

2020 Michigan Dry Bean Performance Trials

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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 $((\text{number infected} / \text{total stand}) * 100)$.

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	PPI	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: $((\text{MAX} + \text{MIN})/2) - 50$

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

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Table 3. Navy bean agronomic and yield results.

VARIETY	White Mold												Appearance (after canning)			
	Maturity	Flowering	Plant Height	Lodging	Infection	Bay	Huron	Sanilac	Tuscola	1-year avg.	2-year avg.	3-year avg.	Seed Size	Bay	Tuscola	avg.
	— dap —	— dap —	— inch —	— (1-5) —	— % —	Lb. A ⁻¹				Lb. A ⁻¹			seeds Lb ⁻¹	— (1-5) —	— (1-5) —	— (1-5) —
Apex	104	38	22.5	3.0	12.7	2691	3679*	2226*	2752	2934*	2849	2886	2028	3.6	4.1	3.9
Argosy	100	44	22.5	2.8	8.4	2815	3066	1856	2880	2654	2745	2813	2241	3.6	3.8	3.7
Armada	100	45	23.0	2.5	8.4	3147*	2957	2085	3257	2861	2838	2908	1925	4.1	4.0	4.0
Blizzard	98	-	24.0	2.1	16.7	3646**	2942	2673*	3215	3119*	2922*	2848	2220	3.9	3.8	3.8
HMS Bounty	103	-	24.0	2.6	2.2	3381*	3207	2643*	3425*	3179*	2929*	3125**	2387	3.1	3.8	3.4
HMS Medalist	101	45	23.0	2.3	19.9	3368*	3389*	2273*	3808**	3191*	2806	2740	2264	3.9	3.6	3.8
Indi	95	43	23.5	2.0	4.3	2987	2517	1618	3006	2532	2488	2536	2278	3.4	2.9	3.2
Merlin	103	-	23.5	3.0	7.6	2894	3138	2346*	2340	2679	2497	2669	2193	3.1	3.3	3.2
Nautica	103	38	21.0	3.1	13.4	3033*	3089	2153	2793	2751	2573	2514	2233	3.8	3.5	3.6
Shock	98	44	22.0	2.7	14.5	3162*	2773	1639	3099	2668	-	-	2086	2.6	3.1	2.8
Valiant	101	46	23.5	2.7	13.0	3056*	3990**	2061	3135	2995*	2747	-	2178	4.1	3.9	4.0
Vigilant	96	46	25.0	1.5	6.5	2502	3615*	1961	2963	2814	2680	-	2378	3.9	2.8	3.3
12039	100	45	24.0	3.0	8.6	2517	3824*	2119	3362	2769	2942*	-	2180	3.3	2.9	3.1
14068	101	45	25.0	2.9	16.3	3151*	3624*	2060	3295	3285*	2913*	2885	2241	2.6	2.9	2.8
14080	102	45	22.5	2.9	6.9	2258	3091	2416*	2800	2605	2685	-	2207	3.6	3.2	3.4
14084	102	47	24.0	2.1	13.7	3453*	3666*	2281*	3456*	3214*	2879	2903	2392	3.5	3.1	3.3
14089	101	47	22.0	2.5	7.2	3175*	2477	2060	3020	2686	-	-	2270	3.3	3.3	3.3
15094	100	45	23.5	2.5	21.0	3492*	3442*	2227*	3423*	3146*	2987	3016*	2126	3.6	3.3	3.5
15095	104	46	21.5	2.9	14.8	3605*	3530*	2781**	3308	3306**	3152**	3097*	2344	4.2	3.3	3.7
EX1702	100	46	22.0	3.1	10.9	2183	2753	2179	2880	2499	2376	2600	2207	3.3	2.9	3.1
EX1708	102	-	23.0	2.8	18.8	3175*	2569	1751	3121	2712	2367	-	2489	3.0	2.7	2.8
EX1711	100	-	23.0	3.0	13.7	2876	2537	2217	2742	2593	2439	-	2155	3.2	3.0	3.1
EX1801	101	47	23.0	2.2	6.5	2543	3042	1802	2722	2527	-	-	2297	3.3	2.9	3.1
EX1802	96	46	21.0	1.5	11.2	2566	3480*	1418	2799	2703	-	-	2301	3.0	3.4	3.2
EX1803	101	-	22.0	2.5	26.8	2741	3198	2093	2997	2845	-	-	2631	2.8	3.2	3.0
EX1804	97	48	22.0	2.5	2.5	2870	2497	1572	2752	2311	-	-	2266	3.6	3.3	3.5
EX1914	101	47	21.0	3.0	11.9	2062	2761	1893	2922	2623	-	-	2072	3.1	3.3	3.2
N18103	97	42	22.5	2.2	12.7	2731	2906	1359	3002	2500	-	-	2029	2.9	2.8	2.8
N19253	100	-	25.0	2.2	7.9	3346*	3292	2182	3143	2966*	-	-	2237	2.7	3.3	3.0
N19285	102	44	22.0	2.9	7.2	2999	2206	2085	2968	2569	-	-	2104	3.4	3.9	3.7
SV1893GH	103	44	22.5	2.9	3.6	2889	3249	1552	3115	2701	2401	-	2129	2.9	3.3	3.1
MEAN:	100	45	22.9	2.6	11.3	2945	3112	2071	3068	2806	2725	2823	2229	3.4	3.3	3.3
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 Infection												Appearance (after canning)				Color (after canning)		
	Maturity	Flowering	Plant Height	Lodging	Infection	Bay	Huron	Sanilac	Tuscola	1-year avg.	2-year avg.	3-year avg.	Seed Size	Bay	Tuscola	avg.	Bay	Tuscola	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>	— (1-5) —	— (1-5) —	— (1-5) —	— (1-5) —	— (1-5) —	— (1-5) —
<i>Adams</i>	101	44	22.0	2.7	7.4	3540	4663*	3099*	3300*	3521	3281*	3250	2066	3.6	3.9	3.7	2.8	2.5	3.7
<i>Black Bear</i>	103	47	20.5	2.9	3.9	3118	4016	2682	3078*	3223	2918	2875	2288	3.0	3.6	3.3	2.6	3.3	3.3
<i>Black Beard</i>	100	47	26.0	2.7	8.8	3684	4250	3156**	3142*	3558	3171*	3292*	1967	4.1	3.5	3.8	4.2	4.2	3.8
<i>Black Tails</i>	96	44	22.5	2.0	12.6	3398	3946	2374	2783	3125	2809	2887	2326	2.9	3.4	3.2	2.6	2.6	3.2
<i>Eclipse</i>	95	44	19.0	1.5	10.2	3052	3726	1721	3245*	2986	-	-	2156	3.1	2.6	2.9	2.6	2.8	2.9
<i>ND Twilight</i>	94	45	20.5	1.5	17.5	2508	3695	1729	2836	2522	-	-	2022	2.9	2.6	2.8	2.6	2.9	2.8
<i>Spectre</i>	101	45	23.5	2.6	4.6	3488	4849**	2822*	3208*	3591*	3190*	3252	2032	2.8	2.1	2.4	3.2	2.8	2.4
<i>Zenith</i>	101	46	22.0	2.4	7.0	3414	3795	2294	3002	3126	2832	2881	2034	3.9	3.5	3.7	4.6	4.8	3.7
<i>Zorro</i>	100	45	22.5	2.5	5.3	3316	4023	2195	3125*	3093	2718	2771	2388	3.7	4.1	3.9	3.3	3.5	3.9
<i>Zorro + Heads Up</i>	100	45	22.0	2.5	4.9	3406	3867	2131	2734	3034	-	-	2421	-	-	-	-	-	-
<i>14500</i>	101	46	23.5	2.7	9.1	4253**	4574*	3039*	3444*	3827**	3435**	3461**	1915	2.9	2.6	2.8	2.8	2.9	2.8
<i>15610</i>	102	47	21.0	2.8	14.0	3222	4189	2843*	3490**	3435	3134	3072	2311	3.4	3.1	3.2	3.2	3.8	3.2
<i>15619</i>	103	45	21.5	3.0	7.0	3140	4653*	2698	3239*	3471	2996	2796	2123	3.8	2.9	3.3	3.6	3.8	3.3
<i>16590</i>	102	46	23.0	3.0	6.7	3077	3900	2484	3095*	3138	-	-	2005	3.1	2.6	2.8	2.8	3.1	2.8
<i>16648</i>	103	47	22.5	3.0	7.0	3053	3940	2454	3096*	3143	-	-	2036	2.7	2.4	2.5	3	2.5	2.5
<i>17704</i>	101	47	25.0	2.5	1.1	3069	3679	2138	2830	2973	-	-	2744	3.7	3.0	3.3	3	2.7	3.3
<i>17708</i>	97	44	23.0	2.5	11.2	3215	3564	1909	2887	2987	-	-	2125	3.6	2.7	3.2	3.7	3.2	3.2
<i>17715</i>	96	47	21.5	2.6	5.3	2850	4376*	2500	2725	3112	-	-	2370	4.3	3.2	3.7	4.4	3.5	3.7
<i>17724</i>	96	44	23.0	2.5	14.0	3475*	3718	2086	2992	3067	-	-	2476	3.6	2.3	2.9	3.2	2.1	2.9
<i>17751</i>	97	43	21.0	2.7	12.6	3747	4291	2652	3131*	3504	-	-	2059	2.9	2.1	2.5	2.6	2.75	2.5
<i>B13SR1-1</i>	100	44	22.0	1.5	10.5	2636	3289	2111	2738	2693	2567	-	1982	1.9	2.1	2.0	2.4	3.3	2.0
<i>B17220</i>	100	45	21.5	1.5	1.8	3222	4308	2273	2942	3193	-	-	2052	4.3	3.6	3.9	4.6	4.4	3.9
<i>B17922</i>	99	46	20.5	1.5	7.7	2877	4523*	2069	2754	3083	2944	-	2333	3.8	3.8	3.8	4.2	4.3	3.8
<i>B18201</i>	98	46	22.0	2.0	6.0	2999	3820	2433	2848	3025	3163	-	1985	4.3	3.9	4.1	3.8	4.4	4.1
<i>B18204</i>	95	44	21.0	2.0	6.0	3116	4228	2059	2703	2958	2699	-	1982	3.4	2.8	3.1	4.1	3.7	3.1
<i>B19330</i>	96	45	20.0	2.0	10.9	3224	3896	2259	3126*	3170	-	-	2042	3.5	2.4	2.9	4	3.6	2.9
<i>B19344</i>	100	45	23.5	2.5	4.6	3286	4447*	2245	3101*	3269	-	-	1860	3.3	3.4	3.4	5	4.5	3.4
<i>B3036368</i>	97	46	21.0	2.8	4.6	2646	4081	1744	3056*	2993	-	-	2205	2.7	2.3	2.5	2.8	2.6	2.5
<i>B3036381</i>	101	45	23.5	3.0	11.6	2649	4217	2578	2793	3059	-	-	2205	4.0	3.8	3.9	4.3	4.1	3.9
<i>BL1402-15</i>	98	43	21.5	2.5	7.7	2914	3890	2416	2865	3124	-	-	1989	4.1	3.9	4.0	4.6	4.1	4.0
MEAN:	99	45	22.1	2.4	8.0	3186	4077	2369	3007	3165	2990	3052	2150	3.4	3.0	3.2	3.5	3.4	3.2
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								Appearance (after canning)			
						Bay	Huron	Sanilac	Tuscola	1-year avg.	2-year avg.	3-year avg.	Seed Size	Bay	Tuscola	avg.
	— dap —	— dap —	— inch —	— (1-5) —	— % —	Lb. A ⁻¹				Lb. A ⁻¹			seeds Lb ⁻¹	— (1-5) —	— (1-5) —	— (1-5) —
Caldera	99	46	26.5	2.5	23.7	1946	2615	2255	3006	2700	2685	2826	1356	3.1	3.9	3.5
Cayenne	98	43	22.5	2.1	10.3	2318	2655	2484	3063	2630	2645	2918*	1375	3.9	2.9	3.4
Ruby	99	43	23.0	3.5	35.6	2098	2638	2414	3251	2600	2496	2687	1594	1.8	1.8	1.8
Viper	100	44	23.0	2.5	26.0	2314	3357	3069**	3747**	3145**	3034**	3059**	1596	2.5	2.3	2.4
16686	97	44	25.0	2.5	40.0	1658	2675	2588	3688*	2652	2494	-	1323	2.1	2.6	2.3
17835	100	42	23.5	3.1	19.6	1428	2335	2004	2948	2085	2430	-	1259	2.5	2.2	2.3
17837	100	40	22.0	2.5	25.2	2185	2511	2619	3695*	2752	2518	-	1494	2.4	2.3	2.3
17839	99	39	24.0	2.6	16.3	2042	2617	2651*	3545*	2713	2458	-	1480	2.6	2.5	2.6
R17604	99	44	24.5	2.0	14.5	1919	2946	2162	3421	2612	2584	-	1616	3.8	3.5	3.6
S18904	100	43	21.5	2.2	17.4	2570	2190	2122	3128	2400	2545	-	1284	1.8	1.8	1.8
MEAN:	99	43	23.5	2.5	22.8	2048	2653	2464	3349	2629	2589	2872	1438	2.6	2.6	2.6
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.

<i>VARIETY</i>	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) —	— % —	— <i>Lb. A⁻¹</i> —				— <i>Lb. A⁻¹</i> —			<i>seeds Lb⁻¹</i>
<i>Charro</i>	103	45	24.0	2.7	14.1	3087*	3765**	2879**	3777**	3377**	2942**	-	1229
<i>LaPaz</i>	98	46	24.0	2.9	14.5	2966*	3597*	2510	3495*	2957	2678	-	1221
<i>ND Falcon</i>	97	46	26.0	2.3	4.3**	2647*	2555	2295	2868	2591	-	-	1270
<i>ND Palomino</i>	103	44	21.0	3.0	23.9	2774*	3088*	1643	3000	2508	-	-	1230
<i>Windbreaker</i>	96	43	20.0	3.0	11.6	1900	2708	1855	2550	2253	-	-	1172
<i>P19103</i>	104	41	24.0	3.0	17.0	3088**	3290*	2659*	3308	3086*	-	-	1318
<i>SV6139GR</i>	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.

	White Mold												
VARIETY	Maturity	Flowering	Plant Height	Lodging	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
Aries	99	37	18.0	2.5	18.3	2117*	2744	1545	2969	2344	2118	-	1290
Eiger	104	44	26.0	2.5	22.3	2622**	3119*	3163**	3662**	3141**	2927**	-	1230
ND Pegasus	96	38	26.0	2.9	26.8	2270*	3831**	2557	3640*	3007*	-	-	1336
Powderhorn	93	38	19.0	2.6	9.7	2066	2921	1731	2920	2409	2071	-	1286
Virgo	103	37	23.0	2.9	26.4	1898	2129	1884	3132	2192	-	-	1260
G18512	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.

<i>VARIETY</i>	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>Amaranto</i>	92	34	16.0	2881*	2340*	3425*	-	1701*	-	926
<i>Bellagio</i>	100	38	21.0	2356	2146*	2880	3086	1805*	2495*	819
<i>Chianti</i>	100	37	18.0	2353	1839	3307*	3363*	962	2085	992
<i>Etna</i>	92	35	14.0	3202*	2694*	3655**	3412*	1369	2003	881
<i>Red Cran 172</i>	95	35	20.0	1865	1919	2293	-	1819*	-	831
<i>Red Cran Up</i>	96	35	14.0	2240	1752	-	-	-	-	858
<i>Vero</i>	90	35	18.0	2642	2436*	3209	3165*	-	-	935
<i>16758</i>	90	35	14.0	2967*	2185*	-	-	-	-	1158
<i>16759</i>	95	34	18.0	3182*	-	-	-	-	-	790
<i>16760</i>	98	34	16.0	3414**	2041*	3467*	3446*	1762*	2459*	931
<i>16761</i>	91	34	15.0	2703	2021*	3135	3277*	1434	2109	897
<i>16764</i>	96	35	18.0	3184*	2613*	3163	2866	1771*	2403*	863
<i>16775</i>	100	38	16.0	2690	2725*	3086	-	1677*	-	915
<i>16816</i>	90	33	16.0	2948*	2834**	-	-	-	-	955
<i>151085</i>	98	36	16.0	2942*	2756*	3271*	3506**	2101**	2522*	796
<i>151093</i>	87	35	20.0	2934*	2867*	3081	3038	1794*	2741**	887
<i>14L1203B</i>	95	33	18.0	2788	-	-	-	-	-	829
<i>16756</i>	98	36	20.0	2428	2269*	-	-	-	-	947
<i>CR1704-2</i>	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.

<i>VARIETY</i>	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
	— <i>dap</i> —	— <i>dap</i> —	— <i>inch</i> —	— <i>Lb. A⁻¹</i> —		— <i>Lb. A⁻¹</i> —		— <i>Lb. A⁻¹</i> —		<i>seeds Lb⁻¹</i>
<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.

<i>VARIETY</i>	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
	— <i>dap</i> —	— <i>dap</i> —	— <i>inch</i> —	— <i>Lb. A⁻¹</i> —		— <i>Lb. A⁻¹</i> —		— <i>Lb. A⁻¹</i> —		<i>seeds Lb⁻¹</i>
<i>Chaparral</i>	105	35	18.0	2193	2296*	2415	3044	1803	1989	912
<i>Dynasty</i>	105	37	18.0	2855*	2583*	3224*	3596**	2205	2428*	783
<i>Epic</i>	102	37	20.0	2728	2379*	2963	2179	2156	2303	776
<i>Montcalm</i>	103	36	18.0	2732	2345*	3082*	3368*	1864	1968	815
<i>Rampart</i>	97	35	18.0	2640	2445*	2766	3079	2114	2281	924
<i>Red Cedar</i>	96	37	16.0	3050*	1032	2799	3004	1652	1855	896
<i>Red Rover</i>	96	34	20.0	2934*	2278*	3250**	3292*	2158	2201	876
<i>Spire</i>	106	36	20.0	1745	2102*	2023	2827	1952	2177	838
<i>Talon</i>	100	38	20.0	2664	2368*	-	-	-	-	914
<i>15977</i>	98	35	18.0	2957*	2340*	-	-	-	-	829
<i>15978</i>	103	38	20.0	2686	2589*	2433	3027	2631**	2619**	848
<i>15981</i>	103	38	20.0	1773	1196	1936	-	1508	-	1124
<i>18991</i>	104	38	18.0	1400	2058	-	-	-	-	789
<i>151011</i>	100	35	18.0	3190**	2196*	3220*	3410*	2084	2343	986
<i>161156</i>	96	35	16.0	3083*	2734*	-	-	-	-	1017
<i>161164</i>	103	37	18.0	2786*	2745**	-	-	-	-	913
<i>181017</i>	103	36	18.0	2596	1874	-	-	-	-	830
<i>K16136</i>	101	36	16.0	3066*	2270*	3171	3399*	2042	2301	908
<i>K19111</i>	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.

<i>VARIETY</i>	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
	- <i>dap</i> -	- <i>dap</i> -	- <i>inch</i> -	— <i>Lb. A⁻¹</i> —		— <i>Lb. A⁻¹</i> —		— <i>Lb. A⁻¹</i> —		<i>seeds Lb⁻¹</i>
<i>Beluga</i>	104	41	20.0	2346	2201	2803	2760	2171	2343**	841
<i>ND White Tail</i>	104	40	20.0	2849	2109	-	-	-	-	922
<i>Yeti</i>	106	39	18.0	1796	2394	2790	3145	1970	2224	841
<i>K16924</i>	97	34	16.0	3546**	2531	3638**	3871**	1950	2201	902
<i>K19830</i>	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.

<i>VARIETY</i>	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
	— <i>dap</i> —	— <i>dap</i> —	— <i>inch</i> —	— <i>Lb. A⁻¹</i> —		— <i>Lb. A⁻¹</i> —		— <i>Lb. A⁻¹</i> —		<i>seeds Lb⁻¹</i>
<i>Claim Jumper</i>	100	40	20.0	2356*	2469*	2821	-	1952	-	1260
<i>SVS-0863</i>	97	42	16.0	2635*	2425*	3118	-	2334	-	1019
<i>Yellowstone</i>	89	38	16.0	2843**	2149	3378	-	1993	-	1269
<i>Y1608-14</i>	96	35	16.0	2609*	2334*	-	-	-	-	1226
<i>Y1609-14</i>	87	34	16.0	2755*	2584**	-	-	-	-	1117
<i>Y1702-22</i>	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 -
<i>HMS Medalist</i>	2.3	17.1**	3461**
<i>Merlin</i>	1.9	20.6*	2285
<i>Valiant</i>	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 -
<i>Adams</i>	2.3	30.8**	3632*
<i>Black Bear</i>	2.6	52.9	3783**
<i>Black Beard</i>	2.7	59.5	3472*
<i>Spectre</i>	2.3	32.5*	3408*
<i>Zenith</i>	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 -
<i>Caldera</i>	3.4	66.5	2814
<i>Cayenne</i>	2.8	43.6**	2848
<i>Viper</i>	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