MICHIGAN DRY BEAN PERFORMANCE TRIALS

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Michigan Dry Bean Performance Trials 2022

Contents

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Introduction

In 2022, Michigan State University researchers and Michigan dry bean producers tested 161 lines from 12 market classes of dry beans. The trial plots (Table 1) were placed in six locations across five Michigan counties: Bay, Huron, Montcalm, Sanilac, and Tuscola (two sites).

Small- and medium-seeded beans were tested in Bay, Huron, Sanilac, and Tuscola counties. Large-seeded beans were tested in Montcalm County and at the Saginaw Valley Research and Extension Center (SVREC) in Tuscola County.

This report summarizes the results of the trials. Please contact Scott Bales (phone 989-262-8550, ext. 2; email balessco@msu.edu) with questions about the 2022 performance trials and suggestions for the 2023 trials.

Table 1. 2022 research trial conditions: The locations, grower co-operators, planting dates, nitrogen application rates and methods, total accumulated growing degree days (GDD), and total precipitation.

County	Co-operator	Planting Date	Nitrogen Rate *(Lbs./A)*	Nitrogen Application Method	Total GDD [a]	Total Precipitation *(Inches)*
Bay	Schindler Farms	June 15	50	Broadcast	1,847	11.37”
Huron	Richmond Brothers	June 8	50	2x2	1,868	5.37”
Montcalm	Rader Farms	June 10	60	Broadcast + 2x2	1,935	13.50 + irrigation
Sanilac	Stoutenburg Farms	June 3	50	Broadcast + 2x2	1,998	8.00”
Tuscola (kidney beans)	Saginaw Valley Research and Extension Center	May 31	40	Broadcast	1,960	7.57”
Tuscola (small & medium seed)	Rayl Farms	June 2	50	2x2	2,108	9.52”

Note. Weather data was retrieved from on-site weather systems reporting to LOCOMOS (Low-Cost Monitoring System) stations. All weather data is from the day of planting to harvest.

[a]Growing degree days (GDD) were calculated using the following equation: $([\mathrm{MAX} + \mathrm{MIN}] \div 2) - 50 = \mathrm{GDD}$

Methods

Dry beans were seeded in four-row plots that measured 6.6′ wide by 20′ long, with 20″ rows. Each entry was replicated four times. All trial plots were designed as randomized complete blocks (RCB). (RCB is a standard agricultural trial design in which entries are randomly assigned to groups or blocks, and the blocks are randomly repeated. The goal of the replication is to control for variables that might affect an entry’s yield, such as soil nutrient levels, pest loads, and variability in soil textures.)

Trials received industry standard seed treatments, fertilization, and weed control applications at labeled rates. White mold fungicides were not applied to any location. The absence of fungicide allowed the evaluation of each entry’s natural tolerance for or avoidance of white mold.

Yield data was obtained by direct harvest for small- and medium-seeded beans. Large-seeded beans were pulled by a two-row Pickett bean puller and then mechanically threshed to prevent harvest loss. Following harvest, samples were cleaned, weighed, and moisture tested.

Table 2. Soil test information from the six 2022 performance trial locations, including the percentage of organic matter, soil type, and soil pH. All macro- and micronutrients were sufficient for dry bean production.

Location	Percentage of Organic Matter	Soil Type	Soil pH
Bay	2.3	Loam	7.3
Huron	2.2	Loam	7.6
Montcalm	1.6	Loamy Sand	6.3
Sanilac	3.5	Loam	7.2
Tuscola (Kidney beans)	2.5	Clay Loam	7.7
Tuscola (Small and medium seed)	2.5	Sandy Loam	7.1

Results

Tables 3 through 12 provide agronomic information such as plant maturity, flowering date, height, lodging, and white mold tolerance. Plant maturity and flowering are rated visually in days after planting (DAP) for all locations. Lodging is rated on a scale of 1 to 5, with 1 indicating that the entry was completely erect in the field at harvest and 5 indicating that it was flat on the ground with stems and pods touching the soil surface. The percentage of white mold infection on each replication was calculated in Bay, Tuscola, and Montcalm counties:

$$(\text{number of infected plants} \div \text{total plants per stand}) \times 100 = \text{percentage of infection}$$

The tables also present each entry's yield results in pounds per acre (Lbs./A) adjusted to 18% moisture.

The combined average yield for each entry across all sites in 2022 is also included. (**Note:** If an entry was grown under different production systems [irrigated versus dry land] at different sites, the combined yield was not calculated.) When possible, two- and three-year average yields were also calculated across locations. For example, the three-year average yield of a navy bean entry (Table 3) includes data from 2020, 2021, and 2022 at four locations per year (12 site-years).

The last three rows of the agronomic and yield results tables list the trial average (mean), least significant difference (LSD), and coefficient of variation (CV), respectively, for the data in each column.

The entry with the **highest** value in each yield column is followed by two asterisks (**). Any yields listed in the same column that are not significantly different from the highest yield are noted with one asterisk. Conversely, the entry with the **lowest** white mold infection percentage is also noted with two asterisks, and any entries in that column that are not significantly different from the lowest infection percentage are marked with one asterisk. This means that if two entries in the same column are followed by either one or two asterisks, the difference in values between the entries is not statistically significant.

Table 3. Navy bean agronomic and yield results.

ENTRY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lbs./A)	Huron (Lbs./A)	Sanilac (Lbs./A)	Tuscola (Lbs./A)	1-year avg. (Lbs./A)	2-year avg. (Lbs./A)	3-year avg. (Lbs./A)
12039	102	48	18.0	3.0	54*	3,483*	2,870*	3,795*	2,570	3,224	3,303	3,166
14075	101	47	18.7	2.8	61*	3,231*	2,845*	3,193	2,519	2,947	NA [a]	NA
14078	101	46	20.0	2.0	73	3,515*	2,771*	2,585	3,370**	3,061	3,124	NA
14084	101	45	20.0	3.3	55*	3,238*	2,321	3,458	2,455	2,868	3,039	3,088
16113	99	46	22.0	1.3	64	3,145	2,325	2,677	3,346*	2,873	NA	NA
213SP	99	45	17.0	3.3	76	2,918	2,465	2,985	2,643	2,753	NA	NA
Argosy	99	45	19.3	3.3	45*	3,142	2,337	2,640	2,687*	2,708	3,076	2,934
Armada (13068)	99	46	18.7	2.3	54*	2,779	2,767*	2,754	3,050*	2,838	3,109	3,026
Blizzard	98	46	21.3	2.0	66	3,324*	2,704	2,335	2,303	2,667	3,101	3,107
EX1802-N	96	46	16.0	1.0	73	2,848	1,888	2,013	2,296	2,172	2,369	2,447
EX1803-N	92	47	19.0	1.0	57*	2,338	1,961	1,968	2,677	2,236	2,359	2,525
EX1804-N	99	46	18.7	1.8	62*	2,706	1,918	2,147	2,343	2,193	2,749	2,577
EX1914-N	98	45	18.7	1.8	57*	2,646	2,130	2,327	2,062	2,291	NA	NA
EX2109-N	97	46	18.0	2.5	75	2,811	2,275	2,028	2,373	2,371	NA	NA
HMS Bounty (12047)	100	46	19.3	1.5	43**	3,270*	3,111*	3,780*	2,864*	3,256*	3,435*	3,355*
HMS Medalist	101	47	20.3	2.5	48*	3,539*	2,683	3,778*	2,831*	3,208	3,310	3,282
Liberty (15095)	101	48	19.3	2.5	53*	3,638**	3,159*	4,599**	3,040*	3,609**	3,611**	3,509**
Merlin	103	46	18.0	3.5	49*	2,500	2,346	2,005	1,956	2,133	2,553	2,574
N18103	97	47	18.7	1.8	76	2,984	2,406	2,949	2,709*	2,695	3,102	2,901
N19246	97	48	19.3	1.8	58*	3,078	2,962*	3,249	3,105*	3,098	3,354	NA
N20388	98	47	18.7	2.0	75	3,023	3,079*	2,818	2,554	2,869	3,058	NA
N20395	98	45	19.3	2.0	79	3,093	2,877*	3,433	3,330*	3,184	NA	NA
N20404	97	46	16.5	1.0	73	2,827	2,238	2,929	2,341	2,563	3,101	NA
N21511	99	47	16.0	2.0	76	2,755	2,570	2,680	3,022*	2,757	NA	NA
N21525	98	47	21.0	1.0	73	2,893	3,179**	2,488	2,662	2,805	NA	NA
Nautica	98	47	18.5	1.7	69	2,802	2,760*	2,557	2,637	2,689	3,074	2,974
ND Polar	100	48	21.0	1.0	56*	2,986	2,564	3,486	2,255	2,822	NA	NA
Rogue	99	47	16.0	4.3	72	2,993	2,555	2,772	2,126	2,611	3,090	NA
SV1893GH	101	47	20.0	2.3	55*	3,132	2,580	2,179	3,054*	2,736	3,221	3,048
T9905	100	47	19.0	3.3	49*	2,223	2,262	2,714	2,592	2,445	NA	NA
Valiant (08077)	98	46	19.0	1.7	59*	2,676	2,360	3,751*	3,180*	2,947	2,984	2,992
Victory (15094)	99	45	19.5	1.7	71	3,226*	2,581	2,444	2,796*	2,762	3,186	3,137
Vigilant	95	46	20.0	1.0	57*	3,229*	2,966*	2,637	2,973*	3,017	3,061	2,962
MEAN:	99	46	18.9	1.7	62	2,999	2,570	2,853	2,688	2,769	3,059	2,978
LSD$_{(0.05)}$:	*NA*	*NA*	*NA*	*NA*	19	465	471	880	690	378	234	192
CV:	*NA*	*NA*	*NA*	*NA*	37.6%	13.2%	15.6%	26.6%	21.6%	23.2%	18.5%	19.2%

"*Note*. The **highest** yield in each yield column and the **lowest** infection percentage in the white mold infection column are marked with two asterisks. Any values in a column that are not statistically different from the column's two-asterisk entry are marked with one asterisk."

[a] NA = Not available.

Table 4. Black bean agronomic and yield results.

ENTRY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lbs./A)	Huron (Lbs./A)	Sanilac (Lbs./A)	Tuscola (Lbs./A)	1-year avg. (Lbs./A)	2-year avg. (Lbs./A)	3-year avg. (Lbs./A)
15619	102	47	19.6	2.5	53	3,444	3,318*	4,379*	2,325	3,367	3,314	3,367
16590	102	46	20.0	2.0	33*	3,467	2,801	3,881	3,273*	3,356	3,515*	3,390
16598	100	45	18.3	3.3	80	3,496	3,123	4,134*	3,194*	3,487	NA[a]	NA
16648	101	47	20.0	2.3	76	3,631*	2,765	4,044*	3,077*	3,380	3,469	3,363
17715	100	47	21.3	2.5	76	3,200	2,625	3,860	3,182*	3,217	3,416	3,315
17751	101	46	20.0	2.3	75	3,664*	3,195*	4,549**	3,721**	3,782*	3,756**	3,672*
Adams	101	46	19.0	2.8	46	3,707*	2,834	3,659	2,635	3,209	3,536*	3,531*
B18094173	99	47	17.6	1.8	43	3,585*	2,912	4,184*	3,265*	3,487	NA	NA
B19309	100	45	19.3	2.0	73	3,809*	2,820	4,039*	3,048*	3,429	3,598*	NA
B19344	101	45	19.6	2.0	74	3,574*	3,022	3,847	3,068*	3,378	3,603*	3,492
B20536	101	46	18.6	1.5	39*	3,500	3,378*	3,354	3,546*	3,445	NA	NA
B20547	100	45	19.3	1.0	24*	3,417	2,809	3,521	2,404	3,038	3,387	NA
B20591	100	44	18.0	1.3	21**	3,089	2,801	3,458	2,899	3,062	3,570*	NA
B20599	100	47	20.0	2.3	60	3,471	3,049	4,234*	3,245*	3,500	NA	NA
B21708	100	46	18.0	2.5	78	3,411	2,517	3,482	3,570*	3,245	NA	NA
B21710	101	45	18.3	1.8	63	3,568*	3,320*	3,857	3,331*	3,519*	NA	NA
B21714	99	46	20.3	1.0	36*	3,689*	3,235*	3,543	2,499	3,242	NA	NA
B3033350	94	44	18.0	1.5	61	3,238	2,246	2,308	2,295	2,522	NA	NA
B3035411	96	45	18.6	2.3	56	3,506	3,068	3,751	3,513*	3,460	NA	NA
B3036381	97	45	19.3	2.5	80	2,860	2,823	3,511	2,744	2,984	3,146	3,117
B5058320	97	44	16.6	2.0	64	3,216	2,987	3,235	2,090	2,882	NA	NA
B7071259	94	45	18.6	1.3	52	3,862*	3,402*	4,016*	2,802	3,520*	NA	NA
B7072269	95	45	19.0	1.8	63	3,664*	2,967	4,082*	3,047*	3,440	NA	NA
BL1726-2	97	47	17.0	2.0	43	3,301	2,767	3,225	1,874	2,792	3,222	NA
Black Bear	102	46	18.0	2.0	41*	3,814*	3,331*	3,940	3,705*	3,697*	3,425	3,358
Black Tails	102	44	19.0	1.3	69	3,072	2,857	3,287	3,508*	3,181	3,177	3,160
BlackBeard (14506)	101	46	22.0	2.0	67	3,107	3,329*	4,186*	2,237	3,215	3,395	3,449
ND Twilight	95	46	17.0	2.7	99	2,359	1,842	2,171	1,826	2,049	2,592	2,529
Nimbus (14500)	101	47	19.5	1.7	61	4,071**	3,655**	4,401*	3,468*	3,899**	3,693*	3,738**
OAC Vortex	99	46	20.0	1.7	66	3,317	3,009	3,803	2,779	3,227	NA	NA
Spectre (14497)	102	48	19.0	2.3	24*	3,345	3,225*	3,976	3,000*	3,387	3,394	3,460
Zenith	100	46	17.0	1.0	25*	3,374	3,243*	4,106*	3,068*	3,448	3,557*	3,414
Zorro	99	47	19.0	1.0	51	2,969	2,892	3,378	3,071*	3,078	3,246	3,182
MEAN:	99	46	18.9	1.9	57	3,418	2974	3,739	2,948	3,270	3,400	3,346
LSD$_{(0.05)}$:	NA	NA	NA	NA	20	561	467	571	721	372	243	187
CV:	NA	NA	NA	NA	34%	13.9%	13.3%	13.0%	20.8%	19.5%	17.3%	16.6%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk.

[a] NA = Not available.

Table 5. Small red and pink bean agronomic and yield results.

ENTRY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lbs./A)	Huron (Lbs./A)	Sanilac (Lbs./A)	Tuscola (Lbs./A)	1-year avg. (Lbs./A)	2-year avg. (Lbs./A)	3-year avg. (Lbs./A)
16686	97	47	16.0	3.5	84	2,998	2,499	3,437	2,870*	2,951	3,249*	3,096
17822	97	47	16.0	3.5	77	3,374	3,515*	4,083*	3,327*	3,574*	NA [a]	NA
17837	98	46	12.7	1.8	93	2,885	3,236*	2,715	1,914	2,688	3,000	2,917
17875	99	45	13.7	3.2	93	2,818	3,102*	3,975*	2,359	3,064	3,251*	NA
19837	96	46	15.0	2.2	73	3,252	2,960	3,713	3,038*	3,241	NA	NA
Coral	100	46	14.5	2.2	48**	2,711	2,985	3,107	3,055*	2,965	3,012	2,829
R20627	100	46	15.3	2.0	51*	2,538	2,459	2,749	2,597	2,577	3,036	NA
R20667	100	47	15.5	1.7	74	2,801	3,117*	2,839	2,894*	2,913	3,199*	NA
R20669	101	45	14.5	2.8	71	3,900**	3,618**	4,407*	3,393**	3,829**	NA	NA
Rosetta	99	46	14.5	2.5	86	3,117	2,656	2,680	2,946*	2,837	3,060	NA
Ruby	99	46	13.0	4.0	77	3,138	2,909	3,999*	2,226	3,068	3,947	2,857
Viper	100	46	15.7	2.8	85	3,739*	3,287*	4,547**	3,074*	3,536*	3,421**	3,329**
MEAN:	99	46	14.7	2.6	76	3,105	3,028	3,521	2,808	3,103	3,131	3006
LSD$_{(0.05)}$:	*NA*	*NA*	*NA*	*NA*	16.6	428	562	809	731	396	283	202
CV:	*NA*	*NA*	*NA*	*NA*	26.2%	11.53%	15.5%	19.2%	21.7%	21.6%	21.9%	19.9%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk.

[a] NA = Not available.

Table 6. Pinto bean agronomic and yield results.

ENTRY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lbs./A)	Huron (Lbs./A)	Sanilac (Lbs./A)	Tuscola (Lbs./A)	1-year avg. (Lbs./A)	2-year avg. (Lbs./A)	3-year avg. (Lbs./A)
Bronco (41767-15)	96	45	18.0	3.6	74*	2021	2226	2342	2283	2218	NA[a]	NA
Charro	101	47	22.0	2.3	85*	3,441*	2,882*	4,241**	3,336*	3,621**	3,546**	3,532**
EX1844-P	95	44	16.0	1.3	72*	1,977	1,952	1,543	3,100*	2,189	NA	NA
EX1845-P	96	43	17.0	1.6	79*	2,311	2,090	1,264	2,566	1,911	NA	NA
EX2143-P	98	46	18.0	2.3	68*	2,982	3,021*	2,577	2,867	2,862	NA	NA
EX2146-P	99	46	17.0	2.0	81*	3,004	2,830*	2,562	2,862	2,814	NA	NA
EX2147-P	98	45	16.0	2.6	75*	2,788	2,184	2,501	2,881	2,588	NA	NA
LaPaz	96	48	19.0	3.3	95	2,910	2,982*	3,491	3,038	3,105	3,250	3,268
ND Falcon	100	47	20.0	2.0	75*	2,921	3,073**	3,011	3,019	3,006	2,806	2,839
ND Palomino	98	44	15.0	4.0	77*	2,828	2,044	2,020	2,610	2,375	2,806	2,846
P19103	102	46	21.5	3.6	63**	3,420*	2,660	3,850*	2,679	3,152	3,538*	3,468*
P19713	98	47	22.5	2.6	83*	3,635**	2,801*	3,485	3,626**	3,488*	3,485*	NA
SV6139GR	96	43	18.0	2.0	88	2,824	2,924*	2,268	2,805	2,705	3,211	3,168
Windbreaker	97	45	14.0	3.6	93	1,858	2,103	1,555	2,665	1,960	2,355	3,440
MEAN:	98	45	18.1	2.6	79	2,780	2,555	2,622	2,881	2,714	3,125	3,080
LSD$_{(0.05)}$:	NA	NA	NA	NA	23.9	520	619	622	544	370	270	204
CV:	NA	NA	NA	NA	25.5%	15.7%	20.3%	19.9%	15.8%	23.1%	20.9%	19.7%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk.

[a] NA = Not available.

Table 7. Great northern bean agronomic and yield results.

ENTRY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lbs./A)	Huron (Lbs./A)	Sanilac (Lbs./A)	Tuscola (Lbs./A)	1-year avg. (Lbs./A)	2-year avg. (Lbs./A)	3-year avg. (Lbs./A)
Aries	95	43	15.0	3.3	79	2,140	2,436	2,499	2,730*	2,391	2,466	2,392
Eiger	99	45	20.0	2.0	59**	2,733*	3,071*	3,710*	3,318**	3,208*	3,277	3,321*
G19613	99	44	20.0	2.3	63*	3,023*	3,021*	3,881*	3,300*	3,306*	3,455*	NA [a]
G21811	98	46	18.0	1.6	63*	3,157**	3,172*	3,396*	3,247*	3,352*	NA	NA
ND Pegasus	100	46	22.0	2.3	69*	2,970*	3,395**	4,027**	2,609*	3,477**	3,586**	3,448**
Powderhorn	93	44	16.0	3.0	72*	2,662	2,911	2,774	2,716*	2,688	2,809	2,730
MEAN:	97	45	18.5	2.4	67	2,781	3,001	3,381	2,987	3,070	3,118	2,973
LSD$_{(0.05)}$:	NA	NA	NA	NA	19.8	706	475	685	783	341	235	215
CV:	NA	NA	NA	NA	34.8%	20.2%	12.6%	16.3%	21.0%	18.7%	18.2%	21.4%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk.

[a] NA = Not available.

Table 8. Cranberry bean agronomic and yield results.

ENTRY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Montcalm (Lbs./A)	Tuscola (Lbs./A)	Irrigated 2-year avg. (Lbs./A)	Irrigated 3-year avg. (Lbs./A)	Dry Land 2-year avg. (Lbs./A)	Dry Land 3-year avg. (Lbs./A)
16756	92	38	17.0	2.8	68	2,442	1,726*	2,961	2,783	1,922	1,991
16758	90	37	14.0	2.0	73	2,608	1,298	3,119	3,003	1,747	1,826
16775	99	40	22.0	1.8	41*	2,601	1,428	2,811	2,771	1,728	1,927
16816	82	34	14.0	3.8	97	2,664	1,627	3,085	3,038	1,787	2,013
151093	98	37	16.0	2.5	74	3,225*	1,910*	3,543*	3,340*	2,359*	2,476*
AAC Scotty	96	38	16.0	1.5	57*	2,620	2,158*	2,754	NA [a]	2,298*	NA
Amaranto (SV3709GC)	87	35	16.0	2.5	71	3,030*	2,079*	3,179*	3,074	1,985	2,071
CR1801-2-2	91	38	22.0	1.8	50*	2,731	1,811*	NA	NA	NA	NA
Etna	91	35	16.0	2.5	83	3,006*	1,525	3,580**	3,454**	1,937	2,103
Firestripe	99	38	19.0	2.0	62*	3,299**	1,705	NA	NA	NA	NA
Jester (151085)	100	36	19.0	3.3	78	2,833*	2,126*	3,142	3,076	2,505**	2,554**
Navabi	96	34	20.0	2.0	38**	3,273*	2,219**	NA	NA	NA	NA
Vero	88	37	16.0	3.0	85	3,109*	2,113*	3,390*	3,214*	2,102	2,078
MEAN:	93	37	17.4	2.4	67	2,880	1,786	3,156	3,084	2,037	2,115
LSD$_{(0.05)}$:	NA	NA	NA	NA	26	561	504	396	289	319	283
CV:	NA	NA	NA	NA	32.3%	16.3%	23.6%	15.0%	13.8%	18.7%	18.0%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk.

[a] NA = Not available.

Table 9. Light red kidney bean agronomic and yield results.

ENTRY	Maturity *(DAP)*	Flowering *(DAP)*	Plant Height *(Inches)*	Lodging *(1-5)*	White Mold Infection *(%)*	Montcalm *(Lbs./A)*	Tuscola *(Lbs./A)*	Irrigated 2-year avg. *(Lbs./A)*	Irrigated 3-year avg. *(Lbs./A)*	Dry Land 2-year avg. *(Lbs./A)*	Dry Land 3-year avg. *(Lbs./A)*
11413	91	35	18.0	1.8	56	3,641*	1,568	3,708*	NA [a]	1,972	*NA*
15916	89	36	14.0	2.5	74	3,445	1,874*	3,590	*NA*	2,310	*NA*
15923	95	34	17.0	2.3	69	3,829*	1,573	3,964**	*NA*	1,953	*NA*
16998	98	36	20.0	1.8	65	3,294	1,557	3,654*	*NA*	2,058	*NA*
161082	91	37	16.0	1.8	65	3,957**	1,686	3,861*	*NA*	2,057	*NA*
Big Red	91	35	18.0	2.8	88	3,244	1,793	3,495	3,486**	2,272	2,245*
California Early	87	34	16.0	1.8	86	3,628*	1,418	3,469	3,434*	1,709	1,771
Clouseau	100	36	18.0	3.0	74	3,356	1,816	3,497	3,266*	2,091	2,100
K20743	100	37	16.0	2.0	76	3,429	1,808	3,779*	*NA*	2,509*	*NA*
K20745	99	37	16.0	2.0	68	3,466	2,005*	*NA*	*NA*	*NA*	*NA*
L1032326	100	38	18.0	2.0	63	3,060	2,016*	*NA*	*NA*	*NA*	*NA*
Pink Panther	98	35	20.0	2.5	74	3,237	1,564	3,423	3,371*	1,964	2,057
PO76D1	100	36	20.0	2.0	31*	3,649*	2,194*	*NA*	*NA*	*NA*	*NA*
Red Dawn (09363)	87	34	14.0	2.0	77	3,426	1,417	3,365	3,393*	2,081	2,127
Ronnie's Red	105	35	20.0	1.8	28**	3,595*	2,206**	2,943	2,552	2,643**	2,582**
MEAN:	95	36	17.4	2.1	66	3,428	1,766	3,562	3,250	2,135	2,147
LSD$_{(0.05)}$:	*NA*	*NA*	*NA*	*NA*	17	428	341	367	355	299	368
CV:	*NA*	*NA*	*NA*	*NA*	22.6%	10.3%	16.2%	12.3%	16.0%	16.8%	22.8%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk.

[a] NA = Not available.

Table 10. Dark red kidney bean agronomic and yield results.

ENTRY	Maturity *(DAP)*	Flowering *(DAP)*	Plant Height *(Inches)*	Lodging *(1-5)*	White Mold Infection *(%)*	Montcalm *(Lbs./A)*	Tuscola *(Lbs./A)*	Irrigated 2-year avg. *(Lbs./A)*	Irrigated 3-year avg. *(Lbs./A)*	Dry Land 2-year avg. *(Lbs./A)*	Dry Land 3-year avg. *(Lbs./A)*
15977	100	37	16.0	2.3	86	2,813	1,608	3,022	3,001	2,204	2,231
15978	103	42	20.0	2.3	81	2,649	2,010	2,129	2,315	2,135	2,226
151011	97	36	16.0	2.5	81	2,810	1,922	3,359*	3,302*	2,242	2,232
161156	90	34	20.0	3.0	81	3,111	1,907	3,593*	3,423*	2,277	2,369
161164	100	38	18.0	3.3	84	3,365*	1,902	3,433*	3,217*	2,153	2,271
181017	101	37	22.0	3.5	85	3,662**	1,778	3,762**	3,373*	2,340	2,247
181020	92	35	18.0	2.3	88	3,436*	1,506	3,033	NA[a]	1,761	*NA*
181021	87	36	22.0	2.5	88	3,455*	1,736	3,186	*NA*	2,076	*NA*
D1034333	98	38	20.0	2.8	70	2,766	1,679	*NA*	*NA*	*NA*	*NA*
Dynasty	100	37	22.0	2.8	75	3,522*	2,504**	3,748*	3,485**	2,746**	2,713**
Epic	104	37	20.0	2.8	68*	3,525*	2,235*	3,474*	3,224*	2,360	2,364
Gallantry	100	38	18.0	2.0	50**	3,204	2,006	3,479*	*NA*	2,338	*NA*
K20217	100	34	20.0	1.8	74	2,716	1,609	*NA*	*NA*	*NA*	*NA*
K20221	98	38	20.0	1.5	52*	2,722	1,785	*NA*	*NA*	*NA*	*NA*
Montcalm	102	36	18.0	2.3	62*	3,050	1,690	2,901	2,844	2,178	2,211
Rampart (09434)	97	36	18.0	1.5	67*	3,163	1,667	3,384*	3,135*	2,208	2,271
Red Hawk	101	35	22.0	2.3	65*	3,267	1,669	3,261*	3,155*	1,624	1,705
Red Rover	98	34	16.0	2.0	67*	2,933	1,715	2,905	2,915	2,134	2,163
MEAN:	98	37	19.2	2.4	73	3,120	1,845	3,244	3,116	2,185	2,250
LSD$_{(0.05)}$:	*NA*	*NA*	*NA*	*NA*	19	342	392	519	382	358	319
CV:	*NA*	*NA*	*NA*	*NA*	21.9%	9.2%	17.9%	19.2%	18.1%	19.7%	19.1%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk.

[a] NA = Not available.

Table 11. White kidney bean agronomic and yield results.

ENTRY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Montcalm (Lbs./A)	Tuscola (Lbs./A)	Irrigated 2-year avg. (Lbs./A)	Irrigated 3-year avg. (Lbs./A)	Dry Land 2-year avg. (Lbs./A)	Dry Land 3-year avg. (Lbs./A)
Beluga	102	38	20.0	1.7	9	2,891	1,502	2,670	2,563	2,116	2,145
Denali	97	34	19.0	1.7	34	3,549*	1,651	3,529**	3,535**	2,279	2,238
K19830	102	35	17.0	2.8	26	3,749*	1,922*	3,496*	3,310*	2,640*	2,619**
K19831	101	37	22.0	1.5	24	3,568*	2,077*	3,171*	*NA*	2,665**	*NA*
K19832	100	39	19.0	2.5	27	3,667*	1,701	*NA*[a]	*NA*	*NA*	*NA*
ND Whitetail	100	38	17.0	2.7	40	3,023	2,141**	3,052	2,992	2,538*	2,416
Snowdon	94	45	18.0	1.2	55	3,303	1,376	3,344*	*NA*	1,889	*NA*
Snowshoe	105	40	20.0	2.5	56	3,806**	1,774	*NA*	*NA*	*NA*	*NA*
WK1601-1	94	38	17.0	2.0	56	3,403*	1,602	*NA*	*NA*	*NA*	*NA*
Yeti	104	41	20.0	2.2	32	3,032	2,018*	3,034	2,715	2,467*	2,367
MEAN:	100	39	19.0	1.4	35	3,399	1,776	3,185	3,023	2,371	2,357
LSD$_{(0.05)}$:	*NA*	*NA*	*NA*	*NA*	*NA*	459	332	432	290	208	195
CV:	*NA*	*NA*	*NA*	*NA*	*NA*	11.1%	15.4%	16.1%	13.9%	10.4%	10.9%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk.

[a] NA = Not available.

Table 12. Mayocoba/yellow bean agronomic and yield results.

ENTRY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Montcalm (Lbs./A)	Tuscola (Lbs./A)	Irrigated 2-year avg. (Lbs./A)	Irrigated 3-year avg. (Lbs./A)	Dry Land 2-year avg. (Lbs./A)	Dry Land 3-year avg. (Lbs./A)
Claim Jumper (13655)	106	34	20	4.2	90*	2,395	2,181*	2,757	2,623	2,602**	2,423**
Motherlode (191274)	102	42	20	3.5	89*	1,889	1,791	1,893	*NA*[a]	2,118	*NA*
Y1608-14	90	40	20	4.0	98	2,546	1,899	2,736	2,677	1,897	1,984
Y1702-22	92	35	22	3.0	70**	3,309**	1,626	3,226**	2,981**	1,975	2,091*
Y1960-1-1	93	35	20	4.5	76*	1,427	2,385**	*NA*	*NA*	*NA*	*NA*
Y19810	105	40	24	2.8	71*	2,751	2,162*	*NA*	*NA*	*NA*	*NA*
Yellowstone	92	39	28	4.5	93*	2,510	1,578	2,714	2,756*	2,205	2,194*
MEAN:	97	38	21	3.7	84	2,404	1,945	2,554	2,743	2,159	2,173
LSD$_{(0.05)}$:	*NA*	*NA*	*NA*	*NA*	24	395	345	295	255	304	345
CV:	*NA*	*NA*	*NA*	*NA*	23.5%	13.4%	14.3%	13.6%	13.4%	16.5%	22.1%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk.

[a] NA = Not available.

2022 Sourcing Information

Table 13. Sources of dry bean entries tested in the 2022 performance trials, organized by market class.

Entry ID	Market Class	Source
15619	BL	ProVita
16590	BL	ProVita
16598	BL	ProVita
16648	BL	ProVita
17715	BL	ProVita
17751	BL	ProVita
Adams	BL	MSU [a]
B18094173	BL	ADM [b]
B19309	BL	MSU
B19344	BL	MSU
B20536	BL	MSU
B20547	BL	MSU
B20591	BL	MSU
B20599	BL	MSU
B21708	BL	MSU
B21710	BL	MSU
B21714	BL	MSU
B3033350	BL	ADM
B3035411	BL	ADM
B3036381	BL	ADM
B5058320	BL	ADM
B7071259	BL	ADM
B7072269	BL	ADM
BL1726-2	BL	USDA
Black Bear	BL	ProVita
Black Tails	BL	ProVita
BlackBeard (14506)	BL	ProVita
ND Twilight	BL	NDSU [c]
Nimbus (14500)	BL	ProVita
OAC Vortex	BL	University of Guelph
Spectre (14497)	BL	ProVita
Zenith	BL	MSU
Zorro	BL	MSU
151093	CR	ProVita
16756	CR	ProVita
16758	CR	ProVita
16760	CR	ProVita
16775	CR	ProVita
16816	CR	ProVita
AAC Scotty	CR	Meridian Seeds
Amaranto (SV3709GC)	CR	Bayer
CR1801-2-2	CR	USDA
Etna	CR	Bayer
Firestripe	CR	TVS [d]
Jester (151085)	CR	ProVita
Navabi	CR	TVS
Vero	CR	ADM
151011	DRK	ProVita
15977	DRK	ProVita
15978	DRK	ProVita
161156	DRK	ProVita
161164	DRK	ProVita
181017	DRK	ProVita
181020	DRK	ProVita
181021	DRK	ProVita
D1034333	DRK	ADM
Dynasty	DRK	Hensall Co-op
Epic	DRK	ProVita
Gallantry	DRK	Hensall Co-op
K20217	DRK	MSU
K20221	DRK	MSU
Montcalm	DRK	MSU
Rampart (09434)	DRK	ProVita
Red Hawk	DRK	MSU
Red Rover	DRK	Bayer
Eiger	GN	MSU
G19613	GN	MSU
G21811	GN	MSU
ND Pegasus	GN	NDSU
Powderhorn	GN	MSU
11413	LRK	ProVita
15916	LRK	ProVita

Entry ID	Market Class	Source
15923	LRK	ProVita
161082	LRK	ProVita
16998	LRK	ProVita
Big Red	LRK	ProVita
California Early	LRK	University of California
Clouseau	LRK	Bayer
K20743	LRK	MSU
K20745	LRK	MSU
L1032326	LRK	ADM
Pink Panther	LRK	Bayer
Red Dawn (09363)	LRK	ProVita
Ronnie's Red	LRK	ProVita
Claim Jumper (13655)	MY	ProVita
Motherlode (191274)	MY	ProVita
Y1608-14	MY	USDA-ARS [e]
Y1702-22	MY	USDA-ARS
Y1960-1-1	MY	USDA
Y19810	MY	MSU
Yellowstone	MY	MSU
12039	NA	ProVita
14075	NA	ProVita
14078	NA	ProVita
14084	NA	ProVita
16113	NA	ProVita
213SP	NA	Gentec
Argosy	NA	Hensall Co-op
Armada (13068)	NA	ProVita
Blizzard	NA	ProVita
EX1802-N	NA	TVS
EX1803-N	NA	TVS
EX1804-N	NA	TVS
EX1914-N	NA	TVS
EX2109-N	NA	TVS
HMS Bounty (12047)	NA	ProVita
HMS Medalist	NA	ProVita
Liberty (15095)	NA	ProVita
Merlin	NA	ProVita
N18103	NA	MSU

Entry ID	Market Class	Source
N19246	NA	MSU
N20388	NA	MSU
N20395	NA	MSU
N20404	NA	MSU
N21511	NA	MSU
N21525	NA	MSU
Nautica	NA	Hensall Co-op
ND Polar	NA	NDSU
Rogue	NA	Hensall Co-op
SV1893GH	NA	Bayer
T9905	NA	TVS
Valiant (08077)	NA	ProVita
Victory (15094)	NA	ProVita
Vigilant	NA	ADM
Bronco (41767-15)	P	TVS
Charro	P	MSU
EX1844-P	P	TVS
EX1845-P	P	TVS
EX2143-P	P	TVS
EX2146-P	P	TVS
EX2147-P	P	TVS
LaPaz	P	ADM
ND Falcon	P	NDSU
ND Palomino	P	NDSU
P19103	P	MSU
P19713	P	MSU
SV6139GR	P	Bayer
Windbreaker	P	Bayer
Coral	PI	MSU
Rosetta	PI	MSU
PO76D1	SO	Gentec
16686	SR	ProVita
17822	SR	ProVita
17837	SR	ProVita
17875	SR	ProVita
19837	SR	ProVita
R20627	SR	MSU
R20667	SR	MSU
R20669	SR	MSU

Entry ID	Market Class	Source
Ruby	SR	ProVita
Viper	SR	ProVita
Beluga	WK	ADM
Denali	WK	MSU
K19830	WK	MSU
K19831	WK	MSU
K19832	WK	MSU
ND Whitetail	WK	NDSU
Snowdon	WK	MSU
Snowshoe	WK	TVS
WK1601-1	WK	USDA
Yeti	WK	Hensall Co-op

Note. Bean entries are listed alphabetically within market classes. BL = black, CR = cranberry, DRK = dark red kidney, GN = great northern, LRK = light red kidney, MY = mayocoba/yellow, NA = navy, P = pinto. PI = pink, SO = soldier, SR = small red, WK = white kidney.

[a] MSU = Michigan State University

[b] ADM = Archer-Daniels-Midland

[c] NDSU = North Dakota State University

[d] TVS = Treasure Valley Seed

[e] USDA-ARS = U.S. Dept. of Agriculture – Agricultural Research Service

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