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2020 OHIO POTATO GERMPLASM EVALUATION REPORT

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IN COOPERATION WITH
NORTHEAST
(NE-1731) REGIONAL PROJECT

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL,
AND ENVIRONMENTAL SCIENCES

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OHIO POTATO GERMPLASM EVALUATIONS - 2020

Summary

Ohio cooperates with private and public breeders in the U.S. and elsewhere in evaluating varieties and experimental lines of fresh and processing potatoes. A total of fifty-two distinct varieties and experimental lines developed in two breeding programs were evaluated in 2020 (Table 1). Entries were placed into one of three experiments completed at the Ohio Agricultural Research and Development Center at The Ohio State University (OARDC) in Wooster, Ohio. The experiments are the Northeast Regional Project 1731 (NE-1731), Triple Observation (OBT) and Single Observation (OBS). Named varieties were included in one study, and numbered entries in three studies. Entries were contributed by breeding programs in Maine (ME), and New York (NY). Entries are listed in Table 2 and include a total of forty varieties contributed by ME, four by NY, and eight varieties included as standards.

The studies were established to evaluate the growth and market traits of each entry when grown under non-irrigated conditions in Ohio. The fact that the trials at OARDC are not irrigated tends to affect the performance of individual entries. Marketable yield of six varieties for 2010-2020 at OARDC are shown in Graph 1.

Procedures

Planting, Stand Establishment and Cultural Practices

Seed potatoes were cut on April 29-May 1, 2020 and allowed to cure under recommended temperature and humidity conditions. Plots were established on May 5, 2020. All entries in the NE-1731 experiment were replicated three times. Entries in the Observation studies were replicated once or three times depending on the study. Percent stand was recorded at 4, 5 and 6 weeks after planting.

Table 3 and Graph 2 contain plot management and climatic data for the study site, located on a well-drained Wooster silt loam. Pest, weed, and disease pressure were minimized using procedures and materials consistent with local commercial practices, including weekly pesticide applications. Vine kill was applied on August 20, 2020.

Crop Yield and Quality

Whole plots in the NE-1731 and Observation trials were harvested on September 16, 2020. Tubers were initially placed in a barn under ambient conditions and were later transferred to humidified refrigerated (47-49° F) storage on October 9, 2020.

On October 1, 2020, tubers were graded. At grading, the total weight of tubers produced by each genotype (across multiple plots, if present) was recorded. The entire harvested weight of each genotype was retained and graded for the NE-1731, OBT and OBS plots. The weight of tubers in the A-size (US #1), B-size, and cull categories was recorded. These weights were also expressed as percentages of the weight of the graded potatoes, and percentages were then applied to the total weight of the potatoes harvested for each genotype in order to calculate its marketable yield (cwt/A).

After grading, tubers were retained for internal and external quality ratings and chipping quality evaluations. Tubers set aside for quality ratings and for chipping were retained in humidified refrigerated (47-49° F) storage until October 26, 2020.

Tubers were rated for internal and external quality on October 14, 2020. Ten randomly selected, A-size, marketable tubers collected at grading were scored for tuber shape, skin color, surface texture, eye depth, general appearance, and the presence or absence of hollow heart, brown center, internal necrosis, and vascular

discoloration using accepted protocols. (See Tuber Data Rating System on p.18). Digital images representing internal and external quality of each genotype were recorded.

In addition, for twenty-nine entries, three healthy tubers per genotype were evaluated for glucose content at the time of internal and external quality ratings on October 14, 2020. Tubers were cut in half lengthwise and glucose content rated using Potato Test Strips (Precision Labs, Inc., 9889 Crescent Park Drive, West Chester, OH 45069). Ratings of three tubers were averaged.

Chipping Quality Evaluation

Tubers were held in refrigerated humidified storage (47-49° F) until October 26, 2020. They were removed and held under ambient conditions (approx. 70-73°F) until being processed on October 27, 2020.

Chipping quality evaluation began with measurements of specific gravity on October 26, 2020. Eight pounds of potatoes were placed in a hydrometer and specific gravity was recorded. On October 27, a subset of four potatoes was selected and peeled using a Rotato Express electric potato peeler or by hand. Peeled potatoes were sliced to a thickness of 0.050-0.054 inches using a Hobart meat slicer (Model 410). Slices were rinsed in cold water and 25 slices fried in a Commercial Pro Model CPF32 electric fryer containing sunflower oil donated by Shearer's Foods, Inc. at 182-184°C (360-363°F) for approximately 3:00 minutes. After frying, the sample was visually evaluated for color using color standards in the Potato Chip Color Reference Chart published by the Snack Food Association. Chips that are very light in color are scored "1" and very dark chips are scored "6". The number of chips out of twenty-five with blister(s) greater than 1 cm (0.39 in) in diameter was recorded. Digital images of chips for each genotype were recorded.

Results

Yield, tuber characteristics, and chipping quality data are presented in Tables 4-10. Total yield and US #1 yield averaged 201 and 170 (cwt/A) across all studies respectively, with a range of 102-327 (total) and 73-292 (US #1). Average total yield in the NE-1731 study was 158 cwt/A among varieties and 166 cwt/A among the selections, with a study range of 102-244 cwt/A. Of the 52 entries evaluated, overall tuber appearance was rated poor-fair (scale rating of 1-3), fair-good (scale rating of 4-6), and good-excellent (scale rating of 7-9) in 0, 14, and 38 entries, respectively.

1. Entries having an overall appearance rating of ≥ 7 (good-excellent) at grading:
    - NE-1731: Dark Red Norland, Katahdin, Kennebec, Snowden, Superior, AF 5280-5, AF 5677-4, NDAF 102629C-4, NDAF 113484B-1, NY 149, NY 151, NY 152, NY 164
    - Triple Observation: AF 4157-6, AF 4648-2, AF 5040-8, AF 5225-1, AF 5429-3, AF 5819-2
    - Single Observation: AAF 11611-2, AF 5931-1, AF 6181-9, AF 6526-7, AF 6531-3, AF 6542-19, AF 6553-3, AF 6562-1, AF 6566-1, AF 6572-3, AF 6585-1, AF 6606-2, NDAF 12143-1, NDAF 14114YCB-3, NDAF 1488-3, NDAF 1489-4, WAF 16134-2, WAF 16220-2, WAF 16220-4

2. Entries having an overall appearance rating of ≥ 7 (good-excellent) at grading and marketable yield ≥ the study average:
    - NE-1731: NDAF 113484B-1, NY 152
    - Triple Observation: AF 4157-6, AF 5040-8, AF 5225-1, AF 5429-3, AF 5819-2
    - Single Observation: AAF 11611-2, AF 5931-1, AF 6526-7, AF 6542-19, AF 6553-3, AF 6562-1, AF 6566-1, AF 6585-1, AF 6606-2

3. Entries having a chip score of ≤ 3:
    - NE-1731: Atlantic, Snowden, AF 5280-5, AF 5677-4, NDAF 102629C-4, NY 152
    - Triple Observation: AF 4157-6, AF 4648-2, AF 5040-8, AF 5429-3, AF 5819-2
    - Single Observation: AAF 11611-2, AF 5931-1, AF 5933-4, AF 6531-3, AF 6541-3, AF 6541-15, AF 6542-16, AF 6542-19, AF 6551-4, AF 6553-3, AF 6555-2, AF 6562-1, AF 6566-1, AF 6594-4, AF 6601-2, AF 6606-2, WAF 16134-2, WAF 16220-2, WAF 16220-4

Table 1. Breeding programs participating in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

			---------- 2020 experiments ----------				
Number	Program	Genotype Codes	NE-1731	Triple Observation	Double Observation	Single[1] Observation	Total
1	Univ. Maine	AAF, AF, NDAF, WAF	4	6		30	40
2	Cornell Univ.	NY	4				4
3	Various	named	8				8
		Total	16	6	0	30	52

[1] Refers to number of single row replicates. All other experiments contained two (Double Observation) or three (NE-1731, Triple Observation) replicates.

Table 2. Varieties and experimental lines planted in the potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

Experiments							
NE-1731		Triple Observation		Double Observation		Single Observation	
1	Atlantic	17	AF 4157-6			23	AAF 11611-2
2	Chieftain	18	AF 4648-2			24	AF 5931-1
3	Dark Red Norland	19	AF 5040-8			25	AF 5933-4
4	Katahdin	20	AF 5225-1			26	AF 6181-9
5	Kennebec	21	AF 5429-3			27	AF 6526-7
6	Snowden	22	AF 5819-2			28	AF 6530-4
7	Superior					29	AF 6531-3
8	Yukon Gold					30	AF 6541-15
9	AF 5280-5					31	AF 6541-3
10	AF 5677-4					32	AF 6542-16
11	NDAF 102629C-4					33	AF 6542-19
12	NDAF 113484B-1					34	AF 6551-4
13	NY 149					35	AF 6553-3
14	NY 151					36	AF 6555-2
15	NY 152 (Lady Liberty)					37	AF 6562-1
16	NY 164					38	AF 6566-1
						39	AF 6572-3
						40	AF 6579-3
						41	AF 6585-1
						42	AF 6594-4
						43	AF 6601-2
						44	AF 6602-10
						45	AF 6606-2
						46	NDAF 12143-1
						47	NDAF 14114YCB-3
						48	NDAF 1488-3
						49	NDAF 1489-4
						50	WAF 16134-2
						51	WAF 16220-2
						52	WAF 16220-4

Graph 1. Yield of marketable, A-size tubers for 6 varieties grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2010-2020.

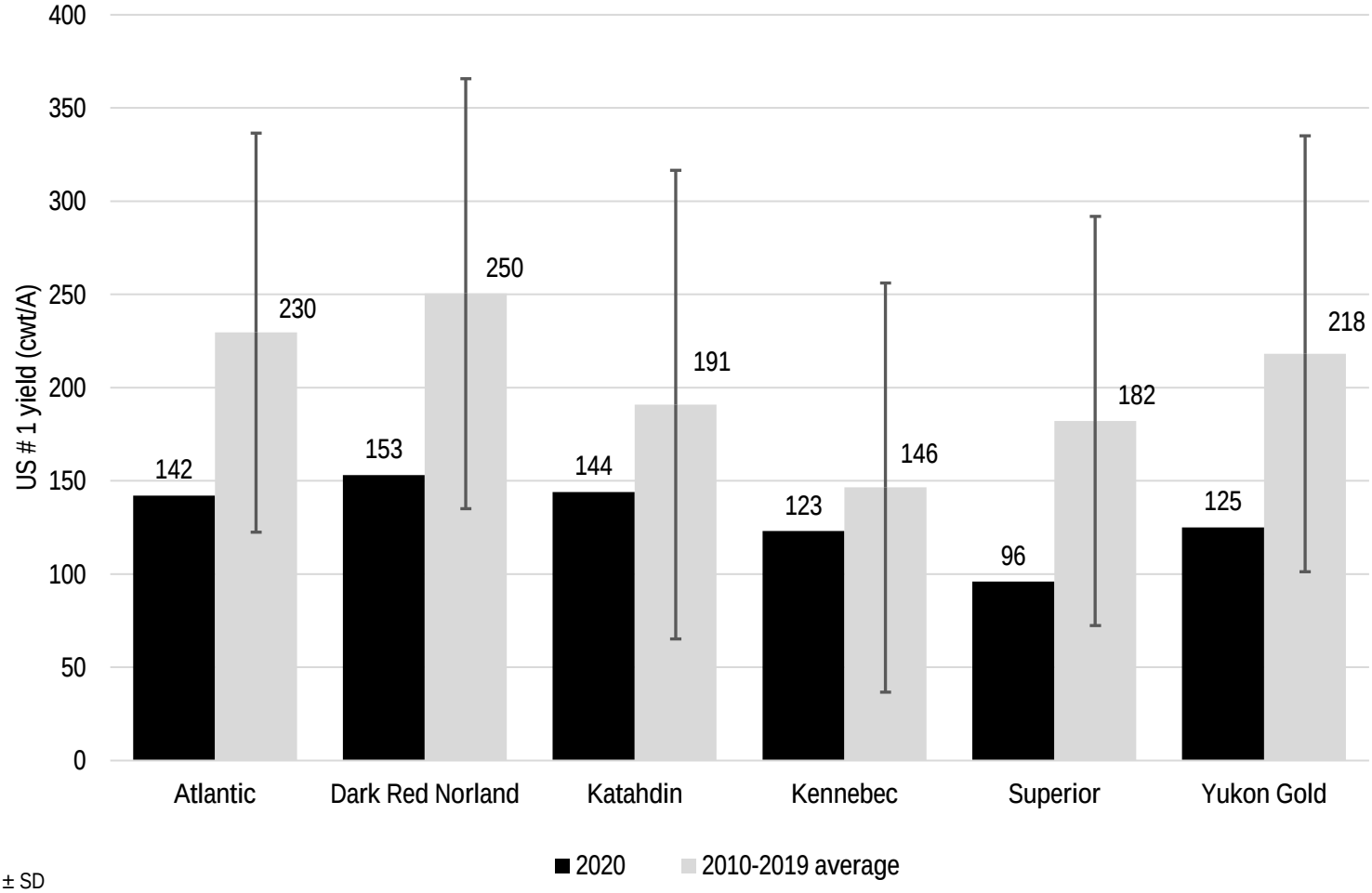

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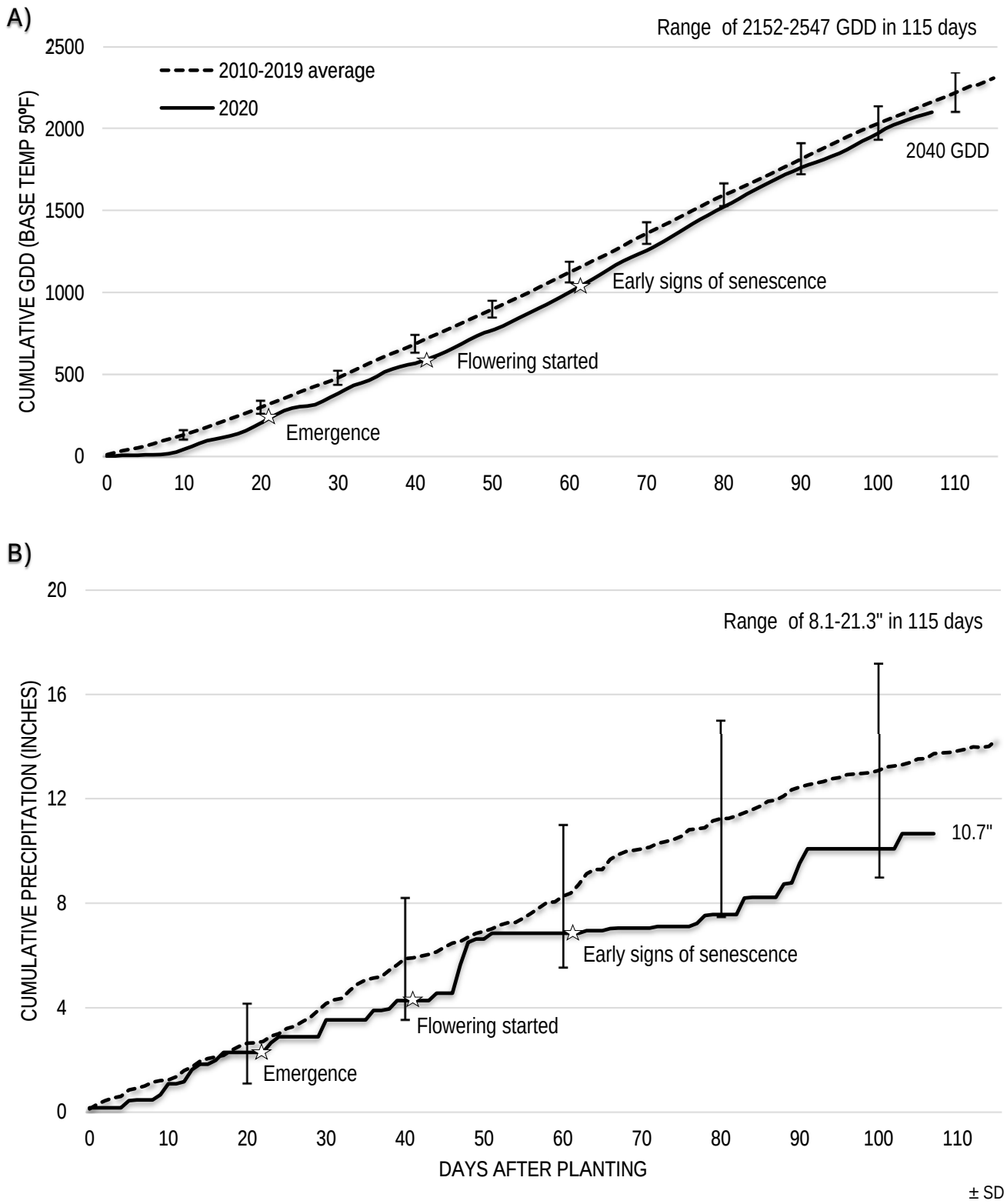
Table 3. Cultural, nutrient, and pest management practices for the potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

Date planted	5-May
Date vine kill	20-Aug
2019 main crop	Sorghum
Spacing (ft.) within, between row	1 x 3.7
Plot width, length (ft.)	3.7 x 30
Soil conditions at planting	Dry-Moist
Irrigation (inches)	None

	Date	Product	Rate (A)
Fertilizer	5-May	19-19-19	400 pounds
Insecticide	5-May	Admire	8 ounces
Herbicide	7-May	Dual II-Magnum	2 pints
		Sencor 75 DF	1 pound
Cover Sprays	Jun-4	Mustang Maxx	3 ounces
		PBO	8 ounces
		Echo 720	1 pint
	Jun-11	Coragen	7.5 ounces
		Quadris	10 ounces
	Jun-18	Roper DF	2 pounds
		Tanos	8 ounces
		Pyganic	17 ounces
		PBO	8 ounces
	Jun-25	Echo 720	1.5 pint
		Athena	15 ounces
	Jul-2	Miravis Prime	11 ounces
	Jul-9	Roper DF	2 pounds
		Tanos	8 ounces
		Radiant SC	8 ounces
	Jul-16	Echo 720	1.5 pint
		Mustang Maxx	2.2 ounces
	Jul-23	Miravis Prime	11 ounces
	Jul-30	Echo 720	1 pint
Vine kill	20-Aug	ForFeit 280	21 ounces

Graph 2. Historical A) cumulative growing degree days (GDD) and B) cumulative precipitation for potato germplasm evaluations at OSU-OARDC in Wooster, OH in 2010-2020 from planting through 115 days after planting. GDD was calculated using the Baskerville-Emin method[1].



[1] Baskerville, G. L.; Emin, P. 1969. Rapid estimation of heat accumulation from maximum and minimum temperatures. Ecology 50:514-517.

Table 4. Yield (cwt/A) of entries grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

	Entry	Total	US #1		Entry	Total	US #1
1	Atlantic	163.0	142.0	23	AAF 11611-2	235.7	181.4
2	Chieftain	180.4	152.9	24	AF 5931-1	248.8	221.8
3	Dark Red Norland	177.5	153.3	25	AF 5933-4	213.9	190.0
4	Katahdin	161.5	143.9	26	AF 6181-9	179.0	144.3
5	Kennebec	151.3	123.0	27	AF 6526-7	218.3	202.5
6	Snowden	173.2	153.9	28	AF 6530-4	205.2	177.2
7	Superior	114.9	96.1	29	AF 6531-3	209.5	169.2
8	Yukon Gold	145.5	125.4	30	AF 6541-15	179.0	152.0
9	AF 5280-5	148.4	123.3	31	AF 6541-3	183.3	159.4
10	AF 5677-4	190.6	165.9	32	AF 6542-16	192.1	130.8
11	NDAF 102629C-4	135.3	114.5	33	AF 6542-19	253.2	218.0
12	NDAF 113484B-1	193.5	170.2	34	AF 6551-4	309.9	292.0
13	NY 149	167.3	134.4	35	AF 6553-3	305.6	265.1
14	NY 151	149.9	125.6	36	AF 6555-2	327.4	289.9
15	NY 152	244.4	216.7	37	AF 6562-1	275.0	251.2
16	NY 164	101.9	73.0	38	AF 6566-1	231.4	211.5
				39	AF 6572-3	209.5	150.6
17	AF 4157-6	208.1	187.0	40	AF 6579-3	213.9	167.2
18	AF 4648-2	183.3	153.7	41	AF 6585-1	253.2	209.2
19	AF 5040-8	202.3	181.2	42	AF 6594-4	205.2	165.4
20	AF 5225-1	276.5	249.3	43	AF 6601-2	209.5	180.5
21	AF 5429-3	229.9	207.2	44	AF 6602-10	192.1	138.4
22	AF 5819-2	229.9	195.6	45	AF 6606-2	261.9	225.2
				46	NDAF 12143-1	152.8	104.9
				47	NDAF 14114YCB-3	196.4	140.0
				48	NDAF 1488-3	139.7	110.7
				49	NDAF 1489-4	200.8	154.7
				50	WAF 16134-2	148.4	120.8
				51	WAF 16220-2	196.4	164.7
	Average	201.1	173.2	52	WAF 16220-4	183.3	152.3

Table 4 (cont.). Yield (%, by wt) of entries grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

	Entry	US #1	B-size		Entry	US #1	B-size
1	Atlantic	87.1	7.7	23	AAF 11611-2	77.0	19.2
2	Chieftain	84.7	10.2	24	AF 5931-1	89.1	8.7
3	Dark Red Norland	86.3	7.5	25	AF 5933-4	88.8	9.5
4	Katahdin	89.1	6.7	26	AF 6181-9	80.6	10.2
5	Kennebec	81.3	9.6	27	AF 6526-7	92.8	5.1
6	Snowden	88.9	8.9	28	AF 6530-4	86.4	11.7
7	Superior	83.6	7.2	29	AF 6531-3	80.8	12.0
8	Yukon Gold	86.2	2.6	30	AF 6541-15	84.9	12.1
9	AF 5280-5	83.1	12.1	31	AF 6541-3	86.9	9.5
10	AF 5677-4	87.0	8.2	32	AF 6542-16	68.1	27.4
11	NDAF 102629C-4	84.6	11.1	33	AF 6542-19	86.1	8.9
12	NDAF 113484B-1	88.0	8.8	34	AF 6551-4	94.2	4.3
13	NY 149	80.3	15.7	35	AF 6553-3	86.8	8.8
14	NY 151	83.8	13.4	36	AF 6555-2	88.5	7.9
15	NY 152	88.6	10.2	37	AF 6562-1	91.3	4.8
16	NY 164	71.7	20.0	38	AF 6566-1	91.4	5.7
				39	AF 6572-3	71.9	16.3
17	AF 4157-6	89.9	8.2	40	AF 6579-3	78.2	7.6
18	AF 4648-2	83.8	13.7	41	AF 6585-1	82.6	9.6
19	AF 5040-8	89.6	8.7	42	AF 6594-4	80.6	15.0
20	AF 5225-1	90.2	8.2	43	AF 6601-2	86.1	11.6
21	AF 5429-3	90.1	4.4	44	AF 6602-10	72.0	23.1
22	AF 5819-2	85.1	13.3	45	AF 6606-2	86.0	7.2
				46	NDAF 12143-1	68.6	27.8
				47	NDAF 14114YCB-3	71.3	24.4
				48	NDAF 1488-3	79.3	15.9
				49	NDAF 1489-4	77.1	17.0
				50	WAF 16134-2	81.4	13.6
				51	WAF 16220-2	83.8	11.9
	Average	83.8	15.6	52	WAF 16220-4	83.1	8.4

* % culls =100% minus the sum of % US #1 and % B-size

Table 5. Tuber skin characteristics of entries grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

	Entry	Color[1]	Texture		Entry	Color	Texture
1	Atlantic	5	5	23	AAF 11611-2	3, 6	5
2	Chieftain	3	5	24	AF 5931-1	8	8
3	Dark Red Norland	2	4	25	AF 5933-4	5	5
4	Katahdin	8	8	26	AF 6181-9	6	6
5	Kennebec	8	7	27	AF 6526-7	6	5
6	Snowden	5	5	28	AF 6530-4	5	5
7	Superior	9	5	29	AF 6531-3	5	6
8	Yukon Gold	6	6	30	AF 6541-15	5	6
9	AF 5280-5	9	7	31	AF 6541-3	6	6
10	AF 5677-4	9	6	32	AF 6542-16	9	8
11	NDAF 102629C-4	6	7	33	AF 6542-19	6	6
12	NDAF 113484B-1	2	5	34	AF 6551-4	3	6
13	NY 149	5	6	35	AF 6553-3	9	7
14	NY 151	5	7	36	AF 6555-2	4	4
15	NY 152	5	5	37	AF 6562-1	9	7
16	NY 164	2	8	38	AF 6566-1	6	6
				39	AF 6572-3	5	6
17	AF 4157-6	6	6	40	AF 6579-3	9	6
18	AF 4648-2	5	7	41	AF 6585-1	6	7
19	AF 5040-8	6	7	42	AF 6594-4	5	8
20	AF 5225-1	4	7	43	AF 6601-2	5	4
21	AF 5429-3	8	8	44	AF 6602-10	6	7
22	AF 5819-2	6	6	45	AF 6606-2	5	6
				46	NDAF 12143-1	2	9
				47	NDAF 14114YCB-3	2	6
				48	NDAF 1488-3	6	8
				49	NDAF 1489-4	1, 6	8
				50	WAF 16134-2	5	5
				51	WAF 16220-2	6	6
				52	WAF 16220-4	4	5

[1] See reference table for rating system on page 18.

Table 6. External tuber characteristics of entries grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

	Entry	Shape[1]	Eye Depth
1	Atlantic	3	3
2	Chieftain	3	1
3	Dark Red Norland	4	7
4	Katahdin	4	7
5	Kennebec	3	7
6	Snowden	2	1
7	Superior	5	5
8	Yukon Gold	2	7
9	AF 5280-5	3	5
10	AF 5677-4	2	3
11	NDAF 102629C-4	2	5
12	NDAF 113484B-1	2	5
13	NY 149	3	5
14	NY 151	2	5
15	NY 152	1	7
16	NY 164	3	7
17	AF 4157-6	3	7
18	AF 4648-2	4	7
19	AF 5040-8	3	3
20	AF 5225-1	3	5
21	AF 5429-3	4	7
22	AF 5819-2	3	3
23	AAF 11611-2	4	5
24	AF 5931-1	3	5
25	AF 5933-4	2	7
26	AF 6181-9	4	9
27	AF 6526-7	4	7
28	AF 6530-4	2	5
29	AF 6531-3	2	5
30	AF 6541-15	3	7
31	AF 6541-3	2	5
32	AF 6542-16	3	5
33	AF 6542-19	3	5
34	AF 6551-4	4	7
35	AF 6553-3	2	5
36	AF 6555-2	3	3
37	AF 6562-1	2	7
38	AF 6566-1	3	7
39	AF 6572-3	4	7
40	AF 6579-3	4	5
41	AF 6585-1	2	5
42	AF 6594-4	3	7
43	AF 6601-2	3	3
44	AF 6602-10	2	5
45	AF 6606-2	2	3
46	NDAF 12143-1	1	5
47	NDAF 14114YCB-3	3	9
48	NDAF 1488-3	1	3
49	NDAF 1489-4	3	3
50	WAF 16134-2	2	9
51	WAF 16220-2	2	5
52	WAF 16220-4	3	9

[1] See reference table for rating system on page 18.

Table 7. Internal tuber defects for entries grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

	Entry	Hollow[1] heart	Brown center		Entry	Hollow heart	Brown center
1	Atlantic	0	0	23	AAF 11611-2	0	0
2	Chieftain	0	0	24	AF 5931-1	0	0
3	Dark Red Norland	0	0	25	AF 5933-4	0	0
4	Katahdin	0	0	26	AF 6181-9	0	0
5	Kennebec	0	0	27	AF 6526-7	0	0
6	Snowden	0	0	28	AF 6530-4	0	0
7	Superior	0	0	29	AF 6531-3	0	0
8	Yukon Gold	0	0	30	AF 6541-15	0	0
9	AF 5280-5	0	0	31	AF 6541-3	0	0
10	AF 5677-4	0	0	32	AF 6542-16	0	0
11	NDAF 102629C-4	0	10	33	AF 6542-19	10	0
12	NDAF 113484B-1	0	0	34	AF 6551-4	0	0
13	NY 149	0	20	35	AF 6553-3	0	0
14	NY 151	0	0	36	AF 6555-2	0	0
15	NY 152	0	0	37	AF 6562-1	0	0
16	NY 164	0	0	38	AF 6566-1	0	0
				39	AF 6572-3	0	0
17	AF 4157-6	0	0	40	AF 6579-3	0	0
18	AF 4648-2	0	0	41	AF 6585-1	0	0
19	AF 5040-8	0	0	42	AF 6594-4	0	0
20	AF 5225-1	0	0	43	AF 6601-2	0	0
21	AF 5429-3	0	0	44	AF 6602-10	0	0
22	AF 5819-2	0	0	45	AF 6606-2	0	0
				46	NDAF 12143-1	0	0
				47	NDAF 14114YCB-3	0	0
				48	NDAF 1488-3	10	0
				49	NDAF 1489-4	0	0
				50	WAF 16134-2	0	0
				51	WAF 16220-2	0	0
				52	WAF 16220-4	0	0

[1] % of tubers out of 10 tubers that contain the defect.

Table 7 (cont.). Internal tuber defects for entries grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

	Entry	Necrosis[1]	Vascular discoloration
1	Atlantic	0	10
2	Chieftain	50	0
3	Dark Red Norland	10	0
4	Katahdin	30	60
5	Kennebec	0	10
6	Snowden	0	20
7	Superior	10	20
8	Yukon Gold	30	0
9	AF 5280-5	0	40
10	AF 5677-4	0	30
11	NDAF 102629C-4	0	30
12	NDAF 113484B-1	10	0
13	NY 149	0	20
14	NY 151	0	0
15	NY 152	10	0
16	NY 164	0	30
17	AF 4157-6	0	20
18	AF 4648-2	0	0
19	AF 5040-8	0	20
20	AF 5225-1	0	10
21	AF 5429-3	20	10
22	AF 5819-2	10	10
23	AAF 11611-2	0	0
24	AF 5931-1	10	0
25	AF 5933-4	0	0
26	AF 6181-9	0	30
27	AF 6526-7	0	40
28	AF 6530-4	0	10
29	AF 6531-3	0	0
30	AF 6541-15	0	10
31	AF 6541-3	0	0
32	AF 6542-16	0	0
33	AF 6542-19	10	10
34	AF 6551-4	0	0
35	AF 6553-3	0	10
36	AF 6555-2	10	0
37	AF 6562-1	0	20
38	AF 6566-1	0	0
39	AF 6572-3	0	10
40	AF 6579-3	50	10
41	AF 6585-1	10	0
42	AF 6594-4	0	0
43	AF 6601-2	0	10
44	AF 6602-10	0	0
45	AF 6606-2	0	0
46	NDAF 12143-1	10	0
47	NDAF 14114YCB-3	40	10
48	NDAF 1488-3	0	0
49	NDAF 1489-4	0	80
50	WAF 16134-2	0	0
51	WAF 16220-2	10	30
52	WAF 16220-4	10	20

[1] % of tubers out of 10 tubers that contain the defect.

Table 8. Overall quality for entries grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

	Entry	Overall[1] appearance	% tubers[2] with defects		Entry	Overall appearance	% tubers with defects
1	Atlantic	5	10	23	AAF 11611-2	9	0
2	Chieftain	5	50	24	AF 5931-1	9	10
3	Dark Red Norland	7	10	25	AF 5933-4	5	0
4	Katahdin	7	80	26	AF 6181-9	9	30
5	Kennebec	7	10	27	AF 6526-7	7	40
6	Snowden	9	20	28	AF 6530-4	5	10
7	Superior	7	30	29	AF 6531-3	7	0
8	Yukon Gold	5	30	30	AF 6541-15	5	10
9	AF 5280-5	9	40	31	AF 6541-3	5	0
10	AF 5677-4	7	30	32	AF 6542-16	5	0
11	NDAF 102629C-4	7	40	33	AF 6542-19	7	30
12	NDAF 113484B-1	9	10	34	AF 6551-4	5	0
13	NY 149	7	30	35	AF 6553-3	7	10
14	NY 151	7	0	36	AF 6555-2	5	10
15	NY 152	9	10	37	AF 6562-1	7	20
16	NY 164	9	30	38	AF 6566-1	9	0
				39	AF 6572-3	7	10
17	AF 4157-6	7	20	40	AF 6579-3	5	60
18	AF 4648-2	9	0	41	AF 6585-1	7	10
19	AF 5040-8	7	20	42	AF 6594-4	5	0
20	AF 5225-1	9	10	43	AF 6601-2	5	10
21	AF 5429-3	7	30	44	AF 6602-10	5	0
22	AF 5819-2	7	20	45	AF 6606-2	7	0
				46	NDAF 12143-1	9	10
				47	NDAF 14114YCB-3	9	50
				48	NDAF 1488-3	7	10
				49	NDAF 1489-4	7	80
				50	WAF 16134-2	7	0
				51	WAF 16220-2	7	40
				52	WAF 16220-4	9	30

[1] See reference table for rating system on page 18.

[2] % of tubers out of 10 tubers that contain defects.

Table 9. Specific gravity and chip quality for entries grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

	Entry	Specific[1] gravity	Chip[2] color	Blister[3] %		Entry	Specific gravity	Chip color	Blister %
1	Atlantic	1.077	2	24	23	AAF 11611-2	1.067	3	8
2	Chieftain	<1.060	5	16	24	AF 5931-1	1.073	1	32
3	Dark Red Norland	<1.060	5	0	25	AF 5933-4	1.082	1	8
4	Katahdin	<1.060	4	16	26	AF 6181-9	1.076	4	4
5	Kennebec	<1.060	4	4	27	AF 6526-7	1.069	4	0
6	Snowden	1.069	3	4	28	AF 6530-4	1.078	4	0
7	Superior	1.064	5	32	29	AF 6531-3	1.084	1	16
8	Yukon Gold	<1.060	5	0	30	AF 6541-15	1.076	3	8
9	AF 5280-5	<1.060	3	0	31	AF 6541-3	1.070	2	8
10	AF 5677-4	1.071	3	4	32	AF 6542-16	1.084	1	20
11	NDAF 102629C-4	1.070	1	8	33	AF 6542-19	1.081	2	8
12	NDAF 113484B-1	<1.060	4	8	34	AF 6551-4	1.071	1	12
13	NY 149	1.067	5	4	35	AF 6553-3	1.079	3	12
14	NY 151	<1.060	6	8	36	AF 6555-2	1.086	2	28
15	NY 152	1.072	1	8	37	AF 6562-1	1.076	1	24
16	NY 164	<1.060	5	12	38	AF 6566-1	1.084	2	12
					39	AF 6572-3	1.074	4	8
17	AF 4157-6	1.080	2	4	40	AF 6579-3	1.070	4	8
18	AF 4648-2	1.085	2	24	41	AF 6585-1	1.066	4	0
19	AF 5040-8	1.088	2	8	42	AF 6594-4	1.078	2	32
20	AF 5225-1	1.068	5	12	43	AF 6601-2	1.076	1	20
21	AF 5429-3	1.078	3	12	44	AF 6602-10	1.073	4	0
22	AF 5819-2	1.069	2	16	45	AF 6606-2	1.072	2	16
					46	NDAF 12143-1	1.066	4	28
					47	NDAF 14114YCB-3	1.072	5	12
					48	NDAF 1488-3	1.075	4	12
					49	NDAF 1489-4	1.069	4	8
					50	WAF 16134-2	1.079	1	12
					51	WAF 16220-2	1.072	2	44
					52	WAF 16220-4	1.080	1	20

[1] Actual data. The correction factor is -0.0005 based on the SFA chart. See reference table on page 19 for starch and dry matter conversions.

[2] SFA Standard (1=light, 6 =dark).

[3] Percentage of chips that developed blisters greater than 1 cm in diameter during the frying process.

Table 10. Glucose for entries grown in potato germplasm evaluations at the OSU-OARDC in Wooster, OH in 2020.

	Entry	Glucose (%)[1]		Entry	Glucose (%)
1	Atlantic	0.00	23	AAF 11611-2	.
2	Chieftain	.	24	AF 5931-1	0.00
3	Dark Red Norland	.	25	AF 5933-4	0.00
4	Katahdin	.	26	AF 6181-9	.
5	Kennebec	.	27	AF 6526-7	0.00
6	Snowden	0.00	28	AF 6530-4	.
7	Superior	.	29	AF 6531-3	0.00
8	Yukon Gold	.	30	AF 6541-15	0.17
9	AF 5280-5	0.03	31	AF 6541-3	0.00
10	AF 5677-4	0.00	32	AF 6542-16	.
11	NDAF 102629C-4	0.70	33	AF 6542-19	0.00
12	NDAF 113484B-1	.	34	AF 6551-4	0.00
13	NY 149	0.00	35	AF 6553-3	0.00
14	NY 151	0.00	36	AF 6555-2	0.00
15	NY 152	0.12	37	AF 6562-1	0.00
16	NY 164	.	38	AF 6566-1	.
			39	AF 6572-3	.
17	AF 4157-6	0.17	40	AF 6579-3	0.25
18	AF 4648-2	0.00	41	AF 6585-1	.
19	AF 5040-8	.	42	AF 6594-4	.
20	AF 5225-1	0.00	43	AF 6601-2	0.00
21	AF 5429-3	0.00	44	AF 6602-10	.
22	AF 5819-2	0.00	45	AF 6606-2	.
			46	NDAF 12143-1	.
			47	NDAF 14114YCB-3	.
			48	NDAF 1488-3	.
			49	NDAF 1489-4	.
			50	WAF 16134-2	0.00
			51	WAF 16220-2	0.00
			52	WAF 16220-4	0.00

[1] 2 weeks before chipping. Average of 3 tubers using Potato Test Strips from Precision Labs, Inc., West Chester, OH 45069.

TUBER DATA RATING SYSTEM

Skin Color
1. Purple
2. Red
3. Pink
4. Dark Brown
5. Brown
6. Tan
7. Buff
8. White
9. Cream

Skin Texture
1. Part. russet
2. Heavy russet
3. Mod. russet
4. Light russet
5. Netted
6. Slight netting
7. Mod. smooth
8. Smooth
9. Very smooth

Shape
1. Round
2. Mostly round
3. Round to oblong
4. Mostly oblong
5. Oblong
6. Oblong to long
7. Mostly long
8. Long
9. Cylindrical

Eye Depth
1. VD
2. --
3. D
4. --
5. Intermediate
6. --
7. S
8. --
9. VS

Appearance
1. Very poor
2. –
3. Poor
4. –
5. Fair
6. –
7. Good
8. –
9. Excellent

Conversion Table for Specific Gravity of Potato Tubers to Content of Starch and Dry Matter % (Calculated from Von Scheele equations: % starch = 17.565 + 199.07 (Sp. Gr.-1.0988); % dry matter = 24.181 + 211.04 (Sp. Gr.-1.0988)

Specific Gravity	Starch %	Dry Matter %	Specific Gravity	Starch %	Dry Matter%
1.050	7.85	13.88	1.081	14.02	20.43
1.051	8.05	14.09	1.082	14.22	20.64
1.052	8.25	14.31	1.083	14.42	20.85
1.053	8.45	14.32	1.084	14.62	21.06
1.054	8.65	14.73	1.085	14.82	21.27
1.055	8.85	14.94	1.086	15.02	21.48
1.056	9.04	15.15	1.987	15.22	21.69
1.057	9.24	15.38	1.088	15.41	21.90
1.058	9.44	15.57	1.089	15.61	22.11
1.059	9.64	15.78	1.090	15.81	22.33
1.060	9.84	15.99	1.091	16.01	22.54
1.061	10.04	16.21	1.092	16.20	22.75
1.062	10.24	16.42	1.093	16.41	22.96
1.063	10.44	16.63	1.094	16.61	23.17
1.064	10.64	16.84	1.095	16.81	23.38
1.065	10.84	17.05	1.096	17.01	23.59
1.066	11.04	17.26	1.097	17.21	23.89
1.067	11.23	17.47	1.098	17.41	24.01
1.068	11.43	17.68	1.099	17.60	24.22
1.069	11.63	17.89	1.100	17.80	24.44
1.070	11.83	18.10	1.101	18.00	24.65
1.071	12.03	18.32	1.102	18.20	24.86
1.072	12.23	18.53	1.103	18.40	25.07
1.073	12.43	18.74	1.104	18.60	25.28
1.074	12.63	18.95	1.105	18.80	25.49
1.075	12.83	19.16	1.106	19.00	25.70
1.076	13.03	19.37	1.107	19.20	25.91
1.077	13.22	19.58	1.180	19.40	26.12
1.078	13.42	19.79	1.109	29.60	26.34
1.079	13.62	20.00	1.110	19.79	26.55
1.080	13.82	220.21	1.111	19.99	26.76

Factors Affecting the Specific Gravity of the White Potato in Maine. Maine Agricultural Experiment Station. Bulletin 583. May 1959.

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External Quality and Potato Chip Images

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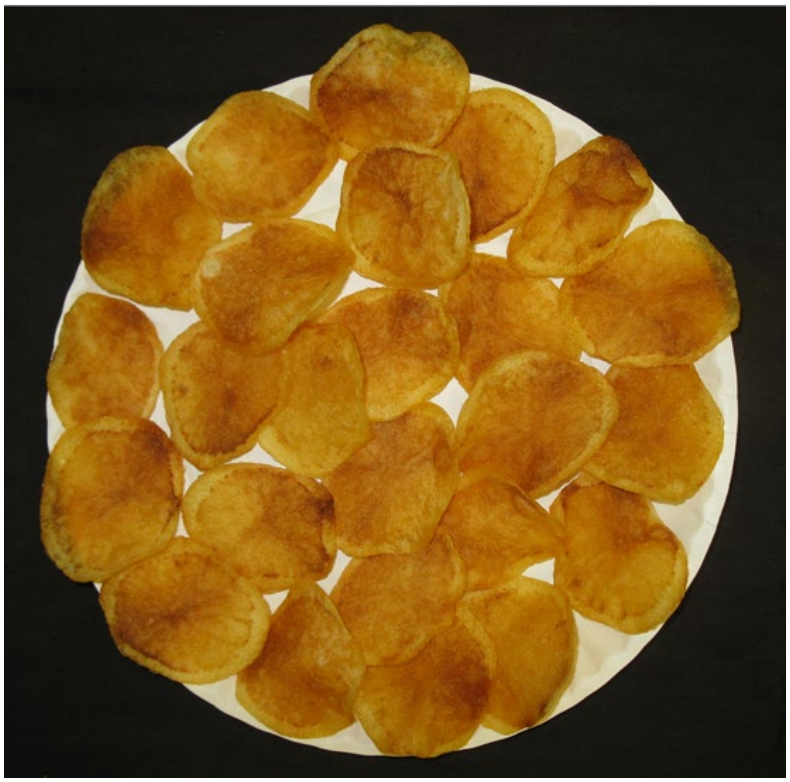
2 - Chieftain



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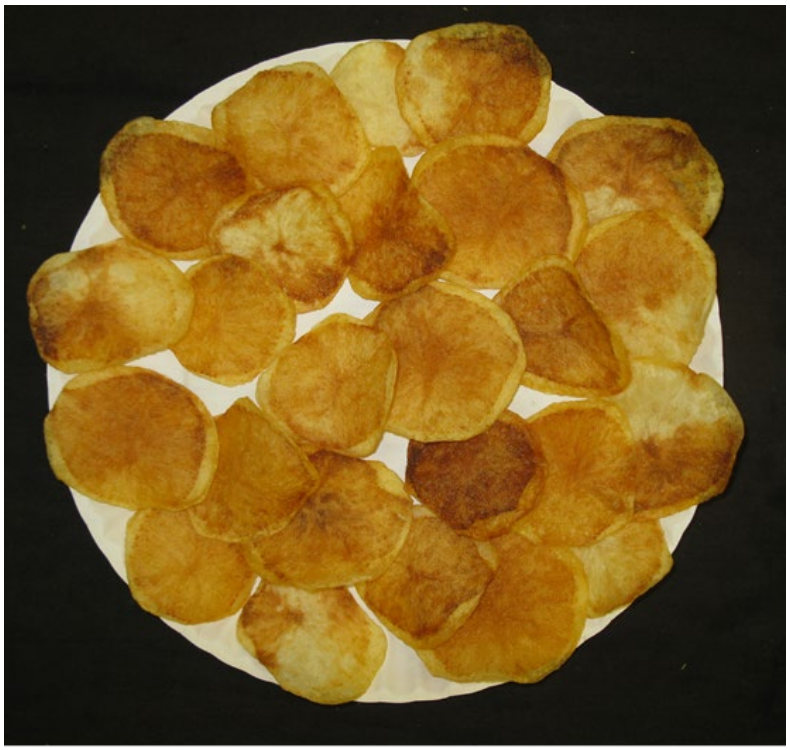
3 - Dark Red Norland



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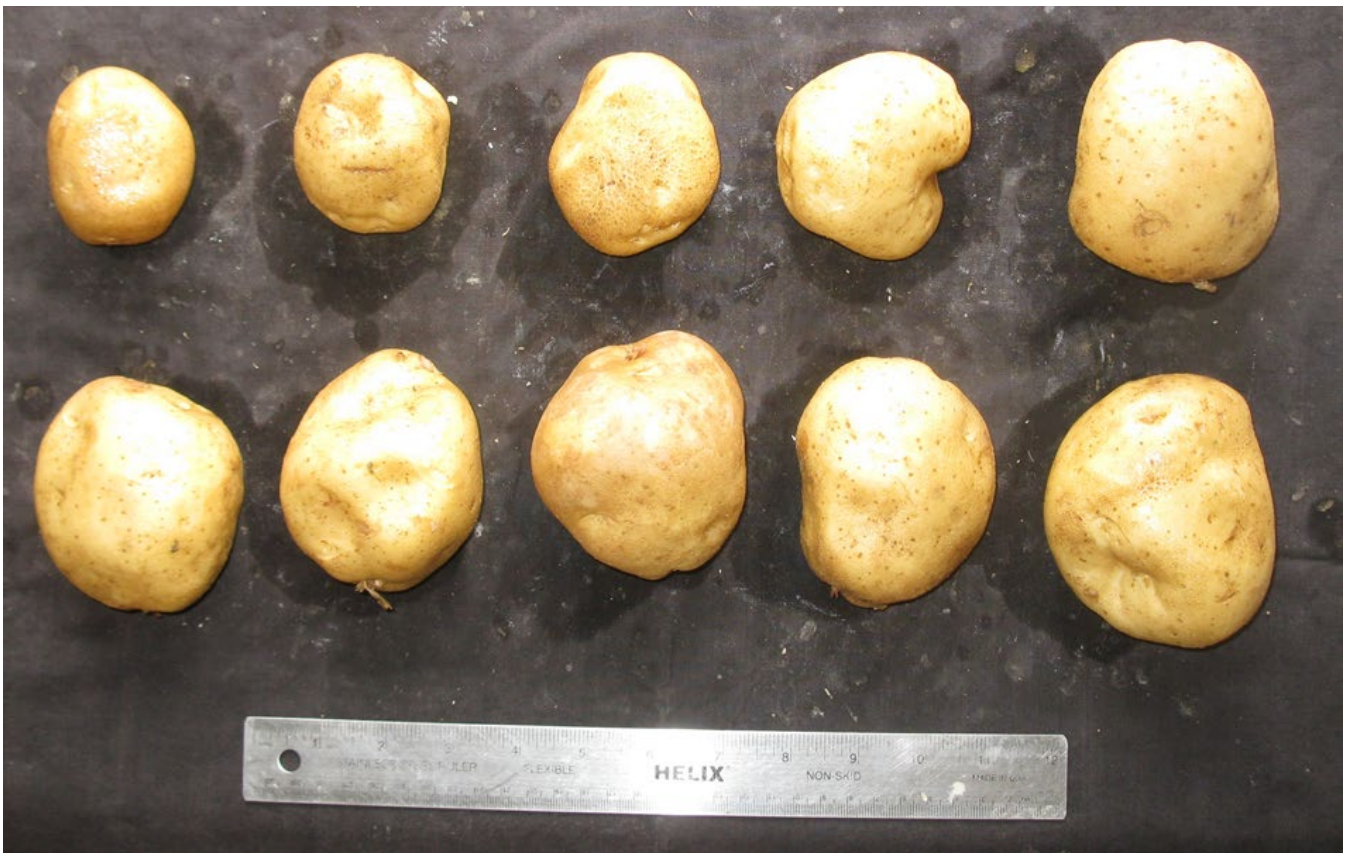
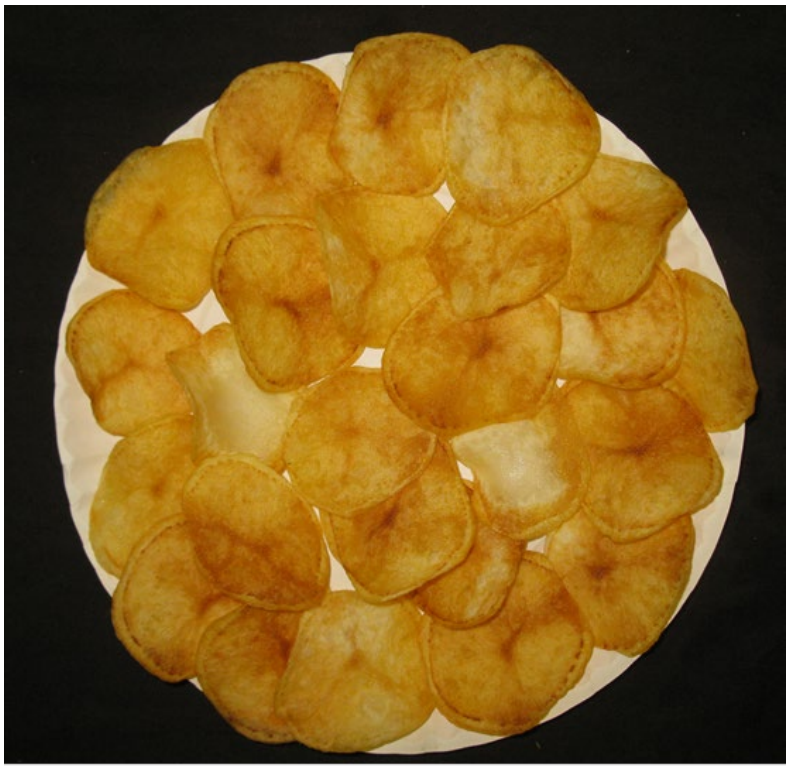


4 - Katahdin



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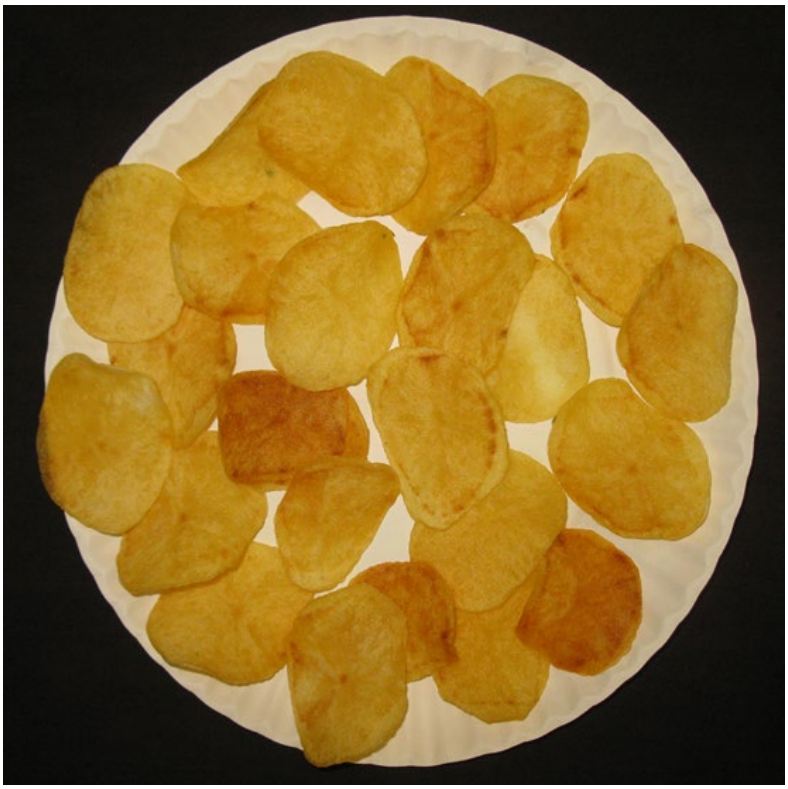
5 - Kennebec



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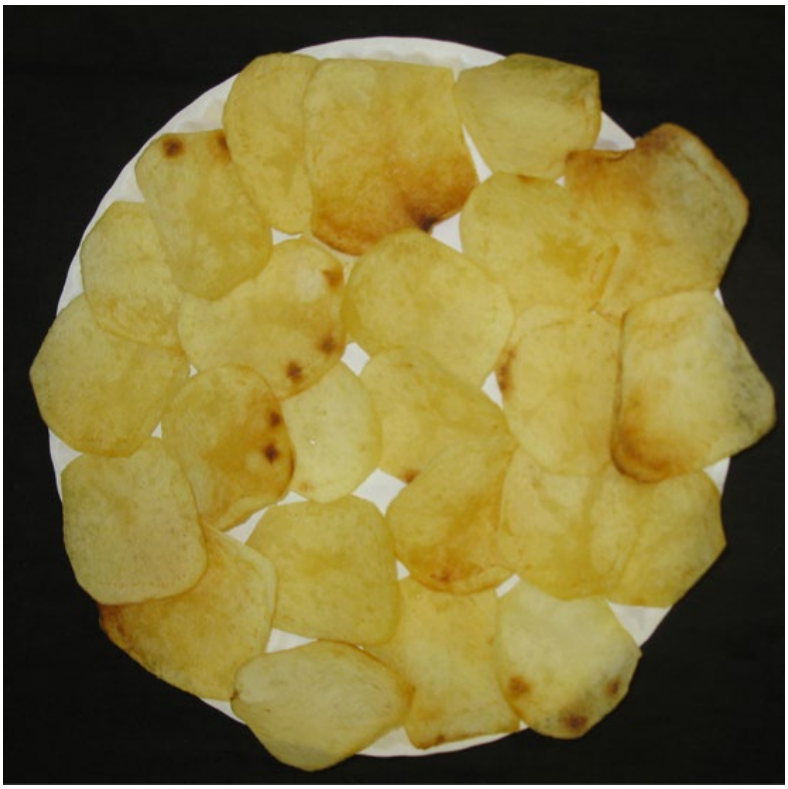
6 - Snowden



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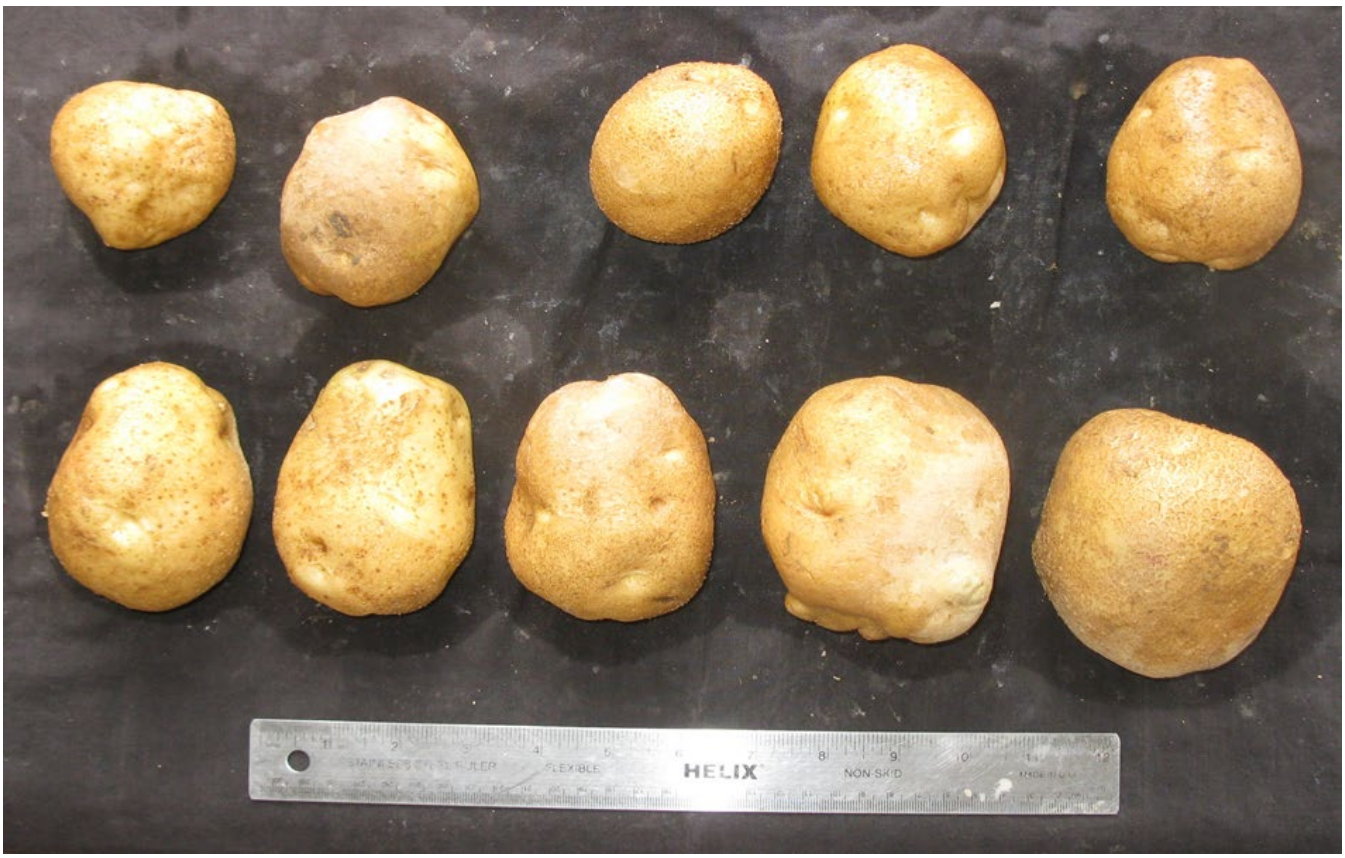
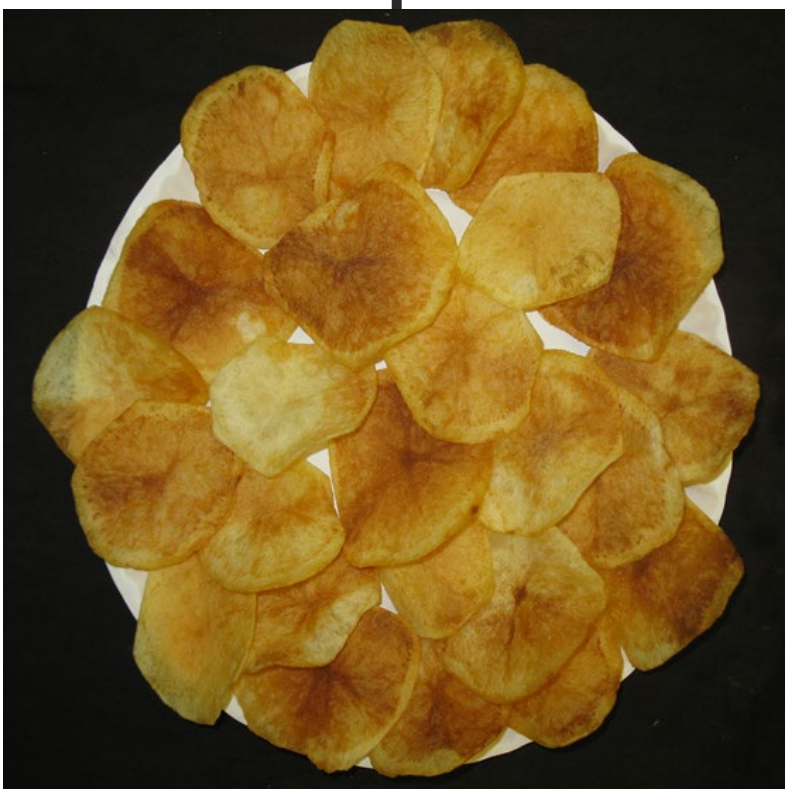


7 - Superior



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8 - Yukon Gold

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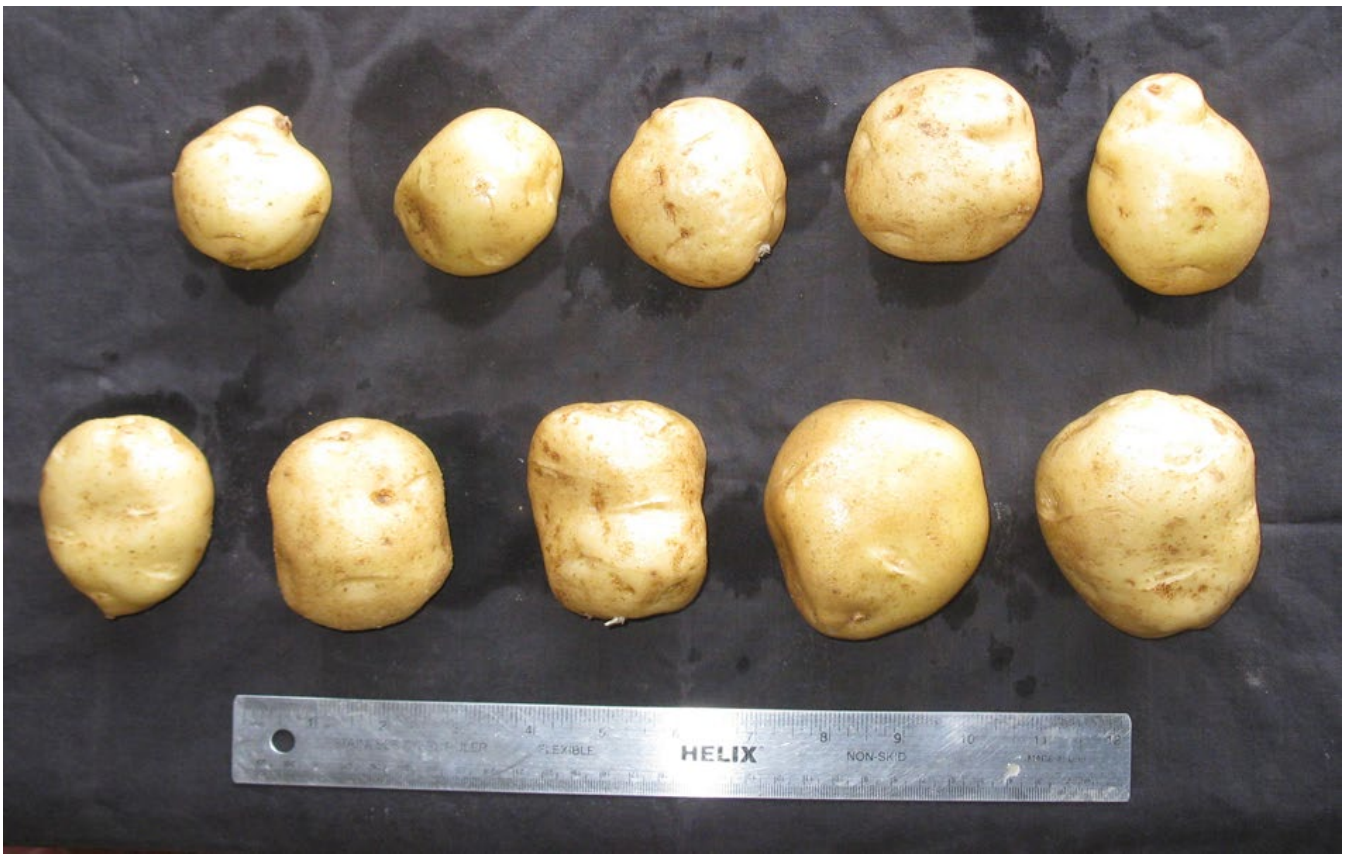

9 - AF 5280-5

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10 - AF 5677-4

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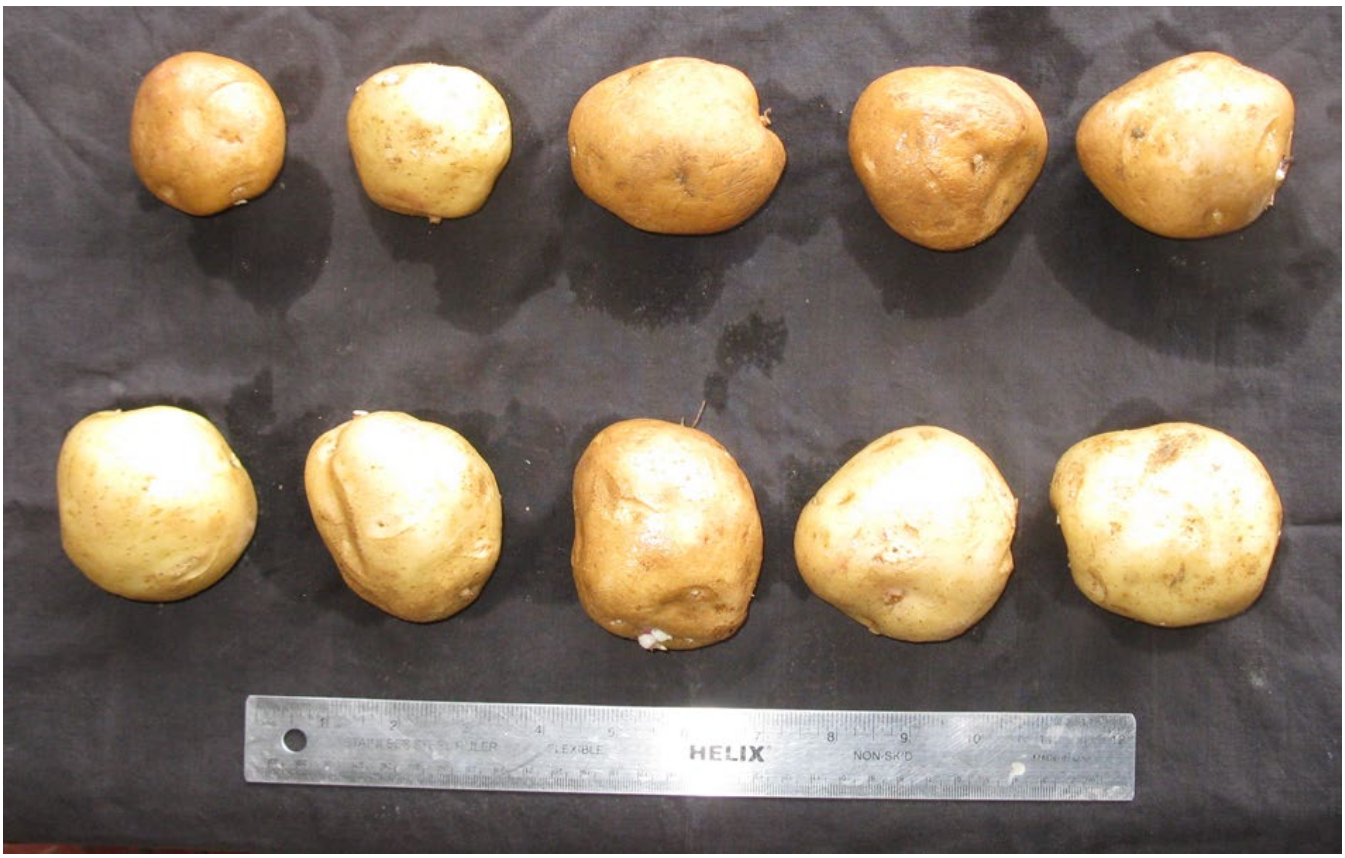

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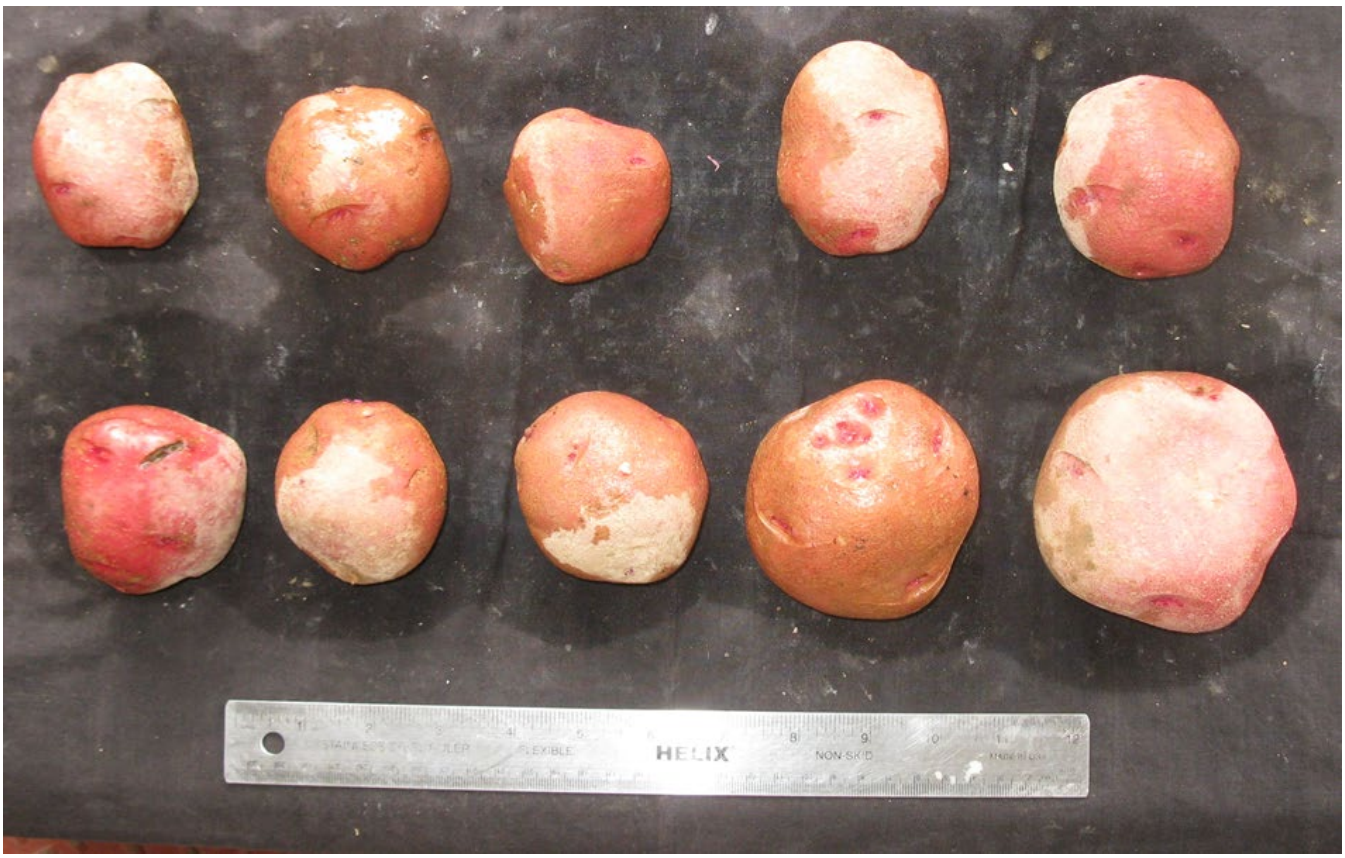

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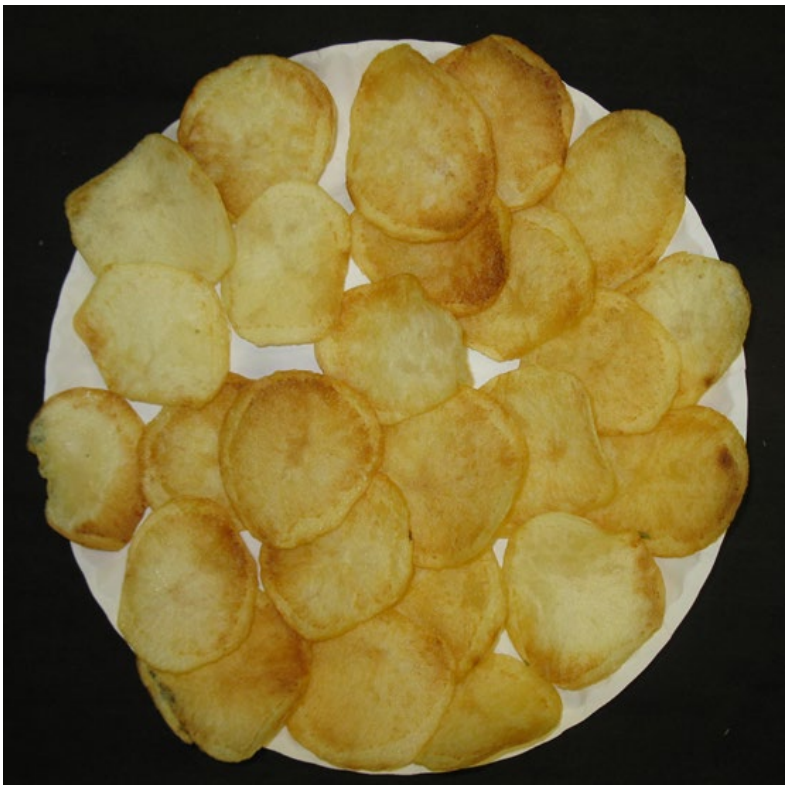

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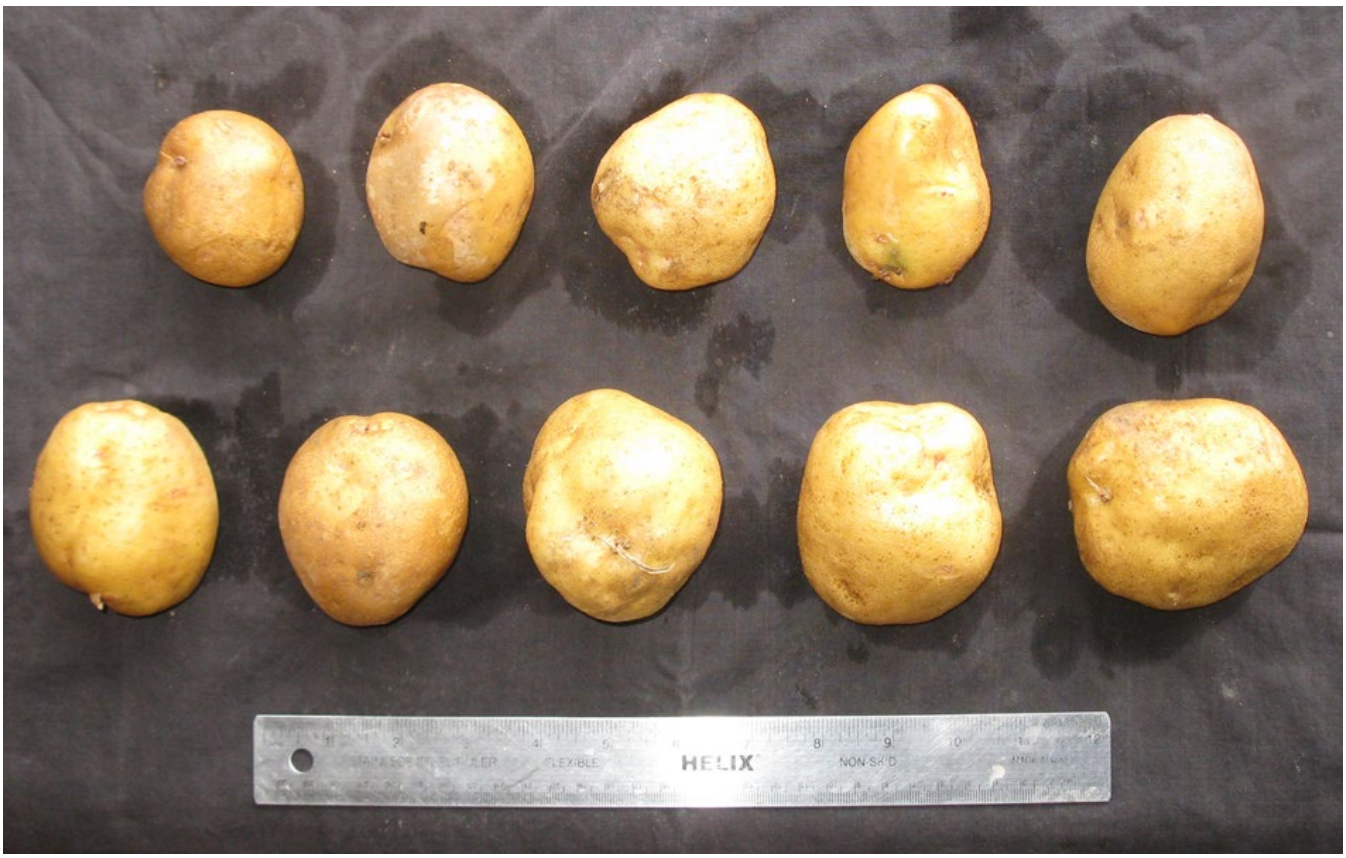
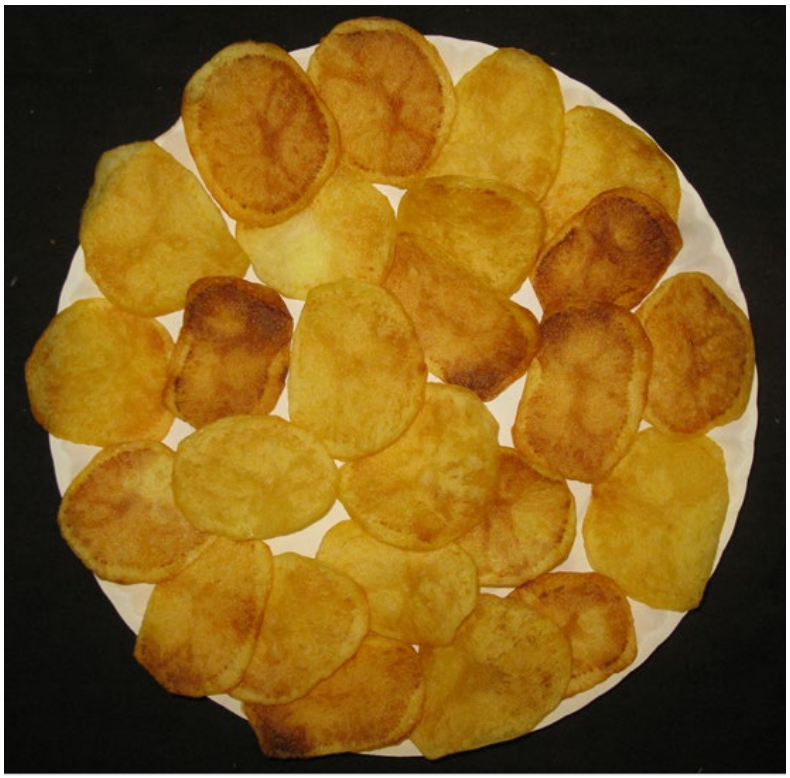


13 - NY 149



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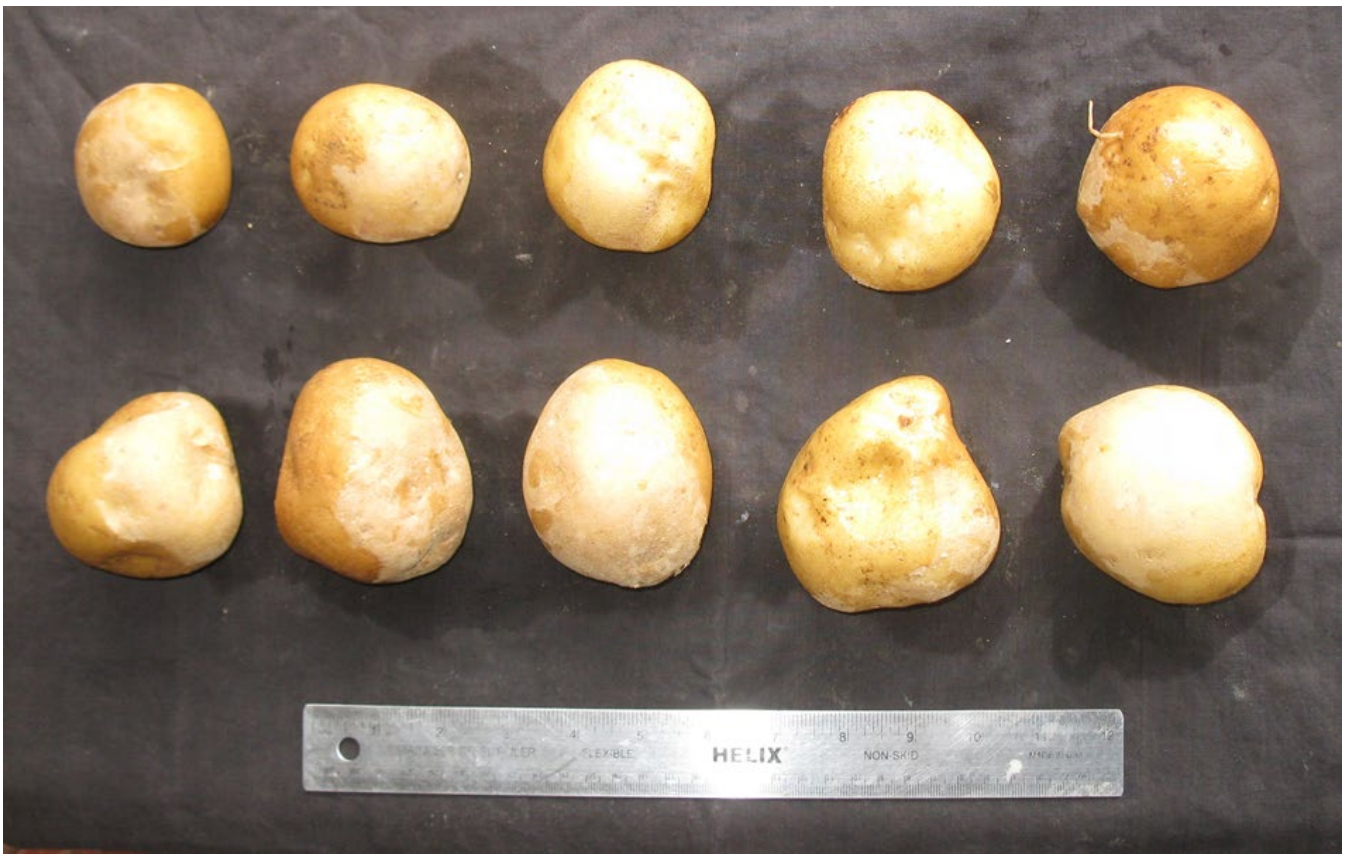

14 - NY 151

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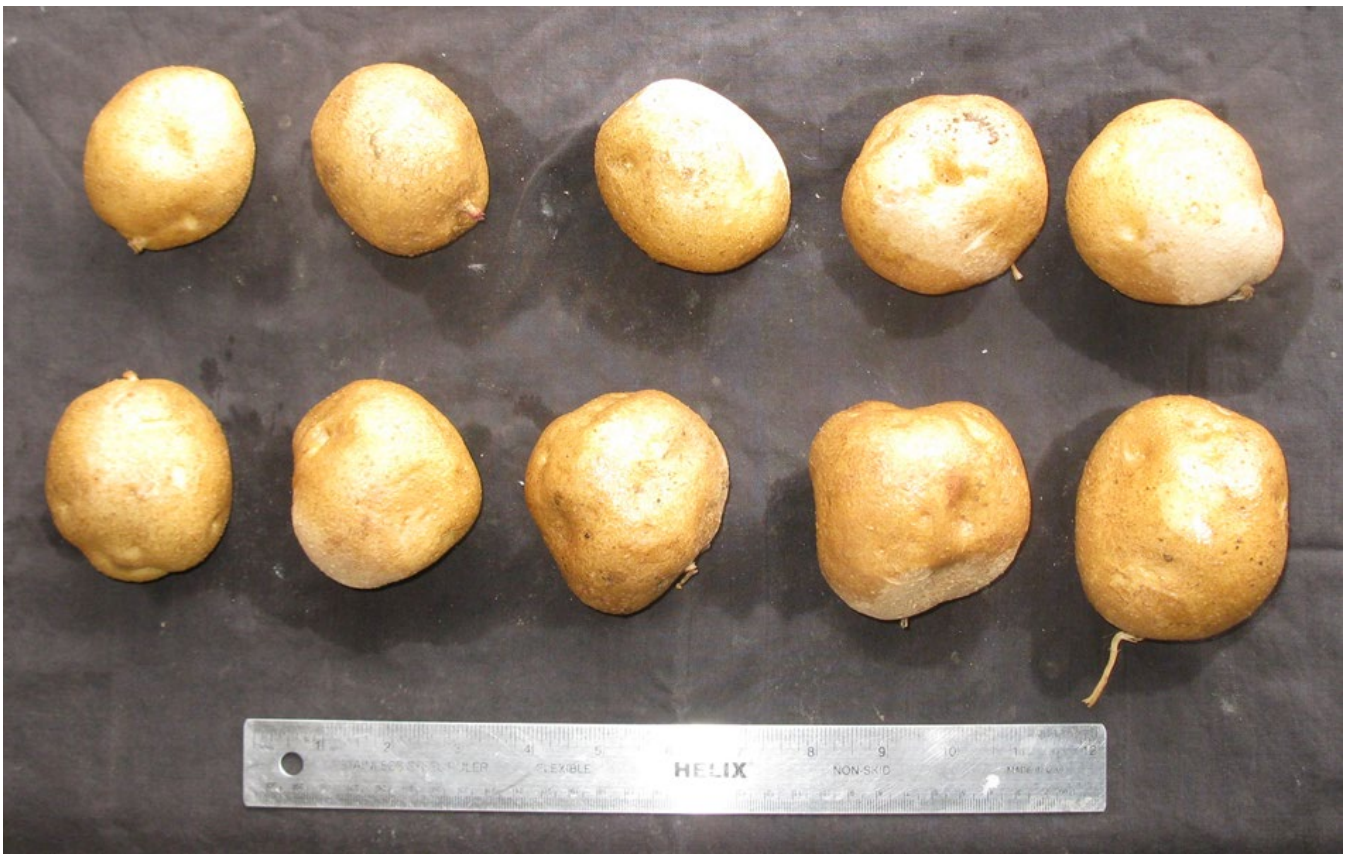
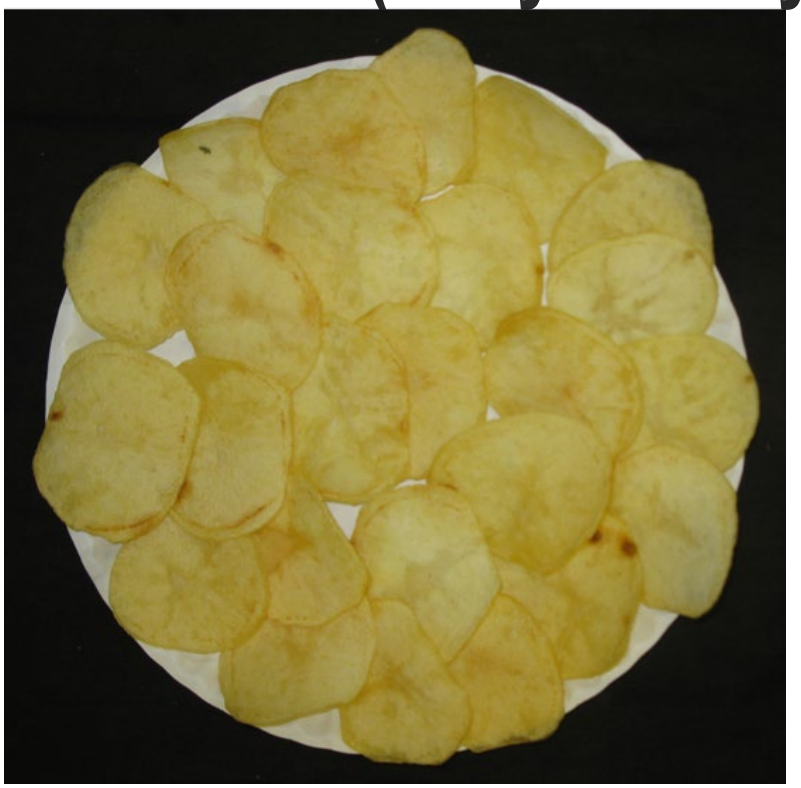


15 - NY 152 (Lady Liberty)



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16 - NY 164

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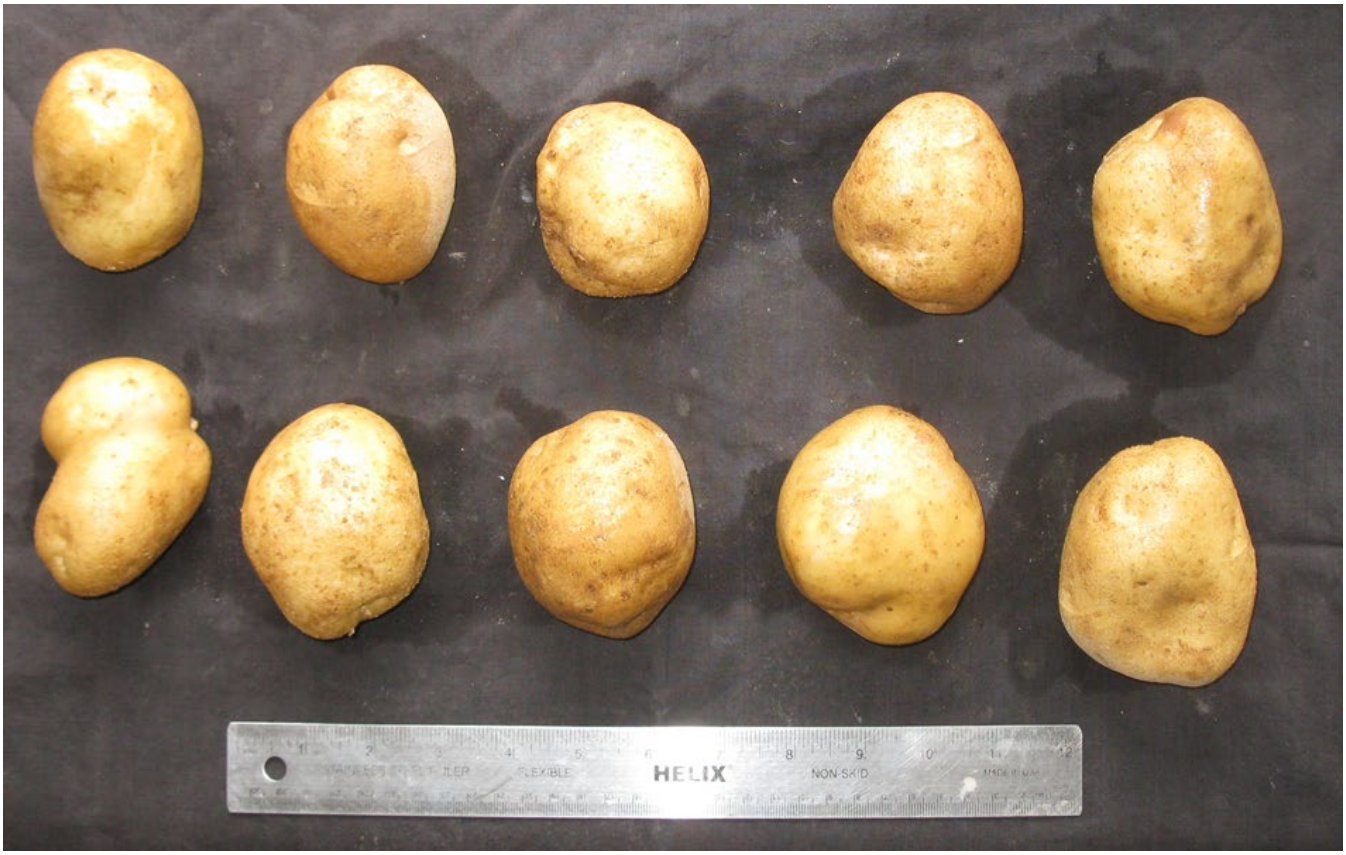

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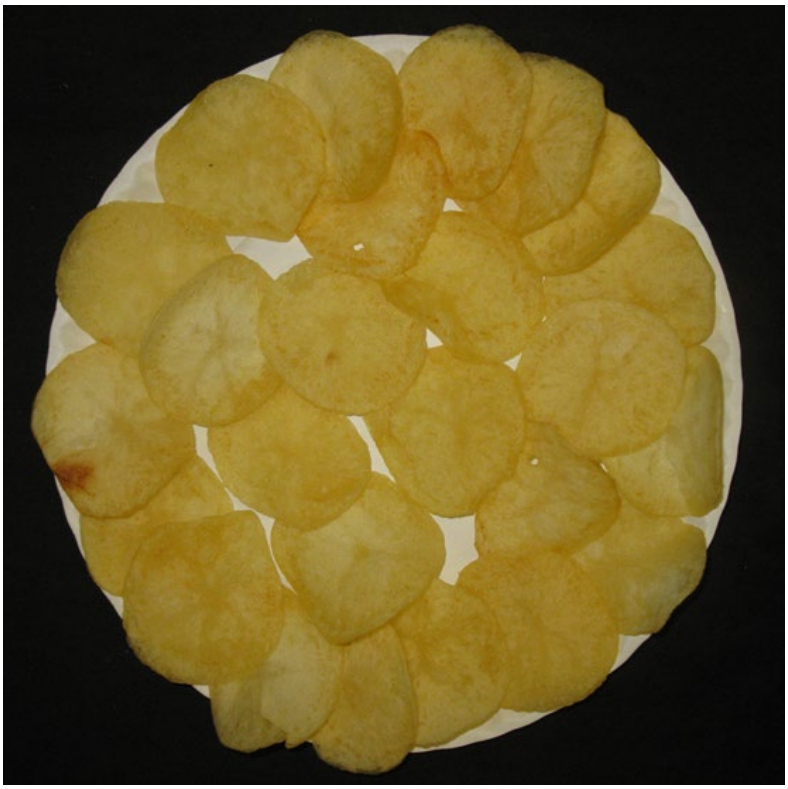

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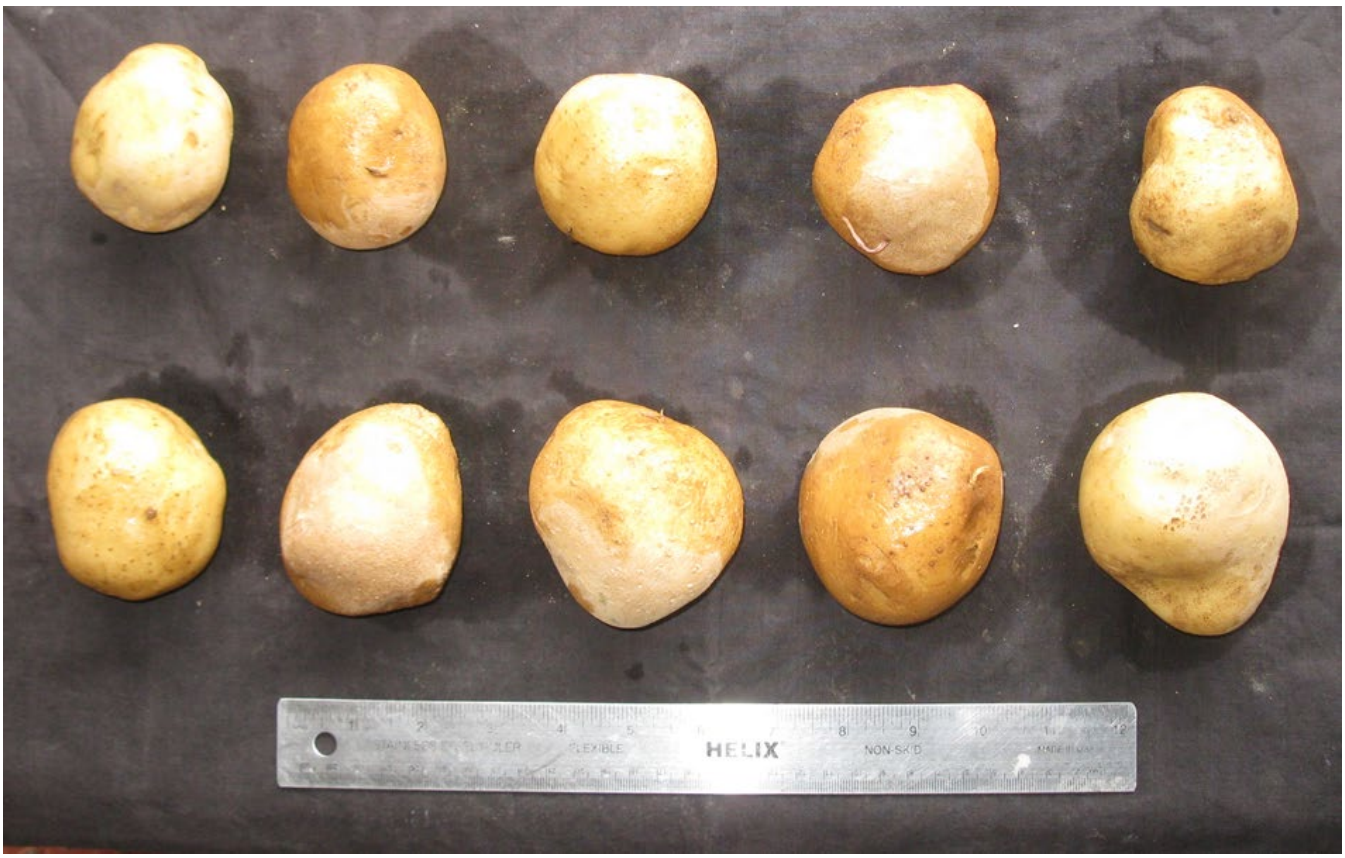

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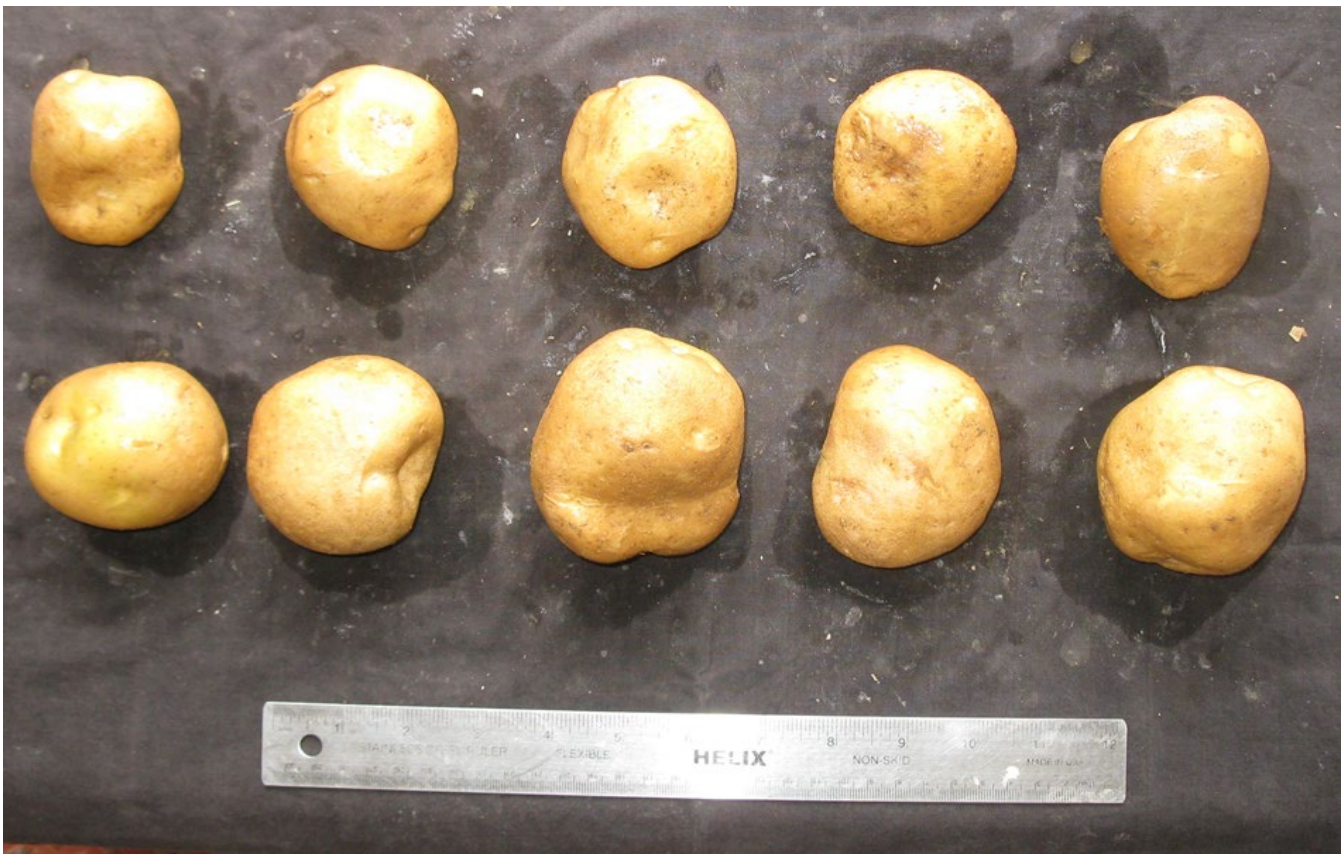

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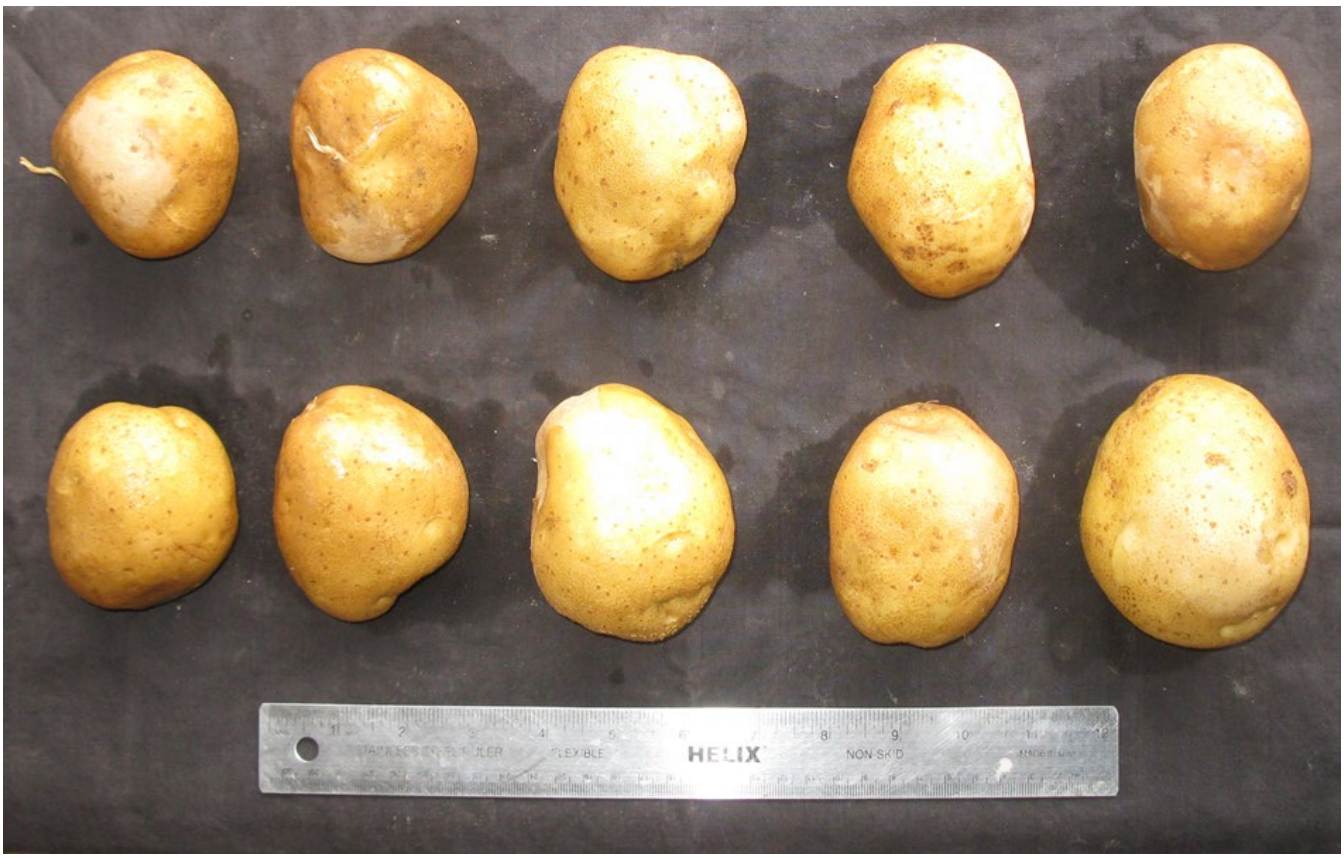

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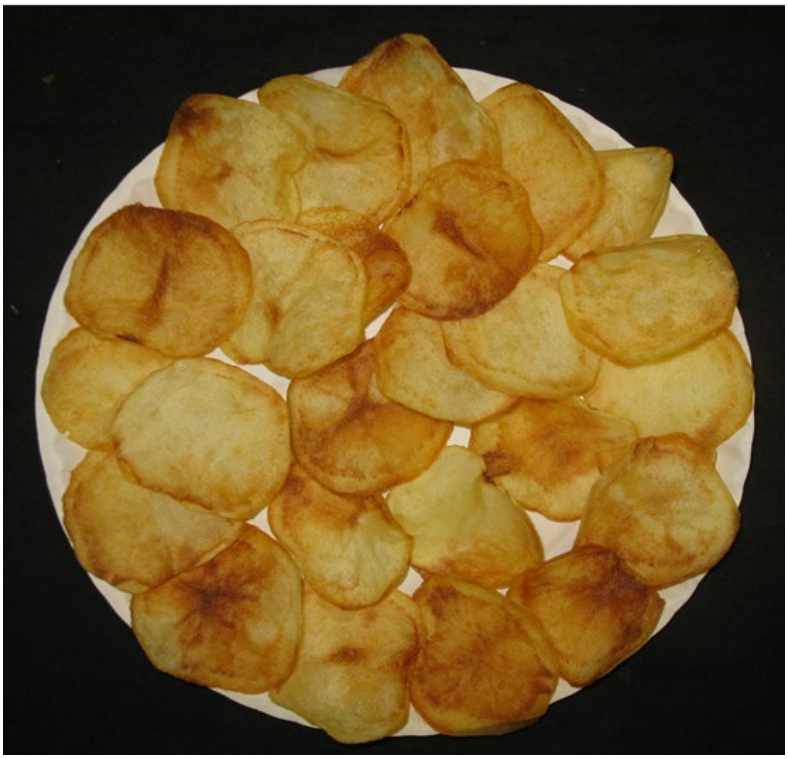

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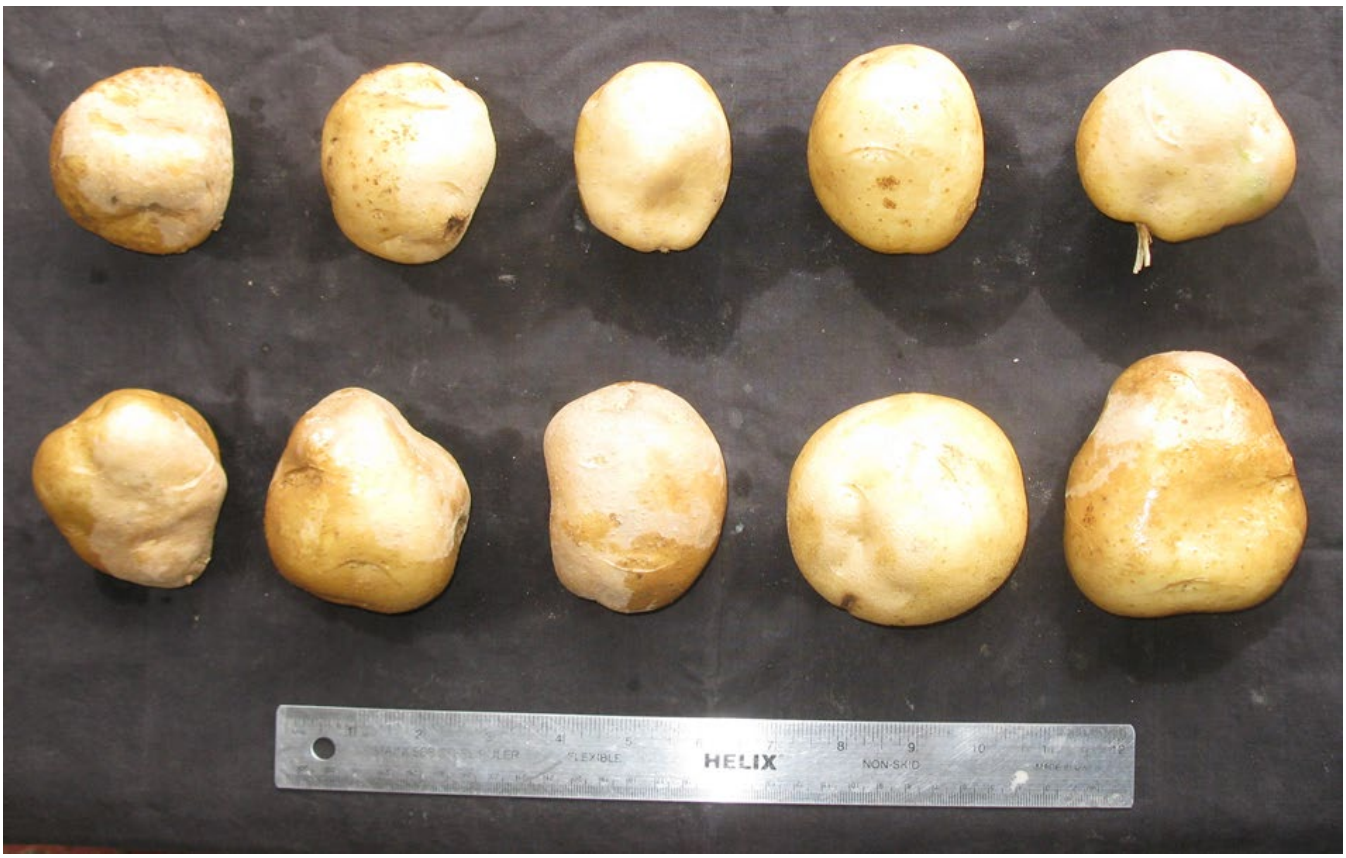
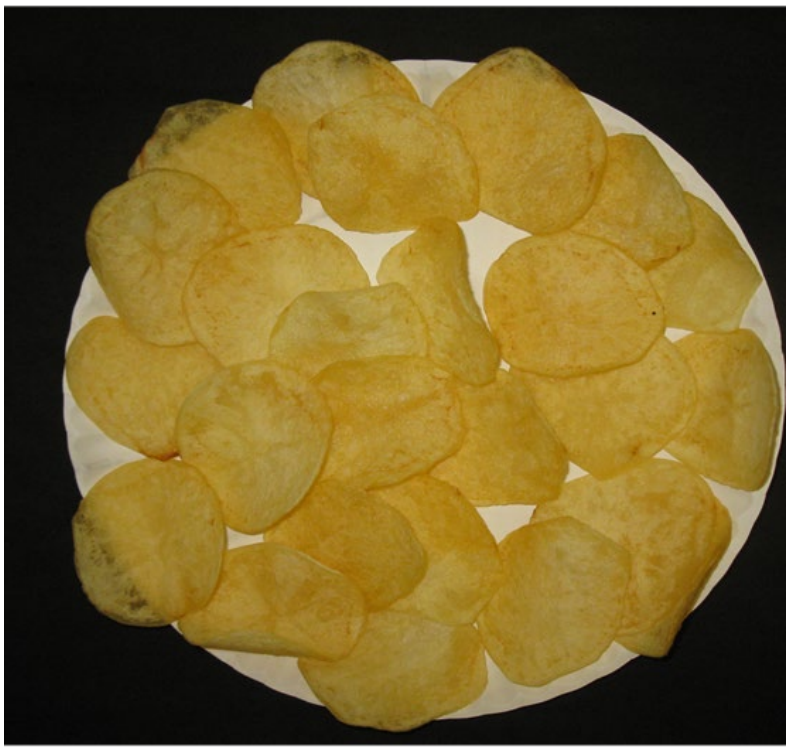


21 - AF 5429-3



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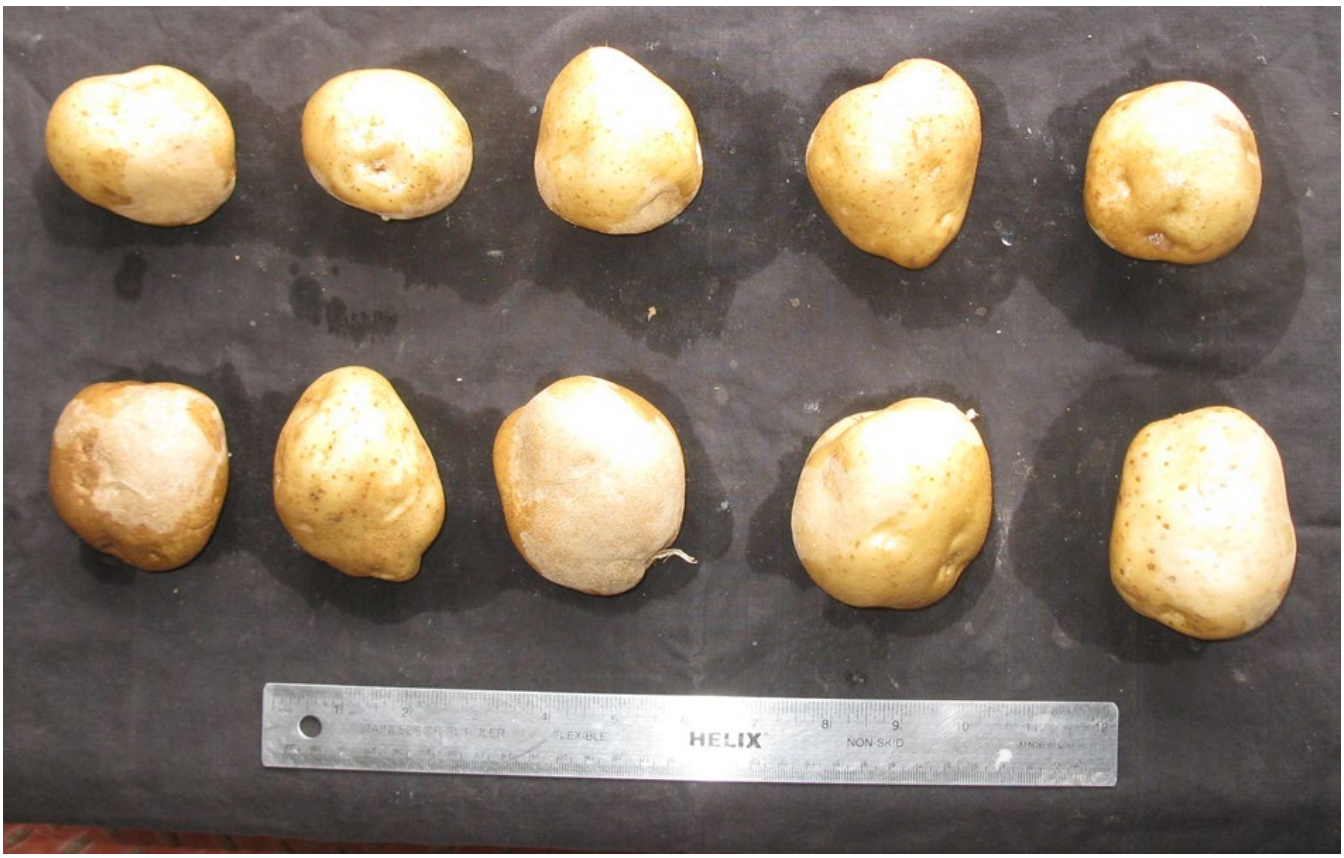

22 - AF 5819-2

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23 - AAF 11611-2

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24 - AF 5931-1

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25 - AF 5933-4

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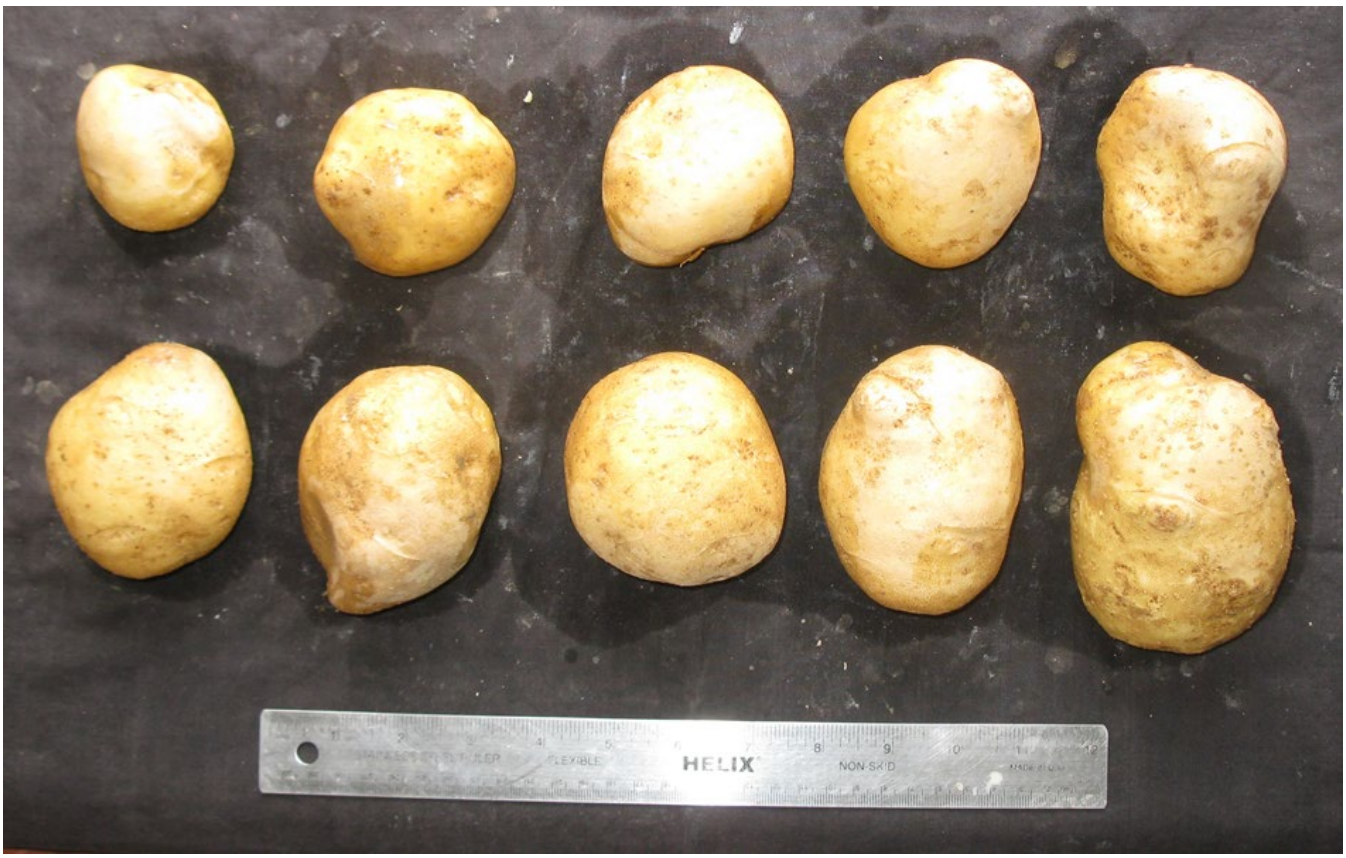

26 - AF 6181-9

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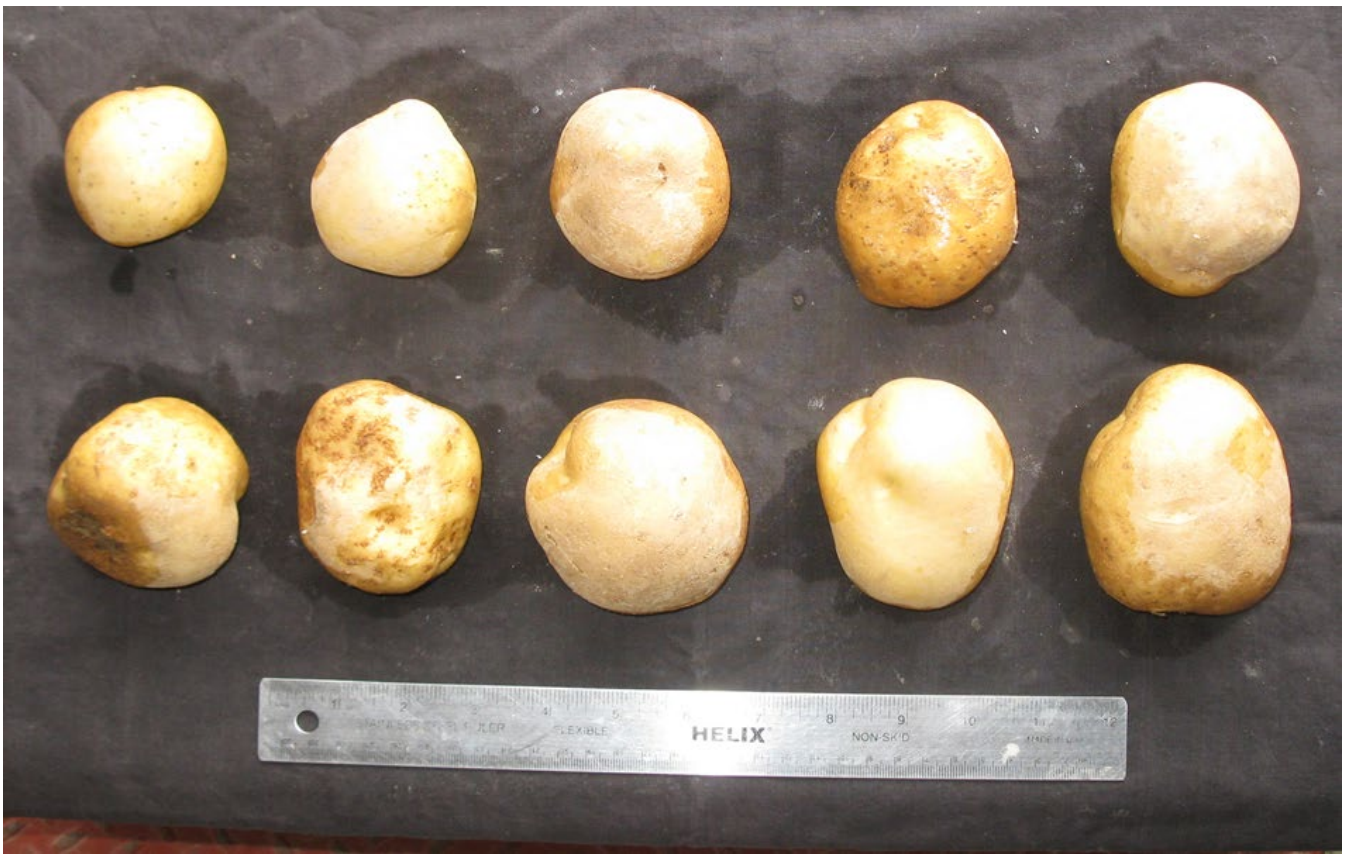

27 - AF 6526-7

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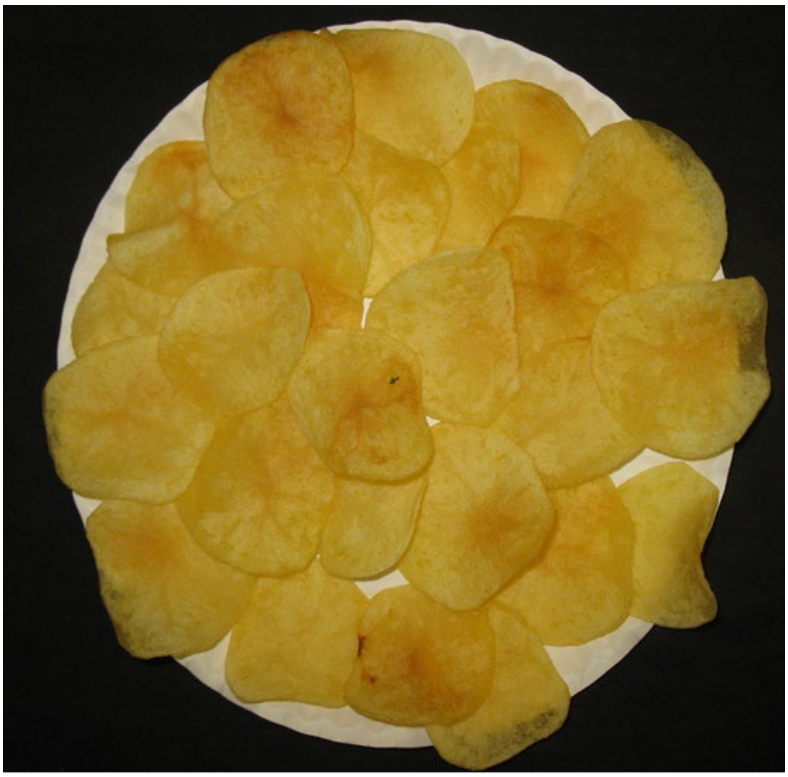
28 - AF 6530-4



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29 - AF 6531-3

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30 - AF 6541-15

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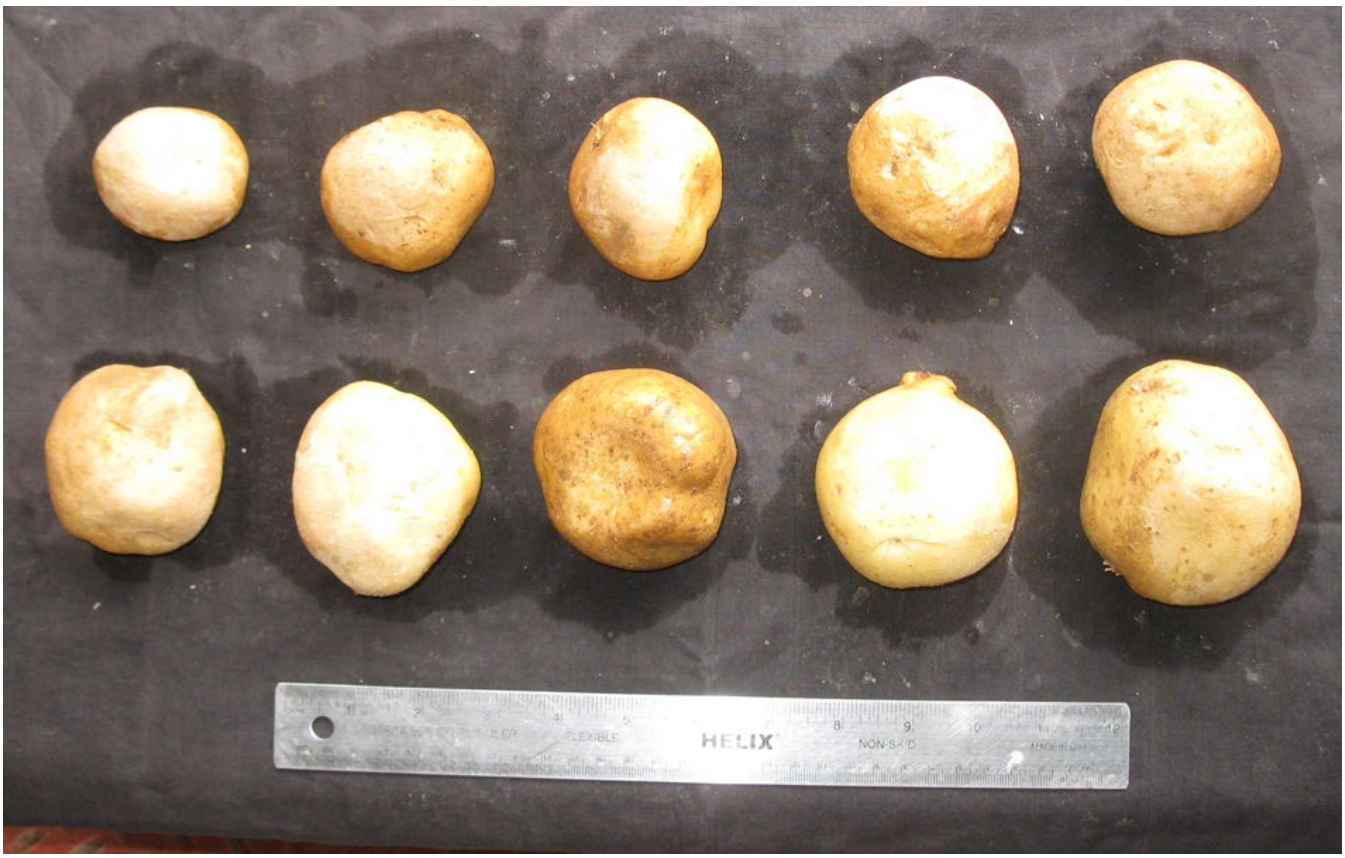

31 - AF 6541-3

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CFAES

32 - AF 6542-16

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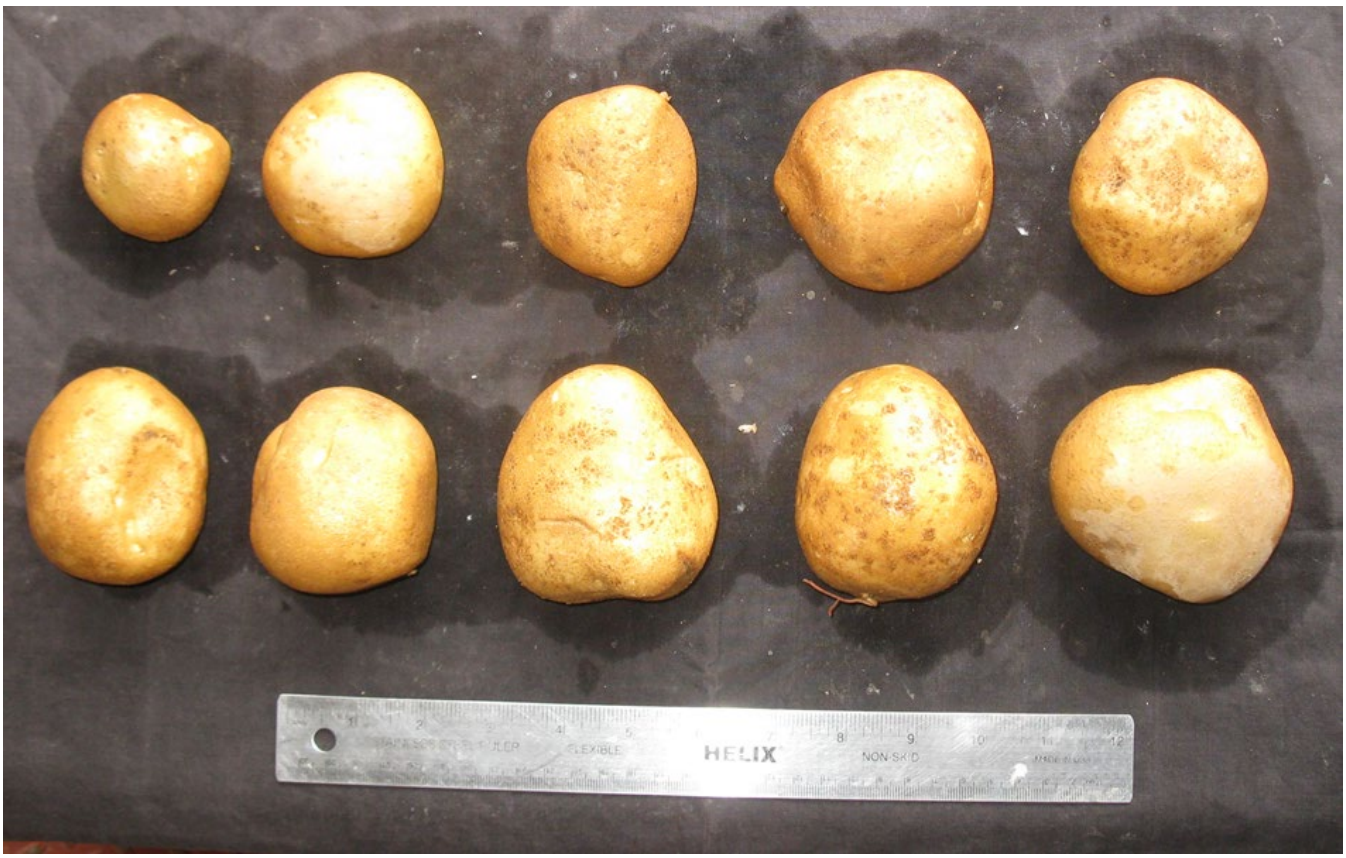
33 - AF 6542-19

CFAES



34 - AF 6551-4

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35 - AF 6553-3

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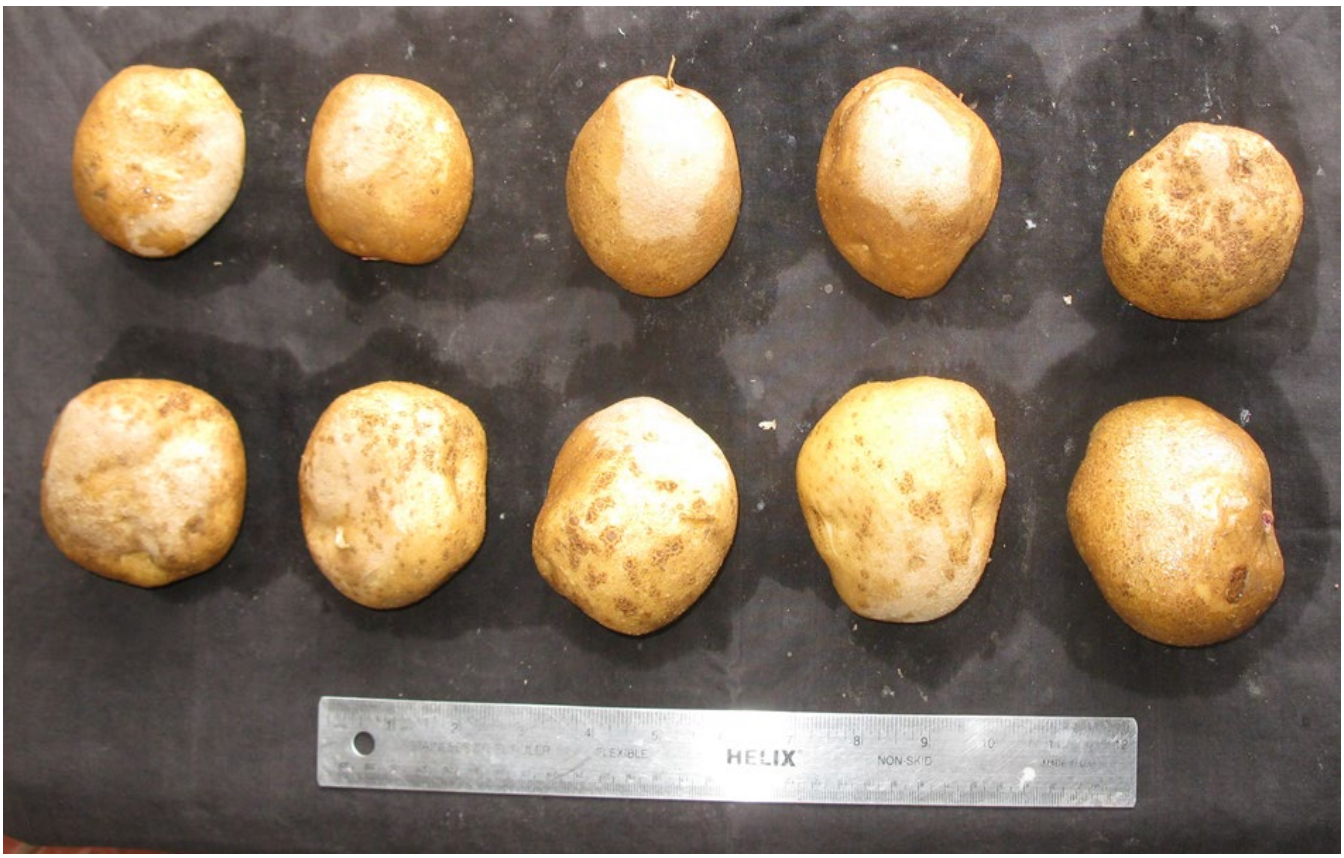
CFAES



36 - AF 6555-2

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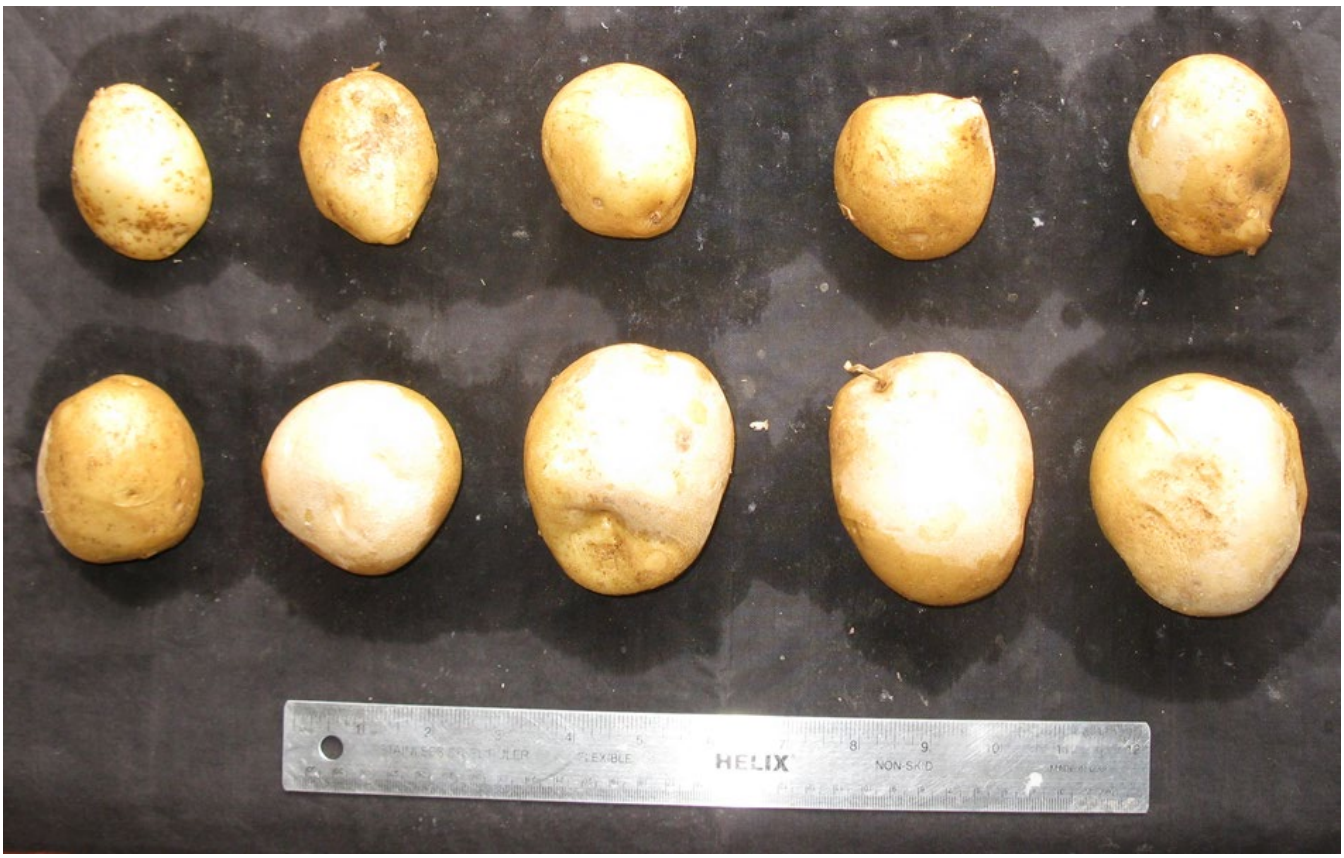

37 - AF 6562-1

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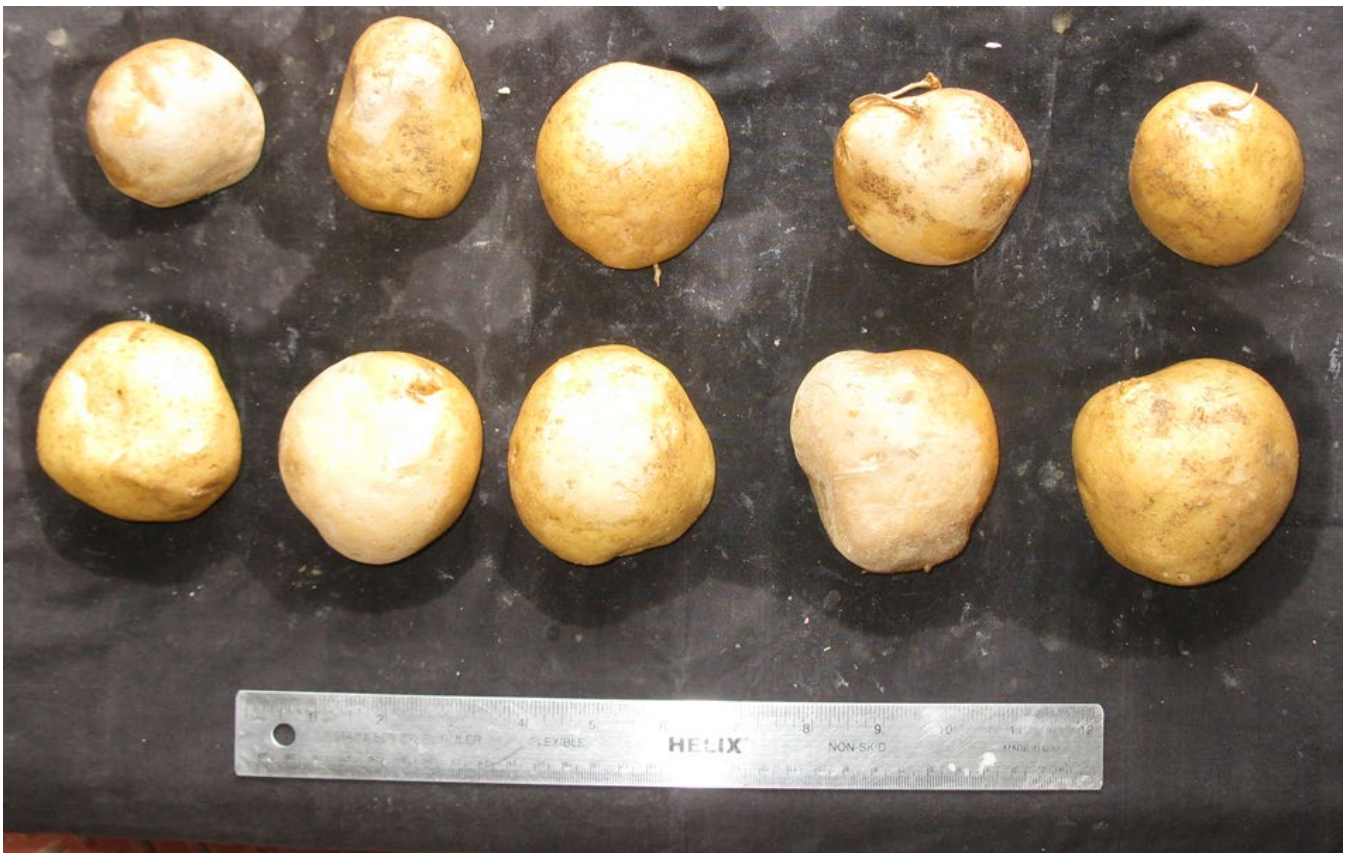

38 - AF 6566-1

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39 - AF 6572-3

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40 - AF 6579-3

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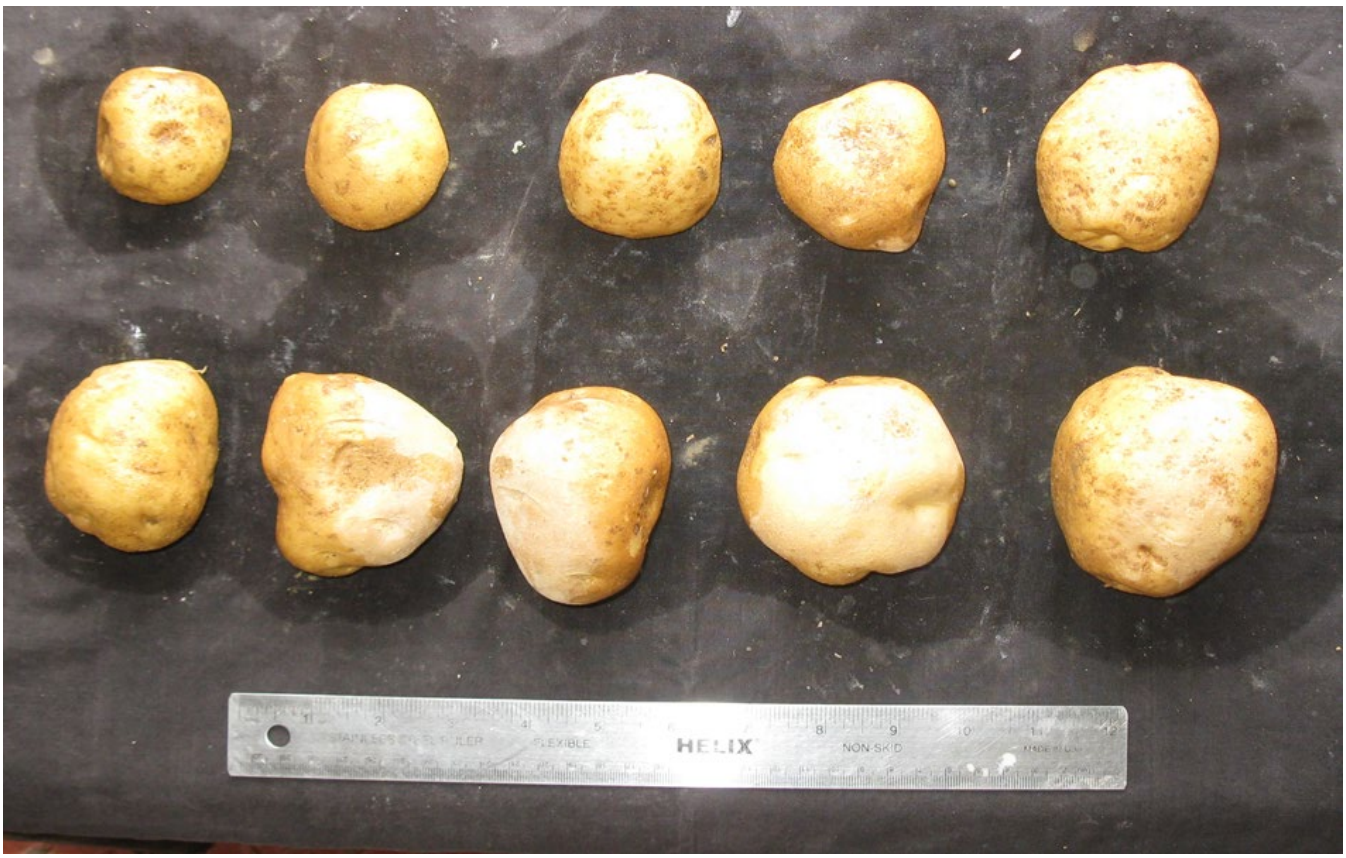

41 - AF 6585-1

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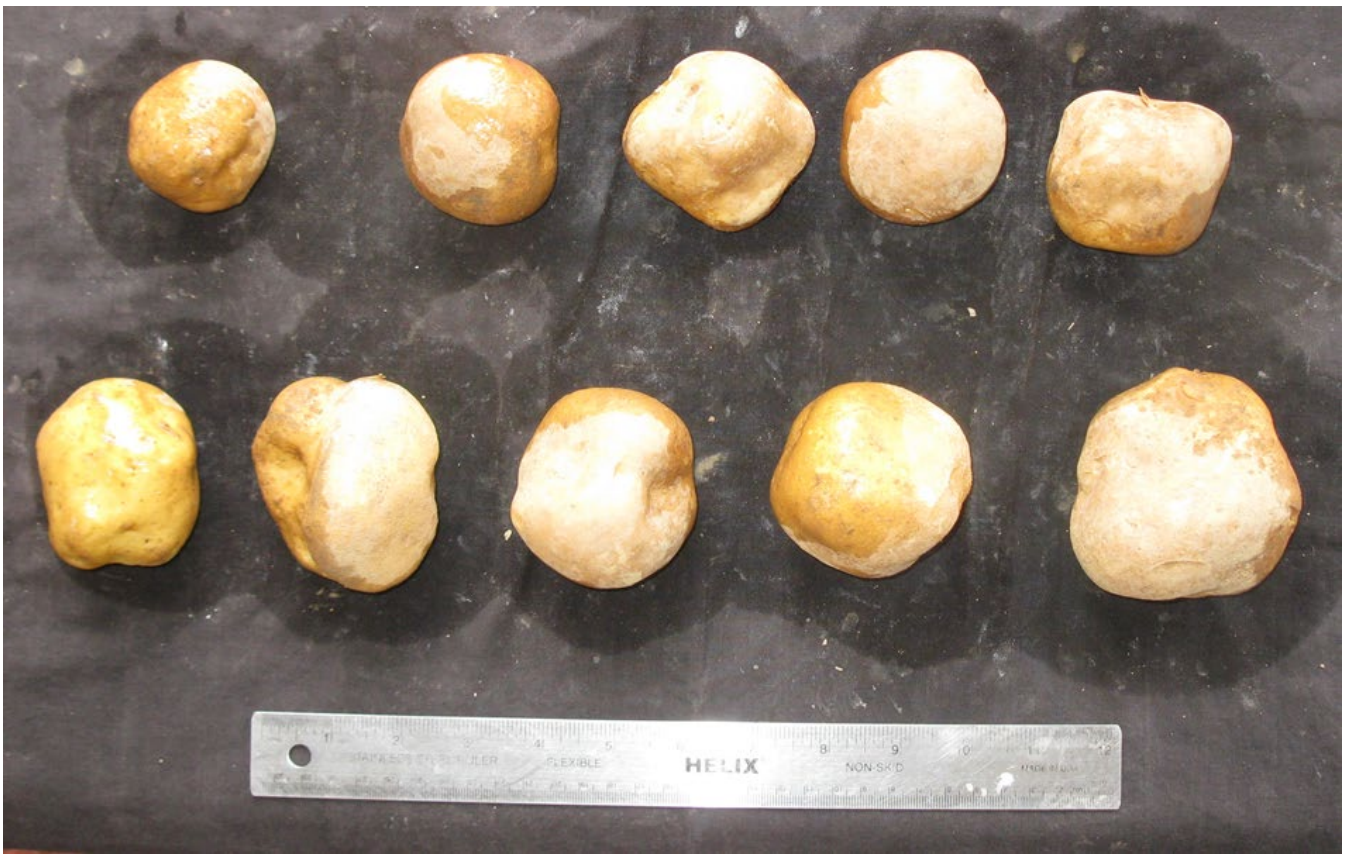

42 - AF 6594-4

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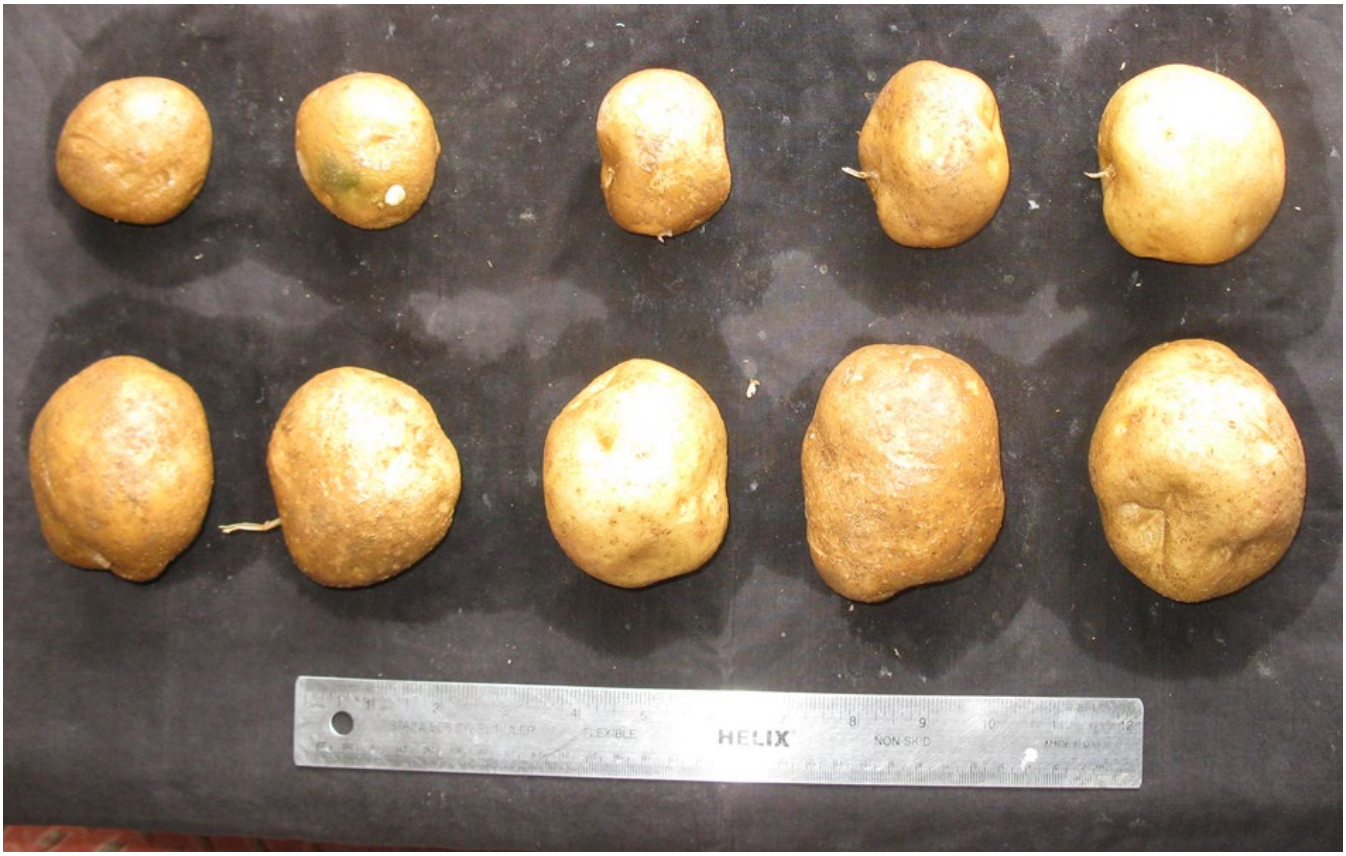

43 - AF 6601-2

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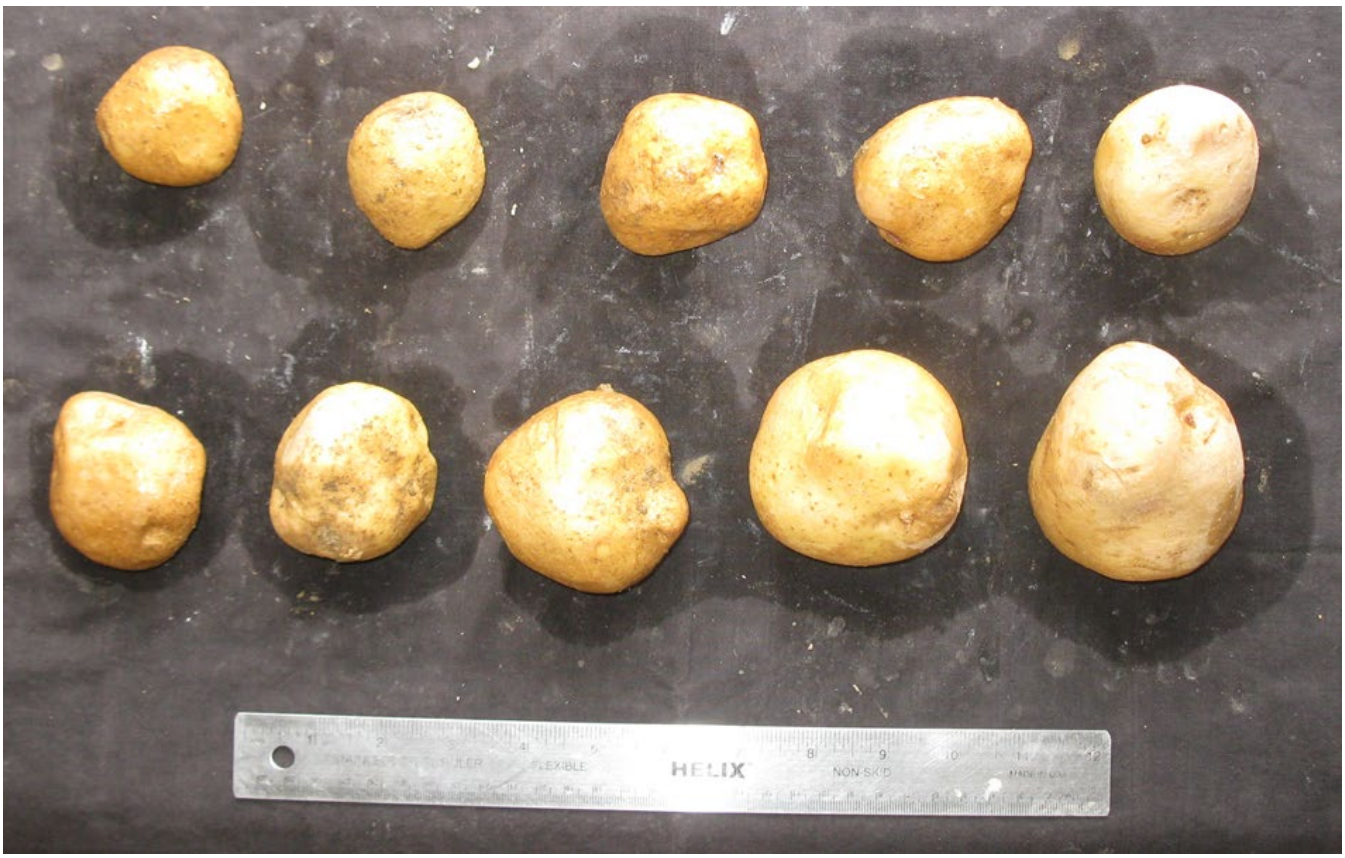
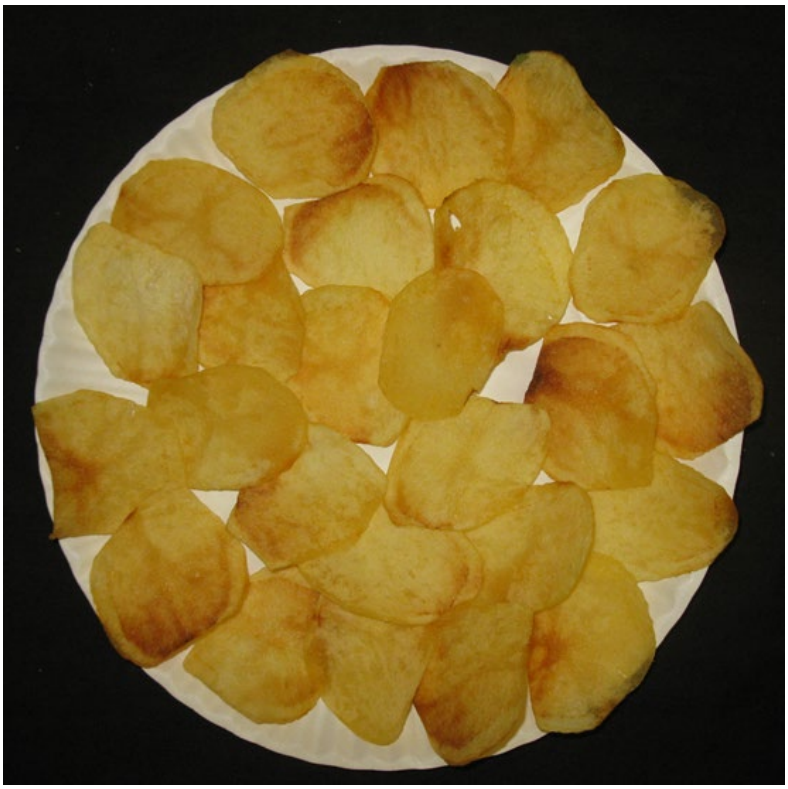


44 - AF 6602-10



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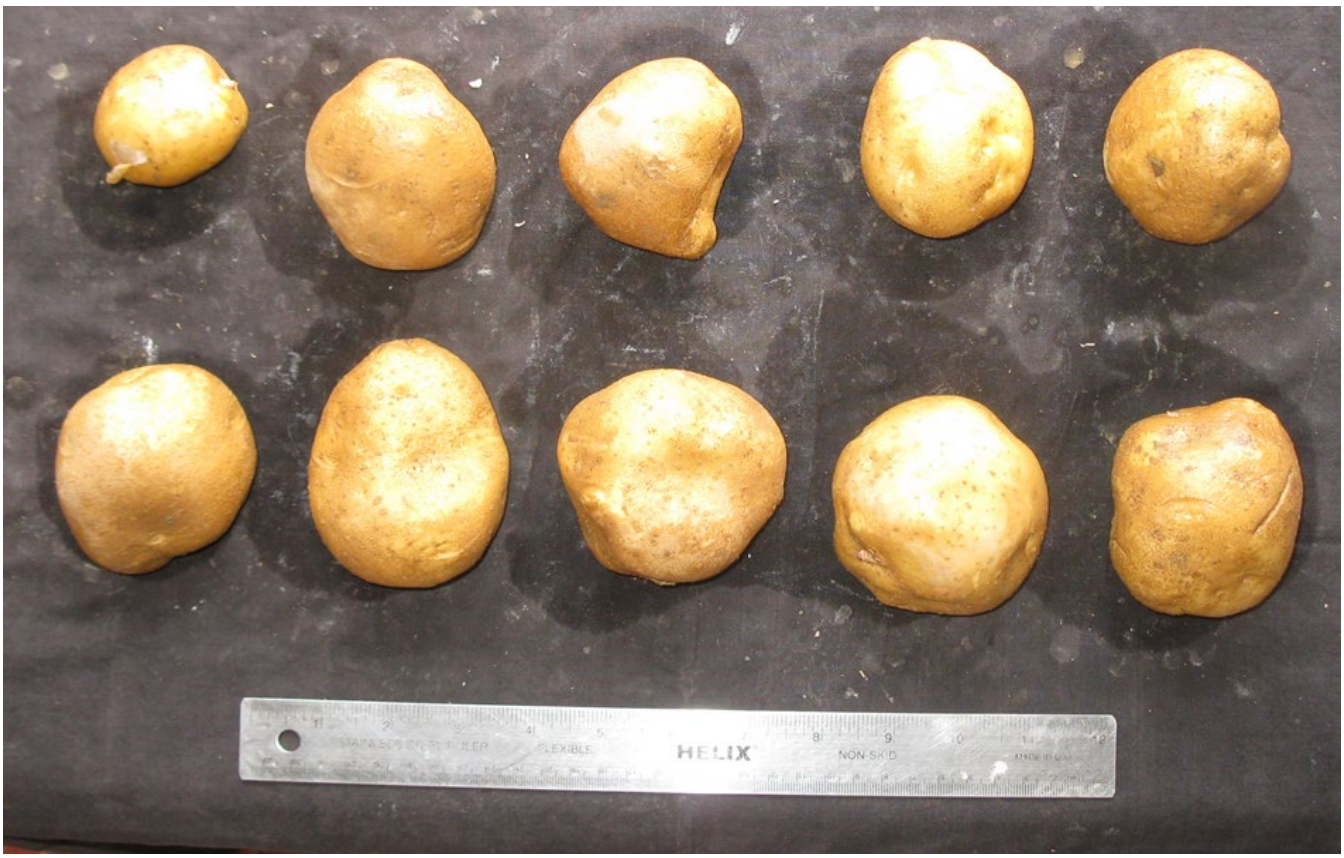

45 - AF 6606-2

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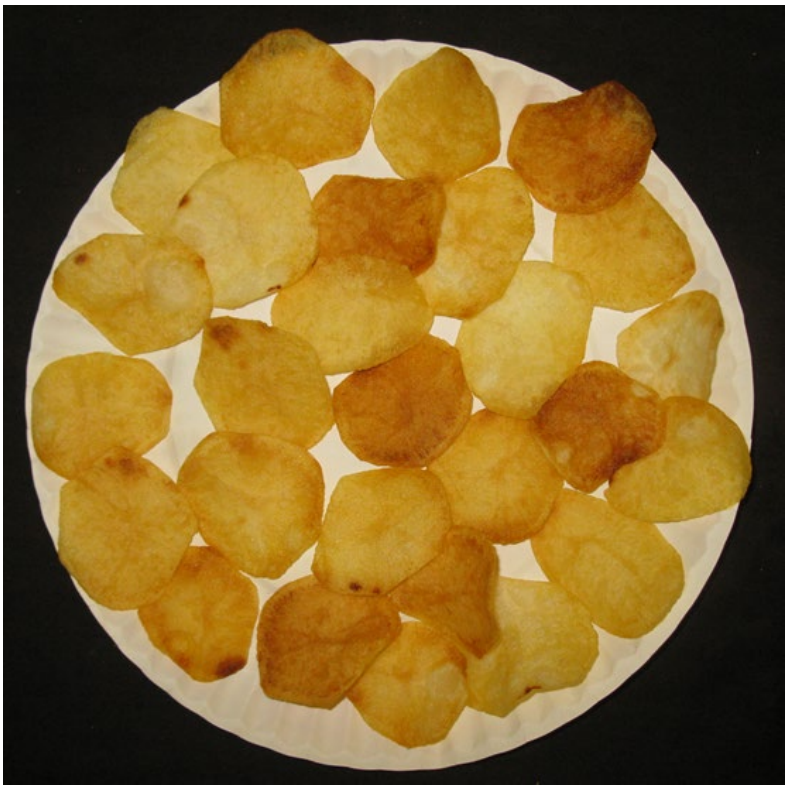
46 - NDAF 12143-1



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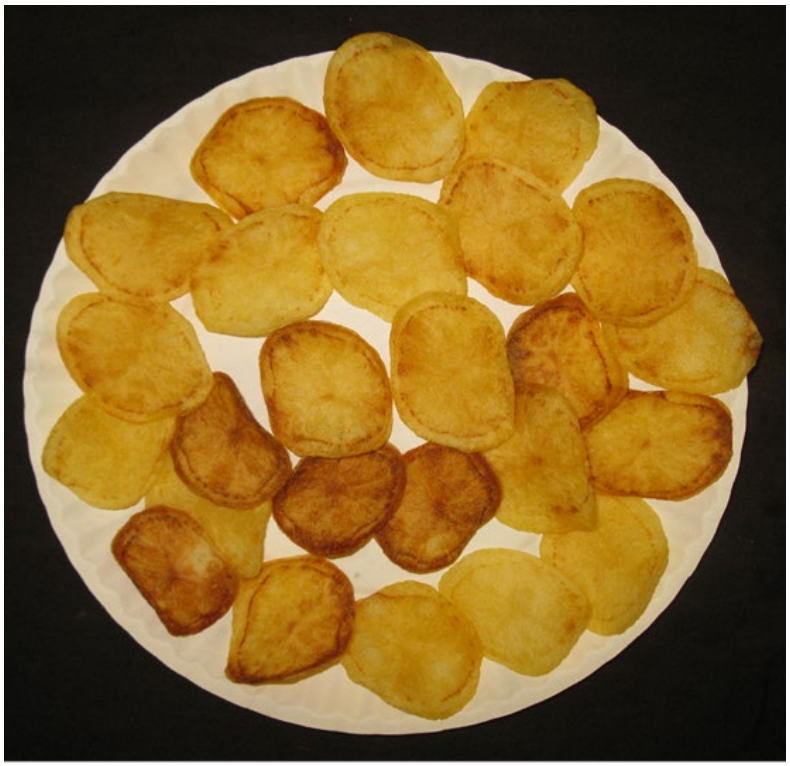
47 - NDAF 14114YCB-3



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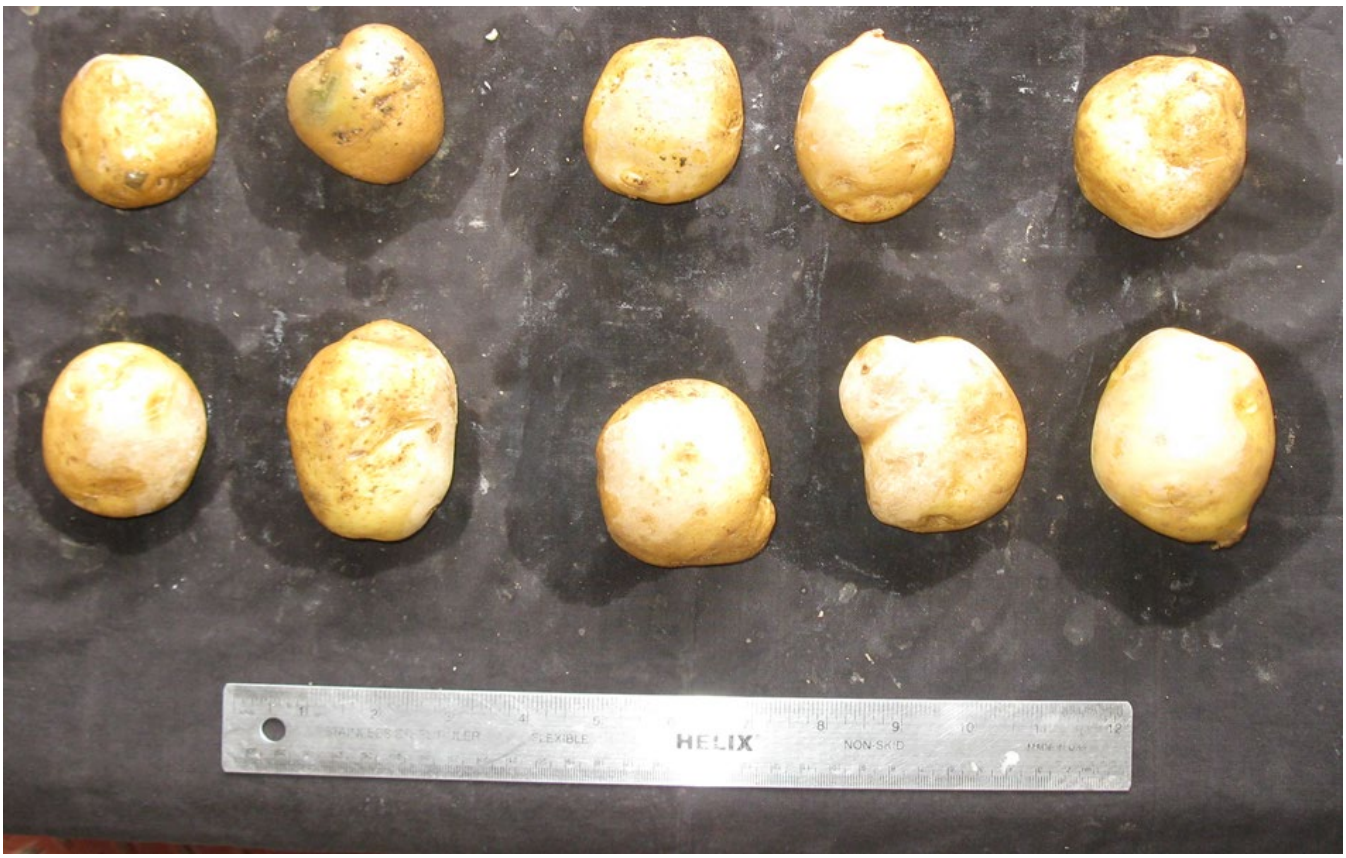
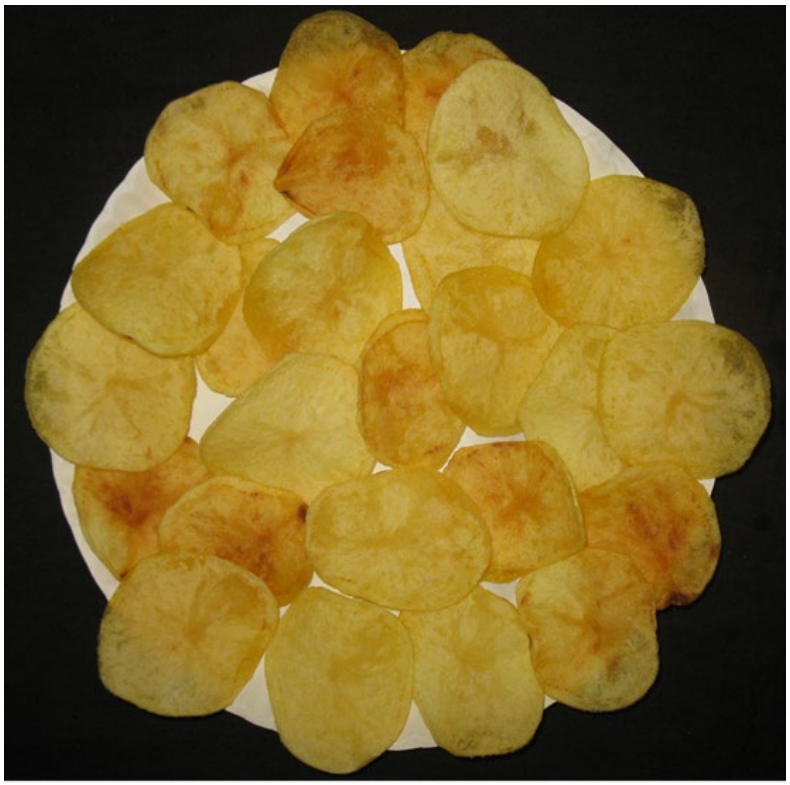


48 - NDAF 1488-3



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49 - NDAF 1489-4

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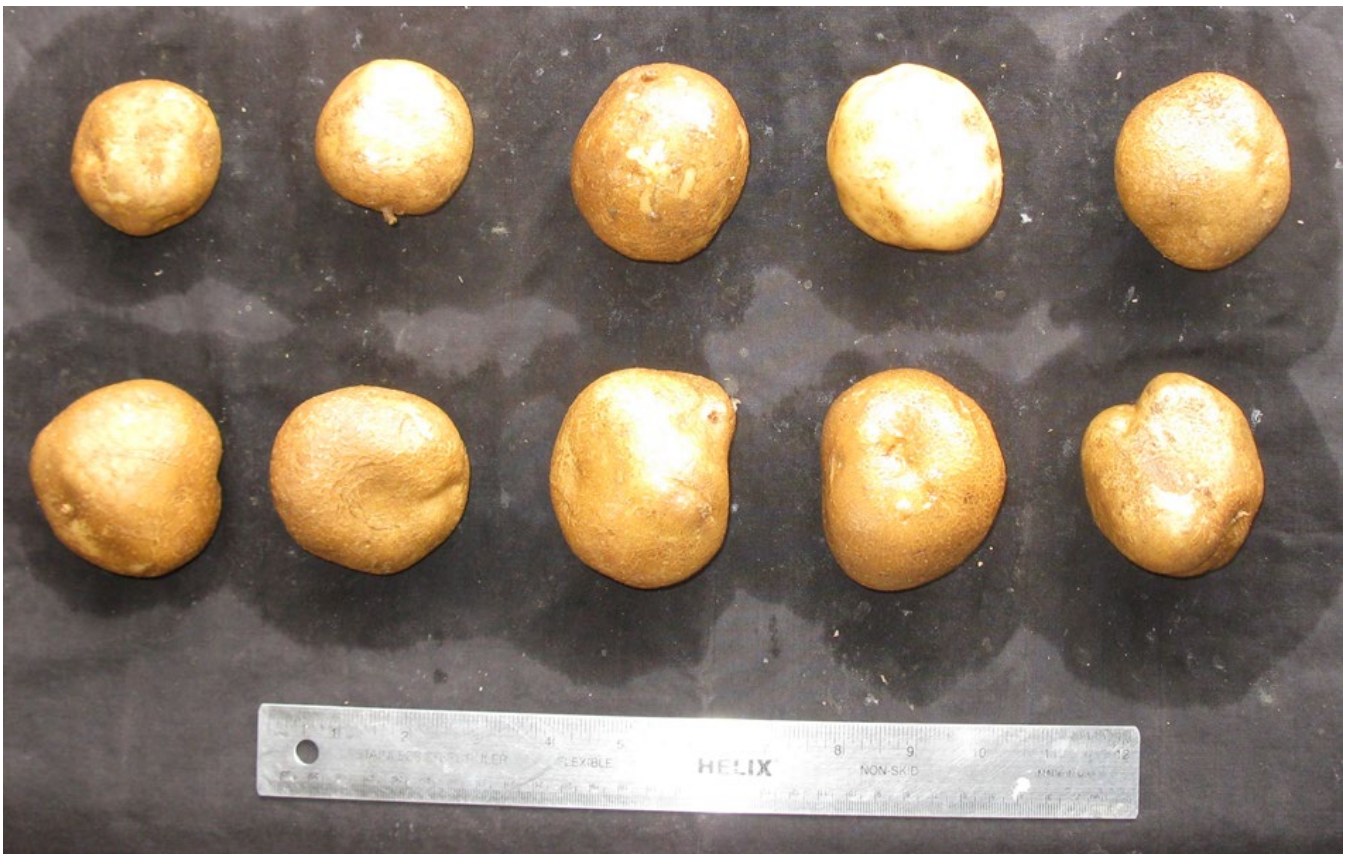

50 - WAF 16134-2

CFAES

51 - WAF 16220-2

CFAES

52 - WAF 16220-4

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