

MICHIGAN DRY BEAN PERFORMANCE TRIALS

2021



Bulletin E3465

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Michigan Dry Bean Performance Trials 2021

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Acknowledgments

This work is supported by the Michigan Bean Commission, MSU AgBioResearch, MSU Extension, and by dry bean breeders in both the public and private sectors.



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This material was produced for MSU Extension (www.extension.msu.edu) by the MSU Extension Educational Materials Team.

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Introduction

One hundred fifty (150) lines from 12 separate market classes were tested across six locations (Table 1) in 2021. In each table documenting the results, you will find such agronomic information as flowering date, plant maturity, height, and disease tolerance. Flowering and plant maturity are rated visually in days after planting (DAP) across all locations. Lodging is evaluated on a scale of 1 to 5, with a 1 indicating that the entry was completely erect in the field at harvest and a 5 indicating that the entry was flat on the ground with stems and pods touching the soils' surface. White mold infection was recorded in Huron County by calculating the percent of infection on each replication (number infected/total stand)*100). In 2021, white mold incidence was evaluated at the Huron County location due to adequate disease pressure. White mold was not present in either location where kidney bean testing was conducted (Montcalm or SVREC), and was not, therefore, evaluated in 2021.

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 counties. Large seeded beans were tested in Montcalm and Tuscola counties (SVREC). Following individual location results, yield is presented combined over locations for 2021 unless production systems differ (irrigated vs. dry land); this combining represents a one-year average across all locations. When possible, this combining is also done for two- and three-year averages across locations and years. For example, a three-year average of navy bean yields includes data from 2019, 2020, and 2021 at four 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 asterisks (**). 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 either one or two asterisks, there is **no** evidence that the entries differed for that given trait.

Table 1. Trial location, grower co-operator, planting date, nitrogen application rate, nitrogen application method, total accumulated growing degree days (GDD), and total precipitation.

County	Co-operator	Planting Date	Nitrogen Rate (lb/A)	Nitrogen Application	Total GDD*	Total Precipitation (inches)
Bay	Weiss Farms	31-May	53	Broadcast	2229	13.3"
Huron	Gentner-Bischer Farms	11-June	42	2x2	1967	14.2"
Sanilac	Keinath Farms	5-June	53	2x2	2243	15.9"
Tuscola (Kidney beans)	SVREC	6-June	42	Broadcast	2308	15.9"
Tuscola (Small and medium seed)	Zimmer Farms	4-June	42	2x2	2347	17.1"
Montcalm	Waldron Farms	3-June	42	2x2	2274	17.6" + Irrigation

*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 & Soil Test Information

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. All trials were designed as a randomized complete block (RCB). 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 allows the evaluation of a variety's natural tolerance or avoidance to white mold when the disease is present. Yield data is obtained by direct harvest for small- and medium-seeded beans. Large seeded beans are pulled by a two row Picket bean puller and then mechanically thrashed to prevent harvest loss. Following harvest, samples are cleaned, weighed, and moisture tested. Questions regarding the 2021 performance trials or suggestions for 2022 should be directed to Scott Bales at 989-262-8550, ext. 2, or balessco@msu.edu.

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

Location	% OM	Soil Type	pH	CEC
Bay	2.6	Sandy Clay Loam	6.8	10.9
Huron	2.8	Loam	7.6	12.1
Sanilac	3.3	Clay Loam	7.6	11.5
Tuscola (Kidney beans)	2.5	Clay Loam	7.7	16.8
Tuscola (Small and medium seed)	3.6	Clay Loam	7.6	16.6
Montcalm	2.3	Sandy Loam	6.3	7.6



Table 3. Navy bean agronomic and yield results.

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lb. A ⁻¹)	Huron (Lb. A ⁻¹)	Sanilac (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	1-year avg. (Lb. A ⁻¹)	2-year avg. (Lb. A ⁻¹)	3-year avg. (Lb. A ⁻¹)
Apex	92	42	17.0	2.5	36*	2959*	3701*	2669	2905	2928	2827	2632
Argosy	92	41	18.0	2.0	33*	2612	3716**	2915	3334*	3028*	2734	2671
Armada	90	44	20.0	2.0	48	3127*	3522*	3009	3120	3108*	2883*	2686
Blizzard	90	43	18.0	1.6	61	3324*	2945	2967	3367*	3120*	2936*	2742
HMS Bounty	91	43	18.0	1.3	21**	2955*	2902	3672**	3158	3130*	3041*	2728
HMS Medalist	92	42	18.0	2.0	51	2951*	2906	2873	3343*	3011*	2985*	2785
Liberty (15095)	91	44	16.0	1.9	49	3123*	2899	3647*	3521*	3233**	3094**	2988**
Merlin	92	42	18.0	1.8	43	2641	2438	2696	2782	2560	2579	2413
Nautica	89	43	17.0	2.1	39*	3158*	3326*	3021	3100	3052*	----	2575
Rogue	90	44	16.0	3.1	60	3109*	3328*	2762	3517*	3149*	2842	----
Shock	90	42	15.0	2.4	61	2874*	2937	2848	3015	2967	2705	----
Valiant	90	43	16.0	1.7	55	2858*	2444	2954	3052	2821	2793	2569
Victory (15094)	89	43	18.0	2.0	49	3079*	2959	3015	3481*	3158*	3071*	2874*
Vigilant	88	42	18.0	1.4	41	2545	2958	3116	2984	2804	2678	----
12039	92	46	16.0	2.2	57	2852*	2924	2948	3335*	2943	2852	2761
14068	91	46	19.0	1.8	67	2126	2107	2818	3611*	2768	2837	2639
14078	91	44	18.0	1.7	56	2532	2949	3018	3075	2840	----	----
14084	90	43	20.0	1.8	48	2961*	2751	2601	3103	2838	2838	2524
EX1802-N	86	45	13.0	1.0	36*	2460	2764	2226	2735	2270	2357	----
EX1803-N	87	44	16.0	1.3	41*	2370	2180	2062	2601	2298	2414	----
EX1804-N	88	43	17.0	1.3	29*	2760	2780	2571	3157	2868	2555	----
N18103	88	44	17.0	1.7	27*	3085*	3129	3206*	3404*	3038*	2852	----
N19226	89	45	18.0	1.9	39*	3203*	2171	2620	3214*	2794	----	----
N19246	90	43	17.0	1.9	42	3319*	2683	3025	3650**	3224*	----	----
N19253	90	42	19.0	1.6	44	3014*	2546	2903	3068	2825	2864	----
N19285	90	42	16.0	2.7	66	2755	2206	2532	3187*	2685	2555	----
N20388	90	43	17.0	1.3	53	2479	2493	3026	3360*	2901	----	----
N20404	88	43	18.0	1.1	30*	3144*	3434*	3230*	3325*	3191*	----	----
SV1893GH	90	44	16.0	2.0	66	3341**	2613	3036	3461*	3135*	2903*	2462
MEAN	90	43	17.2	1.8	45.9	2877	2847	2905	3206	2916	2791	2671
LSD (0.05)	----	----	----	----	19.2	499	577	515	467	289	221	122
CV	----	----	----	----	0.4	14.7%	11.9%	15.0%	12.4%	16.5%	18.7%	13.7%

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.



Table 4. Black bean agronomic and yield results.

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lb. A ⁻¹)	Huron (Lb. A ⁻¹)	Sanilac (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	1-year avg. (Lb. A ⁻¹)	2-year avg. (Lb. A ⁻¹)	3-year avg. (Lb. A ⁻¹)
Ace	88	44	17.0	1.4	56	2695	2928	2895	3298	2954	----	----
Adams	91	45	16.0	1.9	41	3456*	3647**	3276	3752*	3256*	3318**	----
Black Bear	93	46	16.0	1.9	53	2189	2720	2794	3745*	2881	2837	2661
Black Tails	91	45	18.0	1.8	52	2807	2874	2557	3399	2800	2846	2631
Black Beard	91	46	20.0	1.7	54	2609	3355*	3215	3822*	3065	3025	2836*
Eclipse	87	43	17.0	1.3	55	2302	2913	2521	3036	2642	2632	----
ND Twilight	86	44	16.0	2.5	76	2357	3088	2650	3263	2717	2486	----
Nimbus	91	46	18.0	1.8	41	2193	2998	3753**	3290	3006	3294*	3091**
Spectre	93	45	19.0	1.9	28*	2511	2886	3177	3729*	3009	3152*	2872*
Zenith	91	45	16.0	1.5	35*	2722	3282	3207	3728*	3186*	3011	2736
Zorro	91	44	17.0	1.4	34*	2863	3227	2868	3737*	3069	2938	2705
14531	91	45	17.0	1.8	47	2545	3036	2919	3677*	2873	-	-
15610	92	46	16.0	1.5	53	2837	3395*	2661	3399	2943	2913	2774
15619	92	46	17.0	1.9	67	2582	2564	3135	3765*	2705	3001	2727
16590	93	43	17.0	1.7	52	2592	3323*	3275	3785*	3175*	3092*	----
16648	91	44	17.0	2.0	54	2433	3213	3392	4026**	3077	2953	----
17715	90	46	16.0	1.9	55	2917	3236	2984	3721	3187*	2954	----
17751	90	44	17.0	1.3	40	2922	3528*	3131	3582*	3291*	3248*	----
B19309	90	44	17.0	1.6	37*	2860	3378*	3442*	3620*	3218*	----	----
B19330	89	44	17.0	1.7	58	2920	2915	2848	3938*	3085	2997	----
B19344	90	43	18.0	1.5	38*	3579*	2975	3118	3650*	3303*	3217*	----
B20547	90	42	18.0	1.6	19**	3711**	3129	3473*	3528	3375*	----	----
B20591	89	42	17.0	1.7	30*	3169	3579*	3360	3851*	3466**	----	----
B20597	89	42	17.0	1.2	26*	2475	3240	3186	3459	3090	----	----
B3036381	91	45	16.0	2.2	50	2926	3206	3034	3392	2918	2894	----
BL1726-2	88	45	17.0	1.2	33*	3031	3074	3145	3637*	3153	----	----
MEAN	90	45	17.1	1.7	45.6	2763	3126	3086	3587	3047	2973	2782
LSD (0.05)	----	----	----	----	19.5	520	349	341	465	305	267	250
CV	----	----	----	----	36.0%	16.0%	9.5%	9.4%	11.0%	16.5%	21.0%	26.7%

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.



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

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lb. A ⁻¹)	Huron (Lb. A ⁻¹)	Sanilac (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	1-year avg. (Lb. A ⁻¹)	2-year avg. (Lb. A ⁻¹)	3-year avg. (Lb. A ⁻¹)
<i>Cayenne</i>	89	42	19.0	2.0	50	2874*	3340*	2388	3608**	2954	2727	2583
<i>Rosetta</i>	90	43	17.0	1.6	40	2812*	3456*	2245	3432*	2891	-----	-----
<i>Ruby</i>	89	45	14.0	2.8	77	2186	2797	2156	3296*	2495	2590	2363
<i>Viper</i>	85	45	16.0	1.6	53	2327	3522**	3194*	2905	2917	2963**	2830**
16686	89	43	17.0	2.3	66	2941*	3112	3254**	3250*	3130**	2894*	2557
17837	90	44	18.0	1.6	65	2273	3130	2932*	3505*	2922	2794	2506
17839	91	45	17.0	2.0	44	2200	3364*	2635	3550*	2745	2764	2419
17875	88	45	16.0	2.3	44	2661	3380*	3018*	3308*	3035*	-----	-----
R17604	89	43	19.0	1.7	30*	3223**	3333*	2368	3381*	3037*	2765	2598
R20627	89	44	19.0	1.3	22**	3024*	3456*	2375	3452*	3075*	-----	-----
R20667	87	44	18.0	1.3	27*	3106*	3502*	2864*	3119*	3076*	-----	-----
S18904	88	43	15.0	1.4	42	2703	2911	2639	2777	2700	2584	-----
MEAN	89	44	17.0	1.8	46.9	2694	3275	2672	3298	2915	2760	2551
LSD (0.05)	-----	-----	-----	-----	13.0	479	281	534	695	172	147	169
CV	-----	-----	-----	-----	23.7	12.7%	7.1%	16.6%	17.5%	17.5%	17.6%	19.7%

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.



Table 6. Pinto bean agronomic and yield results.

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lb. A ⁻¹)	Huron (Lb. A ⁻¹)	Sanilac (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	1-year avg. (Lb. A ⁻¹)	2-year avg. (Lb. A ⁻¹)	3-year avg. (Lb. A ⁻¹)
<i>Charro</i>	88	43	16.0	2.0	57*	2900	2737	2586*	3641**	2910	3069*	2716**
<i>LaPaz</i>	85	44	17.0	2.0	53*	2828	2775	2831*	3552*	2899	2908	2562*
<i>ND Falcon</i>	90	45	18.0	2.0	57*	2215	2867	1782	2621	2391	2453	----
<i>ND Palomino</i>	91	44	13.0	3.2	72*	2861	2867	2492	3017*	2920	2759	----
<i>Windbreaker</i>	84	43	13.0	3.3	79.0	1997	3129*	1916	2780	2561	2430	----
<i>P19103</i>	92	43	15.0	3.2	52**	3696**	3539**	3014*	3600*	3335**	3171**	----
<i>P19713</i>	87	43	17.0	1.6	58*	2584	2928	3210*	3568*	3072*	----	----
<i>SV6139GR</i>	85	44	16.0	1.7	67*	2973	3363*	3308**	3339*	3177*	3000*	----
MEAN	88	44	15.5	2.4	13.9	2757	2967	2642	3265	2908	2827	2639
LSD (0.05)	----	----	----	----	5.0	383	397	673	692	316	202	256
CV	----	----	----	----	18.8%	11.4%	10.9%	20.9%	17.3%	17.5%	16.7	28.30%

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.

Table 7. Great northern bean agronomic and yield results.

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	White Mold Infection (%)	Bay (Lb. A ⁻¹)	Huron (Lb. A ⁻¹)	Sanilac (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	1-year avg. (Lb. A ⁻¹)	2-year avg. (Lb. A ⁻¹)	3-year avg. (Lb. A ⁻¹)
<i>Aries</i>	85	43	15.0	2.5	69.0	1773	2252	2291	2802*	2286	2302	2153
<i>Draco</i>	85	44	14.0	2.2	51*	2183	2537	2599*	2537	2483	----	----
<i>Eiger</i>	88	45	18.0	2.3	44*	2973*	3171*	2671*	3000*	2953	3149*	2919**
<i>ND Pegasus</i>	87	44	18.0	1.8	37**	3380**	3400**	3178**	3533**	3373**	3223**	----
<i>Powderhorn</i>	84	43	14.0	1.8	48*	2280	3144*	2112	2803*	2659	2554	2300
<i>Virgo</i>	89	43	16.0	2.3	49*	2834	3217*	2852*	2880*	2945	2764	----
<i>14164</i>	86	42	15.0	1.6	51*	2351	2370	2127	1919	2294	----	----
<i>G19611</i>	90	43	17.0	2.3	39*	3008*	3319*	2745*	3073*	3194*	----	----
<i>G19613</i>	86	45	17.0	1.8	44*	3264*	3112*	3073*	3270*	3180*	----	----
MEAN	87	44	16	2.0	47.9	2672	2947	2627	2868	2819	2798	2457
LSD (0.05)	----	----	----	----	16.2	436	335	600	760	231	247	206
CV	----	----	----	----	28.0%	13.5%	9.3%	18.8%	21.0%	13.9%	21.3%	24.7%

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.



Table 8. Cranberry bean agronomic and yield results.

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	Montcalm (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	Irrigated 2-year avg. (Lb. A ⁻¹)	Irrigated 3-year avg. (Lb. A ⁻¹)	Dry Land 2-year avg. (Lb. A ⁻¹)	Dry Land 3-year avg. (Lb. A ⁻¹)
AAC Scotty	97	35	11.0	3.0	2809	2173	----	----	----	----
Amaranto	83	36	11.0	2.7	2988	2006	2765	3011*	1961	1664
Bellagio	83	36	13.0	3.0	2785	2498*	2323	2550	2296	1918
Chianti	84	39	12.0	2.0	3034	2305*	2709	2942	----	----
Etna	81	35	12.0	2.2	3461**	2107	3141*	3267**	2197*	1721
Jester	85	37	13.0	2.2	3326*	2308*	2820	2867	2507*	2130*
Vero	85	36	12.0	2.7	3239*	2134	2934*	2975	1947	----
16756	89	38	13.0	2.2	3072	1973	2768	----	1911	----
16758	83	35	12.0	2.2	3205*	1958	2900	----	1948	----
16760	82	36	10.0	2.7	3333*	2307*	3168*	3152*	2138	1855
16764	81	38	11.0	4.0	2924	2200	2875	2842	2235*	1964*
16775	84	34	12.0	1.5	2795	1822	2520	2704	1994	1663
16776	84	47	15.0	1.5	2507	1983	----	----	----	----
16816	83	34	13.0	2.5	3096	1807	2848	----	2003	----
151093	83	37	13.0	2.5	3405*	2514**	3177**	2947	2519**	2166**
MEAN	84	37	12.3	2.4	3066	2144	2842	2926	2138	1890
LSD (0.05)	----	----	----	----	361	286	265	260	202	237
CV	----	----	----	----	9.8%	11.1%	11.2%	13.1%	16.3%	16.8%

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.



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

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	Montcalm (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	Irrigated 2-year avg. (Lb. A ⁻¹)	Irrigated 3-year avg. (Lb. A ⁻¹)	Dry Land 2-year avg. (Lb. A ⁻¹)	Dry Land 3-year avg. (Lb. A ⁻¹)
<i>Big Red</i>	81	34	12.0	2.5	3306	2429	2888*	2701*	2247*	1938
<i>California Early</i>	80	33	11.0	2.7	2922	2021	2858*	2691*	1949	1462
<i>Clouseau</i>	85	34	10.0	3.2	3211	2370	2848*	2687*	2381*	1713
<i>Coho</i>	84	40	15.0	2.2	2374	2765*	2522	2525*	2512**	2203
<i>Pink Panther</i>	83	34	11.0	2.5	3282	2089	2981*	----	2106	----
<i>Red Dawn</i>	79	35	12.0	2.7	2915	2423	3030**	2781**	2295*	1985
<i>Ronnie's Red</i>	85	39	15.0	1.7	2185	2715*	2131	2395	2498*	2188
<i>Rosie</i>	86	39	14.0	2.2	2058	2336	1845	----	2252*	----
11413	86	34	11.0	3.2	3331	2309	----	----	----	----
15916	84	35	9.0	3.5	3378*	2425	----	----	----	----
15923	84	34	12.0	2.2	3622*	2196	----	----	----	----
16998	84	35	11.0	2.0	3542*	2258	----	----	----	----
161082	84	36	14.0	2.0	3320	2144	----	----	----	----
<i>K17703</i>	85	36	14.0	2.0	----	----	2568	2443	2512*	2812**
<i>K19610</i>	83	40	12.0	2.2	----	----	----	----	----	----
<i>K20734</i>	85	38	15.0	1.7	2430	2928**	----	----	----	----
<i>K20743</i>	86	36	15.0	1.7	3643**	2832*	----	----	----	----
MEAN	84	36	12.5	2.4	2966	2454	2629	2603	2306	2043
LSD_(0.05)	----	----	----	----	458	317	368	322	345	342
CV	----	----	----	----	13.0%	10.9%	16.7%	23.5%	15.4%	22.0%

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.



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

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	Montcalm (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	Irrigated 2-year avg. (Lb. A ⁻¹)	Irrigated 3-year avg. (Lb. A ⁻¹)	Dry Land 2-year avg. (Lb. A ⁻¹)	Dry Land 3-year avg. (Lb. A ⁻¹)
<i>Dynasty</i>	85	38	14.0	2.2	3310*	2639	2955*	3008**	2519**	2223*
<i>Epic</i>	81	37	12.0	2.2	3021	2194	2713*	2750*	2162	2019
<i>Gallantry</i>	84	36	13.0	2.5	3316*	2355	----	----	----	----
<i>Montcalm</i>	86	30	13.0	2.5	3218*	2650**	2675*	2793*	2406*	2064
<i>Rampart</i>	83	37	12.0	2.2	3182*	2462*	2755*	2688	2361*	2070
<i>Red Cedar</i>	85	36	12.0	2.7	2788	2470*	2721*	2592	2195	2066
<i>Red Hawk</i>	85	35	11.0	3.0	2875	1729	2738*	2916*	1771	1754
<i>Red Rover</i>	85	37	13.0	2.7	2541	2255	2565	2759*	2173	1926
15977	85	37	14.0	2.7	3465**	2506*	2731*	----	2359*	----
15978	86	40	12.0	2.0	1468	2061	1896	1906	2169	2278**
151011	81	36	11.0	3.8	3287*	2261	3045**	2967*	2152	2008
161156	84	37	11.0	2.2	3283*	2335	3006*	----	2360*	----
161164	84	36	11.0	2.5	3089*	2121	2774*	----	2221	----
181017	85	40	14.0	2.2	3408*	2561*	2850*	----	2259*	----
181020	84	33	10.0	3.0	2620	1820	----	----	----	----
181021	84	34	10.0	2.5	2794	2102	----	----	----	----
K16136	84	37	14.0	2.2	2643	2467*	2674*	2746*	2312*	2075
K20234	83	37	11.0	2.2	2824	2104	----	----	----	----
MEAN	84	36	12.1	2.5	2952	2283	2721	2712	2244	2048
LSD_(0.05)	----	----	----	----	430	287	391	291	288	225
CV	----	----	----	----	12.2%	10.6%	17.3%	15.8%	13.3%	14.8%

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.



Table 11. White kidney bean agronomic and yield results.

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	Montcalm (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	Irrigated 2-year avg. (Lb. A ⁻¹)	Irrigated 3-year avg. (Lb. A ⁻¹)	Dry Land 2-year avg. (Lb. A ⁻¹)	Dry Land 3-year avg. (Lb. A ⁻¹)
<i>Beluga</i>	86	38	14.0	2.5	2161	2448	2116	2388	2296	2331**
<i>ND White Tail</i>	85	38	14.0	3.0	2663	2591	2588	----	2346	----
<i>Snowdon</i>	82	33	10.0	2.5	2988*	2177	----	----	----	----
<i>Yeti</i>	87	37	14.0	2.2	2678*	2573	2258	2774	2362	2004
<i>K16924</i>	86	35	11.0	2.7	3098**	2566	3113**	3476**	2403	2177*
<i>K19830</i>	85	40	15.0	2.0	2861*	3038**	2728	----	2697**	----
<i>K19831</i>	86	40	16.0	2.0	2448	2872	----	----	----	----
MEAN	85	37	14	2.7	2699	2609	2561	2879	2421	2171
LSD_(0.05)	----	----	----	----	425	118	280	261	176	249
CV	----	----	----	----	12.8%	3.6%	12.8%	18.4	6.7%	19.0%

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.

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

VARIETY	Maturity (DAP)	Flowering (DAP)	Plant Height (Inches)	Lodging (1-5)	Montcalm (Lb. A ⁻¹)	Tuscola (Lb. A ⁻¹)	Irrigated 2-year avg. (Lb. A ⁻¹)	Irrigated 3-year avg. (Lb. A ⁻¹)	Dry Land 2-year avg. (Lb. A ⁻¹)	Dry Land 3-year avg. (Lb. A ⁻¹)
<i>Claim Jumper</i>	85	39	12.0	3.7	2750*	2560	2414*	2576	2305	2029
<i>Motherlode</i>	89	36	14.0	2.7	1756	2161	----	----	----	----
<i>Patron</i>	80	37	10.0	4.0	2843*	3223**	----	----	----	----
<i>SVS-0863</i>	80	38	10.0	4.0	3047**	3146*	2485*	2791*	2719**	2618**
<i>Yellowstone</i>	86	37	10.0	3.5	2575*	2501	2541**	2845**	2182	2008
<i>Y1608-14</i>	82	36	11.0	4.2	2408*	1674	2354*	----	1905	----
<i>Y1702-22</i>	83	34	11.0	2.7	2922*	2092	2397*	----	2031	----
MEAN	84	37	11.1	3.5	2614	2479	2438	2737	2252	2218
LSD_(0.05)	----	----	----	----	462	232	265	247	274	172
CV	----	----	----	----	14.2%	7.6%	12.7%	12.8%	13.0%	10.4

**Highest yielding variety within column.

*Yield not statistically different from the highest yielding variety within column.



Table 13. Irrigated navy bean yield results.

VARIETY	Montcalm (Lb. A ⁻¹)
<i>HMS Bounty</i>	3037
<i>HMS Medalist</i>	2837
<i>Liberty</i>	3483**
<i>Victory</i>	2147*
<i>Armada</i>	3156*
MEAN	3132
LSD (0.05)	338
CV	8.4%

Table 14. Irrigated black bean yield results.

VARIETY	Montcalm (Lb. A ⁻¹)
<i>Adams</i>	3049*
<i>Black Beard</i>	3072*
<i>Nimbus</i>	3306**
<i>Spectre</i>	2681
<i>Zenith</i>	2442
MEAN	2910
LSD (0.05)	630
CV	17.0%

2021 Sourcing Information

Entry	Market Class	Source
11413	LRK	ProVita
12039	NA	ProVita
14068	NA	ProVita
14078	NA	ProVita
14084	NA	ProVita
14164	GN	ADM ^a /ProVita
14531	BL	ProVita
15610	BL	ProVita
15619	BL	ProVita
15916	LRK	ProVita
15923	LRK	ProVita
15977	DRK	ProVita
15978	DRK	ProVita
16590	BL	ProVita
16648	BL	ProVita
16686	SR	ProVita
16756	CR	ProVita
16758	CR	ProVita
16760	CR	ProVita
16764	CR	ProVita
16775	CR	ProVita
16776	CR	ProVita
16816	CR	ProVita
16998	LRK	ProVita

Entry	Market Class	Source
17715	BL	ProVita
17751	BL	ProVita
17837	SR	ProVita
17839	SR	ProVita
17875	SR	ProVita
151011	DRK	ProVita
151093	CR	ProVita
161082	LRK	ProVita
161156	DRK	ProVita
161164	DRK	ProVita
181017	DRK	ProVita
181020	DRK	ProVita
181021	DRK	ProVita
AAC Scotty	CR	Meridian Seeds
Adams (B18504)	BL	MSU ^b
Aries	GN	ProVita
Amaranto (SV3709GC)	CR	Seminis Seeds
Apex	NA	Treasure Valley Seeds
Argosy	NA	Hensall Co-op
Armada (13068)	NA	ProVita
B19309	BL	MSU
B19330	BL	MSU
B19344	BL	MSU
B20547	BL	MSU



Entry	Market Class	Source
B20597	BL	MSU
B3036381	BL	ADM
Bellagio	CR	MSU
Beluga	WK	MSU
Big Red	LRK	ProVita
BL1726-2	BL	USDA ^c
Black Bear	BL	ProVita
Black Tails	BL	ProVita
BlackBeard (14506)	BL	ProVita
Blizzard	NA	ProVita
California Early	LRK	University of California
Cayenne	SR	MSU
Charro (P16901)	P	MSU
Chianti	CR	Seminis Seeds
Claim Jumper	MY	ProVita
Clouseau	LRK	Seminis Seeds
Coho (K15601)	LRK	MSU
Draco	GN	ADM
Dynasty	DRK	Hensall Co-op
Eclipse	BL	NDSU ^d
Eiger (G16351)	GN	MSU
Epic	DRK	ProVita
Etna	CR	Seminis Seeds
EX1802-N	NA	Treasure Valley Seeds
EX1803-N	NA	Treasure Valley Seeds
EX1804-N	NA	Treasure Valley Seeds
G19611	GN	MSU
G19613	GN	MSU
Gallantry	DRK	Hensall Co-op
HMS Bounty	NA	ProVita
HMS Medalist	NA	ProVita
Jester	CR	ProVita
K16136	DRK	MSU
K16924	WK	MSU
K17703	LRK	MSU
K19610	LRK	MSU
K19830	WK	MSU
K20234	DRK	MSU
K20734	LRK	MSU
K20743	LRK	MSU

Entry	Market Class	Source
LaPaz	P	ProVita
Liberty (15095)	NA	ProVita
Merlin	NA	ProVita
Montcalm	DRK	MSU
Motherlode (191274)	MY	ProVita
N18103	NA	MSU
N19226	NA	MSU
N19246	NA	MSU
N19253	NA	MSU
N19285	NA	MSU
N20388	NA	MSU
N20404	NA	MSU
Nautica	NA	Hensall Co-op
ND Falcon	P	NDSU
ND Palomino	P	NDSU
ND Pegasus	GN	NDSU
ND Twilight	BL	NDSU
ND White Tail	WK	NDSU
Nimbus	BL	ProVita
P19103	P	MSU
P19713	P	MSU
Patron	MY	Ohio State University
Pink Panther	LRK	Seminis Seeds
Powderhorn	GN	MSU
R17604	SR	MSU
R20627	SR	MSU
R20667	SR	MSU
Rampart (09434)	DRK	ProVita
Red Cedar	DRK	MSU
Red Dawn (09363)	LRK	ProVita
Red Hawk	DRK	MSU
Red Rover	DRK	Seminis Seeds
Rogue	NA	Hensall Co-op
Ronnie's Red (09360)	LRK	ProVita
Rosetta	PI	MSU
Rosie	LRK	NDSU
Ruby	SR	ProVita
S18904	PINK	MSU
Shock	NA	Hensall Co-op
Snowdon	WK	MSU



Entry	Market Class	Source
Spectre (14497)	BL	ProVita
SV1893GH	NA	Seminis Seeds
SV6139GR	P	Seminis Seeds
SVS-0863	MY	Treasure Valley Seeds
Valiant (08077)	NA	ProVita
Vero	CR	ADM
Victory (15094)	NA	ProVita
Vigilant	NA	ProVita
Viper	SR	ProVita
Virgo (13172)	GN	ADM
Windbreaker	P	Seminis Seeds
Y1608-14	MY	USDA-ARS ^e
Y1702-22	MY	USDA-ARS
Yellowstone (Y16507)	MY	MSU
Yeti	WK	Hensall Co-op
Zenith	BL	MSU
Zorro	BL	MSU

^a ADM = Archer-Daniels-Midland

^b MSU = Michigan State University

^c USDA = U.S. Department of Agriculture

^d NDSU = North Dakota State University

^e USDA-ARS = USDA Agricultural Research Service