

**2018 Soybean Variety Trials-Yields Summary
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Site Description and Research Methods

Conventional Farm Site

In 2018, a variety trial consisting of 10 organic soybean varieties from 3 companies was conducted in block 2 (mapped as Ipava-Osco silt loam) of the WIU Research Farm. The farm is located ~ 2 miles north of Macomb, IL in central McDonough County. In previous years, the trial was replicated at the WIU Allison organic research farm but only the conventional site was planted in 2018.

Four-row plots were planted on June 6th with a John Deere 4-row plot planter at a rate of 160,000 seeds/a. The plots were arranged in a complete randomized block design with 4 replications. Weed control consisted of a standard non-GMO soybean herbicide program and some weeds were manually removed late in the season.

The weather from planting through mid-August was unusually dry (less than 50% of normal precipitation) and conditions during late August and September were unusually wet (more than 200% of normal precipitation).

The middle 2 rows of the 4 row plots (31'-37' in length) were harvested with a Gleaner Model K plot combine on December 8th. All plots in reps 1-3 were harvested while traveling north to ensure better harvesting since many of the plants were leaning to the south. Rep 4 was harvested last, on December 19th, due to ~2' deep snow drifts on December 8th. The data from rep 4 was compromised by the snow drifts and late harvest and was not included in statistical analyses. The soybeans harvested from each sub-plot were weighed and analyzed for moisture content, and yields (bu/a) were calculated assuming 60 lbs per bushel at 13% moisture.

Results & Discussion

The mean yields of the 10 varieties ranged from 45.3 to 53.0 bu/a, but the least significant difference was large (7.7 bu/a) leading to only 2 significance groups (see table 1).

The top yielding varieties were Blue River Organic Seed (BROS) 39C4 and BROS e3776S, which both yielded 53.0 bu/a. BROS 39C4 is a feed grade variety and one of its key traits is a high yield potential. In 2017, it yielded 65.7 bu/a at the organic site (2nd highest) and 47.4 bu/a at the conventional site (9th highest). It is a medium/tall plant with very good standability according to the BROS website. BROS e3776S is a food grade variety. It is rated 4 out of 5 for yield potential on the BROS website and is listed as having extremely high protein levels (estimated 48.8%).

Historically, BROS 34A7 has been a very consistent top yielding variety at both sites, but in 2017 it was not a top performer at the organic site (9th highest @ 57.5 bu/a) or the conventional site (10th highest @ 40.2 bu/a). This year (2018) it ranked last at our conventional site. Its mean yield (45.3 bu/a) was 7.7 bu/a lower than the highest yielding variety.

We have used BROS 34A7 in organic no-till plots since 2009, and it averaged slightly over 70 bu/a in our no-till experiment in 2016. It is a tall leafy variety that competes well against weeds. One weakness of this variety is its relatively low resistance to soybean cyst nematodes. Variety 34A7 is scored 2 out of 5 (5 being the best score) for nematode resistance on the Blue River Organic Seed website and nematode damage to this variety was observed at the organic site in one field during 2011. It is unlikely that the lower yields in 2017 and 2018 were related to nematode damage.

Table 1: Performance of 10 soybean varieties (3 reps)

Variety	Group	Company/ Source	Traits	Conventional WIU Farm Planted 6/6 Yield (bu/a)	Signifi cance Grou pings	R a n k
39C4	3.9	Blue River Organic Seed	Feed Grade	53.0	a	1
e3776s	3.7	Blue River Organic Seed	Feed/Protein	53.0	ab	2
389N	3.8	Great Harvest Organics	Feed Grade	51.4	ab	3
39DC2	3.9	Blue River Organic Seed	Feed Grade	51.0	ab	4
e3865s	3.8	Blue River Organic Seed	Food Grade	50.8	ab	5
232GH	2.3	Great Harvest Organics	Feed Grade	50.5	ab	6
389F.Y	3.8	Clarkson Grain	Food Grade	49.9	ab	7
IOWA 3051	3.0	Clarkson Grain	Food Grade	47.8	ab	8
330GH	3.3	Great Harvest Organics	Feed Grade	46.5	ab	9
34A7	3.4	Blue River Organic Seed	Feed Grade	45.3	b	10
				LSD = 7.7		

Least Significant Difference (LSD) calculated at $\alpha = 0.05$. Soybean varieties with different letters in the significance group columns are highly likely (95% confidence) to have real, non-random differences in yield. Soybean varieties with the same letter may also have real differences in yield, but there is a 95% chance that the reported numerical differences in yield are the result of random variation.

*The conventional site results are from 3 reps (1-3). Data from rep 4 was not included due to yield loss associated with drifting snow and late harvest.

Conclusion

Ten organic soybean varieties were compared under conventional management. The variation in yield within each variety's replicated plots was nearly as large as variation between varieties so few statistically significant differences were identified. Plot yields ranged from 40.4 bu/a to 61.0 bu/a and mean variety yields ranged from 45.3 to 53.0 bu/a. Considering that the plots were planted relatively late (June 6), experienced unusually dry conditions for most of the growing season and were also harvested late (December 8), all varieties in the trial appear to have good yield potential. We are planning to include BROS 34A7 (a top ranking variety in WIU trials for over a decade) in multiple experiments in 2019 (including a variety trial) and thus will soon have more context for interpreting this variety's lower than expected performance in 2017 and 2018.