Colorado Potato Cultivar Management

Research Data Summary

2015



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-Comments Welcome-

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MISSION STATEMENT

The mission of the Colorado Potato Field Management and Physiology Program is to develop cultural management guidelines for the successful, sustainable and economic production of newly released and existing potato cultivars, as well as advanced potato selections that have the potential of being released, through field and laboratory research.

INTRODUCTION

Each potato cultivar has its own unique set of cultural management requirements for maximizing tuber yield of premium size and quality. Therefore, cultural management practices that maximize tuber production and quality of each potato cultivar must be developed. The best guidelines for nutrient management, irrigation management, plant population management, vine kill management, and other cultural management practices are obtained from field experiments conducted in replicated trials. New cultivars are much more successful when release is accompanied by cultivar specific management guidelines. Information reported in this book reveals management practices that are agronomically sound, economically advantageous, and environmentally responsible, while optimizing potato tuber yield and quality. When management guidelines are tailored for individual cultivars it leads to the successful, sustainable, and economic production of the cultivar, which results in the optimization of its genetic potential, while minimizing economic inputs and environmental degradation.

In 2015, potato cultivars were evaluated under Colorado production conditions for their response to nitrogen fertilizer application management, potassium fertilizer application management, plant population (in-row seed piece spacing) management and deficit irrigation management. Performance of several advanced potato selections under different grower management conditions are also reported.

MATERIALS AND METHODS

Nitrogen Management Study

The field study was laid out as randomized complete block design. Treatments included nitrogen application rates at 60, 120,180 and 240 lb. N/ac. A control treatment was included where no nitrogen fertilizer was applied. Each treatment was replicated four times.

Soil samples were taken from each experimental site in the spring of 2015. The soil samples were analyzed for residual soil nitrate nitrogen together with other soil nutrients. Water samples were taken from the irrigation well and analyzed for nitrate nitrogen concentration. The residual soil and irrigation water nitrate nitrogen concentration added up to 40lb N/ac. Knowledge of the residual soil and irrigation water nitrate nitrogen content is important to help estimate how much nitrogen fertilizer will be needed to apply to the potato crop for optimum tuber yield and quality. Residual soil N + irrigation water N + applied N fertilizer = available nitrogen (N) for the plant.

Sixty lb. N/ac was applied pre-plant to all plots except the control treatment. The remaining required N for each treatment was applied in-season in split applications. Urea ammonium nitrate (32-0-0) was used as source of N fertilizer application. In-season N application began after tuber formation. In-season N fertilizer applications were done by applying 5-10 lb. N/acre at every application time until all required N rate for a particular treatment was met.

Potato seed piece were cut and suberized for 7 days before planting. Fortress and Teton Russets were planted on May 13, 2015. Teton Russet was harvested on September 21, 2015. No vine kill was needed for Teton Russet since it senesced naturally. Fortress vines were killed on September 18, 2015 and harvested on September 23, 2015.

Nitrogen Application Timing Studies

Potato cultivars used in this field study were Fortress Russet (AC99375-1RU), and Teton Russet. The experimental design was randomized complete block with five treatments and four replications. The treatments included 1.Control (In-Season) No nitrogen was applied Pre-Plant, but all required N was applied during the growing season 2. Applying all required N at planting (All) 3. Applying 66% of the required N at planting and the rest applied during the potato growing season 4. Applying 50% of the required N at planting and the remainder applied during the growing season, and 5. Appling 33% of the required N at planting and the rest applied during the potato growing season. The total amount of N applied for each treatment was 140 lb. N/acre.

In-season N fertilizer applications were done by applying 5-10 lb. N/acre at every application time until the required N for each treatment was met.

Potato seed pieces were machine planted 12 inches within rows spacing on May 18, 2015. Fortress Russet was killed by mechanical flailing on September 18, 2015. No vine kill was needed for Teton Russet since it senesced naturally. Teton Russet was harvested on September 22. Fortress Russet was harvested on September 23, 2015.

Plant Population Management (In-Row Seed Spacing) Study

Fortress Russet (AC99375-1RU) and Teton Russet were used in the seed spacing study. The study was laid out in the field as randomized complete block design. In-row seed spacing treatments included planting seed at 10, 12, 14, and 16 inches spacing. Each treatment was replicated four times. Each plot consisted of three rows spaced 34 inches apart. All potato seed were planted by hand. Seed was cut and suberized for seven days before planting on May 21, 2015. Fortress Russet vines were killed by mechanical flailing on September 21, 2015, and potatoes were harvested on September 25, 2015.

Reduced Irrigation Water Use in Potato Production

The study was laid out as a factorial arrangement of treatments in a randomized complete block design. Treatments included three deficit irrigation scenarios, (1) application of irrigation water to provide 100% ET replacement for the crop growing season. (2) Providing 100% ET replacement until mid tuber bulking and then applying 90% ET replacement for the rest of the growing season. (3) Providing 100% ET replacement until mid tuber bulking and then applying 80% ET replacement for the rest of the growing season.

Mercury Russet, an early maturity cultivar and Rio Grande Russet, a medium maturity cultivar, were evaluated under the three irrigation scenarios. Each treatment was replicated four times. Each plot consisted of four rows spaced 34 inches apart. Potato seed pieces were machine planted 12 inches within rows on May 23, 2015. Vines of Rio Grande Russet were killed by mechanical flailing on September 18, 2015.

No vine kill was needed for Mercury Russet, since the vines senesced naturally. The deficit irrigation study was harvested on September 24, 2015.

Table 1. Effect of nitrogen application rate on yield and tuber size distribution of Fortress Russet (AC99375-1RU), 2015

Nitrogen rate (lb N/ac)	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/ac)									
0N(71)[1]	394	122	272(69)[2]	127(32)	269	253(64)	16	19	124	3
60N(100)	392	117	275(70)	145(37)	275	243(62)	32	32	145	0
120N(160)	404	102	302(75)	187(46)	302	253(63)	49	49	187	0
180N(220)	423	84	339(80)	229(54)	339	285(67)	54	54	229	0
240N(280)	421	80	341(81)	228(54)	327	291(69)	36	50	214	14

[1] Figures in brackets and beside N rate treatments indicate total available N (applied + soil + irrigation water N).
[2] Figures in brackets and beside yield data indicate % of total.

Table 2. Effect of nitrogen application rate on tuber quality of Fortress Russet (AC99375-1RU), 2015

Nitrogen rate (lb N/ac)	% Growth Cracks	% Knobs	% misshapes	% External[2] Defects	% Hollow Heart	% Brown Center	% Internal[3] Defects	Specific Gravity
0N(71)[1]	1.9	0	1.3	3.2	0.5	0	0.5	1.112
60N(105)	3.0	0	0.4	3.4	0.7	0	0.7	1.107
120N(160)	3.4	0	0	3.4	0.3	0	0.3	1.100
180N(220)	2.7	0	0	2.7	0	0	0	1.098
240N(280)	2.2	0.2	0.4	2.8	0	0	0	1.098

[1] Figures in brackets indicate total available N (applied + soil + irrigation water N).
[2] Includes growth cracks, knobs and misshapes.
[3] Includes hollow heart and brown center.

Table 3. Effect of nitrogen application timing on yield and tuber size distribution of Fortress Russet (AC99375-1RU), 2015

Pre – Plant N Rate (lb N/ac)	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/ac)									
In-Season[1]	486	95	391(81)[2]	269(55)	387	307(63)	80	84	265	4
All	427	98	329(77)	212(50)	317	253(59)	64	76	200	12
66%	443	125	318(72)	208(47)	304	246(56)	58	72	194	14
50%	452	101	351(78)	234(52)	341	291(64)	50	60	224	10
33%	507	103	404(80)	283(56)	391	299(59)	92	105	270	13

[1] Indicates % of required N rate applied pre – plant.
[2] Figures in brackets indicate % of total yield.
Note: Total fertilizer N applied for each treatment was 140lb N/Ac.

Table 4. Effect of nitrogen application timing on tuber quality of Fortress Russet (AC99375-1RU), 2015

Pre – Plant N Rate (lb N/ac)	% Growth Cracks	% Knobs	% misshapes	% External[2] Defects	% Hollow Heart	% Brown Center	% Internal[3] Defects	Specific Gravity
In-Season[1]	0.8	0	1.2	2.0	0	0	0	1.103
All	1.4	0	1.9	3.3	0	0	0	1.107
66%	0.8	0	1.3	2.1	0	0	0	1.102
50%	1.5	0.5	1.5	3.5	0	0	0	1.103
33%	1.4	0.2	1.8	3.4	0	0	0	1.105

[1] Indicates % of required N rate applied pre – plant.
[2] Includes growth cracks, knobs and misshapes.
[3] Includes hollow heart and brown center.
Note: Total fertilizer N applied for each treatment was 140lb N/Ac.

Table 5. Effect of in row seed spacing on yield and tuber size distribution of Fortress Russet (AC99375-1RU), 2015

Seed spacing (Inches)	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/ac)									
10	532	117	415(78)[1]	266(50)	406	351(66)	55	64	257	9
12	548	97	451(82)	292(54)	443	373(68)	70	78	284	8
14	535	100	435(81)	283(53)	426	361(68)	65	74	274	9
16	500	76	424(85)	317(63)	409	307(61)	102	117	302	15

[1] Figures in brackets indicate % of total yield.

Table 6. Effect of in row seed spacing on tuber quality of Fortress Russet (AC99375-1RU), 2015

Seed spacing (inches)	% Growth Cracks	% Knobs	% Misshapes	% External[1] Defects	% Hollow Heart	% Brown Center	% Internal[2] Defects	Specific Gravity
10	0.5	0	0.3	0.8	0	0	0	1.109
12	2.1	0	0.1	2.2	0	0	0	1.110
14	1.9	0.5	0.6	3.0	0	0	0	1.112
16	2.3	0.4	0.7	3.4	0	0	0	1.110

[1] Includes growth cracks, knobs and misshapes.
[2] Includes hollow heart and brown center.

Table 7. Effect of nitrogen application rate on yield and tuber size distribution of Teton Russet, 2015

Nitrogen rate (lb N/ac)	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/ac)									
0N(71)[1]	392	120	272(69)[2]	140(36)	272	240(61)	32	32	140	0
60N(100)	425	114	311(73)	160(38)	311	278(65)	33	33	160	0
120N(160)	464	115	349(75)	209(45)	345	299(64)	46	50	205	4
180N(220)	459	96	363(79)	224(49)	359	323(70)	36	40	220	4
240N(280)	442	99	343(78)	212(48)	343	304(69)	39	39	212	0

[1] Figures in brackets and beside N rate treatments indicate total available N (applied + soil + irrigation water N).
[2] Figures in brackets and beside yield data indicate % of total.

Table 8. Effect of nitrogen application rate on tuber quality of Teton Russet, 2015

Nitrogen rate (lb N/ac)	% Growth Cracks	% Knobs	% misshapes	% External[2] Defects	% Hollow Heart	% Brown Center	% Internal[3] Defects	Specific Gravity
0N(71)[1]	7.8	0	1.2	9.0	0	0	0	1.089
60N(100)	6.6	0	2.3	8.9	0.9	0	0.9	1.088
120N(160)	5.3	0	1.7	7.0	0.8	0	0.8	1.087
180N(220)	3.1	0	1.8	4.9	0	0	0	1.084
240N(280)	3.6	0	2.2	5.8	0	0.4	0.4	1.083

[1] Figures in brackets indicate total available N (applied + soil + irrigation water N).
[2] Includes growth cracks, knobs and misshapes.
[3] Includes hollow heart and brown center.

Table 9. Effect of nitrogen application timing on yield and tuber size distribution of Teton Russet, 2015

Pre – Plant N Rate (lb N/ac)	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/ac)									
In-Season[1]	465	128	337(73)[2]	208(45)	332	302(65)	30	35	203	5
ALL	464	120	344(74)	216(47)	344	299(64)	45	45	216	0
66%	466	143	323(69)	169(36)	323	296(64)	27	27	169	0
50%	497	152	345(69)	206(42)	342	303(61)	39	42	203	3
33%	482	119	363(75)	221(46)	357	315(65)	42	48	215	6

[1] Indicates % of required N rate applied pre – plant.
[2] Figures in brackets indicate % of total yield.
Note: Total fertilizer N applied for each treatment was 140lb N/Ac.

Table 10. Effect of nitrogen application timing on tuber quality of Teton Russet, 2015

Pre – Plant N Rate (lb N/ac)	% Growth Cracks	% Knobs	% misshapes	% External[2] Defects	% Hollow Heart	% Brown Center	% Internal[3] Defects	Specific Gravity
In-Season[1]	2.7	0	2.1	4.8	0	0	0	1.085
All	2.8	0	1.3	4.1	0	0	0	1.088
66%	6.5	0	1.3	7.8	0	0	0	1.085
50%	4.3	0	1.5	5.8	0	0	0	1.085
33%	2.6	0.5	2.8	5.9	0	0	0	1.087

[1] Indicates % of required N rate applied pre – plant.
[2] Includes growth cracks, knobs and misshapes.
[3] Includes hollow heart and brown center.
Note: Total fertilizer N applied for each treatment was 140lb N/Ac.

Table 11. Effect of in row seed spacing on yield and tuber size distribution of Teton Russet, 2015

Seed spacing (Inches)	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/ac)									
10	499	124	375(75)[1]	213(43)	368	335(67)	33	40	206	7
12	456	111	345(76)	212(47)	345	310(68)	35	35	212	0
14	488	92	396(81)	253(52)	393	344(71)	49	52	250	3
16	465	73	392(84)	277(60)	381	339(73)	42	53	266	11

[1] Figures in brackets indicate % of total yield.

Table 12. Effect of in row seed spacing on tuber quality of Teton Russet, 2015

Seed spacing (inches)	% Growth Cracks	% Knobs	% Misshapes	% External[1] Defects	% Hollow Heart	% Brown Center	% Internal[2] Defects	Specific Gravity
10	6.4	0	0.9	7.3	0	0	0	1.095
12	5.8	0	1.1	6.9	0	0	0	1.097
14	6.1	0	0.8	6.9	0	0	0	1.095
16	5.2	0	2.5	7.7	0	0	0	1.096

[1] Includes growth cracks, knobs and misshapes.
[2] Includes hollow heart and brown center.

Table 13. Effect of deficit irrigation on yield and tuber size distribution of Mercury Russet (CO99100-1RU), 2015

Irrigation % of ET	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/ac)									
80	285	76	209(73)[1]	136(48)	205	161(57)	44	48	132	4
90	318	87	231(73)	168(53)	225	172(54)	53	59	162	6
100	326	101	225(69)	136(42)	218	193(59)	25	32	129	7

[1] Figures in brackets indicate % of total yield.

Table 14. Effect of deficit irrigation on tuber quality of Mercury Russet (CO99100-1RU), 2015

Irrigation % of ET	% Growth Cracks	% Knobs	% misshapes	% External[1] Defects	% Hollow Heart	% Brown Center	% Internal[2] Defects	Specific Gravity
80	3.5	2.2	2.4	8.1	0	0	0	1.084
90	9.9	0	1.6	11.5	0	0	0	1.079
100	7.2	0	2.3	9.5	0	0	0	1.080

[1] Includes growth cracks, knobs and misshapes.
[2] Includes hollow heart and brown center.

Table 15. Effect of deficit irrigation on yield and tuber size distribution of Rio Grande Russet, 2015

Irrigation % of ET	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/ac)									
80	423	114	309(73)[1]	170(40)	309	266(63)	43	43	170	0
90	478	119	359(75)	227(48)	346	293(61)	53	66	214	13
100	463	105	358(77)	213(46)	358	302(65)	56	56	213	0

[1] Figures in brackets indicate % of total yield.

Table 16. Effect of deficit irrigation on tuber quality of Rio Grande Russet, 2015

Irrigation % of ET	% Growth Cracks	% Knobs	% misshapes	% External[1] Defects	% Hollow Heart	% Brown Center	% Internal[2] Defects	Specific Gravity
80	2.4	1.6	3.6	7.6	0	0	0	1.087
90	1.7	0	0.8	2.5	0.7	0	0.7	1.088
100	1.4	0	1.0	2.4	0	0	0	1.089

[1] Includes growth cracks, knobs and misshapes.
[2] Includes hollow heart and brown center.

Table 17. Yield and tuber size distribution of Russet Norkotah (sel.8) grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	375	76	299	254	299	160	139	139	254	0
2	599	125	474	408	330	152	178	322	264	144
3	509	64	445	349	422	301	121	144	326	23
4	734	107	627	441	615	504	111	123	429	12
5	648	94	554	406	544	343	201	211	396	10
Mean	573	93	480	371	442	292	150	188	334	38

Table 18. Tuber quality of Russet Norkotah (sel.8) grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	10.4	0	1.075
2	3.1	0	1.074
3	1.6	0	1.082
4	1.4	0	1.078
5	0	0	1.077
Mean	3.3	0	1.077

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 19. Yield and tuber size distribution of CO07049-1RU grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	408	103	305	226	305	252	53	53	226	0
2	568	105	463	293	463	420	43	43	293	0
3	426	88	338	156	338	324	14	14	156	0
4	461	104	357	213	357	304	53	53	213	0
5	449	78	371	258	316	230	86	141	203	55
Mean	463	96	367	229	356	306	50	61	218	11

Table 20. Tuber quality of CO07049-1RU grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	4.5	0	1.077
2	0	0	1.079
3	0	0	1.084
4	0	0	1.081
5	0	0	1.083
Mean	0.9	0	1.081

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 21. Yield and tuber size distribution of CO07015-4RU grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	316	82	234	193	224	170	54	64	183	10
2	515	113	402	312	388	271	117	131	298	14
3	314	113	201	94	201	187	14	14	94	0
4	431	115	316	125	316	316	0	0	125	0
5	436	137	299	170	299	244	55	55	170	0
Mean	402	112	290	179	285	237	48	53	174	5

Table 22. Tuber quality of CO07015-4RU grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	2.6	0	1.072
2	2.0	0	1.076
3	1.3	0	1.080
4	0	0	1.078
5	0	0	1.081
Mean	1.2	0	1.077

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 23. Yield and tuber size distribution of AC05039-2RU grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	257	62	195	139	195	160	35	35	139	0
2	521	80	441	363	431	273	158	168	353	10
3	341	68	273	180	273	228	45	45	180	0
4	414	43	371	291	371	305	66	66	291	0
5	363	90	273	152	273	203	70	70	152	0
Mean	379	69	311	225	309	234	75	77	223	2

Table 24. Tuber quality of AC05039-2RU grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	3.2	0	1.079
2	0	0	1.085
3	0	0	1.090
4	0	0	1.087
5	0	0	1.083
Mean	0.6	0	1.085

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 25. Yield and tuber size distribution of CO07070-10W grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	144	74	70	31	70	70	0	0	31	0
2	611	111	500	334	486	424	62	76	320	14
3	361	109	252	103	252	238	14	14	103	0
4	566	181	385	164	385	371	14	14	164	0
5	568	137	431	264	431	341	90	90	264	0
Mean	450	122	328	179	325	289	36	39	176	3

Table 26. Tuber quality of CO07070-10W grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	0	0	1.099
2	0	0	1.109
3	0	0	1.116
4	0	0	1.116
5	0	1.8	1.115
Mean	0	0.4	1.111

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 27. Yield and tuber size distribution of CO07070-13W grown under different management practices, 2015.

Field number	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	318	64	254	216	229	172	57	82	191	25
2	656	100	556	439	546	396	150	160	429	10
3	410	131	279	131	279	256	23	23	131	0
4	517	162	355	166	355	320	35	35	166	0
5	416	193	223	111	223	223	0	0	111	0
Mean	463	130	333	213	326	273	53	60	206	7

Table 28. Tuber quality of CO07070-13W grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	1.3	0	1.088
2	0	0	1.089
3	0.5	0	1.094
4	2.0	0	1.091
5	0	0	1.090
Mean	0.8	0	1.090

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 29. Yield and tuber size distribution of Yukon Gold grown under different management practices, 2015.

Field number	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	519	31	488	423	377	234	143	254	312	111
2	715	43	672	627	564	213	351	459	519	108
3	465	49	416	312	416	314	102	102	312	0
4	613	43	570	490	490	344	146	226	410	80
5	556	37	519	449	412	248	164	271	342	107
Mean	574	41	533	460	452	271	181	262	379	81

Table 30. Tuber quality of Yukon Gold grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	0	0	1.083
2	8.0	3.4	1.080
3	3.5	0	1.093
4	0	0	1.085
5	3.0	0	1.080
Mean	3.0	0.7	1.084

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 31. Yield and tuber size distribution of CO07370-1W/Y grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	418	139	279	189	279	236	43	43	189	0
2	591	107	484	363	484	406	78	78	363	0
3	402	109	293	178	293	262	31	31	178	0
4	482	160	322	152	322	314	8	8	152	0
5	574	137	437	285	437	377	60	60	285	0
Mean	493	130	363	233	363	319	44	44	233	0

Table 32. Tuber quality of CO07370-1W/Y grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	0	0	1.095
2	1.7	0	1.099
3	0	0	1.085
4	0	0	1.091
5	3.2	0	1.094
Mean	1.0	0	1.093

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 33. Yield and tuber size distribution of CO07131-1W/Y grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	109	109	0	0	0	0	0	0	0	0
2	144	144	0	0	0	0	0	0	0	0
3	27	27	0	0	0	0	0	0	0	0
4	168	168	0	0	0	0	0	0	0	0
5	139	133	6	0	6	6	0	0	0	0
Mean	117	116	1	0	1	1	0	0	0	0

Table 34. Tuber quality of CO07131-1W/Y grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	0	0	1.068
2	0	0	1.081
3	0	0	1.078
4	0	0	1.075
5	0	0	1.081
Mean	0	0	1.077

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 35. Yield and tuber size distribution of Purple Majesty grown under different management practices, 2015.

Field number	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	258	186	72	25	72	72	0	0	25	0
2	416	291	125	39	125	109	16	16	39	0
3	416	242	174	51	174	166	8	8	51	0
4	433	250	182	49	182	182	0	0	49	0
5	347	207	140	84	140	113	27	27	84	0
Mean	374	235	139	50	139	128	10	10	50	0

Table 36. Tuber quality of Purple Majesty grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	0	0	1.071
2	0	0	1.079
3	0	0	1.083
4	0	1.4	1.083
5	0	0	1.074
Mean	0	0.3	1.078

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 37. Yield and tuber size distribution of CO05028-4P/PY grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	619	82	537	412	537	439	98	98	412	0
2	730	109	621	476	621	549	72	72	476	0
3	560	39	521	396	521	293	228	228	396	0
4	677	121	556	392	556	457	99	99	392	0
5	773	86	687	560	664	465	199	222	537	23
Mean	672	87	584	447	580	441	139	144	442	4

Table 38. Tuber quality of CO05028-4P/PY grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	1.0	0	1.082
2	0	0	1.083
3	1.1	0	1.089
4	0	0	1.090
5	0	0	1.094
Mean	0.4	0	1.088

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 39. Yield and tuber size distribution of CO07329-1P/Y grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	547	160	387	250	387	334	53	53	250	0
2	763	172	591	338	591	515	76	76	338	0
3	554	117	437	340	424	289	135	148	328	13
4	665	146	519	379	519	416	103	103	379	0
5	555	135	420	301	420	303	117	117	301	0
Mean	617	146	471	322	468	371	97	99	319	3

Table 40. Tuber quality of CO07329-1P/Y grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	0	0	1.086
2	2.4	0	1.089
3	0.4	0	1.094
4	4.6	0	1.083
5	1.5	0	1.093
Mean	1.8	0	1.089

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 41. Yield and tuber size distribution of CO05035-1PW/Y grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	566	49	517	461	482	263	219	254	426	35
2	736	78	658	574	566	334	232	324	482	92
3	550	33	517	474	482	240	242	277	439	35
4	671	51	620	466	595	480	115	140	441	25
5	626	78	548	443	509	318	191	230	404	39
Mean	630	58	572	483	526	327	200	245	438	45

Table 42. Tuber quality of CO05035-1PW/Y grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	2.2	0	1.084
2	0.8	0	1.087
3	0	0	1.089
4	0	0	1.089
5	0	0	1.082
Mean	0.6	0	1.086

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 43. Yield and tuber size distribution of CO05028-11P/RWP grown under different management practices, 2015.

Field number	Total	< 4oz	> 40z	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	398	117	281	135	281	256	25	25	135	0
2	478	162	316	135	316	281	35	35	135	0
3	478	164	314	164	314	293	21	21	164	0
4	545	84	461	271	461	424	37	37	271	0
5	539	131	408	203	408	369	39	39	203	0
Mean	488	132	356	182	356	325	31	31	182	0

Table 44. Tuber quality of CO05028-11P/RWP grown under different management practices, 2015.

Field Number	% External Defects	% Internal Defects	Specific Gravity
1	3.6	0	1.078
2	3.9	0	1.078
3	3.0	0	1.087
4	0.8	0	1.082
5	0	0	1.086
Mean	2.3	0	1.082

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 45. Yield and tuber size distribution of Sangre grown under different management practices, 2015.

Field number	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	523	76	447	359	408	258	150	189	320	39
2	652	98	554	441	529	345	184	209	416	25
3	627	53	574	469	494	307	187	267	390	80
4	644	80	564	431	552	310	242	254	419	12
5	668	88	580	463	580	404	176	176	463	0
Mean	623	79	544	433	513	325	188	219	402	31

Table 46. Tuber quality of Sangre grown under different management practices, 2015.

Field Number	% External[1] Defects	% Internal[2] Defects	Specific Gravity
1	5.5	0	1.082
2	14.2	0	1.078
3	0	0	1.083
4	2.2	0	1.077
5	0	0	1.080
Mean	4.4	0	1.080

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 47. Tuber diameter of Sangre grown under different management practices, 2015

Field number	< 2in dia[1].	2 – 4in dia.	> 4in dia.	> 2in dia. < 10oz	> 2in dia. > 10oz	> 2in dia.
	Yield (cwt/ac)					
1	35	488	0	299	189	488
2	23	629	0	420	209	629
3	32	595	0	328	267	595
4	29	615	0	361	254	615
5	27	641	0	465	176	641
Mean	29	594	0	375	219	594

[1]Dia = diameter.

Table 48. Yield and tuber size distribution of CO07102-1R grown under different management practices, 2015.

Field number	Total	< 4oz	> 4oz	> 6oz	4 – 16oz	4 – 10oz	10 – 16oz	> 10oz	6 – 16oz	> 16oz
	Yield (cwt/at)									
1	375	156	219	107	219	209	10	10	107	0
2	436	223	213	88	213	213	0	0	88	0
3	318	158	160	41	160	160	0	0	41	0
4	484	140	344	191	344	301	43	43	191	0
5	422	162	260	119	260	244	16	16	119	0
Mean	407	168	239	109	240	226	14	14	109	0

Table 49. Tuber quality of CO07102-1R grown under different management practices, 2015.

Field Number	% External Defects [1]	% Internal Defects[2]	Specific Gravity
1	0	0	1.080
2	2.4	0	1.085
3	3.2	0	1.091
4	1.7	0	1.086
5	0	0	1.091
Mean	1.5	0	1.087

[1]It includes growth cracks, knobs, and misshapes
[2]It includes hollow heart and brown center

Table 50. Tuber diameter of CO07102-1R grown under different management practices, 2015

Field number	< 2in dia[1].	2 – 4in dia.	> 4in dia.	> 2in dia. < 10oz	> 2in dia. > 10oz	> 2in dia.
	Yield (cwt/ac)					
1	78	297	0	287	10	297
2	105	331	0	331	0	331
3	57	261	0	261	0	261
4	53	431	0	388	43	431
5	64	358	0	342	16	358
Mean	71	336	0	322	14	336

[1]Dia = diameter.