

The Influence of Seed Spacing on Chipper Variety Yield and Quality

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Introduction: This study evaluated the influence of seed spacing on six chip varieties' yield, tuber size distribution, and quality. Four seed spacing treatments, 6.75, 9.25, 12.5 and 15 inches, were evaluated using 36 inch rows. The trial was located in a commercial potato field near Tulelake. The varieties evaluated included: Pike, Dakota Pearl, Dakota Crisp, 3502, 8402 and CO97043-14W.

General Trial Information:

Location:	Tulelake, CA- Cooperating Field (Walker Farms)
Soil Type:	Tulebasin mucky silty clay loam
Planting Date:	May 20
Vine Kill Date:	September 28
Days to Vine Kill:	131 days
Harvest Date:	October 13
Irrigation:	Solid-set sprinklers
Plot Size:	3ft by 19 ft. The plot lengths varied from 18.75ft to 19.25ft due to the seed spacing requirements. A border row was planted in between each plot to standardize competition from adjacent potato rows.
In-Row Spacing:	6.75", 9.25", 12.5", and 15"
Row Spacing:	36 inch row spacing
Number of Reps:	4 replications
Fertilizer:	210-158-0-399 (grower field practice)
Weed Control:	Matrix, Metribuzin, and Prowl H2O (post-emergence/grower field practice)
Insecticides:	Leverage (grower field practice)
Fungicides:	Tops MZ (seed treatment), Quadris & Admire Pro (in-furrow at planting), Bravo, Endura, and Manzate (grower field practice)
Fumigation:	Grower Field Practice

Yield:

- Yield was measured on 10/13/10 in every plot. Plots were graded for yield, tuber size distribution, and quality.

Results:

Seed spacing and variety had a significant influence on tuber yield, average tuber weight, and tuber size distribution (Tables 1 and 2). Averaged across variety, the 6.75 inch spacing produced the highest total and US No. 1 tuber yields. Averaged across seed spacings, Dakota Crisp produced the highest total and US No.1 tuber yields.

Yields for each variety and seed spacing combination are presented in Table 3. For most varieties, the 6.75 and 9.25 inch spacing maximized total yield. There was a trend across most varieties for average tuber weight ≥ 10 ounces to increase with increasing seed spacing. For those wanting to maximize yield in the 6 to 10 oz category, the 6.75 or 9.25 inch spacing produced the highest yields.

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Table 1. Tuber Yield & Size Grade for Four Different Seed Spacings Averaged Across Six Chipping Varieties.

Spacing	Total Yield (cwt/A)								Avg Tuber Weight (oz)	
	U.S. No. 1's (cwt)						Culls	Total		%1's
	Total 1's	10-14oz	6-10oz	4-6oz	<4oz	> 14oz				
6.75"	357	40	172	144	101	8	17	483	73	5.0
9.25"	336	61	172	103	76	18	21	450	74	5.6
12.5"	305	71	152	83	51	21	20	397	76	6.0
15"	276	71	145	60	39	33	30	377	73	6.4
Mean	318	61	160	98	67	20	22	427	80	5.8
LSD {0.05}	20	16	16	12	8	8	6	19	5	0.4

Table 2. Tuber Yield & Size Grade of Chipping Varieties Averaged Across Four Different Seed Spacings.

Variety	Total Yield (cwt/A)								Avg Tuber Weight (oz)	
	U.S. No. 1's (cwt)						Culls	Total		%1's
	Total 1's	10-14oz	6-10oz	4-6oz	<4oz	> 14oz				
Pike	279	32	133	113	79	7	10	375	74	5.1
Dakota Pearl	227	27	107	92	90	5	27	348	65	4.5
Dakota Crisp	400	93	204	104	65	34	26	525	76	6.0
3502	348	60	181	108	59	12	28	447	78	5.7
8402	330	93	169	66	38	42	26	437	76	7.3
CO97043-14W	326	58	166	102	68	22	15	430	76	6.0
Mean	318	61	160	98	67	20	22	427	74	5.8
LSD {0.05}	26	17	20	14	11	10	7	23	3	0.5

Table 3. Tuber Yield & Size Grade of Six Chipping Varieties at Four Different Seed Spacings.

Variety	Spacing	Yield (cwt/A)										Avg Tuber Weight
		U.S. No. 1's (cwt)					Total					
		Total 1's	10-14oz	6-10oz	4-6oz	<4oz	> 14oz	Culls	Total	% 1's	Weight	
Pike	6.75"	290	9	128	153	125	0	9	424	68	4.3	
	9.25"	307	31	148	128	84	5	13	408	75	5.0	
	12.5"	270	31	140	101	65	15	10	359	75	5.3	
	15"	247	62	117	69	43	8	10	307	80	6.0	
Dakota Pearl	6.75"	291	18	135	135	121	0	22	433	67	4.3	
	9.25"	223	33	105	86	118	8	16	365	61	4.4	
	12.5"	183	26	71	86	71	2	14	271	67	4.4	
	15"	210	32	118	63	48	9	57	324	65	5.1	
Dakota Crisp	6.75"	461	78	233	150	86	14	26	588	79	5.5	
	9.25"	439	101	227	111	79	31	22	571	77	6.2	
	12.5"	405	111	208	88	53	35	27	519	78	6.5	
	15"	294	83	146	66	44	55	29	421	69	5.6	
3502	6.75"	376	46	195	135	77	11	20	483	77	5.3	
	9.25"	364	64	175	124	76	12	36	487	75	5.4	
	12.5"	328	62	168	100	45	9	30	412	80	5.7	
	15"	324	67	183	74	39	17	25	406	80	6.1	
8402	6.75"	358	60	179	119	77	25	22	481	73	5.5	
	9.25"	352	87	203	59	35	49	27	463	76	7.3	
	12.5"	314	105	152	31	25	30	22	392	80	7.5	
	15"	297	122	143	31	16	66	33	411	72	8.8	
CO97043-14W	6.75"	364	31	162	172	119	2	6	491	74	4.8	
	9.25"	329	49	172	109	64	3	10	405	81	5.3	
	12.5"	329	90	171	69	47	38	17	431	77	6.7	
	15"	283	64	160	60	42	44	25	392	72	6.7	
LSD {0.05}		46	29	42	28	22	17	13	41	5	1	