

69th Annual Report
National Cooperative Dry Bean
Nurseries

2018

Compiled by
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Univ. of Nebraska, Panhandle Res. and Ext. Center

**Cooperative Investigation among California, Colorado, Idaho,
Maryland, Michigan, Montana, Nebraska, North Dakota,
Washington, and Wyoming -State Experiment Stations and
Agricultural Research Centers- as part of the Regional W-3150
Multi-State Project**

and

University of Guelph, Canada

and

Agriculture Research Service – USDA

Call for 2019 Cooperative Dry Bean Nursery

Seed Submissions

It is time to request seed submission for 2019 Cooperative Dry Bean Nurseries. I would like to receive **the list of seed submission** no later than **April 8, 2019** and **the seed** must be here no later than **April 15, 2019**. All entries will be planted in replicated test plots across several locations in the United State and Canada. Data will be taken for seed yield, 100-seed weight and several agronomic and marketing characteristics. They will also be included in several disease nurseries including bean rust and Michigan will conduct canning tests.

The seed requirements for each of the three groups are as follows:

1. Small-seeded (Black, Navy, Others): **~15 lbs/line**.
2. Medium-seeded (Great Northern, Pink, Pinto, Small Red, Others): **~25 lbs/line**.
3. Large-seeded (Cranberry, Kidney, Others): **~35 lbs/line**.

Or 20,000 seeds

As in the past, all lines must be:

- X Western grown (West of the Rocky Mountain)
- X Pathogen free
- X If susceptible to BCMV, an ELISA test will be required.
- X Acceptable commercial quality (no broken, decayed, or off color seed)
- X **Seed should be untreated**

Fees: This fee structure was decided by the W-1150 members at The Annual meeting in Mayaguez, Puerto Rico in 2003as follows:

- Public institutions: \$150/line submitted
- Private institutions: \$300/line submitted

NURSERY OPERATIONS

Public institutions that request a nursery will be charged US \$150 to defray seed handling expenses including treating, bagging, boxing and shipping costs. Please let me know if your institution is going to submit the seeds and participate in the field trial for 2019 CDBN. Should you have any questions or concerns about the submission or participant fees please contact me or if you know anyone else who might like to submit seed or plant the nursery please let me know.

Contact and Shipping Information:

Dr. Carlos Urrea
University of Nebraska
Panhandle Research & Extension Center
4502 Avenue I
Scottsbluff, NE 69631
Office (308) 632-0556
Email: currea2@unl.edu

Table 1. List of Contributors and Cooperators - 2018

Name	Location	Seed Submitted	Planting Seed	Locations No.
Mike Moore	Powell, WY		yes	1
Paul Gepts, Antonia Palkovic	Davis, CA		yes	2
Phil Miklas	Othello, WA	yes	yes	3
Mark Brick, Barry Ogg	Ft. Collins, CO			
Juan M. Osorno, Albert J. Vander Wal, John Posch	Hatton, ND; Park Rapids, MN	yes	yes	4
Carlos Urrea, Eduardo Valentin Cruzado	Scottsbluff, NE	yes	yes	5
Jim Kelly, Evan Wright	Frankenmuth, MI		yes	6
Peter Pauls, Tom Smith	Elora R.S, Ont	yes	yes	7
Talo Pastor- Corrales	Beltsville, MD		yes (rust test)	8
Jim Heitholt	Lingle, WY		yes	9
Phillip Griffiths	Cornell, NY	yes		
James Beaver	Isabela, PR		yes	10

Table 2. Contact information for 2018 Cooperative Dry Bean Nursery

Loc	First Name	Last Name	Affiliation	E-Mail	Phone
CA	Paul	Gepts	University of CA – Davis	plgepts@ucdavis.edu	530-752-774
	Antonia	Palkovic	University of CA – Davis	antoniapalkovic@gmail.com	
CO	Mark	Brick	Colorado State University	Mark.Brick@colostate.edu	970-491-6551
	Barry	Ogg	Colorado State University	Barry.Ogg@Colostate.edu	
ID	Shree	Singh	University of Idaho	singh@uidaho.edu	208-423-6559
	John	Dean	Idaho Seed Bean Co.	isbco@filertel.com	208-734-5221
MD	Marcial (Talo)	Pastor-Corrales	USDA/ARS	talo.pastor-corrales@ars.usda.gov	301-504-6600
MI	Jim	Kelly	Michigan State University	kellyj@msu.edu	517-355-0271
	Evan	Wright	Michigan State University	wright294@msu.edu	
ND	Juan	Osorno	North Dakota State University	juan.osorno@ndsu.edu	701-231-8145
NE	Eduardo	Valentin Cruzado	University of Nebraska	evalentincruzado2@unl.edu	308-632-1480
	Carlos	Urrea	University of Nebraska	currea2@unl.edu	308-632-0556
NY	Phillip	Griffths	Cornell University	pdg8@cornell.edu	315-787-2222
ON	Peter	Pauls	University of Guelph	ppauls@uoguelph.ca	519-824-4120 ext 52460
	Tom	Smith	University of Guelph	thsmith@uoguelph.ca	519-824-4120 ext 8339
PR	James	Beaver	University of Puerto Rico	j_beaver@hotmail.com	787-832-4040 ext. 2566
WA	Phil	Miklas	USDA-ARS	phil.miklas@ars.usda.gov	509-786-9258
WY	Mike	Moore	University of Wyoming	mdmoore@uwyo.edu	307-754-9815
	Jim	Heitholt	University of Wyoming	Jim.Heitholt@uwyo.edu	307-776-3104

Table 3. List of 2018 Cooperative Dry Bean Nursery Entries.

Entry No.	Line	Market class	From
2	Provita	La Paz	Pinto
3	Treasure Valley	Othello	Pinto
4	Miklas	PT16-18	Pinto
5	Miklas	PT11-13B	Pinto
6	Urrea	NE2-17-18	SLD
7	Urrea	NE2-17-39	SLD
8	Osorno	ND-Palomino	SLD
1	U Gelp	ACUG 16-NDP1	Non darkening pinto
9	Urrea	NE1-17-10	Great northern
10	U Gelp	ACUG 15-B4	Black
11	Osorno	Eclipse	Black
12	U Gelp	AAC Shock (14-1)	Navy
13	U Gelp	AAC Argosy	Navy
19	U Gelp	OAC Rosito	Small dark red
20	Miklas	SR10-2-1	Small red
21	Miklas	PK7-4	Pink
14	U Gelp	Yeti	WK
15	U Gelp	Dynasty	DRK
16	U Gelp	OAC Inferno	LRK
17	Provita	CELRK	LRK
18	Griffs	LRK 6	LRK

The 2018 CDBN

The 2018 CDBN comprised 21 test entries and four checks.

Agronomic nurseries

There were approximately 1600 seeds supplied to each location sufficient to plant four 4-row replications, 20 to 25 feet long, for each entry. Seed treatment was provided by Syngenta Seed Co. and consisted of Cruiser, Maxim XL + Apron XL (MSDS are included with bean shipment

unless nursery operator requested otherwise).

Disease Nurseries

There were 400 seeds (untreated) supplied to Beltsville, MD, for rust screening.

DATA RECORDING AND SCALES

The following were commonly recorded data by the CDBN collaborators. For ease and uniformity of reporting we shall describe and abbreviate each trait:

1. **Early Vigor (EV):** Scored on a 1 to 9 scale, where 1= excellent and 9= very poor, within the first 3 weeks after emergence.
2. **Days to Flower (DF):** Actual number of days from planting to when approximately 50% plants in a plot have at least one opened flower.
3. **Days to Maturity (DM):** Actual number of days from planting to when approximately 50% of plants in a plot have at least one dry pod.
4. **Plant Height (PH):** Record in cm from the base of the plant (soil surface) to the top node bearing at least one dry pod with seed.
5. **Growth Habit (GH):** Record during flowering and verified when crop is senescent as type I=determinate erect or upright, II= indeterminate erect, and III= indeterminate prostrate.
6. **Lodging (LG):** Scored at harvest on a 1 to 9 scale, where 1= 100% plants standing erect, and 9= 100% plants lay flat on the ground.
7. **Pod Clearance (PC):** Recorded at harvest as percent of pods on plants not touching the ground or in contact with the soil surface.
8. **Biomass Yield (BY):** Total plant dry weight recorded at 12% moisture and rounded up to the nearest whole number (lb/a).
9. **Seed Yield (SY):** Recorded in lb/a at 12 % moisture and rounded up to the nearest whole number.
10. **Harvest Index (HI):** The ratio of SY/BY expressed in % BY at 12% moisture.
11. **Weight of 100 seeds (SW):** Weight of 100 randomly taken undamaged seed in grams at 12 % moisture.
12. **Appearance Desirability (SD):** An aggregate value for seed size, shape, color and brilliance for the respective market class recorded by various scales (see footnotes).

For other traits and scoring methods, a footnote is provided with associated details.

Table 4. Summary: Agronomic and Phenotypical , Bean Rust Reaction, and Canning Data for the 2018 CDBN[†].

Entry No.	Line	Market class	Yield	100-seed weight	Days to Flowering	Harvest Maturity	Reaction to rust races (MD) [‡]					Canning Score [*]
			lbs/acre	g 100 seeds ⁻¹	days	days	47	49	53	67	Putative rust genes	(1-5)
2	PTO	La Paz	2854	37.6	49.5	92.1	5,4	5,4	2	4,5	Ur-3	3.8
3	PTO	Othello	1959	37.8	42.3	83.5	2	4,5	5	4,5	Ur-6	3.5
4	PTO	PT16-18	2492	37.9	47.9	99.4	2	4,5	3	4	Ur-6, Ur-?	3.9
5	PTO	PT11-13B	2844	41.7	47.4	93.3	2	3	2	3, f2	Ur-6, Ur-3, Ur-	3.5
6	SLDP	NE2-17-18	2730	45.5	46.4	94.3	2	3	2	3, f2	Ur-6, Ur3, Ur-11	3.5
7	SLDP	NE2-17-39	2457	40.0	45.4	94.0	2	2	2	3C	Ur-6, Ur-3, Ur-11?	3.2
8	SLDP	ND-Palomino	2320	39.3	44.6	91.8	4,5	4,5	4,5	4,5		4.5
1	NDP	ACUG 16-NDP1	1902	37.0	48.4	94.9	5,4	5,4	3,f2	5,4	Ur-?	2.9
9	GN	NE1-17-10	2588	38.2	46.4	90.4	2	4,5	2	4,5	Ur-6, Ur-3	3.8
10	BLK	ACUG 15-B4	3157	22.3	49.8	98.7	4,5	4,5	4,5	4,5		3.8
11	BLK	Eclipse	2600	21.5	49.2	92.8	f2,3	f2	2	f2	Ur-3, Ur-11?	3.5
12	NAVY	AAC Shock	2614	23.5	44.0	93.8	4,5	4,5	2	4,5		2.5
13	NAVY	AAC Argosy	2861	24.6	44.7	97.9	4,5	4,5	4,5	4,5		3.6
19	SR	OAC Rosito	2778	22.5	48.5	93.2	3	4,5	3	5	Ur-5	2.9
20	SR	SR10-2-1	2562	39.4	46.1	90.2	4,5	4,5	4,5	4,5		3.3
21	PK	PK7-4	2574	35.1	45.0	90.1	4,5	4,5	4,5	4,5		3.8
14	WK	Yeti	1684	53.6	45.1	95.3	4,5	4,5	4,5	4,5		1.5
15	DRK	Dynasty	1924	57.7	44.6	94.1	4,5	4,5	4,5	4,5		1.8
16	LRK	Inferno	1855	58.6	44.5	96.1	4,5	4,5	4,5	4,5		2.3
17	LRK	CELRK	1446	53.1	40.2	82.7	4,5	4,5	4,5	4,5		1.4
18	LRK	LRK 6	1992	45.0	45.0	90.0	4,5	4,5	4,5	4,5		3.1
	Mean		2731	37.4	47.0	92.6						

[†] Across locations not all market classes are tested in the exact same trial. At certain locations large, medium and small seeded market classes are tested in different trials within the same field or in completely different locations. California yield data was removed from the overall mean.

[‡] Standard bean rust grading scale used in the greenhouse for these evaluations: 1 = no visible symptoms; 2 = Necrotic spots without sporulation; 3 = Tiny uredinia (sporulating pustules) less than 0.3mm in diameter; f2 = faint and tiny chlorotic spots; 4 = Medium-size uredinia, 0.3-0.5mm in diameter; 5 = Large uredinia, 0.5-0.8 mm in diameter. Reactions 2, 3, f2 are considered Resistant and 4, 5 are considered Susceptible.

* Canning data from Michigan: these are visual ratings based on overall appearance averaged across a group of ~15 evaluators. The scale is 1 to 5, where 1 = undesirable, and 5 = desirable.

Table 5. 2018 CDBN. Summary for seed yield (lbs/acre) for individual locations.

Entry	Market Class	Name	Canada	CA	MI	NE	ND†	WA	WY	Average
			lbs/acre							
2	PTO	La Paz	2447	815	3877	4282	1931	3822	2800	2854
3	PTO	Othello	1092	568	2796	3391	1680	2223	1960	1959
4	PTO	PT16-18	2497	1230	2825	3845	1530	3328	2190	2492
5	PTO	PT11-13B	3028	1148	3412	4151	2166	3736	2266	2844
6	SLDP	NE2-17-18	2556	709	3871	3910	1802	4045	2219	2730
7	SLDP	NE2-17-39	2124	859	2939	3522	2032	3523	2197	2457
8	SLDP	ND-Palomino	2329	403	3106	4052	1827	2089	2435	2320
1	NDP	ACUG 16-NDP1	1660	408	2572	2421	1650	2685	1920	1902
9	GN	NE1-17-10	1928	594	2650	3653	3031	3506	2751	2588
10	BLK	ACUG 15-B4	3326	1052	3416	4758	2591	3991	2963	3157
11	BLK	Eclipse	2009	721	3314	3856	2479	3164	2654	2600
12	NAVY	AAC Shock	2700	842	3153	3943	2733	2903	2026	2614
13	NAVY	AAC Argosy	3046	557	3683	4410	2763	3111	2458	2861
19	SR	OAC Rosito	2574	1146	3083	3707	2679	3883	2375	2778
20	SR	SR10-2-1	2382	907	2869	3075	2639	3431	2627	2562
21	PK	PK7-4	1646	866	3813	3663	2426	3083	2519	2574
14	WK	Yeti	1634	1023	2603	2918	1106	1172 [‡]	1333	1684
15	DRK	Dynasty	2298	844	3052	3203	916	1091 [‡]	2067	1924
16	LRK	Inferno	2539	733	2723	3326	1143	723 [‡]	1800	1855
17	LRK	CELRK	1714	878	2510	2133	625	786 [‡]	1478	1446
18	LRK	LRK 6	2237	613	3019	3423	1088	1286 [‡]	2280	1992
		Grand Mean	2275		3382	3602	2070	2742	2317	2731
		CV %	6.9		8.9	6.7	22.3	15.2	19	
		LSD 0.05	186		411	480	647	581	611	
		Grand Mean					852			
		CV %					31.7			
		LSD 0.05					378			

† Park Rapids, MN (yield in bold)

‡ These entries were grown in a separate part of the field which experienced herbicide damage.

Table 6. 2018 CDBN. Summary for 100-seed weight (g) for individual locations.

Entry	Market Class	Name	Canada	MI	NE	ND	WA	WY	Average
			gr						
2	PTO	La Paz	42.2	38.0	31.9	32.8	44.3	36.4	37.6
3	PTO	Othello	42.8	40.2	34.2	33.5	38.1	37.8	37.8
4	PTO	PT16-18	44.4	35.8	34.5	33.9	42.2	36.9	37.9
5	PTO	PT11-13B	44.5	41.2	33.5	38.8	50.3	42.2	41.7
6	SLDP	NE2-17-18	45.1	48.7	44.9	39.7	51.3	43.5	45.5
7	SLDP	NE2-17-39	41.5	42.2	37.1	34.8	43.7	40.9	40.0
8	SLDP	ND-Palomino	42.9	38.3	35.6	35.1	43.1	40.8	39.3
1	NDP	ACUG 16-NDP1	37.8	36.7	34.8	32.7	42.5	37.2	37.0
9	GN	NE1-17-10	41.2	37.8	33.2	36.1	42.7	38.4	38.2
10	BLK	ACUG 15-B4	23.7	23.5	21.5	19.4	23.9	22.2	22.3
11	BLK	Eclipse	21.4	20.8	20.0	20.0	24.9	21.9	21.5
12	NAVY	AAC Shock	22.4	26.3	22.1	22.6	25.3	22.2	23.5
13	NAVY	AAC Argosy	25.1	25.4	22.0	22.1	28.4	24.4	24.6
19	SR	OAC Rosito	24.8	25.8	20.2	19.2	23.7	21.4	22.5
20	SR	SR10-2-1	42.1	44.9	35.3	34.2	41.5	38.4	39.4
21	PK	PK7-4	40.3	40.7	31.9	27.3	36.2	34.2	35.1
14	WK	Yeti	56.3	60.8	54.7	49.6	42.9 [†]	46.8	53.6
15	DRK	Dynasty	64.3	67.3	60.1	45.9	48.9 [†]	50.9	57.7
16	LRK	Inferno	67.4	61.3	60.8	51.2	47.3 [†]	52.2	58.6
17	LRK	CELRK	60.1	65.0	55.4	38.6	37.2 [‡]	46.2	53.1
18	LRK	LRK 6	46.2	51.8	47.2	38.7	45.0 [‡]	41.3	45.0
		Grand Mean		39.6	36.7	35.9	39.2	35.5	37.4
		CV%		3.9	3.2	5.9	6.1	5.9	
		LSD 0.05		2.1	2.3	3.0	4.1	2.9	
		Grand Mean				46.0			
		CV%				5.6			
		LSD 0.05				3.6			

[†] Park Rapids, MN (100-seed weight in bold)

[‡] These entries were grown in a separate part of the field which experienced herbicide damage.

Table 7. 2018 CDBN. Summary for Days to Flowering (days) and Days To Harvest Maturity (days) for individual locations.

E	Market Class	Name	Days to Flowering							Days to Maturity						
			CA	MI	NE	ND	WA	WY	Average	Canada	MI	NE	ND	WA	WY	Average
			days							days						
2	PTO	La Paz	46.0	43.0	52.0	46.0	52.0	58.0	49.5	86.2	95.0	96.8	92.5	94.3	88.0	92.1
3	PTO	Othello	37.7	38.0	41.0	41.0	40.3	56.0	42.3	83.0	93.0	83.0	87.0	79.0	76.0	83.5
4	PTO	PT16-18	43.0	45.0	50.0	45.3	48.3	56.0	47.9	90.8	110.0	104.0	112.0	93.7	86.0	99.4
5	PTO	PT11-13B	43.7	43.0	45.0	45.0	51.0	57.0	47.4	90.2	96.0	96.5	96.8	95.3	85.0	93.3
6	SLDP	NE2-17-18	40.7	43.0	45.0	46.0	50.0	54.0	46.4	85.5	96.0	98.3	103.0	97.0	86.0	94.3
7	SLDP	NE2-17-39	42.0	43.0	42.0	45.0	47.3	53.0	45.4	85.2	99.0	97.8	105.3	90.0	87.0	94.0
8	SLDP	ND-Palomino	40.7	43.0	44.0	42.3	42.7	55.0	44.6	86.0	100.0	97.5	96.8	89.7	81.0	91.8
1	NDP	ACUG 16-NDP1	45.0	44.0	49.0	47.0	50.7	55.0	48.4	88.3	102.0	96.0	102.0	97.3	84.0	94.9
9	GN	NE1-17-10	43.0	43.0	43.0	43.3	49.3	57.0	46.4	85.3	97.0	94.0	86.8	94.3	85.0	90.4
10	BLK	ACUG 15-B4	46.3	48.0	52.0	44.0	52.7	56.0	49.8	104.5	99.0	104.0	95.3	101.3	88.0	98.7
11	BLK	Eclipse	45.7	48.0	48.0	42.3	53.0	58.0	49.2	87.7	98.0	97.0	90.0	100.0	84.0	92.8
12	NAVY	AAC Shock	42.0	43.0	42.0	39.8	43.3	54.0	44.0	87.1	103.0	93.3	97.5	99.7	82.0	93.8
13	NAVY	AAC Argosy	41.3	42.0	44.0	42.0	45.7	53.0	44.7	94.4	104.0	98.5	106.8	99.7	84.0	97.9
19	SR	OAC Rosito	45.3	44.0	48.0	44.3	53.3	56.0	48.5	94.7	96.0	97.0	87.0	99.3	85.0	93.2
20	SR	SR10-2-1	41.7	42.0	49.0	41.0	48.7	54.0	46.1	85.9	96.0	94.0	90.0	89.3	86.0	90.2
21	PK	PK7-4	39.0	43.0	43.0	45.0	46.0	54.0	45.0	84.2	100.0	89.0	95.5	89.0	83.0	90.1
14	WK	Yeti	40.3	40.0	47.0	-	49.3 [†]	53.0	45.1	92.6	99.0	98.3	101.5	91.7 [†]	85.0	95.3
15	DRK	Dynasty	41.3	39.0	45.0	-	43.0 [†]	53.0	44.6	90.6	100.0	99.3	96.5	92.3 [†]	84.0	94.1
16	LRK	Inferno	41.0	40.0	44.0	-	42.0 [†]	53.0	44.5	93.1	101.0	102.5	98.8	92.0 [†]	85.0	96.1
17	LRK	CELRK	38.3	34.0	35.5	-	38.0 [†]	53.0	40.2	80.4	89.0	84.5	82.8	78.7 [†]	77.0	82.7
18	LRK	LRK 6	42.0	39.0	46.0	-	45.3 [†]	53.0	45.0	88.0	95.0	98.3	88.0	91.0 [†]	81.0	90.0
		Grand Mean		43.0	45.5	44.4	47.2	55.0	47.0	88.7	98.6	96.2	94.7	93.1	84.0	92.6
		CV%		2.3	0.2	4.3	2.7	3.6		1.4	1.9	1.2	3.9	4.0	2.2	
		LSD 0.05		1.7	0.2	2.7	1.8	2.8		1.4	3.2	2.4	5.1	3.3	2.6	
		Grand Mean											97.0			
		CV%											3.5			
		LSD 0.05											4.8			

[†] Park Rapids, MN (Days to flowering and harvest maturity in bold)

[‡] These entries were grown in a separate part of the field which experienced herbicide damage.

Table 8. 2018 Cooperative Dry Bean Nursery (CDBN). Rust disease evaluation under greenhouse conditions with individual races of the rust pathogen¹

	Name	Market class	Cooperator	Reactions [#] to races of <i>Uromyces appendiculatus</i>				Putative rust resistance genes
				47	49	53	67	
2	La Paz	Pinto	Provita	5,4	5,4	2	4,5	<i>Ur-3</i>
3	Othello	Pinto	Treasure Valley	2	4,5	4,5	4,5	<i>Ur-6</i>
4	PT16-18	Pinto	Miklas	2	4,5	3	4	<i>Ur-6, Ur-?</i>
5	PT11-13B	Pinto	Miklas	2	3	2	3, f2	<i>Ur-6, Ur-3, Ur-*</i>
6	NE2-17-18	Pinto SLD	Urrea	2	3	2	3, f2	<i>Ur-6, Ur3, Ur-11</i>
7	NE2-17-39	Pinto SLD	Urrea	2	2	2	3C	<i>Ur-6, Ur-3, Ur-11?</i>
8	ND-Palomino	Pinto SLD	Osorno	4,5	4,5	4,5	4,5	
1	ACUG 16-NDP1	Pinto, Non Dark.	U Guelph	5,4	5,4	3,f2	5,4	<i>Ur-?</i>
9	NE1-17-10	Great Northern	Urrea	2	4,5	2	4,5	<i>Ur-6, Ur-3</i>
10	ACUG 15-B4	Black	U Guelph	4,5	4,5	4,5	4,5	
11	Eclipse	Black	Osorno	f2,3	f2	2	f2	<i>Ur-3, Ur-11?</i>
12	AAC Shock (14-1)	Navy	U Guelph	4,5	4,5	2	4,5	
13	AAC Argosy	Navy	U Guelph	4,5	4,5	4,5	4,5	
19	OAC Rosito	Small Red	U Guelph	3	4,5	3	5	<i>Ur-5</i>
20	SR10-2-1	Small Red	Miklas	4,5	4,5	4,5	4,5	
21	PK7-4	Pink	Miklas	4,5	4,5	4,5	4,5	
14	Yeti	WK	U Guelph	4,5	4,5	4,5	4,5	
15	Dynasty	DRK	U Guelph	4,5	4,5	4,5	4,5	**
16	Inferno	LRK	U Guelph	4,5	4,5	4,5	4,5	
17	CELRK	LRK	Provita	4,5	4,5	4,5	4,5	
18	LRK 6	LRK	Griffiths	4,5	4,5	4,5	4,5	
	Check Cultivars	Genes						
	Pinto 114	None identified		4,5	4,5	4,5	4,5	
	Aurora	<i>Ur-3</i>		4,5	4,5	2	4,5	
	Early Gallatin	<i>Ur-4</i>		4,5	2	4,5	4,5	
	Golden Gate Wax	<i>Ur-6</i>		2	4,5	4,5	4,5	
	Mexico 309	<i>Ur-5</i>		3, f2	4,5	3, f2	4,5	
	GN 1140	<i>Ur-7</i>		4,5	3	4,5	3	
	PI 181996	<i>Ur-11</i>		f2	f2	f2	f2	

Due to extreme weather (rain, heat) most nurseries planted in the field were lost during 2018. Therefore, the 21 entries of the 2018 CDBN were inoculated with individually with four races of the bean rust pathogen. Each of these races identify a rust resistance gene =, alone or in combination. These races were: race 53 that identifies *Ur-3*, 49 that identifies *Ur-4*, 47 identifies *Ur-6* and race 67 that identifies *Ur-11*. Even though this inoculation is highly laborious, it was conducted twice because some entries produced mixed reactions. Another evaluation is in progress to confirm these results.

*Could be *Ur-7* or *Ur-11*.

**Previously evaluated as intermediately resistant under field conditions at Beltsville, MD; but, the nurseries in the field were inoculated with other races of the rust pathogen; a mixture of races 38, 39, 40, 41, and 43. #Standard bean rust grading scale used in the greenhouse for these evaluations: 1 = no visible symptoms; 2 = Necrotic spots without sporulation; 3 = Tiny uredinia (sporulating pustules) less than 0.3mm in diameter; f2 = faint and tiny chlorotic spots; 4 = Medium-size uredinia, 0.3-0.5mm in diameter; 5 = Large uredinia, 0.5-0.8 mm in diameter. Reactions 2, 3, f2 are considered Resistant and 4, 5 are considered Susceptible.

Table 9. Miscellaneous traits data for 2018 CDBN.

Entry No.	Line	Market class	Canada	MI	ND	WA	MI		NE	ON		WA
			Plant Height				Lodging	Des. Score	Test Weight	Growth Habit	Harvest ability	Emergence
			cm				(1-5)	(1-7)	lbs/bu		(1-5)	(1-9)
2	PTO	La Paz	37	49.5	59	54.0	3.0	4.0	62.9	2b	2.5	2.0
3	PTO	Othello	27	43.5	52	36.0	3.5	3.0	63.5	2b	4.3	2.8
4	PTO	PT16-18	51	45.0	60	54.0	3.5	3.0	62.8	2b	3.5	2.0
5	PTO	PT11-13B	44	47.5	64	57.3	2.5	4.0	61.3	2b	1.8	2.0
6	SLDP	NE2-17-18	34	45.0	64	42.3	4.0	3.0	61.1	2b	4.1	2.0
7	SLDP	NE2-17-39	26	43.5	56	44.7	4.5	3.0	60.0	2b	3.7	2.3
8	SLDP	ND-Palomino	39	46.0	61	53.3	3.0	4.0	58.9	2b	2.5	2.3
1	NDP	ACUG 16-NDP1	44	48.5	59	58.7	2.5	5.0	59.0	2b	1.2	3.7
9	GN	NE1-17-10	36	47.5	53	45.0	3.0	4.0	61.5	2a	2.2	2.7
10	BLK	ACUG 15-B4	48	47.5	68	65.3	2.0	3.5	63.4	2a	3.6	2.3
11	BLK	Eclipse	50	50.0	59	64.3	1.0	4.5	63.5	2b	1.3	2.2
12	NAVY	AAC Shock	47	49.0	63	55.0	2.0	4.0	62.9	2b	1.5	2.3
13	NAVY	AAC Argosy	43	50.0	61	59.3	2.0	4.0	63.6	2b	2.0	2.7
19	SR	OAC Rosito	40	49.5	65	61.7	1.5	5.0	64.7	2b	2.0	2.2
20	SR	SR10-2-1	45	46.5	61	50.0	2.5	4.0	62.2	2b	1.9	2.3
21	PK	PK7-4	28	47.0	64	50.7	3.0	4.0	62.2	2b	3.9	2.5
14	WK	Yeti	42	52.0	46	39.3 [†]	2.0	4.0	59.9	1	1.3	3.8
15	DRK	Dynasty	45	52.0	47	38.3 [†]	2.0	3.5	57.1	1	1.2	2.5
16	LRK	Inferno	46	53.5	49	38.3 [†]	3.0	3.5	57.4	1	2.4	2.0
17	LRK	CELRK	35	45.0	28	26.7 [†]	1.0	4.0	57.2	1	1.3	3.2
18	LRK	LRK 6	42	48.5	39	40.0 [†]	1.5	4.5	56.2	1	1.3	2.0
		Mean	49.3	47.6	60		2.8	4.0	61.0		2.4	2.5
		CV %	6.0	2.7	10.6		15.8	6.6	1.2		19.8	24.0
		LSD 0.05	5.6	2.2	9		0.7	0.4	1.4		0.6	0.9
		Mean*			43							
		CV %*			9.3							
		LSD 0.05*			6							

[†] Park Rapids, MN (miscellaneous traits in bold)

* These entries were grown in a separate part of the field which experienced herbicide damage.

Table 10. Canning data for 2018 CDBN from Michigan.

Entry	Market Class	Name	Canning Score (1-5) [†]
2	PTO	La Paz	3.8
3	PTO	Othello	3.5
4	PTO	PT16-18	3.9
5	PTO	PT11-13B	3.5
6	SLDP	NE2-17-18	3.5
7	SLDP	NE2-17-39	3.2
8	SLDP	ND-Palomino	4.5
1	NDP	ACUG 16-NDP1	2.9
9	GN	NE1-17-10	3.8
10	BLK	ACUG 15-B4	3.8
11	BLK	Eclipse	3.5
12	NAVY	AAC Shock	2.5
13	NAVY	AAC Argosy	3.6
19	SR	OAC Rosito	2.9
20	SR	SR10-2-1	3.3
21	PK	PK7-4	3.8
14	WK	Yeti	1.5
15	DRK	Dynasty	1.8
16	LRK	Inferno	2.3
17	LRK	CELRK	1.4
18	LRK	LRK 6	3.1

[†] These are visual ratings based on overall appearance averaged across a group of 15 evaluators. The scale is 1 to 5, where 1 = undesirable, and 5 = desirable.

2018 CDBN Notes

2018 Dry Bean Performance Evaluation at Powell, WY

Mike Moore and Jolene Sweet, Wyoming Seed Certification Service; Jim Heitholt, Camby Reynolds and Andi Pierson, Powell Research and Extension Center

In 2016, Wyoming ranked tenth nationally in dry bean (*Phaseolus vulgaris* L.) production, and fourth in the production of pinto beans. In the same year, Wyoming growers produced 733,000 hundred-weight of pinto beans on 31,100 harvested acres, averaging 23.6 hundred-weight per acre. The University of Wyoming Seed Certification Service coordinates the dry bean variety performance evaluation at the Powell location in a continuous and on-going program. In cooperation with the National Cooperative Dry Bean Nursery, a wide range of germplasm is evaluated each year, assisting producers in selecting varieties best suited for Wyoming soils and climate. Please note that this report represents only the Powell CDBN. The Lingle CDBN data are presented separately.

Materials and Methods

The experiment was located at the University of Wyoming Research and Extension Center in Powell, Wyoming. The soil, a Garland clay loam, (fine, mixed, mesic: Typic Haplarid), was prepared by roller harrow and leveled in the spring. Chemical weed control consisted of a preplant incorporated chemical treatment of 2 pints of Sonalan and 14 ounces of Outlook applied on May 17. The plots received 20 units of N, 30 units of P and 5 units of Zn per acre on May 18. The plots were planted on May 22 in three-row plots that were 5.5 feet wide by 20 feet long. IH 185 planter units with cone attachments were used, set on 22-inch row spacing. The experimental design was a randomized block with 4 replications. Cultivation occurred during the growing season when appropriate. Furrow irrigation was applied on June 4, July 2, July 14, July 31, August 12, and August 24. Visual estimates for days to 50 percent bloom (50 percent of plants at second bloom) and days to maturity (50 percent of the plants with one buckskin pod) were made. Subplots of one row by 10 feet were pulled by hand, and plots were threshed with an Almaco stationary plot thresher. The seed was hand-picked to remove dirt clods and seed mixtures. Samples were then weighed for clean seed yield per plot and seeds per pound.

Results and Discussion

Stand establishment was good, with warm soil and good moisture at planting. Summer temperatures and precipitation were reasonable, and all entries matured prior to the first frost. Flowering dates, maturity dates, and yield components are presented in the table below (page 2).

Acknowledgements

This nursery was possible only with significant assistance. The Powell R & E Center staff, Brad May and Keith Schaefer, managed the plots.

CDBN trial planted at Lingle, WY

The Lingle CDBN site received hail damage in early September (not to mention milder hail storms in June and July). Not data is presented.
