

72nd Annual Report
National Cooperative Dry Bean
Nursery

2021

Compiled by
Carlos A. Urrea, Coordinator
Univ. of Nebraska, Panhandle Res. & Ext. 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 2022 Cooperative Dry Bean Nursery

Seed Submissions

It is time to request seed submission for the 2022 Cooperative Dry Bean Nurseries. I want to receive **the list of send submissions** no later than **April 8, 2022**, and **the seed** must be here no later than **April 15, 2022**. All entries will be planted in replicated test plots across several United States and Canada locations. 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 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 2021 CDBN. Should you have any questions or concerns about the submission or participant fees, don't hesitate to get in touch with 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 - 2021

Name	Location	Seed Submitted	Planting Seed	Locations No.
Mike Moore, Jim Heitholt	Powell, WY		yes	1
Paul Gepts, Antonia Palkovic	Davis, CA		yes	2
Phil Miklas	Othello, WA	yes	yes	3
Barry Ogg	Ft. Collins, CO		yes	4
Juan M. Osorno, Albert J. Vander Wal, John Posch	Hatton, ND; Park Rapids, MN	yes	yes	5
Carlos Urrea	Scottsbluff, NE	yes	yes	6
Francisco Gomez, Evan Wright	Frankenmuth and Entrican, MI	yes	yes	7
Valerio Hoyos-Villegas, Shamus H. McGuire	Quebec, Canada		yes	8
Talo Pastor- Corrales	Beltsville, MD		yes (rust test)	9

Table 2. Contact information for 2021 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		antoniapalkovic@gmail.com	
CO	Maria	Munoz Amatriain	Colorado State University	Maria.Munoz_Amatriain@colostate.edu	970-491-3691
	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
MI	Jim	Kelly	Michigan State University	kellyj@msu.edu	517-355-0271
	Francisco	Gomez		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	Eduardo	Valentin Cruzado	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
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 2021 Cooperative Dry Bean Nursery Entries.

ENT.	COOPERATOR	CODE	MARKET CLASS
1	Miklas	USDA-Rattler (PT11-13-31)	PTO
2	Miklas	PT16-9	PTO
3	Miklas	PT10-12-1	PTO
4	Miklas	PT9-5-6	PTO
5	Treasure Valley	Othello	PTO
6	Urrea	NE2-20-3	PTO
7	Urrea	NE2-20-12	PTO
8	Urrea	NE2-20-14	PTO
9	Miklas	GN16-7-3	GN
10	Urrea	NE1-20-19	GN
11	Urrea	NE1-20-21	GN
12	Treasure Valley	PNE-6-94-75/Kodiak, LAPAZ	PTO
13	Treasure Valley	CELRK	LRK
14	Wright	Adams	BLK
15	Treasure Valley	Eclipse	BLK

The 2021 CDBN

The 2021 CDBN comprised 11 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

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

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. 2021 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
		lbs/acre	g	days	days	(1-5)†
PT11-13-31, USDA RATTLER	PTO	3989	43.8	48	93	2.8
PT16-9, USDA DIAMONDBACK	PTO	3324	40.6	47	93	4.3
USDA Basin (PT10-12-1)	PTO	3402	38.3	48	94	2.8
PT9-5-6	PTO	3710	37.5	48	92	2.3
NW410//VICTOR/AURORA, OTHELLO	PTO	3380	40.2	44	86	2.4
NE2-20-3	PTO	3145	41.1	45	93	3.5
NE2-20-12	PTO	3178	41.2	45	88	3.0
NE2-20-14	PTO	3073	40.8	44	86	2.5
PNE-6-94-75/Kodiak, LAPAZ	PTO	3937	38.8	46	94	2.5
GN16-7-3	GN	3620	40.8	46	91	3.3
NE1-20-19	GN	3387	38.3	43	94	3.6
NE1-20-21	GN	2810	44.1	49	94	2.8
CELRK	LRK	2488	56.9	41	88	2.7
Zenith//Alpena*/B09197, ADAMS	BLK	3833	22.3	50	96	2.6
ND9902621-2, ECLIPSE	BLK	3307	21.5	49	95	3.1
Grand Mean		3636	39.1	47	91	2.9

† 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.

‡ ND and Quebec data were excluded.

Table 5. 2021 CDBN. Summary for seed yield (lbs/acre) for individual locations

	Market Class	ID	CA	MI	NE	WA	WY	ND	Quebec	Average	Average‡
1	PTO	PT11-13-31, USDA RATTLER	3662	3300	5540	4362	3082	1570	1250	3252	3989
2	PTO	PT16-9, USDA DIAMONDBACK	2472	2880	3824	4564	2879	2139	1196	2850	3324
3	PTO	USDA Basin (PT10-12-1)	2746	2740	4154	4557	2814	1956	947	2845	3402
4	PTO	PT9-5-6	3278	2913	4119	4335	3907	1785	1465	3115	3710
5	PTO	NW410//VICTOR/AURORA, OTHELLO	2668	2644	4087	4031	3472	1347	417	2667	3380
6	PTO	NE2-20-3	1511	3259	3695	4005	3256	1861	1328	2702	3145
7	PTO	NE2-20-12	1890	2086	4593	4088	3231	1274	884	2578	3178
8	PTO	NE2-20-14	1410	2098	4311	4520	3024	1286	1161	2544	3073
12	PTO	PNE-6-94-75/Kodiak, LAPAZ	3153	3250	5060	4825	3400		1156	3474	3937
9	GN	GN16-7-3	2330	3004	4382	5219	3163		1044	3190	3620
10	GN	NE1-20-19	3086	2338	3881	4972	2659		1131	3011	3387
11	GN	NE1-20-21	524	2384	4538	3663	2942		1361	2569	2810
13	LRK	CELRK	1597	2003	2988	3419	2434		607	2175	2488
14	BLK	Zenith//Alpena*/B09197, ADAMS	2327	3437	4444	4866	4089	1224†	1095	3376	3833
15	BLK	ND9902621-2, ECLIPSE	2120	3046	3881	4314	3175			3307	3307
		GRAND MEAN	2318	2759	4233	4383	3168	1693	1066	2803	3372
		LSD 0.05	483	392	762	NS	388	519	520		
		CV %	15.0	9.4	8.8	18.0	16.6	26.2	28.6		
		GRAND MEAN						1223†			
		LSD 0.05						803†			
		CV %						38†			

† Only 2 reps were harvested due to Dicamba drift.

‡ ND and Quebec data were excluded.

Table 6. 2021 CDBN. Summary for the 100-seed weight (g) for individual locations.

Market Class	ID	MI	NE	ND	Quebec	WA	WY	Average‡		
1	PTO	PT11-13-31, USDA RATTLER		43.0	40.8	37.2	33.3	49.5	42.0	43.8
2	PTO	PT16-9, USDA DIAMONDBACK		38.7	35.6	35.1	28.0	48.1	40.0	40.6
3	PTO	USDA Basin (PT10-12-1)		39.2	35.1	33.5	25.3	43.0	36.0	38.3
4	PTO	PT9-5-6		41.1	31.4	32.6	30.0	41.4	36.0	37.5
5	PTO	NW410//VICTOR/AURORA, OTHELLO		44.3	35.7	32.4	31.3	44.9	36.0	40.2
6	PTO	NE2-20-3		41.1	38.1	32.3	30.3	46.1	39.0	41.1
7	PTO	NE2-20-12		43.1	38.1	31.2	31.8	45.8	38.0	41.2
8	PTO	NE2-20-14		41.7	38.4	32.6	28.5	45.3	38.0	40.8
12	PTO	PNE-6-94-75/Kodiak, LAPAZ		40.0	35.1		28.8	45.3	35.0	38.8
9	GN	GN16-7-3		39.0	38.8		30.0	47.6	38.0	40.8
10	GN	NE1-20-19		40.6	33.6		26.8	43.1	36.0	38.3
11	GN	NE1-20-21		45.2	42.1		32.8	48.9	40.0	44.1
13	LRK	CELRK		65.0	56.2		50.8	58.3	48.0	56.9
14	BLK	Zenith//Alpena*/B09197, ADAMS		22.6	21.5	18.1†	17.0	25.3	20.0	22.3
15	BLK	ND9902621-2, ECLIPSE		20.1	20.3			25.7	20.0	21.5
GRAND MEAN				40.3	36.0	34.6	30.1	43.9	36.0	39.1
LSD 0.05				1.3	2.5	3.1	5.4	3.5	2.0	
CV %				1.9	3.4	7.7	10.5	5.0	3.3	
GRAND MEAN						19.2†				
LSD 0.05						2.3†				
CV %						7.0†				

† Only 2 reps were harvested due to Dicamba drift.

‡ ND and Quebec data were excluded.

Table 7. 2021 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										
		MI	NE	ND	WY	Mean	MI	NE	ND	WA	WY	Mean					
1	PTO	PT11-13-31, USDA RATTLER					42	47	51	51	48	83	97	86	110	89	93
2	PTO	PT16-9, USDA DIAMONDBACK					42	47	49	51	47	83	99	88	106	87	93
3	PTO	USDA Basin (PT10-12-1)					43	47	51	51	48	83	99	95	106	87	94
4	PTO	PT9-5-6					42	47	50	54	48	83	91	88	108	91	92
5	PTO	NW410//VICTOR/AURORA, OTHELLO					41	41	48	47	44	81	90	86	102	73	86
6	PTO	NE2-20-3					41	43	49	48	45	84	100	95	104	80	93
7	PTO	NE2-20-12					41	44	47	47	45	82	90	85	104	80	88
8	PTO	NE2-20-14					40	42	47	47	44	82	87	83	99	79	86
12	PTO	PNE-6-94-75/Kodiak, LAPAZ					42	47		50	46	83	95		109	89	94
9	GN	GN16-7-3					41	47		49	46	83	91		104	86	91
10	GN	NE1-20-19					40	42		48	43	83	98		109	86	94
11	GN	NE1-20-21					44	48		56	49	83	97		104	91	94
13	Lrk	CELrk					35	40		47	41	86	92		100	75	88
14	BLK	Zenith//Alpena*/B09197, ADAMS					44	50		55	50	83	99		110	93	96
15	BLK	ND9902621-2, ECLIPSE					44	49		54	49	86	99		107	89	95
GRAND MEAN						41	45	50	50	47	83	95	87	106	85	91	
LSD 0.05						1	1	2	2		1	4	10	4	3		
CV %						2.1	1.6	3.1	2.4		0.5	2.0	10.1	3.0	2.9		

Table 8. 2020 CDBN. Miscellaneous Traits Data.

Ent	Market Class	ID	MI	WA	MI	NE	ND	Average	MI	NE		MI
			Lodging		Plant height				Des. Score	Test Weight	Moisture	Canning
			(1-5)	(1-9)	cms				(1-7)‡	lbs/bu	%	Score (1-5)§
1	PTO	PT11-13-31, USDA RATTLER	1.7	5.3	49.3	57.7	47.3	51.4	6.0	60.9	9.5	2.8
2	PTO	PT16-9, USDA DIAMONDBACK	2.0	5.0	46.0	53.3	60.5	53.3	5.7	61.5	9.6	4.3
3	PTO	USDA Basin (PT10-12-1)	2.3	4.7	42.3	55.7	54.0	50.7	4.3	61.4	9.8	2.8
4	PTO	PT9-5-6	2.0	4.7	46.0	52.7	52.3	50.3	4.7	62.1	9.0	2.3
5	PTO	NW410//VICTOR/AURORA, OTHELLO	3.3	9.0	30.0	34.7	49.5	38.1	3.0	62.1	9.2	2.4
6	PTO	NE2-20-3	3.0	5.7	47.3	53.3	45.5	48.7	3.3	59.7	9.5	3.5
7	PTO	NE2-20-12	3.3	7.7	35.0	40.3	49.3	41.5	3.0	58.6	9.0	3.0
8	PTO	NE2-20-14	3.0	6.8	34.0	44.7	47.3	42.0	3.0	62.5	9.5	2.5
12	PTO	PNE-6-94-75/Kodiak, LAPAZ	2.0	3.3	45.3	53.3		49.3	5.0	60.3	9.6	2.5
9	GN	GN16-7-3	2.0	5.7	46.0	51.3		48.7	4.3	60.1	9.3	3.3
10	GN	NE1-20-19	3.0	7.0	44.0	48.0		46.0	3.0	62.6	9.7	3.6
11	GN	NE1-20-21	2.0	4.3	46.7	50.7		48.7	4.3	62.2	9.6	2.8
13	LRK	CELRK	1.3	2.3	45.6	50.7		48.1	3.0	58.8	9.1	2.7
14	BLK	Zenith//Alpena*/B09197, ADAMS	1.7	4.3	45.0	57.7	46†	49.6	6.0	64.3	8.5	2.6
15	BLK	ND9902621-2, ECLIPSE	2.0	4.3	40.0	54.0		47.0	3.5	63.2	8.6	3.1
GRAND MEAN			2.3	5.3	42.8	50.5	52.3	48.5	4.1	61.3	9.3	2.9
LSD 0.05			0.6	1.0	4.2	7.5	10.8		0.6	0.7	0.3	
CV %			17.6	11.0	7.0	7.3	17.6		10.6	0.6	1.7	
GRAND MEAN							19.2†					
LSD 0.05							2.3†					
CV %							7.0†					

† Only 2 reps were harvested due to Dicamba drift.

‡ 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.

Table 9. Evaluation of the CDBN 2021 with different races of *Uromyces appendiculatus* and genotyped with molecular markers tagging the *Ur-3*, *Ur-4*, *Ur-5*, and *Ur-11* rust resistance genes. Phenotyping was conducted under greenhouse conditions and genotyping in the laboratory of the common bean program, SGIL, BARC-West, ARS-USDA

Entry #	Entry Name	Market Class	Races of <i>U. appendiculatus</i>				Putative RR genes	Molecular markers from SGIL				Miklas markers		a = Indicates the resistance allele is not present b = Indicates the resistance allele is present
			47	53	67	108		<i>Ur-3</i>	<i>Ur-4</i>	<i>Ur-5</i>	<i>Ur-11</i>	<i>Ur-11</i>	<i>Ur-11</i>	
			SS68	SS240	SS183	SS322		S11_51 647815	S11_51 904022					
1	USDA-Rattler (PT11-13-31)	PTO	3/4	2/3	3/3	2/4	<i>Ur-3+Ur-11</i>	b	a	a	b	b	b	3 evaluations in greenhouse produced same results; some plants had <i>Ur-3</i> ; others had <i>Ur-3</i> , <i>Ur-11</i>
1	USDA-Rattler (PT11-13-31)	PTO	5,4/5	2/4	5,4/4	2/4	<i>Ur-3</i>	b	a	a	b	b	b	Molecular marker confirmed presence of <i>Ur-3</i> . Markers for <i>Ur-11</i> produced erratic results.
2	PT16-9	PTO	2/5	2/3	4/4	2/2	<i>Ur-3+Ur-6</i>	b	a	a	a	a	a	One evaluation in greenhouse indicated presence of <i>Ur-3</i> and <i>Ur-6</i> in all plants.
3	PT10-12-1	PTO	5,4/5	2,2/3	5,4/5	2/3	<i>Ur-3</i>	b	a	a	a	a	a	2 Evaluations in greenhouse indicated the presence of <i>Ur-3</i> . Molecular marker confirmed the presence of <i>Ur-3</i> .
4	PT9-5-6	PTO	4,5/4	2/4	4,5/4	2/4	<i>Ur-3</i>	b	a	a	a	a	a	3 evaluations in greenhouse produced same results. Some plants had <i>Ur-3</i> and others had <i>Ur-3</i> , <i>Ur-11</i>
			3,2/3	2/4	3,2/4	2/4	<i>Ur-3, Ur-11</i>	b	a	a	a	a	a	Molecular marker confirmed the presence of <i>Ur-3</i> . Markers for <i>Ur-11</i> produced erratic results.
5	Othello	PTO	2/5	5,4/4	5,4/4	5,4/4	<i>Ur-6</i>	a	a	a	a	a	a	One evaluation in greenhouse indicated presence of <i>Ur-6</i> in all plants. We don't have a <i>Ur-6</i> marker
6	NE2-20-3	PTO	2,2/3	2,2/3	2,2/3	5,4/4	<i>Ur-11</i>	a	a	a	b	b	b	One evaluation in greenhouse indicated presence of <i>Ur-11</i> in all plants. Molecular markers confirmed the presence of <i>Ur-11</i>
7	NE2-20-12	PTO	2/4	2/4	2/4	5,4/5	<i>Ur-6+Ur-11</i>	a	a	a	b	b	b	2 evaluations in greenhouse indicated that all plants had <i>Ur-6</i> and <i>Ur-11</i> . Molecular markers confirmed presence of <i>Ur-11</i>
8	NE2-20-14	PTO	2/5	3/4	3/4	5,4/4	<i>Ur-6+Ur-11</i>	a	a	a	b	b	b	One evaluation in greenhouse indicated that all plants had <i>Ur-6</i> and <i>Ur-11</i> . Molecular markers confirmed the presence of <i>Ur-11</i> . We don't have a <i>Ur-6</i> marker
9	GN16-7-3	GN	4,5/5	2,2/4	5,4/5	2/4	<i>Ur-3</i>	b	a	a	a	a	a	2 Evaluations in greenhouse indicated all plants had <i>Ur-3</i> . Molecular marker confirmed presence of <i>Ur-3</i>
10	NE1-20-19	GN	4/4	2/2	5,4/4	2/4	<i>Ur-3</i>	b	a	a	a	a	a	One evaluation in greenhouse indicated all plants had <i>Ur-3</i> . Molecular marker confirmed presence of <i>Ur-3</i>
11	NE1-20-21	GN	4,5/5	2/3	4,5/5	2/4	<i>Ur-3</i>	b	a	a	a	a	a	One evaluation in greenhouse indicated all plants had <i>Ur-3</i> . Molecular marker confirmed the presence of <i>Ur-3</i>
12	PNE-6-94-75/Kodiak, LAPAZ	PTO	4/5	2/4	4/5	2/3	<i>Ur-3</i>	b	a	a	a	a	a	One evaluation in greenhouse indicated all plants had <i>Ur-3</i> . Molecular marker confirmed presence of <i>Ur-3</i>
13	CELRK	LRK	4,5/5	4,5/4	4,5/4	4,5/4	no gene	a	a	a	a	a	a	One evaluation in greenhouse and molecular markers indicated absence of rust resistance genes
14	Adams	BLK	4,5/5	4,5/4	4,5/4	4,5/4	No RR gene	a	a	-	a	a	a	One evaluation in greenhouse and molecular markers indicated absence of rust resistance (RR) genes
15	Eclipse	BLK	4,5/4	4,5/4	4,5/4	4,5/4	No RR gene	a	a	a	a	a	a	2 Evaluations in greenhouse indicated that some plants had <i>Ur-3</i> and other plants did not have a RR gene
15	Eclipse	BLK	4,5/5	2/3	4,5/4	2/4	<i>Ur-3</i>	b	a	a	a	a	a	Molecular marker confirmed presence of <i>Ur-3</i> in some plants.

2021 CDBN Notes

2021 Dry Bean Performance Evaluation at Powell, WY

Mike Moore, and Kyle Webber, Wyoming Seed Certification Service; Jim Heitholt and Samuel George, Powell Research and Extension Center

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, and with funding from the Wyoming Bean Commission, a wide range of germplasm is evaluated each year, assisting producers in selecting varieties best suited for Wyoming soils and climate.

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 1 pint of Outlook applied on May 6. The plots received 80 units of N, 130 units of P, 80 units of K, 70 units of sulfate, and 8 units of zinc per acre on May 6. The plots were planted on May 28 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 May 14, June 11, July 4, July 13, July 21 and August 15. 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 those plants 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 excellent soil and weather conditions. The growing season had no days over 100 degrees, but was consistently in the mid to upper 90's, with warm nights, leading to the earliest trial harvest in the last 20 years. Flowering, maturity, seed size, and yield data are presented in Table 1 on page 2.

GN16-17-3, NE1-20-19, and NE1-20-2 lines had highly variable seed size and shape, and may have been a market class mixture. With no other white bean market classes in the trial, it is likely a seed stock issue.

Acknowledgements

This nursery was possible only with significant assistance of the Powell R & E Center assistant farm managers Brad May and Keith Schaefer.

CDBN trial planted at Hatton, ND

The trial at Hatton, ND was affected by a Dicamba drift.

CDBN trial planted at UC Davis, CA

The 2021 Cooperative Dry Bean Nursery (CDBN) included 12 entries and 3 checks [California Early Light Red Kidney (CELRK), Othello, and Eclipse] in 2021. Most of the 2021 entries were submitted by Phil Miklas at USDA-ARS in Pullman, WA, or Carlos Urrea at the University of Nebraska (Scottsbluff, NE), and were predominantly pinto and great northern market classes. Adams, a black bean variety released by Jim Kelly at Michigan State University in 2021, was also included in the trial.

The CDBN was planted to a dry worked field at UC Davis Agronomy Field Facility on June 14, and was irrigated for germination using surface drip starting June 15. Once the stand was established, the surface drip was removed and the plots were irrigated using sub-surface drip for the remainder of the season. The average stand count on June 30 was 81% for the CDBN using this method, but this moderate germination rate also reflects crows pulling up and killing emerging seedlings from many plots. This was particularly a problem with this planting in 2021, and less so with the earlier-planted projects at UC Davis. Plots were cut and windrowed in the last week of September and threshed with a belt thresher the week of October 11.
