

NEW YORK STATE 2019 DRY BEAN CULTIVAR TRIAL REPORT Dark Red Kidneys, Light Red Kidneys, Black Turtle and Cranberry

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PROCEDURE AND MATERIALS

Location: NYS Agricultural Research Farm – Research North, Geneva - soil type - Lima silt loam

Planting Dates: 6/5/19 (kidneys and cranberries), 6/14 (blacks, pintos and navies)
Row Width: 30 inches, Row length: 30 ft. In-row Spacing: (Kidneys and cranberries – 5-6 seeds/ft., blacks, navies and small reds - 6-8 seeds/ft.)

Conventional Tillage Fertilizer: 300#/A of 8-14-21

Herbicide: Basagran, Reflex and Raptor post emergence (6/26)

Planter - Two Row Monosem Vacuum Planter

Plot Size: 1 row 35 ft long - 4 replications (4 replications harvested – best three reps used)

The objective of this trial was to compare the performance of new varieties with the industry standard varieties in terms of yield, maturity, height of pods, disease resistance, adaptation to NYS growing conditions and quality. This was accomplished in cooperation with the NYS Dry Bean Industry in an attempt to find new, higher quality, and disease resistant varieties that are adapted to our climate and soil conditions. For both replicated and observation entries, yield of ten feet per replication was obtained by pulling the plants and hand picking the pods. An Almeco thresher was used to shell the pods. Seeds were hand graded to remove the splits and blemished seeds prior to processing. Seed count is a true sample of what was harvested.

Plentiful rainfall all spring until early July. A month of dry weather might have hurt the kidneys and cranberries planted 6/5 as they were in flower during that period. The small seeded beans had good moisture during flower. Dry down was fairly uniform and no dessicants were used. As mentioned above, each replication was harvested but the best three replications were used for the data tables. See the weather insert at the end of the summary for a breakdown of temperatures and precipitation over the growing season.

As I am retiring as of the first of the year, Michael Rosato will be attending the dry bean grower meeting. As of this time, a cutting is planned for early 2020 at the Furman Foods plant. Jim Ballerstein, Cornell Agritech, jwb2@cornell.edu(email)

We wish to thank the NYS Dry Bean Association and cooperating seed companies ProVita and ADM for their financial support of the project. We especially want to thank Furman Foods, Inc. for processing the seed for the industry cutting.

Special thanks to my crew - Floyd Baker, Kim Day, Noah Czadzeck and Carla Yannotti for their assistance in day to day operations. **In addition to the regular report for 2019, a four year summary is also included with data from 2016 – 2019.**

Table 1 - Cultivar List and Seed Source**Dark Red Kidney**

Cultivar	Seed Source
Chaparral	ProVita
Epic	ProVita
Spire (09431)	ProVita
Rampart (0934)	ProVita
151011	ProVita
15981	ProVita
Red Hawk (std)	Treasure Valley

Light Red Kidney

Big Red	ProVita
Red Zone	ProVita
Ronnie's Red	ProVita
6269	ProVita
Red Dawn (09363)	ProVita
15907	ProVita
15926	ProVita
Cal Early (std)	Treasure Valley
Inferno	Hensall Cooperative

Blacks

Black Bear	ProVita
Black Tails	ProVita
13505	ProVita
Spectre (14497)	ProVita
BlackBeard (14506)	ProVita
Eclipse	ProVita
Ace (B8006282)	ADM
Zenith (std)	Treasure Valley
T39 (std)	Treasure Valley

Cranberries

Cultivar	Seed Source
151085	ProVita
151093	ProVita
16760	ProVita
16775	ProVita
Vero	ADM
Etna	Treasure Valley

Pinto

Vibrant	ProVita
Radiant	ProVita
La Paz	ProVita
Monterrey	ProVita

Navy

HMS Medalist	ProVita
Merlin	ProVita
13068	ProVita
15094	ProVita
15095	ProVita

Table 2 - Yield and Plant Characteristics

Cultivar	Pod Length (in)	Seeds per pod (10 pod sample)	Plant Habit Rating	Moisture %	Count per lb.	Plants per foot	Lbs per acre	Bushels per acre
DRK								
Chaparral	5-to 5.5	3 to 5	3	12.7	967	5.2	2049	34.1
Epic	4.5 to 5.5	3 to 5	3	13.6	814	5.4	1790	29.8
Spire	5 to 5.5	4 to 5	3.5	13.0	830	4.6	2138	35.6
Rampart	5 to 6	4 to 5	3	13.1	878	4.9	2182	36.4
151011	4.5 to 5.5	3 to 4	3.5	11.9	1036	5.8	1649	27.5
15981	5 to 6	5	3	13.5	776	5.5	1667	27.8
Red Hawk	4 to 5	5 to 6	3	12.6	832	5.6	1744	29.1
LRK								
Big Red	5.5 to 6.5	4 to 5	3.5	12.9	792	4.7	2092	34.9
Red Zone	4 to 6	4 to 5	3	12.3	829	4.3	1857	30.9
Ronnie's Red	5 to 6	6	3.5	12.4	770	5.5	2287	38.1
6269	5 to 6	2 to 5	2	12.5	811	4.5	1457	24.3
Red Dawn	5.5 to 6	5	3	13.1	794	5.3	1887	31.5
15907	5 to 5.5	3 to 5	2	13.0	741	4.6	2264	37.7
15926	5 to 5.5	3 to 5	2	13.3	712	4.8	1910	31.8
Cal Early	4 to 6	3 to 5	3	11.9	753	4.2	2013	33.5
Inferno	4 to 5	2 to 4	3	13.6	777	4.9	2474	41.2
Blacks								
Black Bear	3.5 to 4	7 to 8	4	10.6	2135	6.8	2897	48.3
Black Tails	3.5 to 4	5 to 6	4	9.6	1970	7.0	3227	53.8
13505	3.5 to 4	6 to 7	5	10.9	2202	6.4	3064	51.1
Spectre	3.5	5 to 6	4.5	8.1	2064	5.8	3210	53.5
BlackBeard	3.75 to 4	6 to 7	4	8.6	2124	6.8	2738	45.6
Eclipse	4 to 4.5	7	4.5	9.3	2299	5.2	3187	53.1
Ace	4 to 4.5	7 to 8	3.5	10.7	2331	5.7	2875	47.9
Zenith	4 to 4.5	6 to 7	4	13.0	2006	4.9	3449	57.5
T39	4 to 4.25	7 to 8	3.5	8.4	2310	5.6	2860	47.7
Cranberries								
151085	4.5 to 5.5	4 to 5	3	13.9	793	4.5	2156	35.9
151093	4 to 5	5 to 6	3	14.2	937	4.0	1967	32.8
16760	4.5 to 5	5	3	14.9	920	6.0	1726	28.8
16775	3.5 to 4	5	3	13.6	965	4.0	1252	20.9
Vero	4.5 to 5.	5 to 6	3	12.7	887	4.8	1488	24.8
Etna	5.5 to 6.5	6 to 7	3	10.1	728	2.7	1252	20.9
Pinto								
Vibrant	4 to 4.5	5 to 6	3	9.7	1304	5.6	2528	42.1
Radiant	4.25 to 4.5	5	3	11.5	1180	5.4	2699	45.0
La Paz	3.5 to 4.5	4 to 6	3.5	15.3	1171	5.6	3483	58.0
Monterrey	4.5 to 5.5	5 to 6	3.5	15.5	1181	5.3	3000	50.0
Navy								
HMS Medalist	3.5 to 4	5	4	9.0	2440	6.8	2166	36.1
Merlin	3.5 to 3.75	5 to 6	3.5	8.6	2454	4.5	3432	57.2
13068	3.5 to 4	5 to 6	3.5	8.1	2023	5.3	2902	48.4
15094	3.75 to 4.25	5 to 6	3.5	8.1	2046	5.1	2617	43.6
15095	3.75 to 4	5	3.5	8.4	2276	6.2	2658	44.3

Table 3. Cultivar List 2016-2019

2016

Dark Red Kidney

Chaparral	Provita
Epic	Provita
09431	Provita
09434	Provita
Red Rover	TV
Red Hawk	TV
Dynasty	TV

Light Red Kidney

Big Red	Provita
Red Zone	Provita
Red Flag	Provita
Red Dog	Provita
09363	Provita
09378	Provita
09357	Provita
Clouseau	TV
Pink Panther	TV
Wallace	TV
Cal Early	TV
09360	Provita
06269	Provita

2017

Dark Red Kidney

Chaparral	Provita
Epic	Provita
9431	Provita
9434	Provita
Red Rover	Seminis/TV
Red Hawk (std)	MSU/TV
Dynasty	Canada
15981	Provita
151021	Provita

Light Red Kidney

Big Red	TV
Red Zone	TV
Red Flag	TV
Red Dog	TV
9363	TV
9378	TV
9357	TV
Clouseau	Seminis/TV
Pink Panther	Seminis/TV
Wallace	TV
Cal Early (std)	TV
6269	TV
L6010061	ADM
Ronnie's Red	TV
15926	Provita
Inferno	Canada
15907	Provita

2018

Dark Red Kidney

Chaparral	Provita
Epic	Provita
9431	Provita
Rampart (09434)	Provita
Red Rover	Seminis/TV
Red Hawk (std)	TV
Dynasty	Canada/TV
15981	Provita
151011	Provita

Light Red Kidney

Big Red	Provita
Red Zone	Provita
9363	Provita
Pink Panther std	TV
Cal Early (std)	TV
6269	Provita
Ronnie's Red	Provita
15926	Provita
Inferno	Canada
15907	Provita
L1020316	ADM

2019

Dark Red Kidney

Chaparral	ProVita
Epic	ProVita
Spire (09431)	ProVita
Rampart (09434)	ProVita
Red Hawk (std)	TV
15981	ProVita
151011	ProVita

Light Red Kidney

Big Red	ProVita
Red Zone	ProVita
Red Dawn (09363)	ProVita
Cal Early (std)	TV
6269	ProVita
Ronnie's Red	ProVita
15926	ProVita
Inferno	Hensall Cooperative
15907	ProVita

Table 3. Cultivar List 2016-2019

2016

Blacks

12576 (Black Bear)	Provita
13503	Provita
13505	Provita
14497	Provita
14506	Provita
Zenith (new)	TV
Zorro	TV
Black Velvet	TV
Eclipse	TV
T39	TV
Shania	ADM
B0040613	ADM
B1048276	ADM
13489	Provita

Cranberry

Etna	TV
Vero	ADM
Krimson	TV
Hooter	TV
Bellagio	MSU

2017

Blacks

Black Bear	Provita
13503	Provita
13505	Provita
14497	Provita
14506	Provita
Zenith	MSU/TV
Zorro (std)	MSU/TV
Black Velvet	Seminis/TV
Eclipse	NDSU/TV
T39 (std)	TV
Shania	ADM
B0040613	ADM
B1048276	ADM
Black Tails	Provita
B8006282	ADM
B1048280	ADM

Cranberry

Etna (std)	Seminis/TV
Vero	ADM
Krimson	TV
Hooter	Seminis/TV

2018

Blacks

Black Bear (12576)	Provita
13503	Provita
13505	Provita
14497	Provita
14506	Provita
Zenith	TV
Zorro (std)	TV
Eclipse (std)	Provita
T39 (std)	TV
B3036368	ADM
B1048276	ADM
Black Tails (13489)	Provita
B8006282	ADM
B5054341	ADM

Cranberry

Etna (std)	TV
Vero	ADM

151093	Provita
16760	Provita
151085	Provita
151084	Provita
151106	Provita
16761	Provita
16764	Provita
16766	Provita

2019

Blacks

Black Bear	ProVita
13505	ProVita
Spectre (14497)	ProVita
BlackBeard (14506)	ProVita
Zenith (std)	TV

Ace (B8006282)	ADM
Eclipse	ProVita
T39 (std)	Treasure Valley

Black Tails	ProVita
Ace (B8006282)	ADM

Cranberries

Etna	TV
Vero	ADM

151093	ProVita
16760	ProVita
151085	ProVita

16775	ProVita
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Table 3. Cultivar List 2016-2019

2016

White Kidney

Beluga	MSU
Snowden	MSU

2017

White Kidney

Yeti	Canada
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2018

White Kidney

Beluga	MSU
Snowden	MSU
Yeti	Canada

2019

Pintos

Vibrant	Provita
Radiant	Provita
La Paz	Provita
Monterrey	Provita

Pinto

Vibrant	ProVita
Radiant	ProVita
La Paz	ProVita
Monterrey	ProVita

Navy

DS105W0	TV
T9905	TV

Navy

Medalist	ADM
Merlin	ADM

Navy

HMS Medalist	ProVita
Merlin	ProVita
13068	ProVita
15094	ProVita
15095	ProVita

Small Red

OAC Rosito	Canada
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Small Red

Viper
Ruby
Merlot

Table 4. Plant Characteristics

Cultivar	Year	Plant Habit (rating)	Plt ht. (in)	Plt width (in)	Pod length (in.)	Seeds per pod (10 pod sample)	Maturity (days compared to std)
Dark Red Kidney							
Red Rover	2016	3.5	18	16.5	4.5-5.25	4 to 5	minus 1
	2017	3.7	19	22	4.5-5	5	plus 1
	2018	na	na	na	5.0-6.0	4 to 5	plus 1
Dynasty	2016	3.25	20	18	4.5-6.0	5 to 7	minus 1
	2017	3.2	19	22	5-5.5	6	plus 5
	2018	na	na	na	5-5.5	5 to 6	plus 2
Red Hawk (std)	2016	3.25	18.5	17	4.5-5.5	4 to 6	0
	2017	3.7	19	22	5.5	5 to 6	0
	2018	na	na	na	5.0-5.5	4 to 5	0
	2019	3.0	na	na	4 to 5	5 to 6	na
Rampart (09434)	2016	3	17	15.5	5 to 6	4 to 7	0
	2017	3.3	19	22	5-5.5	5	plus 3
	2018	na	na	na	5.0-6.5	5	0
	2019	3.0	na	na	5 to 6	4 to 5	na
Spire (09431)	2016	3	16	19	5 to 6	5 to 8	plus 2
	2017	3.2	20	24	5.5-6	6to 7	plus 5
	2018	na	na	na	6.75-7	5 to 6	plus 2
	2019	3.5	na	na	5 to 5.5	4 to 5	na
Chaparral	2016	2.75	18	16	5.5-6.5	5 to 7	plus 3
	2017	2.8	18	22	5-5.5	5 to 6	plus 4
	2018	na	na	na	5.5-6	5	plus 1
	2019	3.0	na	na	5-to 5.5	3 to 5	na
Epic	2016	3	18	16.5	4.5-6.25	4 to 7	plus 4
	2017	3.0	19	22	5-5.5	5	plus 5
	2018	na	na	na	4.5-5.5	4	0
	2019	3.0	na	na	4.5 to 5.5	3 to 5	na
15981	2017	3.5	21	23	5-5.5	5	plus 2
	2018	na	na	na	5.5-6.25	4 to 5	plus 2
	2019	3	na	na	5 to 6	5	na
151011	2018		na	na	4.5-5.5	4	0
	2019	3.5	na	na	4.5 to 5.5	3 to 4	na

Table 4. Plant Characteristics continued:

Cultivar	Year	Plant Habit (rating)	Plt ht. (in)	Plt width (in)	Pod length (in.)	Seeds per pod (10 pod sample)	Maturity (days compared to std)
Light Red Kidney							
09357	2016	3.25	17	15.5	4-6.25	5 to 7	minus 1
	2017	2.8	17	20	5.5-6	4 to 5	minus 2
Cal Early (std)	2016	3.75	16	13.5	4-5.5	4 to 5	0
	2017	3.2	17	20	4.5-5	5 to 6	0
	2018	na	na	na	5 to 6	4 to 5	0
	2019	3.0	na	na			na
Red Dawn (09363)	2016	3.75	15.5	12	5.25-5.5	4 to 5	0
	2017	2.7	17	20	5.5-6	5 to 6	minus 2
	2018	na	na	na	4.5-5.5	5 to 6	minus 2
	2019	3.0	na	na	5.5 to 6	5	na
06269	2016	3.5	17.5	17	4.5-6	3 to 6	0
	2017	3.3	18	21	6	5 to 6	plus 4
	2018	na	na	na	5.5-6.5	5 to 6	plus 2
	2019	2.0	na	na	5 to 6	2 to 5	na
Wallace	2016	3.5	16.5	17	5.5-7	4 to 5	0
	2017	3.5	17	19	6-6.5	6to 7	plus 2
Big Red	2016	3	17	14.5	5.0-6.0	5 to 6	plus 2
	2017	3.2	18	22	5-5.5	5	plus 2
	2018	na	na	na	5 to 6	5	0
	2019	3.5	na	na	5.5 to 6.5	4 to 5	na
Red Dog	2016	3	20.5	21	4.5-6.0	4 to 5	plus 2
	2017	2.8	17	20	5-5.5	5 to 6	plus 3
09378	2016	3.25	15.5	13.5	5-5.5	3 to 5	plus 2
	2017	3.5	18	20	5-5.5	4 to 5	0
Red Flag	2016	3.25	20.5	17.5	4.5-5.5	4 to 5	plus 3
	2017	3.3	20	21	5	4 to 5	plus 3
Clouseau	2016	3.25	17.5	18	4-5.5	3 to 5	plus 3
	2017	3.3	19	20	5.5-6	5	plus 4
Pink Panther	2016	3.25	18	20.5	4.5-5.5	3 to 5	plus 3
	2017	2.7	17	21	5	4 to 5	plus 4
	2018	na	na	na	5	4 to 5	0
Red Zone	2016	3.5	23.5	24.5	5.0-6.0	5 to 6	plus 5 to 6
	2017	3.3	22	22	5.5-6	5 to 6	plus 5
	2018	na	na	na	5.75-6.5	4 to 5	plus 3
	2019	3.0	na	na	4 to 6	4 to 5	na
Ronnie's Red	2017	3.7	19	19	6	6	plus 3
	2018	na	na	na	5.0-6.0	4 to 6	plus 2
	2019	3.5	na	na	5 to 6	6	na
15926	2017	3.0	18	21	5-5.5	5 to 6	plus 5
	2018	na	na	na	5.0-6.0	4 to 5	plus 2
	2019	2.0	na	na	5 to 5.5	3 to 5	na
Inferno	2017	3.0	19	22	5-5.5	5 to 6	plus 6
	2018	na	na	na	5.0-6.0	5 to 6	plus 3
	2019	3.0	na	na	4 to 5	2 to 4	na
15907	2017	3.2	17	21	5	4 to 5	plus 7
	2018	na	na	na	5.0-6.0	4 to 5	plus 2
	2019	2.0	na	na	5 to 5.5	3 to 5	na

Table 4. Plant Characteristics continued:

Cultivar		Plant Habit (rating)	Plt ht. (in)	Plt width (in)	Pod length (in.)	Seeds per pod (10 pod sample)	Maturity (days compared to std)
Black							
Eclipse	2016	5	19.5	12.5	4-5.0	6 to 8	minus 3
	2017	4.2	22	21	3.5	7 to 8	minus 3
	2018	na	na	na	3.5-4	6to 7	minus 1
	2019	4.5	na	na	4 to 4.5	7	na
13503	2016	4	22	15.5	3-3.5	4 to 6	minus 2
	2017	3.7	24	26	3.5-4	6	minus 1
	2018	na	na	na	3-3.5	6to 7	plus 1
BlackBeard (14506)	2016	4.5	23.5	16.5	4-4.5	5 to 7	minus 2
	2017	4.2	26	23	4	7	plus 3
	2018	na	na	na	4-4.5	7 to 8	plus 4
	2019	4.0	na	na	3.75 to 4	6 to 7	na
T39	2016	2	13	14	3-4.0	4 to 8	minus 2
	2017	3.5	22	24	3-3.5	7	0
	2018	na	na	na	3.5-4	6to 7	plus 4
	2019	3.5	na	na	4 to 4.25	7 to 8	na
13505	2016	5	23	11.5	3-3.75	6	minus 1
	2017	3.7	24	25	3.5-4	7	plus 3
	2018	na	na	na	3.25-3.75	6to 7	plus 1
	2019	5.0	na	na	3.5 to 4	6 to 7	na
Spectre (14497)	2016	3.5	23	19.5	3-3.75	6	minus 1
	2017	3.5	24	26	3.5	6	plus 3
	2018	na	na	na	2.75-3.5	5 to 6	plus 3
	2019	4.5	na	na	3.5	5 to 6	na
Zenith (new)	2016	5	22	12	3.5-4.5	5 to 7	minus 1
	2017	3.8	23	23	3.5	7	0
	2018	na	na	na	3.5-4	6to 7	0
	2019	4.0	na	na	4 to 4.5	6 to 7	na
B1048276	2016	4	18	17	3.5-4.5	5 to 8	minus 1
	2017	3.5	22	25	4	7 to 8	minus 1
	2018	na	na	na	3.5-4	7 to 8	minus 2
Zorro (std)	2016	4.5	21.5	14	3-3.75	5 to 8	0
	2017	3.7	23	23	3.5	6to 7	0
	2018	na	na	na	3.75-4	7	0
Shania	2016	4	20	15.5	3.0-4	6 to 8	0
	2017	3.8	23	27	3.5	7	plus 3
Black Bear	2016	4.25	20.5	15	3.5-4.5	6to 7	plus 1
	2017	3.8	23	24	4.5	8	plus 3
	2018	na	na	na	4-4.5	7 to 8	plus 3
	2019	4.0	na	na	3.5 to 4	7 to 8	na
Black Tails	2016	4.25	23.5	15.5	3.5-4	5 to 8	plus 2
	2017	3.3	22	25	3.5-4	7	0
	2018	na	na	na	3.5-4	5 to 7	0
	2019	4.0	na	na	3.5 to 4	5 to 6	na
Black Velvet	2016	4.25	22	17	3.25-4.25	4 to 7	plus 2
	2017	4.2	23	23	3.5-4	6to 7	plus 6
B0040613	2016	3.75	18	16	3.25-4.25	6to 7	plus 2
	2017	3.3	24	24	3-3.5	6to 7	plus 1
Ace (B8006282)	2018	3.3	22	24	3.5	7	minus 1
	2019	3.5	na	na	4 to 4.5	7 to 8	na

Table 4. Plant Characteristics continued:							
Cultivar		Plant Habit (rating)	Plt ht. (in)	Plt width (in)	Pod length (in.)	Seeds per pod (10 pod sample)	Maturity (days compared to std)
Cranberry							
Etna (std)	2016	3.5	17.5	14	4.5-5.5	5 to 7	0
	2017	3.5	18	20	5.5	5 to 6	0
	2018	na	na	na	5-5.5	5 to 7	0
	2019	3.0	na	na	5.5 to 6.5	6 to 7	na
Krimson	2016	3.25	15	17	4-6.0	4 to 6	0
	2017	3.5	19	22	4.5-5.5	5	plus 2
Vero	2016	3.5	17.5	15	4.5-5.5	4 to 6	plus 1
	2017	3.5	18	22	5	3 to 7	plus 1
	2018	na	na	na	4.5-5.5	4 to 5	plus 1
	2019	3.0	na	na	4.5 to 5.	5 to 6	na
Hooter	2016	3.75	21.5	20	3.5-4.5	4 to 5	plus 2
	2017	3.5	19	23	5-5.5	3 to 5	plus 4
Bellagio	2016	3	18	15	4.0-5.0	4 to 6	plus 2
16766	2108	na	na	na	4.5-6.0	6	minus 2
16760	2018	na	na	na	5.0-5.5	5	minus 1
151085	2108	na	na	na	4.5-5.5	4 to 6	plus 1
	2019	3.0	na	na	4.5 to 5.5	4 to 5	na
151093	2018	na	na	na	5-5.5	6to 7	plus 1
	2019	3.0	na	na	4 to 5	5 to 6	na
151106	2108	na	na	na	4.5-5.5	5 to 7	plus 1
16761	2018	na	na	na	4.5-5	6	plus 1
16764	2108	na	na	na	4.25-5.5	5 to 6	plus 1
151084	2018	na	na	na	5.5-6	6	plus 2
16760	2019	3.0	na	na	4.5 to 5	5	na
16775	2019	3.0	na	na	3.5 to 4	5	na

White Kidney

Snowden	2016	3.5	17.5	12	5-6.0	4 to 6	minus 1
Beluga (std)	2016	3	16	17	3.5-5.5	3 to 4	0
Yeti	2017	3.5	20	21	5.5	6	plus 4
	2018	na	na	na	5-5.5	4 to 5	plus 2

Small Red

OAC Rosito	2017	4.3	21	23	4	7	0
Viper	2018	na	na	na	4-4.5	5 to 6	0
Ruby	2018	na	na	na	3.5-4	5	0
Merlot	2018	na	na	na	3.5-4.5	5	0

Table 4. Plant Characteristics continued:

Cultivar		Plant Habit (rating)	Plt ht. (in)	Plt width (in)	Pod length (in.)	Seeds per pod (10 pod sample)	Maturity (days compared to std)
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Navy

DS105W0	2017	3.5	23	25	3.5-4	7	0
T9905	2017	3.3	21	24	3-3.5	5 to 6	0
Medalist	2018	na	na	na	3-3.5	6	0
	2019	4.0	na	na	3.5 to 4	5	na
Merlin	2018	na	na	na	3	5 to 6	0
	2019	3.5	na	na	3.5 to 3.75	5 to 6	na
13068	2019	3.5	na	na	3.5 to 4	5 to 6	na
15094	2019	3.5	na	na	3.75 to 4.25	5 to 6	na
15095	2019	3.5	na	na	3.75 to 4	5	na

Pinto

Vibrant	2018	na	na	na	4-4.5	6	0
	2019	3.0	na	na	4 to 4.5	5 to 6	na
Radiant	2018	na	na	na	na	na	0
	2019	3.0	na	na	4.25 to 4.5	5	na
La Paz	2018	na	na	na	4-5.0	6	0
	2019	3.5	na	na	3.5 to 4.5	4 to 6	na
Monterrey	2018	na	na	na	4-5.0	4 to 8	0
	2019	3.5	na	na	4.5 to 5.5	5 to 6	na

Table 5. Yield multiple year report

Cultivar	year	Moisture %	Count per lb.	Plants/ft	Lbs per acre	bushels/A
Dark Red Kidney						
Red Rover	2016	11.4	835	3.1	1997	33.3
	2017	13.7	790	3.5	2723	45.4
	2018	14.3	756	3.8	1971	32.8
Dynasty	2016	12.4	823	3.3	2763	46
	2017	13.8	752	3.4	2240	37.3
	2018	13.9	711	3.7	2165	36.1
Red Hawk (std)	2016	11.3	950	3.7	2270	37.8
	2017	14.0	883	2.6	2060	34.3
	2018	14.2	818	3.9	1590	26.5
	2019	12.6	832	5.6	1744	29.1
Rampart	2016	11.2	968	3.3	1850	30.8
	2017	12.9	865	2.7	2273	37.9
	2018	13.7	852	3.7	1842	30.7
	2019	13.1	878	4.9	2182	36.4
Spire	2016	11.4	962	3.6	2208	36.8
	2017	14.0	850	3.2	2177	36.3
	2018	14.8	787	4.6	1957	32.6
	2019	13.0	830	4.6	2138	35.6
Chaparral	2016	12.1	1071	2.7	1677	28
	2017	13.8	945	4.2	2184	36.4
	2018	13.6	914	4.6	1786	29.8
	2019	12.7	967	5.2	2049	34.1
Epic	2016	11.4	852	3.5	2147	35.8
	2017	15.3	820	3.7	2196	36.6
	2018	14.1	734	4.6	2086	34.8
	2019	13.6	814	5.4	1790	29.8
15981	2017	13.1	757	3.0	1702	28.4
	2018	12.5	771	4.7	1181	19.7
	2019	13.5	776	5.5	1667	27.8
151021	2017	12.4	940	3.8	1437	23.9
151011	2018	15.2	975	4.7	1371	22.9
	2019	11.9	1036	5.8	1649	27.5

Table 5. Yield continued:

Cultivar	year	Moisture %	Count per lb.	Plants/ft	Lbs per acre	bushels/A
Light Red Kidney						
09357	2016	11.3	885	3.6	2008	33.5
	2017	12.1	823	4.7	1523	25.4
Cal Early (std)	2016	11.3	885	4.2	2746	45.8
	2017	12.8	757	3.6	2089	34.8
	2018	11.3	757	4.3	1627	27.1
	2019	11.9	753	4.2	2013	33.5
06269	2016	11.4	931	3.8	3376	56.3
	2017	13.9	845	3.6	2210	36.8
	2018	11.6	820	4.7	976	16.3
	2019	12.5	811	4.5	1457	24.3
Red Dawn	2016	11.3	850	3.6	2606	43.4
	2017	12.1	748	4.7	1848	30.8
	2018	10.3	746	4.6	1928	32.1
	2019	13.1	794	5.3	1887	31.5
Wallace	2016	8.8	1058	4.1	2697	45
	2017	13.4	922	3.1	1681	28.0
Big Red	2016	11.3	852	3.9	2321	38.7
	2017	13.0	782	4.4	1719	28.6
	2018	11.9	752	4.0	1661	27.7
	2019	12.9	792	4.7	2092	34.9
Red Dog	2016	11.1	853	3.5	2450	40.8
	2017	13.1	764	4.2	1407	23.4
09378	2016	11.2	887	4.2	2707	45.1
	2017	12.1	725	4.3	1706	28.4
Red Flag	2016	11.2	863	3.5	2119	35.3
	2017	13.0	779	3.8	1405	23.4
Clouseau	2016	11.1	836	3.8	2400	40
	2017	12.9	712	3.7	2353	39.2
Pink Panther	2016	11.4	825	3.9	2490	41.5
	2017	12.8	713	3.4	1785	29.7
	2018	11.6	756	4.0	1807	30.1
09360	2016	11.2	831	4.3	2574	42.9
Red Zone	2016	11.3	894	3.3	2176	36.3
	2017	14.3	796	3.7	2081	34.7
	2018	12.3	779	4.3	2370	39.5
	2019	12.3	829	4.3	1857	30.9
15907	2017	14.9	729	4.6	2641	44.0
	2018	12.8	762	4.2	1875	31.2
	2019	13.0	741	4.6	2264	37.7
Inferno	2017	14.2	700	3.3	2734	45.6
	2018	14.2	744	4.9	2781	46.4
	2019	13.6	777	4.9	2474	41.2
Ronnie's Red	2017	14.7	698	4.5	1851	30.8
	2018	12.5	731	4.6	2118	35.3
	2019	12.4	770	5.5	2287	38.1
15926	2017	13.2	690	4.1	2201	36.7
	2018	14.0	695	4.2	1919	32.0
	2019	13.3	712	4.8	1910	31.8

Table 5. Yield Continued:

Cultivar (Blacks)	year	Moisture %	Ct. per lb.	Plants/ft	Lbs / acre	Bushel/A
Eclipse	2016	8.1	2152	4.8	2683	44.7
	2017	14.2	2129	4.2	2389	39.8
	2018	11.7	2377	5.9	1944	32.4
	2019	9.3	2299	5.2	3187	53.1
13503	2016	8.3	2105	4.8	2879	48
	2017	14.5	2016	7.7	3258	54.3
	2018	8.1	2380	6.3	2230	37.2
BlackBeard	2016	7.8	2061	5.5	2956	49.3
	2017	14.0	1860	5.3	3311	55.2
	2018	11.2	2048	6.5	2072	34.5
	2019	8.6	2124	6.8	2738	45.6
T39	2016	7.9	2057	4.5	2781	46.4
	2017	14.7	1956	4.5	3322	55.4
	2018	11.6	2254	6.5	2535	42.3
	2019	8.4	2310	5.6	2860	47.7
13505	2016	8.0	2191	4.8	2806	46.8
	2017	14.2	2023	6.2	3138	52.3
	2018	7.7	2484	7.2	2274	37.9
	2019	10.9	2202	6.4	3064	51.1
Spectre	2016	8.4	2047	5.8	3348	55.8
	2017	14.8	1938	6.8	3967	66.1
	2018	9.5	2205	6.0	2230	37.2
	2019	8.1	2064	5.8	3210	53.5
Zenith (std)	2016	8.2	1992	4.8	3279	54.7
	2017	14.5	1923	3.6	3458	57.6
	2018	12.0	2066	5.1	2694	44.9
	2019	13.0	2006	4.9	3449	57.5
B1048276	2016	8.4	2406	4.4	2942	49.0
	2017	12.9	2099	7.4	2973	49.6
	2018	8.0	2444	7.2	2410	40.2
Zorro	2016	8.3	2120	5.4	3136	52.3
	2017	14.1	1896	5.0	3827	63.8
	2018	12.5	2187	5.5	2608	43.5
Shania	2016	7.8	2187	4.7	3119	52.0
	2017	12.5	1871	6.7	3982	66.4
Black Bear	2016	8.0	2101	5.3	3189	53.1
	2017	13.2	1949	7.0	3548	59.1
	2018	10.7	2457	6.2	2270	37.8
	2019	10.6	2135	6.8	2897	48.3
Black Tails	2016	7.8	2051	5.3	3443	57.4
	2017	13.6	1956	6.9	3455	57.6
	2018	7.9	2388	6.7	2608	43.5
	2019	9.6	1970	7.0	3227	53.8
Black Velvet	2016	8.1	1910	4.8	2840	47.3
	2017	15.2	1798	3.4	2750	45.8
B0040613	2016	7.7	2153	4.9	3156	52.6
	2017	13.3	1933	7.0	3390	56.5
Ace	2017	12.6	2055	7.5	3023	50.4
	2018	7.6	2557	6.9	2274	37.9
	2019	10.7	2331	5.7	2875	47.9

Table 5. Yield Continued:

Cultivar	year	Moisture %	Count per lb.	Plants/ft	Lbs per acre	Bushel/A
Cranberry						
Etna (std)	2016	11.0	906	4.3	2502	41.7
	2017	12.6	750	3.3	2306	38.4
	2018	13.0	745	4.3	2422	40.4
	2019	10.1	728	2.7	1252	20.9
Krimson	2016	10.6	918	4.1	2833	47.2
	2017	11.8	763	2.2	2417	40.3
Vero	2016	11.1	906	4.0	2709	45.1
	2017	12.4	752	4.1	1923	32.1
	2018	13.6	744	4.2	2028	33.8
	2019	12.7	887	4.8	1488	24.8
Hooter	2016	11.2	896	4.8	2471	41.2
	2017	12.4	766	3.3	1700	28.3
Bellagio	2016	11.4	890	3.6	2459	41
16766	2018	11.0	745	4.7	2057	34.3
16760	2018	13.4	768	4.9	2161	36.0
151085	2018	13.6	689	3.8	2754	45.9
	2019	13.9	793	4.5	2156	35.9
151093	2018	14.6	799	3.6	2541	42.4
	2019	14.2	937	4.0	1967	32.8
151106	2018	11.0	827	3.0	1494	24.9
16761	2018	13.7	733	4.4	2410	40.2
16764	2018	14.5	744	4.5	2070	34.5
151084	2018	15.2	762	3.3	1903	31.7
16760	2019	14.9	920	6.0	1726	28.8
16775	2019	13.6	965	4.0	1252	20.9
White Kidney						
Snowden	2016	11.0	845	2.9	2042	34
	2018	13.9	686	2.9	1921	32.0
Beluga (std)	2016	11.1	938	3.0	2454	40.9
	2018	13.7	789	3.9	1502	25.0
Yeti	2017	13.9	842	2.5	1892	31.5
	2018	14.1	746	3.9	1688	28.1

Table 5. Yield Continued:

Cultivar	year	Moisture %	Count per lb.	Plants/ft	Lbs per acre	Bushel/A
Small Red						
OAC Rosito	2017	14.0	1915	5.1	3463	58
Viper	2018	13.1	1578	7.7	2668	44.5
Ruby	2018	13.5	1537	7.4	2681	44.7
Merlot	2018	12.5	1380	5.7	2712	45.2
Navy						
DS105W0	2017	13.3	1780	3.6	3575	59.6
T9905	2017	16.7	1822	4.9	4520	75.3
Medalist	2018	12.9	2604	7.1	2689	44.8
	2019	9.0	2440	6.8	2166	36.1
Merlin	2018	9.9	2430	7.1	3182	53.0
	2019	8.6	2454	4.5	3432	57.2
13068	2019	8.1	2023	5.3	2902	48.4
15094	2019	8.1	2046	5.1	2617	43.6
15095	2019	8.4	2276	6.2	2658	44.3
Pinto						
Vibrant	2018	11.5	1444	6.0	2263	37.7
	2019	9.7	1304	5.6	2528	42.1
Radiant	2018	12.2	1407	6.0	2276	37.9
	2019	11.5	1180	5.4	2699	45.0
La Paz	2018	15.2	1366	7.6	2793	46.5
	2019	15.3	1171	5.6	3483	58.0
Monterrey	2018	13.0	1343	6.8	2708	45.1
	2019	15.5	1181	5.3	3000	50.0