

Azuki Beans – An Alternative Pulse Crop in Manitoba

Ten azuki bean lines were identified with good adaptation to Manitoba growing conditions. All lines had lower yield and longer maturity than the navy bean checks, but greater resistance to common bacterial blight and bacterial brown spot. Four of the ten lines had promising yield levels.



AZUKI BEANS ARE an important pulse crop worldwide, especially in China, Japan and Korea. In recent years, production has significantly increased in Ontario, but no production has been reported in Manitoba or other western Canadian provinces.

Research and development of azuki beans in North America is very limited and there are currently no varieties available that are adapted to Manitoba growing conditions. The objective of this study was to investigate the feasibility of growing azuki beans in southern Manitoba.

From a larger collection of azuki lines sourced from the USDA and China, 24 lines were selected and grown in small plot trials at Morden and Winkler in 2017. In 2018 and 2019, 20 to 22 of these lines were grown again at Morden, Portage and Winkler. All azuki beans were compared to the navy bean check varieties, T9905 and Envoy. Agronomic characteristics were measured, including yield, days to maturity (DTM), thousand seed weight (TSW) and plant height. Resistance to common bacterial blight (CBB) and bacterial brown spot (BBS) were also evaluated in the dry bean disease nursery at Morden.

Dry soil conditions during seeding in 2018 and 2019 resulted in low and uneven emergence. The weed pressure experienced in these plots also showed the poor competitive ability of azuki beans compared to other bean types.

In general, azuki bean yields were significantly lower than the navy bean checks. Average azuki yields ranged from 1243–1624 lbs/ac in 2017 and 280–690 lbs/ac

in 2018 (Table 1). Yields were much more variable in 2019 due to poor emergence and snow-covered plots at harvest, ranging from 21–1367 lbs/ac (data not shown). The most comparable azuki lines relative to the navy bean checks were MAZ-3303, MAZ-3320, MAZ-3323 and MAZ-3311 (Table 1). It should be noted that there is a price premium for azuki beans, which may offset lower yields.

All azuki lines matured significantly later than the navy bean checks. Days to maturity (DTM) for azuki beans was 104 to 112 days, compared to 89 to 92 days for navy beans (Table 1). This finding suggests that earlier planting would be more suitable for this alternative bean type, but it comes with the risk of spring frost in Manitoba. Leaves of azuki plants also remained green much longer after pods had matured than the navy bean checks, highlighting the benefit of desiccation.

As for other agronomic characteristics, azuki bean plants were comparable in height to Envoy navy beans, but all lines were significantly shorter than T9905 (Table 1). Seed weights of all azuki lines, except MAZ-3303, were lower than the navy bean check varieties (Table 1).

Assessments of CBB (2018) and BBS (2019) proved that azuki beans had greater resistance than the check variety, Envoy (Table 1), and similar or better resistance ratings than the CBB-resistant checks, HR45 and OAC Rex (data not shown). This finding is promising for farms that deal with high CBB or BBS infections.

Testing the best azuki bean lines will continue at Morden to provide additional evaluations. Future directions from this research would be to assess weed control and proper herbicide selection, as azuki beans are sensitive to injury from common dry bean herbicides. ▀

Table 1. Agronomic performance and disease resistance of the top azuki bean lines compared to navy beans.

Azuki Bean Lines	2017 Yield (lbs/ac)	2018 Yield (lbs/ac)	Days to Maturity (DTM)	TSW (g/1000 seeds)	Plant Height (cm)	CBB Severity (1–5)	CBB Incidence (%)	BBS Severity (1–5)	BBS Incidence (%)
MAZ-3317	1243	431	104	110	39	0	0	3	7
MAZ-3340	1254	448	108	120	39	3	2	3	5
MAZ-3320	1576	690	109	117	40	0	0	3	3
MAZ-3323	1546	507	111	119	43	0	0	3	4
MAZ-3345	1393	280	111	121	38	1	0	3	6
MAZ-3303	1624	680	112	141	45	0	0	3	7
MAZ-3335	1553	348	112	113	40	1	0	2	5
MAZ-3311	1527	492	112	112	47	0	0	3	4
MAZ-3338	1373	383	112	108	41	1	0	3	5
MAZ-3304	1284	473	112	116	48	0	0	3	4
Navy Bean Check Varieties									
Envoy	1974	1971	89	159	41	5	77	3	37
T9905	–	2502	92	161	54	–	–	–	–
CV %	18.7	36	3.8	8.5	6.5	11.2	45.1	4.3	62
LSD (0.05)	342	411	4	21	5	1	2	1	7

CV = coefficient of variation; LSD = least significant difference at a 95% confidence level. Bacterial brown spot (BBS) results are from 2019. Common bacterial blight (CBB) results are from 2018. Severities were rated on a 0 to 5 scale, where 0 = no symptoms, 1 = <5%, 2 = 5–10%, 3 = 10–25%, 4 = 25–50% and 5 = 50–100%.