32	19	910
8/18/22	69.8	79.0	60.6	0.00	1.32	20	930
8/19/22	71.5	85.1	57.9	0.00	1.32	22	951
8/20/22	74.7	87.8	61.5	0.02	1.34	25	976
8/21/22	74.4	82.8	66.0	0.15	1.49	24	1000
8/22/22	71.8	77.9	65.8	0.04	1.53	22	1022
8/23/22	71.5	77.7	65.3	0.03	1.56	22	1043
8/24/22	72.8	81.7	63.9	0.02	1.58	23	1066
8/25/22	71.3	80.8	61.9	0.02	1.60	21	1088
8/26/22	72.0	79.3	64.8	0.01	1.61	22	1110
8/27/22	66.8	75.6	58.1	0.01	1.62	16	1126
8/28/22	70.5	85.5	55.6	0.01	1.63	21	1147
8/29/22	80.3	90.7	69.8	0.01	1.64	30	1177
8/30/22	69.9	75.0	64.8	0.01	1.65	20	1197
8/31/22	70.0	77.9	62.1	0.00	1.65	20	1217
9/1/22	62.0	70.5	53.6	0.01	1.66	12	1229
9/2/22	65.5	78.8	52.3	0.00	1.66	16	1244
9/3/22	71.9	82.6	61.3	0.00	1.66	22	1266
9/4/22	67.1	71.6	62.6	0.00	1.66	17	1283