

74th Annual Report National Cooperative Dry Bean Nursery

2023

**Compiled by
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Univ. of Nebraska, Panhandle Res., Ext. & Educ. Center**

**Cooperative Investigation among California, Colorado,
Maryland, Michigan, Nebraska, North Dakota, Washington, and
Wyoming -State Experiment Stations and Agricultural Research
Centers- as part of the Regional W-4150 Multi-State Project**

and

McGill University, Canada

and

Agriculture Research Service – USDA

Call for 2024 Cooperative Dry Bean Nursery

Seed Submissions

It is time to request seed submission for the 2024 Cooperative Dry Bean Nurseries. I want to receive **the list of entries** by **April 5, 2024**, and the seed must be in Scottsbluff, NE, by **April 12, 2024**. All entries will be planted in replicated test plots across several United States and Canada locations. Data for seed yield, 100-seed weight, and several agronomic and marketing characteristics will be taken. They will also be included in several disease nurseries, including bean rust and common bacterial blight. 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 Mountains)
- 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 2003 as 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 will submit the seeds and participate in the field trial for 2024 CDBN. Don't hesitate to contact me if you have any questions or concerns about the submission or participant fees. If you know anyone else who might like to submit seeds or plant the nursery, please let me know.

Contact and Shipping Information:

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

Table 1. List of Contributors and Cooperators - 2023

Name	Location	Seed Submitted	Planting Seed	Locations No.
Mike Moore, Jim Heitholt	Powell, WY		yes	1
Christine Diepenbrock, Antonia Palkovic	Davis, CA		yes	2
Phil Miklas	Othello, WA	yes	yes	3
Juan M. Osorno, Makenson Maisonneuve	Hatton, ND	yes	yes	4
Carlos Urrea, Cody Kaarstad	Scottsbluff, NE	yes	yes	5
Francisco Gomez, Evan Wright	Frankenmuth and Entrican, MI	yes	yes	6
Valerio Hoyos-Villegas, Shamus H. McGuire	Quebec, Canada		yes	7
Tim Porch, Giovanni Lorenzo	Juana Diaz, PR		yes	8

Table 2. Contact information for 2023 Cooperative Dry Bean Nursery

Loc	First Name	Last Name	Affiliation	E-Mail	Phone
CA	Christine	Diepenbrock	University of CA – Davis	chdiepenbrock@ucdavis.edu	
	Antonia	Palkovic		antoniapalkovic@gmail.com	
	Barry	Ogg		Barry.Ogg@Colostate.edu	
ID	John	Dean	Idaho Seed Bean Co.	isbco@filertel.com	208-734-5221
MD	Talo	Pastor-Corrales	USDA-ARS	talo.pastor-corrales@ars.usda.gov	301-504-6600
	Francisco	Gomez	Michigan State University	gomezfr1@msu.edu	517-353-0120
	Evan	Wright		wright294@msu.edu	517-355-2287
ND	Juan	Osorno	North Dakota State University	juan.osorno@ndsu.edu	701-231-8145
	Martin	Hochhalter	Meridian Seeds	mhochhalter@meridianseeds.co	701-532-3975
NE	Cody	Kaarstad	University of Nebraska	evalentincruzado2@unl.edu	308-632-1480
	Carlos	Urrea		currea2@unl.edu	308-632-0556
NY	Phillip	Griffiths	Cornell University	pdg8@cornell.edu	315-787-2222
ON	Peter	Pauls	University of Guelph	ppauls@uoguelph.ca	519-824-4120 ext 52460
	Tom	Smith		thsmith@uoguelph.ca	519-824-4120 ext 8339
OR	Lucas	Nebert	Oregon State University	nebertl@gmail.com	
	Jim	Myers		myersja@hort.oregonstate.edu	
QC	Valerio	Hoyos-Villegas	McGill University	valerio.hoyos-villegas@mcgill.ca	514-398-7856
PR	Tim	Porch	USDA-ARS	timothy.porch@usda.gov	787-238-8024
	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 2023 Cooperative Dry Bean Nursery Entries.

EN T.	COOPERATOR	CODE	MARKET CLASS
1	ND151355	Black	Osorno
2	Eclipse	Black	
3	CR17-1-7-B2	Cran	Miklas
4	ND Redbarn	DRK	Osorno
5	Eiger	GN	Wright
6	NE1-21-24	GN	Urrea
7	NE1-21-41	GN	Urrea
8	NE1-21-42	GN	Urrea
9	NE1-21-25	GN	Urrea
10	NE1-21-1	GN	Urrea
11	NE1-21-34	GN	Urrea
12	NE1-21-20	GN	Urrea
13	NE1-22-5	GN	Urrea
14	NE1-22-55	GN	Urrea
15	ND151660	LRK	Osorno
16	CLERK	LRK	
17	AuSable	Navy	Wright
18	Coral	Pink	Wright
19	ND171707	Pink	Osorno
20	Charro	Pinto	Wright
21	USDA Cody	Pinto	Miklas
22	USDA Basin	Pinto	Miklas
23	Othello	Pinto	
24	La Paz	Pinto	
25	NE2-21-34	Pinto	Urrea
26	NE2-21-8	Pinto	Urrea
27	ND Rodeo	SDP	Osorno
28	NE2-17-37	SDP	Urrea

The 2023 CDBN

The 2022 CDBN comprised 24 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 the nursery operator requested otherwise).

Disease Nurseries

For rust screening, four hundred seeds (untreated) were supplied to Beltsville, MD.

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% of 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 verify when the 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 a 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 seeds 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).

A footnote is provided with associated details for other traits and scoring methods.

Table 4. 2023 CDBN Summary: Yield, 100-Seed Weight, Phenotypical, and Canning Data across locations.

Entry	Market Class	Yield†	100-Seed Weight‡	Days to Flowering	Days to Maturity	Canning Appearance
		lbs/acre	g	days	days	(1-5)‡
ND151355	Black	2787	20.24	52	100	3.0
Eclipse	Black	2810	21.28	50	99	2.9
CR17-1-7-B2	Cran	1928	64.94	45	92	3.8
ND Redbarn	DRK	1548	51.38	45	96	3.4
Eiger	GN	3576	36.52	48	101	3.2
NE1-21-24	GN	3227	38.45	48	97	3.5
NE1-21-41	GN	2843	38.50	47	94	3.7
NE1-21-42	GN	2728	38.90	48	96	3.1
NE1-21-25	GN	3190	38.65	48	95	3.7
NE1-21-1	GN	3579	38.18	48	94	3.9
NE1-21-34	GN	2778	41.30	47	98	3.6
NE1-21-20	GN	3417	44.70	46	97	3.9
NE1-22-5	GN	3352	38.12	48	98	3.6
NE1-22-55	GN	3665	39.10	48	96	3.4
ND151660	LRK	895	52.77	44	93	3.2
CLERK	LRK	1503	57.72	44	92	4.2
AuSable	Navy	2988	23.26	51	96	3.7
Coral	Pink	3191	38.56	48	101	3.4
ND171707	Pink	3711	31.99	48	100	3.1
Charro	Pinto	3206	40.55	51	98	3.6
USDA Cody	Pinto	3416	37.74	47	97	2.9
USDA Basin	Pinto	3117	38.54	49	101	2.5
Othello	Pinto	2845	39.24	45	87	3.9
La Paz	Pinto	3391	37.11	49	98	2.1
NE2-21-34	Pinto	2950	39.93	48	101	4.1
NE2-21-8	Pinto	2991	43.91	47	96	2.5
ND Rodeo	SDP	3366	42.04	50	104	2.0
NE2-17-37	SDP	2924	39.66	45	97	3.3
GRAND MEAN		2946	39.21	48	97	3.3

† CA and ND yield data were removed because of the high CV%.

‡ 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. 2023 CDBN. Summary for seed yield (lbs/acre) for individual locations									
ID	Market Class	CA	CAN	MI	ND	NE	WA	WYO	Average †
ND151355	Black	1594	1477	2292	919	3669	2965	3534	2787
Eclipse	Black	1173	1604	2526	847	2721	3573	3626	2810
CR17-1-7-B2	Cran	1102	848	579	792	2685	3156	2370	1928
ND Redbarn	DRK	144	1723	1361	713	1211	1618	1829	1548
Eiger	GN	2286	2925	3047	1429	3879	4435	3593	3576
NE1-21-24	GN	945	3331	2514	658	2643	4072	3572	3227
NE1-21-41	GN	1095	2658	1808	1158	3245	3867	2638	2843
NE1-21-42	GN	421	2786	1869	423	2079	4195	2713	2728
NE1-21-25	GN	1402	2838	2178	1218	3097	4312	3524	3190
NE1-21-1	GN	831	2804	2845	741	4351	4141	3755	3579
NE1-21-34	GN	997	2164	2316	1034	2738	3648	3025	2778
NE1-21-20	GN	1380	2496	2512	1112	3914	4494	3670	3417
NE1-22-5	GN	1132	3024	1708	779	3603	4308	4114	3352
NE1-22-55	GN	1719	3192	2636	868	3895	4894	3708	3665
ND151660	LRK	306	1230	659	159	411		1279	895
CLERK	LRK	1185	1881	792	463	1190	1681	1974	1503
AuSable	Navy	1539	2245	1734	941	3130	3944	3888	2988
Coral	Pink	1496	2654	2992	1127	2699	4080	3529	3191
ND171707	Pink	1590	3458	2581	1196	4088	4908	3522	3711
Charro	Pinto	1774	3155	2488	1179	3346	3776	3264	3206
USDA Cody	Pinto	1895	2969	2390	1239	3614	4313	3792	3416
USDA Basin	Pinto	1896	2537	1965	1336	3482	4457	3144	3117
Othello	Pinto	1442	2431	1548	1115	3971	2759	3514	2845
La Paz	Pinto	1917	3167	2209	1346	3723	4113	3742	3391
NE2-21-34	Pinto	860	2464	2017	1393	3879	2774	3614	2950
NE2-21-8	Pinto	725	2512	2236	881	3721	3503	2983	2991
ND Rodeo	SDP	900	2480	2731	1104	3527	4399	3694	3366
NE2-17-37	SDP	692	2332	1876	910	3318	3978	3115	2924
GRAND MEAN		1240	2478	2086	967	3137	3791	3240	2946
LSD 0.05			596	528	597	996	819	642	
CV %		50.6	17.0	12.6	45.2	15.9	14.0	14.1	
† CA and ND yield data were removed because of the high CV%.									

Table 6. 2023 CDBN. Summary for 100-seed weight (g) for individual locations.

Entry	ID	Market Class	CAN	ND	NE	WA	WY	Average
1	ND151355	Black	24.0	16.0	18.9	21.9	20.4	20.2
2	Eclipse	Black	25.0	16.9	18.9	23.7	22.0	21.3
3	CR17-1-7-B2	Cran	68.0	53.5	62.6	73.9	66.8	64.9
4	ND Redbarn	DRK	58.0	42.7	50.4	52.6	53.1	51.4
5	Eiger	GN	41.0	33.7	31.7	40.5	35.7	36.5
6	NE1-21-24	GN	41.0	31.1	36.6	44.5	39.0	38.4
7	NE1-21-41	GN	40.0	32.6	35.2	44.6	40.1	38.5
8	NE1-21-42	GN	42.0	32.2	35.9	46.4	38.1	38.9
9	NE1-21-25	GN	42.0	31.7	36.8	44.5	38.2	38.7
10	NE1-21-1	GN	39.0	32.2	35.6	45.4	38.7	38.2
11	NE1-21-34	GN	43.0	35.5	39.5	46.6	42.0	41.3
12	NE1-21-20	GN	48.0	35.3	42.9	50.9	46.4	44.7
13	NE1-22-5	GN	41.0	30.4	35.3	44.7	39.2	38.1
14	NE1-22-55	GN	42.0	32.0	36.9	45.4	39.2	39.1
15	ND151660	LRK	62.0	43.0	51.6	.	54.5	52.8
16	CLERK	LRK	69.0	44.7	55.1	64.4	55.4	57.7
17	AuSable	Navy	26.0	19.7	20.6	26.3	23.6	23.3
18	Coral	Pink	43.0	31.8	35.7	41.8	40.5	38.6
19	ND171707	Pink	26.0	26.3	33.9	38.3	35.5	32.0
20	Charro	Pinto	42.0	35.5	38.4	47.5	39.4	40.5
21	USDA Cody	Pinto	41.0	32.5	33.7	42.3	39.3	37.7
22	USDA Basin	Pinto	40.0	32.8	38.3	44.2	37.5	38.5
23	Othello	Pinto	42.0	30.1	38.2	44.4	41.5	39.2
24	La Paz	Pinto	41.0	30.2	33.4	42.8	38.2	37.1
25	NE2-21-34	Pinto	42.0	32.6	39.3	44.2	41.5	39.9
26	NE2-21-8	Pinto	47.0	32.2	42.7	51.0	46.6	43.9
27	ND Rodeo	SDP	42.0	36.7	40.7	49.7	41.1	42.0
28	NE2-17-37	SDP	44.0	31.4	38.5	44.1	40.4	39.7
GRAND MEAN			42.8	32.7	37.8	44.7	38.1	39.2
LSD 0.05			6.6	2.9	2.5	3.1	.	
CV %			10.9	6.5	3.3	5.0	3.7	

Table 7. 2023 CDBN for Days to flowering (days) and Days to Harvest Maturity (days) for individual locations.

	Market Class	ID	Days to Flowering						Days to Harvest Maturity					
			CA	MI	ND	NE	WYO	Mean	CAN	MI	NE	WA	WYO	Mean
1	ND151355	Black	49	53	46	48	63	52	88	106	97	103	106	100
2	Eclipse	Black	48	50	45	48	62	50	88	105	93	101	107	99
3	CR17-1-7-B2	Cran	45	41	43	41	54	45	87	98	90	97	87	92
4	ND Redbarn	DRK	44	40	45	42	54	45	90	104	98	95	94	96
5	Eiger	GN	46	50	39	46	59	48	90	107	94	100	116	101
6	NE1-21-24	GN	46	46	45	46	56	48	85	104	91	95	112	97
7	NE1-21-41	GN	44	46	43	47	56	47	84	95	98	97	95	94
8	NE1-21-42	GN	45	46	47	47	56	48	87	101	99	103	91	96
9	NE1-21-25	GN	46	47	43	46	57	48	86	104	93	96	94	95
10	NE1-21-1	GN	44	46	47	45	57	48	84	103	90	98	97	94
11	NE1-21-34	GN	46	46	41	45	56	47	88	103	98	98	103	98
12	NE1-21-20	GN	44	46	40	44	57	46	85	102	93	102	103	97
13	NE1-22-5	GN	45	45	48	45	56	48	85	102	95	96	114	98
14	NE1-22-55	GN	46	47	43	45	57	48	88	104	93	101	94	96
15	ND151660	LRK	45	39	44	40	54	44	87	106	89		90	93
16	CLERK	LRK	41	37	45	41	54	44	86	92	104	93	85	92
17	AuSable	Navy	49	49	47	48	62	51	85	100	93	99	106	96
18	Coral	Pink	45	48	43	47	59	48	89	108	95	100	115	101
19	ND171707	Pink	45	47	46	47	57	48	89	107	100	100	106	100
20	Charro	Pinto	52	51	48	42	60	51	91	104	87	102	108	98
21	USDA Cody	Pinto	46	49	42	42	58	47	85	103	94	98	107	97
22	USDA Basin	Pinto	47	50	42	47	61	49	86	105	98	98	116	101
23	Othello	Pinto	43	43	42	42	54	45	84	85	89	92	85	87
24	La Paz	Pinto	47	52	43	47	57	49	86	103	94	100	105	98
25	NE2-21-34	Pinto	44	47	46	47	56	48	83	104	102	103	115	101
26	NE2-21-8	Pinto	43	46	45	48	55	47	84	103	100	100	93	96
27	ND Rodeo	SDP	47	49	47	46	59	50	90	105	105	102	116	104
28	NE2-17-37	SDP	43	45	39	44	56	45	89	103	96	99	97	97
GRAND MEAN				46	44	45	57	48	87	102	95	99	102	97
LSD 0.05				1	5	2	2		4	2	4	3	14	
CV %				1.8	8.9	2.0	2.4		3.5	1.1	2.3	2.0	10.0	

Table 8. 2023 CDBN. Miscellaneous Traits Data.											
Ent	Market Class	ID	CA	MI	NE	Mean	MI	NE		MI	WA
			Lodging	Plant height			Des. Score	Test Weight	Moisture	Canning	Plant Stand
			(1-9)	cms			(1-7)†‡	lbs/bu	%	(1-5)§	(1-9)
1	ND151355	Black	1.5	38.5	57.7	48.1	4	63.9	11.7	3	3.0
2	Eclipse	Black	3.4	41.0	56.7	48.8	4.5	63.5	11.9	2.9	2.7
3	CR17-1-7-B2	Cran	4.3	37.0	45.3	41.2	4	58.6	12.4	3.8	3.3
4	ND Redbarn	DRK	1.2	38.5	45.7	42.1	5.33	59.4	11.7	3.4	4.7
5	Eiger	GN	3.6	40.5	55.3	47.9	5	61.3	11.5	3.2	3.0
6	NE1-21-24	GN	4.0	47.5	53.0	50.2	4.5	60.4	12.1	3.5	1.7
7	NE1-21-41	GN	5.9	35.0	57.0	46.0	4	62.9	12.4	3.7	3.3
8	NE1-21-42	GN	6.3	46.0	59.3	52.7	3	62.6	12.3	3.1	5.5
9	NE1-21-25	GN	6.0	38.5	52.7	45.6	4	61.9	11.5	3.7	4.8
10	NE1-21-1	GN	4.0	36.5	55.0	45.7	5	61.0	12.4	3.9	2.7
11	NE1-21-34	GN	3.0	38.0	56.0	47.0	4.5	60.2	11.7	3.6	4.7
12	NE1-21-20	GN	5.3	48.0	60.7	54.3	3.5	61.7	13.1	3.9	2.7
13	NE1-22-5	GN	4.8	37.0	57.0	47.0	4	61.2	11.4	3.6	3.3
14	NE1-22-55	GN	3.6	37.5	50.7	44.1	4	59.3	12.4	3.4	3.3
15	ND151660	LRK	2.5	40.0	42.0	41.0	4	58.6	11.8	3.2	8.0
16	CLERK	LRK	1.6	37.7	44.3	41.0	3.67	54.6	12.1	4.2	4.8
17	AuSable	Navy	3.9	42.5	59.0	50.7	6	62.3	13.2	3.7	1.7
18	Coral	Pink	4.2	36.0	61.0	48.5	5	63.5	11.9	3.4	2.3
19	ND171707	Pink	2.7	46.5	58.0	52.2	4.5	63.0	12.3	3.1	1.7
20	Charro	Pinto	5.6	49.5	41.0	45.2	5.5	61.9	11.9	3.6	3.3
21	USDA Cody	Pinto	3.6	47.0	51.7	49.3	5.5	61.0	12.1	2.9	1.7
22	USDA Basin	Pinto	3.8	47.0	60.0	53.5	3	63.2	12.1	2.5	2.3
23	Othello	Pinto	7.5	32.0	54.0	43.0	3	61.4	12.3	3.9	2.3
24	La Paz	Pinto	3.6	46.0	59.3	52.7	4.5	62.6	11.8	2.1	2.3
25	NE2-21-34	Pinto	4.8	47.0	58.7	52.8	3	61.6	12.6	4.1	2.7
26	NE2-21-8	Pinto	3.9	45.0	62.3	53.7	3	62.3	12.3	2.5	2.7
27	ND Rodeo	SDP	4.9	42.0	55.0	48.5	4	62.9	12.3	2	3.0
28	NE2-17-37	SDP	5.0	45.0	57.0	51.0	3.5	60.2	12.2	3.3	5.0
		GRAND MEAN	4.3	41.5	54.5	48.0	4.2	61.3	12.1	3.3	3.1
		LSD 0.05		5.7	6.1		0.7	2.6	1.0		1.6
		CV %	42.7	8.0	5.5		10.3	2.1	3.9		34.0

† Desire Score: 1 = worst, 7 or 10 = best.

§ 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.