

# 2021 POTATO VARIETY TRIALS

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## Introduction

New potato varieties were evaluated in 2021 for their productivity and their suitability for fresh market and processing. Potatoes in Malheur County, Oregon, are grown under contract for processors to make frozen potato products for the food service industry and grocery chain stores. There is very little production for fresh pack or open market sales, and very few growers store potatoes on their farms. There is also no local production of varieties for making potato chips.

The varieties grown for processing in Malheur County are mainly ‘Ranger Russet’, ‘Shepody’, and ‘Russet Burbank’. Harvest begins in July and potatoes arrive at processing plants for storage or processing directly from the field.

Prolonged vine health supports increased potato yield, but the “early die” syndrome can limit tuber bulking later than mid-August. Early die causes early senescence of the vines of susceptible varieties such as Shepody and Russet Burbank. A complex of soil pathogens, including bacteria, nematodes, and fungi, particularly *Verticillium* wilt, causes early die in Malheur County. Early die is worse when the crop rotation between potato crops is shorter.

Small acreages of new varieties or advanced selections are sometimes grown under contract to study the feasibility of expanding their use. To replace an existing processing variety, a new potato variety must have numerous outstanding characteristics. The yield should be at least as high as the yield of the currently contracted varieties. The tubers need to have low reducing sugars for light fry color and high specific gravity. A new variety should be resistant to tuber defects or deformities caused by disease, water stress, or heat. It should begin tuber bulking early and grow rapidly for early harvest. Late-harvested varieties resistant to early die can continue bulking into September.

Potato tubers with red to yellow carotenoid or red, blue, and purple anthocyanin pigments are of interest because of the antioxidant properties of these pigments in human nutrition.

Potato variety development trials at the Malheur Experiment Station in 2021 included the Tri-State Russet Trial with 17 entries, the Oregon Statewide Russet Trial with 36 entries, the Preliminary Yield Russet Trial with 130 entries, the National Fry Processing Trial (NFPT) with 65 entries, the Oregon Statewide Specialty Trial of 14 colored-skin and/or colored-flesh potato entries, the Western Region Specialty Trial of 11 colored-skin and/or colored-flesh potato entries, the Preliminary Yield Specialty Trial of 10 colored-skin and/or colored-flesh potato entries, the Oregon Statewide Chip Trial with 10 entries, and the Preliminary Yield Chip Trial

with 23 entries. Through these trials and active cooperation with other scientists in Oregon, Idaho, and Washington, promising new lines are bred and evaluated. Eventually, the lines may be released as new varieties.

## Materials and Methods

The potato variety trials were grown in 2021 on Owyhee silt loam, following winter wheat. After the wheat was harvested in 2020, the stubble was shredded and the field was irrigated to sprout unharvested wheat kernels and then the field was disked and plowed. Based on a soil test, 50 lb nitrogen (N)/acre 44 lb phosphorus/acre, 83 lb potassium/acre, 200 lb sulfur/acre, 11 lb manganese /acre, 2 lb copper/acre, and 1 lb boron/acre were broadcast in the fall of 2020 after plowing. After plowing and groundhogging, the field was fumigated with 20 gal/acre of Telone® II and bedded on 36-inch row spacing in the fall of 2020. On March 30, 2021, 100 lb N/acre and 8 oz/acre of Admire® Pro (imidacloprid) were shanked in the bed center.

Seed of all varieties was cut by hand into 2.5-oz seed pieces, treated with Maxim® MZ (fludioxonil, mancozeb) dust, and stored briefly to suberize. Potato seed pieces were planted using a two-row assist-feed planter with 9-inch seed spacing in 36-inch rows. Red potatoes were planted at the end of each plot as markers to separate the potato plots at harvest, except in the specialty trials where russeted potatoes were used as markers.

The Tri-State Russet Trial was planted on April 6. The Oregon Statewide Russet Trial and the National Fry Processing Trial were planted on April 7. The Western Region Specialty Trial, Oregon Statewide Specialty Trial, Oregon Statewide Chip Trial, Preliminary Yield Chip Trial, and Preliminary Yield Specialty Trial were planted on April 8. The Preliminary Yield Russet Trial was planted on April 9.

All trials, except the preliminary yield trials, had plots that were a single bed wide with 30 seed pieces (23 ft long) replicated 4 times. The preliminary yield trials had plots that were two beds wide with 20 seed pieces (15 ft long) replicated once. The National Fry Processing Trial had plots that were a single bed wide with 30 seed pieces, replicated once for Tier 1 clones, twice for Tier 2 clones, and three times for Tier 3 clones.

After planting, hills were reformed over the rows with a Lilliston Rolling Cultivator. The herbicides Prowl® H<sub>2</sub>O (pendimethalin) at 0.95 lb ai/acre, Dual Magnum® (S-metolachlor) at 1.27 lb ai/acre, Eptam® 7E (S-ethyl dipropylthiocarbamate) at 5 pints/acre, and Roundup® at 2 pints/acre were applied as a tank mix for weed control on April 29. The herbicides were incorporated by sprinkler irrigation with approximately 0.75 inch of water. The herbicides Poast® (sethoxydim) at 2.5 pints/acre and Matrix® (rimsulfuron) at 0.25 oz ai/acre and the fungicides Bravo Weather Stick® (chlorothalonil) at 1 pint/acre and Luna® Tranquility (fluopyram+pyrimethanil) at 11.2 oz/acre were broadcast on June 7 and June 29.

Emergence started on May 5. Irrigations were managed to maintain the soil water tension below 60 cb. Soil water tension was measured at seed piece depth (8-inch depth) using eight Watermark soil moisture sensors (Model 200SS, Irrrometer Co. Inc., Riverside, CA) connected to two RealmFive (Lincoln, NE) Flex dataloggers. Irrigation decisions were based on the average of all eight sensors. Irrigations started on May 18 and ended on September 10, totaling 22 irrigations applying 26 inches of water. Precipitation from emergence to the last irrigation totaled 1.8 inches.

Fertilization during plant growth was based on weekly petiole and soil solution tests starting June 3 and ending August 12. Based on the tissue and soil tests, a total of 52 lb N/acre was applied during the growing season. Fertilizer was injected into the sprinkler system during irrigation.

The vines in the Tri-State Russet Early Trial were flailed on August 19, and on August 26 the potatoes were harvested. For the other trials, the vines were flailed on September 15. The harvest dates were: September 22 NFPT, September 23 PYT2 Russet, September 27 PYT2 Chip, September 29 PYT2 Specialty, September 30 Regional Specialty and State Specialty, October 4 State Chip, and October 5 State Russet.

At harvest, potatoes in each plot were lifted with a two-row digger that laid the tubers back onto the soil in each row. At harvest, visual evaluations were made that included observations of desirable traits (i.e., high yield of large, smooth, uniformly shaped and sized, oblong to long, attractively russeted tubers with shallow eyes evenly distributed over the tuber length). Observations were also made of external tuber defects, including growth cracks, knobs, thumbnail cracks, curved or irregularly shaped tubers, pointed ends, stem-end decay, attached stolons, heat sprouts, chain tubers, folded bud ends, scab, rough skin due to excessive russeting, and pigmented eyes. A note was made for each plot to keep or discard the clone based on the overall appearance of the tubers.

Tubers were placed into burlap sacks and placed in a barn where they were kept under tarps until grading. Tubers were graded by market class (U.S. No. 1 and U.S. No. 2) and weight (<4 oz, 4–6 oz, 6–12 oz, and >12 oz). Tubers were graded as U.S. No. 2 if any of the following conditions occurred: growth cracks, bottleneck shape, abnormally curved shape, or two or more knobs. Marketable tubers are U.S. No. 1 and U.S. No. 2 larger than 4 oz. A 20-tuber sample from each plot was placed into storage. The storage temperature was gradually reduced to 45°F.

After 6 weeks in storage, a 10-tuber sample from each plot of the Tri-State Russet Trial, Oregon Statewide Russet Trial, Preliminary Yield Russet Trial, Oregon Statewide Chip Trial, and Preliminary Yield Chip Trial was evaluated for tuber quality traits for processing. Ten tubers per plot of the Tri-State Russet Trial, Oregon Statewide Russet Trial, and Preliminary Yield Russet Trial were cut lengthwise and the 10 center slices were fried for 2.5 minutes in 375°F soybean oil. For the Oregon Statewide Chip Trial, 10 tubers per plot were cut into 0.06-inch slices and fried for 2.5 minutes in 375°F soybean oil. Percent light reflectance was measured on the stem and bud ends of each slice for the russet varieties using a Photovolt reflectance meter model 577A (Photovolt Instruments, Inc. Minneapolis, MN) with a green tristimulus filter calibrated to read 0% light reflectance on the black standard cup and 77.1% light reflectance on the white porcelain standard plate. For the chip varieties, fry color was rated subjectively on a scale of 1 to 5, where 1 is lightest and 5 is darkest.

Specific gravity of all varieties was measured from a 10-tuber sample from each plot using the weight-in-air, weight-in-water method. All varieties were evaluated for internal tuber defects from a 10-tuber sample from each plot.

Data from all trials were analyzed with the general linear models analysis of variance procedure in NCSS (Number Cruncher Statistical Systems, Kaysville, UT). Means comparisons were made using Fisher's protected LSD (least significant difference) at the 95% confidence level.

## Results and Discussion

In 2021, the months of June and July were unusually hot. Above average air temperature occurred for prolonged periods in June and July (Figures 2 and 3). The average maximum air temperature for July was the highest since records began at the Malheur Experiment Station in 1943 (Table 5). The average low temperatures for June and July were the highest since 1943.

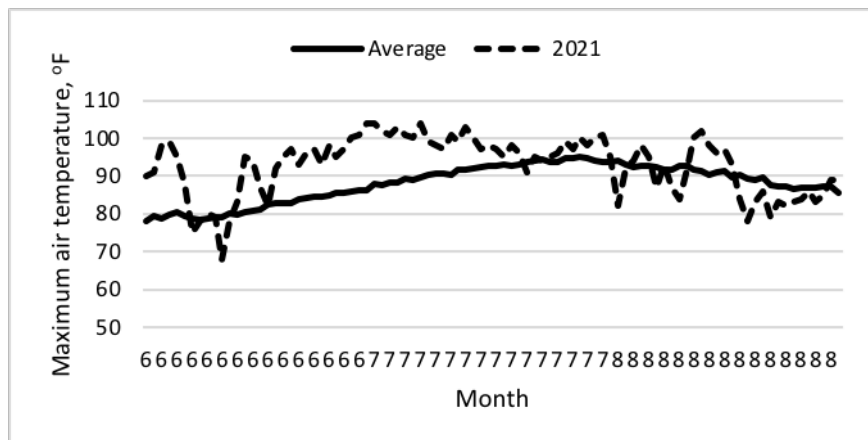


Figure 1. Maximum daily air temperature for June, July, and August in 2021 and the 79-year average. Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

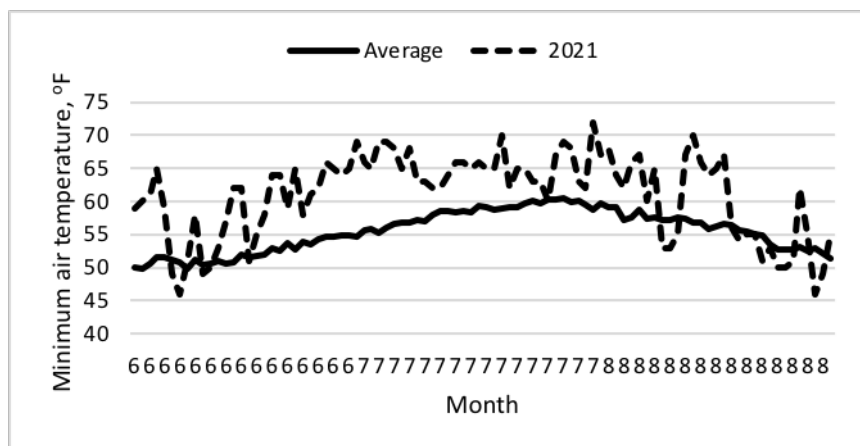


Figure 2. Minimum daily air temperature for June, July, and August in 2021 and the 79-year average. Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Table 1. Monthly average maximum and minimum air temperature (°F) in 2021 and the 79-year averages. Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

		Apr	May	Jun	Jul	Aug
Maximum	2021	66.7	73.5	90.6	98.7	89
	Average	64.3	73.5	81.8	91.9	90.1
Minimum	2021	35.2	47.0	58.9	65.4	58.7
	Average	37.3	45.2	52.1	58.3	55.8

Despite the hot weather, the crop developed normally with minimal pest and disease pressure.

Petiole nitrate levels remained close to the critical level during the season (Figure 3). The soil solution N levels remained above the critical level all season, and the total available soil N remained above 100 lb N/acre until early August (Figures 4 and 5).

Performance data for the cultivars evaluated can be found in tables 2 through 19.

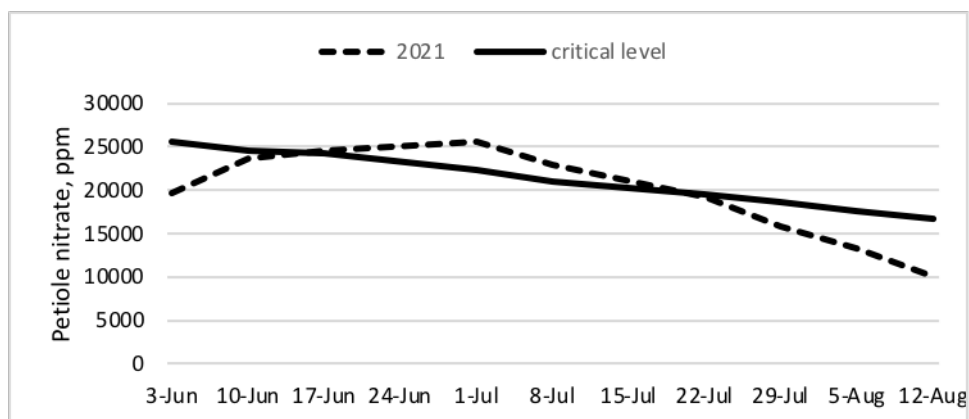


Figure 3. Petiole nitrate over time. Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

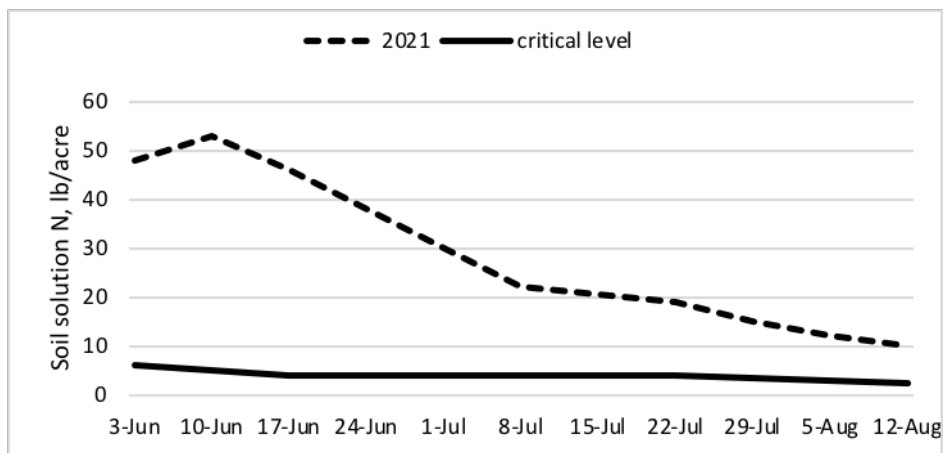


Figure 4. Soil solution N over time. Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

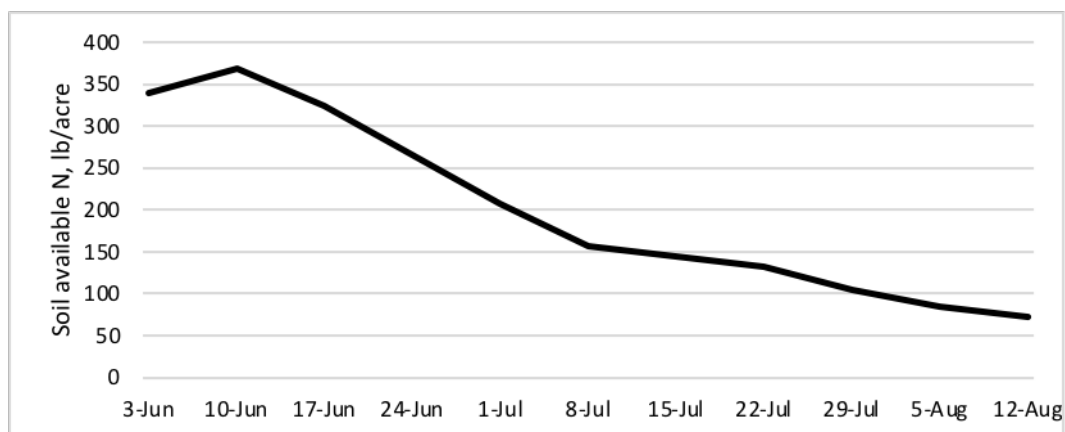


Figure 5. Soil available N over time. Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

## Acknowledgements

This project was funded by the USDA ARS, Oregon Potato Commission, Oregon State University, and Malheur County Education Service District and supported by Formula Grant nos. 2021-31100-06041 and 2021-31200-06041 from the USDA National Institute of Food and Agriculture.

Table 2. Tri-State Russet Trial potato yield, grade, and processing quality, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Variety/Clone	Percent No. 1	Total yield	U.S. No. 1					U.S. No. 2	Marketable	<4 oz	Cull	Average tuber weight	No. of tubers /plant	Length/width	Specific gravity	Average fry color, light reflectance	Sugar ends
			Total	>20 oz	10 to 20 oz	6 to 10 oz	4 to 6 oz										
	%		cwt/acre									oz		ratio	g cm <sup>-3</sup>	----- % -----	
Clearwater Russet	79.8	537	431	0	131	193	106	20	451	85	1	5.1	8.7	1.9	1.077	42.2	5.0
Ranger Russet	62.2	607	380	0	92	176	113	93	473	111	23	4.3	11.7	2.1	1.074	37.6	20.0
Russet Burbank	51.3	578	299	0	88	125	87	107	406	85	87	5.1	9.5	2.1	1.065	28.1	42.5
Russet Norkotah	74.2	429	318	2	79	137	99	15	333	91	5	4.4	8.2	2.1	1.069	31.9	40.0
Shepody	41.7	480	199	0	44	102	52	168	366	74	39	3.9	10.2	2.1	1.068	38.7	25.0
A09086-1LB	78.4	690	542	2	86	274	180	11	553	134	3	4.6	12.3	1.8	1.087	40.8	2.5
A09136-9LB	77.6	512	407	16	197	132	62	40	447	60	5	6.0	7.0	1.8	1.082	38.7	5.0
A10130-1	88.3	589	522	76	290	115	41	27	548	37	4	8.2	5.9	2.2	1.062	36.7	27.5
A10594-4sto	81.6	611	499	0	239	179	81	57	556	55	0	6.0	8.6	1.9	1.079	42.0	2.5
A11175-12TE	68.2	550	375	4	75	155	141	51	426	123	1	4.4	10.3	1.8	1.074	50.5	0.0
A11259-1	61.9	566	356	2	153	128	72	130	486	76	4	5.2	9.1	2.1	1.069	42.9	5.0
A11326-1	74.8	627	470	11	182	193	84	63	533	93	1	4.8	10.9	1.9	1.085	36.0	20.0
A12114-7	71.7	525	386	0	83	202	102	30	416	108	1	4.8	9.1	1.9	1.077	39.3	0.0
A12305-2adg	75.7	800	611	50	323	195	43	107	718	34	48	8.6	7.8	2.1	1.074	43.5	35.0
AFA5661-8	72.8	555	403	21	204	144	35	103	507	47	1	6.5	7.1	1.9	1.088	45.2	7.5
AOR11217-3	79.3	570	452	0	99	217	136	23	475	93	2	5.2	9.1	2.0	1.081	44.7	5.0
AOR13064-2	79.7	479	386	8	142	165	71	19	405	39	36	6.9	5.8	2.0	1.077	44.8	5.0
Mean	71.7	571	414	11	147	167	89	63	476	79	15	5.5	8.9	2.0	1.076	40.2	14.6
LSD (0.05)	9.6	115	128	18	76	66	36	33	134	24	32	1.0	1.5	0.3	0.006	7.1	17.1

NS = not significant

Table 3. Tri-State Russet Trial tuber internal defects, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Variety/Clone	Vascular discoloration	Hollow heart	Internal brown spot	Black spot bruise
	----- % -----			
Clearwater				
Russet	0.0	0.0	0.0	0.0
Ranger Russet	0.0	0.0	12.5	0.0
Russet Burbank	0.0	0.0	0.0	0.0
Russet Norkotah	0.0	0.0	0.0	0.0
Shepody	0.0	0.0	0.0	0.0
A09086-1LB	0.0	0.0	0.0	0.0
A09136-9LB	0.0	0.0	17.5	0.0
A10130-1	0.0	0.0	0.0	0.0
A10594-4sto	0.0	0.0	0.0	0.0
A11175-12TE	0.0	0.0	7.5	0.0
A11259-1	0.0	2.5	0.0	0.0
A11326-1	0.0	2.5	0.0	0.0
A12114-7	0.0	0.0	0.0	0.0
A12305-2adg	0.0	0.0	0.0	0.0
AFA5661-8	0.0	0.0	0.0	0.0
AOR11217-3	0.0	0.0	2.5	0.0
AOR13064-2	0.0	0.0	0.0	0.0
Mean	0.0	0.3	2.4	0.0
LSD (0.05)	NS	NS	10.1	NS

NS = not significant



Table 4. Tri-State Russet Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021. Tuber defect observations are from four plots for each clone. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lowercase letters. Since there were four replicates, a clone could be scored for the same attribute up to four times.

Variety/Clone	K or D	Description
Clearwater Russet	4K	3 curved, 3 pointed, bottleneck, small, 2 heart
Ranger Russet	4D	4 Curved, 4 Irregular, 2 knobs, 2 growth cracks, 2 Pointed, pointed, heart, 2 zero usable
Russet Burbank	4D	4 Irregular, 3 Curved, curved, Knobs, knobs, 4 Pointed, growth cracks, bottleneck, 2 zero usable
Russet Norkotah	4d	3 curved, 2 pointed, Small, 3 small, irregular
Shepody	4D	4 Curved, 3 Knobs, knobs, Irregular, growth cracks, 3 Pointed, heart, 3 zero usable
A09086-1LB	2k, 2d	3 irregular, 3 small, 3 pointed
A09136-9LB	3D, k	2 Pointed, pointed, growth cracks, sprouts, 2 Irregular, 2 Small
A10130-1	4K	growth cracks, 2 pointed, 2 heart, curved, bottleneck, knobs, Big
A10594-4sto	4K	folded bud end, 3 curved, heart, 2 growth cracks, 3 knobs, irregular
A11175-12TE	2d, 2D	2 Small, small, 3 irregular, folded bud end, 2 curved, 2 round, rough
A11259-1	3D, d	3 Irregular, 3 Pointed, pointed, 3 growth cracks, Growth cracks, heart, 2 curved
A11326-1	K, k, 2d	Small, 2 small, Irregular, 3 irregular, 2 growth cracks, bottleneck, pointed
A12114-7	2K, d, D	curved, 2 growth cracks, pointed, heart, 2 small, Small
A12305-2adg	3D, d	3 Pointed, pointed, 4 curved, irregular, 2 heart
AFA5661-8	4D	3 Pointed, pointed, 2 curved, 3 growth cracks, Growth cracks, bottleneck, 3 Irregular
AOR11217-3	2D, 2d	2 Pointed, 2 pointed, growth cracks, Pear, 2 small
AOR13064-2	4D	4 Pointed, 2 curved, irregular, jelly end

Table 5. Oregon Statewide Russet Trial potato yield, grade, and processing quality, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021. Continued on next page.

Variety/Clone	Percent No. 1 %	Total yield	U.S. No. 1					U.S. No. 2	Marketable	<4 oz	Cull	Average tuber weight oz	No. of tubers /plant	Length/width ratio	Specific gravity g cm <sup>-3</sup>	Average fry color, light reflectance %	Sugar ends
			Total	>20 oz	10 to 20 oz	6 to 10 oz	4 to 6 oz										
Ranger Russet	65.2	728.7	471.7	10.7	155.0	215.5	90.5	151.8	623.6	87.0	18.2	5.9	10.3	2.0	1.081	42.1	5.0
Russet Burbank	52.3	667.6	349.8	8.9	124.3	139.5	77.1	156.3	506.1	71.1	90.3	6.7	8.4	2.2	1.072	38.0	37.5
Russet Norkotah	78.2	485.6	379.6	0.0	119.5	164.7	95.4	21.7	401.3	84.3	0.0	5.2	7.7	2.1	1.067	35.0	30.0
AOR10093-11	70.7	787.5	558.1	45.7	288.3	181.3	42.8	163.1	721.2	60.1	6.1	7.8	8.4	1.8	1.084	43.5	2.5
AOR10129-1	86.2	748.3	647.4	25.6	322.4	235.1	64.3	45.0	692.4	47.7	8.2	7.5	8.2	2.0	1.071	44.5	32.5
AOR11027-4	83.9	569.6	479.2	66.7	236.8	121.7	54.0	45.6	524.8	33.2	11.6	8.8	5.4	2.0	1.078	40.6	12.5
AOR12069-3	78.3	529.5	413.0	17.2	207.2	117.8	70.9	15.2	428.2	58.0	43.3	6.6	6.6	1.7	1.087	43.0	2.5
AOR10063-2	83.1	896.2	748.8	40.3	370.9	250.4	87.2	86.6	835.4	51.3	9.5	8.0	9.3	2.0	1.086	43.2	0.0
AOR10071-8	84.7	862.1	730.4	57.2	346.1	238.8	88.4	40.9	771.3	69.6	21.1	7.5	9.5	3.5	1.086	45.8	12.5
AOR15421-4	89.1	706.7	628.2	186.9	321.2	91.4	28.7	51.8	680.0	20.6	6.1	11.3	5.2	1.9	1.061	33.1	5.0
AOR15122-2	70.8	643.1	455.3	68.1	240.1	108.7	38.4	164.9	620.2	22.9	0.0	10.4	5.1	1.8	1.098	50.0	0.0
AOR15122-3	79.6	609.8	486.7	103.9	259.4	85.7	37.8	90.7	577.4	28.7	3.7	9.2	5.5	2.0	1.074	39.6	15.0
AOR15125-2	85.5	730.9	625.5	12.5	236.7	267.9	108.4	37.6	663.1	66.9	1.0	6.9	8.7	2.1	1.066	36.9	10.0
AOR15125-3	82.2	629.4	518.4	15.7	192.6	227.1	83.0	41.4	559.7	52.6	17.0	6.7	7.7	2.3	1.082	47.6	2.5
AOR15194-1	84.6	419.9	355.8	11.8	120.0	156.4	67.7	17.7	373.5	36.2	10.2	6.9	5.0	1.9	1.084	37.1	7.5
AOR15194-2	88.0	703.0	617.7	67.6	339.9	162.1	48.2	43.0	660.7	38.2	4.0	8.7	6.7	1.9	1.084	45.7	2.5
AOR15218-6	84.3	611.7	519.0	8.5	217.6	214.0	78.9	40.7	559.7	51.5	0.4	7.0	7.2	2.1	1.074	49.9	0.0
AOR15227-2	86.0	688.5	592.4	73.0	332.3	133.7	53.4	58.2	650.7	36.6	1.2	8.8	6.5	1.8	1.092	47.6	2.5

Table 6. Continued. Oregon Statewide Russet Trial potato yield, grade, and processing quality, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Variety/Clone	Percent No. 1	Total yield	U.S. No. 1					U.S. No. 2	Marketable	<4 oz	Cull	Average tuber weight	No. of tubers /plant	Length/width	Specific gravity	Average fry color, light reflectance	Sugar ends
			Total	>20 oz	10 to 20 oz	6 to 10 oz	4 to 6 oz										
	%	----- cwt/acre -----										oz		ratio	g cm <sup>-3</sup>	----- % -----	
AOR15288-1	72.0	458.4	332.8	32.4	140.4	106.3	53.6	76.4	409.2	47.8	1.5	7.0	5.5	1.9	1.071	43.9	20.0
AOR15291-1	67.5	630.8	430.5	4.6	122.2	196.3	107.4	99.1	529.6	101.2	0.0	5.4	9.8	1.7	1.081	45.8	0.0
AOR16002-1	85.2	727.6	620.7	35.7	356.1	170.8	58.2	62.6	683.3	35.7	8.5	8.6	7.0	1.8	1.079	44.4	5.0
OR11222-4	70.1	868.1	609.7	61.4	323.7	161.2	63.4	181.7	791.4	66.5	10.2	8.1	8.9	2.1	1.071	46.0	0.0
OR11202-1	90.0	699.4	630.7	119.7	293.0	178.4	39.5	32.1	662.8	36.6	0.0	9.0	6.5	1.8	1.066	41.7	5.0
OR11181-5	74.7	676.0	505.3	55.7	260.1	137.4	52.0	134.0	639.3	35.6	1.1	8.6	6.5	1.7	1.077	38.3	2.5
OR11182-1	90.6	622.7	564.2	33.8	279.0	184.4	67.0	19.8	583.9	36.5	2.2	8.2	6.3	1.9	1.080	40.4	2.5
AOR15144-2	72.1	855.8	625.1	8.9	252.4	240.5	123.3	121.2	746.2	108.9	0.6	5.9	11.9	1.7	1.090	47.1	10.0
AOR15152-2	72.3	1048.4	759.2	160.0	346.4	176.8	75.9	223.0	982.1	54.5	11.8	9.6	9.0	1.9	1.083	43.5	0.0
AOR15152-4	88.1	768.2	675.9	78.8	355.2	190.4	51.5	59.6	735.5	32.1	0.6	9.5	6.7	2.0	1.088	43.1	0.0
AOR15219-2	76.8	846.6	651.0	32.5	321.1	225.0	72.4	142.4	793.4	53.2	0.0	7.8	9.0	1.8	1.090	49.8	0.0
AOR15292-3	66.7	699.6	468.3	14.8	213.4	153.8	86.4	175.5	643.8	55.2	0.6	7.0	8.3	1.8	1.084	42.5	10.0
AOR16032-1	72.6	555.8	404.1	4.0	142.9	166.5	90.7	81.5	485.6	70.0	0.2	6.4	7.3	2.0	1.074	44.6	0.0
AOR16039-4	82.7	823.6	678.6	33.6	333.7	241.4	69.8	91.4	770.0	46.6	7.0	8.2	8.4	2.0	1.069	29.9	12.5
AOR16050-1	84.4	848.1	717.9	50.8	337.4	250.0	79.6	86.4	804.2	41.4	2.5	8.5	8.3	1.8	1.085	44.8	2.5
AOR16072-9	88.5	542.5	480.9	74.9	248.5	119.7	37.8	37.1	518.0	24.4	0.2	9.0	5.1	1.6	1.103	49.0	0.0
AOR16078-3	74.3	879.6	655.7	52.8	278.9	228.0	95.9	23.2	678.8	63.4	137.4	7.7	9.5	1.7	1.069	39.9	5.0
AOR15100-1	88.0	671.5	594.8	47.2	317.4	175.9	54.2	23.0	617.7	38.9	14.8	8.2	6.8	1.7	1.080	43.5	2.5
Mean	79.1	701.1	555.1	47.8	259.8	178.2	69.3	81.7	636.8	51.8	12.5	7.9	7.6	1.9	1.080	42.8	7.2
LSD (0.05)	8.0	127.1	128.6	46.9	93.1	55.0	21.6	37.4	133.6	20.7	31.9	1.2	1.3	NS	0.006	8.4	16.8

Table 7. Oregon Statewide Russet Trial tuber internal defects, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Variety/Clone	Vascular discoloration	Hollow heart	Internal brown spot	Black spot bruise
	----- % -----			
Ranger Russet	0.0	0.0	0.0	0.0
Russet Burbank	0.0	0.0	0.0	0.0
Russet Norkotah	0.0	0.0	0.0	0.0
AOR10093-11	0.0	0.0	0.0	0.0
AOR10129-1	0.0	0.0	7.5	0.0
AOR11027-4	0.0	0.0	5.0	0.0
AOR12069-3	0.0	0.0	25.0	0.0
AOR10063-2	0.0	0.0	0.0	0.0
AOR10071-8	0.0	0.0	0.0	0.0
AOR15421-4	0.0	0.0	12.5	0.0
AOR15122-2	0.0	0.0	0.0	0.0
AOR15122-3	0.0	0.0	0.0	0.0
AOR15125-2	0.0	0.0	32.5	0.0
AOR15125-3	0.0	0.0	0.0	0.0
AOR15194-1	2.5	0.0	5.0	0.0
AOR15194-2	0.0	0.0	0.0	0.0
AOR15218-6	0.0	0.0	0.0	0.0
AOR15227-2	0.0	0.0	0.0	0.0
AOR15288-1	0.0	0.0	0.0	0.0
AOR15291-1	2.5	0.0	2.5	0.0
AOR16002-1	0.0	0.0	2.5	0.0
OR11222-4	0.0	0.0	0.0	0.0
OR11202-1	0.0	0.0	5.0	0.0
OR11181-5	0.0	0.0	0.0	0.0
OR11182-1	0.0	0.0	0.0	0.0
AOR15144-2	0.0	0.0	0.0	0.0
AOR15152-2	0.0	0.0	2.5	0.0
AOR15152-4	0.0	0.0	0.0	0.0
AOR15219-2	0.0	0.0	0.0	0.0
AOR15292-3	0.0	0.0	5.0	0.0
AOR16032-1	0.0	0.0	0.0	0.0
AOR16039-4	0.0	2.5	50.0	0.0
AOR16050-1	0.0	0.0	0.0	0.0
AOR16072-9	0.0	0.0	0.0	0.0
AOR16078-3	0.0	0.0	0.0	0.0
AOR15100-1	0.0	0.0	2.5	0.0
Mean	0.1	0.1	4.4	0.0
LSD (0.05)	NS	NS	10.8	NS

NS = not significant.

Table 8. Oregon Statewide Russet Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021. Tuber defect observations are from four plots for each clone. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lowercase letters. Since there were four replicates, a clone could be scored for the same attribute up to four times.

Variety/Clone	K or D	Disposition
Ranger Russet	3D, d	Curved, 3 curved, club end, 3 growth cracks, 4 pointy, 2 knobs, 3 bottleneck
Russet Burbank	4D	2 Curved, 2 curved, 2 Bottleneck, bottleneck, 4 knobs, 2 growth cracks, 2 pointy, small
Russet Norkotah	2K, 2k	heart, curved, 4 small, pointy
AOR10093-11	3D, k	heart, knobs, pointy, growth cracks, club end
AOR10129-1	3k, D	2 knobs, bottleneck, 2 growth cracks, 3 pointy, Pointy, pear, heart, 3 curved
AOR11027-4	2d, 2D	knob, 3 pointy, Pointy, jelly end rot, 2 pear, 3 bottleneck, 2 pear, 3 curved
AOR12069-3	4 D	2 Pointy, pointy, irregular, curved, 3 Pear, bottleneck, small
AOR10063-2	3d, D	3 pointy, Pointy, heart, 3 curved, Curved, 2 growth cracks, 2 heart, knobs
AOR10071-8	3d, k	growth cracks, bottleneck, 4 pointy, 2 pear, 2 dumbbell, curved
AOR15421-4	3K, k	water rot, 4 heart, Pointy, pointy, 2 curved, water rot
AOR15122-2	D	bottleneck, growth cracks, curved, pointy, club end
AOR15122-3	2D	alligator hide, 2 curved, heart, 2 Pointy, growth cracks
AOR15125-2	3k, K	3 pointy, small, 4 curved, growth cracks, heart
AOR15125-3	4D	bottleneck, 4 Pointy, dumbbell, curved, growth cracks
AOR15194-1	3d, k	3 pointy, Pointy, low yield, heart, 2 pear, small
AOR15194-2	D,d,2k	2 Pointy, 2 pointy, pear, dumbbell, curved
AOR15218-6	2d, 2D	3 bottleneck, Bottleneck, growth cracks, 2 pear, 2 pointy, Pointy, heart, curved
AOR15227-2	2k, 2d	4 pointy, 2 bottleneck, 3 curved, Curved, growth cracks,
AOR15288-1	3D, d	2 growth cracks, bottleneck, 4 pointy, small, knobs, curved, Curved, heart, low yield
AOR15291-1	2D, d, k	Pointy, 2 pointy, growth cracks, 2 knobs, curved, 2 pear, bottleneck, small, Small, sprouts, round
AOR16002-1	3d, k	3 pointy, Pointy, heart, pear, curved, 2 knobs
OR11222-4	3D, k	Curved, 3 curved, 3 growth cracks, bottleneck, Thin, thin, pointy, heart
OR11202-1	2k	growth cracks, pear, 2 pointy
OR11181-5	4D	3 growth cracks, Growth cracks, 2 bottleneck, 2 pointy, pear, 4 curved, 3 heart, small
OR11182-1	2k, 2d	heart, 3 pointy, Pointy, pear, 2 growth cracks, curved, bottleneck
AOR15144-2	4D	Small, 2 small, Pointy, pointy, 2 pear, Pear, 2 bottleneck, 2 curved, knobs, heart
AOR15152-2	2D, d, k	4 pointy, 3 bottleneck, Bottleneck, 4 curved, 2 growth cracks, Growth cracks, heart
AOR15152-4	3k, d	4 pointy, 4 curved, 3 heart, bottleneck, knobs, pear
AOR15219-2	3D, d	3 bottleneck, 2 pear, 3 growth cracks, irregular, 4 curved, 2 heart, dumbbell, 2 pointy, Pointy, greening
AOR15292-3	2D, 2d	4 growth cracks, 3 curved, Curved, small, knobs, bottleneck, heart, alligator hide
AOR16032-1	3D, d	2 heart, irregular, 3 pointy, 3 growth cracks, 4 curved, dumbbell, heart, bottleneck, 2 small
AOR16039-4	3k, d	4 pointy, 4 curved, 4 growth cracks, knobs, dumbbell, small
AOR16050-1	D, 2d, k	2 heart, 2 bottleneck, 4 pointy, 2 pear, curved, 2 growth cracks
AOR16072-9	3d, K	small, round, 3 pointy, 4 bottleneck, growth cracks, 3 heart
AOR16078-3	3D, k	Jelly end rot, jelly end rot, 2 Pear, pear, Pointy, pointy, bottleneck, small
AOR15100-1	3d, D	3 heart, curved, 3 pointy, Pointy, bottleneck, dumbbell, Pear, pear

Table 9. National Fry Processing Trial yield, grade, and processing quality for Tier 1 varieties (one replicate), Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Tier	Variety/Clone	Total yield	>10 oz	6 to 10 oz	4 to 6 oz	U.S. No. 2	<4 oz	Cull	Specific gravity
		----- cwt/acre -----							g cm <sup>-3</sup>
1	AOR15166-2	873.5	537.7	189.2	59.6	38.9	48.2	0.0	1.092
	AOR12069-3	531.8	236.8	143.9	60.3	21.3	62.0	7.4	1.088
	AOR10063-2	994.4	453.9	252.1	111.8	87.2	89.4	0.0	1.089
	AOR10071-8	725.7	306.7	151.0	88.4	103.4	76.3	0.0	1.073
	COTX08063-2Ru	682.5	258.3	268.7	72.2	23.6	59.7	0.0	1.103
	AF6075-8	860.2	502.1	117.8	36.1	171.0	25.2	8.1	1.067
	AF6086-7	576.2	127.8	191.6	138.2	31.0	87.6	0.0	1.073
	AF6110-3	512.1	36.1	246.0	155.9	6.1	68.0	0.0	1.076
	AF6338-6	733.1	141.9	275.7	81.4	179.0	51.3	3.8	1.086
	AF6377-12	709.2	421.7	161.0	31.0	51.0	44.5	0.0	1.101
	AF6384-2	838.6	273.3	182.0	94.9	232.3	56.1	0.0	1.071
	COAF13066-1	666.2	61.6	225.7	120.0	132.9	122.4	3.7	1.079
	WAF14006-6	848.2	556.0	209.3	31.6	13.3	36.7	1.3	1.081
	A15041-13	665.9	518.5	79.8	22.0	27.2	18.4	0.0	1.064
	A13074-1TE	891.1	449.5	163.0	35.6	198.0	44.9	0.0	1.075
	A13085-2	629.1	143.2	198.6	167.7	23.2	90.4	6.0	1.072
	A11887-5adg	966.6	495.3	108.2	95.6	203.0	61.6	3.0	1.067
	A12303-4sto	647.0	136.8	201.3	107.6	104.4	88.4	8.7	1.089
	A14026-16adg	882.0	93.3	264.8	170.8	282.0	71.2	0.0	1.085
	COA15494-8	543.0	168.6	97.8	47.6	137.5	90.2	1.3	1.073
	A15008-2TE	653.9	172.4	235.6	118.1	18.0	109.8	0.0	1.059
	A15028-16	535.2	110.1	224.3	90.4	43.2	66.0	1.3	1.076
	A15094-11	1031.8	430.4	251.7	117.5	128.9	99.4	3.9	1.070
	A15094-13	949.5	249.6	145.7	56.7	407.3	85.7	4.5	1.078
	A15258-1	824.4	273.3	313.6	77.2	90.9	69.5	0.0	1.070
	A07914-4CR	693.4	248.8	166.9	99.5	135.9	37.4	4.8	1.067
	A15190-8CR	949.0	482.4	118.4	66.2	188.4	85.2	8.4	1.074
	A15042-1	513.0	117.8	120.7	69.7	140.4	64.5	0.0	1.073
	A16117-4	716.3	257.0	185.2	68.2	175.3	30.6	0.0	1.076
	A15099-10PMTV	723.7	465.9	161.0	30.3	14.5	38.4	13.6	1.079
	A14057-4adg	904.6	67.4	142.2	113.6	475.0	106.4	0.0	1.073
	ND1413YB-1Russ	740.2	446.9	126.2	40.7	90.4	36.1	0.0	1.075
	ND14130C-4Russ	699.2	13.2	134.9	191.3	162.6	197.2	0.0	1.078
	AC12080-4RU	587.9	113.6	202.1	158.0	26.5	87.7	0.0	1.073
	AC12090-3RU	696.6	189.4	260.5	128.2	59.2	59.4	0.0	1.070
	CO13003-1RU	678.4	284.0	213.4	134.2	4.5	38.6	3.6	1.075

Table 10. National Fry Processing Trial yield, grade, and processing quality for Tier 2 (two replicates) and Tier 3 (three replicates) varieties, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Tier	Variety/Clone	Total yield	>10 oz	6 to 10 oz		U.S. No. 2			Specific gravity
				4 to 6 oz	cwt/acre	<4 oz	Cull	g cm <sup>-3</sup>	
2	CO12378-1RU	614.4	53.4	151.2	176.8	50.3	182.8	0.0	1.085
	A09136-9LB	573.6	179.2	129.8	70.8	99.4	77.7	16.6	1.076
	A10020-3sto	714.5	279.7	168.8	81.2	121.2	62.4	1.1	1.069
	A10635-2VR	632.8	2.1	44.3	146.5	165.9	270.8	3.2	1.080
	A12304-1sto	774.4	148.7	325.3	142.9	27.8	129.7	0.0	1.092
	A12305-2adg	924.3	498.5	177.0	63.9	147.8	33.0	4.1	1.081
	A12327-5	1053.4	624.5	137.2	62.0	188.2	41.1	0.3	1.075
	A13036-1	905.1	346.9	113.3	48.3	348.5	31.7	16.4	1.080
	A13038-3	816.0	478.4	117.5	28.2	163.2	28.6	0.0	1.077
	AFA5661-8	827.4	271.9	126.4	43.8	342.7	42.6	0.0	1.084
	AF5736-16	648.3	399.6	166.5	48.7	12.7	20.8	0.0	1.082
	AAF10596-1	650.1	260.2	179.6	45.0	111.8	53.4	0.0	1.080
	COAF11018-10	509.9	183.1	136.9	91.4	33.1	65.4	0.0	1.083
	AF5521-1 (CY19)	598.2	88.5	219.3	108.6	138.2	43.6	0.0	1.075
	ND1412Y-5Russ	849.2	235.4	345.4	91.4	131.3	43.5	2.1	1.082
	ND14110B-1Russ	608.8	230.9	140.4	59.3	130.1	44.2	3.9	1.080
	AOR10093-11	944.8	432.2	156.9	52.8	255.9	44.8	2.1	1.090
	AOR10129-1	747.4	360.1	199.9	66.1	72.3	49.0	0.0	1.073
	AOR11027-4	480.3	209.8	138.5	46.1	54.9	25.6	5.4	1.069
	Mean	730.1	278.1	167.1	77.6	136.6	67.9	2.9	1.080
LSD (0.05)	168.6	145.1	116.2	42.3	64.5	29.7	9.7	0.008	
3	AF5707-1	939.9	66.2	214.8	279.4	138.4	240.2	0.8	1.079
	AF5750-16	773.5	90.0	276.1	210.3	58.7	138.4	0.0	1.071
	AOR13064-2	564.8	295.8	141.1	65.6	31.1	28.8	2.3	1.074
	CO11009-3RU	777.8	303.6	264.5	102.1	65.8	38.1	3.7	1.099
	A09086-1LB	884.0	217.5	343.6	178.8	47.6	96.5	0.0	1.086
	A12314-1sto	571.7	200.1	156.2	72.8	106.3	36.3	0.0	1.073
	W13A11229-1rus	816.0	111.1	206.2	185.7	162.6	149.4	1.0	1.079
	ND12241YB-2Russ (CY19)	553.7	194.5	215.7	88.7	24.9	29.9	0.0	1.087
	<i>Russet Burbank</i>	817.4	179.6	120.3	62.4	299.6	75.2	80.3	1.064
	<i>Ranger Russet</i>	722.5	153.4	207.3	123.6	136.2	93.4	8.7	1.077
	Mean	742.1	181.2	214.6	136.9	107.1	92.6	9.7	1.079
LSD (0.05)	162.3	99.5	86.2	75.2	86.2	33.8	28.5	0.020	

NS = not significant.

Table 11. Oregon Statewide Specialty Trial yield and grade of colored-flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Variety/Clone	Total yield	<1¼ inch	U.S. No. 1					U.S. No. 2	Cull	Average tuber weight	No. of tubers /plant	Length/width	Specific gravity
			<4 oz	4 to 6 oz	6 to 10 oz	10 to 14 oz	>14 oz						
----- cwt/acre -----										oz	ratio	g cm <sup>-3</sup>	
Yukon Gold	467.1	14.5	54.2	83.9	142.4	88.6	60.3	22.3	0.9	5.8	6.6	1.0	1.072
Chieftain	894.8	46.0	111.9	159.6	255.3	150.4	53.5	115.8	2.2	5.0	14.8	1.2	1.066
Purple Majesty	662.0	138.1	229.3	88.3	54.9	14.8	0.9	135.6	0.0	2.6	21.4	1.5	1.073
COOR15235-3	210.5	128.2	69.0	9.4	0.6	0.0	0.0	1.9	1.5	1.2	14.2	1.3	1.082
COOR15108-1	645.6	73.2	201.3	179.2	162.0	13.2	0.0	14.2	2.5	3.3	16.1	1.2	1.085
COOR15113-3	445.0	56.7	145.4	132.3	75.8	5.6	1.6	18.8	8.6	2.9	12.8	1.2	1.054
COOR15207-9	499.4	118.7	195.6	77.5	62.8	27.3	7.7	7.7	2.0	2.5	16.1	1.2	1.080
POR18PG15-1	363.6	94.5	87.9	42.8	14.1	1.0	0.0	90.1	33.1	1.9	15.8	1.7	1.070
POR18PG37-2	662.6	228.8	262.3	99.7	38.8	1.0	0.0	30.7	1.3	1.8	30.5	1.2	1.086
POR18PG37-4	594.2	278.4	252.3	40.5	5.8	0.0	0.6	12.7	3.9	1.6	30.0	1.1	1.079
POR18PG54-1	521.1	7.3	47.3	90.5	236.8	116.4	13.9	5.4	3.6	6.2	6.9	1.1	1.064
NDOR13140B-1	468.3	80.2	190.9	109.6	75.4	6.5	1.4	2.3	1.9	2.7	14.1	1.1	1.067
POR17PG64-2	831.4	87.0	218.5	203.1	198.0	43.7	6.3	74.3	0.5	3.4	20.5	1.5	1.067
POR18NCK5-4	438.9	14.5	68.6	102.6	122.6	75.7	36.9	13.2	4.8	5.2	6.9	1.3	1.069
Mean	550.3	97.6	152.5	101.4	103.2	38.9	13.1	38.9	4.8	3.3	16.2	1.3	1.072
LSD (0.05)	141.2	33.7	40.3	35.1	50.2	34.3	22.6	46.5	4	0.64	3.9	0.16	0.006



Table 12. Oregon Statewide Specialty Trial tuber internal defects of colored-flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Variety/Clone	Vascular discoloration	Hollow heart	Internal brown spot	Black spot bruise
----- % -----				
Yukon Gold	0	0	12.5	0
Chieftain	0	0	7.5	0
Purple Majesty	0	0	0	0
COOR15235-3	0	0	0	0
COOR15108-1	0	0	2.5	0
COOR15113-3	0	2.5	0	0
COOR15207-9	0	0	0	2.5
POR18PG15-1	0	0	12.5	5
POR18PG37-2	0	0	0	0
POR18PG37-4	0	0	0	2.5
POR18PG54-1	0	0	2.5	0
NDOR13140B-1	0	0	0	0
POR17PG64-2	0	0	5	0
POR18NCK5-4	0	0	5	0
Mean	0	0.2	3.4	0.7
LSD (0.05)	NS	NS	7.7	NS

NS = not significant.

Table 13. Oregon Statewide Specialty Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021. Tuber defect observations are from four plots for each clone. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lowercase letters. Since there were four replicates, a clone could be scored for the same attribute up to four times.

Variety/Clone	K or D	Description
Yukon Gold	3d, k	flaky skin, 2 growth cracks, pointy, water rot, 2 too big, lumpy
Chieftain	2D, d, k	2 dull, 2 large, 2 growth cracks, irregular, chain tubers, sprouts
Purple Majesty	3D, d	3 Sprouts, pointy, bottleneck, flaky skin
COOR15235-3	2D, K, k	2 low yield
COOR15108-1	2K, 2k	
COOR15113-3	3D, d	3 Sprouts, sprouts
COOR15207-9	4K	
POR18PG15-1	4D	4 Sprouts
POR18PG37-2	3k, K	flaky skin, sprouts, sticky stolon
POR18PG37-4	4K	pointy
POR18PG54-1	2k, 2k?	growth cracks, large
NDOR13140B-1	2K, 2k	
POR17PG64-2	2k, 2d	knobs, large, 2 sprouts, chain tubers, growth cracks
POR18NCK5-4	K, 2k?, D	growth cracks, large, ugly

Table 14. Western Region Specialty Trial yield and grade of colored-flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Type	Variety/Clone	Total yield	U.S. No. 1					Cull	Average tuber weight	No. of tubers /plant	Length/ width	Length/ depth	Specific gravity
			<2 oz	2 to 4 oz	4 to 6 oz	6 to 10 oz	>10 oz						
			----- cwt/acre -----						oz		ratio	ratio	g cm <sup>-3</sup>
Red skin/White Flesh	Chieftain	909.8	55.2	132.3	168.7	225.5	164.3	163.8	4.5	16.6	1.20	1.75	1.061
	Red LaSoda	1078.9	23.6	59.5	96.5	170.3	347.2	382.0	7.5	11.9	1.09	1.71	1.07
	Modoc	625.7	36.9	127.5	148.3	180.3	109.5	23.2	4.3	12.1	1.10	1.49	1.069
	A08122-12Rsto	826.0	70.2	222.9	221.7	229.6	45.3	36.4	3.7	18.5	1.10	1.52	1.076
	NDA8512C-1R	422.5	20.8	87.4	99.9	135.7	67.8	11.0	4.5	7.8	1.06	1.39	1.065
Yellow Flesh	Yukon Gold	493.8	12.6	56.6	94.3	162.5	140.5	27.2	5.7	7.1	1.16	1.68	1.074
	A08120-4Y	545.2	237.3	250.5	39.8	3.4	0.0	14.2	1.7	25.9	1.16	1.68	1.066
	AORTX09037-1W/Y	885.2	103.7	349.0	228.3	136.2	24.0	44.0	3.2	22.9	1.16	1.58	1.082
	CO11250-1W/Y	873.1	110.9	324.0	238.9	127.1	9.2	63.0	2.8	26.5	1.32	2.00	1.09
	CO11266-1W/Y	667.2	134.9	209.1	134.1	83.5	9.3	96.3	2.3	24.7	1.34	1.85	1.074
	COTX10118-4Wpe/Y	883.9	101.3	253.1	203.7	178.0	53.2	94.6	3.3	22.2	1.14	1.75	1.065
	Mean	746.5	82.5	188.3	152.2	148.4	88.2	86.9	4.0	17.8	1.17	1.67	1.072
	LSD (0.05)	145.6	33.2	54.3	47.3	58.9	58.0	61	0.74	4.5	0.08	0.14	0.007

Table 15. Western Region Specialty Trial tuber internal defects of colored-flesh clones, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Type	Variety/Clone	Vascular discoloration	Hollow heart	Internal brown spot	Black spot bruise
		----- % -----			
Red skin/White Flesh	Chieftain	0	0	7.5	0
	Red LaSoda	0	0	2.5	0
	Modoc	0	0	0	2.5
	A08122-12Rsto	0	0	7.5	7.5
	NDA8512C-1R	0	0	0	2.5
Yellow Flesh	Yukon Gold	0	0	10	5
	A08120-4Y	0	0	0	0
	AORTX09037-1W/Y	0	0	37.5	2.5
	CO11250-1W/Y	0	0	2.5	0
	CO11266-1W/Y	0	0	0	0
	COTX10118-4Wpe/Y	0	0	0	0
Mean		0.0	0.0	6.1	1.8
LSD (0.05)		NS	NS	19.4	NS

NS = not significant.

Table 16. Western Region Specialty Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021. Tuber defect observations are from four plots for each clone. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lowercase letters. Since there were four replicates, a clone could be scored for the same attribute up to four times.

Variety/Clone	K or D	Description
Chieftain	2D, 2d	Sprouts, sprouts, Chain tubers, chain tubers, knobs, dull, too big, lumpy
Red LaSoda	4D	4 too big, chain tubers, dumbell, growth cracks, 3 lumpy, folded bud end, dull, irregular, knobs
Modoc	3K, k	2 growth cracks, irregular, pointy
A08122-12Rsto	4K	3 growth cracks, rodent damage
NDA8512C-1R	4K	2 low yield
Yukon Gold	2d, 2k	folded bud end, 2 irregular, 2 flaky skin, growth cracks
A08120-4Y	2D, 2d	4 cracked skin
AORTX09037-1W/Y	2D, 2d	4 flaky skin, 3 growth cracks, sticky stolon, pointy
CO11250-1W/Y	3d, D	growth cracks, 2 pear, skin cracks, Cracked skin, 2 flaky skin, pointy
CO11266-1W/Y	3D, d	pear, growth cracks, 4 flaky skin, dumbell, pointy, sprouts
COTX10118-4Wpe/Y	2d, k	2 pointy, 3 growth cracks, 2 flaky skin, 2 dumbell, irregular, greening, sprouts

Table 17. Oregon Statewide Chip Trial yield and grade, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Variety/Clone	Total yield	> 14 oz	10-14 oz	6 to 10 oz	4 to 6 oz	<4 oz	No. 2	Cull	Average tuber	No. of tubers	Length/width	Specific gravity	Fry color <sup>a</sup>	Sugar end
									weight	/plant				
----- cwt/acre -----							oz	ratio	g cm <sup>-3</sup>	0 - 5	%			
Atlantic	733.5	59.4	117.0	288.8	144.8	111.3	10.8	1.5	5.7	10.6	1.12	1.084	2.1	42.5
Snowden	711.9	40.8	115.9	274.5	169.7	108.1	2.3	0.7	5.6	10.4	1.02	1.074	1.7	2.5
NYORN41-5	567.4	36.4	83.9	196.6	127.5	113.4	9.4	0.2	5.0	9.4	1.05	1.085	1.4	0.0
OR16ER.2.1435	767.5	35.7	107.5	277.9	184.9	156.2	3.9	1.4	5.1	12.4	1.08	1.080	1.8	5.0
AOR13124-6	642.5	90.7	170.8	218.4	90.9	50.5	19.3	2.0	7.5	7.4	1.08	1.083	1.7	0.0
NDOR13320CAB-2	540.4	8.0	23.4	144.6	164.0	186.8	9.1	4.6	3.7	12.2	1.02	1.076	1.4	0.0
AOR10922-1	759.1	10.7	74.8	284.9	174.2	187.3	27.2	0.1	4.4	14.3	1.06	1.083	1.8	10.0
COOR16014-3	663.3	1.4	18.7	229.5	250.1	159.3	4.4	0.0	4.5	12.2	1.13	1.074	1.6	2.5
NDOR14307CB-5	973.3	177.3	228.1	274.6	120.4	100.9	64.9	7.3	7.0	11.5	1.05	1.075	1.6	17.5
AOR15303-3	662.5	46.3	135.5	261.6	120.2	68.3	22.0	8.7	6.3	8.9	1.10	1.086	1.7	17.5
Mean	702.1	50.6	107.5	245.1	154.7	124.2	17.3	2.6	5.5	10.9	1.07	1.080	1.7	9.8
LSD (0.05)	119.9	47.9	55.0	70.6	47.2	36.4	15	NS	0.9	1.9	0.06	NS	NS	26

<sup>a</sup>Fry color was rated subjectively on a scale of 1 to 5, where 1 is lightest and 5 is darkest.

Table 18. Oregon Statewide Chip Trial tuber internal defects, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021.

Variety/Clone	Vascular discoloration	Hollow heart	Internal brown spot	Black spot bruise
----- % -----				
Atlantic	0	2.5	47.5	5.0
Snowden	0	0.0	0.0	2.5
NYORN41-5	0	0.0	2.5	5.0
OR16ER.2.1435	0	0.0	0.0	0.0
AOR13124-6	0	0.0	2.5	2.5
NDOR13320CAB-2	0	0.0	52.5	2.5
AOR10922-1	0	0.0	26.7	0.0
COOR16014-3	0	0.0	0.0	2.5
NDOR14307CB-5	0	0.0	12.5	0.0
AOR15303-3	0	0.0	0.0	10.0
Mean	0.0	0.3	14.4	3.0
LSD (0.05)	NS	NS	21.0	NS

NS = not significant

Table 19. Oregon Statewide Chip Trial tuber visual observations at harvest, Malheur Experiment Station, Oregon State University, Ontario, OR, 2021. Tuber defect observations are from four plots for each clone. K = clone should be saved, D = clone should be discarded. Capital letters denote a higher intensity of an observation compared to lowercase letters. Since there were four replicates, a clone could be scored for the same attribute up to four times.

Variety/Clone	K or D	Description
Atlantic	4k	irregular, small
Snowden	2D, d, k	2 folded bud end, 2 irregular, small, growth cracks
NYORN41-5	3k, d	low yield
OR16ER.2.1435	3k, d	Small
AOR13124-6	3k, K	growth cracks, pointy, water rot
NDOR13320CAB-2	2D, d, k	2 Small, small, pointy
AOR10922-1	2D, d	2 Sprouts, small
COOR16014-3	3d, k	4 small
NDOR14307CB-5	3D, d	3 irregular, growth cracks, 2 sprouts, knobs, pointy, 2 flat, large, pink skin
AOR15303-3	3k, D	irregular, rough, growth cracks, folded bud end