

MICHIGAN DRY BEAN PERFORMANCE TRIALS

2022



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Michigan Dry Bean Performance Trials 2022

Contents

Introduction	1	Results	2
Table 1. 2022 research trial conditions	1	Table 3. HeadsUp Seed Treatment agronomic and yield results	4
Methods	1		
Table 2. Soil test information.....	2		

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Author

Scott Bales, Dry Bean Specialist
Department of Plant, Soil, and Microbial Sciences
Michigan State University
Email: baslessco@msu.edu
Phone: 989-262-8550

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Introduction

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

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

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

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

County	Co-operator	Planting Date	Nitrogen Rate (Lbs./A)	Nitrogen Application Method	Total GDD ^a	Total Precipitation (Inches)
Bay	Schindler Farms	June 15	50	Broadcast	1,847	11.37"
Huron	Richmond Brothers	June 8	50	2x2	1,868	5.37"
Sanilac	Stoutenburg Farms	June 3	50	Broadcast + 2x2	1,998	8.00"
Tuscola (small & medium seed)	Rayl Farms	June 2	50	2x2	2,108	9.52"

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

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

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

Yield data was obtained by direct harvest for small- and medium-seeded beans. Following harvest, samples were cleaned, weighed, and moisture tested.

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

Location	Percentage of Organic Matter	Soil Type	Soil pH
Bay	2.3	Loam	7.3
Huron	2.2	Loam	7.6
Sanilac	3.5	Loam	7.2
Tuscola	2.5	Sandy Loam	7.1

Results

Tables 3 provides agronomic information including white mold tolerance. The percentage of white mold infection on each replication was calculated in Bay, and Tuscola counties:

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

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

The combined average yield for each entry across all sites in 2022 is also included. The last three rows of the agronomic and yield results tables list the trial average (mean), least significant difference (LSD), and coefficient of variation (CV), respectively, for the data in each column.

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

Table 3. Headsup Seed Treatment agronomic and yield results.

ENTRY	Bay Co. White Mold Infection (%)	Tuscola Co. White Mold Infection (%)	Two Location Average White Mold Infection (%)	Bay (Lbs./A)	Huron (Lbs./A)	Sanilac (Lbs./A)	Tuscola (Lbs./A)	1-year avg. (Lbs./A)
<i>Cruiser Seed Treatment</i>	13	70	46	3076	2311	3315	2909	2973
<i>Cruiser Seed Treatment + HeadsUp (0.5oz cwt⁻¹)</i>	33	66	50	3559*	2509	3189	3211	3117
<i>Cruiser Seed Treatment Fb. HeadsUp (1oz cwt⁻¹)</i>	27	65	46	3802**	2493	3445	3394	3272
MEAN:	25	67	47	3479	2439	3062	3172	3120
LSD_{(0.05):}	NS	NS	NS	298	NS	NS	NS	NS
CV:	44.1%	9.8%	54.2%	6.0%	14.5%	7.6%	12.7%	17.0%

Note. The highest yielding entry in each column is marked with two asterisks. Any entries in the column with yields that were not statistically different from the highest yielding entry are marked with one asterisk. Variety used was 'Black Bear' black bean sourced from cooperative elevator company.