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North Dakota Fresh Market Potato

Cultivar/Selection Trial Results for 2021

Andy Robinson

Extension Potato Agronomist,
NDSU/University of Minnesota

Eric Brandvik

Research Specialist, NDSU

Peter Ihry

Agriculture Technician, NDSU

Potato cultivars or selections included in this report were selected from recently released cultivars, advancing selections with release potential (numbered lines progressing through the trial process), or cultivars that are new to the U.S. Standard potato cultivars used by growers served as checks. For comparison, studies conducted in 2019 (<https://www.ag.ndsu.edu/publications/crops/north-dakota-fresh-market-potato-cultivar-selection-trial-results-for-2019>) and 2020 (<https://www.ag.ndsu.edu/publications/crops/north-dakota-fresh-market-potato-cultivar-selection-trial-results-for-2020>) evaluated red and yellow-skinned fresh potatoes.

In 2021, two trials were conducted to identify traits of red- and yellow-skinned potato cultivars and advanced selections at Crystal, N.D. Sixteen red-skinned cultivars and 32 yellow-skinned cultivars were evaluated. Plots were established in a commercial, non-irrigated potato field utilizing common potato-production practices. The authors acknowledge J.G. Hall and Sons for hosting these trials.

Prior to planting, urea at 120 pounds of nitrogen (N) per acre was broadcast and incorporated. A randomized complete block design with four replicates was utilized. Seed tubers were hand cut to approximately 2-ounce seed pieces prior to planting; an exception was the cultivar Obama, which was planted using whole seed tubers.

Tubers were planted on June 17, 2021, in a single row with 9-inch within-row spacing. Plots were 3 feet wide and 30 feet long.

Stand and stem counts on 10 plants in a row in each plot was taken on July 22. Plant stand was measured on 10 plants on Aug. 9. Vine length was measured on three plants from the base of the plant to the vine tip on Aug. 31. Vigor evaluation was completed on

Aug. 31. A rating of 1 indicated least vigor and 5 greatest vigor. Plots were harvested on Sept. 29 and 30 with a single-row plot harvester.

After harvest, potatoes were stored at 55 F until grading. The tuber size profile distribution was determined by sorting all potatoes harvested into C size (less than 1.875 inches), B size (1.875 to 2.25 inches), A size (2.25 to 3.5 inches) and Chef size (greater than 3.5 inches). Total yield is a summation of C + B + A + Chef.

The 2021 agronomic data presented in Tables 1 through 4 were analyzed statistically. Yield data from 2019 and 2020 are presented as averages and were not 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

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they might be due to error inherent in the experimental process.

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 or 0.10, it means that with 95% or 90% confidence, respectively, the higher-yielding cultivar/selection has a significant yield advantage. When the difference between two cultivars/selections is less than the LSD value, no significant difference was found between the two under these growing conditions.

Table 1. Agronomic performance of red-skinned potato cultivars/selections near Crystal, ND, 2021.

Cultivar	Stand ¹	Stem/ plant ²	Vine length ³	Vigor ⁴	Specific gravity
Autumn Rose	83	3.2	3.5	70	1.081
Cerata	89	3.6	3.8	104	1.065
CO99076-6R	79	3.0	3.8	71	1.076
Dark Red Norland	86	3.4	2.0	66	1.074
Dark Red Norland (Real Potato)	86	4.5	3.0	72	1.072
MSW 343-2R	82	1.4	3.5	61	1.059
ND113207-1R	82	3.8	3.0	68	1.065
ND14113Y-9R	85	4.7	4.0	70	1.070
ND1431Y-2R	85	3.2	3.3	72	1.073
ND1455Y-1R	84	3.8	3.0	59	1.074
NDAF113484B-1	86	1.8	3.0	57	1.072
Red Norland	91	3.8	2.3	70	1.072
Red Pontiac	85	3.3	4.0	80	1.071
Roko	87	3.3	4.3	75	1.078
Sangre	67	1.5	3.5	55	1.071
W8890-1R	88	4.1	4.0	76	1.074
Mean	84	3.3	70	3.4	1.072
CV	8	25	12	14	0.2
LSD p=0.05	10	1.2	12	0.7	0.004
LSD p=0.1	8	1.0	10	0.6	0.003

¹ Stand count was taken on July 22 (five weeks after planting) by counting every emerged plant and dividing by the number planted.

² Stems per plant were counted on 10 plants on July 22 (five weeks after planting) and are shown as the average number of stems per plant.

³ Vine length was measured on three plants from the base of the plant to the vine tip on August 31.

⁴ Vigor evaluation was completed on August 31 (11 weeks after planting). A rating of 1 indicated least vigor and 5 greatest vigor.

The CV stands for coefficient of variation and 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.

The data provided does not indicate endorsement or approval by the authors, or NDSU Extension or University of Minnesota Extension. Reproduction of the tables is permissible if presented with all the same information found in this publication (meaning no portion is

deleted and the order of the data is not rearranged).

The authors acknowledge the contribution of cultivars and advanced selections for this work from the breeding programs at North Dakota State University, University of Minnesota, U.S. Department of Agriculture-Agricultural Research Service, Colorado State University, University of Wisconsin, University of Maine, Michigan State University, EBE Farms, Northern Konstar Potatoes, Parkland Seed, Real Potato, Solanum, Southern Potato and SunRain.

Table 2. Graded yield of red-skinned potato cultivars/selections near Crystal, ND, 2021 with total yields compared to previous trial years.

Cultivar	C ¹	B	A	Chef	Total yield			
					2021	2020 ²	2019 ³	3-year average
	-----cwt/a-----							
Autumn Rose	6	88	28	0	122	239	196	186
Cerata	10	79	43	0	132	330	126	196
CO99076-6R	2	53	114	2	170	311	118	200
Dark Red Norland	4	78	91	1	174	370	158	234
Dark Red Norland (Real Potato)	6	99	107	0	212	308	176	232
MSW 343-2R	1	46	103	3	153	356	--	--
ND113207-1R	4	67	103	6	180	283	193	219
ND14113Y-9R	8	77	81	0	166	--	--	--
ND1431Y-2R	3	41	105	3	152	336	--	--
ND1455Y-1R	2	62	58	0	122	195	--	--
NDAF113484B-1	1	49	110	0	159	309	--	--
Red Norland	2	51	129	8	190	326	198	238
Red Pontiac	2	50	142	1	195	295	197	229
Roko	3	92	49	2	146	327	148	207
Sangre	2	32	40	1	74	139	89	101
W8890-1R	5	83	89	0	177	299	197	224
Mean	4	65	87	2	158	295	163	206
CV	54	17	34	246	20	--	--	--
LSD p=0.05	3	16	42	ns	44	--	--	--
LSD p=0.1	2	13	35	ns	37	--	--	--

¹ Harvested potato tubers were sorted on a Kerian Speed sizer as C = less than 1.875, B = 1.875-2.25, A = 2.25-3.5 and Chef = greater than 3.5 inches.

² Complete data from the 2020 trial can be found at <https://www.ag.ndsu.edu/publications/crops/north-dakota-fresh-market-potato-cultivar-selection-trial-results-for-2020>

³ Complete data from the 2019 trial can be found at <https://www.ag.ndsu.edu/publications/crops/north-dakota-fresh-market-potato-cultivar-selection-trial-results-for-2019>

Table 3. Agronomic performance of yellow-skinned potato cultivars/selections near Crystal, ND, 2021.

Cultivar	Stand ¹	Stem/plant ²	Vine length ³	Vigor ⁴	Specific gravity
	%	number	cm		
A00286-3Y	87	3.3	66	4.8	1.078
Actrice	83	3.3	68	2.0	1.064
Agata	81	3.7	62	2.8	1.076
Alegria	81	3.3	75	2.8	1.080
Arizona	84	4.2	63	3.0	1.061
Belmonda	78	3.6	72	4.5	1.084
Cascada	87	4.5	66	4.0	1.072
CO05037-3W/Y	79	5.1	68	2.3	1.082
CO10064-1W/Y	89	4.7	64	3.0	1.088
CO11250-1WY	86	6.4	75	3.8	1.084
CO11266-1W/Y	84	4.3	74	3.3	1.080
Constance	88	4.7	75	3.3	1.081
Crop 56	85	5.0	88	4.0	1.078
Crop 58	81	3.3	74	2.8	1.072
Crop 80	86	4.6	79	4.0	1.076
Dania	80	4.6	76	3.8	1.072
Electra	85	4.8	67	3.3	1.068
Gala	83	4.0	71	3.0	1.075
Jelly	82	3.4	72	4.5	1.074
Lanorma	84	4.0	82	3.3	1.066
Melody	83	2.8	82	3.8	1.067
Montreal	84	3.7	66	2.8	1.074
Musica	81	3.7	76	3.8	1.069
ND1241-1Y	84	2.7	63	3.8	1.091
ND1487-1Y	88	4.9	80	4.0	1.073
NDA081451CB-1CY	88	3.6	72	3.5	1.084
Noelle	90	7.2	68	2.5	1.072
Obama	84	4.6	77	3.3	1.072
Paroli	88	4.4	74	3.0	1.071
W13103-2Y	85	3.4	65	3.3	1.070
W15240-2Y	89	4.3	68	3.0	1.070
W15248-17Y	89	2.4	57	2.3	1.070
Mean	85	4.1	71	3.3	1.075
CV	8	22	12	16	0.6
LSD p=0.05	ns	1.3	12	0.7	0.009
LSD p=0.1	ns	1.1	10	0.6	0.008

¹ Stand count was taken on July 22 (five weeks after planting) by counting every emerged plant and dividing by the number planted.

² Stems per plant were counted on 10 plants on July 22 (five weeks after planting) and are shown as the average number of stems per plant.

³ Vine length was measured on three plants from the base of the plant to the vine tip on August 31.

⁴ Vigor evaluation was completed on August 31 (11 weeks after planting). A rating of 1 indicated least vigor and 5 greatest vigor.



Figure 1.
Research plots near Crystal, ND on July 14, 2021.
(Robinson, NDSU/UMN)

Table 4. Graded yield of yellow-skinned potato cultivars/selections near Crystal, ND, 2021 with total yields compared to previous trial years.

Cultivar	C ¹	B	A	Chef	Total yield			
					2021	2020 ²	2019 ³	3-year average
					----- cwt/a -----			
A00286-3Y	7	82	42	0	130	391	132	218
Actrice	3	70	126	2	201	533	168	301
Agata	1	75	111	3	189	489	193	290
Alegria	2	68	65	5	141	491	132	255
Arizona	2	81	91	1	175	486	206	289
Belmonda	3	75	50	0	128	463	110	234
Cascada	7	106	16	4	134	--	--	--
CO05037-3W/Y	6	100	37	0	143	372	118	211
CO10064-1W/Y	7	108	24	0	139	360	127	209
CO11250-1WY	20	102	8	0	129	329	--	--
CO11266-1W/Y	10	69	5	0	84	309	--	--
Constance	3	98	65	0	165	--	--	--
Crop 56	12	83	2	0	97	352	122	190
Crop 58	2	73	82	4	161	384	162	236
Crop 80	4	100	55	0	159	384	131	225
Dania	5	124	48	0	177	--	--	--
Electra	5	70	9	0	84	476	149	236
Gala	5	113	54	0	172	--	--	--
Jelly	2	93	49	0	143	317	119	193
Lanorma	3	73	30	0	107	380	157	215
Melody	5	65	51	1	122	--	81	--
Montreal	4	70	116	3	192	468	212	291
Musica	4	127	58	0	190	528	155	291
ND1241-1Y	7	77	38	0	123	323	138	195
ND1487-1Y	11	120	38	0	168	431	--	--
NDA081451CB-1CY	4	101	55	0	159	385	112	219
Noelle	17	114	15	0	146	383	130	220
Obama	2	109	107	0	218	541	185	315
Paroli	5	87	111	3	207	457	--	--
W13103-2Y	6	78	94	1	178	--	--	--
W15240-2Y	5	115	49	1	170	329	--	--
W15248-17Y	1	72	36	0	108	--	--	--
Mean	6	90	54	1	151	414	145	241
CV	50	15	42	371	18	--	--	--
LSD p=0.05	4	19	32	ns	38	--	--	--
LSD p=0.1	3	16	27	ns	32	--	--	--

¹ Harvested potato tubers were sorted on a Kerian Speed sizer as C = less than 1.875, B = 1.875-2.25, A = 2.25-3.5 and Chef = greater than 3.5 inches.

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