



Storage Trial Results for the North Dakota Fresh Market Potato Trials

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Over the past three years, we have been evaluating newer cultivars and advancing selections in two different trials, one focused on red-skinned potatoes and the other on yellow-skinned potatoes. The yield results for these trials can be found at z.umn.edu/Potato2019, z.umn.edu/Potato2020 and z.umn.edu/Potato2021.

Alternatively, search for “North Dakota Fresh Market Potato Cultivar/Selection Trial Results” online.

As part of these trials, sub-samples of 20 tubers harvested were placed in small mesh bags and placed into a post-harvest pressure bruise storage test bin at the U.S. Department of Agriculture-Agricultural Research Station (USDA-ARS) Potato Worksite in East Grand Forks, Minnesota.

The pressure bruise chambers were setup to simulate storage in a commercial potato bin at the USDA-ARS Potato Worksite. At harvest, a sub-sample of 20 tubers harvested in September or early October were placed in small mesh bags. All samples were weighed and placed in storage within one day of harvest. Following a period for wound healing, the temperature was slowly reduced to 42 degrees Fahrenheit with 95% relative humidity and an airflow of 1.5 cfm/cwt. A pressure plate was used to provide pressure by incrementally increasing the pressure until it reached 2.1 lb/inch² to simulate pile pressure. Potato tubers remained in the pressure bruise chamber for about five to six months until February or early March. After removing the tubers, they were weighed, and the number and size of pressure bruises were measured.

Standard cultivars were used as benchmarks for other entries, including Red Norland, Dark Red Norland, Red Pontiac and Sangre. For the yellows, industry standards

included Actrice, Agata, Musica and Alegria, serving as benchmarks, depending on the variety you have experience with on your farm operation.

Differences were found among clones for most qualities. Sangre, W8890-1R and Roko (Table 1) were the best storage red clones in 2019-2021. They consistently had fewer pressure bruises, average smaller bruise area and less weight loss following storage. For the yellow-skinned clone trial, only data from 2020-2021 is presented (Table 2) because the 2019 harvest was interrupted by a snowstorm. Of the yellows tested, the data indicate more variability. NDA081451, Obama, CO05037-3, CO10064-1, Actrice and Lanorma had fewer pressure bruises, smaller average bruise area and less weight loss following storage.

The data presented in Tables 1 and 2 were analyzed statistically. These analyses allow the reader to ascertain, at a predetermined level of confidence, if the differences observed among cultivars/selections are reliable or if they might be due to error inherent in the experimental process.



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The LSD (least significant difference) values beneath the columns apply only to the numbers in the column in which they appear. If the difference between two cultivars/selections exceeds the LSD value at 0.05, it indicates with 95% confidence the higher-yielding cultivar/selection significantly differs. An LSD value of 0.1 indicates a 90% confidence or nine times out of ten a difference will be found. When the difference between

two cultivars/selections is less than the LSD value, no significant difference was found between the two clones under these storage conditions.

Coefficient of variation (CV) is expressed as a percentage. The CV is a measure of variability in the trial. Large CVs mean a large amount of variation that could not be attributed to differences in the cultivars/selections.

Table 1. Pressure bruising (flattening) results of red-skinned potato trials from 2019-2021, following five to six months of storage with the temperature of 42 degrees Fahrenheit with 95% relative humidity, and an airflow of 1.5 cfm/cwt at East Grand Forks, MN.

Cultivar/selection	Tuber diameter --- inch ---	Bruises/tuber --- number ---	Mean bruise area/tuber ----- inch ² -----	Average bruise size ---	Weight loss --- % ---
Autumn Rose	2.1	4.7	2.5	0.54	8.9
Cerata	2.4	4.0	2.4	0.64	7.5
CO99076-6R	2.3	4.7	3.1	0.69	9.8
Dark Red Norland	2.3	4.1	2.6	0.70	7.8
Dark Red Norland (Real Potato)	2.4	3.8	2.2	0.61	7.2
ND113207-1R	2.3	4.0	2.2	0.61	7.2
Red Norland	2.5	3.4	2.0	0.62	6.4
Red Pontiac	2.5	3.5	2.2	0.66	7.5
Roko	2.3	2.8	1.4	0.49	5.8
Sangre	2.3	2.2	1.2	0.48	6.0
W8890-1R	2.4	3.7	1.9	0.55	6.1
Mean	2.3	3.7	2.2	0.60	7.3
CV	8	34	33	25	15
LSD p=0.05	0.1	1.0	0.6	0.12	0.9
LSD p=0.1	0.1	0.9	0.5	0.10	0.8



Image 1. Red-skinned potato tubers out of pressure bin with marks on flattening spots.

Table 2. Pressure bruising (flattening) results of the yellow-skinned potato trial, following five to six months of storage with the temperature of 42 degrees Fahrenheit with 95% relative humidity, and an airflow of 1.5 cfm/cwt at East Grand Forks, MN.

Cultivar/selection	Tuber diameter	Bruises/tuber	Mean bruise area/tuber	Average bruise size	Weight loss
	--- inch ---	--- number ---	----- inch ² -----		--- % ---
A00286-3Y	2.3	2.7	1.2	0.47	5.2
Actrice	2.5	2.2	1.1	0.57	4.9
Agata	2.4	2.8	1.4	0.53	5.1
Alegria	2.5	3.2	1.8	0.57	6.5
Arizona	2.4	3.4	1.7	0.54	5.7
Belmonda	2.3	3.8	2.0	0.56	7.6
CO05037-3	2.3	1.9	0.8	0.44	4.4
CO10064-1	2.2	2.1	1.1	0.54	4.7
CO11250-1	2.0	2.6	1.1	0.44	5.9
CO11266-1	2.0	2.7	1.3	0.46	8.0
Crop 56	2.0	3.0	1.3	0.44	6.8
Crop 58	2.4	2.8	1.5	0.57	6.9
Crop 80	2.3	3.0	1.5	0.53	6.7
Electra	2.4	2.4	1.2	0.49	4.8
Jelly	2.3	3.0	1.8	0.58	6.2
Lanorma	2.5	2.2	1.1	0.48	5.3
Montreal	2.5	2.3	1.3	0.55	5.4
Musica	2.2	3.2	1.7	0.54	6.5
ND1241-1Y	2.3	2.3	1.1	0.49	5.8
ND1487-1Y	2.1	2.7	1.5	0.56	7.4
NDA081451	2.4	1.5	0.7	0.50	5.4
Noelle	2.1	2.5	1.1	0.47	5.4
Obama	2.3	1.7	0.8	0.48	4.0
Paroli	2.4	3.4	2.0	0.60	6.5
W15240-2Y	2.2	3.9	2.0	0.54	8.2
Mean	2.3	2.7	1.4	0.52	6.0
CV	8	27	36	28	17
LSD p=0.05	0.2	0.7	0.5	ns	1.0
LSD p=0.10	0.1	0.6	0.4	ns	0.8



Image 2.
Yellow-skinned potato tubers out of pressure bin with marks on flattening spots.

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