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2022 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 2022, we tested over 150 varieties and breeding lines in the replicated variety trials, 137 lines in the North Central Regional trial plus over 150 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) 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 (along with the graduate students Thilani Jayakody, Kaela Panicucci 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. 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 2021 on this ground. A severe rain event late in 2022 flooded the southern tiers of some of the trials. There was no serious damage from insects, diseases or weeds.

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 Preliminary (chip-processors and tablestock), Preliminary Pigmented, the North Central Regional, NCPT and the early observational trials.

2022 was the twelfth 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 10 trial locations (Northern sites: NY, MI, WI, ND, OR and Southern: NC, FL, CA, TX) in addition to a scab trial Wisconsin. The North Central trial was reformatted to have 15-hill plots of earlier generation selections for a total of 137 lines plus controls for the chip, russet and table markets.

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 composite tuber 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. Stem end scores were also recorded. Tuber samples were also stored at 45°F (7.2°C) for chip-processing out of storage in January and April. 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 nine years now. The 2022 late blight trial was conducted at the MSU campus Plant Pathology Farm. 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 52 entries evaluated in the trial results is given in **Table 1**. Overall, the yields for the Advanced trial (141 days) were above average. The check varieties for this trial were Lamoka, Snowden and Atlantic. The highest yielding and most promising lines were MSFF037-17, MSBB630-2, MSAA260-03, MSDD553-1, MSDD372-07, Mackinaw, MSDD244-15, and MSEE207-2. These lines have high yield potential, high specific gravity, and scab resistance. Specific gravity was average with a trial average of 1.080. Snowden and Atlantic had a specific gravity of 1.082. These promising chip-processing entries in the trial had excellent chip-processing quality out of the field and will be testing out of storage further into the storage season. Almost all of the MSU breeding lines have scab resistance having scab resistance scores equal or better than Lamoka. Mackinaw (MSX540-4) has PVY and late blight resistance while 24 other entries had PVY resistance. Other promising lines to watch are Petoskey, MSZ242-13, MSDD247-11, MSBB610-13, MSBB058-3, and MSBB058-1.

B. North Central Regional Trial (Table 2)

This trial provided a new format to test our fourth-year material in Michigan as well as ND, MN, and WI. The trial with 137 lines was evaluated after 126 days. The promising chippers in the trial were MSGG409-3, MSGG276-4, MSGG195-1, MSGG302-3 and MSGG263-1. Our promising table lines are MSGG084-1, MSGG039-11, MSGG039-08, MSGG127-3R and MSGG137-1R. Currently our results are showing that we are obtaining lines with scab and PVY resistance.

C. Adaptation Trial (Table 3)

The Adaptation Trial of the tablestock lines was harvested after 130 days and the results of 52 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. The reference cultivars Yukon Gold and Superior are reported in the tablestock trial. In general, the yields were average and internal defects were observed in some lines. The promising lines were MSFF353-1R, MSZ109-8PP, MSBB190-1, MSFF211-2, MSBB371-1YSPL, MSCC553-1R and MSAA182-3R. Scab tolerance is becoming more prevalent among the advanced selections, but the challenge remains to combine scab, PVY and late blight resistance with a commercial skin finish. Blackspot bruising was low for most lines.

D. 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 2022, there were 48 harvested entries trialed in the three Preliminary trials. PVY resistance is found in over a third of the lines tested.

The chip-processing Preliminary Trial (**Table 4**) had 26 harvested entries after 140 days. Most of the lines chip-processed well from the field but only 16 lines had acceptable specific gravity values. Internal quality weakness was predominantly vascular discoloration. Scab resistance was prevalent among the lines. Promising MSU lines are MSEE035-4, MSEE016-10, MSFF038-3, MSDD039-01, MSEE115-1 and MSFF061-1 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 19 lines in the trial with scab ratings equal or lower than 1.8, whereas Snowden had a scab rating of 3.3.

Tables 5 and 6 summarizes 12 harvested tablestock entries evaluated in the Preliminary Tablestock Trial. Reba was the check variety. These tablestock and pigmented trials were harvested and evaluated after 130 days. 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. Many of these MSU lines have commercial agronomic

performance and specialty characteristics, but scab resistance varied among the lines. Eight lines were scored as scab resistant. Blackspot bruising is low and internal defects were mostly hollow heart.

E. Diploid Replicated trial (Table 7)

13 Diploid lines were agronomically evaluated against Atlantic and Lamoka. The trial was harvested at 135 days. Five lines were comparable in yield to Atlantic and Lamoka. This trial demonstrates that we are achieving greater yield potential as we breed at the diploid level. We will continue to focus on yield, but we will put more emphasis on market traits as we continue to breed and select.

F. Potato Common Scab Evaluation (Tables 8 and 9)

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 nine years. This location is being used for the early generation observational scab trial (151 lines) and the scab variety trial (145 lines) and diploid scab trial (224). In 2022, 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 2020-2022 scab ratings are based upon the Montcalm Research Center site. **Table 8** categorizes many of the varieties and advanced selections tested in 2022 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 without pitting. Scores of 4.0 or greater are found on lines with >50% surface infection and severe pitted lesions.

The check varieties Red Norland, Yukon Gold, Mackinaw, Lamoka, Atlantic, and Snowden can be used as references (in bold, **Table 8**). The table is sorted in ascending order by 2022 scab rating. This year's results continue to indicate that we have been able to breed numerous lines with resistance to scab. Average scab ratings ranged from 0.5 – 3.3 for the variety trial. A total of 99 entries tested had a scab rating of 1.7 or lower in 2022. Most notable scab resistant MSU lines are found in the trial summaries **(Tables 1-7)**. Of the 151 early generation selections that were evaluated, 100 had scab resistance (scab rating of ≤ 1.5) (**Table 9**).

F. Late Blight Trial (Table 10)

In 2022, 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 two times in August with the US-23 genotype of *P. infestans*. Late blight infection was progressed well and data was collected into September. Twenty-seven of 82 lines were classified as late blight resistant in the replicated trial. Nineteen of the lines were also PVY resistant. Select early generation lines were tested for late blight resistance. Forty-two of 53 selections were classified as resistant.

G. Blackspot Bruise Susceptibility (Table 11)

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 11**. 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 2022, the bruise levels were higher than 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 1-7**).

H. 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 (Mackinaw), MSV030-4 (Petoskey), MSW474-1, and MSZ242-13. Our newest graduates of the NCPT are MSBB058-1, MSAA217-3 and MSBB626-11. Minituber production and/or commercial seed have been produced of the newer lines and will be tested in Michigan in 2023.

Table 1

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

ADVANCED CHIP-PROCESSING TRIAL
MONTCALM RESEARCH CENTER
May 9 to September 27, 2022 (141 days)
DD Base 40°F 3313[9]

			CWT/A		PERCENT OF TOTAL[1]							PERCENT (%) TUBER QUALITY[4]								3-YR AVG US#1
LINE	PVY Resistant	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	CHIP SCORE[2]	HH	VD	IBS	BC	SCAB[5]	MAT[6]	BRUISE[7]	LB[8]	CWT/A
MSDD088-1		2	767	800	96	4	94	2	0	1.071	1.5	5	0	0	0	0.8	3.0	0.4		-
MSAA324-04		2	753	775	97	3	91	7	0	1.074	2.0	5	0	0	0	1.3	3.5	1.2	S	-
MSFF036-1	PVYR	2	733	766	96	4	91	5	0	1.071	1.5	5	5	0	0	2.3	3.0	0.8		-
MSAA254-4		2	668	696	96	4	87	10	0	1.080	1.5	5	10	0	0	1.2	4.5	2.4		-
MSFF037-17	PVYR	2	667	720	93	7	93	0	0	1.082	1.0	0	0	10	0	2.0	3.0	2.4	MR	-
MSBB636-11	PVYR	2	664	689	97	4	96	1	0	1.075	1.5	0	0	0	0	1.2	3.0	0.8		-
MSAA260-03		2	653	683	96	5	96	0	0	1.080	1.5	5	0	0	0	1.5	3.5	1.4	S	393
MSBB635-14	PVYR	2	652	681	96	5	95	1	0	1.074	2.0	0	35	0	0	1.0	3.0	1.9		450
MSDD553-1	PVYR	2	624	657	95	5	94	1	0	1.082	1.5	0	5	0	0	1.8	3.5	2.7	MR	-
MSDD372-07	PVYR	2	623	667	94	7	93	1	0	1.091	1.5	15	0	0	0	1.8	4.0	2.3	R	-
MSEE207-2	PVYR	2	602	630	96	5	94	2	0	1.080	2.0	5	0	0	0	0.7	4.0	1.3		-
MSBB230-2		2	578	627	93	8	91	2	1	1.081	1.5	5	0	0	15	1.3	4.5	1.9		-
MSDD244-15	PVYR	2	568	602	95	5	94	1	1	1.080	1.0	0	0	0	0	1.0	3.5	3.0	R	403*
MSW474-1		2	565	641	89	12	89	0	0	1.082	1.5	0	0	0	0	1.0	3.0	3.1		420*
Mackinaw	PVYR	**2**	**553**	**588**	**94**	**6**	**94**	**0**	**0**	**1.085**	**1.0**	**0**	**0**	**0**	**0**	**1.8**	**3.5**	**2.3**	**MR**	**419**
MSBB630-2	PVYR	2	551	596	93	8	92	1	0	1.078	1.5	10	0	0	20	1.0	4.0	2.5		575*
MSDD249-9	PVYR	2	542	555	98	3	91	7	0	1.084	1.5	15	0	5	0	2.0	3.5	1.7	R	-
MSFF206-2	PVYR	2	541	580	94	6	91	3	1	1.077	1.5	60	0	0	0	1.8	4.0	1.7		-
MSBB058-1		2	530	570	93	8	93	0	0	1.081	1.5	0	5	0	0	1.2	3.0	1.2	S	-
MSCC009-1		2	524	552	95	5	95	0	1	1.073	1.5	5	0	0	0	1.3	2.5	1.8		-
MSFF007-2		2	511	562	91	9	90	2	1	1.083	2.0	5	15	0	0	1.2	3.5	2.3	MR	-
Petoskey		2	510	545	94	7	94	0	0	1.083	1.0	0	0	0	0	1.7	3.0	1.4		354
MSDD376-4	PVYR	2	498	559	89	11	89	0	0	1.082	1.5	15	5	10	5	1.7	2.5	2.5		-
MSBB610-13	PVYR	2	498	513	97	4	93	4	0	1.078	1.0	5	0	0	0	1.8	2.5	0.5		-
Lady Liberty		2	490	530	93	8	93	0	0	1.077	1.5	5	25	0	0	1.7	2.5	1.5	S	-
MSDD244-05	PVYR	2	480	499	97	4	96	1	0	1.084	1.5	0	5	0	0	1.0	3.0	1.5	MS	-
MSBB058-4		2	477	524	91	8	90	0	3	1.077	1.0	0	5	10	0	1.5	4.5	1.6		418*
MSDD247-07	PVYR	2	475	495	96	4	96	0	0	1.092	1.5	0	0	5	0	1.7	3.0	2.5	R	391*
MSAA076-6		2	474	540	88	11	88	0	2	1.084	1.5	0	5	0	0	1.3	2.5	2.1		424
MSEE031-3	PVYR	2	449	488	92	8	92	0	1	1.079	1.5	5	10	0	0	1.3	3.0	1.6	MR	-
MSFF079-16	PVYR	2	435	446	98	3	91	7	0	1.075	1.5	20	0	0	0	0.8	3.5	1.6	R	-
MSCC129-2	PVYR	2	435	444	98	2	98	1	0	1.069	1.5	10	20	5	0	1.5	3.5	-	R	-
MSBB614-15		2	430	448	96	4	95	2	0	1.083	1.5	10	10	0	0	0.7	4.5	1.8	R	397*

												PERCENT (%)								3-YR AVG
	PVY		CWT/A		PERCENT OF TOTAL[1]						CHIP	TUBER QUALITY[4]								US#1
LINE	Resistant	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	SCORE[2]	HH	VD	IBS	BC	SCAB[5]	MAT[6]	BRUISE[7]	LB[8]	CWT/A
NY168		2	429	512	84	16	84	0	0	1.085	1.5	0	0	0	0	2.3	3.0	1.4	MR	-
MSBB058-3	PVYR	2	426	437	98	3	97	2	0	1.082	2.0	0	10	0	0	1.2	5.0	1.9	R	408*
NY163		2	417	473	88	10	88	0	2	1.081	1.0	0	0	0	0	2.0	2.5	0.4	MS	-
MSCC058-1		2	414	438	95	6	93	2	0	1.080	1.0	55	15	0	10	1.8	3.5	4.1		356
MSDD089-2		2	411	432	96	4	93	3	1	1.074	1.0	0	0	0	0	1.0	3.0	0.9		-
Snowden		**2**	**411**	**483**	**85**	**15**	**85**	**0**	**0**	**1.082**	**1.0**	**10**	**5**	**0**	**0**	**3.3**	**3.5**	**1.6**	**MR**	**314**
MSBB079-2		2	410	450	91	7	86	6	2	1.072	1.5	15	0	0	0	0.8	3.0	1.6	S	-
MSBB626-11	PVYR	2	410	450	90	9	89	1	2	1.080	2.0	25	10	0	0	1.0	3.5	1.4	R	402
MSZ242-13		2	407	470	87	12	87	0	1	1.074	1.5	10	0	0	0	0.8	3.0	0.1	MS	347
MSFF097-6	PVYR	2	405	451	90	11	89	1	0	1.086	1.5	0	10	5	0	0.8	3.0	2.2		-
MSDD247-11	PVYR	2	403	440	92	8	91	1	1	1.088	1.0	0	0	0	0	1.2	2.0	1.8	MR	401*
Atlantic		**2**	**378**	**404**	**94**	**7**	**94**	**0**	**0**	**1.082**	**2.0**	**50**	**5**	**10**	**0**	**3.1**	**3.0**	**1.5**	**S**	**285**
MSFF292-1		2	373	393	95	5	95	1	0	1.085	1.5	0	0	0	0	1.2	3.0	1.4		-
MSFF017-1		2	372	397	94	6	92	2	1	1.080	1.5	0	0	0	0	1.3	3.0	1.1		-
Lamoka		**2**	**370**	**403**	**92**	**8**	**92**	**1**	**1**	**1.079**	**1.0**	**0**	**10**	**0**	**0**	**2.0**	**2.5**	**0.9**	**MR**	**304**
MSCC376-1		2	349	368	95	5	93	2	1	1.078	1.0	5	5	0	0	0.8	3.0	1.6		-
MSDD085-13	PVYR	2	348	398	88	13	88	0	0	1.083	1.5	0	0	0	0	1.2	2.5	1.6		277*
MSBB008-3		2	322	334	97	3	97	0	0	1.076	1.5	0	10	0	5	1.2	3.0	1.8		-
MSFF073-3	PVYR	2	261	303	86	14	86	0	0	1.085	1.5	0	0	0	0	1.3	2.5	1.4	MS	-
MEAN			497	532						1.080						1.4	3.2	1.7		368
$HSD_{0.05}$			323	321						0.012										

[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 20 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 29, 2022; 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.

[8]LB Late blight (*P. infestans* US-23) foliar disease reaction. R=Resistant, MR=Moderate Resistance, MS=Moderate Susceptibility, S=Susceptible

Plant Date: 5/9/22

Vine Kill: 9/8/22

Days from planting to vine kill: 122

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

Table 2

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

NORTH CENTRAL REGIONAL TRIAL
MONTCALM RESEARCH CENTER
May 10 to September 13, 2022 (126 days)
DD Base 40°F 3140[9]

LINE	PVY RESISTANT	N	CWT/A US#1	CWT/A TOTAL	PERCENT OF TOTAL[1] US#1	Bs	As	OV	PO	SP GR	CHIP SCORE[2]	OTF SED[3]	PERCENT (%) TUBER QUALITY[4] HH	VD	IBS	BC	MAT[5]	SCAB[6]	BRUISE[7]	LB[8]
Chip																				
MSGG194-3	PVYR	1	942	995	95	4	91	4	2	1.067	1.0	2.0	0	0	0	10	3.0	2	1.9	R
MSGG190-4	PVYR	1	753	799	94	5	94	0	1	1.066	1.0	0.5	0	0	0	0	2.0	3	0.6	R
MSGG409-3	PVYR	1	745	790	94	4	94	0	1	1.079	1.0	0.0	0	10	20	0	3.0	1.5	0.5	R
MN19TX18093-1		1	714	784	91	9	91	0	0	1.068	1.5	4.0	0	10	0	0	3.0			
MSGG276-4	PVYR	1	650	671	97	3	97	0	0	1.076	1.0	2.0	0	0	0	0	3.0	2	1.5	R
W19007-4		1	630	664	95	5	95	0	0	1.075	1.0	0.5	20	0	0	0	4.0			
W19007-18		1	624	647	96	4	96	0	0	1.086	1.5	3.0	10	0	0	10	3.0			
MSGG195-1	PVYR	1	619	655	95	5	95	0	0	1.079	1.0	2.5	20	0	0	10	2.0	2	1.6	S
W19023-13		1	597	656	91	8	91	0	1	1.079	1.5	3.5	0	0	0	0	4.0			
MSGG302-3	PVYR	1	580	616	94	5	94	0	0	1.081	1.0	1.0	20	30	20	0	3.0	1.5	0.2	R
MSGG263-1	PVYR	1	580	631	92	7	85	7	1	1.077	1.0	2.5	0	10	0	0	3.0	1	0.6	S
MSGG221-3	PVYR	1	571	615	93	6	91	2	1	1.060	1.5	4.0	0	0	0	0	3.0	2.5	0.7	R
MSGG207-1	PVYR	1	570	658	87	13	87	0	0	1.066	1.5	3.0	10	0	0	0	3.0	2.5	0.1	R
MN19TX18304-1		1	565	656	86	13	86	0	1	1.078	1.5	2.0	10	0	0	0	2.0			
MSGG863-A2		1	559	581	96	3	96	0	1	1.081	nd	nd	10	0	0	0	4.0	-	1.0	
Snowden		**2**	**544**	**601**	**90**	**10**	**90**	**0**	**0**	**1.082**	**1.0**	**1.0**	**5**	**25**	**0**	**0**	**3.0**			
MSGG302-1	PVYR	1	541	570	95	3	81	14	2	1.083	1.0	0.0	30	20	0	0	2.0	1	0.0	R
MSGG212-4	PVYR	1	541	646	84	15	84	0	2	1.085	2.5	3.5	0	10	20	0	2.0	3.5	0.6	R
ND1741C-5		1	520	558	93	6	93	0	1	1.080	1.0	0.5	60	0	0	0	3.0			
MSGG365-1	PVYR	1	516	543	95	5	95	0	0	1.078	1.0	1.0	20	10	0	0	2.0	2	0.7	R
W19022-9		1	509	554	92	6	92	0	2	1.073	1.0	4.5	0	10	0	0	4.0			
MSGG426-2	PVYR	1	498	533	93	7	93	0	0	1.074	1.5	3.5	0	20	0	0	2.0	1.0	1.0	R
MSGG409-2	PVYR	1	498	693	72	5	72	0	23	1.074	1.5	2.0	30	0	50	10	3.0	1.5	0.1	R
MSGG282-20	PVYR	1	497	530	94	6	94	0	0	1.073	1.0	0.5	0	0	0	0	2.0	1.5	1.6	R
W19020-20		1	487	513	95	5	95	0	0	1.076	1.5	0.5	0	0	0	0	3.0			
W19023-21		1	478	532	90	6	86	4	4	1.068	1.0	1.5	0	0	0	0	4.0			
Atlantic		**2**	**462**	**490**	**94**	**6**	**94**	**0**	**0**	**1.075**	**1.0**	**0.5**	**10**	**5**	**10**	**0**	**2.0**			
W19009-23		1	454	472	96	4	96	0	0	1.079	nd	nd	10	0	0	10	3.0			
MSHH664-1		1	448	557	80	18	80	0	2	1.065	nd	nd	30	20	10	0	3.0	-	3.7	
MSGG384-2		1	424	436	97	3	97	0	0	1.075	1.0	2.0	10	0	0	0	3.0	0.5	0.9	R
W19023-24		1	423	484	87	12	85	3	1	1.080	1.0	3.0	0	0	0	0	4.0			
MN19AOR16065-9		1	421	444	95	5	95	0	0	1.076	1.5	3.5	0	0	0	0	3.0			
MSGG268-4	PVYR	1	419	460	91	8	91	0	1	1.064	1.5	3.0	0	0	0	0	3.0	0.5	0.6	MR
ND176Y-1		1	417	474	88	10	88	0	1	1.070	1.5	2.5	0	30	0	0	2.0			
MSGG190-1	PVYR	1	414	496	84	12	84	0	5	1.069	1.0	0.0	0	0	0	0	3.0	1.5	0.2	R
MSGG328-5	PVYR	1	413	515	80	20	80	0	0	1.061	1.5	2.5	0	0	0	0	3.0	2.0	0.4	R
MSGG349-3	PVYR	1	407	514	79	18	79	0	3	1.070	1.0	2.0	0	0	0	0	3.0	1.5	1.4	R
W19009-20		1	404	506	80	13	80	0	7	1.070	1.0	2.0	0	0	10	40	3.0			
MSGG169-2	PVYR	1	401	407	98	2	87	12	0	1.072	1.5	1.0	0	50	0	0	3.0	1.5	1.0	S
MSGG294-1	PVYR	1	399	425	94	5	94	0	1	1.061	1.0	1.0	0	10	0	0	3.0	3.0	1.0	R
W19007-11		1	393	424	93	7	93	0	0	1.073	1.0	2.0	0	10	50	0	3.0			
W19012-3		1	383	418	92	8	92	0	0	1.081	1.0	0.0	0	0	50	0	3.0			
W19002-14		1	378	426	89	10	89	0	1	1.074	1.0	1.0	30	0	10	0	3.0			
W19008-2		1	370	391	95	5	95	0	0	1.066	1.5	3.5	30	0	0	0	3.0			

LINE	PVY RESISTANT	N	CWT/A		PERCENT OF TOTAL[1]					SP GR	CHIP SCORE[2]	OTF SED[3]	PERCENT (%) TUBER QUALITY[4]				MAT[5]	SCAB[6]	BRUISE[7]	LB[8]
			US#1	TOTAL	US#1	Bs	As	OV	PO				HH	VD	IBS	BC				
Lamoka		**2**	**370**	**395**	**94**	**6**	**94**	**0**	**0**	**1.074**	**1.0**	**3.0**	**0**	**15**	**0**	**0**	**3.0**			
W19019-2		1	367	383	96	3	93	3	1	1.074	1.0	0.5	20	0	0	0	3.0			
W19012-9		1	366	418	88	12	88	0	0	1.071	1.5	0.5	0	0	0	0	3.0			
W19005-7		1	363	434	84	16	84	0	0	1.079	1.0	0.5	20	0	0	0	1.0			
W19008-3		1	354	436	81	19	81	0	0	1.081	1.0	1.0	0	0	40	30	2.0			
W19009-15		1	353	403	87	11	87	0	2	1.078	1.0	0.0	0	10	0	0	4.0			
ND1789-1		1	338	372	91	9	91	0	0	1.075	1.0	1.0	0	0	0	0	2.0			
MSGG242-1	PVYR	1	337	397	85	15	85	0	0	1.076	1.0	2.5	0	0	20	0	3.0	1.0	0.3	R
ND1776-8		1	331	359	92	8	92	0	0	1.065	1.5	3.5	0	0	0	0	3.0			
MSGG343-1	PVYR	1	329	468	70	11	70	0	19	1.088	1.5	1.0	70	10	0	0	3.0	2.5	2.0	R
W19024-18		1	329	387	85	11	85	0	4	1.083	1.0	1.5	0	30	0	0	3.0			
W19009-26		1	328	363	90	8	90	0	2	1.075	1.5	3.0	0	20	20	20	2.0			
ND1734-7		1	310	376	83	17	83	0	0	1.059	1.0	4.5	0	20	30	0	2.0			
W19013-8		1	299	346	86	11	83	3	3	1.075	1.0	0.5	20	20	0	0	2.0			
ND1734-4		1	289	363	80	18	80	0	2	1.065	1.0	2.0	0	0	0	0	2.0			
W19012-30		1	283	371	76	16	76	0	8	1.085	1.0	2.5	0	10	10	0	3.0			
W19028-19		1	282	468	60	16	60	0	23	1.075	1.0	1.5	0	0	0	0	4.0			
W19012-14		1	281	359	78	22	78	0	0	1.083	1.0	0.0	0	10	0	0	3.0			
W19022-18		1	266	351	76	24	76	0	0	1.063	1.5	2.0	10	0	0	0	2.0			
W19020-16		1	252	274	92	4	92	0	4	1.079	1.5	1.0	50	0	0	0	3.0			
ND1780-2		1	250	283	88	10	88	0	2	1.066	1.0	0.5	0	10	0	0	3.0			
W19013-1		1	249	320	78	22	78	0	0	1.075	1.0	1.0	0	0	0	0	3.0			
MN19TX18120-1		1	247	305	81	18	81	0	1	1.069	nd	nd	0	0	0	0	5.0			
W19012-24		1	241	360	67	33	67	0	0	1.094	1.0	0.5	0	0	0	0	3.0			
MSGG181-5	PVYR	1	238	284	84	13	84	0	3	1.064	1.0	1.5	0	0	0	0	2.0	3.0	0.4	R
W19016-5		1	227	370	61	35	61	0	4	1.072	1.0	1.0	0	10	0	10	2.0			
MSGG690-1		1	226	302	75	10	75	0	15	1.067	4.0	3.0	10	0	0	0	3.0	-	0.5	
W19003-3		1	214	366	59	41	59	0	0	1.090	1.0	0.0	0	0	0	0	2.0			
W19012-13		1	206	246	84	16	84	0	0	1.064	1.0	2.0	0	10	0	10	1.0			
W19012-12		1	202	283	71	29	71	0	0	1.079	1.0	0.0	0	0	0	0	3.0			
W19022-25		1	198	262	76	19	76	0	5	1.076	1.0	0.5	0	0	0	0	4.0			
ND1776-11		1	184	218	85	15	85	0	0	1.065	1.0	0.0	0	10	0	0	1.0			
ND14359ABC-3		1	176	222	79	19	79	0	2	1.062	1.0	1.0	0	10	0	10	4.0			
MN19AF6866-12		1	171	240	71	29	71	0	0	1.073	nd	nd	0	10	0	0	2.0			
ND14348ABC-1		1	161	208	78	22	78	0	1	1.065	nd	nd	0	0	0	0	2.0			
W19007-7		1	159	239	67	33	67	0	0	1.076	1.0	0.5	0	0	0	0	2.0			
W19017-3		1	154	299	51	49	51	0	0	1.068	1.0	0.5	0	0	0	0	3.0			
MEAN			404	464						1.074							2.8	1.8	0.9	

LINE	PVY RESISTANT	N	CWT/A US#1	CWT/A TOTAL	PERCENT OF TOTAL[1] US#1	Bs	As	OV	PO	SP GR	CHIP SCORE[2]	OTF SED[3]	PERCENT (%) TUBER QUALITY[4] HH	VD	IBS	BC	MAT[5]	SCAB[6]	BRUISE[7]	LB[8]
Russet																				
AND08368-1Russ		1	536	684	78	11	77	2	10	1.070			20.0	20.0	20	0	3.0			
AND15396-2Russ		1	512	587	87	4	87	0	9	1.079			20.0	40.0	0	0	2.0			
ND1791-3Russ		1	475	611	78	8	78	0	14	1.078			0.0	10.0	30	0	3.0			
ND1762-19Russ		1	420	473	89	8	89	0	3	1.079			0.0	0.0	0	0	2.0			
AND15394-2Russ		1	328	416	79	20	79	0	1	1.075			0.0	0.0	0	0	1.0			
MN19AOR16123-7		1	325	353	92	8	92	0	0	1.058			10.0	10.0	0	0	3.0			
MN19AOR16061-2		1	309	369	84	9	84	0	7	1.072			20.0	10.0	0	10	2.0			
ND1760-23Russ		1	274	342	80	11	80	0	9	1.071			0.0	0.0	0	0	2.0			
MN19AOR16061-7		1	270	330	82	17	82	0	1	1.066			0.0	0.0	0	0	3.0			
ND1714Y-1Russ		1	261	368	71	27	71	0	2	1.075			0.0	10.0	0	0	2.0			
AND08380-1Russ		1	195	309	63	35	63	0	2	1.066			0.0	0.0	0	0	1.0			
Russet Burbank		**2**	**194**	**391**	**50**	**23**	**50**	**0**	**28**	**1.064**			**20.0**	**5.0**	**10**	**0**	**2.5**			
ND1795-4Russ		1	193	262	74	22	74	0	4	1.061			0.0	0.0	10	0	2.0			
Russet Norkotah		**2**	**189**	**262**	**72**	**25**	**72**	**0**	**3**	**1.061**			**20.0**	**10.0**	**0**	**0**	**2.0**			
MEAN			320	411						1.070							2.2			
Red																				
MSGG127-3R	PVYR	1	678	748	91	9	89	2	0	1.076			0	10	0	0	3.0	1.5	0.9	R
MSGG137-1R	PVYR	1	517	578	90	6	87	3	5	1.062			0	0	0	0	-	2.0	0.4	R
ND1757-2R		1	489	509	96	4	94	2	0	1.055			0	10	90	0	3.0			
ND1757-3R		1	429	483	89	5	89	0	6	1.063			10	10	0	0	3.0			
Red Lasoda		**2**	**417**	**470**	**89**	**3**	**84**	**5**	**9**	**1.054**			**0**	**30**	**0**	**0**	**2.0**			
MN19AF6933-4		1	416	465	89	7	87	3	4	1.061			0	0	0	0	2.0			
MN19AF6933-9		1	386	426	90	7	88	2	3	1.058			30	20	20	0	2.0			
ND14341B-1R		1	383	468	82	12	82	0	6	1.068			0	0	0	0	3.0			
ND1753Y-3R		1	377	437	86	13	86	0	1	1.064			30	10	0	20	3.0			
ND1727Y-1R		1	376	405	93	7	93	0	0	1.064			30	0	0	0	4.0			
MN19TX17722-3		1	368	385	95	4	95	0	0	1.058			0	20	0	0	2.0			
ND14339C-5R		1	350	380	92	6	92	0	2	1.051			0	0	0	0	1.0			
MN19ND14342-3		1	343	381	90	4	83	7	6	1.052			0	20	30	0	3.0			
ND1757-7R		1	340	382	89	10	89	0	1	1.051			0	10	0	0	3.0			
ND1757-10R		1	338	381	89	10	89	0	1	1.057			0	0	0	0	2.0			
Red Norland		**1**	**319**	**344**	**93**	**6**	**89**	**3**	**1**	**1.055**			**0**	**0**	**0**	**0**	**2.0**			
Dark Red Norland		**2**	**307**	**334**	**92**	**6**	**92**	**0**	**2**	**1.052**			**0**	**5**	**0**	**0**	**1.5**			
MN19AF6933-6		1	296	321	92	6	92	0	1	1.052			0	0	40	0	3.0			
ND14339C-4R		1	254	293	87	13	87	0	0	1.055			0	0	0	0	2.0			
ND1727Y-3R		1	202	233	87	13	79	8	0	1.062			0	10	0	0	3.0			
MSGG135-1R	PVYR	1	181	463	39	61	39	0	0	1.069			0	0	0	0	3.0	1.0	0.2	R
ND1753Y-5R		1	115	248	46	54	46	0	0	1.058			0	0	0	0	3.0			
ND1753Y-8R		1	52	197	27	73	27	0	0	1.050			0	0	0	0	3.0			
MEAN			345	406						1.059							2.6	1.5	0.5	

LINE	PVY RESISTANT	N	CWT/A US#1	CWT/A TOTAL	PERCENT OF TOTAL[1] US#1	Bs	As	OV	PO	SP GR	CHIP SCORE[2]	OTF SED[3]	PERCENT (%) TUBER QUALITY[4] HH	VD	IBS	BC	MAT[5]	SCAB[6]	BRUISE[7]	LB[8]
Table/Speciality																				
ND14384-1RRY		1	695	839	83	12	83	0	5	1.057			0	0	0	0	3.0			
MSGG084-1	PVYR	1	569	609	93	6	93	0	1	1.059			0	0	10	0	2.0			MR
MSGG039-11	PVYR	1	471	533	88	6	88	0	5	1.059			0	0	0	0	2.0	2.5	0.0	MR
MSGG039-08	PVYR	1	446	615	73	26	73	0	2	1.066			0	0	0	0	2.0	2.5	0.5	R
MN19TX18206-7		1	442	599	74	19	71	3	7	1.058			10	0	0	0	3.0			
ND14384-6RRY		1	413	467	89	5	89	0	6	1.064			0	0	0	0	3.0			
ND14384-4RRY		1	395	489	81	15	81	0	4	1.050			0	0	0	0	3.0			
MN19AF6945-3		1	391	445	88	9	88	0	3	1.066			0	10	0	0	2.0			
MSGG158-11PP	PVYR	1	381	458	83	17	83	0	0	1.057			0	0	0	0	3.0	4.0	0.1	MR
ND14337-2RY	PVYR	1	349	550	63	23	63	0	13	1.049			0	30	0	0	2.0			
MSGG078-7	PVYR	1	342	466	73	24	73	0	2	1.054			0	10	0	0	2.0	2.5	0.2	R
MN19TX18240-1		1	271	337	80	18	80	0	1	1.061			0	0	0	0	2.0			
MSGG068-1		1	244	296	82	15	82	0	2	1.061			10	20	0	0	2.0	3.0	0.6	MS
ND1731-1RR		1	210	501	42	57	42	0	1	1.075			0	0	0	0	3.0			
MEAN			401	515						1.060							2.4	2.9	0.3	
$HSD_{0.05}$			393	427						0.009										

[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 10 Oversize and/or A-size tubers cut.

[5]MATURITY RATING: August 29, 2022; Ratings 1-5; 1: Early (vines completely dead); 5: Late (vigorous vine, some flowering).

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

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

[8]LB Late blight (*P. infestans* US-23) foliar disease reaction. R=Resistant, MR=Moderate Resistance, MS=Moderate Susceptibility, S=Susceptible

Plant Date: 5/10/22

Vine Kill: 9/2/22

Days from planting to vine kill: 115

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

Table 3

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

ADAPTATION TRIAL, TABLESTOCK LINES
MONTCALM RESEARCH CENTER
May 9 to September 16, 2022 (130 days)
DD Base 40°F 3313[7]

												PERCENT (%)							
	PVY		CWT/A		PERCENT OF TOTAL[1]							TUBER QUALITY[2]							
LINE	RESISTANT	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC	SCAB[3]	MAT[4]	BRUISE[5]	LB[6]
MSFF353-1R		2	653	682	96	4	94	1	0	1.077	0	0	15	0	2.0	3.0	0.6	
MSZ109-8PP		2	638	702	91	7	91	0	2	1.057	0	5	0	0	0.8	2.5	0.3	
MSBB190-1		2	627	651	96	3	93	3	1	1.077	0	5	5	0	1.8	4.0	1.5	R
MSFF211-2	PVYR	2	551	582	95	3	91	3	2	1.060	5	0	0	0	1.2	4.0	0.0	
MSAA174-1	PVYR	2	520	542	96	3	95	1	1	1.058	0	10	20	0	1.7	3.0	0.9	MR
MSCC447-01WR		2	511	564	91	6	87	3	3	1.070	0	15	25	0	2.2	3.5	2.8	MS
MSCC553-1R	PVYR	2	490	519	94	4	93	1	1	1.067	0	0	0	0	1.2	3.0	0.2	
Blackberry		2	483	628	74	24	74	0	1	1.057	0	0	0	0	1.7	3.5	0.5	MS
MSBB343-2Y		2	478	514	93	5	86	7	2	1.064	10	25	5	0	2.3	3.0	0.3	
MSFF142-1P		2	466	575	81	18	81	0	1	1.067	0	0	0	0	0.8	4.5	0.0	
MSFF120-2Y		2	466	526	88	11	88	0	1	1.065	5	0	15	0	1.0	2.0	0.1	
Jacqueline Lee		2	455	658	69	27	69	0	4	1.078	0	10	0	0	2.8	2.5	0.8	MS
MSEE048-2Y	PVYR	2	445	477	92	5	92	1	2	1.067	0	0	20	0	1.2	3.5	0.4	R
MSFF305-1RY	PVYR	2	412	461	89	10	89	0	0	1.066	0	0	0	0	1.3	3.0	0.1	
Dark Red Norland		**2**	**412**	**455**	**90**	**8**	**90**	**0**	**1**	**1.056**	**0**	**0**	**0**	**0**	**1.3**	**1.0**	**0.1**	**S**
MSZ590-1SPL		2	395	440	90	8	89	1	3	1.061	30	10	0	0	1.0	3.0	0.3	
MSCC724-1Y		2	391	431	91	7	90	1	2	1.072	10	10	0	0	2.0	3.5	0.2	
MSFF182-1R	PVYR	2	382	512	73	24	73	0	3	1.078	10	15	5	0	1.7	3.5	0.8	
MSFF335-2RR		2	375	506	74	25	74	0	0	1.055	0	25	0	0	1.2	3.5	1.1	
MSFF200-4PYSPL	PVYR	2	373	431	77	22	77	0	2	1.067	0	0	0	0	1.7	2.5	1.8	
MSFF142-2SPL		2	362	412	88	12	88	0	0	1.062	0	0	35	0	1.0	2.5	0.2	
MSBB075-1Y		2	361	418	87	5	83	3	8	1.071	0	0	0	0	1.5	3.0	0.4	
MSBB371-1YSPL		2	356	441	81	18	81	0	1	1.069	0	10	5	0	1.2	1.5	0.2	S
MSFF247-2Y	PVYR	2	344	409	83	15	83	0	2	1.062	0	5	0	0	1.8	3.0	0.2	R
MSZ615-2		2	328	352	93	6	93	0	1	1.062	0	0	0	0	1.5	2.5	0.4	S
Yukon Gold		**2**	**324**	**348**	**93**	**7**	**92**	**1**	**0**	**1.070**	**0**	**0**	**15**	**0**	**2.7**	**1.5**	**0.4**	**S**
MSBB305-2SPL		2	319	359	89	11	89	0	1	1.053	0	10	0	0	1.3	2.0	0.2	
MSAA182-3R		2	317	427	73	26	73	0	1	1.075	0	0	0	0	1.0	3.5	0.2	
MSFF134-1PP		2	307	357	86	12	86	0	2	1.067	0	0	0	0	1.3	1.5	0.3	
MSBB351-1		2	305	321	95	4	95	0	1	1.051	0	0	0	0	1.2	1.5	0.1	S
MSFF351-1RR		2	304	372	82	12	82	0	6	1.063	0	0	5	0	1.2	4.0	0.7	
MSCC720-1WP		2	269	400	67	33	67	0	0	1.071	0	30	0	0	3.0	3.0	1.2	
MSFF223-1RY		2	254	328	79	17	78	1	4	1.071	40	20	0	0	1.0	3.0	0.3	R
MSAA101-1RR		2	244	363	66	32	66	0	1	1.074	0	15	0	0	1.0	2.5	0.8	
MSFF130-1R		2	243	425	57	42	57	0	1	1.066	0	5	0	0	1.5	2.0	0.0	

LINE	PVY RESISTANT	N	CWT/A US#1	CWT/A TOTAL	PERCENT OF TOTAL[1] US#1	Bs	As	OV	PO	SP GR	PERCENT (%) TUBER QUALITY[2] HH	VD	IBS	BC	SCAB[3]	MAT[4]	BRUISE[5]	LB[6]
MSAA706-7PP		2	229	252	88	12	86	2	0	1.055	10	0	20	0	1.2	3.5	1.0	
MSFF198-13PY	PVYR	2	215	364	59	40	59	0	1	1.054	5	0	0	0	2.5	1.0	0.3	
MSFF134-2RR		2	169	240	70	29	70	0	1	1.061	0	35	20	0	0.5	3.0	0.8	
MEAN			389	459						1.065					1.5	2.8	0.5	
$HSD_{0.05}$			510	NS						0.014								

[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 20 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 29, 2022; 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]LB: Late blight (*P. infestans* US-23) foliar disease reaction. R=Resistant, MR=Moderate Resistance, MS=Moderate Susceptibility, S=Susceptible

Plant Date: 5/9/22

Vine Kill: 9/8/22

[7]Enviroweather: Entrican Station. Planting to vine kill 122

Table 4

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

PRELIMINARY TRIAL, CHIP-PROCESSING LINES
MONTCALM RESEARCH CENTER
May 9 to September 26, 2022 (140 days)
DD Base 40°F 3313[7]

			CWT/A		PERCENT OF TOTAL[1]						PERCENT (%) TUBER QUALITY[2]							
LINE	PVY RESISTANT	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC	SCAB[3]	MAT[4]	BRUISE[5]	LB[6]
MSDD084-19	PVYR	1	-	750	-	-	-	-	-	1.079	0.0	0.0	0	0	1.3	3.0	0.5	
MSEE035-4	PVYR	1	659	739	89	11	85	5	0	1.093	10.0	0.0	0	0	0.8	3.0	2.6	R
MSX156-1Y		1	593	607	98	1	89	9	1	1.065	0.0	0.0	0	0	2.2	3.0	1.1	
Mackinaw	PVYR	1	549	574	96	4	96	0	0	1.082	0.0	0.0	0	0	1.8	3.0	1.8	MR
MSEE016-10	PVYR	1	504	543	93	7	93	0	0	1.089	0.0	0.0	10	0	1.3	3.0	2.2	
NY174		1	487	526	93	7	93	0	0	1.080	0.0	0.0	0	0	2.5	2.0	1.0	MR
MSFF303-3	PVYR	1	473	657	72	26	72	0	2	1.070	0.0	0.0	0	0	1.5	3.0	1.2	
MSFF038-3	PVYR	1	451	483	93	5	93	0	2	1.079	10.0	0.0	0	0	1.8	3.0	1.7	MR
MSDD039-01		1	437	478	91	8	91	0	0	1.081	0.0	10.0	0	0	1.7	3.0	-	
MSEE115-1		1	404	428	94	4	93	2	2	1.078	0.0	0.0	0	0	1.2	3.0	1.5	
MSEE016-07		1	390	411	95	5	92	3	0	1.085	0.0	0.0	0	0	1.5	5.0	1.6	
MSFF061-1		1	372	423	88	12	88	0	0	1.084	0.0	0.0	0	0	1.0	3.0	0.4	
MSX194-3		1	368	417	88	12	88	0	0	1.069	0.0	10.0	0	0	1.2	3.0	0.9	MR
MSFF035-2	PVYR	1	364	388	94	4	94	0	2	1.074	0.0	10.0	10	0	1.2	1.0	2.3	
Snowden		1	349	418	84	16	84	0	0	1.083	10.0	50.0	0	0	3.3	2.0	1.6	MR
MSZ242-13		1	339	392	86	13	86	0	0	1.089	0.0	20.0	0	0	0.8	3.0	0.8	MS
NY175		1	331	430	77	22	77	0	1	1.077	0.0	0.0	0	0	2.2	1.0	2.3	MS
Manistee		**1**	**323**	**388**	**83**	**17**	**83**	**0**	**0**	**1.078**	**0.0**	**0.0**	**0**	**0**	**2.8**	**1.0**	**1.3**	**S**
MSFF217-1	PVYR	1	306	361	85	15	85	0	0	1.073	0.0	0.0	0	0	2.0	3.0	0.8	MR
Atlantic		**1**	**293**	**312**	**94**	**6**	**94**	**0**	**0**	**1.087**	**10.0**	**10.0**	**0**	**0**	**3.1**	**2.0**	**1.4**	**S**
MSEE182-3	PVYR	1	262	380	69	31	69	0	0	1.078	0.0	0.0	0	0	1.2	3.0	1.2	R
MSDD497-B		1	262	291	90	10	90	0	0	1.052	0.0	0.0	0	0	1.0	2.0	0.1	
NYR1-7		1	258	307	84	15	84	0	1	1.075	10.0	0.0	0	0	0.0	3.0	1.2	
MSBB038-1		1	207	230	90	8	90	0	2	1.065	0.0	30.0	0	0	1.2	2.0	0.6	
MSFF058-1		1	182	205	89	11	89	0	0	1.072	0.0	10.0	0	0	1.5	3.0	1.2	S
MSFF335-1RR		1	98	360	27	73	27	0	0	1.067	0.0	0.0	0	0	1.7	1.0	-	
MEAN			370	442						1.077					1.6	2.6	1.3	

[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 10 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 29, 2022; 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]LB: Late blight (*P. infestans* US-23) foliar disease reaction. R=Resistant, MR=Moderate Resistance, MS=Moderate Susceptibility, S=Susceptible

Plant Date: 5/9/22
Vine Kill: 9/8/22
Days from planting to vine kill: 122

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

Table 5

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

PRELIMINARY TRIAL, TABLESTOCK LINES
MONTCALM RESEARCH CENTER
May 9 to September 16, 2022 (130 days)
DD Base 40°F 3313[7]

					PERCENT OF TOTAL[1]						PERCENT (%) TUBER QUALITY[2]							
	PVY		CWT/A															
LINE	RESISTANT	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC	SCAB[3]	MAT[4]	BRUISE[5]	LB[6]
Danina		1	567	680	83	12	83	0	4	1.071	0	0	0	0	2.3	2.0	0.1	MR
Reba		**1**	**540**	**561**	**96**	**4**	**95**	**1**	**0**	**1.070**	**0**	**0**	**0**	**0**	**2.5**	**2.0**	**1.0**	**S**
Bonafide		1	345	428	81	17	81	0	2	1.060	0	0	0	0	1.5	4.0	0.1	
Paroli		1	334	392	85	13	85	0	2	1.052	0	0	0	0	2.0	1.0	0.0	S
MSZ436-2SPL		1	329	381	86	13	85	1	1	1.050	0	0	10	0	2.0	1.0	0.1	
Dark Red Norland		**1**	**325**	**394**	**83**	**16**	**83**	**0**	**1**	**1.056**	**0**	**0**	**0**	**0**	**1.3**	**1.0**	**0.1**	
Spartan Splash		1	287	359	80	20	80	0	0	1.068	0	0	0	0	2.3	3.0	0.2	
MSFF228-2RY		1	213	403	53	43	53	0	4	1.064	0	0	0	0	1.2	2.0	0.2	
W15248-17Y		1	212	276	77	23	77	0	0	1.050	0	0	0	0	1.5	1.0	0.0	MS
MSGGUNK-4Spl	PVYR	1	203	390	52	48	52	0	0	1.058	0	0	0	0	1.2	1.0	0.2	
CO09128-5W/Y		1	138	287	48	52	48	0	0	1.067	0	0	0	0	3.0	1.0	0.1	S
CO09128-3W/Y		1	34	206	16	84	16	0	0	1.056	0	0	0	0	2.5	1.0	0.1	S
MEAN			294	396						1.060					1.9	1.7	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 10 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 29, 2022; 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]LB: Late blight (*P. infestans* US-23) foliar disease reaction. R=Resistant, MR=Moderate Resistance, MS=Moderate Susceptibility, S=Susceptible

Plant Date: 5/9/22
Vine Kill: 9/8/22
Days from planting to vine kill: 122

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

Table 6

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

PRELIMINARY TRIAL, PIGMENTED LINES
MONTCALM RESEARCH CENTER
May 9 to September 16, 2022 (130 days)
DD Base 40°F 3313[7]

			CWT/A		PERCENT OF TOTAL[1]						PERCENT (%) TUBER QUALITY[2]							
LINE	PVY RESISTANT	N	US#1	TOTAL	US#1	Bs	As	OV	PO	SP GR	HH	VD	IBS	BC	SCAB[3]	MAT[4]	Bruise[5]	LB[6]
MSCC282-2PP	PVYR	1	782	838	93	6	89	5	1	1.069	0	0	0	0	2.2	3.0	1.0	
NDA050237B-1R		1	702	769	91	7	90	2	2	1.061	0	0	0	0	1.3	2.0	0.2	MR
Blackberry		1	437	531	82	17	82	0	0	1.063	0	0	0	0	1.7	3.0	-	MS
MSFF338-1PP		1	361	484	75	25	75	0	0	1.057	0	0	0	0	2.3	3.0	0.2	
MSFF335-3Pinto		1	251	580	43	52	43	0	5	1.060	0	0	0	0	2.8	2.0	0.6	
MSFF334-1Pinto		1	245	465	53	44	53	0	4	1.062	0	0	0	0	1.2	5.0	0.2	
Dark Red Norland		**1**	**240**	**293**	**82**	**16**	**82**	**0**	**2**	**1.055**	**10**	**20**	**0**	**0**	**1.3**	**1.0**	**0.0**	**S**
MSCC282-3RR		1	228	431	53	46	53	0	1	1.071	0	0	40	0	0.7	3.0	1.6	
MSBB272-01P		1	215	366	59	38	59	0	3	1.065	0	20	0	0	2.5	2.0	0.0	
Purple Majesty		1	118	252	47	45	47	0	8	1.065	0	0	0	0	-	1.0	-	
MEAN			358	501						1.063					1.8	2.5	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 10 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 29, 2022; 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]LB: Late blight (*P. infestans* US-23) foliar disease reaction. R=Resistant, MR=Moderate Resistance, MS=Moderate Susceptibility, S=Susceptible

Plant Date: 5/9/22
Vine Kill: 9/8/22
Days from planting to vine kill: 122

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

Table 7

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

DIPLOID REPLICATED TRIAL
MONTCALM RESEARCH CENTER
May 9 to September 21, 2022 (135 days)
DD Base 40°F 3313[4]

		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	MAT[3]
MSGG863-A2	3	551	624	88	9	88	0	3	1.080	0	0	3	0	3.0
MSHH699-02	3	432	581	75	18	75	0	8	1.074	17	13	7	3	3.0
MSHH664-01	3	423	594	70	28	70	0	2	1.068	47	3	13	0	4.0
Atlantic	**3**	**410**	**447**	**92**	**7**	**90**	**2**	**2**	**1.077**	**43**	**7**	**7**	**3**	**3.0**
MSGG671-01	3	357	486	72	20	72	0	9	1.075	37	10	10	7	4.0
MSEE853-27	3	327	421	78	16	78	0	6	1.076	77	3	3	10	4.7
MSGG690-01	3	323	421	77	12	77	0	11	1.071	13	3	3	0	3.0
MSGG691-06	3	307	435	68	31	68	0	1	1.072	3	0	0	0	3.3
MSFF690-01	3	296	391	74	23	74	0	2	1.073	20	43	13	3	3.0
MSGG826-A1	3	284	333	85	15	85	0	0	1.082	43	10	10	3	3.3
Lamoka	**3**	**259**	**345**	**74**	**24**	**74**	**0**	**2**	**1.076**	**0**	**7**	**0**	**0**	**2.7**
MSGG816-A1	3	218	276	78	21	78	0	1	1.078	10	0	3	7	4.3
MSGG655-05	3	192	284	67	33	67	0	0	1.062	0	0	7	0	3.0
MSGG647-01	3	92	274	34	63	34	0	4	1.073	0	0	0	0	2.3
MSFF696-01	3	70	292	23	76	23	0	1	1.074	7	0	7	7	3.0
MEAN		303	414						1.074					3.3
$HSD_{0.05}$		245	248						0.014					

[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 20 Oversize and/or A-size tubers cut.

[3]MATURITY RATING: August 29, 2022; Ratings 1-5; 1: Early (vines completely dead); 5: Late (vigorous vine, some flowering).

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

Plant Date: 5/9/22
Vine Kill: 9/8/22
Days from planting to vine kill: 122

Table 8

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

2020-22 SCAB DISEASE TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER , MI

LINE	3-YR* AVG.	2022 RATING	2022 WORST	2022 N	2021 RATING	2021 WORST	2021 N	2020 RATING	2020 WORST	2020 N
Sorted by ascending 2022 Average Rating;										
MSFF134-2RR	-	0.5	0.5	3						
MSBB614-15	0.5*	0.7	1.0	3	0.3	0.5	3			
MSCC282-3RR	0.6	0.7	1.0	3	0.5	0.5	3	0.5	0.5	3
MSEE207-2	0.6	0.7	1.0	3	0.5	0.5	3	0.7	1.0	3
MSBB079-2	1.1*	0.8	1.0	3				1.3	2.0	3
MSBB614-11	-	0.8	1.0	3						
MSCC266-1	1*	0.8	1.0	3				1.2	1.5	3
MSCC376-1	0.8*	0.8	1.0	3	0.8	1.5	3			
MSDD088-1	1.3*	0.8	1.0	3	1.7	2.0	3			
MSEE035-4	1*	0.8	1.0	3	1.2	1.5	3			
MSFF079-16	-	0.8	1.0	3						
MSFF097-6	-	0.8	1.5	3						
MSFF142-1P	1.2*	0.8	1.0	3	1.5	2.0	3			
MSZ109-8PP	1.1	0.8	1.0	3	1.3	1.5	3	1.2	1.5	3
MSZ242-13	1.3	0.8	1.0	3	2.0	2.0	3	1.2	1.5	3
MSAA101-1RR	1.0	1.0	1.0	3	1.2	1.5	3	0.8	1.0	3
MSAA182-3R	1.2*	1.0	1.5	3				1.3	1.5	3
MSBB626-11	1.0	1.0	1.0	3	1.2	1.5	3	0.8	1.5	3
MSBB630-2	1.3*	1.0	1.5	3	1.7	2.0	3			
MSBB635-14	1.3	1.0	1.5	3	1.2	1.5	3	1.7	2.0	3
MSDD089-2	-	1.0	1.5	3						
MSDD244-05	1.2*	1.0	1.0	3	1.3	2.0	3			
MSDD244-15	0.9*	1.0	1.5	3	0.8	1.0	3			
MSDD497-B	1.1*	1.0	1.0	3				1.2	1.5	3
MSFF061-1	-	1.0	1.0	3						
MSFF120-2Y	1*	1.0	1.0	3	1.0	1.5	3			
MSFF142-2Spl	1*	1.0	1.0	3	1.0	1.5	3			
MSFF223-1RY	-	1.0	1.5	3						
MSW474-1	0.8*	1.0	1.5	3	0.5	0.5	3			
MSZ590-1	1.0	1.0	1.5	3	1.3	1.5	3	0.7	1.0	3
MSAA036-9	-	1.2	1.5	3						
MSAA254-4	-	1.2	1.5	3						
MSAA706-7PP	1.4*	1.2	1.5	3				1.7	2.5	3
MSBB008-3	1.1*	1.2	1.5	3	1.0	1.5	3			
MSBB038-1	-	1.2	1.5	3						
MSBB038-3	-	1.2	1.5	3						
MSBB058-1	1.3*	1.2	1.5	3				1.3	1.5	3
MSBB058-3	1.4*	1.2	1.5	3	1.7	2.0	3			
MSBB351-1	1.1	1.2	1.5	3	1.2	1.5	3	0.8	1.5	3
MSBB371-1YSpl	1.2	1.2	2.0	3	1.3	2.0	3	1.2	2.0	3
MSBB636-11	-	1.2	1.5	3						
MSCC553-1R	1.8*	1.2	1.5	3	2.5	3.0	3			
MSDD085-13	0.8*	1.2	1.5	3	0.5	0.5	3			
MSDD114-10	-	1.2	1.5	3						
MSDD247-11	0.8*	1.2	2.0	3	0.5	0.5	3			
MSEE048-2Y	0.9*	1.2	1.5	3	0.7	1.0	3			
MSEE115-1	1.1*	1.2	1.5	3				1.0	1.5	3
MSEE182-3	1.1	1.2	2.0	3	1.7	3.0	3	0.5	1.0	3
MSFF007-2	-	1.2	1.5	3						
MSFF035-2	1.3*	1.2	1.5	3	1.5	2.0	3			

Table 8

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

2020-22 SCAB DISEASE TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER , MI

LINE	3-YR* AVG.	2022 RATING	2022 WORST	2022 N	2021 RATING	2021 WORST	2021 N	2020 RATING	2020 WORST	2020 N
MSFF211-2	1.3*	1.2	1.5	3	1.3	1.5	3			
MSFF228-2RY	-	1.2	1.5	3						
MSFF292-1	-	1.2	2.0	3						
MSFF334-1Pinto	0.9*	1.2	1.5	3	0.7	1.0	3			
MSFF335-2RR	-	1.2	2.0	3						
MSFF351-1RR	-	1.2	1.5	3						
MSGGUNK-4Spl	-	1.2	1.5	3						
MSX194-3	-	1.2	1.5	3						
Dark Red Norland	1.3*	1.3	2.0	6	1.2	2.0	3			
MSAA076-6	1.2	1.3	2.0	3	0.8	1.0	3	1.3	1.5	3
MSAA324-04	-	1.3	2.0	3						
MSAA328-4	1.4	1.3	1.5	3	1.5	1.5	3	1.3	1.5	3
MSBB230-2	-	1.3	1.5	3						
MSBB305-2SPL	1.5*	1.3	1.5	3				1.7	3.0	3
MSCC009-1	-	1.3	1.5	3						
MSDD084-19	-	1.3	1.5	3						
MSEE016-10	1.7*	1.3	2.0	3	2.0	2.0	3			
MSEE031-3	1.2	1.3	1.5	3	1.3	2.0	3	1.0	1.0	3
MSFF017-1	-	1.3	1.5	3						
MSFF022-2	-	1.3	1.5	3						
MSFF031-6	1.2*	1.3	1.5	3	1.0	1.5	3			
MSFF073-3	1.1*	1.3	1.5	3	0.8	1.0	3			
MSFF134-1PP	1.6*	1.3	1.5	3	1.8	2.0	3			
MSFF305-1RY	1.5*	1.3	1.5	3	1.7	2.0	3			
NDA050237B-1R	-	1.3	1.5	3						
Bonafide	1.6	1.5	1.5	3	1.7	2.0	3	1.7	2.0	3
MSAA260-3	1.4	1.5	1.5	3	1.7	2.0	3	1.2	1.5	3
MSBB058-4	1.3*	1.5	2.0	3	1.2	1.5	3			
MSBB075-1Y	1.9*	1.5	2.0	3	2.3	3.0	3			
MSCC129-2	-	1.5	2.0	3						
MSEE016-07	1.7*	1.5	2.5	3	1.8	2.5	3			
MSFF058-1	-	1.5	2.5	3						
MSFF130-1R	-	1.5	2.5	3						
MSFF303-3	-	1.5	2.5	3						
MSZ615-2	1.5	1.5	2.0	3	1.5	2.0	3	1.5	1.5	3
W15248-17Y	-	1.5	2.5	3						
Blackberry	1.7	1.7	2.5	3	2.2	3.0	3	1.3	1.5	3
Lady Liberty	-	1.7	2.0	3						
MSAA174-1	1.7	1.7	2.0	3	1.8	2.5	3	1.7	2.0	3
MSDD039-01	-	1.7	2.0	3						
MSDD247-07	1.4*	1.7	2.0	3	1.2	1.5	3			
MSDD376-4	1.6*	1.7	2.0	3	1.5	2.5	3			
MSFF031-3SPL	1.4*	1.7	2.0	3	1.2	1.5	3			
MSFF050-1	-	1.7	3.0	3						
MSFF182-1R	-	1.7	2.0	3						
MSFF200-4PYSPL	2*	1.7	2.5	3	2.3	3.0	3			
MSFF206-1	-	1.7	2.0	3						
MSFF335-1RR	-	1.7	2.5	3						
Petoskey	1.4	1.7	2.0	3	1.3	2.0	6	1.3	1.5	3
Mackinaw[PVYR, LBR]	**1.8**	**1.8**	**2.5**	**6**	**1.8**	**2.5**	**3**	**1.7**	**2.0**	**3**
MSBB190-1	1.8*	1.8	2.5	3				1.7	2.0	3

Table 8

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

2020-22 SCAB DISEASE TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER , MI

LINE	3-YR* AVG.	2022 RATING	2022 WORST	2022 N	2021 RATING	2021 WORST	2021 N	2020 RATING	2020 WORST	2020 N
MSBB610-13	1.3*	1.8	2.5	3				0.8	1.0	3
MSCC058-1	1.7	1.8	2.5	3	1.5	2.0	3	1.7	2.0	3
MSDD372-07	1.8*	1.8	2.0	3	1.7	2.0	3			
MSDD553-1	2*	1.8	2.0	3	2.2	2.5	3			
MSFF038-3	-	1.8	2.0	3						
MSFF206-2	-	1.8	2.0	3						
MSFF247-2Y	1.9*	1.8	2.5	3	2.0	2.5	3			
Lamoka	**1.4**	**2.0**	**2.5**	**3**	**1.5**	**2.0**	**3**	**0.8**	**1.0**	**3**
MSCC724-1Y	-	2.0	2.0	3						
MSDD249-9	1.9*	2.0	2.0	3	1.8	2.0	3			
MSFF037-17	-	2.0	2.0	3						
MSFF217-1	-	2.0	2.5	3						
MSFF353-1R	-	2.0	2.5	3						
MSZ436-2SPL	2.0	2.0	2.5	3	2.2	3.0	3	1.8	2.0	3
MSZ513-2	1.7	2.0	2.5	3	1.7	2.0	3	1.5	2.0	3
NY163	-	2.0	2.5	3						
Paroli	2*	2.0	2.5	3				2.0	2.5	3
MSCC282-2PP	1.9*	2.2	2.5	3				1.7	2.0	3
MSCC300-1	2.3	2.2	2.5	3	2.8	3.5	3	2.0	2.0	3
MSCC447-1WR	2.1	2.2	2.5	3	2.2	3.0	3	1.8	2.0	3
MSX156-1Y	2.2	2.2	2.5	3	2.2	2.5	3	2.2	2.5	3
NY175	-	2.2	3.0	3						
Danina	-	2.3	2.5	3						
MSBB343-2Y	2.1*	2.3	2.5	3	1.8	2.0	3			
MSFF002-1	1.9*	2.3	2.5	3	1.5	2.5	3			
MSFF036-1	-	2.3	3.0	3						
MSFF338-1PP	-	2.3	3.0	3						
NY168	-	2.3	2.5	3						
Spartan Splash	-	2.3	2.5	3						
CO09128-3W/Y	-	2.5	3.0	3						
MSBB272-1P	2.3*	2.5	3.5	3				2.0	2.0	3
MSFF198-13PY	1.8*	2.5	2.5	3	1.0	1.5	3			
NY174	-	2.5	2.5	3						
Reba	**2.4**	**2.5**	**3.0**	**3**	**2.2**	**2.5**	**3**	**2.7**	**3.0**	**3**
MSFF029-10	2.3*	2.7	3.0	3	1.8	2.0	3			
Yukon Gold	**2.3**	**2.7**	**3.0**	**3**	**1.8**	**2.5**	**3**	**2.5**	**2.5**	**1**
Jacqueline Lee	2.9*	2.8	3.5	3				3.0	3.0	2
Manistee	2.7	2.8	3.5	3	2.8	3.0	3	2.5	3.0	3
MSFF335-3Pinto	-	2.8	3.5	3						
CO09128-5W/Y	-	3.0	3.5	3						
MSCC720-1WP	3.2*	3.0	3.0	3	3.3	4.0	3			
Atlantic	**2.6**	**3.1**	**3.5**	**6**	**2.8**	**3.5**	**3**	**1.9**	**3.0**	**6**
Snowden	**2.9**	**3.3**	**3.5**	**6**	**3.0**	**3.5**	**3**	**2.4**	**3.5**	**6**
Mean		**1.5**			**1.5**			**1.5**		
$HSD_{0.05}$ =		**1.3**								

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.

Table 9

MICHIGAN STATE UNIVERSITY

POTATO BREEDING and GENETICS

2022 SCAB DISEASE EARLY GENERATION TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER, MI

LINE	2022 RATING	2022 N	LINE	2022 RATING	2022 N
Sorted by ascending 2022 Rating:					
MSGG268-4	0.5	1	MSHH015-05	1.5	1
MSGG384-2	0.5	1	MSHH018-3	1.5	1
MSHH056-19	0.5	1	MSHH018-4	1.5	1
MSHH119-1	0.5	1	MSHH037-8	1.5	1
MSHH137-1	0.5	1	MSHH043-03	1.5	1
MSHH161-06	0.5	1	MSHH043-10	1.5	1
MSHH176-3	0.5	1	MSHH053-19	1.5	1
MSGG084-1	1.0	1	MSHH064-2	1.5	1
MSGG135-1R	1.0	1	MSHH069-3	1.5	1
MSGG242-1	1.0	1	MSHH113-10	1.5	1
MSGG263-1	1.0	1	MSHH113-22	1.5	1
MSGG302-1	1.0	1	MSHH134-20	1.5	1
MSGG426-2	1.0	1	MSHH157-4RR	1.5	1
MSGGUNK-4Spl	1.0	1	MSHH184-02	1.5	1
MSHH004-2	1.0	1	MSHH185-04	1.5	1
MSHH040-4	1.0	1	MSHH191-1	1.5	1
MSHH045-4	1.0	1	MSHH201-05	1.5	1
MSHH046-1	1.0	1	MSHH228-5RR	1.5	1
MSHH053-04	1.0	1	MSGG137-1R	2.0	1
MSHH053-13	1.0	1	MSGG194-3	2.0	1
MSHH053-23	1.0	1	MSGG195-1	2.0	1
MSHH056-03	1.0	1	MSGG276-4	2.0	1
MSHH066-6	1.0	1	MSGG328-5	2.0	1
MSHH091-03	1.0	1	MSGG365-1	2.0	1
MSHH113-06	1.0	1	MSHH010-10	2.0	1
MSHH115-1	1.0	1	MSHH015-10	2.0	1
MSHH149-08	1.0	1	MSHH018-1	2.0	1
MSHH161-16	1.0	1	MSHH025-2	2.0	1
MSHH164-03	1.0	1	MSHH034-12	2.0	1
MSHH164-09	1.0	1	MSHH043-07	2.0	1
MSHH170-5R	1.0	1	MSHH048-4	2.0	1
MSHH176-2	1.0	1	MSHH053-03	2.0	1
MSHH184-06	1.0	1	MSHH063-2	2.0	1
MSGG127-3R	1.5	1	MSHH068-10	2.0	1
MSGG169-2	1.5	1	MSHH087-3	2.0	1
MSGG190-1	1.5	1	MSHH087-7	2.0	1
MSGG282-20	1.5	1	MSHH089-11	2.0	1
MSGG302-3	1.5	1	MSHH090-5	2.0	1
MSGG394-3	1.5	1	MSHH117-1	2.0	1
MSGG409-2	1.5	1	MSHH128-1	2.0	1
MSGG409-3	1.5	1	MSHH130-1	2.0	1

Table 9

MICHIGAN STATE UNIVERSITY

POTATO BREEDING and GENETICS

2022 SCAB DISEASE EARLY GENERATION TRIAL SUMMARY
SCAB NURSERY, MONTCALM RESEARCH CENTER, MI

LINE	2022 RATING	2022 N	LINE	2022 RATING	2022 N
Sorted by ascending 2022 Rating:					
MSHH131-5	2.0	1	MSHH216-06	2.5	1
MSHH134-23	2.0	1	MSHH223-4	2.5	1
MSHH150-13	2.0	1	MSGG068-1	3.0	1
MSHH161-04	2.0	1	MSGG181-5	3.0	1
MSHH161-05	2.0	1	MSGG190-4	3.0	1
MSHH164-08	2.0	1	MSGG294-1	3.0	1
MSHH169-16	2.0	1	MSHH015-12	3.0	1
MSHH172-3	2.0	1	MSHH095-2	3.0	1
MSHH177-5	2.0	1	MSHH151-02mini	3.0	1
MSHH179-20	2.0	1	MSHH155-7	3.0	1
MSHH201-17	2.0	1	MSHH163-3RR	3.0	1
MSHH206-11	2.0	1	MSHH169-26	3.0	1
MSHH206-29	2.0	1	MSHH171-2PP	3.0	1
MSHH208-10	2.0	1	MSHH180-04	3.0	1
MSHH228-3PP	2.0	1	MSHH206-04	3.0	1
MSHH228-6PP	2.0	1	MSHH206-25	3.0	1
MSHH137-2	2.2	1	MSHH215-1P	3.0	1
MSGG039-08	2.5	1	MSHH223-1	3.0	1
MSGG039-11	2.5	1	MSHH227-4	3.0	1
MSGG078-7	2.5	1	MSGG212-4	3.5	1
MSGG207-1	2.5	1	MSHH170-3R	3.5	1
MSGG221-3	2.5	1	MSHH179-04	3.5	1
MSGG343-1	2.5	1	MSHH199-5	3.5	1
MSHH001-1	2.5	1	MSHH216-04	3.5	1
MSHH015-08	2.5	1	MSGG158-11PP	4.0	1
MSHH063-5	2.5	1	MSHH038-1	4.0	1
MSHH086-06	2.5	1	MSHH172-7	4.0	1
MSHH089-06	2.5	1	MSHH226-1	4.0	1
MSHH097-12	2.5	1			
MSHH105-4	2.5	1			
MSHH116-5	2.5	1			
MSHH127-04	2.5	1			
MSHH149-13	2.5	1			
MSHH149-17	2.5	1			
MSHH155-6	2.5	1			
MSHH160-05	2.5	1			
MSHH169-13	2.5	1			
MSHH170-4P	2.5	1			
MSHH179-19	2.5	1			
MSHH183-04	2.5	1			
MSHH214-3	2.5	1			

Table 10

2022 MSU LATE BLIGHT VARIETY TRIAL
PLANT PATHOLOGY FARM, LANSING, MI

Line Sort:

LINE	N	RAUDPC[1] MEAN	
Atlantic	**5**	**68.0**	**S**
Blackberry	3	45.0	MS
CO09128-3W/Y	3	98.0	S
CO09128-5W/Y	3	66.7	S
Danina	3	30.0	MR
Dark Red Norland	**3**	**100.0**	**S**
Jacqueline Lee	3	46.7	MS
Lady Liberty	3	21.7	MR
Lamoka	**3**	**75.0**	**S**
Mackinaw	**6**	**20.7**	**MR**
Manistee	**3**	**90.0**	**S**
MSAA174-1	3	20.3	MR
MSAA260-03	3	56.7	MS
MSAA324-04	3	60.0	MS
MSBB058-1	3	73.3	S
MSBB058-3	3	1.0	R
MSBB079-2	3	73.3	S
MSBB190-1	3	8.7	R
MSBB323-01	3	4.0	R
MSBB343-2Y	2	3.0	R
MSBB351-1	3	80.0	S
MSBB371-1YSPL	3	71.7	S
MSBB614-11	3	13.7	R
MSBB614-15	3	0.7	R
MSBB626-11	3	15.0	R
MSCC129-2	3	16.7	R
MSCC300-1	3	15.0	R
MSCC447-01WR	3	38.3	MS
MSDD114-10	3	3.3	R
MSDD244-05	3	41.3	MS
MSDD244-15	3	6.0	R
MSDD247-07	3	11.7	R
MSDD247-11	3	23.3	MR
MSDD249-9	3	5.0	R
MSDD372-07	3	2.0	R
MSDD553-1	3	33.3	MR
MSEE031-3	3	31.7	MR
MSEE035-4	3	1.3	R
MSEE048-2Y	3	4.0	R
MSEE182-3	3	13.3	R
MSEE207-2	3	8.3	R
MSEE853-27	3	25.0	MR
MSFF007-2	3	25.0	MR
MSFF031-6	3	15.7	R
MSFF037-17	3	25.0	MR
MSFF038-3	3	25.0	MR
MSFF058-1	2	87.5	S
MSFF072-1Y	3	11.7	R
MSFF073-3	3	51.7	MS
MSFF079-16	3	11.7	R

RAUDPC Sort:

LINE	N	RAUDPC[1] MEAN	
MSBB614-15	3	0.7	R
MSBB058-3	3	1.0	R
MSEE035-4	3	1.3	R
MSDD372-07	3	2.0	R
MSBB343-2Y	2	3.0	R
MSDD114-10	3	3.3	R
MSFF230-2PY	3	3.3	R
MSBB323-01	3	4.0	R
MSEE048-2Y	3	4.0	R
MSDD249-9	3	5.0	R
MSDD244-15	3	6.0	R
MSFF247-2Y	3	6.7	R
MSFF230-1	3	7.3	R
MSEE207-2	3	8.3	R
MSBB190-1	3	8.7	R
MSFF223-1RY	3	9.3	R
MSDD247-07	3	11.7	R
MSFF072-1Y	3	11.7	R
MSFF079-16	3	11.7	R
MSGG863-A2	3	12.0	R
MSEE182-3	3	13.3	R
MSBB614-11	3	13.7	R
MSBB626-11	3	15.0	R
MSCC300-1	3	15.0	R
MSFF031-6	3	15.7	R
MSCC129-2	3	16.7	R
MSFF182-1R	3	17.3	R
MSFF217-1	3	18.7	MR
MSHH664-01	3	20.0	MR
MSAA174-1	3	20.3	MR
Mackinaw	**6**	**20.7**	**MR**
Lady Liberty	3	21.7	MR
MSDD247-11	3	23.3	MR
NY168	3	24.0	MR
MSEE853-27	3	25.0	MR
MSFF007-2	3	25.0	MR
MSFF037-17	3	25.0	MR
MSFF038-3	3	25.0	MR
MSGG691-06	3	26.7	MR
NY174	3	26.7	MR
Snowden	**3**	**28.3**	**MR**
Danina	3	30.0	MR
MSFF130-1R	3	30.0	MR
MSX194-3	3	30.0	MR
MSEE031-3	3	31.7	MR
MSDD553-1	3	33.3	MR
MSHH699-02	3	33.3	MR
NDA050237B-1R	3	33.7	MR
MSFF696-01	3	36.7	MS
MSCC447-01WR	3	38.3	MS

2022 MSU LATE BLIGHT VARIETY TRIAL
PLANT PATHOLOGY FARM, LANSING, MI

Line Sort: ***RAUDPC Sort:***

LINE	N	RAUDPC[1] MEAN		LINE	N	RAUDPC[1] MEAN	
MSFF130-1R	3	30.0	MR	NY175	3	38.3	MS
MSFF182-1R	3	17.3	R	MSDD244-05	3	41.3	MS
MSFF217-1	3	18.7	MR	MSGG690-01	3	41.7	MS
MSFF223-1RY	3	9.3	R	MSGG826-A1	3	43.3	MS
MSFF230-1	3	7.3	R	Blackberry	3	45.0	MS
MSFF230-2PY	3	3.3	R	Jacqueline Lee	3	46.7	MS
MSFF247-2Y	3	6.7	R	MSFF073-3	3	51.7	MS
MSFF690-01	3	71.7	S	MSZ242-13	3	51.7	MS
MSFF696-01	3	36.7	MS	NY163	3	53.3	MS
MSGG647-01	1	80.0	S	MSAA260-03	3	56.7	MS
MSGG655-05	3	78.3	S	W15248-17Y	2	57.5	MS
MSGG671-01	3	65.0	S	MSAA324-04	3	60.0	MS
MSGG690-01	3	41.7	MS	MSGG671-01	3	65.0	S
MSGG691-06	3	26.7	MR	CO09128-5W/Y	3	66.7	S
MSGG826-A1	3	43.3	MS	**Atlantic**	**5**	**68.0**	**S**
MSGG863-A2	3	12.0	R	MSBB371-1YSPL	3	71.7	S
MSHH664-01	3	20.0	MR	MSFF690-01	3	71.7	S
MSHH699-02	3	33.3	MR	MSBB058-1	3	73.3	S
MSX194-3	3	30.0	MR	MSBB079-2	3	73.3	S
MSZ242-13	3	51.7	MS	**Lamoka**	**3**	**75.0**	**S**
MSZ513-2	2	87.5	S	MSGG655-05	3	78.3	S
MSZ615-2	3	81.7	S	Paroli	3	78.3	S
NDA050237B-1R	3	33.7	MR	MSBB351-1	3	80.0	S
NY163	3	53.3	MS	MSGG647-01	1	80.0	S
NY168	3	24.0	MR	MSZ615-2	3	81.7	S
NY174	3	26.7	MR	MSFF058-1	2	87.5	S
NY175	3	38.3	MS	MSZ513-2	2	87.5	S
Paroli	3	78.3	S	**Yukon Gold**	**3**	**89.3**	**S**
Reba	**3**	**99.7**	**S**	**Manistee**	**3**	**90.0**	**S**
Snowden	**3**	**28.3**	**MR**	CO09128-3W/Y	3	98.0	S
W15248-17Y	2	57.5	MS	**Reba**	**3**	**99.7**	**S**
Yukon Gold	**3**	**89.3**	**S**	**Dark Red Norland**	**3**	**100.0**	**S**

[1]Ratings indicate the average plot RAUDPC (Relative Area Under the Disease Progress Curve).

LB Isolate used: US-23

Table 11

MICHIGAN STATE UNIVERSITY

POTATO BREEDING and GENETICS

2022 MSU LATE BLIGHT EARLY GENERATION TRIAL
PATHOLOGY FARM EAST, LANSING, MI

LINE	RAUDPC[1] MEAN	LB RESISTANCE	N	LINE	RAUDPC[1] MEAN	LB RESISTANCE	N
Sorted by ascending 2022 RAUDPC							
MSGG135-1R	0.0	R	1	MSHH018-4	5.0	R	1
MSGG302-3	0.0	R	1	MSHH034-12	5.0	R	1
MSGG328-5	0.0	R	1	MSHH038-1	5.0	R	1
MSHH053-03	0.0	R	1	MSHH043-03	5.0	R	1
MSHH053-04	0.0	R	1	MSHH043-07	5.0	R	1
MSHH053-13	0.0	R	1	MSHH043-10	5.0	R	1
MSHH056-19	0.0	R	1	MSHH046-1	5.0	R	1
MSHH087-3	0.0	R	1	MSHH053-19	5.0	R	1
MSHH113-10	0.0	R	1	MSHH063-5	5.0	R	1
MSHH113-22	0.0	R	1	MSHH069-3	5.0	R	1
MSHH134-20	0.0	R	1	MSHH089-11	5.0	R	1
MSHH134-23	0.0	R	1	MSHH090-5	5.0	R	1
MSGG078-7	1.0	R	1	MSHH095-2	5.0	R	1
MSGG127-3R	1.0	R	1	MSHH105-4	5.0	R	1
MSGG137-1R	1.0	R	1	MSHH113-06	5.0	R	1
MSGG276-4	1.0	R	1	MSHH115-1	5.0	R	1
MSGG282-20	1.0	R	1	MSHH127-04	5.0	R	1
MSGG294-1	1.0	R	1	MSHH137-2	5.0	R	1
MSGG365-1	1.0	R	1	MSHH191-1	5.0	R	1
MSGG394-3	1.0	R	1	MSHH208-10	5.0	R	1
MSHH001-1	1.0	R	1	MSGG181-5	10.0	R	1
MSHH004-2	1.0	R	1	MSGG207-1	10.0	R	1
MSHH010-10	1.0	R	1	MSGG302-1	10.0	R	1
MSHH015-05	1.0	R	1	MSGG343-1	10.0	R	1
MSHH025-2	1.0	R	1	MSHH068-10	10.0	R	1
MSHH045-4	1.0	R	1	MSHH117-1	10.0	R	1
MSHH053-23	1.0	R	1	MSHH157-4RR	10.0	R	1
MSHH056-03	1.0	R	1	MSHH170-4P	10.0	R	1
MSHH086-06	1.0	R	1	MSHH171-2PP	10.0	R	1
MSHH087-7	1.0	R	1	MSHH201-05	10.0	R	1
MSHH091-03	1.0	R	1	MSHH216-06	10.0	R	1
MSHH131-5	1.0	R	1	MSGG039-08	15.0	R	1
MSHH170-5R	1.0	R	1	MSGG194-3	15.0	R	1
MSHH172-3	1.0	R	1	MSGG409-3	15.0	R	1
MSHH172-7	1.0	R	1	MSHH015-08	15.0	R	1
MSHH185-04	1.0	R	1	MSHH015-12	15.0	R	1
MSHH215-1P	1.0	R	1	MSHH048-4	15.0	R	1
MSHH228-3PP	1.0	R	1	MSHH063-2	15.0	R	1
MSHH228-5RR	1.0	R	1	MSHH066-6	15.0	R	1
MSGG409-2	2.0	R	1	MSHH170-3R	15.0	R	1
MSHH018-1	2.0	R	1	MSHH206-25	15.0	R	1
MSHH128-1	2.0	R	1	MSHH228-6PP	15.0	R	1
MSGG384-2	3.0	R	1	MSGG039-11	20.0	MR	1
MSHH116-5	3.0	R	1	MSGG158-11PP	20.0	MR	1
MSHH137-1	3.0	R	1	MSHH037-8	20.0	MR	1
MSGG190-1	5.0	R	1	MSHH097-12	20.0	MR	1
MSGG190-4	5.0	R	1	MSHH206-11	20.0	MR	1
MSGG212-4	5.0	R	1	MSHH216-04	20.0	MR	1
MSGG221-3	5.0	R	1	MSHH064-2	25.0	MR	1
MSGG242-1	5.0	R	1	MSHH223-4	25.0	MR	1
MSGG426-2	5.0	R	1	MSGG084-1	30.0	MR	1
MSHH015-10	5.0	R	1	MSGG268-4	35.0	MR	1

Table 11

MICHIGAN STATE UNIVERSITY

POTATO BREEDING and GENETICS

2022 MSU LATE BLIGHT EARLY GENERATION TRIAL
PATHOLOGY FARM EAST, LANSING, MI

LINE	RAUDPC[1] MEAN	LB RESISTANCE	N	LINE	RAUDPC[1] MEAN	LB RESISTANCE	N
Sorted by ascending 2022 RAUDPC							
MSHH018-3	5.0	R	1	MSHH130-1	40.0	MS	1
MSHH223-1	40.0	MS	1				
MSGG068-1	50.0	MS	1				
MSHH199-5	50.0	MS	1				
MSHH214-3	50.0	MS	1				
MSHH226-1	50.0	MS	1				
MSHH201-17	60.0	MS	1				
MSHH227-4	60.0	MS	1				
MSHH119-1	70.0	S	1				
MSHH163-3RR	70.0	S	1				
MSGG195-1	75.0	S	1				
MSGG263-1	75.0	S	1				
MSHH206-04	75.0	S	1				
MSGG169-2	80.0	S	1				
MSGGUNK-4Spl	85.0	S	1				
MSHH040-4	90.0	S	1				
MSHH206-29	90.0	S	1				

[1]Ratings indicate the average plot RAUDPC (Relative Area Under the Disease Progress Curve).

Table 12

MICHIGAN STATE UNIVERSITY
POTATO BREEDING and GENETICS

2022 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
ADVANCED TRIAL, CHIP-PROCESSING LINES									
MSZ242-13	1.074	12	1	0	0	0	0	92	0.1
MSDD088-1	1.071	14	10	0	0	0	0	58	0.4
NY163	1.081	16	8	0	1	0	0	64	0.4
MSBB610-13	1.078	13	10	1	0	0	0	54	0.5
FL2137	**1.081**	**13**	**9**	**2**	**0**	**0**	**0**	**54**	**0.5**
MSBB636-11	1.075	12	8	4	1	0	0	48	0.8
MSFF036-1	1.071	9	11	5	0	0	0	36	0.8
Lamoka	**1.079**	**10**	**8**	**7**	**0**	**0**	**0**	**40**	**0.9**
MSDD089-2	1.074	10	10	5	1	0	0	38	0.9
MSFF017-1	1.080	8	10	4	2	1	0	32	1.1
MSAA324-04	1.074	11	5	4	4	0	1	44	1.2
MSBB058-1	1.081	8	6	9	2	0	0	32	1.2
MSEE207-2	1.080	6	9	8	1	0	1	24	1.3
MSBB626-11	1.080	5	12	3	4	1	0	20	1.4
NY168	1.085	6	9	7	2	0	1	24	1.4
Petoskey	1.083	4	11	7	3	0	0	16	1.4
MSFF292-1	1.085	6	8	6	5	0	0	24	1.4
MSAA260-03	1.080	6	9	2	4	2	0	26	1.4
MSFF073-3	1.085	7	7	4	7	0	0	28	1.4
Lady Liberty	1.077	5	8	8	2	0	1	21	1.5
MSDD244-05	1.084	7	6	8	2	1	1	28	1.5
Atlantic	**1.082**	**9**	**7**	**2**	**3**	**2**	**2**	36	1.5
MSDD085-13	1.083	2	11	8	4	0	0	8	1.6
MSBB058-4	1.077	4	6	10	2	1	0	17	1.6
MSEE031-3	1.079	3	8	10	4	0	0	12	1.6
MSFF079-16	1.075	4	12	4	1	3	1	16	1.6
MSBB079-2	1.072	4	9	3	6	1	0	17	1.6
MSCC376-1	1.078	5	8	7	5	0	1	19	1.6
Snowden	**1.082**	**5**	**8**	**4**	**5**	**2**	**0**	**21**	**1.6**
MSDD249-9	1.084	6	7	5	4	2	1	24	1.7
MSFF206-2	1.077	5	7	5	7	1	0	20	1.7
MSBB614-15	1.083	2	11	8	2	2	1	8	1.8
MSCC009-1	1.073	4	3	11	6	0	0	17	1.8
MSBB008-3	1.076	4	9	7	4	1	2	15	1.8
MSDD247-11	1.088	6	5	6	4	3	1	24	1.8
MSBB230-2	1.081	4	6	6	8	0	1	16	1.9
MSBB635-14	1.074	2	7	10	4	2	0	8	1.9
MSBB058-3	1.082	5	4	6	6	3	0	21	1.9
MSAA076-6	1.084	5	4	5	4	3	2	22	2.1
MSFF097-6	1.086	1	6	6	10	2	0	4	2.2
Mackinaw	**1.085**	**2**	**6**	**6**	**7**	**2**	**2**	**8**	**2.3**
MSDD372-07	1.091	2	5	8	4	6	0	8	2.3
MSFF007-2	1.083	3	6	7	2	4	3	12	2.3
MSAA254-4	1.080	5	6	5	4	2	6	18	2.4
MSFF037-17	1.082	4	4	6	5	2	4	16	2.4
MSDD376-4	1.082	3	3	6	7	2	3	13	2.5
MSBB630-2	1.078	0	2	5	4	2	0	0	2.5
MSDD247-07	1.092	4	2	8	4	3	4	16	2.5
MSDD553-1	1.082	1	3	9	7	4	3	4	2.7
MSDD244-15	1.080	0	3	7	7	2	5	0	3.0
MSW474-1	1.082	3	4	2	4	2	10	12	3.1
MSCC058-1	1.080	0	0	3	4	6	12	0	4.1
ADAPTATION TRIAL, TABLESTOCK LINES									
MSFF142-1P	1.067	25	0	0	0	0	0	100	0.0
MSFF130-1R	1.066	24	1	0	0	0	0	96	0.0
MSFF211-2	1.060	24	1	0	0	0	0	96	0.0

ENTRY	SP GR	NUMBER OF SPOTS PER TUBER 0	1	2	3	4	5+	PERCENT (%) BRUISE FREE	AVERAGE SPOTS/TUBER
MSBB351-1	1.051	23	2	0	0	0	0	92	0.1
MSFF305-1RY	1.066	22	2	0	0	0	0	92	0.1
MSFF120-2Y	1.065	22	3	0	0	0	0	88	0.1
Dark Red Norland	**1.056**	**20**	**3**	**0**	**0**	**0**	**0**	**87**	**0.1**
MSAA182-3R	1.075	21	4	0	0	0	0	84	0.2
MSCC553-1R	1.067	22	2	1	0	0	0	88	0.2
MSFF247-2Y	1.062	20	3	1	0	0	0	83	0.2
MSCC724-1Y	1.072	18	3	1	0	0	0	82	0.2
MSBB305-2SPL	1.053	19	6	0	0	0	0	76	0.2
MSBB371-1YSPL	1.069	20	4	1	0	0	0	80	0.2
MSFF142-2SPL	1.062	19	6	0	0	0	0	76	0.2
MSBB343-2Y	1.064	20	4	0	1	0	0	80	0.3
MSFF134-1PP	1.067	18	7	0	0	0	0	72	0.3
MSFF198-13PY	1.054	19	5	1	0	0	0	76	0.3
MSZ109-8PP	1.057	19	5	1	0	0	0	76	0.3
MSZ590-1SPL	1.061	19	5	1	0	0	0	76	0.3
MSFF223-1RY	1.071	17	7	0	0	0	0	71	0.3
MSEE048-2Y	1.067	19	3	3	0	0	0	76	0.4
MSZ615-2	1.062	17	7	1	0	0	0	68	0.4
Yukon Gold	**1.070**	**17**	**6**	**2**	**0**	**0**	**0**	**68**	**0.4**
MSBB075-1Y	1.071	18	4	2	1	0	0	72	0.4
Blackberry	1.057	16	6	3	0	0	0	64	0.5
MSFF353-1R	1.077	12	11	2	0	0	0	48	0.6
MSFF351-1RR	1.063	11	9	3	0	0	0	48	0.7
MSFF182-1R	1.078	11	11	1	2	0	0	44	0.8
Jacqueline Lee	1.078	12	7	5	1	0	0	48	0.8
MSAA101-1RR	1.074	10	10	5	0	0	0	40	0.8
MSFF134-2RR	1.061	9	12	3	1	0	0	36	0.8
MSAA174-1	1.058	11	8	4	2	0	0	44	0.9
MSAA706-7PP	1.055	4	16	5	0	0	0	16	1.0
MSFF335-2RR	1.055	7	10	6	2	0	0	28	1.1
MSCC720-1WP	1.071	8	8	6	2	1	0	32	1.2
MSBB190-1	1.077	5	7	9	4	0	0	20	1.5
MSFF200-4PYSPL	1.067	1	5	3	4	0	0	8	1.8
MSCC447-01WR	1.070	1	3	6	7	6	2	4	2.8
PREC									
MSDD497-B	1.052	19	1	0	0	0	0	95	0.1
MSFF061-1	1.084	10	7	0	0	0	0	59	0.4
MSDD084-19	1.079	8	8	0	0	0	0	50	0.5
MSBB038-1	1.065	13	10	2	0	0	0	52	0.6
MSZ242-13	1.089	9	13	2	1	0	0	36	0.8
MSFF217-1	1.073	11	8	5	1	0	0	44	0.8
MSX194-3	1.069	10	8	4	0	1	0	43	0.9
NY174	1.080	8	9	8	0	0	0	32	1.0
MSX156-1Y	1.065	8	9	6	2	0	0	32	1.1
MSEE182-3	1.078	7	10	4	4	0	0	28	1.2
MSFF303-3	1.070	7	10	4	4	0	0	28	1.2
NYR1-7	1.075	7	13	2	1	3	0	27	1.2
MSFF058-1	1.072	8	7	6	4	0	0	32	1.2
Manistee	1.078	5	7	6	1	1	0	25	1.3
Atlantic	**1.087**	**5**	**10**	**6**	**3**	**1**	**0**	**20**	**1.4**
MSEE115-1	1.078	3	8	5	4	0	0	15	1.5
MSEE016-07	1.085	4	10	5	5	1	0	16	1.6
Snowden	**1.083**	**6**	**5**	**8**	**5**	**0**	**1**	**24**	**1.6**
MSFF038-3	1.079	7	4	7	5	0	2	28	1.7
Mackinaw	**1.082**	**1**	**6**	**9**	**4**	**0**	**0**	**5**	**1.8**
MSEE016-10	1.089	3	7	6	3	4	2	12	2.2
NY175	1.077	3	6	3	9	2	2	12	2.3
MSFF035-2	1.074	4	3	4	9	5	0	16	2.3
MSEE035-4	1.093	3	2	8	5	3	4	12	2.6
PREPIG									
Dark Red Norland	**1.055**	**24**	**1**	**0**	**0**	**0**	**0**	**96**	**0.0**

ENTRY	SP GR	NUMBER OF SPOTS PER TUBER 0	1	2	3	4	5+	PERCENT (%) BRUISE FREE	AVERAGE SPOTS/TUBER
MSBB272-01P	1.065	24	1	0	0	0	0	96	0.0
NDA050237B-1R	1.061	21	4	0	0	0	0	84	0.2
MSFF334-1Pinto	1.062	19	6	0	0	0	0	76	0.2
MSFF338-1PP	1.057	20	4	1	0	0	0	80	0.2
MSFF335-3Pinto	1.060	17	4	2	2	0	0	68	0.6
MSCC282-2PP	1.069	7	10	8	0	0	0	28	1.0
MSCC282-3RR	1.071	5	9	7	1	2	1	20	1.6
PRET									
Paroli	1.052	25	0	0	0	0	0	100	0.0
W15248-17Y	1.050	25	0	0	0	0	0	100	0.0
Bonafide (MSV093-1Y)	1.060	23	2	0	0	0	0	92	0.1
CO09128-5W/Y	1.067	23	2	0	0	0	0	92	0.1
Danina	1.071	23	2	0	0	0	0	92	0.1
CO09128-3W/Y	1.056	21	2	0	0	0	0	91	0.1
Dark Red Norland	**1.056**	**22**	**3**	**0**	**0**	**0**	**0**	**88**	**0.1**
MSZ436-2SPL	1.050	22	3	0	0	0	0	88	0.1
MSFF228-2RY	1.064	21	4	0	0	0	0	84	0.2
MSGGUNK-4Spl	1.058	21	4	0	0	0	0	84	0.2
Spartan Splash	1.068	19	6	0	0	0	0	76	0.2
Reba	**1.070**	**10**	**7**	**6**	**1**	**1**	**0**	**40**	**1.0**
NCR									
MSGG039-11	1.059	24	1	0	0	0	0	96	0.0
MSGG302-1	1.083	24	1	0	0	0	0	96	0.0
MSGG409-2	1.074	23	3	0	0	0	0	88	0.1
MSGG158-11PP	1.057	22	3	0	0	0	0	88	0.1
MSGG207-1	1.066	22	3	0	0	0	0	88	0.1
MSGG078-7	1.054	18	4	0	0	0	0	82	0.2
MSGG190-1	1.069	20	5	0	0	0	0	80	0.2
MSGG302-3	1.081	20	3	1	0	0	0	83	0.2
MSGG084-1	1.059	19	6	0	0	0	0	76	0.2
MSGG135-1R	1.069	19	6	0	0	0	0	76	0.2
MSGG242-1	1.076	18	7	0	0	0	0	72	0.3
MSGG181-5	1.064	18	5	1	1	0	0	72	0.4
MSGG137-1R	1.062	17	5	3	0	0	0	68	0.4
MSGG328-5	1.061	16	7	2	0	0	0	64	0.4
MSGG039-08	1.066	13	12	0	0	0	0	52	0.5
MSGG409-3	1.079	9	10	0	0	0	0	47	0.5
MSGG690-1	1.067	9	10	0	0	0	0	47	0.5
MSGG268-4	1.064	15	7	2	1	0	0	60	0.6
MSGG212-4	1.085	16	6	1	1	1	0	64	0.6
MSGG068-1	1.061	15	6	2	2	0	0	60	0.6
MSGG190-4	1.066	15	6	2	2	0	0	60	0.6
MSGG263-1	1.077	14	7	3	1	0	0	56	0.6
MSGG365-1	1.078	15	4	3	2	0	0	63	0.7
MSGG221-3	1.060	16	4	5	2	0	0	59	0.7
MSGG384-2	1.075	11	7	6	1	0	0	44	0.9
MSGG127-3R	1.076	8	11	6	0	0	0	32	0.9
MSGG169-2	1.072	10	4	5	0	0	1	50	1.0
MSGG426-2	1.074	11	7	4	3	0	0	44	1.0
MSGG863-A2	1.081	11	7	4	3	0	0	44	1.0
MSGG294-1	1.061	12	4	5	4	0	0	48	1.0
MSGG349-3	1.070	5	6	7	1	1	0	25	1.4
MSGG276-4	1.076	9	6	3	2	3	1	38	1.5
MSGG282-20	1.073	4	5	7	4	0	0	20	1.6
MSGG195-1	1.079	5	5	9	5	0	0	21	1.6
MSGG194-3	1.067	1	9	6	7	1	0	4	1.9
MSGG343-1	1.088	1	11	7	2	2	2	4	2.0
MSHH664-1	1.065	0	2	1	9	3	10	0	3.7
USPB/SFA TRIAL CHECK SAMPLES (Not bruised)									
W15NYR11-13	1.072	19	6	0	0	0	0	76	0.2
NY163	1.080	16	8	1	0	0	0	64	0.4

ENTRY	SP GR	NUMBER OF SPOTS PER TUBER 0	1	2	3	4	5+	PERCENT (%) BRUISE FREE	AVERAGE SPOTS/TUBER
MSAFB635-15	1.084	13	8	3	1	0	0	52	0.7
MSZ242-13	1.093	14	6	3	2	0	0	56	0.7
Lamoka	**1.080**	**11**	**9**	**5**	**0**	**0**	**0**	**44**	**0.8**
MSAFB609-12	1.080	10	11	4	0	0	0	40	0.8
NY168	1.086	8	13	4	0	0	0	32	0.8
Snowden	**1.085**	**12**	**4**	**5**	**3**	**1**	**0**	**48**	**1.1**
W15125-4	1.082	2	8	8	5	2	0	8	1.9
MSW474-1	1.081	5	4	5	5	0	4	22	2.1
USPB/SFA TRIAL BRUISE SAMPLES									
W15NYR11-13	1.072	11	11	3	0	0	0	44	0.7
NY163	1.080	13	6	4	3	0	0	50	0.9
MSZ242-13	1.093	8	8	8	1	0	0	32	1.1
MSAFB609-12	1.080	4	9	9	3	0	0	**16**	1.4
Lamoka	**1.080**	**6**	**7**	**7**	**3**	**2**	**0**	**24**	**1.5**
MSAFB635-15	1.084	5	9	5	2	1	3	20	1.8
NY168	1.086	3	8	7	6	0	1	**12**	1.8
W15125-4	1.082	0	7	6	3	5	2	0	2.5
MSW474-1	1.081	1	5	4	8	3	3	4	2.7
Snowden	**1.085**	**1**	**1**	**4**	**6**	**6**	**7**	**4**	**3.4**

* Thirteen to twenty-five (dependent on the number of replications used) 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 11/9 &11/2022.

The table is presented in ascending order of average number of spots per tuber.