

MICHIGAN DRY BEAN PERFORMANCE TRIALS

2020



MSU Extension



2020

2020 Michigan Dry Bean Performance Trials

Scott Bales, *MSU Dry Bean Specialist*

Introduction: 148 lines from 10 separate market classes were tested across 5 locations (Table 1) in 2020. In each result table you will find information on agronomics such as flowering date, plant maturity, height, and disease tolerance. Flowering and plant maturity are rated visually in days after planting (DAP) across all locations. In 2020 plant height and lodging were recorded at the Bay and Tuscola County locations due to adequate plant growth. Lodging is evaluated on a scale of 1-5. A 1 indicates that the entry was completely erect in the field at harvest; inversely, a 5 indicated that the entry was flat on the ground with stems and pods touching the soils surface. White mold infection was recorded in Tuscola County by calculating percent infection on each replication ((number infected/ total stand)*100).

Yield results are presented in pounds per acre (lb. A⁻¹) adjusted to 18% moisture for all locations. Small and medium seeded beans were tested in Bay, Huron, Sanilac, and Tuscola County. Large seeded beans were tested in Montcalm and Tuscola County. Following individual location results, yield is presented combined over locations for 2020 unless production systems differ (irrigated vs. dry land), this represents a 1-year average across all locations. When possible this is also done for 2- and 3- year averages across locations and years. For example, a 3-year average of navy bean yield results includes data from 2018, 2019, and 2020 at 4 locations per year (12 site years).

At the bottom of most columns you will find the trial average (mean), least significant difference (LSD) and coefficient of variation (CV) for the data within that column. To assist in the evaluation of these results the entry with the highest numerical yield in each column (trial and year) is followed by two asterisk (**). However, entries that are not significantly different from the highest yielding entry are followed by one asterisk(*). This means that if an entry is followed by an asterisk (one or two) there is **no** evidence that the entries differed for that given trait.

Table 1. Trial location, grower cooperator, planting date, nitrogen application method and timing, total accumulated growing degree days (GDD), and total precipitation.

County	Cooperator	Planting Date	Nitrogen application	Total GDD*	Total Precipitation (inches)
Bay	Schindler Farms	7-Jun	2x2	2081	10.72
Sanilac	Aldrich Farms	5-Jun	PPI	2127	10.89
Tuscola	Bednarski Farms	6-Jun	2x2	2049	10.42
Montcalm	Jaquays Farms	15-Jun	2x2 + side-dress	1923	9.68 + irrigation
Huron	Pawlowski Farms	5-Jun	2x2	2158	16.71

*Weather data retrieved from the nearest Michigan Automated Weather Network (MAWN) and the Enviro-weather Program station nearest to the trial. All weather data is from the day of planting to October 1. Growing degree days were calculated using the following equation: ((MAX + MIN)/2)-50

Methods: Dry beans were seeded in four row plots (20" rows) that measure 6.6' wide by 20' long. Each entry is replicated **four** times within the trial with one exception. Kidney, cranberry, and yellow beans planted in Tuscola County in 2020 had **two** replications. All trials were designed as randomized complete block (RCB). Trials received industry standard seed treatments, fertilization, and weed control applications at labeled rates. White mold fungicides are not applied to any location. The absence of fungicide allows the evaluation of a varieties natural tolerance or avoidance to white mold when the disease when present. Yield data is obtained by direct harvest for small and medium seeded beans. Large seeded beans are pulled by hand and then mechanically thrashed to prevent harvest loss. Following harvest samples are cleaned, weighed, and moisture tested. Questions regarding the 2020 variety trials, or suggestions for 2021 should be directed to Scott Bales: (989)-262-8550 ext. 2; Balessco@msu.edu.

Table 2. Soil test information from the 5 county locations including organic matter (%OM), pH, and cation exchange capacity (CEC). All macro and micro nutrients were sufficient for dry bean production.

Location	OM (%)	pH	CEC
Tuscola	2.3	7.3	9.6
Huron	3.0	7.4	10.8
Sanilac	2.3	7.5	9.2
Bay	2.2	6.8	10.5
Montcalm	1.1	5.8	4.3

<u>TRIAL</u>	<u>PAGE</u>
Navy beans.....	4
Black beans.....	5
Small Red and Pink beans	6
Pinto beans	7
Great Northern beans	8
Cranberry beans	9
Light Red Kidney beans	10
Dark Red Kidney beans	11
White Kidney beans	12
Mayocoba/yellow beans	13
Irrigated Navy, Black, and Small Red bean white mold trial.....	14
Sourcing Information	15

Table 3. Navy bean agronomic and yield results.

VARIETY	Maturity	Flowering	Plant Height	Lodging	White Mold Infection	Bay	Huron	Sanilac	Tuscola	1-year avg.	2-year avg.	3-year avg.	Seed Size
	— <i>dap</i> —	— <i>dap</i> —	— <i>inch</i> —	— (1-5) —	— % —	Lb. A ⁻¹				Lb. A ⁻¹			seeds Lb ⁻¹
Apex	104	38	22.5	3.0	12.7	2691	3679*	2226*	2752	2934*	2849	2886	2028
Argosy	100	44	22.5	2.8	8.4	2815	3066	1856	2880	2654	2745	2813	2241
Armada	100	45	23.0	2.5	8.4	3147*	2957	2085	3257	2861	2838	2908	1925
Blizzard	98	-	24.0	2.1	16.7	3646**	2942	2673*	3215	3119*	2922*	2848	2220
HMS Bounty	103	-	24.0	2.6	2.2	3381*	3207	2643*	3425*	3179*	2929*	3125**	2387
HMS Medalist	101	45	23.0	2.3	19.9	3368*	3389*	2273*	3808**	3191*	2806	2740	2264
Indi	95	43	23.5	2.0	4.3	2987	2517	1618	3006	2532	2488	2536	2278
Merlin	103	-	23.5	3.0	7.6	2894	3138	2346*	2340	2679	2497	2669	2193
Nautica	103	38	21.0	3.1	13.4	3033*	3089	2153	2793	2751	2573	2514	2233
Shock	98	44	22.0	2.7	14.5	3162*	2773	1639	3099	2668	-	-	2086
Valiant	101	46	23.5	2.7	13.0	3056*	3990**	2061	3135	2995*	2747	-	2178
Vigilant	96	46	25.0	1.5	6.5	2502	3615*	1961	2963	2814	2680	-	2378
12039	100	45	24.0	3.0	8.6	2517	3824*	2119	3362	2769	2942*	-	2180
14068	101	45	25.0	2.9	16.3	3151*	3624*	2060	3295	3285*	2913*	2885	2241
14080	102	45	22.5	2.9	6.9	2258	3091	2416*	2800	2605	2685	-	2207
14084	102	47	24.0	2.1	13.7	3453*	3666*	2281*	3456*	3214*	2879	2903	2392
14089	101	47	22.0	2.5	7.2	3175*	2477	2060	3020	2686	-	-	2270
15094	100	45	23.5	2.5	21.0	3492*	3442*	2227*	3423*	3146*	2987	3016*	2126
15095	104	46	21.5	2.9	14.8	3605*	3530*	2781**	3308	3306**	3152**	3097*	2344
EX1702	100	46	22.0	3.1	10.9	2183	2753	2179	2880	2499	2376	2600	2207
EX1708	102	-	23.0	2.8	18.8	3175*	2569	1751	3121	2712	2367	-	2489
EX1711	100	-	23.0	3.0	13.7	2876	2537	2217	2742	2593	2439	-	2155
EX1801	101	47	23.0	2.2	6.5	2543	3042	1802	2722	2527	-	-	2297
EX1802	96	46	21.0	1.5	11.2	2566	3480*	1418	2799	2703	-	-	2301
EX1803	101	-	22.0	2.5	26.8	2741	3198	2093	2997	2845	-	-	2631
EX1804	97	48	22.0	2.5	2.5	2870	2497	1572	2752	2311	-	-	2266
EX1914	101	47	21.0	3.0	11.9	2062	2761	1893	2922	2623	-	-	2072
N18103	97	42	22.5	2.2	12.7	2731	2906	1359	3002	2500	-	-	2029
N19253	100	-	25.0	2.2	7.9	3346*	3292	2182	3143	2966*	-	-	2237
N19285	102	44	22.0	2.9	7.2	2999	2206	2085	2968	2569	-	-	2104
SV1893GH	103	44	22.5	2.9	3.6	2889	3249	1552	3115	2701	2401	-	2129
MEAN:	100	45	22.9	2.6	11.3	2945	3112	2071	3068	2806	2725	2823	2229
LSD _(0.05) :	-	-	-	-	NS	617	621	556	399	395	257	182	-
CV:	-	-	-	-	-	17.8%	17.1%	22.9%	11.1%	23.8%	22.9%	19.2%	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Table 4. Black bean agronomic and yield results.

VARIETY	White Mold												Seed Size
	Maturity	Flowering	Plant Height	Lodging	Infection	Bay	Huron	Sanilac	Tuscola	1-year avg.	2-year avg.	3-year avg.	
	— dap —	— dap —	— inch —	— (1-5) —	— % —	Lb. A ⁻¹				Lb. A ⁻¹			seeds Lb ⁻¹
Adams	101	44	22.0	2.7	7.4	3540	4663*	3099*	3300*	3521	3281*	3250	2066
Black Bear	103	47	20.5	2.9	3.9	3118	4016	2682	3078*	3223	2918	2875	2288
Black Beard	100	47	26.0	2.7	8.8	3684	4250	3156**	3142*	3558	3171*	3292*	1967
Black Tails	96	44	22.5	2.0	12.6	3398	3946	2374	2783	3125	2809	2887	2326
Eclipse	95	44	19.0	1.5	10.2	3052	3726	1721	3245*	2986	-	-	2156
ND Twilight	94	45	20.5	1.5	17.5	2508	3695	1729	2836	2522	-	-	2022
Spectre	101	45	23.5	2.6	4.6	3488	4849**	2822*	3208*	3591*	3190*	3252	2032
Zenith	101	46	22.0	2.4	7.0	3414	3795	2294	3002	3126	2832	2881	2034
Zorro	100	45	22.5	2.5	5.3	3316	4023	2195	3125*	3093	2718	2771	2388
Zorro + Heads Up	100	45	22.0	2.5	4.9	3406	3867	2131	2734	3034	-	-	2421
14500	101	46	23.5	2.7	9.1	4253**	4574*	3039*	3444*	3827**	3435**	3461**	1915
15610	102	47	21.0	2.8	14.0	3222	4189	2843*	3490**	3435	3134	3072	2311
15619	103	45	21.5	3.0	7.0	3140	4653*	2698	3239*	3471	2996	2796	2123
16590	102	46	23.0	3.0	6.7	3077	3900	2484	3095*	3138	-	-	2005
16648	103	47	22.5	3.0	7.0	3053	3940	2454	3096*	3143	-	-	2036
17704	101	47	25.0	2.5	1.1	3069	3679	2138	2830	2973	-	-	2744
17708	97	44	23.0	2.5	11.2	3215	3564	1909	2887	2987	-	-	2125
17715	96	47	21.5	2.6	5.3	2850	4376*	2500	2725	3112	-	-	2370
17724	96	44	23.0	2.5	14.0	3475*	3718	2086	2992	3067	-	-	2476
17751	97	43	21.0	2.7	12.6	3747	4291	2652	3131*	3504	-	-	2059
B13SR1-1	100	44	22.0	1.5	10.5	2636	3289	2111	2738	2693	2567	-	1982
B17220	100	45	21.5	1.5	1.8	3222	4308	2273	2942	3193	-	-	2052
B17922	99	46	20.5	1.5	7.7	2877	4523*	2069	2754	3083	2944	-	2333
B18201	98	46	22.0	2.0	6.0	2999	3820	2433	2848	3025	3163	-	1985
B18204	95	44	21.0	2.0	6.0	3116	4228	2059	2703	2958	2699	-	1982
B19330	96	45	20.0	2.0	10.9	3224	3896	2259	3126*	3170	-	-	2042
B19344	100	45	23.5	2.5	4.6	3286	4447*	2245	3101*	3269	-	-	1860
B3036368	97	46	21.0	2.8	4.6	2646	4081	1744	3056*	2993	-	-	2205
B3036381	101	45	23.5	3.0	11.6	2649	4217	2578	2793	3059	-	-	2205
BL1402-15	98	43	21.5	2.5	7.7	2914	3890	2416	2865	3124	-	-	1989
MEAN:	99	45	22.1	2.4	8.0	3186	4077	2369	3007	3165	2990	3052	2150
LSD _(0.05) :	-	-	-	-	NS	556	533	384	467	266	272	187	-
CV:	-	-	-	-	-	14.8%	11.1%	13.7%	13.2%	14.4%	22.1%	18.2%	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Table 5. Small Red and Pink bean agronomic and yield results.

VARIETY	Maturity	Flowering	Plant Height	Lodging	White Mold Infection	Bay	Huron	Sanilac	Tuscola	1-year avg.	2-year avg.	3-year avg.	Seed Size
	— dap —	— dap —	— inch —	— (1-5) —	— % —	Lb. A ⁻¹				Lb. A ⁻¹			seeds Lb ⁻¹
<i>Caldera</i>	99	46	26.5	2.5	23.7	1946	2615	2255	3006	2700	2685	2826	1356
<i>Cayenne</i>	98	43	22.5	2.1	10.3	2318	2655	2484	3063	2630	2645	2918*	1375
<i>Ruby</i>	99	43	23.0	3.5	35.6	2098	2638	2414	3251	2600	2496	2687	1594
<i>Viper</i>	100	44	23.0	2.5	26.0	2314	3357	3069**	3747**	3145**	3034**	3059**	1596
16686	97	44	25.0	2.5	40.0	1658	2675	2588	3688*	2652	2494	-	1323
17835	100	42	23.5	3.1	19.6	1428	2335	2004	2948	2085	2430	-	1259
17837	100	40	22.0	2.5	25.2	2185	2511	2619	3695*	2752	2518	-	1494
17839	99	39	24.0	2.6	16.3	2042	2617	2651*	3545*	2713	2458	-	1480
R17604	99	44	24.5	2.0	14.5	1919	2946	2162	3421	2612	2584	-	1616
S18904	100	43	21.5	2.2	17.4	2570	2190	2122	3128	2400	2545	-	1284
MEAN:	99	43	23.5	2.5	22.8	2048	2653	2464	3349	2629	2589	2872	1438
LSD (0.05):	-	-	-	-	NS	NS	NS	422	301	294	276	215	-
CV:	-	-	-	-	-	-	-	14.6 %	7.5 %	26.7%	25.0%	22.1%	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Table 6. Pinto bean agronomic and yield results.

VARIETY	White Mold												Seed Size
	Maturity	Flowering	Plant Height	Lodging	Infection	Bay	Huron	Sanilac	Tuscola	1-year avg.	2-year avg.	3-year avg.	
	— <i>dap</i> —	— <i>dap</i> —	— <i>inch</i> —	— (1-5) —	— % —	— <i>Lb. A⁻¹</i> —				— <i>Lb. A⁻¹</i> —			<i>seeds Lb⁻¹</i>
Charro	103	45	24.0	2.7	14.1	3087*	3765**	2879**	3777**	3377**	2942**	-	1229
LaPaz	98	46	24.0	2.9	14.5	2966*	3597*	2510	3495*	2957	2678	-	1221
ND Falcon	97	46	26.0	2.3	4.3**	2647*	2555	2295	2868	2591	-	-	1270
ND Palomino	103	44	21.0	3.0	23.9	2774*	3088*	1643	3000	2508	-	-	1230
Windbreaker	96	43	20.0	3.0	11.6	1900	2708	1855	2550	2253	-	-	1172
P19103	104	41	24.0	3.0	17.0	3088**	3290*	2659*	3308	3086*	-	-	1318
SV6139GR	92	44	21.5	2.7	11.9	2529*	3146*	2318	3238	2807	-	-	1252
MEAN:	99	44	22.9	2.8	13.9	2713	3164	2308	3176	2797	2810	-	1242
LSD _(0.05) :	-	-	-	-	5.0	670	742	352	391	358	231	-	-
CV:	-	-	-	-	18.8%	20.1%	18.9%	12.4%	10.0%	21.7%	19.4	-	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Table 7. Great Northern bean agronomic and yield results.

VARIETY	White Mold												Seed Size
	Maturity	Flowering	Plant Height	Lodging	Infection	Bay	Huron	Sanilac	Tuscola	1-year avg.	2-year avg.	3-year avg.	
	— <i>dap</i> —	— <i>dap</i> —	— <i>inch</i> —	— (1-5) —	— % —	— <i>Lb. A⁻¹</i> —				— <i>Lb. A⁻¹</i> —			<i>seeds Lb⁻¹</i>
<i>Aries</i>	99	37	18.0	2.5	18.3	2117*	2744	1545	2969	2344	2118	-	1290
<i>Eiger</i>	104	44	26.0	2.5	22.3	2622**	3119*	3163**	3662**	3141**	2927**	-	1230
<i>ND Pegasus</i>	96	38	26.0	2.9	26.8	2270*	3831**	2557	3640*	3007*	-	-	1336
<i>Powderhorn</i>	93	38	19.0	2.6	9.7	2066	2921	1731	2920	2409	2071	-	1286
<i>Virgo</i>	103	37	23.0	2.9	26.4	1898	2129	1884	3132	2192	-	-	1260
<i>G18512</i>	102	44	23.0	2.2	18.3	1806	3431*	2107	3052	2599	-	-	1202
MEAN:	100	40	22.5	2.6	20.3	2130	3029	2164	3229	2615	2372	-	1267
LSD_(0.05):	-	-	-	-	NS	530	728	343	339	210	269	-	-
CV:	-	-	-	-	-	19.9 %	14.4 %	12.8 %	8.5 %	16.6 %	27.3%	-	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Table 8. Cranberry bean agronomic and yield results.

VARIETY	Maturity	Flowering	Plant Height	Montcalm	Tuscola	Irrigated 2- year avg.	Irrigated 3- year avg.	Dry Land 2- year avg.	Dry Land 3- year avg.	Seed Size
	- dap -	- dap -	- inch -	— Lb. A ⁻¹ —		— Lb. A ⁻¹ —		— Lb. A ⁻¹ —		seeds Lb ⁻¹
Amaranto	92	34	16.0	2881*	2340*	3425*	-	1701*	-	926
Bellagio	100	38	21.0	2356	2146*	2880	3086	1805*	2495*	819
Chianti	100	37	18.0	2353	1839	3307*	3363*	962	2085	992
Etna	92	35	14.0	3202*	2694*	3655**	3412*	1369	2003	881
Red Cran 172	95	35	20.0	1865	1919	2293	-	1819*	-	831
Red Cran Up	96	35	14.0	2240	1752	-	-	-	-	858
Vero	90	35	18.0	2642	2436*	3209	3165*	-	-	935
16758	90	35	14.0	2967*	2185*	-	-	-	-	1158
16759	95	34	18.0	3182*	-	-	-	-	-	790
16760	98	34	16.0	3414**	2041*	3467*	3446*	1762*	2459*	931
16761	91	34	15.0	2703	2021*	3135	3277*	1434	2109	897
16764	96	35	18.0	3184*	2613*	3163	2866	1771*	2403*	863
16775	100	38	16.0	2690	2725*	3086	-	1677*	-	915
16816	90	33	16.0	2948*	2834**	-	-	-	-	955
151085	98	36	16.0	2942*	2756*	3271*	3506**	2101**	2522*	796
151093	87	35	20.0	2934*	2867*	3081	3038	1794*	2741**	887
14L1203B	95	33	18.0	2788	-	-	-	-	-	829
16756	98	36	20.0	2428	2269*	-	-	-	-	947
CR1704-2	95	34	16.0	2398	1626	-	-	-	-	849
MEAN:	95	35	17.1	2748	2290	3244	3229	1651	2352	898
LSD _(0.05) :	-	-	-	590	901	402	375	544	347	-
CV:	-	-	-	18.2 %	22.5	14.8%	17.1%	29.7%	19.7%	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Table 9. Light Red Kidney bean agronomic and yield results.

VARIETY	Maturity	Flowering	Plant Height	Montcalm	Tuscola	Irrigated 2- year avg.	Irrigated 3- year avg.	Dry Land 2- year avg.	Dry Land 3- year avg.	Seed Size
	— dap —	— dap —	— inch —	— Lb. A ⁻¹ —		— Lb. A ⁻¹ —		— Lb. A ⁻¹ —		seeds Lb ⁻¹
<i>Big Red</i>	92	37	14.0	2799	2224	2974	2932	1968	2041	782
<i>California Early</i>	91	35	16.0	3355*	2022	3500*	3184*	1575	1851	835
<i>Clouseau</i>	98	36	18.0	2805	2138	3280*	3322*	1565	1982	793
<i>Coho</i>	101	37	16.0	3026*	2274	2861	3297*	2409*	2409*	1030
<i>Pink Panther</i>	98	36	16.0	3268*	2427	-	-	-	-	802
<i>Red Dawn</i>	89	35	16.0	3565**	2242	3612**	3517*	1712	1945	881
<i>Ronnie's Red</i>	104	35	24.0	2538	2318	2676	3275*	2461**	2603**	752
<i>Rosie</i>	104	37	20.0	1795	2363	-	-	-	-	859
<i>15907</i>	105	39	18.0	1881	2017	2148	2595	2387*	2514*	786
<i>15926</i>	107	38	20.0	1620	1900	2077	2634	2014	2230	719
<i>K17703</i>	103	37	16.0	2786	2291	3072*	3581**	1991	2338*	816
<i>K17704</i>	103	35	20.0	2400	2214	-	-	-	-	844
<i>K19605</i>	103	35	18.0	2164	2517	-	-	-	-	768
MEAN:	100	36	17.8	2637	2235	2911	3148	2002	2212	820
LSD_(0.05):	-	-	-	572	NS	541	529	413	318	-
CV:	-	-	-	18.3 %	-	22.2%	24.7%	22.9%	19.3%	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Table 10. Dark Red Kidney bean agronomic and yield results.

VARIETY	Maturity	Flowering	Plant Height	Montcalm	Tuscola	Irrigated 2- year avg.	Irrigated 3- year avg.	Dry Land 2- year avg.	Dry Land 3- year avg.	Seed Size
	— dap —	— dap —	— inch —	— Lb. A ⁻¹ —		— Lb. A ⁻¹ —		— Lb. A ⁻¹ —		seeds Lb ⁻¹
Chaparral	105	35	18.0	2193	2296*	2415	3044	1803	1989	912
Dynasty	105	37	18.0	2855*	2583*	3224*	3596**	2205	2428*	783
Epic	102	37	20.0	2728	2379*	2963	2179	2156	2303	776
Montcalm	103	36	18.0	2732	2345*	3082*	3368*	1864	1968	815
Rampart	97	35	18.0	2640	2445*	2766	3079	2114	2281	924
Red Cedar	96	37	16.0	3050*	1032	2799	3004	1652	1855	896
Red Rover	96	34	20.0	2934*	2278*	3250**	3292*	2158	2201	876
Spire	106	36	20.0	1745	2102*	2023	2827	1952	2177	838
Talon	100	38	20.0	2664	2368*	-	-	-	-	914
15977	98	35	18.0	2957*	2340*	-	-	-	-	829
15978	103	38	20.0	2686	2589*	2433	3027	2631**	2619**	848
15981	103	38	20.0	1773	1196	1936	-	1508	-	1124
18991	104	38	18.0	1400	2058	-	-	-	-	789
151011	100	35	18.0	3190**	2196*	3220*	3410*	2084	2343	986
161156	96	35	16.0	3083*	2734*	-	-	-	-	1017
161164	103	37	18.0	2786*	2745**	-	-	-	-	913
181017	103	36	18.0	2596	1874	-	-	-	-	830
K16136	101	36	16.0	3066*	2270*	3171	3399*	2042	2301	908
K19111	102	40	20.0	2762*	2103*	-	-	-	-	928
MEAN:	101	36	18.4	2631	2271	2758	3202	2048	2224	890
LSD _(0.05) :	-	-	-	445	650	390	357	354	261	-
CV:	-	-	-	14.2 %	17.0%	17.0%	16.5%	17.8%	15.7%	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Table 11. White Kidney bean agronomic and yield results.

VARIETY	Maturity	Flowering	Plant Height	Montcalm	Tuscola	Irrigated 2- year avg.	Irrigated 3- year avg.	Dry Land 2- year avg.	Dry Land 3- year avg.	Seed Size
	- dap -	- dap -	- inch -	— Lb. A ⁻¹ —		— Lb. A ⁻¹ —		— Lb. A ⁻¹ —		seeds Lb ⁻¹
Beluga	104	41	20.0	2346	2201	2803	2760	2171	2343**	841
ND White Tail	104	40	20.0	2849	2109	-	-	-	-	922
Yeti	106	39	18.0	1796	2394	2790	3145	1970	2224	841
K16924	97	34	16.0	3546**	2531	3638**	3871**	1950	2201	902
K19830	106	40	20.0	2942	2336	-	-	-	-	795
MEAN:	103	39	18.8	2695	2272	3077	3258	2030	2256	860
LSD (0.05) :	-	-	-	339	NS	491	418	NS	296	-
CV:	-	-	-	9.3 %	-	18.1%	18.3%	-	16.9%	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

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

VARIETY	Maturity	Flowering	Plant Height	Montcalm	Tuscola	Irrigated 2- year avg.	Irrigated 3- year avg.	Dry Land 2- year avg.	Dry Land 3- year avg.	Seed Size
	— dap —	— dap —	— inch —	— Lb. A ⁻¹ —	— Lb. A ⁻¹ —	— Lb. A ⁻¹ —	— Lb. A ⁻¹ —	— Lb. A ⁻¹ —	— Lb. A ⁻¹ —	seeds Lb ⁻¹
Claim Jumper	100	40	20.0	2356*	2469*	2821	-	1952	-	1260
SVS-0863	97	42	16.0	2635*	2425*	3118	-	2334	-	1019
Yellowstone	89	38	16.0	2843**	2149	3378	-	1993	-	1269
Y1608-14	96	35	16.0	2609*	2334*	-	-	-	-	1226
Y1609-14	87	34	16.0	2755*	2584**	-	-	-	-	1117
Y1702-22	95	35	16.0	2490	2562*	-	-	-	-	1335
MEAN:	94	37	16.7	2614	2420	3105	-	2166	-	1204
LSD (0.05) :	-	-	-	260	339	NS	-	NS	-	-
CV:	-	-	-	7.5 %	5.9 %	-	-	-	-	-

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

Table 13. Irrigated Navy bean lodging, white mold and yield results.

VARIETY	Lodging	White Mold Infection	Montcalm
	- (1-5) -	- % -	- Lb. A ⁻¹ -
HMS Medalist	2.3	17.1**	3461**
Merlin	1.9	20.6*	2285
Valiant	2.1	54.3	2981*
MEAN:	2.1	30.6	2909
LSD _(0.05) :	-	6.3	851
CV:	-	31.2%	21.3%

Table 14. Irrigated Black bean lodging, white mold and yield results.

VARIETY	Lodging	White Mold Infection	Montcalm
	- (1-5) -	- % -	- Lb. A ⁻¹ -
Adams	2.3	30.8**	3632*
Black Bear	2.6	52.9	3783**
Black Beard	2.7	59.5	3472*
Spectre	2.3	32.5*	3408*
Zenith	2.4	39.3*	2739
MEAN:	2.4	43.1	3407
LSD _(0.05) :		22.0	912
CV:		35.9%	20.0%

Table 13. Irrigated Small Red bean lodging, white mold and yield results.

VARIETY	Lodging	White Mold Infection	Montcalm
	- (1-5) -	- % -	- Lb. A ⁻¹ -
Caldera	3.4	66.5	2814
Cayenne	2.8	43.6**	2848
Viper	2.8	54.7*	3822**
MEAN:	2.9	54.9	3161
LSD _(0.05) :	-	21.9	715
CV:	-	30.3	16.4%

**Highest yielding variety within column

*Yield not statistically different than the highest yielding variety within column

2020 Sourcing information:

<u>Entry</u>	<u>Market Class</u>	<u>Source</u>
12039	NA	ProVita
14068	NA	ProVita
14080	NA	ProVita
14084	NA	ProVita
14089	NA	ProVita
14500	BL	ProVita
15094	NA	ProVita
15095	NA	ProVita
15610	BL	ProVita
15619	BL	ProVita
15907	LRK	ProVita
15926	LRK	ProVita
15977	DRK	ProVita
15978	DRK	ProVita
15981	DRK	ProVita
16590	BL	ProVita
16648	BL	ProVita
16686	SR	ProVita
16756	CR	ProVita
16758	CR	ProVita
16759	CR	ProVita
16760	CR	ProVita
16761	CR	ProVita
16764	CR	ProVita
16775	CR	ProVita
16816	CR	ProVita
17704	BL	ProVita
17708	BL	ProVita
17715	BL	ProVita
17724	BL	ProVita
17751	BL	ProVita
17835	SR	ProVita
17837	SR	ProVita
17839	SR	ProVita
18991	DRK	ProVita
151011	DRK	ProVita
151085	CR	ProVita
151093	CR	ProVita
161156	DRK	ProVita
161164	DRK	ProVita
181017	DRK	ProVita

<u>Entry</u>	<u>Market Class</u>	<u>Source</u>
14L1203B	CR	USDA-ARS
Adams (B18504)	BL	Michigan State University
Aires	GN	ProVita
Amaranto (SV3709GC)	CR	Seminis Seeds
Apex	NA	Treasure Valley Seeds
Argosy	NA	Canada-Hensall District Coop
Armada (13068)	NA	ProVita
B13SR1-1	BL	GenTec Seeds LTD
B17220	BL	Michigan State University
B17922	BL	Michigan State University
B18201	BL	Michigan State University
B18204	BL	Michigan State University
B19330	BL	Michigan State University
B19344	BL	Michigan State University
B3036368	BL	Archer Daniels Midland (ADM)
B3036381	BL	Archer Daniels Midland (ADM)
Bellagio	CR	Michigan State University
Beluga	WK	Michigan State University
Big Red	LRK	ProVita
BL1402-15	BL	USDA-ARS
Black Bear	BL	ProVita
Black Tails	BL	ProVita
BlackBeard (14506)	BL	ProVita
Blizzard	NA	ProVita
Caldera (11511)	SR	ProVita
California Early	LRK	University of California
Cayenne	SR	Michigan State University
Chaparral	DRK	ProVita
Charro (P16901)	P	Michigan State University
Chianti	CR	Seminis Seeds
Claim Jumper	MY	ProVita
Clouseau	LRK	Seminis Seeds
Coho (K15601)	LRK	Michigan State University
CR1704-2	CR	USDA-ARS
Dynasty	DRK	Canada-Hensall District Coop
Eclipse	BL	North Dakota State University
Eiger (G16351)	GN	Michigan State University
Epic	DRK	ProVita
Etna	CR	Seminis Seeds
EX1702	NA	Treasure Valley Seeds
EX1708	NA	Treasure Valley Seeds
EX1711	NA	Treasure Valley Seeds

<u>Entry</u>	<u>Market Class</u>	<u>Source</u>
EX1801	NA	Treasure Valley Seeds
EX1802	NA	Treasure Valley Seeds
EX1803	NA	Treasure Valley Seeds
EX1804	NA	Treasure Valley Seeds
EX1914	NA	Treasure Valley Seeds
G18512	GN	Michigan State University
HMS Bounty	NA	ProVita
HMS Medalist	NA	ProVita
Indi	NA	Archer Daniels Midland (ADM)
K16136	DRK	Michigan State University
K16924	WK	Michigan State University
K17703	LRK	Michigan State University
K17704	LRK	Michigan State University
K19111	DRK	Michigan State University
K19605	LRK	Michigan State University
K19830	WK	Michigan State University
LaPaz	P	ProVita
Merlin	NA	ProVita
Montcalm	DRK	Michigan State University
N18103	NA	Michigan State University
N19253	NA	Michigan State University
N19285	NA	Michigan State University
Nautica	NA	Canada-Hensall District Coop
ND Falcon	P	North Dakota State University
ND Palomino	P	North Dakota State University
ND Pegasus	GN	North Dakota State University
ND Twilight	BL	North Dakota State University
ND White Tail	WK	North Dakota State University
P19103	P	Michigan State University
Pink Panther	LRK	Seminis Seeds
Powderhorn	GN	Michigan State University
R17604	SR	Michigan State University
Rampart (09434)	DRK	ProVita
Red Cedar	DRK	Michigan State University
Red Cran 172	CR	GenTec Seeds LTD
Red Cran Up	CR	GenTec Seeds LTD
Red Dawn (09363)	LRK	ProVita
Red Hawk	DRK	Michigan State University
Red Rover	DRK	Seminis Seeds
Ronnie's Red (09360)	LRK	ProVita
Rosie	LRK	North Dakota State University
Ruby	SR	ProVita
S18904	PINK	Michigan State University

<u>Entry</u>	<u>Market Class</u>	<u>Source</u>
Shock	NA	Canada-Hensall District Coop
Snowdon	WK	Michigan State University
Spectre (14497)	BL	ProVita
Spire(09431)	DRK	ProVita
SV1893GH	NA	Seminis Seeds
SV6139GR	P	Seminis Seeds
SVS-0863	MY	Treasure Valley Seeds
Talon	DRK	North Dakota State University
Valiant (08077)	NA	ProVita
Vero	CR	Archer Daniels Midland (ADM)
Vigilant	NA	ProVita
Viper	SR	ProVita
Virgo (13172)	GN	Archer Daniels Midland (ADM)
Windbreaker	P	Seminis Seeds
Y1608-14	MY	USDA-ARS
Y1609-14	MY	USDA-ARS
Y1702-22	MY	USDA-ARS
Yellowstone (Y16507)	MY	Michigan State University
Yeti	WK	Canada-Hensall District Coop
Zenith	BL	Michigan State University
Zorro	BL	Michigan State University