

2023 Early Maturity Soybean Variety Trial

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For a sixth year, Michigan State University Extension received funding from the Michigan Soybean Committee to evaluate early maturing soybean varieties in the Upper Peninsula. Our objective was to inform farmers in Northern Michigan about the performance of soybean varieties adapted to local conditions. This included yield potential of individual varieties, as well as gathering additional information on grain quality and deer preference.

Thirty-two soybean varieties solicited from seed companies and MSU were planted on a commercial farm in Cooks, MI on May 22, 2023. Growing degree-day accumulation from planting to harvest was near normal for Cooks, but total precipitation during this period was approximately four inches below the five-year average. Precipitation was particularly short in the early summer and fall, placing Cooks at D0-D1 on the Drought Monitor June 20 – July 11 and again Aug 22 through harvest. This resulted in delayed emergence, somewhat uneven stands and higher weed pressure, which were all confounding factors. The trial was harvested October 17th using a Wintersteiger plot combine. Forage soybean varieties from Eagle Seed were not harvested due to lack of mature pods (MG 7.0). Seed was cleaned, weighed and yield corrected for moisture content to a standard 13%. Data were analyzed using ANOVA and Tukey's HSD test ($\alpha = 0.05$) in the Agricolae package for R.

Soybean population averaged 130,680 plants per acre (3 plants/ft²). A few varieties had significantly lower populations ($p=0.02$), but grain yield was not correlated with plant stand. The trial averaged 17.76 bu/ac, with the lowest yielding variety producing 13.13 bu/ac and the best performing variety yielding 26.55 bu/ac. The average soybean yield for Michigan's Upper Peninsula is 25.50 bu/ac (Source: USDA NASS). Drought exacerbated site variability, leading to large differences in soybean yield among replicates ($p<0.0001$). However, there were still significant differences among varieties in grain yield ($p=0.08$), protein ($p<0.0001$) and oil concentration ($p<0.0001$).

Since 2019, we have collected evidence demonstrating that soybean tissue sugar (Water Soluble Carbohydrate, WSC) concentration and deer damage vary significantly among soybean varieties, and that deer damage is correlated with soybean tissue sugar concentration. In 2023, we collected tissue samples from our variety entries to again measure WSC concentration. However, due to a shipping error, these samples have yet to be analyzed. We will update this report when the tissue sugar data becomes available in a few weeks.

Many thanks to Michigan Soybean Committee, our seed suppliers and Dave Robere for hosting the 2023 variety trial!

TRIAL DETAILS

PURPOSE:

Compare performance of available performance of available commercial soybean varieties, RM 0.5-2.0, under Northern Michigan conditions

TRIAL LOCATION:

Robere Farms in Cooks, MI on Cookson Trenary silt loam

EXPERIMENTAL DESIGN:

Randomized complete block design with four replications

TRIAL MANAGEMENT:

- Conventional tillage
- Previous crop barley
- 8 seed brands, 32 varieties, RM 0.5-1.9 (7.0 in forage beans)
- Planted May 22, 2023 at 170,000 seeds per acre
- Plots 4' X 16' with 7 in. row spacing
- Borders and alleys planted to minimize edge effect
- 200 lbs. per acre of 0-0-60 potash top-dressed
- Post-emerge herbicide: 5 fl oz/ac Raptor + 2 pt/ac Basagran + 25 oz/ac COC + 7oz/ac Boost



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Table 1. Soybean yield and quality at Cooks, MI by brand and relative maturity.
 (* denotes varieties that performed similarly to the **BEST** variety for a given metric at alpha = 0.05.)

Brand	Variety	MG	Stand (1 ft ²)	Yield (bu/a)	Protein (%)	Oil (%)	Sugar (%)
Asgrow	AG07XF4	0.7	2.63*	17.15	25.16*	22.94	TBD
Asgrow	AG08XF4	0.8	3.13*	14.43	26.47*	22.80	TBD
Asgrow	AG09XF3	0.9	2.75*	16.33	26.03*	21.86	TBD
Asgrow	AO9E33	0.9	1.50	19.83*	23.95*	23.26*	TBD
Asgrow	A10E33	1.0	2.88*	19.40*	25.30*	22.17	TBD
Dairyland	DSR-0585E	0.5	2.88*	16.05	23.46	23.75*	TBD
Dairyland	DSR-0757E	0.7	2.38*	13.20	21.94	22.75	TBD
Dairyland	DSR-0920E	0.9	2.88*	19.23*	25.86*	22.22	TBD
Dairyland	DSR-1290E	1.2	2.13	14.68	21.65	23.94*	TBD
DF	DF 3124 N E3	1.2	3.50*	23.93*	24.29*	23.04	TBD
DF	DF 3143 N E3	1.4	4.13*	21.13*	25.55*	23.73*	TBD
DF	DF 151 N	1.5	5.38	24.95*	25.51*	22.15	TBD
DF	DF 3194 N E3	1.9	3.88*	26.55	23.02	23.91*	TBD
Eagle	Big Fellow	7.0	2.75*	NA	NA	NA	TBD
Eagle	Large lad	7.0	2.88*	NA	NA	NA	TBD
Legend	07E165N	0.7	2.75*	22.33*	26.89*	22.84	TBD
Legend	09E345N	0.9	2.50*	19.58*	23.86	23.51*	TBD
Legend	11E153N	1.1	2.63*	18.15	23.97*	23.59*	TBD
Legend	14E152N	1.4	3.75*	13.90	25.07*	23.69*	TBD
MSU	E19191	1.3	3.13*	13.68	24.03*	22.62	TBD
MSU	E19314T	1.6	3.50*	13.13	27.94	22.72	TBD
MSU	E13268	1.7	3.00*	16.83	23.19	23.90*	TBD
MSU	E20078	NA	3.88*	15.23	26.28*	23.32*	TBD
Pioneer	06A85E	0.6	2.00	15.23	24.23*	23.03	TBD
Pioneer	08A44E	0.8	3.00*	16.08	23.18	23.37*	TBD
Pioneer	14A12E	1.4	3.00*	15.43	27.46*	22.41	TBD
Pioneer	17A87E	1.7	3.50*	17.35	24.91*	22.75	TBD
Pioneer	18A73E	1.8	3.13*	21.70*	25.28*	24.30	TBD
Pioneer	19A37E	1.9	3.38*	19.18*	24.06*	23.39*	TBD
Rob-See-Co	IS0822 E3	0.8	3.38*	16.58	27.27*	23.03	TBD
Rob-See-Co	AGL1150	1.1	1.63	15.95	24.83*	22.74	TBD
Rob-See-Co	AE1930	1.9	2.38*	15.70	22.84	23.45*	TBD
Average		1.6	3.00	17.76	24.78	23.10	TBD

