

MICHIGAN DRY BEAN PERFORMANCE TRIALS

2023



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Michigan Dry Bean Performance Trials 2023

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Introduction

In 2023, Michigan State University researchers and Michigan dry bean producers tested 150 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 fields).

Small- and medium-seeded beans were tested in Bay, Huron, Sanilac, and Tuscola counties. Large-seeded beans were tested in Montcalm and Tuscola counties.

This report summarizes the results of the trials. Please contact Scott Bales (phone 989-262-8550, extension 2; email balessco@msu.edu) with questions about the 2023 performance trials and suggestions for the 2024 trials.

Table 1. 2023 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	Spartan Acres	May 24	45	2x2	1,913	13.6"
Huron	Gruehn Farms	June 1	60	Broadcast	1,791	13.2"
Montcalm	Waldron Farms	May 31	85	2x2 followed by topdress	1,823	15.6" + irrigation
Sanilac	Shaw Farms	May 31	60	Broadcast	1,816	9.6"
Tuscola	Saginaw Valley Research and Extension Center (two fields)	June 2	45	Broadcast	1,870	13.8"

Note. Weather data was retrieved from the nearest Michigan Automated Weather Network (MAWN) and the MSU Enviroweather station nearest to the trial. All weather data is from the day of planting to harvest.

^aGrowing degree days (GDD) were calculated using the following equation: $[(MAX + MIN) \div 2] - 50 = GDD$

Methods

Dry beans were seeded in four-row plots that measured 6.6' wide by 24' 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 [Table 2], pest loads, and variability in soil textures.)

Trials received industry standard seed treatments, fertilization, and weed control applications at labeled rates. 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 2023 performance trial locations, including the percentage of organic matter, soil type, soil pH, and soil cation exchange capacity (CEC). All macro- and micronutrients were sufficient for dry bean production.

Location	Percentage of Organic Matter	Soil Type	Soil pH	Soil CEC
Bay	2.4	Sandy Clay Loam	7.0	11.2
Huron	4.8	Sandy Loam	7.5	19.0
Montcalm	1.9	Sandy Loam	6.7	5.3
Sanilac	4.6	Sandy Clay Loam	7.8	18.6
Tuscola	3.3	Clay	7.1	19.3



Results

Tables 3 through 12 provide agronomic information such as plant maturity, height, lodging, and white mold tolerance. Plant maturity is 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 Huron County due to sufficient disease pressure:

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

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 2023 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 2021, 2022, and 2023 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 13 lists the sources of the dry bean varieties tested in 2023. The entries are organized by bean market class.



Table 3. Navy bean agronomic and yield results.

ENTRY	Maturity (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	101	21	3.8	72	3,538	4,008**	3,320*	2,335	3,357*	3,058	3,112
13057	99	25	3.3	97	3,412	3,407*	2,998	1,714	2,703	NA ^a	NA
14075	99	23	3.3	85	2,778	2,770	2,587	2,934*	2,952*	2,748	NA
14078	102	23	1.8	62*	3,666*	3,315*	3,238*	1,791	2,976*	2,990	2,947
14084	101	22	2.5	84	3,337	3,384*	2,999	1,997	3,079*	2,878	2,873
Argosy	102	22	2.3	73	2,818	3,110*	3,412*	2,344	2,766	2,648	2,839
Armada (13068)	100	19	2.0	80	3,901*	3,569*	2,966	2,553*	3,349*	3,000	3,052
Au Sable (N18103)	97	19	2.8	94	3,373	2,713	2,098	1,849	2,730	2,582	2,821
Blizzard	100	21	2.3	87	3,755*	3,552*	3,817*	2,225	3,361*	2,913	3,045
Charm	102	21	2.3	79	3,507	3,605*	3,138	3,358**	3,340*	NA	NA
EX1802-N	96	18	1.0	93	2,350	2,852	2,344	1,571	2,330	2,214	2,263
EX1803-N	96	19	1.0	64*	2,787	2,006	2,082	1,293	2,199	2,093	2,180
EX2109-N	98	18	2.0	99	2,999	3,302*	1,845	1,546	2,512	2,389	NA
EX2110-N	100	19	1.0	80	2,671	2,640	1,983	1,338	2,479	NA	NA
EX2111-N	99	19	1.3	84	3,194	2,539	2,076	2,057	2,492	NA	NA
HMS Bounty (12047)	101	22	1.8	70*	4,483**	3,290*	3,180	3,229*	3,365*	3,259*	3,296*
HMS Medalist	102	21	3.0	97	3,660*	3,731*	3,487*	2,905*	3,473*	3,227	3,210
Liberty (15095)	102	22	3.3	86	4,114*	3,380*	3,005	3,089*	3,425*	3,364**	3,365**
N19246	97	18	1.8	74	3,155	1,947	2,606	2,426	2,327	2,728	2,903
N20395	100	19	1.0	87	2,914	3,069*	2,554	2,231	2,598	2,873	NA
N21510	100	22	1.8	78	3,297	3,436*	2,844	2,374	2,944*	NA	NA
N21526	98	19	1.0	91	3,263	2,869	2,711	2,151	2,889	NA	NA
N21532	98	22	1.5	55**	3,015	3,485*	2,527	2,373	2,865	NA	NA
N22616	100	22	1.5	68*	3,291	3,412*	3,183	2,229	3,154*	NA	NA
N22630	98	22	1.3	76	2,577	3,163*	2,699	2,003	2,497	NA	NA
Nautica	101	22	1.3	82	3,573	2,557	2,634	3,093*	2,858	2,676	2,866
ND Polar	102	21	2.0	87	3,308	2,145	2,414	1,984	2,232	2,571	NA
OAC Seal	102	18	2.5	66*	3,028	3,280*	2,832	2,689*	2,928*	NA	NA
Rogue	100	19	3.5	92	3,644*	3,255*	3,071	2,636*	3,139*	2,755	2,953
SV1893GH	103	20	4.0	92	3,794*	2,628	2,905	2,594*	3,111*	2,781	3,015
T9905	102	18	4.0	95	3,476	2,655	2,942	2,426	2,881	2,557	NA
Valiant (08077)	99	20	1.5	99	3,537	3,766*	3,247*	2,725*	3,156*	3,029	2,975
Victory (15094)	99	21	2.3	91	3,578	3,935*	3,852**	2,982*	3,477**	3,087	3,148
Vigilant	96	21	1.0	72	3,197	2,798	2,171	2,535*	2,714	2,664	2,767
MEAN:	100	20	2.0	80	3,334	3,126	2,833	2,326	2,928	2,795	2,928
LSD_{(0.05):}	NA	NA	NA	18	599	655	284	924	561	118	142
CV:	NA	NA	NA	19%	15.30%	17.80%	14.10%	19.50%	19.40%	10.00%	14.10%

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)	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	20	4.0	90	2,466	3,450	3,246	2,859*	2,796	2,966	2,990
15655	103	21	3.8	77	2,753	3,708	3,175	3,372*	3,180	NA ^a	NA
16594	102	18	3.3	91	2,544	3,427	2,958	2,595	3,084	NA	NA
16598	102	21	3.8	99	3,223*	4,051	3,373	2,993*	3,305	3,249	NA
17751	101	19	2.3	86	2,651	3,912	3,283	2,516	3,152	3,310*	3,365*
B18094173	100	19	1.5	60	3,023*	4,594*	4,069*	2,928*	3,226	3,382*	NA
B1904-3-1	101	20	1.8	62	3,282*	3,740	3,803*	3,106*	3,571*	NA	NA
B19309	100	18	2.3	69	2,516	3,848	3,584*	2,737*	3,202	3,201	3,304*
B20536	102	20	2.0	46*	2,738	4,648*	3,262	2,405	3,264	3,312*	NA
B20591	100	18	1.5	45*	2,413	4,362*	3,604*	2,854*	3,471	3,032	3,288*
B20599	100	19	2.5	69	2,781	4,780**	3,472	3,278*	3,268	3,363*	NA
B21710	101	16	1.3	73	3,030*	3,672	2,821	3,324*	3,522*	3,037	NA
B22003	101	20	1.3	62	2,852	3,786	3,571*	1,728	2,859	NA	NA
B22041	99	20	2.3	66	3,345*	4,596*	3,189	2,828*	3,768*	NA	NA
B22854	99	18	2.0	99	2,666	3,749	3,268	3,031*	3,154	NA	NA
B3035411	99	19	2.0	95	2,621	3,688	3,696*	2,625	3,071	3,147	NA
B4062257	101	18	1.5	60	2,086	3,662	3,329	2,775*	3,007	NA	NA
B5054313	100	20	2.5	85	2,682	4,295*	3,438	2,832*	3,467	NA	NA
B7071259	97	19	1.3	73	3,795*	4,473*	3,363	3,183*	3,861**	3,570**	NA
B7072252	99	18	2.0	85	2,874	4,564*	4,235**	2,762*	3,372	NA	NA
B7072269	98	18	2.5	79	2,953*	4,224	3,394	2,668*	3,200	3,202	NA
Bannock	101	17	1.8	49*	1,967	4,125	3,909*	2,275	3,193	NA	NA
Black Bear	105	20	2.0	61	3,642*	3,952	3,308	2,919*	3,361	3,403*	3,247*
Black Pearl (B19344)	100	16	2.3	93	2,517	3,352	3,302	2,359	2,829	2,988	3,181*
Black Tails	102	22	2.5	82	3,016*	3,141	2,259	2,767*	2,632	2,792	2,847
BlackBeard (14506)	103	25	3.0	94	3,816*	4,369*	3,732*	3,507**	3,653*	3,324*	3,326*
Eclipse	98	39	1.8	80	1,955	3,464	2,898	2,331	2,582	NA	NA
ND Twilight	96	15	3.3	99	2,457	2,799	2,849	1,759	2,543	2,207	2,428
Nimbus (14500)	103	19	1.8	53	3,833**	3,728	3,417	2,562	3,293	3,462*	3,391**
Spectre (14497)	105	20	2.3	24**	3,052*	3,643	3,211	2,704*	3,141	3,148	3,155*
Umbra	105	20	3.3	50*	2,307	4,270	3,358	3,030*	3,364	NA	NA
Zenith	100	18	1.3	39*	2,417	3,645	2,777	2,189	2,884	3,018	3,150*
MEAN:	100	19	2.2	72	2,822	3,929	3,348	2,744	3,197	3,156	3,139
LSD _(0.05) :	NA	NA	NA	19	387	495	294	846	340	278	241
CV:	NA	NA	NA	23%	19.40%	10.70%	12.40%	18.10%	18.20%	17.90%	19.10%

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.

^aNA = Not available.



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

ENTRY	Maturity (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	98	21	4.2	61*	3,627*	3,594**	3,409*	2,847*	3,543*	3,061	3,149
17822	99	21	4.2	84	4,111*	2,905	3,310	2,735*	3,442	3,378*	NA ^a
17837	100	22	3.2	70*	4,291**	3,410*	3,899**	2,153	3,867**	3,088	3,087
17875	99	18	3.7	89	2,930	2,348	2,379	2,693*	2,553	2,725	2,899
19837	96	17	3.0	98	3,825*	2,738	3,618*	3,362**	3,393	3,180	NA
19857	101	21	4.5	61**	3,833*	2,829	2,991	2,732*	3,218	NA	NA
Coral ^b	102	19	3.0	76*	3,703*	2,680	2,796	2,350*	3,060	2,854	2,853
R20653	103	21	4.5	73*	4,220*	2,916	3,399*	2,757*	3,512	NA	NA
R20667	100	18	3.2	79*	3,192	2,620	3,258	2,551*	3,024	2,846	2,992
R20669	102	21	4.0	75*	4,225*	2,713	3,657*	3,271*	3,532*	3,552**	NA
R22092	99	18	1.7	66*	3,339	3,026	2,791	2,748*	3,052	NA	NA
R22716	99	21	2.7	77*	4,038*	2,178	2,436	3,018*	2,884	NA	NA
Viper	100	21	4.0	91	3,953*	3,230*	3,495*	2,566*	3,559*	3,408*	3,289**
MEAN:	100	19	3.5	77	3,791	2,861	3,188	2,752	3,280	3,121	3,045
LSD_{(0.05):}	NA	NA	NA	21	819	386	557	1028	348	261	119
CV:	NA	NA	NA	23%	18.10%	11.30%	14.65%	20.97%	15.69%	18.99%	11.11%

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.

^b Pink bean variety.



Table 6. Pinto bean (conventional and slow darkening) agronomic and yield results.

ENTRY	Maturity (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)
<i>Charro</i>	101	21	3.0	36	2,554	3,812**	3,881*	3,393*	3,541*	3,442**	3,369**
<i>EX2143-P</i>	97	17	2.5	88	2,869	2,347	2,357	2,102	2,524	NA ^a	NA
<i>EX2145-P</i>	97	19	2.7	88	3,420*	2,420	2,617	2,110	2,819	NA	NA
<i>Gleam^b</i>	98	21	2.7	95	2,550	3,131	3,475	2,984*	3,052	NA	NA
<i>Mystic^b</i>	98	19	3.0	98	2,913*	2,934	3,489	2,784	3,112	NA	NA
<i>ND Falcon</i>	101	22	2.0	12**	2,307	2,887	2,577	2,422	2,591	2,691	2,679
<i>ND Palomino^b</i>	99	20	4.3	82	3,233*	3,528*	4,111**	2,823*	3,624**	2,812	2,822
<i>ND Rodeo^b</i>	100	19	4.2	64	3,698**	3,389	3,411	2,982*	3,499*	NA	NA
<i>P19713</i>	98	21	2.2	75	3,238*	3,265	3,736*	2,616	3,413*	3,273	3,263*
<i>SV6139GR</i>	98	20	2.5	94	3,209*	2,158	3,487	2,272	2,952	2,676	2,950
<i>USDA Diamondback^b</i>	99	20	2.5	92	2,749	2,334	2,287	2,645	2,456	NA	NA
<i>USDA Rattler</i>	98	19	1.7	54	3,201*	3,150	2,557	3,222*	2,969	NA	NA
<i>Vibrant^b</i>	98	21	3.5	99	3,253*	3,200	2,816	3,529**	3,090	NA	NA
MEAN:	99	20	2.8	75	3,015	2,966	3,139	2,760	3,040	2,911	3,017
LSD_{(0.05):}	NA	NA	NA	16	792	327	583	735	319	158	191
CV:	NA	NA	NA	18%	22.02%	9.24%	15.56%	14.94%	15.50%	12.77%	18.41%

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.

^b Slow darkening variety.



Table 7. Great northern bean agronomic and yield results.

ENTRY	Maturity (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)
<i>Aries</i>	96	18	3.8	99	3,208	2,273	2,187	2,000	2,417	2,322	2,337
<i>Eiger</i>	99	19	2.7	58	4,678**	3,139**	3,328**	2,462*	3,402**	3,195**	3,170*
<i>G19613</i>	99	19	1.5	18**	4,148*	2,815*	2,233	2,213*	2,852	2,966*	3,097*
<i>ND Pegasus</i>	100	20	2.2	77	3,455	2,490	2,976*	2,483**	2,851	2,986*	3,178**
<i>Powderhorn</i>	94	15	1.7	91	2,407	2,663*	2,194	2,057*	2,330	2,417	2,521
MEAN:	98	18	2.4	68	3,579	2,676	2,584	2,243	2,770	2,777	2,860
LSD_{(0.05):}	NA ^a	NA	NA	19	904	530	461	474	291	273	195
CV:	NA	NA	NA	22%	20.06%	15.70%	14.17%	16.77%	17.76%	23.79%	20.21%

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)	Plant Height (Inches)	Lodging (1-5)	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	20	1.0	3,558*	2,659	2,873	2,995	1,941	2,008
16758	89	14	1.0	2,789	1,858	2,606	2,871	1,321	1,599
16775	103	14	2.0	2,174	2,880	2,271	2,449	1,790	1,851
16816	92	14	1.0	3,041*	2,233	2,726	2,942	1,700	1,816
151093	104	16	4.0	3,901**	3,678	3,428**	3,512**	2,360*	2,527*
<i>Amaranto</i>	92	14	1.0	2,775	2,214	2,885	3,010	1,831	1,956
<i>CR17-1-7-B2</i>	105	18	4.0	1,709	3,626	NA ^a	NA	NA	NA
<i>Etna</i>	98	16	1.0	3,239*	2,269	3,003	3,296*	1,688	1,913
<i>Firestripe</i>	100	16	1.0	3,317*	3,514	3,204*	NA	2,141*	NA
<i>Jester (151085)</i>	102	18	2.0	2,285	3,966**	2,459	2,802	2,617**	2,654**
<i>Krimson</i>	95	14	3.0	2,244	2,103	NA	NA	NA	NA
<i>Navabi</i>	102	16	1.0	2,475	1,758	2,811	NA	1,830	NA
MEAN:	97	15	1.7	2,748	2,630	2,827	2,985	1,922	2,040
LSD_{(0.05):}	NA	NA	NA	436	1009	318	227	508	312
CV:	NA	NA	NA	13.20%	27.48%	13.50%	11.23%	31.60%	22.55%

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)	Plant Height (Inches)	Lodging (1-5)	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	97	18	2.0	3,218*	1,744	3,272*	3,420*	1,849	2,109*
15916	95	19	2.0	2,811	2,368*	2,879	3,109	2,314*	2,416*
15923	98	17	2.0	3,458*	2,082*	3,333**	3,499**	1,431	1,771
16998	95	18	2.0	2,718	2,581*	2,790	3,086	2,088	2,219*
161082	97	18	2.0	3,088*	3,543*	3,239*	3,317*	2,597**	2,504**
<i>Big Red</i>	94	18	2.0	2,827	1,791	2,974	3,162	1,455	1,871
<i>California Early</i>	96	16	2.0	2,566	2,236*	2,839	2,904	1,876	1,902
<i>K20743</i>	98	19	2.0	2,718	3,014*	2,698	3,256*	2,176	2,491*
<i>K22604</i>	101	19	3.0	3,548**	3,607**	NA ^a	NA	NA	NA
<i>Pink Panther</i>	99	16	1.0	3,043*	2,430*	3,091*	3,252*	1,916	2,029
<i>Red Dawn (09363)</i>	94	16	2.0	2,596	1,731	2,940	2,970	1,883	2,090*
<i>Ronnie's Red</i>	103	22	3.0	2,707	2,835*	3,034*	2,754	2,187*	2,447*
MEAN:	99	18.2	2.3	2,941	2,497	3,033*	3,156	1,979	2,168
LSD_{(0.05):}	NA	NA	NA	509	926	329	270	601	422
CV:	NA	NA	NA	14.47%	30.97%	12.78%	12.64%	36.47%	28.78%

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)	Plant Height (Inches)	Lodging (1-5)	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	19	3.0	1,741	1,963	2,192	2,656	1,672	2,029*
161156	100	16	3.0	2,506	1,895	2,736	3,069*	2,235*	2,327*
161165	94	18	1.0	2,832*	2,822**	NA ^a	NA	NA	NA
181017	100	20	2.0	2,530	2,563*	3,036*	3,212**	2,499**	2,567**
181020	97	14	3.0	2,659	2,232*	2,720	2,856	1,447	1,664
181021	92	22	1.0	2,863*	2,393*	3,152*	2,896	1,635	1,858
DRK1601-1	95	20	3.0	1,835	2,015	NA	NA	NA	NA
Dynasty	99	22	3.0	2,627	2,663*	2,857	3,108*	2,424*	2,553*
Epic	101	20	3.0	3,197**	2,070	3,204**	3,178*	2,224*	2,363*
Gallantry	102	23	3.0	2,723*	2,643*	2,771	3,042*	1,949*	2,163*
Montcalm	100	20	2.0	2,834*	2,395*	2,839	2,773	2,072*	2,072*
ND Redbarn	102	22	2.0	2,357	1,586	NA	NA	NA	NA
Rampart (09434)	101	18	3.0	2,705*	2,165	2,899	3,033*	2,025*	2,229*
Red Hawk	98	18	2.0	2,451	2,514*	2,531	2,681	1,633	1,634
Seattle (151011)	101	18	2.0	2,310	2,501*	2,607	2,934*	2,332	2,358*
MEAN:	99	18.6	2.2	2,545	2,295	2,795	2,953	2,012	2,151
LSD_(0.05):	NA	NA	NA	368	548	290	305	567	394
CV:	NA	NA	NA	12.17%	19.80%	12.47%	15.30%	33.00%	27.10%

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)	Plant Height (Inches)	Lodging (1-5)	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)
<i>Beluga</i>	104	16	3.0	2,321	3,090*	2,598	2,491	2,248	2,377
<i>Denali</i>	98	18	2.0	3,063*	2,869*	3,175*	3,194**	2,122	2,337
<i>K19830</i>	101	20	2.0	2,839*	3,091*	3,172*	3,109*	2,402*	2,698*
<i>K19832</i>	101	18	1.0	3,284*	3,221*	3,178*	NA ^a	2,501	NA
<i>ND Whitetail</i>	101	17	3.0	2,266	3,032*	2,854	2,828	2,665*	2,707**
<i>Snowdon</i>	102	18	2.0	2,247	2,291	2,713	2,845	1,832	2,013
<i>Snowshoe</i>	104	20	3.0	2,794	3,163*	3,134*	NA	2,914**	NA
<i>WK1601-1</i>	102	18	2.0	3,303**	3,514**	3,236**	NA	2,534*	NA
MEAN:	101	18	2.3	2,764	3,034	3,008	2,893	2,402	2,426
LSD_(0.05):	NA	NA	NA	486	889	523	343	567	262
CV:	NA	NA	NA	14.46%	22.60%	20.78%	17.31%	28.19%	15.75%

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)	Plant Height (Inches)	Lodging (1-5)	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)
<i>Claim Jumper (13655)</i>	103	18	4.0	2,445*	3,362**	2,338	2,501	2,717**	2,731**
<i>Motherlode (191274)</i>	102	20	4.0	2,220	2,818*	2,084	2,025	2,257	2,368
<i>RRY1803-1-1</i>	94	18	3.0	2,047	2,440	NA ^a	NA	NA	NA
<i>Y1608-14</i>	99	18	3.0	2,153	1,790	2,263	2,340	1,838	1,880
<i>Y1702-22</i>	95	16	2.0	2,538*	2,312	2,811**	2,800**	1,802	1,949
<i>Y19817</i>	99	18	3.0	2,851*	3,096*	NA	NA	NA	NA
<i>Yellowstone</i>	98	16	4.0	2,856**	2,388	2,598*	2,611*	1,935	2,169
MEAN:	99	18	3.2	2,444	2,601	2,419	2,455	2,110	2,219
LSD_(0.05):	NA	NA	NA	460	638	294	236	394	271
CV:	NA	NA	NA	15.37%	19.94%	14.32%	14.05%	21.97%	17.85%

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.



2023 Sourcing Information

Table 13. Sources of dry bean entries tested in the 2023 performance trials, organized by market class.

Entry ID	Market Class	Source	Entry ID	Market Class	Source
15655	BL	ProVita	Etna	CR	Bayer
16594	BL	ProVita	Firestripe	CR	TVS ^e
16598	BL	ProVita	Jester (151085)	CR	ProVita
17751	BL	ProVita	Krimson	CR	TVS
15619	BL	ProVita	Navabi	CR	TVS
B18094173	BL	ADM ^a	15977	DRK	ProVita
B1904-3-1	BL	MSU ^b	161156	DRK	ProVita
B19309	BL	MSU	161165	DRK	ProVita
B20536	BL	MSU	181017	DRK	ProVita
B20591	BL	MSU	181020	DRK	ProVita
B20599	BL	MSU	181021	DRK	ProVita
B21710	BL	MSU	DRK1601-1	DRK	USDA-ARS
B22003	BL	MSU	Dynasty	DRK	Hensall Co-op
B22041	BL	MSU	Epic	DRK	ProVita
B22854	BL	MSU	Gallantry	DRK	Hensall Co-op
B3035411	BL	ADM	Montcalm	DRK	MSU
B4062257	BL	ADM	ND Redbarn	DRK	NDSU
B5054313	BL	ADM	Rampart (09434)	DRK	ProVita
B7071259	BL	ADM	Red Hawk	DRK	MSU
B7072252	BL	ADM	Seattle (151011)	DRK	ProVita
B7072269	BL	ADM	Aries	GN	ADM
Bannock	BL	Hensall Co-op	Eiger	GN	MSU
Black Bear	BL	ProVita	G19613	GN	MSU
Black Pearl (B19344)	BL	MSU	ND Pegasus	GN	NDSU
Black Tails	BL	ProVita	Powderhorn	GN	MSU
BlackBeard (14506)	BL	ProVita	11413	LRK	ProVita
Eclipse	BL	NDSU ^c	15916	LRK	ProVita
ND Twilight	BL	NDSU	15923	LRK	ProVita
Nimbus (14500)	BL	ProVita	16998	LRK	ProVita
Spectre (14497)	BL	ProVita	161082	LRK	ProVita
Umbra	BL	Hensall Co-op	Big Red	LRK	ProVita
Zenith	BL	MSU	California Early	LRK	TVS
16756	CR	ProVita	K20743	LRK	MSU
16758	CR	ProVita	K22604	LRK	MSU
16775	CR	ProVita	Pink Panther	LRK	Bayer
16816	CR	ProVita	Red Dawn (09363)	LRK	ProVita
151093	CR	ProVita	Ronnie's Red	LRK	ProVita
Amaranto	CR	Bayer	Claim Jumper (13655)	MY	ProVita
CR17-1-7-B2	CR	USDA-ARS ^d	Motherlode (191274)	MY	ProVita



Entry ID	Market Class	Source
<i>RRY1803-1-1</i>	MY	USDA-ARS
<i>Y1608-14</i>	MY	USDA-ARS
<i>Y1702-22</i>	MY	USDA-ARS
<i>Y19817</i>	MY	MSU
<i>Yellowstone</i>	MY	MSU
<i>12039</i>	NA	ProVita
<i>13057</i>	NA	ProVita
<i>14075</i>	NA	ProVita
<i>14078</i>	NA	ProVita
<i>14084</i>	NA	ProVita
<i>Argosy</i>	NA	Hensall Co-op
<i>Armada (13068)</i>	NA	ProVita
<i>Au Sable (N18103)</i>	NA	MSU
<i>Blizzard</i>	NA	ProVita
<i>Charm</i>	NA	TVS
<i>EX1802-N</i>	NA	TVS
<i>EX1803-N</i>	NA	TVS
<i>EX2109-N</i>	NA	TVS
<i>EX2110-N</i>	NA	TVS
<i>EX2111-N</i>	NA	TVS
<i>HMS Bounty (12047)</i>	NA	ProVita
<i>HMS Medalist</i>	NA	ProVita
<i>Liberty (15095)</i>	NA	ProVita
<i>N19246</i>	NA	MSU
<i>N20395</i>	NA	MSU
<i>N21510</i>	NA	MSU
<i>N21526</i>	NA	MSU
<i>N21532</i>	NA	MSU
<i>N22616</i>	NA	MSU
<i>N22630</i>	NA	MSU
<i>Nautica</i>	NA	Hensall Co-op
<i>ND Polar</i>	NA	NDSU
<i>OAC Seal</i>	NA	Jefferies Seeds
<i>Rogue</i>	NA	Hensall Co-op
<i>SV1893GH</i>	NA	Bayer
<i>T9905</i>	NA	TVS
<i>Valiant (08077)</i>	NA	ProVita
<i>Victory (15094)</i>	NA	ProVita
<i>Vigilant</i>	NA	ADM
<i>Charro</i>	P	MSU
<i>EX2143-P</i>	P	TVS

Entry ID	Market Class	Source
<i>EX2145-P</i>	P	TVS
<i>ND Falcon</i>	P	NDSU
<i>P19713</i>	P	MSU
<i>SV6139GR</i>	P	Bayer
<i>USDA Rattler</i>	P	Kelly Bean
<i>Coral</i>	PI	MSU
<i>Gleam</i>	SDP	ProVita
<i>Mystic</i>	SDP	ProVita
<i>ND Palomino</i>	SDP	NDSU
<i>ND Rodeo</i>	SDP	NDSU
<i>USDA Diamondback</i>	SDP	Kelly Bean
<i>Vibrant</i>	SDP	ProVita
<i>16686</i>	SR	ProVita
<i>17822</i>	SR	ProVita
<i>17837</i>	SR	ProVita
<i>17875</i>	SR	ProVita
<i>19837</i>	SR	ProVita
<i>19857</i>	SR	ProVita
<i>R20653</i>	SR	MSU
<i>R20667</i>	SR	MSU
<i>R20669</i>	SR	MSU
<i>R22092</i>	SR	MSU
<i>R22716</i>	SR	MSU
<i>Viper</i>	SR	ProVita
<i>Beluga</i>	WK	MSU
<i>Denali</i>	WK	MSU
<i>K19830</i>	WK	MSU
<i>K19832</i>	WK	MSU
<i>ND Whitetail</i>	WK	NDSU
<i>Snowdon</i>	WK	MSU
<i>Snowshoe</i>	WK	TVS

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, SDP = slow darkening pinto, SR = small red, WK = white kidney.

^a ADM = Archer-Daniels-Midland

^b MSU = Michigan State University

^c NDSU = North Dakota State University

^d USDA-ARS = U.S. Dept. of Agriculture – Agricultural Research Service

^e TVS = Treasure Valley Seed