Colorado Potato Cultivar Management

Data Summary 2007



Samuel Y.C. Essah, Research Scientist

Colorado State University
Department of Horticulture & Landscape Architecture
San Luis Valley Research Center
Center, Colorado

-Comments Welcome-

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MISSION STATEMENT

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

Each potato cultivar or advance selection has its own unique set of cultural management requirements to maximize tuber yield of premium size and grade tubers. Therefore, cultural management practices that maximize the production and quality of individual potato cultivars must be developed.

The best guidelines for fertility practices, irrigation management, plant population management, vine kill management, and other 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. This information relates growth habit and other plant characteristics to nutrient and other management strategies for yield and quality goals, which are agronomically sound, economically advantageous, and environmentally responsible.

When management guidelines are tailored for individual cultivars it leads to the successful, sustainable, and economic production of those cultivars, which results in the optimization of their genetic potential, while minimizing economic inputs and environmental impact.

Table 1. Effect of total nitrogen rate on yield and tuber size distribution of Rio Grande Russet, 2007

Nitrogen Rate (lb N/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-16oz	4-12oz	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)					
0 (28)[1]	310	185	125	125	125	0	125	37	0	0
60 (88)	399	220	179	179	172	7	179	70	0	0
120 (148)	410	197	213	208	199	9	208	101	0	5
180 (208)	434	217	217	217	214	3	217	75	0	0
240 (268)	393	177	216	216	197	19	216	118	0	0

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 2. Effect of total nitrogen rate on tuber quality of Rio Grande Russet, 2007

Nitrogen Rate (lb N/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
0 (28)[1]	0	0	1.089
60 (88)	0	0	1.088
120 (148)	0	0	1.086
180 (208)	0	0	1.083
240 (268)	0	0	1.082

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

Table 3. Effect of total nitrogen rate on yield and tuber size distribution of Rio Grande Russet, (two year average) 2006 and 2007

Nitrogen Rate (lb N/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)				
0 (77)[1]	385	144	241	236	214	22	124	5	5
60 (137)	469	158	311	305	252	53	158	30	6
120 (197)	426	138	288	283	242	41	164	14	5
180 (257)	471	166	305	305	273	32	138	17	0
240 (317)	452	132	320	320	286	34	187	11	0

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 4. Effect of total nitrogen rate on tuber quality of Rio Grande Russet, (two year average) 2006 and 2007

Nitrogen Rate (lb N/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
0 (77)[1]	1.4	0	1.088
60 (137)	0.5	0	1.085
120 (197)	1.5	0	1.084
180 (257)	1	0	1.081
240 (317)	1.8	0	1.081

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

Table 5. Effect of Pre-Plant nitrogen application rate on yield and tuber size distribution of Rio Grande Russet, 2007

Pre-plant N Rate (lbN/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)					
31(61)[1]	446	191	255	255	249	6	255	86	0	0
60 (90)	401	207	194	194	190	4	194	83	0	0
80 (110)	462	235	227	227	219	8	227	105	0	0
100 (130)	393	174	219	219	204	15	210	98	9	0

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 6. Effect of Pre-plant nitrogen application rate on tuber quality of Rio Grande Russet, 2007

Pre-plant nitrogen rate (lbN/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
31 (61)[1]	3.5	0.4	1.089
60 (90)	1.3	0.6	1.090
80 (110)	5.3	1.3	1.093
100 (130)	5.3	4.1	1.090

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

Table 7. Effect of Pre-Plant nitrogen application rate on yield and tuber size distribution of Rio Grande Russet, (two year average) 2006 and 2007

Pre-plant N Rate (lbN/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)				
31 (81)[1]	422	144	278	278	258	20	123	8	0
60 (110)	452	166	286	286	262	24	139	8	0
80 (130)	440	170	270	262	242	20	139	4	8
100 (150)	408	146	262	262	228	34	128	18	0

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 8. Effect of Pre-plant nitrogen application rate on tuber quality of Rio Grande Russet, (two year average) 2006 and 2007

Pre-plant nitrogen rate (lbN/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
31 (81)[1]	2.1	0.2	1.085
60 (110)	1.3	0.3	1.086
80 (130)	4.6	0.7	1.087
100 (150)	3.7	2.9	1.086

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

Table 9. Effect of irrigation and seed piece spacing on yield and tuber size distribution of Rio Grande Russet, 2007

Irrigation and seed spacing treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-16oz	4-12oz	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)					
100%/10in[1]	442	199	243	239	219	20	230	95	9	4
100%/12 in	456	178	278	278	264	14	274	103	4	0
100%/14 in	422	181	241	241	238	3	241	113	0	0
71%/10 in	367	135	232	228	217	11	225	100	3	4
71%/12 in	378	127	251	251	244	7	251	140	0	0
71%/14 in	405	112	293	293	257	36	280	138	13	0

[1]100% = Full ET plus rain water (18 inches), 71% = 71% of full ET plus rain water (12.7 inches)

Table 10. Effect of irrigation and seed piece spacing on tuber quality of Rio Grande Russet, 2007

Irrigation and seed spacing treatment	% External Defects[2]	% Internal Defects[3]	Specific Gravity
100%/10 in[1]	2.3	4.8	1.090
100%/12 in	4.4	2.1	1.089
100%/14 in	4.9	2.6	1.089
71%/10 in	1.6	1.0	1.089
71%/12 in	0.3	0	1.089
71%/14 in	0.3	2.1	1.087

[1]100% = Full ET plus rain water (18 inches), 71% = 71% of full ET plus rain water (12.7 inches)
[2]Includes growth cracks, knobs and misshapes
[3]Includes hollow heart and brown center

Table 11. Effect of irrigation and seed piece spacing on yield and tuber size distribution of Rio Grande Russet, (two year average) 2006 and 2007

Irrigation and seed spacing treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)				
100%/10 in[1]	467	175	292	285	258	27	131	11	7
100%/12 in	481	160	321	315	274	41	154	17	6
100%/14 in	480	155	325	321	284	37	177	12	4
74%/10 in	412	135	277	275	246	29	141	7	2
74%/12 in	430	137	293	291	253	38	158	13	2
74%/14 in	415	119	296	296	251	45	159	16	0

[1]100% = Full ET plus rain water (19 inches), 74% = 74% of full ET plus rain water (14 inches)

Table 12. Effect of total irrigation rate and seed piece spacing on tuber quality of Rio Grande Russet, (two year average) 2006 and 2007

Irrigation and seed spacing treatment	% External Defects[2]	% Internal Defects[3]	Specific Gravity
100%/10 in[1]	1.4	2.4	1.087
100%/12 in	5.5	1.6	1.086
100%/14 in	3.9	2.4	1.086
74%/10 in	1.7	0.5	1.089
74%/12 in	1.5	0.9	1.088
74%/14 in	2.4	2.0	1.087

[1]100% = Full ET plus rain water (19 inches), 77% = 77% of full ET plus rain water (14 inches)
[2]Includes growth cracks, knobs and misshapes
[3]Includes hollow heart and brown center

Table 13. Effect of single drop and cut seed on yield and tuber size distribution of Rio Grande Russet, 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
Single drop	440	174	266	266	255	11	258	112	8	0
Cut seed	443	195	248	248	240	8	248	110	0	0

Table 14. Effect of single drop and cut seed on tuber quality of Rio Grande Russet, 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	1.2	0	1.086
Cut seed	3.9	0	1.084

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

Table 15. Effect of single drop and cut seed on yield and tuber size distribution of Rio Grande Russet, (two year average) 2006 and 2007

treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)								
Single drop	448	165	283	283	259	24	134	9	0
Cut seed	454	161	293	291	262	29	149	9	2

Table 16. Effect of single drop and cut seed on tuber quality of Rio Grande Russet, (two year average) 2006 and 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	0.9	0	1.084
Cut seed	2.8	0	1.082

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

Table 17. Effect of different cover crops on subsequent potato yield and tuber size distribution of Rio Grande Russet, 2007

Cover Crop	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
Fallow	434	122	312	312	257	55	287	171	25	0
Sorghum Sudan	447	101	346	346	301	45	334	188	12	0
Mustard	398	92	306	306	271	35	289	166	17	0
Sordan 79	423	109	314	311	277	34	300	172	11	3
Sordan Hay Removed	429	105	324	321	272	49	310	194	11	3
Canola	436	115	321	321	287	34	309	181	12	0

Table 18. Effect of different cover crops on subsequent tuber quality of Rio Grande Russet, 2007

Cover Crop	% External Defects	% Internal Defects
Fallow	0	0
Sorghum Sudan	0.3	0
Mustard	0	0
Sordan 79	0.4	0
Sordan Hay Removed	0	0
Canola	0	1.0

Table 19. Effect of different cover crops on subsequent potato yield and tuber size distribution of Rio Grande Russet, (two year average) 2006 and 2007

Cover Crop	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)				
Fallow	427	102	325	323	267	56	187	22	2
Sorghum Sudan	453	88	365	360	274	86	193	40	5
Mustard	401	90	311	305	258	47	182	16	6
Sordan 79	436	97	339	336	272	64	192	30	3
Sordan Hay Removed	445	87	358	351	277	74	219	23	7
Canola	415	94	321	320	255	65	182	29	1

Table 20. Effect of different cover crops on subsequent potato tuber quality of Rio Grande Russet, (two year average) 2006 and 2007

Cover Crop	% External Defects	% Internal Defects
Fallow	1.6	0
Sorghum Sudan	1.3	0
Mustard	0.2	0
Sordan 79	0.9	0
Sordan Hay Removed	0.9	0
Canola	0.6	0.5

Table 21. Effect of total nitrogen rate on yield and tuber size distribution of Canela Russet, 2007

Nitrogen Rate (lb N/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
0 (28)[1]	226	71	155	155	152	3	155	68	0	0
60 (88)	346	66	280	270	238	32	266	178	4	10
120 (148)	427	71	356	351	296	55	327	205	24	5
180 (208)	365	76	289	283	222	61	250	167	33	6
240 (268)	370	69	301	301	247	54	275	175	26	0

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 22. Effect of total nitrogen rate on tuber quality of Canela Russet, 2007

Nitrogen Rate (lb N/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
0 (28)[1]	0	0	1.105
60 (88)	0.3	0	1.103
120 (148)	0	0	1.094
180 (208)	1.7	0	1.089
240 (268)	0	0	1.086

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

Table 23. Effect of total nitrogen rate on yield and tuber size distribution of Canela Russet, (two year average) 2006 and 2007

Nitrogen Rate (lb N/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)								
0 (77)[1]	293	63	230	230	213	17	137	9	0
60 (137)	415	52	363	349	281	68	252	19	14
120 (197)	423	58	365	357	272	85	213	48	8
180 (257)	392	57	335	328	243	85	208	42	7
240 (317)	384	60	324	324	256	68	199	31	0

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 24. Effect of total nitrogen rate on tuber quality of Canela Russet, (two year average) 2006 and 2007

Nitrogen Rate (lb N/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
0 (77)[1]	0	0	1.101
60 (137)	0.2	0	1.100
120 (197)	0	0	1.095
180 (257)	1.4	0	1.090
240 (317)	0	0	1.089

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

Table 25. Effect of Pre-Plant nitrogen application rate on yield and tuber size distribution of Canela Russet, 2007

Pre-plant N Rate (lbN/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
31(61)[1]	392	71	321	316	274	42	301	187	15	5
60 (90)	379	81	298	288	258	30	275	158	13	10
80 (110)	399	91	308	303	258	45	279	168	24	5
100 (130)	354	68	286	271	178	93	218	121	53	15

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 26. Effect of Pre-plant nitrogen application rate on tuber quality of Canela Russet, 2007

Pre-plant nitrogen rate (lbN/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
31(61)[1]	0	0	1.096
60 (90)	0	0	1.097
80 (110)	0	0	1.093
100 (130)	0	1.7	1.091

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

Table 27. Effect of Pre-Plant nitrogen application rate on yield and tuber size distribution of Canela Russet, (two year average) 2006 and 2007

Pre-plant N Rate (lbN/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-16oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)								
31(81)[1]	331	61	270	267	230	37	149	10	3
60 (110)	364	60	304	293	248	45	183	17	11
80 (130)	406	65	341	332	264	68	214	28	9
100 (150)	371	59	312	301	223	78	174	34	11

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 28. Effect of Pre-plant nitrogen application rate on tuber quality of Canela Russet, (two year average) 2006 and 2007

Pre-plant nitrogen rate (lbN/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
31(81)[1]	0	0	1.094
60 (110)	0	0	1.094
80 (130)	0.3	0	1.093
100 (150)	0	1.6	1.093

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

Table 29. Effect of single drop and cut seed on yield and tuber size distribution of Canela Russet, 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
Single drop	362	58	304	299	222	77	273	186	26	5
Cut seed	381	57	324	319	203	116	279	205	40	5

Table 30. Effect of single drop and cut seed on tuber quality of Canela Russet, 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	1.1	0	1.092
Cut seed	0.7	0	1.092

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

Table 31. Effect of single drop and cut seed on yield and tuber size distribution of Canela Russet, (two year average) 2006 and 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-16oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)								
Single drop	363	60	303	301	235	66	183	31	2
Cut seed	376	54	322	320	237	83	205	33	2

Table 32. Effect of single drop and cut seed on tuber quality of Canela Russet, (two year average) 2006 and 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	0.6	0	1.092
Cut seed	0.4	0	1.093

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

Table 33. Effect of seed size and reconditioned seed on stem number, tuber number and mean tuber weight of Canela Russet, 2007

Treatment (seed size and age)	Stems/Plant	Tubers/Plant	Mean tuber wt (g)
2-2.5oz Cold[1]	2	5	198
2-2.5oz Warm[2]	2	5	172
3-3.5oz Cold	3	5	195
3-3.5oz Warm	3	6	207

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting

Table 34. Effect of seed size averaged over reconditioned seed on stem number, tuber number and mean tuber weight of Canela Russet, 2007

Treatment (seed size)	Stems/Plant	Tubers/Plant	Mean tuber wt (g)
2-2.5oz	2	5	185
3-3.5oz	3	6	201

Table 35. Effect of reconditioned seed averaged over seed size on stem number, tuber number and mean tuber weight of Canela Russet, 2007

Treatment (seed age)	Stems/Plant	Tubers/Plant	Mean tuber wt (g)
Cold[1]	2	5	197
Warm[2]	3	6	190

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting

Table 36. Effect of seed size and reconditioned seed on yield and tuber size distribution of Canela Russet, 2007

Treatment (seed size/age)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)					
2-2.5oz Cold[1]	376	24	352	347	237	110	292	235	55	5
2-2.5oz Warm[2]	389	46	343	329	235	94	294	218	35	14
3-3.5oz Cold	426	42	384	376	301	75	344	230	32	8
3-3.5oz Warm	369	40	329	305	228	77	278	216	27	24

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting

Table 37. Effect of seed size and reconditioned seed on tuber quality of Canela Russet, 2007

Treatment (seed size/age)	% External Defects[3]	% Internal Defects[4]	Specific Gravity
2-2.5oz Cold[1]	0	0	1.097
2-2.5oz Warm[2]	0	0.9	1.094
3-3.5oz Cold	2.6	1.0	1.093
3-3.5oz Warm	0	0.9	1.097

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting
[3]Includes growth cracks, knobs and misshapes
[4]Includes hollow heart and brown center

Table 38. Effect of seed size averaged over reconditioned seed on yield and tuber size distribution of Canela Russet, 2007

Treatment (seed size)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)					
2-2.5oz	383	35	348	338	236	102	293	227	45	10
3-3.5oz	398	41	357	341	265	76	311	223	30	16

Table 39. Effect of seed size averaged over reconditioned seed on tuber quality of Canela Russet, 2007

Treatment (seed size)	% External Defects[1]	% Internal Defects[2]	Specific Gravity
2-2.5oz	0	0.5	1.096
3-3.5oz	1.3	1.0	1.095

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

Table 40. Effect of reconditioned seed averaged over seed size on yield and tuber size distribution of Canela Russet, 2007

Treatment (seed age)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)					
Cold[1]	401	33	368	362	269	93	318	232	44	6
Warm[2]	379	43	336	317	232	85	286	217	31	19

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting

Table 41. Effect of reconditioned seed averaged over seed size on tuber quality of Canela Russet, 2007

Treatment (reconditioned seed)	% External Defects[3]	% Internal Defects[4]	Specific Gravity
Cold[1]	1.3	0.5	1.095
Warm[2]	0	0.9	1.096

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting
[3]Includes growth cracks, knobs and misshapes
[4]Includes hollow heart and brown center

Table 42. Effect of seed size and reconditioned seed on stem number, tuber number and mean tuber weight of Canela Russet, (two year average) 2005 and 2007

Treatment (seed size and age)	Stems/Plant	Tubers/Plant	Mean tuber wt.(g)
2-2.5oz Cold[1]	2	6	201
2-2.5oz Warm[2]	2	6	197
3-3.5oz Cold	2	7	195
3-3.5oz Warm	3	8	196

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting

Table 43. Effect of seed size averaged over reconditioned seed on stem number, tuber number and mean tuber weight of Canela Russet, (two year average), 2005 and 2007

Treatment (seed size)	Stems/Plant	Tubers/Plant	Mean tuber wt (g)
2-2.5oz	2	6	199
3-3.5oz	3	8	196

Table 44. Effect of reconditioned seed averaged over seed size on stem number, tuber number and mean tuber weight of Canela Russet, (two year average) 2005 and 2007

Treatment (seed age)	Stems/Plant	Tubers/Plant	Mean tuber wt (g)
Cold[1]	2	7	198
Warm[2]	3	7	197

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting

Table 45. Effect of seed size and reconditioned seed on yield and tuber size distribution of Canela Russet, (two year average) 2005 and 2007

Treatment (seed size/age)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-16oz	12-16oz	>16oz
				Yield (cwt/ac)				
2-2.5oz Cold[1]	479	41	438	423	278	145	76	15
2-2.5oz Warm[2]	465	43	422	391	241	150	76	31
3-3.5oz Cold	512	49	463	448	321	127	57	15
3-3.5oz Warm	444	43	401	376	277	99	49	25

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting

Table 46. Effect of seed size and reconditioned seed on tuber quality of Canela Russet, (two year average) 2005 and 2007

Treatment (seed size/age)	% External Defects[3]	% Internal Defects[4]	Specific Gravity
2-2.5oz Cold[1]	0	0.6	1.099
2-2.5oz Warm[2]	0.5	0.5	1.096
3-3.5oz Cold	1.3	0.5	1.096
3-3.5oz Warm	0.5	0.5	1.098

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting
[3]Includes growth cracks, knobs and misshapes
[4]Includes hollow heart and brown center

Table 47. Effect of seed size averaged over reconditioned seed on yield and tuber size distribution of Canela Russet, (two year average) 2005 and 2007

Treatment (seed size)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	12-16oz	>16oz
				Yield (cwt/ac)				
2-2.5oz	472	42	430	407	259	148	76	23
3-3.5oz	478	46	432	412	299	113	53	20

Table 48. Effect of seed size averaged over reconditioned seed on tuber quality of Canela Russet, (two year average) 2005 and 2007

Treatment (seed size)	% External Defects[1]	% Internal Defects[2]	Specific Gravity
2-2.5oz	0.3	0.6	1.098
3-3.5oz	0.9	0.5	1.097

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

Table 49. Effect of reconditioned seed averaged over seed size on yield and tuber size distribution of Canela Russet, (two year average) 2005 and 2007

Treatment (seed age)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	12-16oz	>16oz
				Yield (cwt/ac)				
Cold[1]	496	45	451	436	300	136	67	15
Warm[2]	455	43	412	384	259	125	63	28

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 21 days before planting

Table 50.. Effect of reconditioned seed averaged over seed size on tuber quality of Canela Russet, (two year average) 2005 and 2007

Treatment (seed age)	% External Defects[3]	% Internal Defects[4]	Specific Gravity
Cold[1]	0.7	0.6	1.098
Warm[2]	0.5	0.5	1.097

[1]Cold = Seed planted directly from cold storage
[2]Warm = Seed reconditioned at 70 ^{0}F for 14 days before planting
[3]Includes growth cracks, knobs and misshapes
[4]Includes hollow heart and brown center

Table 51. Effect of Pre-Plant nitrogen application rate on yield and tuber size distribution of Russet Norkotah (sel.8), 2007

Pre-plant N Rate (lbN/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
31(61)[1]	552	70	482	443	358	85	408	289	35	39
60 (90)	489	93	396	396	313	83	361	240	35	0
80 (110)	503	107	396	371	289	82	319	182	52	25
100 (130)	489	94	395	360	238	122	318	219	42	35

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 52. Effect of Pre-plant nitrogen application rate on tuber quality of Russet Norkotah (sel.8), 2007

Pre-plant nitrogen rate (lbN/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
31(61)[1]	1.8	2.5	1.078
60 (90)	1.9	2.6	1.078
80 (110)	1.7	1.1	1.078
100 (130)	2.3	1.8	1.079

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

Table 53. Effect of Pre-Plant nitrogen application rate on yield and tuber size distribution of Russet Norkotah (sel. 8), (two year average) 2006 and 2007

Pre-plant N Rate (lbN/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-16oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)								
31(81)[1]	456	74	382	363	307	56	233	24	19
60 (110)	467	88	379	368	299	69	207	34	11
80 (130)	471	82	389	372	278	94	218	44	17
100 (150)	469	89	380	349	243	106	219	37	31

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 54. Effect of Pre-plant nitrogen application rate on tuber quality of Russet Norkotah (sel.8), (two year average) 2006 and 2007

Pre-plant nitrogen rate (lbN/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
31(81)[1]	1.2	1.3	1.079
60 (110)	2.3	1.3	1.076
80 (130)	0.9	1.7	1.076
100 (150)	1.9	0.9	1.078

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

Table 55. Effect of compost tea, fungicide application, and nitrogen application rate on yield and tuber size distribution of Russet Norkotah (sel.8), 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
80N[1]	338	62	276	272	196	76	234	161	38	4
120N	323	44	279	261	184	77	226	166	35	18
80N-CT	332	53	279	273	210	63	242	166	31	6
120N-CT	318	36	282	278	206	72	244	176	34	4
80N-F	324	45	279	268	188	80	230	177	38	11
120N-F	381	48	333	307	209	98	249	183	58	26

[1]N = Nitrogen rate (lb N/ac)
CT = Compost Tea Applied
F = Fungicide Applied

Table 56. Effect of compost tea, fungicide application, and nitrogen application rate on tuber quality of Russet Norkotah (sel.8), 2007

Treatment	% External Defects[2]	% Internal Defects[3]	Specific Gravity
80N[1]	2.4	0	1.080
120N	1.2	1.9	1.080
80N-CT	2.7	2.8	1.083
120N-CT	1.9	0	1.080
80N-F	1.8	0.6	1.085
120N-F	2.5	1.8	1.083

[1]N = Nitrogen rate (lb N/ac)
CT = Compost Tea Applied
F = Fungicide Applied
[2]Includes growth cracks, knobs and misshapes
[3]Includes hollow heart and brown center

Table 57. Effect of compost tea, fungicide application, and N application rate on yield and tuber size distribution of Russet Nugget, 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
80N[1]	286	154	132	132	123	9	128	49	4	0
120N	278	148	130	128	118	10	124	45	4	2
80N-CT	291	137	154	154	151	3	154	54	0	0
120N-CT	269	129	140	140	134	6	138	61	2	0
80N-F	302	145	157	157	149	8	152	47	5	0
120N-F	324	146	178	178	157	21	174	81	4	0

[1]N = Nitrogen rate (lb N/ac)
CT = Compost Tea Applied
F = Fungicide Applied

Table 58. Effect of compost tea, fungicide application, and nitrogen application rate on tuber quality of Russet Nugget, 2007

Treatment	% External Defects[2]	% Internal Defects[3]	Specific Gravity
80N[1]	2.4	0	1.089
120N	0.6	0	1.089
80N-CT	0.3	0	1.089
120N-CT	2.7	0	1.087
80N-F	1.2	0	1.092
120N-F	0.8	0	1.090

[1]N = Nitrogen rate (lb N/ac)
CT = Compost Tea Applied
F = Fungicide Applied
[2]Includes growth cracks, knobs and misshapes
[3]Includes hollow heart and brown center

Table 59. Effect of total nitrogen rate on yield and tuber size distribution of Russet Norkotah (sel.112), 2007

Nitrogen Rate (lb N/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
60 (88)[1]	359	122	237	237	210	27	218	107	19	0
120 (148)	405	121	284	276	229	47	266	171	10	8
180 (208)	477	88	389	351	270	81	303	206	48	38

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 60. Effect of total nitrogen rate on tuber quality of Russet Norkotah (sel.112), 2007

Nitrogen Rate (lb N/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
60 (88)[1]	2.7	0	1.082
120 (148)	7.6	0	1.077
180 (208)	6.1	0.9	1.074

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

Table 61. Effect of total nitrogen rate on yield and tuber size distribution of Blazer Russet, 2007

Nitrogen Rate (lb N/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
0 (32)[1]	340	61	279	273	242	31	268	171	5	6
60 (92)	362	80	282	276	255	21	276	151	0	6
120 (152)	413	63	350	344	287	57	328	188	16	6
180 (212)	404	95	309	309	257	52	293	200	16	0

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 62. Effect of total nitrogen rate on tuber quality of Blazer Russet, 2007

Nitrogen Rate (lb N/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
0 (32)[1]	2.4	2.2	1.090
60 (92)	2.3	0	1.085
120 (152)	7.0	3.1	1.083
180 (212)	2.2	0	1.082

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

Table 63. Effect of single drop and cut seed on yield and tuber size distribution of Colorado Rose, 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
Single drop	493	153	340	335	303	32	327	157	8	5
Cut seed	489	135	354	348	308	40	340	198	8	6

Table 64. Effect of single drop and cut seed on tuber quality of Colorado Rose, 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	0.8	0	1.078
Cut seed	2.5	1.2	1.081

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

Table 65. Effect of single drop and cut seed on tuber diameter of Colorado Rose, 2007

Treatment	< 2 in	2 – 4 in	> 4 in	> 2 in < 10oz	> 2 in > 10oz
Single drop	77	418	0	380	38
Cut seed	78	408	6	372	42

Table 66. Effect of single drop and cut seed on yield and tuber size distribution of Colorado Rose, (two year average) 2006 and 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)								
Single drop	489	160	329	327	308	19	161	4	2
Cut seed	492	120	372	361	316	45	221	15	11

Table 67. Effect of single drop and cut seed on tuber quality of Colorado Rose, (two year average) 2006 and 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	1.3	0	1.077
Cut seed	1.6	0.6	1.079

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

Table 68. Effect of single drop and cut seed on tuber diameter of Colorado Rose, (two year average) 2006 and 2007

Treatment	< 2 in	2 – 4 in	> 4 in	> 2 in < 10oz	> 2 in > 10oz
Single drop	85	403	0	381	22
Cut seed	69	409	7	366	50

Table 69. Effect of single drop and cut seed on yield and tuber size distribution of Rio Colorado, 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-16oz	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
Single drop	497	326	171	171	171	0	171	20	0	0
Cut seed	500	302	198	198	198	0	198	20	0	0

Table 70. Effect of single drop and cut seed on tuber quality of Rio Colorado, 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	0.4	0	1.083
Cut seed	0	0	1.084

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

Table 71. Effect of single drop and cut seed on tuber diameter of Rio Colorado, 2007

Treatment	< 2 in	2 – 4 in	> 4 in	> 2 in < 10oz	> 2 in > 10oz
Single drop	134	365	0	365	0
Cut seed	118	383	0	383	0

Table 72. Effect of single drop and cut seed on yield and tuber size distribution of Rio Colorado, (two year average) 2006 and 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)								
Single drop	468	281	187	187	187	0	31	0	0
Cut seed	435	243	192	192	189	3	38	0	0

Table 73. Effect of single drop and cut seed on tuber quality of Rio Colorado, (two year average) 2006 and 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	0.5	0	1.080
Cut seed	0.4	0.4	1.081

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

Table 74. Effect of single drop and cut seed on tuber diameter of Rio Colorado, (two year average) 2006 and 2007

Treatment	< 2 in	2 – 4 in	> 4 in	> 2 in < 10oz	> 2 in > 10oz
Single drop	142	325	0	325	0
Cut seed	116	317	0	315	2

Table 75. Effect of single drop and cut seed on yield and tuber size distribution of Mountain Rose , 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
Single drop	464	223	241	241	237	4	241	66	0	0
Cut seed	410	225	185	185	185	0	185	51	0	0

Table 76. Effect of single drop and cut seed on tuber quality of Mountain Rose, 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	0	0	1.082
Cut seed	1.7	0	1.082

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

Table 77. Effect of single drop and cut seed on yield and tuber size distribution of Mountain Rose, (two year average) 2006 and 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)								
Single drop	423	195	228	228	226	2	78	0	0
Cut seed	351	178	173	173	173	0	57	0	0

Table 78. Effect of single drop and cut seed on tuber quality of Mountain Rose, (two year average) 2006 and 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	1.6	0	1.079
Cut seed	7.0	0	1.079

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

Table 79. Effect of single drop and cut seed on yield and tuber size distribution of Purple Majesty, 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)									
Single drop	474	351	123	123	123	0	123	33	0	0
Cut seed	451	301	150	150	142	8	150	48	0	0

Table 80. Effect of single drop and cut seed on tuber quality of Purple Majesty, 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	0	0	1.078
Cut seed	0	2.0	1.080

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

Table 81. Effect of single drop and cut seed on yield and tuber size distribution of Purple Majesty, (two year average) 2006 and 2007

Treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
	Yield (cwt/ac)								
Single drop	424	293	131	131	128	3	37	0	0
Cut seed	402	272	130	130	126	4	46	0	0

Table 82. Effect of single drop and cut seed on tuber quality of Purple Majesty, (two year average) 2006 and 2007

Treatment	% External Defects[1]	% Internal Defects[2]	Specific Gravity
Single drop	0	0	1.077
Cut seed	0	1	1.078

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

Table 83. Effect of irrigation and seed piece spacing on yield and tuber size distribution of Purple Majesty, 2007

Irrigation and seed spacing treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)					
100%/10in[1]	452	288	164	164	159	5	164	56	0	0
100%/12 in	466	272	194	194	191	3	194	65	0	0
100%/14 in	461	292	169	169	169	0	169	49	0	0
71%/10 in	417	283	134	134	132	2	134	34	0	0
71%/12 in	376	243	133	133	133	0	133	23	0	0
71%/14 in	383	270	113	113	107	6	110	33	3	0

[1]100% = Full ET plus rain water (18 inches), 71% = 71% of full ET plus rain water (12.7 inches)

Table 84. Effect of irrigation and seed piece spacing on tuber quality of Purple Majesty, 2007

Irrigation and seed spacing treatment	% External Defects[2]	% Internal Defects[3]	Specific Gravity
100%/10 in[1]	0.5	0	1.081
100%/12 in	0	0	1.082
100%/14 in	0.5	0	1.081
71%/10 in	0	0.8	1.080
71%/12 in	0	0	1.081
71%/14 in	0	0.5	1.079

[1]100% = Full ET plus rain water (18 inches), 71% = 71% of full ET plus rain water (12.7 inches)
[2]Includes growth cracks, knobs and misshapes
[3]Includes hollow heart and brown center

Table 85. Effect of irrigation and seed piece spacing on yield and tuber size distribution of Purple Majesty, (two year average) 2006 and 2007

Irrigation and seed Spacing treatment	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)				
100%/10in[1]	452	282	170	167	157	10	57	4	3
100%/12 in	418	270	148	148	142	6	46	0	0
100%/14 in	451	257	194	194	182	12	64	6	0
74%/10 in	387	267	120	120	117	3	35	0	0
74%/12 in	378	260	118	118	118	0	24	0	0
74%/14 in	371	233	138	138	132	6	51	4	0

[1]100% = Full ET plus rain water (19 inches), 74% = 74% of full ET plus rain water (14 inches)

Table 86. Effect of irrigation and seed piece spacing on tuber quality of Purple Majesty, (two year average) 2006 and 2007

Irrigation and seed spacing treatment	% External Defects[2]	% Internal Defects[3]	Specific Gravity
100%/10 in[1]	2.1	1.2	1.078
100%/12 in	0.9	0	1.077
100%/14 in	1.2	0.2	1.077
74%/10 in	0	1.0	1.079
74%/12 in	0.3	0.3	1.078
74%/14 in	0	1.7	1.078

[1]100% = Full ET plus rain water (19 inches), 74% = 74% of full ET plus rain water (14 inches)
[2]Includes growth cracks, knobs and misshapes
[3]Includes hollow heart and brown center

Table 87. Effect of total nitrogen rate on yield and tuber size distribution of Yukon Gold, 2007

Nitrogen Rate (lb N/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)					
0 (28)[1]	351	70	281	275	250	25	271	183	4	6
60 (88)	502	89	413	402	356	46	393	245	9	11
120 (148)	490	75	415	415	339	76	392	264	23	0
180 (208)	458	98	360	354	281	73	334	228	20	6

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 88. Effect of total nitrogen rate on tuber quality of Yukon Gold, 2007

Nitrogen Rate (lb N/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
0 (28)[1]	3.7	0	1.091
60 (88)	0.4	1.0	1.088
120 (148)	1.6	0.2	1.084
180 (208)	2.8	0	1.083

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

Table 89. Effect of total nitrogen rate on yield and tuber size distribution of Satina, 2007

Nitrogen Rate (lb N/ac)	Total	< 4oz	> 4oz	4-16oz	4-10oz	10-160z	4-12oz	6-12oz	12-16oz	>16oz
					Yield (cwt/ac)					
0 (28)[1]	320	84	236	236	226	10	231	130	5	0
60 (88)	405	147	258	258	230	28	243	120	15	0
120 (148)	476	192	284	278	266	12	273	94	5	6
180 (208)	467	158	309	296	274	22	283	114	13	13

[1]Figures in brackets indicate total available N (applied plus soil and irrigation water N).

Table 90. Effect of total nitrogen rate on tuber quality of Satina, 2007

Nitrogen Rate (lb N/ac)	% External Defects[2]	% Internal Defects[3]	Specific Gravity
0 (28)[1]	0	0	1.087
60 (88)	0.5	0	1.074
120 (148)	0.1	0	1.077
180 (208)	0	0	1.077

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