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2020 POTATO VARIETY EVALUATIONS

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INTRODUCTION

Each year, the MSU potato breeding and genetics team conducts a series of variety trials to assess advanced potato selections from the Michigan State University and other potato breeding programs at the Montcalm Research Center (MRC). In 2020, we tested over 150 varieties and breeding lines in the replicated variety trials, plus over 120 lines in the National Chip Processing Trial (NCPT). The variety evaluation also includes disease testing in the scab nursery (Montcalm Research Center) and foliar late blight evaluation (MSU Campus Plant Pathology Farm). The objectives of the evaluations are to identify superior varieties for fresh or chip-processing markets (chip, round white/yellow table, specialty/red and russet). The varieties were compared in groups according to market class, tuber type, skin color, and to the advancement in selection. Each season, total and marketable yields, specific gravity, tuber appearance, incidence of external and internal defects, chip color (from the field as well as from 45°F (7.2°C) and 50°F (10°C) storage at 3 and 6 months), along with susceptibilities to common scab, late blight (foliar and tuber), and blackspot bruising are determined.

We would like to acknowledge the collaborative effort of the Michigan Potato Industry and research colleagues Matthew Klein and the MSU Potato Breeding Team (especially graduate students Natalie Kirkwyland, Ruben Almiron, Sarah Lee and Will Behling) for helping to get the field research done.

PROCEDURE

The field variety trials were conducted at the Montcalm Research Center in Entrican, MI. Due to COVID-19-related university research constraints, trial replication was reduced to a maximum of two. A randomized complete block design was used. The plots were 23 feet (7 m) long and spacing between plants was 10 inches (25.4 cm). Inter-row spacing was 34 inches (86.4 cm). Supplemental irrigation was applied as needed. Nutrient, weed, disease and insect management were similar to recommendations used by the commercial operations in Montcalm County. The field experiments were conducted on a sandy loam soil that has been out of potato production for 5 years. Oats were grown in 2019 on this ground. A severe rain event in late May flooded 40% of the trial ground. That section of the trials did not emerge so the number of lines and replications were lost for the season.

The most advanced selections were tested in the Advanced chip and tablestock trials, representing selections at a stage after the preliminary trials. The other field trials were the Russet, Preliminary (chip-processors and tablestock), Preliminary Pigmented, the NCPT and the early observational trials.

2020 was the tenth year of the National Chip Processing Trial (NCPT). The purpose of the trial is to evaluate early generation breeding lines from the US public breeding programs for their use in chip-processing. The NCPT has 9 trial locations (Northern sites: NY, MI, WI, ND, OR and Southern: NC, FL, CA, TX) in addition to a scab trial Wisconsin.

In each of these trials, the yield was graded into four size classes (pick outs, Bs, As, oversize) using the new Kerian sizer on the grading line, incidence of external and internal defects in >3.25 in. (8.25 cm) diameter potatoes were recorded. Samples were taken for specific gravity, chip-processing, disease tests and bruising tests. Chip quality was assessed on 25-tuber composite samples, taking two slices from each tuber. Chips were fried at 345°F (174°C) for 2 minutes 15 seconds or until fully cooked. The chip color was measured visually with the SFA 1-5 color chart. Tuber samples were also stored at 45°F (7.2°C) and 50°F (10°C) for chip-processing out of storage in January and April. Select advanced selections are also placed in the MPIC B.F. Burt Cargill Commercial Demonstration Storage in Entrican, MI for monthly sampling. This testing was not done since we did not have enough tubers from the trials this year to sample. The lines in the agronomic trials were assessed for common scab resistance at the nursery at the Montcalm Research Center. There has been very strong scab disease pressure at the new Montcalm Scab Disease Nursery for eight years now. The 2020 late blight trial was conducted at the MSU campus Plant Pathology Farm but weather conditions were not conducive. The simulated blackspot bruise (from 50°F tuber temperature) results for average spots per tuber have also been incorporated into the summary sheets.

RESULTS

A. Advanced Chip-Processing Trials (Table 1)

A summary of the 47 entries evaluated in the trial results is given in **Table 1**. Overall, the yields for the Advanced trial (147 days) were above average. The check varieties for this trial were Lamoka, Manistee, Snowden and Atlantic. The highest yielding and most promising lines were MSAA252-7, MSZ219-1, MSBB611-3, and MSAA076-6. Internal defects were minimal for 2020. Specific gravity was average with a trial average of 1.083. Snowden and Atlantic had a specific gravity of 1.084 and 1.085, respectively. All chip-processing entries in the trial had excellent chip-processing quality out of the field, with an SFA score of 1.0. Almost all of the MSU breeding lines have scab resistance. Nineteen MSU chipping lines were classified as having scab resistance scores equal or better than Lamoka. Mackinaw (MSX540-4) has PVY and late blight resistance while MSZ219-1 has scab, PVY and late blight resistance. Other promising

lines to watch are MSZ242-13, MSZ242-09, MSBB058-1, MSBB617-2 and MSAA217-3.

B. Russet Trial (Table 2)

In 2020, 11 lines were evaluated after 134 days. The results are summarized in **Table 2**. Russet Norkotah and GoldRush were the reference varieties used in the trial. In general, the yields were below average for many russet lines while A09086-1LB, Umatilla Russet, Plover Russet and A08433-4Sto were the top tier for yield. In most cases specific gravity was below average with 1.072 average for the trial. Severe hollow heart was observed in Sunset Russet. Bruise incidence was low. Scab resistance was variable with susceptibility was observed in a number of the russet lines.

D. Adaptation Trial (Table 3)

The Adaptation Trial of the tablestock lines was harvested after 134 days and the results of 35 lines are summarized in **Table 3**. The many of the lines evaluated in the Adaptation Trial were tested in the Preliminary Trials the previous year. Two reference cultivars (Yukon Gold and Superior) are reported in the tablestock trial. In general, the yields were below average and internal defects were low. The highest yielding and promising lines were MSZ416-8RY, MSV093-1Y, MSBB213-1SPL and MSZ551-1. Scab tolerance is becoming more prevalent among the advanced selections but the challenge remains to combine scab, PVY and late blight resistance. Other promising lines in the trial are MSCC515-2Y, MSW476-4R, MSV179-1, MST252-1Y and Blackberry. Blackspot bruising was low for most lines.

E. Preliminary Trials (Tables 4, 5 and 6)

The Preliminary trials (chip, table, pigmented) are the first trials for evaluating new advanced selections from the MSU potato breeding program. The division of the trials was based upon pedigree assessment for chip-processing and tablestock utilization. In 2020, there were 82 harvested entries trialed in the three Preliminary trials.

The chip-processing Preliminary Trial (**Table 4**) had 49 harvested entries after 135 days. Many of the lines chip-processed well from the field but specific gravity values were below average with Snowden at 1.077. Internal quality weakness was predominantly vascular discoloration. Promising MSU lines are MSBB017-1, MSEE131-1, MSEE142-1, MSEE149-2, MSEE171-2, MSEE101-2, MSEE018-2 and MSBB625-2 combining yield, specific gravity, scab resistance and chip quality. Some of these lines also have PVY resistance. We continue to make progress selecting for chip-processing with scab resistance with 21 lines in the trial with scab ratings equal or lower than 1.7, whereas Snowden had a scab rating of 2.4.

Table 5 summarizes 17 harvested tablestock entries evaluated in the Preliminary Tablestock Trial. Jacqueline Lee, Reba and Yukon Gold were the check varieties. This tablestock trial was harvested and evaluated after 135 days. MSBB305-2SPL, MSEE199-1, MSCC314-1 and MSBB371-1YSPL all have high yield potential, low

internal defects and scab resistance, as well as low blackspot bruising. In general, the level of scab resistance and internal quality are improving in this pool of lines. We are working towards better skin finish also. This trial also included some European varieties. None of the lines were promising due to poor shape and/or scab susceptibility.

The interest in the specialty market continues to increase. In 2020, 16 harvested entries were evaluated in the Preliminary Pigmented Trial (**Table 6**), which was harvested at 135 days. This trial evaluated breeding lines with unique skin and flesh colors. Many of these MSU lines have commercial agronomic performance and specialty characteristics, as well as some scab resistance. Seven lines were scored as scab resistance. Blackspot bruising is low and internal defects were almost non-existent. MSBB371-1YSPL and MSBB305-2SPL combine high yield and scab resistance.

F. Potato Common Scab Evaluation (Tables 7 and 8)

Each year, a replicated field trial is conducted to assess resistance to common scab. The scab trial is now located at the Montcalm Research Center where high common scab disease pressure was observed in the previous eight years. This location is being used for the early generation observational scab trial (246 lines) and the scab variety trial (262 lines) and diploid scab trial (338). In 2020, the scab infection was a good level with the susceptible controls having some coverage of pitted scab.

We use a rating scale of 0-5 based upon a combined score for scab coverage and lesion severity. Usually examining one year's data does not indicate which varieties are resistant but it should begin to identify ones that can be classified as susceptible to scab. Our goal is to evaluate important advanced selections and varieties in the study at least three years to obtain a valid estimate of the level of resistance in each line. The 2018-2020 scab ratings are based upon the Montcalm Research Center site. **Table 7** categorizes many of the varieties and advanced selections tested in 2020 over a three-year period. The varieties and breeding lines are placed into nine categories based upon scab infection level and lesion severity. A rating of 0 indicates zero scab infection. A score of 1.0 indicates a trace amount of infection. A moderate resistance (1.2 – 1.5) correlates with <10% infection. Scores of 4.0 or greater are found on lines with >50% surface infection and severe pitted lesions.

The check varieties Russet Norkotah, GoldRush, Red Norland, Yukon Gold, Onaway, Pike, Atlantic, and Snowden can be used as references (in bold, **Table 7**). The table is sorted in ascending order by 2020 scab rating. This year's results continue to indicate that we have been able to breed numerous lines with resistance to scab. Scab ratings ranged from 0.3 - 4.0 for the variety trial. A total of 109 entries tested had a scab rating of 1.5 or lower in 2020. Most notable scab resistant MSU lines are found in the trial summaries **(Tables 1-6)**. Of the 246 early generation selections that were evaluated, 138 had scab resistance (scab rating of ≤ 1.5) (**Table 8**).

H. Late Blight Trial

In 2020, the late blight trial was planted at the East Lansing campus Plant Pathology farm. All entries were planted in early June for late blight evaluation. These include lines tested in a replicated manner from the agronomic variety trial and entries in the early generation observation plots. The trials were inoculated three times in August and September with the US-23 genotype of *P. infestans*. Late blight infection was identified in the spreader rows but it would not spread since the weather conditions were too dry and breezy. As a result, we did not collect data that could discriminate resistant from susceptible lines.

I. Blackspot Bruise Susceptibility (Table 9)

Evaluations of advanced seedlings and new varieties for their susceptibility to blackspot bruising are also important in the variety evaluation program. Based upon the results collected over the past years, the non-bruised check sample has been removed from our bruise assessment. A composite bruise sample of each line in the trials consisted of 25 tubers (a composite of 4 replications) from each line, collected at the time of grading. The 25-tuber sample was held in 50°F (10°C) storage overnight and then was placed in a hexagon plywood drum and tumbled 10 times to provide a simulated bruise. The samples were peeled in an abrasive peeler in October and individual tubers were assessed for the number of blackspot bruises on each potato. These data are shown in **Table 9**. The bruise data are represented in two ways: percentage of bruise free potatoes and average number of bruises per tuber. A high percentage of bruise-free potatoes is the desired goal; however, the numbers of blackspot bruises per potato is also important. Cultivars which show blackspot incidence greater than Atlantic are approaching the bruise-susceptible rating. In addition, the data is grouped by trial, since the bruise levels can vary between trials. In 2020, the bruise levels were average compared to previous years. There are many lines with lower blackspot bruise potential across the trials. Some of our advanced selections are similar to or less than Atlantic and Snowden in their level of bruising. A few lines will high susceptibility to bruise were identified and will be discontinued from testing. All the bruise ratings are also found in the variety trial tables (**Tables 1-6**).

J. National Chip Processing Trial (NCPT) data available on-line

The Potatoes USA-funded National Chip Processing Trial (NCPT) is an effort to synergize the strengths of the public breeding programs in the U.S. to identify improved chip-processing varieties for the industry. Cooperating breeding programs include the USDA (Idaho and Maryland) and land grant universities (Colorado, Maine, Michigan, Minnesota, North Carolina, North Dakota, New York, Oregon, Wisconsin and Texas). The coordinated breeding effort includes early stage evaluation of key traits (yield, specific gravity, chip color, chip defects and shape) from coordinated trials in 10 locations. Since the inception of the trial in 2010, over 1,000 different potato entries, including reference varieties, have been evaluated. The data for all the lines tested are summarized on a searchable, centralized database housed at Medius (https://potatoesusa.medius.re). More than 40 promising new breeding lines from the trials have been fast-tracked for larger-scale commercial trials and processor evaluation.

The NCPT is also a feeder for the national SNAC International trials. We are using the NCPT trials to more effectively identify promising new selections. Notable MSU lines that have been identified are MSW485-2 (Huron Chipper), MSX540-4 (Makinaw), MSV030-4 (Petoskey), MSW474-1, and MSZ242-13. Minituber production and/or commercial seed have been produced of the newer lines and will be tested in Michigan in 2021.

Table 1

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

ADVANCED CHIP-PROCESSING TRIAL
MONTCALM RESEARCH CENTER
May 5 to September 29, 2020 (147 days)
DD Base 40°F 3216[8]

		CWT/A		PERCENT OF TOTAL[1]						CHIP	OTF	PERCENT (%) TUBER QUALITY[4]							3-YR AVG US#1
LINE	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	SCORE[2]	SED[3]	HH	VD	IBS	BC	SCAB[5]	MAT[6]	BRUISE[7]	CWT/A
MSAA252-7	1	389	409	95	5	95	0	0	1.083	1.0	0	10	0	0	0	1.5	5.0	3.6	-
MSBB626-11	2	378	409	93	8	92	1	0	1.085	1.5	1	5	0	0	0	0.8	4	3.0	-
MSZ219-01	1	375	390	96	4	89	7	0	1.080	1.0	0	0	0	0	0	0.7	3.0	1.3	341
MSAA076-6	1	370	413	90	10	90	0	0	1.092	1.0	0	0	0	10	0	1.3	3.0	2.7	334*
MSAA328-4	1	348	362	96	3	96	0	1	1.081	1.0	0	0	0	0	0	1.3	3.0	2.8	-
Huron Chipper	1	337	379	89	11	89	0	0	1.083	1.0	0	0	20	0	0	1.3	3.0	0.9	338
MSBB079-2	1	325	371	88	11	88	0	1	1.083	1.0	0	0	0	0	0	1.3	3.0	2.3	-
MSZ120-04	1	324	358	91	8	91	0	2	1.082	1.0	0	0	20	0	0	1.5	5.0	2.5	370*
MSBB611-3	1	320	360	89	10	89	0	1	1.086	1.5	0	0	0	0	0	2.5	3.0	3.6	-
MSBB635-14	2	318	353	91	9	91	0	2	1.081	1.0	0	0	10	0	0	1.7	2.5	1.3	-
MSBB610-13	1	317	338	94	5	94	0	1	1.083	1.0	0	0	0	0	0	0.8	2.0	1.3	-
MSBB617-2	1	315	339	93	6	93	0	1	1.083	1.0	0	20	10	0	0	1.5	2.0	0.6	-
MSAA100-1	1	314	326	96	4	96	0	0	1.069	ND	ND	0	70	0	0	1.3	3.0	ND	-
MSBB058-1	1	307	342	90	10	90	0	1	1.093	1.0	0	0	0	0	0	1.3	3.0	3.5	-
MSX245-2Y	1	304	329	92	4	90	2	4	1.081	1.0	1	0	0	0	0	1.8	4.0	1.0	404*
MSAA498-18	2	303	330	92	8	92	1	0	1.086	1.0	0	5	0	0	0	0.8	3.5	2.9	-
MSZ219-13	1	296	320	93	7	93	0	0	1.086	1.0	0	0	0	0	0	1.2	3.0	2.9	325
MSAA513-1	1	293	321	91	5	89	2	3	1.078	1.0	0	0	20	0	0	1.5	2.0	3.0	-
MSCC058-1	1	291	323	90	7	88	2	3	1.086	1.0	0	30	0	0	0	1.7	3	2.5	-
Mackinaw	2	291	319	91	9	91	0	1	1.090	1.0	0	0	0	0	0	1.7	3.5	1.3	277
MSAA232-4	1	285	329	87	9	87	0	4	1.081	1.0	0	10	0	0	0	2.2	3.0	0.5	-
Manistee	**1**	**279**	**331**	**84**	**16**	**84**	**0**	**0**	**1.079**	**1.0**	**0**	**0**	**0**	**0**	**0**	**2.5**	**2.0**	**0.5**	**276**
MSZ052-14	1	276	314	88	12	88	0	0	1.077	ND	ND	0	0	0	0	1.5	3.0	ND	278
MSZ052-11	1	271	328	83	15	83	0	2	1.078	ND	ND	0	0	0	0	0.5	3.0	ND	-
MSZ242-09	1	263	318	83	9	83	0	8	1.089	1.0	0	10	0	0	0	1.3	4.0	1.0	269
MSCC168-1	1	259	298	87	13	87	0	0	1.076	1.0	0	0	0	0	0	2.0	2.0	3.3	-
MSZ242-13	1	259	294	88	9	88	0	3	1.099	1.0	0	0	0	0	0	1.2	3.0	2.8	276
MSZ063-2	1	252	342	74	25	74	0	1	1.084	1.0	0	0	0	0	0	1.8	2	0.8	-
MSAA260-3	1	251	305	82	7	80	2	11	1.080	1.0	1	0	0	0	0	1.2	4.0	2.0	-
MSV498-1	1	248	269	92	8	92	0	0	1.078	ND	ND	0	80	0	0	1.7	2.0	ND	310
MSAA217-3	1	247	256	96	4	96	0	0	1.091	1.0	0	30	10	0	0	2.3	3	2.3	-
MSZ194-2	1	245	258	95	5	95	0	0	1.078	ND	ND	0	0	0	0	2.0	2.0	ND	-
MSZ242-07	1	241	288	84	12	84	0	4	1.098	1.0	0	0	0	0	0	1.0	3.0	1.4	305
Lamoka	**2**	**238**	**288**	**83**	**17**	**83**	**0**	**1**	**1.082**	**1.0**	**0**	**0**	**10**	**0**	**0**	**0.8**	**2.5**	**2.6**	**277**
MSBB618-9	1	229	295	78	15	76	2	8	1.066	ND	ND	0	0	0	0	1.5	2.0	ND	-
MSY156-2	1	229	280	81	18	81	0	0	1.084	1.0	0	0	0	0	0	1.0	4.0	0.3	331*
MSZ219-14	1	229	283	81	11	81	0	8	1.081	ND	ND	50	0	0	0	1.0	3.0	ND	329
FL2137	**2**	**221**	**256**	**86**	**10**	**86**	**0**	**4**	**1.085**	**1.0**	**1**	**5**	**5**	**0**	**0**	**1.8**	**2.0**	**1.3**	**227***
MSZ052-13	1	214	243	88	12	88	0	0	1.085	ND	ND	0	0	0	0	0.5	3	ND	234*
Snowden	**1**	**211**	**286**	**74**	**26**	**74**	**0**	**1**	**1.084**	**1.0**	**0**	**0**	**20**	**0**	**0**	**2.4**	**2.0**	**2.3**	**239**
MSX526-1	2	203	235	86	14	86	0	0	1.083	1.0	0	0	0	0	0	1.3	2	1.4	-
Petoskey	1	200	236	85	15	85	0	0	1.092	1.0	1	0	0	0	0	1.3	2.0	1.0	199*
MSW163-3	1	190	243	78	6	78	0	16	1.074	ND	ND	0	0	0	0	1.2	3.0	ND	-
MSCC266-1	1	165	180	92	7	92	0	1	1.066	ND	ND	0	0	0	10	1.2	1.0	ND	-
Atlantic	**2**	**149**	**170**	**87**	**13**	**87**	**0**	**1**	**1.085**	**1.0**	**0**	**10**	**5**	**0**	**0**	**1.9**	**2.0**	**1.8**	**242**
MSZ248-10	1	122	159	77	6	77	0	17	1.083	ND	ND	0	0	0	0	1.0	4.0	ND	269*
MSBB614-10	1	107	121	88	8	88	0	4	1.078	1.0	0	0	0	0	0	1.2	3.0	0.4	-
MEAN		268	304						1.083							1.4	2.9	1.9	

[1]SIZE: B: < 2 in.; A: 2-3.25 in.; OV: > 3.25 in.; PO: Pickouts.

[2]CHIP SCORE: SNAC Scale (Out of the field); Ratings: 1-5; 1: Excellent, 5: Poor.

[3]SED: Stem End Defect, Based on Paul Bethke's (USDA/UWisconsin - Madison) 0 - 5 scale. 0 = no SED; 3 = significant SED; 5 = severe SED

[4]QUALITY: HH: Hollow Heart; BC: Brown Center; VD: Vascular Discoloration; IBS: Internal Brown Spot. Percent of 40 Oversize and/or A-size tubers cut.

[5]SCAB DISEASE RATING: MSU Scab Nursery; 0: No Infection; 1: Low Infection <5%; 3: Intermediate; 5: Highly Susceptible.

[6]MATURITY RATING: August 20, 2019; Ratings 1-5; 1: Early (vines completely dead); 5: Late (vigorous vine, some flowering).

[7]BRUISE: Simulated blackspot bruise test, average number of spots per tuber.

Plant Date: 5/5/20
Vine Kill: 9/1/20
Days from planting to vine kill: 119

[8]Enviroweather: Entrican Station. Planting to vine kill

Table 2

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

RUSSET TRIAL
MONTCALM RESEARCH CENTER
May 05 to September 16, 2020 (134 days)
DD Base 40°F 3216[6]

		CWT/A		PERCENT OF TOTAL[1]						PERCENT (%) TUBER QUALITY[2]							3-YR AVG US#1
LINE	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC	SCAB[3]	MAT[4]	BRUISE[5]	CWT/A
A09086-1LB	1	354	471	75	24	75	0	1	1.077	0	0	0	0	3.2	4.0	0.1	-
Umatilla Russet	1	335	494	68	26	68	0	6	1.084	10	0	0	0	0.8	4.0	1.5	-
Plover Russet	1	333	364	92	6	92	0	2	1.066	0	0	0	0	1.5	2.0	1.0	-
A08433-4Sto	1	330	392	84	13	84	0	3	1.072	30	0	0	0	2.3	4.0	0.2	-
CO09205-2Rus	1	312	384	81	19	81	0	0	1.070	10	0	0	0	2.7	3.0	1.1	-
Alverstone Russet (HZPC)	1	289	411	70	13	70	0	17	1.074	30	0	10	0	2.3	3.0	0.4	-
Dakota Russet	1	278	309	90	9	90	0	1	1.081	30	30	0	0	1.8	3.0	0.8	293*
SunSet Russet (TX13590-9Rus)	1	270	321	84	14	84	0	2	1.077	90	30	0	0	2.0	3.0	0.7	-
AO06191-1	1	248	281	88	10	88	0	2	1.079	0	0	0	0	0.5	2.0	0.5	-
Vanguard Russet	1	235	261	90	10	90	0	0	1.058	10	0	0	0	1.5	1.0	0.5	204
Goldrush Russet	**1**	**213**	**339**	**63**	**23**	**63**	**0**	**14**	**1.061**	**0**	**50**	**0**	**0**	**0.3**	**2.0**	**0.4**	**201**
Russet Norkotah/Texas 112	**1**	**197**	**288**	**69**	**31**	**69**	**0**	**1**	**1.064**	**30**	**20**	**10**	**0**	**2.5**	**1.5**	**0.1**	**201**
MEAN		283	359						1.072					1.8	2.7	0.6	202

* Two-Year Average

[1]SIZE: B: < 4 oz.; A: 4-10 oz.; OV: > 10 oz.; PO: Pickouts.
[2]QUALITY: HH: Hollow Heart; BC: Brown Center; VD: Vascular Discoloration; IBS: Internal Brown Spot. Percent of 40 Oversize and/or A-size tubers cut.
[3]SCAB DISEASE RATING: MSU Scab Nursery; 0: No Infection; 1: Low Infection <5%; 3: Intermediate; 5: Highly Susceptible.
[4]MATURITY RATING: August 20, 2019; Ratings 1-5; 1: Early (vines completely dead); 5: Late (vigorous vine, some flowering).
[5]BRUISE: Simulated blackspot bruise test average number of spots per tuber.
[6]Enviroweather: Entrican Station. Planting to vine kill

Plant Date: 5/5/20
Vine Kill: 9/1/20
Days from planting to vine kill: 119

Table 3

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

ADAPTATION TRIAL, TABLESTOCK LINES
MONTCALM RESEARCH CENTER
May 05 to September 16, 2020 (134 days)
DD Base 40°F 3216[6]

		CWT/A		PERCENT OF TOTAL[1]						PERCENT (%) TUBER QUALITY[2]						
LINE	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC	SCAB[3]	MAT[4]	BRUISE[5]
MSZ416-8RY	1	430	490	88	9	49	37	4	1.056	0	10	0	0	1.2	2.0	0.8
MSAA120-1	1	410	437	94	5	92	2	1	1.071	30	0	0	0	2.2	3.0	1.2
MSBB213-1Spl	1	406	427	95	4	95	0	1	1.078	0	30	0	10	1.5	3.0	0.9
MSV093-1Y	1	405	437	93	3	93	0	4	1.067	0	0	0	0	1.7	4.0	0.4
MSZ551-1	1	388	419	93	5	87	6	2	1.075	0	10	0	0	1.8	4.0	1.9
MSX156-1Y	1	381	399	95	3	94	2	2	1.068	0	0	0	0	2.2	3.0	1.7
MSAA196-1	1	316	351	90	8	90	0	2	1.063	0	0	0	0	1.7	4.0	0.3
MSCC300-1	1	313	358	87	8	84	3	5	1.073	30	0	0	0	2.0	2.0	0.5
Blackberry	1	312	496	63	36	63	0	1	1.066	0	0	0	0	1.3	4.0	0.0
MSV443-1PP	2	292	350	84	17	83	1	0	1.062	0	0	0	0	1.3	2.0	0.2
MSY111-1	2	284	327	87	9	86	1	5	1.089	5	35	0	0	1.3	3.5	0.6
MSZ436-2Spl	1	268	289	93	7	91	2	0	1.054	0	10	0	0	1.8	2.0	0.1
MSCC302-1	1	260	296	88	12	88	0	0	1.076	0	0	0	0	2.0	3.0	1.9
MSW476-4R	1	259	317	82	17	82	0	1	1.073	0	30	0	0	2.0	2.0	0.8
Superior	**1**	**247**	**269**	**92**	**8**	**92**	**0**	**0**	**1.056**	**0**	**10**	**10**	**0**	**1.8**	**1.0**	**0.5**
MSCC515-2Y	1	242	269	90	9	90	0	1	1.066	0	0	0	0	2.0	2.0	0.1
MSV179-1	2	241	250	97	2	65	33	1	1.069	0	0	0	0	1.5	3.0	0.4
MSZ427-3R	1	239	290	83	15	83	0	2	1.055	0	10	0	0	2.0	2.0	0.4
MSW038-4Y	1	228	290	79	11	79	0	10	1.069	0	0	0	0	2.3	2.0	0.7
MSBB351-1	1	225	244	92	6	89	3	2	1.059	10	0	0	0	0.8	2.0	0.3
MSX193-1Y	1	225	273	82	18	82	0	0	1.073	0	10	0	0	2.7	2.0	0.3
MSX324-2R	1	218	285	76	20	76	0	4	1.066	0	0	0	0	1.2	1.0	0.6
MSX497-6	1	208	218	96	4	96	0	0	1.069	0	10	0	0	2.8	2.0	nd
MSAA174-1	1	204	234	87	11	87	0	2	1.056	0	10	0	0	1.7	2.0	0.2
MSX137-6	1	199	325	61	38	59	2	0	1.075	0	0	0	0	1.7	3.0	0.3
MSZ109-8PP	1	199	279	71	23	71	0	5	1.063	0	0	0	0	1.2	3.0	0.3
MSX324-1P	1	195	272	72	28	72	0	1	1.076	0	0	0	0	1.0	1.0	0.5
Yukon Gold	**1**	**194**	**202**	**96**	**4**	**93**	**3**	**0**	**1.064**	**20**	**0**	**0**	**10**	**2.5**	**1.0**	**0.5**
MSX293-1Y	1	191	228	84	16	84	0	0	1.066	0	10	0	0	2.7	2.0	0.2
MST252-1Y	1	186	246	76	24	76	0	0	1.066	0	0	0	0	0.8	1.0	0.6
MSZ268-1Y	1	185	263	70	7	70	0	23	1.072	10	10	0	0	1.0	4.0	0.4
MSZ590-1	1	184	260	71	28	71	0	1	1.061	10	0	0	0	0.7	2.0	1.1
MSY507-2	1	164	225	73	21	73	0	6	1.076	0	10	0	0	1.0	2.0	1.7
Queen Anne	1	157	245	64	34	64	0	2	1.061	0	0	0	0	1.8	1.0	0.1
MSZ615-2	2	139	176	81	18	79	2	2	1.066	0	20	0	0	1.5	1.0	0.5
MEAN		206	257						1.066					1.7	1.9	0.5

[1]SIZE: B: < 2 in.; A: 2-3.25 in.; OV: > 3.25 in.; PO: Pickouts.

[2]QUALITY: HH: Hollow Heart; BC: Brown Center; VD: Vascular Discoloration; IBS: Internal Brown Spot. Percent of 40 Oversize and/or A-size tubers cut.

[3]SCAB DISEASE RATING: MSU Scab Nursery; 0: No Infection; 1: Low Infection <5%; 3: Intermediate; 5: Highly Susceptible.

[4]MATURITY RATING: August 20, 2019; Ratings 1-5; 1: Early (vines completely dead); 5: Late (vigorous vine, some flowering).

[5]BRUISE: Simulated blackspot bruise test average number of spots per tuber.

[6]Enviroweather: Entrican Station. Planting to vine kill

Plant Date: 5/5/20
Vine Kill: 9/1/20
Days from planting to vine kill: 119

Table 4

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

PRELIMINARY TRIAL, CHIP-PROCESSING LINES
MONTCALM RESEARCH CENTER
May 5 to September 17, 2020 (135 days)
DD Base 40°F 3216[8]

		CWT/A		PERCENT OF TOTAL[1]						CHIP	OTF	PERCENT (%) TUBER QUALITY[4]						
LINE	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	SCORE[2]	SED[3]	HH	VD	IBS	BC	SCAB[5]	MAT[6]	BRUISE[7]
MSCC725-232	1	457	533	86	7	84	1	7	1.068	1.0	0.0	30	0	0	0	1.2	4.0	0.1
MSBB017-1	1	439	545	81	19	81	0	1	1.079	1.5	0.0	0	20	0	0	1.8	3.0	1.2
MSEE033-2	1	434	453	96	4	92	4	0	1.071	1.0	0.0	10	20	10	0	1.7	3.0	0.5
MSEE131-1	1	420	443	95	4	93	1	1	1.077	1.5	0.0	10	0	0	0	1.7	4.0	0.4
MSEE063-6	1	414	428	97	3	93	4	0	1.076	1.0	0.0	0	10	0	0	1.0	4.0	0.2
MSBB621-3	1	413	460	90	10	90	0	0	1.069	1.5	2.0	0	30	0	0	2.0	4.0	0.9
MSEE163-1	1	403	450	90	9	90	0	1	1.074	1.0	0.0	0	30	0	0	1.0	4.0	ND
MSDD497-B	1	374	386	97	3	95	1	0	1.056	1.5	2.0	0	10	0	0	1.2	4.0	0.0
MSEE157-1	1	371	408	91	9	88	3	0	1.077	1.5	2.0	0	0	0	0	0.8	3.0	0.4
MSEE207-02	1	363	402	90	7	90	0	2	1.075	1.0	1.0	0	20	0	0	0.7	4.0	0.8
MSEE142-1	1	358	384	93	7	93	0	0	1.081	1.0	1.0	0	20	0	0	1.8	3.0	ND
MSEE149-2	1	336	339	99	1	95	4	0	1.084	1.5	2.0	0	10	0	0	1.3	4.0	1.3
MSBB179-1	1	335	351	95	5	90	5	0	1.072	1.0	0.0	0	60	0	0	1.2	3.0	1.1
MSEE136-1	1	331	375	88	12	88	0	0	1.072	2.0	2.0	0	0	0	0	2.0	2.0	0.9
MSEE171-2	1	330	341	97	3	93	4	0	1.082	1.5	2.0	0	10	70	0	1.0	4.0	2.9
MSEE031-3	1	326	358	91	9	91	0	0	1.078	1.5	1.0	0	10	20	0	1.0	2.0	0.6
MSEE101-2	1	325	358	91	9	91	0	0	1.083	1.5	1.0	0	0	0	0	1.0	2.0	1.4
Snowden	**1**	**324**	**382**	**85**	**15**	**85**	**0**	**0**	**1.077**	**1.0**	**0.0**	**0**	**80**	**0**	**0**	**2.4**	**2.0**	**1.5**
MSBB623-12	1	322	345	93	6	93	0	1	1.070	1.0	1.0	0	50	0	0	1.7	2.0	0.4
MSEE180-3P	1	317	393	81	19	81	0	0	1.076	ND	ND	0	10	0	0	0.8	2.0	0.2
MSEE149-1	1	313	324	97	3	82	15	0	1.075	1.0	0.0	10	20	0	0	1.3	5.0	1.6
MSBB190-1	1	306	324	95	5	90	4	0	1.068	1.5	1.0	10	0	0	0	1.7	3.0	0.4
MSEE151-2	1	296	343	86	10	86	0	3	1.075	1.0	1.0	0	20	10	0	1.2	2.0	1.4
MSEE018-2	1	283	317	89	7	88	2	3	1.092	1.5	1.0	0	10	0	0	2.0	4.0	2.1
MSEE151-3	1	280	339	83	17	83	0	1	1.078	1.0	0.0	0	10	0	0	2.7	2.0	0.3
MSEE052-5	1	275	316	87	10	87	0	3	1.070	1.0	1.0	0	10	0	0	1.2	3.0	0.0
MSBB107-1	1	273	315	87	12	87	0	1	1.068	1.0	0.0	0	0	0	0	2.3	3.0	0.1
MSX042-3	1	269	293	92	7	92	0	2	1.079	1.0	0.0	0	0	0	0	1.5	2.0	0.6
MSBB651-4	1	266	312	85	15	85	0	0	1.071	1.0	0.0	0	0	0	0	1.0	ND	0.4
MSDD530-1	1	249	281	88	12	88	0	0	1.065	1.0	0.0	0	0	0	0	1.8	3.0	0.2
MSBB166-1	1	240	297	81	18	81	0	1	1.071	1.5	0.0	10	0	0	0	1.0	2.0	1.0
MSAA241-1	1	234	265	88	12	88	0	0	1.077	1.0	0.0	0	30	0	0	1.2	3.0	0.9
MSEE137-3	1	227	272	84	16	84	0	0	1.077	1.0	1.0	0	0	0	0	1.8	2.0	0.2
MSBB625-2	1	217	259	84	16	84	0	0	1.089	1.5	0.0	10	20	10	0	0.8	3.0	1.0

Table 4

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

PRELIMINARY TRIAL, CHIP-PROCESSING LINES
MONTCALM RESEARCH CENTER
May 5 to September 17, 2020 (135 days)
DD Base 40°F 3216[8]

		CWT/A		PERCENT OF TOTAL[1]						CHIP	OTF	PERCENT (%) TUBER QUALITY[4]						
LINE	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	SCORE[2]	SED[3]	HH	VD	IBS	BC	SCAB[5]	MAT[6]	BRUISE[7]
MSZ219-46	1	208	215	97	3	97	0	0	1.074	1.0	0.0	0	20	0	0	1.3	3.0	0.5
Pike	**1**	**207**	**268**	**77**	**19**	**77**	**0**	**3**	**1.075**	**1.0**	**1.0**	**0**	**10**	**0**	**0**	**0.8**	**2.0**	**0.3**
Atlantic	**1**	**196**	**233**	**84**	**16**	**84**	**0**	**0**	**1.082**	**1.0**	**1.0**	**30**	**30**	**20**	**0**	**1.9**	**2.0**	**1.2**
MSEE074-2	1	192	207	93	7	93	0	0	1.073	1.0	0.0	0	0	0	0	0.8	1.0	0.4
MSAA085-1	1	183	233	79	21	79	0	0	1.071	1.0	0.0	10	20	0	0	1.8	2.0	0.2
MSEE010-3	1	177	199	89	10	89	0	1	1.070	1.5	1.0	0	20	0	0	1.3	2.0	0.3
MSBB634-8	1	174	195	89	10	89	0	1	1.071	1.0	1.0	0	30	20	0	1.2	3.0	0.1
MSEE025-1	1	174	185	94	4	94	0	1	1.076	1.0	0.0	0	30	0	0	0.8	3.0	0.8
MSEE141-2	1	167	184	91	9	91	0	0	1.079	1.5	1.0	0	10	0	0	1.2	1.0	0.6
MSEE038-1	1	134	190	71	29	71	0	0	1.057	1.0	0.0	0	0	0	0	1.8	1.0	0.2
MSEE190-1	1	132	165	80	20	80	0	0	1.073	1.0	1.0	0	30	0	0	1.3	3.0	0.6
MSEE154-1	1	129	185	70	30	70	0	0	1.059	1.0	0.0	0	10	0	0	1.7	1.0	0.2
MSBB020-8	1	92	174	53	46	53	0	1	1.076	1.0	0.0	0	0	0	0	0.8	2.0	0.9
MSEE022-8	1	51	140	37	63	37	0	0	1.077	1.5	1.0	0	0	0	0	1.7	3.0	0.0
MEAN		278	316						1.074							1.4	2.7	0.7

[1]SIZE: B: < 2 in.; A: 2-3.25 in.; OV: > 3.25 in.; PO: Pickouts.

[2]CHIP SCORE: SNAC Scale (Out of the field); Ratings: 1-5; 1: Excellent, 5: Poor.

[3]SED: Stem End Defect, Based on Paul Bethke's (USDA/UWisconsin - Madison) 0 - 5 scale. 0 = no SED; 3 = significant SED; 5 = severe SED

[4]QUALITY: HH: Hollow Heart; BC: Brown Center; VD: Vascular Discoloration; IBS: Internal Brown Spot. Percent of 40 Oversize and/or A-size tubers cut.

[5]SCAB DISEASE RATING: MSU Scab Nursery; 0: No Infection; 1: Low Infection <5%; 3: Intermediate; 5: Highly Susceptible.

[6]MATURITY RATING: August 20, 2019; Ratings 1-5; 1: Early (vines completely dead); 5: Late (vigorous vine, some flowering).

[7]BRUISE: Simulated blackspot bruise test average number of spots per tuber.

Plant Date: 5/5/20
Vine Kill: 9/1/20
Days from planting to vine kill: 119

[8]Enviroweather: Entrican Station. Planting to vine kill

Table 5

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

PRELIMINARY TRIAL, TABLESTOCK LINES
MONTCALM RESEARCH CENTER
May 5 to September 17, 2020 (135 days)
DD Base 40°F 3216[6]

		CWT/A		PERCENT OF TOTAL[1]						PERCENT (%) TUBER QUALITY[2]						
LINE	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC	SCAB[3]	MAT[4]	BRUISE[5]
MSBB305-2SPL	1	351	410	86	14	86	0	0	1.060	0	10	0	0	1.7	3.0	0.3
MSEE199-1	1	274	332	83	5	66	17	13	1.073	0	0	0	0	0.3	3.0	0.9
MSCC314-1	1	259	289	90	6	88	2	4	1.065	10	10	0	10	1.5	2.0	0.1
Paroli	1	259	306	85	14	85	0	2	1.054	0	0	0	0	2.0	1.0	0.0
Melody	1	255	304	84	14	84	0	2	1.067	0	0	0	0	2.3	4.0	0.8
MSBB371-1YSPL	1	247	333	74	24	74	0	2	1.070	0	10	0	0	1.2	1.0	0.5
MSAA342-2	1	242	254	95	5	88	7	0	1.065	0	10	0	0	1.7	3.0	1.0
Reba	**1**	**234**	**274**	**85**	**14**	**85**	**0**	**1**	**1.063**	**10**	**0**	**0**	**0**	**2.7**	**3.0**	**0.5**
Constance	1	234	336	69	20	69	0	10	1.060	0	0	10	0	2.8	2.0	0.7
Allora	1	201	267	75	18	75	0	7	1.064	0	0	0	0	2.5	3.0	0.5
Jacqueline Lee	**1**	**182**	**357**	**51**	**35**	**51**	**0**	**14**	**1.081**	**0**	**10**	**0**	**0**	**3.0**	**3.0**	**1.8**
Golden Globe	1	179	357	50	21	50	0	29	1.060	0	0	0	0	2.2	2.0	0.2
MSCC724-1Y	1	168	208	81	12	81	0	7	1.066	0	0	0	0	ND	1.0	0.3
Yukon Gold	**1**	**136**	**156**	**87**	**8**	**87**	**0**	**4**	**1.062**	**10**	**0**	**0**	**0**	**2.5**	**2.0**	**ND**
Nixie	1	120	257	47	50	47	0	3	1.065	0	0	0	0	2.8	3.0	0.1
MSEE255-1	1	120	144	83	8	76	7	9	1.073	10	20	10	0	1.5	3.0	1.4
MSEE085-1	1	58	235	25	75	25	0	1	1.075	0	0	0	0	1.5	3.0	0.7
MEAN		207	283						1.066					2.0	2.5	0.6

[1]SIZE: B: < 2 in.; A: 2-3.25 in.; OV: > 3.25 in.; PO: Pickouts.

[2]QUALITY: HH: Hollow Heart; BC: Brown Center; VD: Vascular Discoloration; IBS: Internal Brown Spot. Percent of 40 Oversize and/or A-size tubers cut.

[3]SCAB DISEASE RATING: MSU Scab Nursery; 0: No Infection; 1: Low Infection <5%; 3: Intermediate; 5: Highly Susceptible.

[4]MATURITY RATING: August 20, 2019; Ratings 1-5; 1: Early (vines completely dead); 5: Late (vigorous vine, some flowering).

[5]BRUISE: Simulated blackspot bruise test average number of spots per tuber.

[6]Enviroweather: Entrican Station. Planting to vine kill

Plant Date: 5/5/20
Vine Kill: 9/1/20
Days from planting to vine kill: 119

Table 6

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

PRELIMINARY TRIAL, PIGMENTED LINES
MONTCALM RESEARCH CENTER
May 5 to September 17, 2019 (135 days)
DD Base 40°F 3216[6]

		CWT/A		PERCENT OF TOTAL[1]						PERCENT (%) TUBER QUALITY[2]						
LINE	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC	SCAB[3]	MAT[4]	Bruise[5]
Fenway Red	1	325	391	83	14	81	2	3	1.072	0	10	0	0	2.3	3.0	0.5
CO99076-6R	1	275	327	84	11	84	0	5	1.067	0	10	0	0	2.8	2.0	0.7
MSZ107-6PP	1	243	341	71	28	71	0	1	1.075	0	0	0	0	1.8	1.0	0.2
MSEE247-6WP	1	236	278	85	14	85	0	1	1.060	10	0	0	0	1.0	2.0	0.1
MSBB308-2P	1	228	288	79	19	79	0	2	1.056	0	50	0	0	1.2	2.0	0.1
MSAA101-1RR	1	226	344	66	31	66	0	4	1.081	0	10	0	0	0.8	3.0	0.2
Dark Red NorlaND	**1**	**207**	**255**	**81**	**17**	**81**	**0**	**1**	**1.052**	**0**	**20**	**0**	**0**	**ND**	**1.0**	**0.1**
MSAA127-7PP mini	1	187	258	73	27	73	0	0	1.053	0	0	0	0	1.7	1.0	0.4
MSCC614-1RYSPL	1	179	333	54	45	54	0	1	1.079	0	10	0	0	1.7	2.0	0.2
MSZ427-1R mini	1	141	253	56	44	56	0	1	1.057	0	0	0	0	0.8	1.0	0.1
MSBB250-1PP	1	140	399	35	63	35	0	2	1.078	0	0	0	0	1.7	4.0	0.2
MSAA706-7PP	1	122	146	84	16	84	0	0	1.065	0	0	0	0	1.7	3.0	0.3
Vicki (HZPC)	1	118	238	50	37	50	0	13	1.065	0	0	0	0	0.7	3.0	0.1
MSX443-3P mini	1	97	305	32	68	32	0	0	1.074	0	0	10	0	1.8	4.0	0.1
MSCC542-1P	1	86	128	67	31	67	0	2	1.054	0	10	0	0	1.5	2.0	0.1
MSAA157-2PY	1	70	106	66	33	66	0	1	1.067	0	0	0	0	2.8	3.0	0.3
MEAN		180	274						1.066					1.6	2.3	0.2

[1]SIZE: B: < 2 in.; A: 2-3.25 in.; OV: > 3.25 in.; PO: Pickouts.

[2]QUALITY: HH: Hollow Heart; BC: Brown Center; VD: Vascular Discoloration; IBS: Internal Brown Spot. Percent of 40 Oversize and/or A-size tubers cut.

[3]SCAB DISEASE RATING: MSU Scab Nursery; 0: No Infection; 1: Low Infection <5%; 3: Intermediate; 5: Highly Susceptible.

[4]MATURITY RATING: August 20, 2019; Ratings 1-5; 1: Early (vines completely dead); 5: Late (vigorous vine, some flowering).

[5]BRUISE: Simulated blackspot bruise test, average number of spots per tuber.

[6]Enviroweather: Entrican Station. Planting to vine kill

Plant Date: 5/5/20
Vine Kill: 9/1/20
Days from planting to vine kill: 119

Table 7

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

2018-20 SCAB DISEASE TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER , MI

LINE	3-YR* AVG.	2020 RATING	2020 WORST	2020 N	2019 RATING	2019 WORST	2019 N	2018 RATING	2018 WORST	2018 N
Sorted by ascending 2020Average Rating;										
Goldrush Russet	**0.4**	**0.3**	**0.5**	**3**	**0.7**	**1.0**	**3**	**0.3**	**0.5**	**3**
MSEE199-1	-	0.3	0.5	3						
AO06191-1	-	0.5	0.5	3						
MSCC282-3RR	-	0.5	0.5	3						
MSEE182-3	-	0.5	1.0	3						
MSZ052-11	-	0.5	0.5	3						
MSZ052-13	0.6*	0.5	0.5	3	0.7	1.0	3			
MSEE207-2	-	0.7	1.0	3						
MSZ219-01^{PVYR}	0.6	0.7	1.0	3	0.5	0.5	3	0.5	0.5	3
MSZ590-1	1.0	0.7	1.0	3	1.3	1.5	3	1.0	1.0	3
Vicki	-	0.7	1.0	3						
MSEE025-1	-	0.8	1.0	2						
Lamoka	**1.4**	**0.8**	**1.0**	**3**	**1.5**	**2.0**	**3**	**2.0**	**2.5**	**3**
MSAA101-1RR	0.7	0.8	1.0	3	0.8	1.5	3	0.5	0.5	3
MSAA498-18	-	0.8	1.0	3						
MSBB020-8	0.8*	0.8	1.0	3	0.8	1.0	2			
MSBB351-1	-	0.8	1.5	3						
MSBB610-13	-	0.8	1.0	3						
MSBB625-2	-	0.8	1.0	3						
MSBB626-11	-	0.8	1.5	3						
MSEE074-2	-	0.8	1.0	3						
MSEE157-1	-	0.8	1.0	3						
MSEE180-3P	-	0.8	1.0	3						
MST252-1Y	1.3	0.8	1.0	3	1.7	2.0	3	1.5	1.5	3
MSZ427-1R	0.9	0.8	1.0	3	0.7	1.5	3	1.2	1.5	3
Pike	**1.4**	**0.8**	**1.0**	**3**	**1.5**	**2.0**	**3**	**1.8**	**2.0**	**6**
Umatilla Russet	-	0.8	1.5	3						
MSBB166-1	-	1.0	1.5	3						
MSBB651-4	-	1.0	1.0	3						
MSEE031-3	-	1.0	1.0	3						
MSEE063-6	-	1.0	1.0	3						
MSEE101-2	-	1.0	1.5	3						
MSEE115-1	-	1.0	1.5	3						
MSEE163-1	-	1.0	1.0	3						
MSEE171-2	-	1.0	1.5	3						
MSEE247-6WP	-	1.0	1.5	3						
MSX324-1P	1.1	1.0	1.0	3	1.3	1.5	3	0.8	1.0	3
MSY156-2	-	1.0	1.5	3						
MSY507-2	-	1.0	1.0	2						
MSZ219-14^{PVYR}	0.9	1.0	1.0	3	0.8	1.5	3	0.8	1.0	3
MSZ242-07	1.3	1.0	1.5	3	1.3	1.5	3	1.5	2.0	3
MSZ248-10	-	1.0	1.5	3						
MSZ268-1Y	-	1.0	1.0	3						
MSZ443-1PP	1.6	1.0	1.5	3	1.5	2.0	3	2.2	2.5	3
MSAA241-1	-	1.2	1.5	3						
MSAA260-3	-	1.2	1.5	3						
MSBB179-1	-	1.2	1.5	3						
MSBB308-2P	1.2*	1.2	2.0	3	1.2	1.5	3			
MSBB371-1YSpl	1.5*	1.2	2.0	3	1.8	2.0	3			
MSBB614-10	-	1.2	1.5	3						

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2018-20 SCAB DISEASE TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER , MI

LINE	3-YR* AVG.	2020 RATING	2020 WORST	2020 N	2019 RATING	2019 WORST	2019 N	2018 RATING	2018 WORST	2018 N
MSBB634-8	1.3*	1.2	1.5	3	1.5	2.0	3			
MSCC266-1	-	1.2	1.5	3						
MSCC725-232	-	1.2	1.5	3						
MSDD497-B	-	1.2	1.5	3						
MSEE052-5	-	1.2	1.5	3						
MSEE141-2	-	1.2	2.0	3						
MSEE151-2	-	1.2	1.5	3						
MSW163-3	-	1.2	1.5	3						
MSX324-2R	1.4	1.2	1.5	3	1.2	2.0	3	2.0	2.0	3
MSZ109-8PP	-	1.2	1.5	3						
MSZ219-13^{PVYR}	0.9	1.2	2.0	3	0.7	1.0	3	0.8	1.0	3
MSZ242-13	1.2	1.2	1.5	3	1.2	1.5	3	1.3	1.5	3
MSZ413-6P	1.4	1.2	1.5	3	1.8	2.0	3	1.3	2.0	3
MSZ416-8RY	1.1*	1.2	1.5	3	1.0	1.5	3			
Blackberry (MSZ109-10PP)	1.2	1.3	1.5	3	1.2	1.5	3	1.2	1.5	3
Huron Chipper (MSW485-2)	1.7	1.3	1.5	3	2.0	2.5	3	1.7	2.0	3
MSAA076-6	1.5	1.3	1.5	3	1.8	2.5	3	1.3	1.5	3
MSAA100-1	-	1.3	1.5	3						
MSAA161-4RY	1.2	1.3	2.5	3	1.3	1.5	3	0.8	1.0	3
MSAA182-3R	1.5	1.3	1.5	3	1.7	2.0	3	1.5	2.0	3
MSAA328-4	-	1.3	1.5	3						
MSBB058-1	-	1.3	1.5	3						
MSBB079-2	1.3*	1.3	2.0	3	1.3	1.5	3			
MSBB637-6	-	1.3	1.5	3						
MSEE010-3	-	1.3	1.5	3						
MSEE149-1	-	1.3	1.5	3						
MSEE149-2	-	1.3	2.0	3						
MSEE169-1	-	1.3	1.5	3						
MSEE190-1	-	1.3	1.5	3						
MSV443-1PP	1.4	1.3	2.0	3	1.3	1.5	3	1.5	2.0	3
MSX225-2	1.4	1.3	1.5	3	1.3	1.5	2	1.5	2.0	3
MSX526-1	1.2*	1.3	2.0	3	1.2	1.5	3			
MSY111-1	-	1.3	1.5	3						
MSZ219-46	-	1.3	1.5	3						
MSZ242-09	1.2	1.3	2.0	3	1.5	1.5	2	0.7	1.0	3
Petoskey (MSV030-4)	1.3*	1.3	1.5	3	1.3	2.0	3			
Isle Royale (MSX569-1R)	1.7	1.5	2.5	3	2.3	3.5	3	1.3	2.0	3
MSAA252-7	-	1.5	2.0	3						
MSAA513-1	-	1.5	2.0	3						
MSAA570-3	-	1.5	2.0	3						
MSBB213-1Spl	1.4*	1.5	1.5	3	1.3	1.5	2			
MSBB364-1	1.4*	1.5	2.0	3	1.3	1.5	3			
MSBB617-2	-	1.5	1.5	3						
MSBB618-9	-	1.5	2.0	3						
MSCC314-1	-	1.5	2.5	3						
MSCC542-1P	-	1.5	2.0	3						
MSEE085-1	-	1.5	2.0	3						
MSEE102-1	-	1.5	2.0	2						
MSEE130-1	-	1.5	2.0	3						
MSEE255-1	-	1.5	1.5	3						
MSV179-1	1.5	1.5	2.5	3	1.5	2.0	2	1.5	1.5	1

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SCAB NURSERY, MONTCALM RESEARCH CENTER , MI

LINE	3-YR* AVG.	2020 RATING	2020 WORST	2020 N	2019 RATING	2019 WORST	2019 N	2018 RATING	2018 WORST	2018 N
MSX042-3	-	1.5	1.5	3						
MSX398-2	1.6	1.5	2.5	2	1.5	2.5	3	1.8	2.0	3
MSZ052-14	1.4	1.5	1.5	3	1.3	1.5	3	1.5	2.0	3
MSZ120-4	1.6	1.5	2.0	3	1.7	2.0	3	1.7	2.0	3
MSZ513-2	1.5	1.5	2.0	3	1.7	2.0	3	1.3	2.0	3
MSZ615-2	1.4	1.5	1.5	3	1.2	1.5	3	1.7	2.0	3
Plover Russet	-	1.5	2.0	2						
Vanguard Russet (TX08352-5Rus)	1.6	1.5	2.0	3	1.3	1.5	3	1.8	2.5	3
Mackinaw (MSX540-4)[PVYR, LBR]	1.7	1.7	2.0	3	1.5	2.0	3	1.8	2.0	3
MSAA127-7PP	1.9	1.7	2.5	3	1.8	2.0	3	2.2	2.5	3
MSAA174-1	1.6	1.7	2.0	3	1.5	1.5	3	1.5	2.0	3
MSAA196-1	-	1.7	2.5	3						
MSAA313-1	-	1.7	2.5	3						
MSAA342-2	1.8*	1.7	2.0	3	1.8	2.5	3			
MSAA373-3	-	1.7	2.0	3						
MSAA706-7PP	1.6	1.7	2.5	3	1.3	1.5	3	1.8	3.0	3
MSBB190-1	1.8*	1.7	2.0	3	2.0	2.0	3			
MSBB250-1PP	-	1.7	2.0	3						
MSBB252-1PP	-	1.7	3.5	3						
MSBB305-2Spl	1.6*	1.7	3.0	3	1.5	1.5	2			
MSBB623-12	-	1.7	2.5	3						
MSBB635-14	1.4*	1.7	2.0	3	1.2	1.5	3			
MSCC058-1	-	1.7	2.0	3						
MSCC282-2PP	-	1.7	2.0	3						
MSCC287-1	-	1.7	2.0	3						
MSCC614-1RYSPL	-	1.7	2.5	3						
MSEE022-8	-	1.7	2.5	3						
MSEE033-2	-	1.7	2.0	3						
MSEE131-1	-	1.7	2.0	3						
MSEE154-1	-	1.7	2.5	3						
MSEE187-1	-	1.7	2.0	3						
MSV093-1Y	1.5	1.7	2.0	3	1.2	1.5	3	1.7	2.0	3
MSV498-1	1.6	1.7	2.0	3	1.2	2.0	3	1.8	2.0	3
MSX137-6	-	1.7	2.0	3						
MSX472-2	1.4	1.7	2.0	3	1.3	1.5	2	1.3	2.0	3
MSZ109-7PP	1.7	1.7	2.5	3	1.5	2.0	3	1.8	2.0	3
MSZ248-02	-	1.7	2.0	3						
Queen Anne	1.8	1.8	2.5	2	1.8	2.0	3	1.7	2.0	3
Superior	1.7*	1.8	2.5	2	1.7	2.0	3			
Dakota Russet	-	1.8	2.5	3						
MSAA085-1Y	1.8	1.8	2.0	3	1.8	2.0	3	1.8	2.0	3
MSAA166-2P	-	1.8	2.5	3						
MSBB017-1	-	1.8	2.5	3						
MSBB238-1RY	1.3*	1.8	2.0	3	0.8	1.0	3			
MSCC447-1WR	-	1.8	2.0	3						
MSCC576-1	-	1.8	2.0	3						
MSDD530-1	-	1.8	2.5	3						
MSEE038-1	-	1.8	2.0	3						
MSEE137-3	-	1.8	2.0	3						
MSEE142-1	-	1.8	2.5	3						
MSW164-2	-	1.8	2.5	3						

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LINE	3-YR* AVG.	2020 RATING	2020 WORST	2020 N	2019 RATING	2019 WORST	2019 N	2018 RATING	2018 WORST	2018 N
MSX050-1	-	1.8	2.0	3						
MSX245-2Y	1.9	1.8	2.0	3	2.0	2.0	3	2.0	2.0	3
MSX443-3P	2.1	1.8	2.5	3	2.0	2.5	3	2.5	4.0	3
MSZ063-2	-	1.8	2.5	3						
MSZ107-6PP	2.0	1.8	2.0	3	2.3	2.5	2	2.0	2.5	3
MSZ436-2SPL	1.8	1.8	2.0	3	1.8	2.0	3	1.8	2.0	3
MSZ551-1	1.8*	1.8	2.5	3	1.8	2.0	3			
Atlantic	**2.5**	**1.9**	**3.0**	**6**	**2.5**	**2.5**	**3**	**3.0**	**3.5**	**3**
MSBB272-1P	-	2.0	2.0	3						
MSBB621-3	1.8*	2.0	2.5	3	1.7	2.0	3			
MSCC168-1	-	2.0	2.0	3						
MSCC300-1	-	2.0	2.0	3						
MSCC302-1	-	2.0	2.5	3						
MSCC512-1PP	-	2.0	2.0	3						
MSCC515-2Y	-	2.0	2.5	3						
MSEE018-2	-	2.0	2.0	3						
MSEE055-1R	-	2.0	2.5	2						
MSEE136-1	-	2.0	2.0	3						
MSEE142-2	-	2.0	2.0	3						
MSW476-4R	-	2.0	2.0	3						
MSZ194-2	-	2.0	2.5	3						
MSZ427-3R	1.8	2.0	2.5	3	1.3	2.0	3	2.0	2.5	3
Paroli	-	2.0	2.5	3						
Sunset Russet	-	2.0	2.5	3						
Golden Globe	-	2.2	3.0	3						
MSAA120-1	-	2.2	2.5	3						
MSAA232-4	-	2.2	2.5	3						
MSX156-1Y	2.3	2.2	2.5	3	2.7	3.0	3	2.1	2.5	5
A08433-4sto	-	2.3	3.5	3						
Alverstone	-	2.3	3.5	3						
Fenway Red	-	2.3	3.0	3						
Melody	-	2.3	2.5	3						
MSAA217-3	-	2.3	3.0	3						
MSAA275-3	-	2.3	3.0	3						
MSBB107-1	2.2*	2.3	2.5	3	2.2	2.5	3			
MSBB270-1YSpl	2.1*	2.3	2.5	3	1.8	2.5	3			
MSW038-4Y	-	2.3	2.5	3						
Snowden	**2.7**	**2.4**	**3.5**	**6**	**2.8**	**3.5**	**6**	**3.0**	**3.5**	**3**
Allora	-	2.5	2.5	3						
Manistee	**2.6**	**2.5**	**3.0**	**3**	**3.0**	**3.5**	**3**	**2.2**	**2.5**	**3**
MSBB611-3	-	2.5	3.5	3						
Russet Norkotah	**2.5**	**2.5**	**3.0**	**3**	**2.2**	**3.0**	**3**	**2.8**	**4.0**	**3**
Yukon Gold	**2.7**	**2.5**	**2.5**	**1**	**3.0**	**3.5**	**6**	**2.6**	**3.5**	**6**
CO09205-2Rus	-	2.7	3.5	3						
MSEE151-3	-	2.7	3.0	3						
MSRM#2	-	2.7	3.5	3						
MSX193-1Y	2.3*	2.7	3.0	3	2.0	2.5	2			
MSX293-1Y	-	2.7	3.0	3						
Reba	**2.6**	**2.7**	**3.0**	**3**	**2.5**	**2.5**	**2**	**2.5**	**2.5**	**3**
Michigan Purple	-	2.8	3.0	2						
CO99076-6R	-	2.8	3.5	3						

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LINE	3-YR* AVG.	2020 RATING	2020 WORST	2020 N	2019 RATING	2019 WORST	2019 N	2018 RATING	2018 WORST	2018 N
Constance	-	2.8	3.0	3						
MSAA157-2PY	2.8	2.8	4.0	3	3.3	3.5	3	2.3	2.5	3
MSEE202-4	-	2.8	3.5	3						
MSX497-6^{LBR}	2.7	2.8	3.5	3	2.2	3.0	3	3.0	3.5	3
Nixie	-	2.8	3.0	3						
Jacqueline Lee	-	3.0	3.0	2						
MSBB719-1	2.6*	3.0	3.5	3	2.2	2.5	3			
A09086-1LB	-	3.2	3.5	3						

SCAB DISEASE RATING: MSU Scab Nursery plot rating of 0-5; 0: No Infection; 1: Low Infection <5%, no pitted leisions; 3: Intermediate >20%, some pitted leisions (Susceptible, as commonly seen on Atlantic); 5: Highly Susceptible, >75% coverage and severe pitted leisions.
N = Number of replications.
*2-Year Average.

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2020 SCAB DISEASE EARLY GENERATION TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER, MI

LINE	2020 RATING	LINE	2020 RATING
Sorted by ascending 2020 Rating:			
MSCC248-2	0.5	MSEE074-01	1.0
MSCC282-3RR	0.5	MSEE085-01	1.0
MSCC300-1	0.5	MSEE101-02	1.0
MSCC376-1	0.5	MSEE102-01	1.0
MSCC542-1P	0.5	MSEE136-01	1.0
MSCC553-1R	0.5	MSEE149-01	1.0
MSEE025-01	0.5	MSEE157-01	1.0
MSEE054-20	0.5	MSEE163-01	1.0
MSEE074-02	0.5	MSEE169-01	1.0
MSFF018-1	0.5	MSEE187-01	1.0
MSFF032-4	0.5	MSEE199-01	1.0
MSFF037-17	0.5	MSEE204-10	1.0
MSFF044-1	0.5	MSEE204-13	1.0
MSFF061-1	0.5	MSEE255-01	1.0
MSFF073-03	0.5	MSFF006-01	1.0
MSFF111-1	0.5	MSFF017-1	1.0
MSFF142-1P	0.5	MSFF031-06	1.0
MSFF142-2SPL	0.5	MSFF033-10	1.0
MSFF145-1P	0.5	MSFF035-3	1.0
MSFF193-3	0.5	MSFF043-04	1.0
MSFF198-03	0.5	MSFF043-10	1.0
MSFF198-13PY	0.5	MSFF056-1Y	1.0
MSFF223-1RY	0.5	MSFF067-1	1.0
MSFF274-2	0.5	MSFF073-07	1.0
MSFF296-01	0.5	MSFF120-1	1.0
MSFF316-1R	0.5	MSFF131-1SPL	1.0
MSFF321-1	0.5	MSFF134-2RR	1.0
MSFF344-3RY	0.5	MSFF148-1PP	1.0
MSSCC614-01RY	0.5	MSFF171-1	1.0
MSCC009-1	1.0	MSFF178-1	1.0
MSCC129-02	1.0	MSFF211-02	1.0
MSCC168-1	1.0	MSFF234-1R	1.0
MSCC256-2	1.0	MSFF271-3	1.0
MSCC374-1Y	1.0	MSFF277-1	1.0
MSCC409-1	1.0	MSFF283-1	1.0
MSEE022-08	1.0	MSFF297-1	1.0
MSEE031-03	1.0	MSFF303-03	1.0
MSEE035-05	1.0	MSFF316-1	1.0
MSEE049-07	1.0	MSFF323-1RY	1.0
MSEE057-13	1.0	MSFF331-2RR	1.0
MSEE063-06	1.0	MSFF334-1PINTORR	1.0

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2020 SCAB DISEASE EARLY GENERATION TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER, MI

LINE	2020 RATING	LINE	2020 RATING
Sorted by ascending 2020 Rating:			
MSFF338-01PP	1.0	MSFF145-2R	1.5
MSFF351-1RR	1.0	MSFF147-1RR	1.5
MSFF079-16	1.3	MSFF149-1	1.5
MSCC248-3	1.5	MSFF189-1Y	1.5
MSCC266-1	1.5	MSFF193-2	1.5
MSCC287-1	1.5	MSFF217-1	1.5
MSCC576-1	1.5	MSFF244-1PP	1.5
MSDD050-B	1.5	MSFF247-2Y	1.5
MSDD085-13	1.5	MSFF261-1	1.5
MSEE002-01	1.5	MSFF271-1	1.5
MSEE002-03	1.5	MSFF292-1	1.5
MSEE016-10	1.5	MSFF305-1RY	1.5
MSEE033-02	1.5	MSFF320-3	1.5
MSEE035-04	1.5	MSFF335-02RR	1.5
MSEE038-01	1.5	MSFF345-1R	1.5
MSEE052-05	1.5	MSFF050-1	1.8
MSEE115-01	1.5	MSCC058-1	2.0
MSEE130-01	1.5	MSCC081-1	2.0
MSEE151-02	1.5	MSCC084-1	2.0
MSEE182-03	1.5	MSCC246-07	2.0
MSEE190-01	1.5	MSCC282-2PP	2.0
MSEE247-6WP	1.5	MSCC302-1	2.0
MSFF011-1	1.5	MSCC314-1	2.0
MSFF013-1	1.5	MSCC515-2Y	2.0
MSFF022-2	1.5	MSCC724-014	2.0
MSFF025-1	1.5	MSEE010-03	2.0
MSFF030-1WR	1.5	MSEE131-01	2.0
MSFF031-03	1.5	MSEE137-03	2.0
MSFF031-16	1.5	MSEE141-02	2.0
MSFF034-07	1.5	MSEE142-02	2.0
MSFF035-2	1.5	MSEE149-02	2.0
MSFF035-4	1.5	MSEE151-03	2.0
MSFF055-01Y	1.5	MSEE154-01	2.0
MSFF058-1	1.5	MSEE171-02	2.0
MSFF069-1Y	1.5	MSEE180-3P	2.0
MSFF072-4	1.5	MSEE207-02	2.0
MSFF091-01	1.5	MSFF003-1	2.0
MSFF120-02Y	1.5	MSFF007-2	2.0
MSFF140-1WP	1.5	MSFF008-1	2.0
MSFF143-1PW	1.5	MSFF009-01	2.0
MSFF143-2PW	1.5	MSFF014-01	2.0

Table 8

MICHIGAN STATE UNIVERSITY

POTATO BREEDING and GENETICS

2020 SCAB DISEASE EARLY GENERATION TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER, MI

LINE	2020 RATING	LINE	2020 RATING
Sorted by ascending 2020 Rating:			
MSFF015-01	2.0	MSDD530-01	2.5
MSFF017-2	2.0	MSEE055-1R	2.5
MSFF017-3	2.0	MSEE191-03	2.5
MSFF022-1	2.0	MSEE202-04	2.5
MSFF022-4	2.0	MSFF016-01	2.5
MSFF023-01	2.0	MSFF017-4	2.5
MSFF034-04P	2.0	MSFF022-1	2.5
MSFF036-01	2.0	MSFF022-3	2.5
MSFF037-06	2.0	MSFF029-10	2.5
MSFF037-07	2.0	MSFF038-4	2.5
MSFF038-3	2.0	MSFF075-1	2.5
MSFF054-1	2.0	MSFF098-04	2.5
MSFF072-1Y	2.0	MSFF106-1	2.5
MSFF075-2	2.0	MSFF114-1	2.5
MSFF077-4	2.0	MSFF163-2	2.5
MSFF094-4	2.0	MSFF200-04PYSPL	2.5
MSFF097-6	2.0	MSFF210-1	2.5
MSFF097-7	2.0	MSFF226-1RY	2.5
MSFF097-8	2.0	MSFF230-1	2.5
MSFF109-01	2.0	MSFF247-1	2.5
MSFF117-02	2.0	MSFF263-1PP	2.5
MSFF117-1	2.0	MSFF286-1	2.5
MSFF127-1WP	2.0	MSFF286-2	2.5
MSFF134-1PP	2.0	MSFF304-2R	2.5
MSFF138-1R	2.0	MSFF305-2RY	2.5
MSFF142-3SPL	2.0	MSFF305-4RY	2.5
MSFF143-3P	2.0	MSFF316-6Y	2.5
MSFF182-1R	2.0	MSFF322-1	2.5
MSFF206-1	2.0	MSFF331-1PP	2.5
MSFF206-2	2.0	MSFF335-1RR	2.5
MSFF223-01PY	2.0	MSFF346-1RY	2.5
MSFF230-01PY	2.0	MSFF007-01	3.0
MSFF267-1	2.0	MSFF034-01	3.0
MSFF267-2	2.0	MSFF086-2	3.0
MSFF271-02	2.0	MSFF168-1	3.0
MSFF274-1	2.0	MSFF203-1	3.0
MSFF321-2	2.0	MSFF219-1Y	3.0
MSFF335-3PINTO	2.0	MSFF243-1RR	3.0
MSFF351-2PP	2.0	MSFF321-03	3.0
MSFF354-1RR	2.0	MSFF336-1PP	3.5
MSCC512-1PP	2.5	MSFF138-2P	4.0

Table 9

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

2020 BLACKSPOT BRUISE SUSCEPTIBILITY TEST
SIMULATED BRUISE SAMPLES*

ENTRY	SP GR	NUMBER OF SPOTS PER TUBER 0	1	2	3	4	5+	PERCENT (%) BRUISE FREE	AVERAGE SPOTS/TUBER
RUSSET TRIAL									
A09086-1LB	1.077	18	1	0	0	0	0	95	0.1
Russet Norkotah/Texas 112	**1.064**	**23**	**2**	**0**	**0**	**0**	**0**	**92**	**0.1**
A08433-4Sto	1.072	21	3	1	0	0	0	84	0.2
Goldrush Russet	**1.061**	**19**	**4**	**1**	**1**	**0**	**0**	**76**	**0.4**
Alverstone Russet (HZPC)	1.074	17	6	2	0	0	0	68	0.4
Vanguard Russet	1.058	19	1	3	0	1	0	79	0.5
AO06191-1	1.079	15	9	0	1	0	0	60	0.5
SunSet Russet (TX13590-9Rus)	1.077	13	7	4	1	0	0	52	0.7
Dakota Russet	1.081	11	7	7	0	0	0	44	0.8
Plover Russet	1.066	8	10	4	2	0	0	33	1.0
CO09205-2Rus	1.070	6	9	7	1	0	0	26	1.1
Umatilla Russet	1.084	7	6	5	6	1	0	28	1.5
ADAPTATION TRIAL, CHIP-PROCESSING LINES									
MSY156-2	1.084	15	5	0	0	0	0	75	0.3
MSBB614-10	1.078	7	2	1	0	0	0	70	0.4
MSAA232-4	1.081	14	3	3	0	0	0	70	0.5
Manistee	1.079	16	4	3	1	0	0	67	0.5
MSBB617-2	1.083	13	4	2	1	0	0	65	0.6
MSZ063-2	1.084	11	9	4	1	0	0	44	0.8
Huron Chipper	1.083	8	6	6	0	0	0	40	0.9
MSZ242-09	1.089	5	12	2	1	0	0	25	1.0
Petoskey	1.092	9	6	4	0	0	1	45	1.0
MSX245-2Y	1.081	7	8	4	0	1	0	35	1.0
Mackinaw	1.090	5	8	5	1	1	0	25	1.3
MSBB610-13	1.083	6	9	2	1	1	1	30	1.3
MSBB635-14	1.081	9	4	1	5	1	0	45	1.3
MSZ219-01	1.080	5	7	6	2	0	0	25	1.3
MSX526-1	1.083	4	6	9	1	0	0	20	1.4
MSZ242-07	1.098	7	5	2	4	0	1	37	1.4
Atlantic	**1.085**	**3**	**5**	**6**	**2**	**3**	**0**	**16**	**1.8**
MSAA260-3	1.080	4	3	4	5	3	0	21	2.0
Snowden	**1.084**	**1**	**5**	**7**	**3**	**3**	**1**	**5**	**2.3**
MSAA498-18	1.086	2	7	4	4	4	2	8	2.3
MSAA217-3	1.091	1	4	9	2	2	2	5	2.3
MSBB079-2	1.083	2	6	4	3	2	3	10	2.3
MSCC058-1	1.086	1	3	7	4	5	0	5	2.5
MSZ120-04	1.082	1	2	9	5	1	2	5	2.5
Lamoka	**1.082**	**1**	**3**	**5**	**6**	**4**	**1**	**5**	**2.6**
MSAA076-6	1.092	0	3	5	9	1	2	0	2.7
MSAA328-4	1.081	1	2	4	7	5	1	5	2.8
MSZ242-13	1.099	0	3	7	3	5	2	0	2.8
MSBB626-11	1.085	2	1	5	7	3	4	7	2.9
MSZ219-13	1.086	0	3	7	7	5	3	0	2.9
MSAA513-1	1.078	0	2	6	5	5	2	0	3.0
MSCC168-1	1.076	2	1	2	5	5	5	10	3.3
MSBB058-1	1.093	0	0	6	5	3	6	0	3.5
MSBB611-3	1.086	0	0	3	8	4	5	0	3.6
MSAA252-7	1.083	0	0	3	8	3	6	0	3.6

SIMULATED BRUISE SAMPLES*

ENTRY	SP GR	NUMBER OF SPOTS PER TUBER 0	1	2	3	4	5+	PERCENT (%) BRUISE FREE	AVERAGE SPOTS/TUBER
ADAPTATION TRIAL, TABLESTOCK LINES									
Blackberry	1.066	20	0	0	0	0	0	100	0.0
Queen Anne	1.061	19	1	0	0	0	0	95	0.1
MSZ436-2SPL	1.054	19	1	0	0	0	0	95	0.1
MSCC515-2Y	1.066	18	1	0	0	0	0	95	0.1
MSAA174-1	1.056	17	3	0	0	0	0	85	0.2
MSV443-1PP	1.062	17	3	0	0	0	0	85	0.2
MSX293-1Y	1.066	17	3	0	0	0	0	85	0.2
MSBB351-1	1.059	14	5	0	0	0	0	74	0.3
MSZ109-8PP	1.063	14	5	0	0	0	0	74	0.3
MSX137-6	1.075	18	2	2	0	0	0	82	0.3
MSAA196-1	1.063	14	6	0	0	0	0	70	0.3
MSX193-1Y	1.073	14	6	0	0	0	0	70	0.3
MSV093-1Y	1.067	14	5	1	0	0	0	70	0.4
MSZ268-1Y	1.072	14	5	1	0	0	0	70	0.4
MSZ427-3R	1.055	14	5	1	0	0	0	70	0.4
MSV179-1	1.069	15	3	1	1	0	0	75	0.4
MSX324-1P	1.076	14	4	1	1	0	0	70	0.5
MSCC300-1	1.073	13	4	3	0	0	0	65	0.5
Superior	**1.056**	**12**	**6**	**2**	**0**	**0**	**0**	**60**	**0.5**
Yukon Gold	**1.064**	**13**	**5**	**2**	**1**	**0**	**0**	**63**	**0.5**
MSZ615-2	1.066	14	4	3	0	1	0	68	0.5
MST252-1Y	1.066	12	5	2	1	0	0	60	0.6
MSX324-2R	1.066	12	5	2	1	0	0	60	0.6
MSY111-1	1.089	12	4	4	0	0	0	60	0.6
MSW038-4Y	1.069	15	0	3	1	1	0	75	0.7
MSZ416-8RY	1.056	11	5	2	2	0	0	55	0.8
MSW476-4R	1.073	10	3	5	1	0	0	53	0.8
MSBB213-1SPL	1.078	11	5	1	2	1	0	55	0.9
MSZ590-1	1.061	7	9	1	2	0	1	35	1.1
MSAA120-1	1.071	7	6	4	3	0	0	35	1.2
MSX156-1Y	1.068	5	6	3	3	2	1	25	1.7
MSY507-2	1.076	5	8	2	1	1	3	25	1.7
MSCC302-1	1.076	4	3	8	3	1	1	20	1.9
MSZ551-1	1.075	4	3	6	5	2	0	20	1.9
PRELIMINARY TRIAL, CHIP-PROCESSING LINES									
MSEE022-8	1.077	20	0	0	0	0	0	100	0.0
MSEE052-5	1.070	25	0	0	0	0	0	100	0.0
MSDD497-B	1.056	20	1	0	0	0	0	95	0.0
MSBB107-1	1.068	19	1	0	0	0	0	95	0.1
MSBB634-8	1.071	18	2	0	0	0	0	90	0.1
MSCC725-232	1.068	18	2	0	0	0	0	90	0.1
MSEE038-1	1.057	17	3	0	0	0	0	85	0.2
MSDD530-1	1.065	17	1	1	0	0	0	89	0.2
MSEE137-3	1.077	22	2	1	0	0	0	88	0.2
MSAA085-1	1.071	16	4	0	0	0	0	80	0.2
MSEE063-6	1.076	16	4	0	0	0	0	80	0.2
MSEE154-1	1.059	20	5	0	0	0	0	80	0.2
MSEE180-3P	1.076	16	4	0	0	0	0	80	0.2
MSEE010-3	1.070	16	3	1	0	0	0	80	0.3
Pike	**1.075**	**15**	**5**	**0**	**0**	**0**	**0**	**75**	**0.3**
MSEE151-3	1.078	16	2	0	1	0	0	84	0.3

SIMULATED BRUISE SAMPLES*

ENTRY	SP GR	NUMBER OF SPOTS PER TUBER 0	1	2	3	4	5+	PERCENT (%) BRUISE FREE	AVERAGE SPOTS/TUBER
MSBB623-12	1.070	15	3	2	0	0	0	75	0.4
MSEE074-2	1.073	15	3	2	0	0	0	75	0.4
MSEE131-1	1.077	14	5	1	0	0	0	70	0.4
MSBB190-1	1.068	13	5	1	0	0	0	68	0.4
MSEE157-1	1.077	12	8	0	0	0	0	60	0.4
MSBB651-4	1.071	18	5	0	2	0	0	72	0.4
MSZ219-46	1.074	13	3	3	0	0	0	68	0.5
MSEE033-2	1.071	13	6	2	0	0	0	62	0.5
MSEE190-1	1.073	14	2	3	1	0	0	70	0.6
MSEE141-2	1.079	11	5	3	0	0	0	58	0.6
MSEE031-3	1.078	12	5	2	1	0	0	60	0.6
MSX042-3	1.079	10	7	1	1	0	0	53	0.6
MSEE025-1	1.076	10	8	0	1	1	0	50	0.8
MSEE207-02	1.075	9	7	4	0	0	0	45	0.8
MSAA241-1	1.077	10	7	1	1	0	1	50	0.9
MSBB020-8	1.076	8	7	5	0	0	0	40	0.9
MSEE136-1	1.072	11	8	5	0	1	0	44	0.9
MSBB621-3	1.069	6	12	1	0	1	0	30	0.9
MSBB625-2	1.089	7	9	5	1	0	0	32	1.0
MSBB166-1	1.071	9	6	4	3	0	0	41	1.0
MSBB179-1	1.072	9	4	3	4	0	0	45	1.1
MSBB017-1	1.079	6	7	5	2	0	0	30	1.2
Atlantic	**1.082**	**5**	**10**	**2**	**2**	**1**	**0**	**25**	**1.2**
MSEE149-2	1.084	10	4	2	2	2	1	49	1.3
MSEE101-2	1.083	4	9	5	1	0	1	20	1.4
MSEE151-2	1.075	7	2	7	4	0	0	35	1.4
Snowden	**1.077**	**5**	**5**	**6**	**4**	**0**	**0**	**25**	**1.5**
MSEE149-1	1.075	9	3	1	3	3	1	45	1.6
MSEE018-2	1.092	4	4	3	6	2	1	20	2.1
MSEE171-2	1.082	1	1	7	5	3	3	5	2.9
PRELIMINARY TRIAL, TABLESTOCK LINES									
Paroli	1.054	20	0	0	0	0	0	100	0.0
MSAA342-2	1.065	19	1	0	0	0	0	95	0.1
MSCC314-1	1.065	19	1	0	0	0	0	95	0.1
Nixie	1.065	18	2	0	0	0	0	90	0.1
Golden Globe	1.060	18	2	1	0	0	0	86	0.2
MSCC724-14	1.066	15	5	0	0	0	0	75	0.3
MSBB305-2SPL	1.060	15	4	1	0	0	0	75	0.3
Allora	1.064	17	4	4	0	0	0	68	0.5
Reba	**1.063**	**14**	**3**	**2**	**1**	**0**	**0**	**70**	**0.5**
MSBB371-1YSPL	1.070	9	10	0	0	0	0	47	0.5
Constance	1.060	8	11	1	0	0	0	40	0.7
MSEE085-1	1.075	10	8	1	1	0	0	50	0.7
Melody	1.067	8	9	3	0	0	0	40	0.8
MSEE199-1	1.073	9	5	5	1	0	0	45	0.9
MSEE255-1	1.073	9	4	2	2	2	1	45	1.4
Jacqueline Lee	1.081	2	6	8	3	0	1	10	1.8
PRELIMINARY TRIAL, PIGMENTED LINES									
Dark Red Norland	**1.052**	**19**	**1**	**0**	**0**	**0**	**0**	**95**	**0.1**
MSZ427-1R mini	1.057	19	1	0	0	0	0	95	0.1
MSBB308-2P	1.056	18	2	0	0	0	0	90	0.1
MSEE247-6WP	1.060	18	2	0	0	0	0	90	0.1

SIMULATED BRUISE SAMPLES*

ENTRY	SP GR	NUMBER OF SPOTS PER TUBER 0	1	2	3	4	5+	PERCENT (%) BRUISE FREE	AVERAGE SPOTS/TUBER
MSX443-3P mini	1.074	18	2	0	0	0	0	90	0.1
MSCC542-1P	1.054	17	2	0	0	0	0	89	0.1
Vicki (HZPC)	1.065	18	1	0	0	0	0	95	0.1
MSAA101-1RR	1.081	17	3	0	0	0	0	85	0.2
MSBB250-1PP	1.078	17	3	0	0	0	0	85	0.2
MSCC614-1RYSPL	1.079	18	1	1	0	0	0	90	0.2
MSZ107-6PP	1.075	14	4	0	0	0	0	78	0.2
MSAA157-2PY	1.067	16	3	1	0	0	0	80	0.3
MSAA706-7PP	1.065	16	3	1	0	0	0	80	0.3
MSAA127-7PP	1.053	12	8	0	0	0	0	60	0.4
Fenway Red	1.072	14	3	2	1	0	0	70	0.5
CO99076-6R	1.067	10	6	4	0	0	0	50	0.7
USPB/SFA TRIAL CHECK SAMPLES (Not bruised)									
MSZ063-2	1.080	21	3	1	0	0	0	84	0.2
Lamoka	1.082	14	10	1	0	0	0	56	0.5
CO11023-9W	1.066	15	7	2	1	0	0	60	0.6
Petoskey	1.090	13	7	5	0	0	0	52	0.7
Snowden	1.081	10	12	2	1	0	0	40	0.8
CO11023-2W	1.088	10	10	3	2	0	0	40	0.9
MSZ242-13	1.096	10	7	7	1	0	0	40	1.0
B2869-29	1.083	8	11	4	2	0	0	32	1.0
ND7519-1	1.085	6	13	6	0	0	0	24	1.0
MSW474-1	1.083	10	5	6	4	0	0	40	1.2
NY163	1.081	7	5	10	2	1	0	28	1.4
USPB/SFA TRIAL BRUISE SAMPLES									
MSZ063-2	1.080	5	11	8	1	0	0	20	1.2
ND7519-1	1.085	3	13	6	3	0	0	12	1.4
Lamoka	1.082	3	8	6	8	0	0	12	1.8
NY163	1.081	3	4	8	6	4	0	12	2.2
CO11023-9W	1.066	5	1	8	4	4	3	20	2.4
CO11023-2W	1.088	0	5	8	6	5	1	0	2.6
B2869-29	1.083	2	3	7	3	4	6	8	2.9
Snowden	1.081	0	1	5	9	6	4	0	3.3
Petoskey	1.090	0	4	4	3	8	6	0	3.3
MSW474-1	1.083	0	0	3	9	7	6	0	3.6
MSZ242-13	1.096	0	0	5	5	7	8	0	3.7

* Selected A-size tuber samples were collected at harvest, held at 50 F at least 12 hours,
and placed in a six-sided plywood drum and rotated ten times to produce simulated bruising.
Samples were abrasive-peeled and scored 11/11 & 12/2020.
The table is presented in ascending order of average number of spots per tuber.