Organic Evaluation and Increase of a Determinate Buckwheat Variety

Steve Zwinger, Steve Schaubert, Owen Trangsrud, Theresa Podoll, and Verna Kragnes

Buckwheat is a late planted, short-season, broadleaf crop that is adapted to the North Dakota environment. Buckwheat also has a positive impact on a number of ecosystem services including weed suppression, nutrient addition, erosion control, and tilth improvement. Buckwheat, with its long flowering periods and abundant flowers, provides habitat for pollinators. The majority of buckwheat varieties are indeterminate, meaning they will continue to flower and set seed throughout the season until the crop is terminated. This report will focus on the determinate variety, Devyatka, which has an earlier, shorter flowering period and earlier maturity.

In the summer of 2012, the Northern Plains Sustainable Agriculture Society Farm Breeding Club (FBC) members met with agricultural representatives from Ukraine who came to North Dakota to study crop management and to attend trade shows. They provided the FBC with one kilogram each of two of their favorite buckwheat varieties, which are large seeded and determinate in their growth. Results from the initial project “New Buckwheat varieties for Greater Sustainability” can be found in the North Central SARE final report, https://projects.sare.org/project-reports/fnc13-924/.

Only small amounts of seed remained after the initial work was completed in 2014. In 2019, the CREC, in collaboration with NPSAS, increased the remaining seed on the Research Center’s certified organic plot ground. The increase was planted May 31, swathed August 19, harvested August 29 and resulted in 99.6 pounds (1179 lbs/ac) of clean seed to be furthered increased in 2020 along with evaluations to compare the line to currently planted indeterminate varieties.

An organic variety trial was planted at the CREC on May 25 on ground that was previously cover crop. Six currently available buckwheat varieties with the indeterminate growth habit were planted to compare their performance to Devyatka. Conditions were good at seeding with fast uniform emergence that aided in weed control. Devyatka was earlier to flower and mature, it was swathed on August 20 and harvested on September 1. The other varieties were swathed on August 27 and harvested on September 4. Data gathered on flowering (Table 1), illustrate that most of the varieties started to flower 35 to 36 days after planting with Devyatka starting to flower in 30 days. Data also show that this variety is shorter when compared to the other varieties. This reduced height did result in less plant lodging compared to other varieties. Test weight was significantly lower for Devyatka compared to other varieties. Growing conditions and seed yields in the 2020 organic variety trial were excellent, the highest ever recorded in the organic tests at the CREC. Seed yield of Devyatka was good, 1459 lbs/ac, although it was significantly lower than all other varieties tested, with a trial mean of 2066 lbs/ac. Koto was the highest yielding entry at 2362 lbs/ac. Koto also had one of the highest test weights in the trial.

Organic buckwheat variety trial, August 27.

Table 1. Organic Buckwheat Variety Trial, 2020

Variety	Days to Bloom	Plant Height	Plant Lodge	Test Weight	Seed Yield
		inch	0-9	lb/bu	lb/ac
Springfield	36.0	46.7	1.3	47.7	2211
Horizon	35.8	48.6	1.3	47.8	2291
Koma	35.8	42.8	1.8	49.3	1952
Koto	35.0	46.0	1.0	49.3	2362
Manor	34.8	49.2	1.5	48.0	1907
Devyatka	30.0	32.0	0.0	44.9	1459
Green Testa	35.8	46.0	2.0	48.2	1970
Mean	34.7	45.1	1.3	47.8	2066
C.V. (%)	1.5	6.1	60.0	2.2	10.5
LSD 0.05	0.7	4.1	1.2	1.6	320

Seed was increased this year at two locations to insure against severe weather conditions. The main increase was a 1.8 acre planting managed by Owen Trangsrud on a certified organic farm in north central Ransom County, near Enderlin, ND. Plant heights were greater at this location at 49 inches tall with some plants reaching heights of 64 inches. Plant lodging occurred near the end of the growing season due to the tall plant height. The crop was swathed on September 2 and harvested September 12. The field yielded 3740 lbs. of seed or 2077 lbs/ac. This site received more rainfall than the CREC site with 15.76” compared to 9.04” at the CREC. A small backup increase was planted at the CREC that yielded 71 lbs. clean seed or 1085 lbs/ac. Yield at this site was reduced due to deer predation.

The 2020 growing season provided conditions that resulted in higher buckwheat yields. This environment appears to favor the traditional indeterminate varieties. Plans are to continue testing this variety to determine its performance across a range of growing season environments.

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