

## Soybeans

### 2019 EARLY MATURITY VARIETY TRIAL - Escanaba

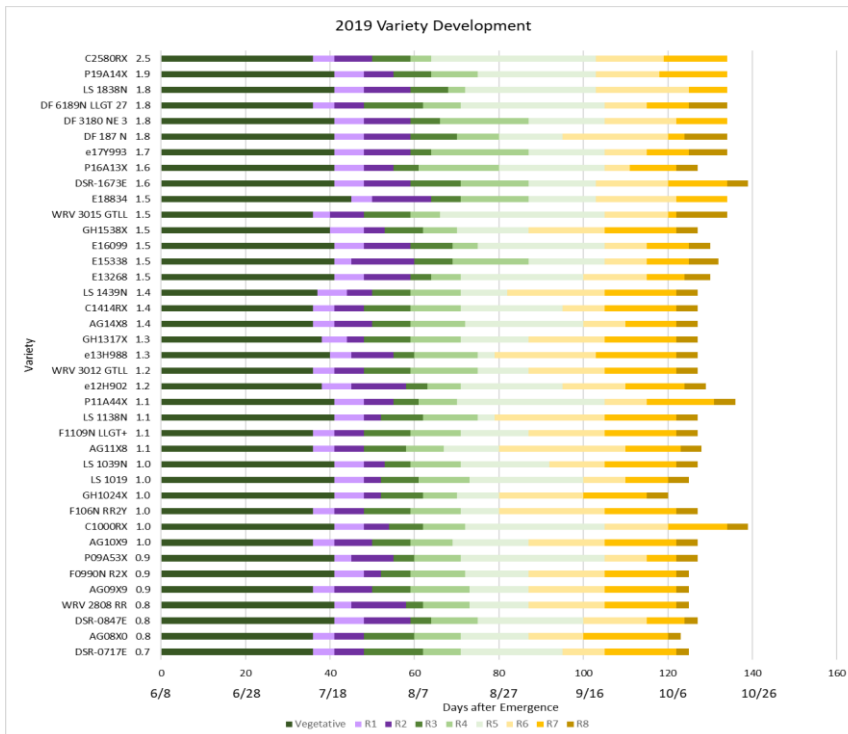
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Approximately 67,000 acres of soybean are planted in Northern MI and the Upper Peninsula (U.P.). Due to the generally short growing season and highly variable environmental conditions present across this large region, tailored variety recommendations are of utmost importance to growers. Public variety performance information for extra-early maturity groups (RM 0.00-1.20) has previously not been available in Michigan.

In 2019, Michigan State University Extension received funding from the Michigan Soybean Promotion Committee to evaluate early maturing soybean varieties at two sites; one in Northeast Lower MI and one in the U.P. (see separate report for NE). 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 variety phenology and susceptibility to white-tailed deer damage.

Thirty-nine soybean varieties were planted in Escanaba, MI on June 3, 2019. We observed the development of, and deer damage to, all varieties weekly in order to record differences between brands, varieties and maturity groups. Growing degree day accumulation from planting to harvest was near normal at this location (1680 base 50). Rainfall was seven inches above the six year average, yet D0 drought conditions occurred mid-September, compromising grain fill.

**Figure 1.** 2019 Soybean phenology by calendar days in Escanaba, MI.



## TRIAL DETAILS

### PURPOSE:

Compare performance of available commercial soybean varieties, RM 0.7-2.5, under Northern Michigan conditions

### TRIAL LOCATION:

MSU Forest Biomass Innovation Center in Escanaba, MI on well-drained Onaway fine sandy loam

### EXPERIMENTAL DESIGN:

Randomized complete block design with three replications.

### TRIAL MANAGEMENT:

- 11 seed brands, 39 varieties, RM 0.7-2.5
- Planted June 3, 2019 at 170,000 seeds per acre
- Plots 4' X 16' with 7 in. row spacing
- Borders and alleys planted to minimize edge effect, fenced for deer
- 200 lbs. per acre of 0-14-42 applied at planting
- Post-emerge herbicide, 4 oz/ac of Raptor + 1 qt basagran + 16 oz of Select

### TAKE AWAYS:

- Soybeans RM 0.7-1.7 are adapted to the S. UP
- Deer preferred soybean varieties with higher soluble sugar.



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Soybeans were harvested October 31<sup>st</sup> using a Winterstieger plot combine. Some of the latest maturing varieties had been killed by frost before drying naturally. Seed was weighed and yield corrected for moisture content to a standard 13%. The trial averaged 47.54 bu/ac, with the lowest yielding variety producing 32.12 bu/ac and the best performing variety yielding 59.28 bu/ac. Yield for the LG variety C2580RX is not reported due to seed contamination. The average soybean yield for Delta and Menominee counties is 41.0 bu/ac (Source: NASS). There were no significant differences in yield between maturity groups in 2019 at the UP or NE locations. However, some varieties with RM >1.7 did not mature before frost in both years of UP trials. Based on our two years of data, soybeans of RM 0.7-1.7 appear to be well adapted to the southern UP. We recommend that growers plant multiple soybean varieties within this range to mitigate weather and agronomic risk.

**Table 1.** Soybean yield in the Escanaba trial by brand and relative maturity. ( \* denotes varieties that yielded similarly to the highest yielding variety at alpha = 0.05.\*\* denotes the highest yielding variety overall)

Brand	Variety	Maturity Group	Yield (bu/ac)	Sig.	Brand	Variety	Maturity Group	Yield (bu/ac)	Sig.
Asgrow	AG14X8	1.4	57.18	*	Legacy Seeds	LS1019	1.0	52.12	*
Asgrow	AG11X8	1.1	46.89	*	Legacy Seeds	LS 1039N	1.0	48.51	*
Asgrow	AG10X9	1.0	50.86	*	LG Seeds	C2580RX	2.5	NA	
Asgrow	AG09X9	0.9	50.14	*	LG Seeds	C1414Rx	1.4	55.60	*
Asgrow	AG08X0	0.8	32.12		LG Seeds	C1000RX	1.0	44.89	*
Dairyland	DSR-1673E	1.6	44.14	*	MSU	E18834	1.8	33.81	
Dairyland	DSR-0847E	0.8	48.68	*	MSU	E16099	1.6	51.88	*
Dairyland	DSR-0717E	0.7	44.87	*	MSU	E15338	1.5	46.54	*
DF Seeds	DF3180NE3	1.8	55.80	*	MSU	E13268	1.3	49.20	*
DF Seeds	DF6189NLLGT27	1.8	51.08	*	Pioneer	P19A14X	1.9	59.28	**
DF Seeds	DF187	1.8	46.44	*	Pioneer	P16A13X	1.6	42.36	*
Federal Hybrids	F1109NLLGT+	1.1	55.24	*	Pioneer	P11A44X	1.1	51.06	*
Federal Hybrids	F106NRR2Y	1.0	43.72	*	Pioneer	P09A53X	0.9	55.04	*
Federal Hybrids	FO99ONR2X	0.9	46.81	*	Wolf River Valley	WRV 3015 GTLL	1.5	44.79	*
Golden Harvest	GH1538X	1.5	48.47	*	Wolf River Valley	WRV 3012 GTLL	1.2	41.40	*
Golden Harvest	GH1317X	1.3	44.85	*	Wolf River Valley	WRV 2808RR	0.8	50.62	*
Golden Harvest	GH1024X	1.0	41.93	*	ZFS	e17Y993	1.7	44.60	*
Legacy Seeds	LS1838N	1.8	38.58	*	ZFS	e13H988	1.3	38.98	*
Legacy Seeds	LS1439N	1.4	48.51	*	ZFS	e12H902	1.2	43.90	*
Legacy Seeds	LS1138N	1.1	52.27	*	Average		1.3	47.54	

We also sought to understand the interaction of soybean forage quality and white-tailed deer feeding in the UP. This was accomplished by comparing deer damage in the field to forage quality of soybean leaves analyzed by Dairyland Labs. Of fifteen forage quality parameters measured, only water soluble carbohydrates (WSC, sugar) was correlated with soybean defoliation (Fig. 2). WSC was positively correlated with mean variety defoliation rated on July 3 & 8, 2019. This finding is similar to our 2018 results showing a negative correlation between starch (vs. simple sugars) in corn silage hybrids and black bear damage. Without replication of forage quality data within varieties, we were not able to identify significant differences in WSC by variety. WSC was not correlated with soybean yield in this study, suggesting that it could be used to select for deer resistant soybeans.

**Figure 2.** Defoliation of soybean varieties on July 8, 2019 by water-soluble carbohydrate content.

