

HZPC Potato Variety – Nitrogen Rate Trial, 2001

General Comments:

Best Management Practices (BMPs) have been implemented for potato growers to regulate the amount of nitrogen applied to a potato crop. The BMPs do not restrict farming. However, growers are concerned that the nitrogen rate recommendations could reduce potato production and, in turn, their economic viability.

Planting fresh market potato varieties that require less nitrogen than varieties currently planted would allow growers to efficiently produce a potato crop while following all suggested BMPs. This report investigates several high nitrogen efficient potato varieties from HZPC America's Corporation under multiple nitrogen rates. Production and quality characteristics were assessed under North Florida growing conditions.

Planting Site:	Hastings REC, Yelvington Farm
Planting Date:	March 6, 2001
Harvest Date:	June 4, 2001
Season Length:	100 days
Replications:	4
Plot Size:	10 ft
Row Spacing:	8 inches in-row, 40 inches between-row
Fertilizer:	Nitrogen Rates (ammonium nitrate): 0, 62.5, 125, 250 lb N/acre applied in an equal split application at planting and 27 days after planting. 36 lb P/A 150 lb K/A
Highest Total Yield:	Fresh Market, Fabula (431 cwt/acre @ 125 lb N/A)
Highest Marketable Yield:	Fresh Market, Fabula (389 cwt/acre @ 125 lb N/A)
Best Overall Tuber Appearance:	La Chipper

Discussion:

The traditional (Atlantic and La Chipper) and alternative varieties produced respectively well under a low nitrogen program (125 and 62.5 lb N/acre). This could have been for several reasons including a.) all the varieties have a high nitrogen efficiency or b.) below normal rainfall in recent years and cover cropping have "recycled" nitrogen for use by the potato crop. Experiments are currently underway to estimate the amount of nitrogen that can be recycled using off-season cover crops in North Florida.

Overall, tuber quality of all varieties was good. However, heat sprouts were noted with Mondial and Divina. An earlier planting date may reduce the incidence of heat sprouts as well as improving overall quality of all varieties. It was noted that as nitrogen rate increased, the incidence of a "scurfy" texture on the fresh market potato tubers increased. The tuber confirmation was very good for Caesar, Fabula, Morning Gold, and AF1615-1. Adoption of the alternative varieties in Florida would increase the interest in Florida fresh market potatoes.

Florida Table 33. High nitrogen efficiency potato trial. Yield, marketable yield, percentage of yield by grade, size distribution, percent culls and specific gravity of eight potato varieties grown at different nitrogen rates at Hastings, FL. - 2001.

Main Effects	Total	Marketable	Size					Size		Specific Gravity
	Yield	Yield ¹	Distribution by Class (%) ²					Distribution (%)		
	(cwt/A)	(cwt/A)	1	2	3	4	5	2 to 4	3 to 4	
Clone										
Atlantic	392	353	4	38	46	12	0	96	58	1.076
La Chipper	363	314	5	47	37	10	1	94	47	1.069
Mondial	271	191	26	71	3	0	0	74	3	1.055
Morning Gold	311	252	10	68	21	1	0	90	22	1.065
Fabula	371	327	4	43	39	13	0	96	53	1.058
Divina	185	152	15	74	10	0	0	85	10	1.060
Caesar	258	210	16	79	5	0	0	84	5	1.062
AF1615-1	339	282	7	63	29	2	0	93	30	1.068
<i>LSD</i> ³	33	32	3.6	9.1	7.7	4.2	0.8	3.6	8.1	0.002
<i>P Value</i>	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0105	0.0001	0.0001	0.0001
Nitrogen Rate										
(total lbs/A)										
0	246	203	14	64	18	4	0	86	22	1.061
63	343	285	10	62	23	5	0	90	28	1.065
125	372	312	8	55	29	8	0	92	37	1.065
250	283	241	12	61	24	3	0	88	27	1.066
<i>LSD</i> ³	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>
<i>P Value</i>	0.2540	0.2887	0.4525	0.1439	0.3799	0.2602	0.5151	0.4983	0.3022	0.2265

¹ - Marketable Yield: size classes 2 to 4

² - Size classes: 1 = <1 7/8", 2 = 1 7/8 to 2.5", 3 = 2.5 to 3.25", 4 = 3.25 to 4", 5 = >4"

³ - Means separated within columns by the *LSD* means separation test.

Florida Table 34. High nitrogen efficiency potato trial. Yield, marketable yield, percentage of yield by grade, size distribution, percent culls and specific gravity of eight potato varieties grown at different nitrogen rates at Hastings, FL. - 2001.

Variety	Nitrogen Rate (lb) /A	Total Yield (cwt/A)	Marketable Yield ¹ (cwt/A)	Size Distribution by Class (%) ²					Size Distribution (%)		% culls	Specific Gravity
				1	2	3	4	5	2 to 4	3 to 4		
				Season-100 days								
Atlantic												
	0	295	261	12	29	42	17	0	88	59	7	1.072
	63	415	391	6	36	47	11	0	94	58	3	1.076
	125	519	465	10	19	50	21	0	90	70	9	1.077
	250	340	294	14	42	43	2	0	86	45	11	1.081
La Chipper												
	0	279	250	10	46	32	11	0	90	43	6	1.066
	63	380	310	16	39	35	8	2	82	43	11	1.071
	125	420	352	14	36	35	12	2	84	48	12	1.069
	250	374	344	8	38	45	9	0	92	54	4	1.073
Mondial												
	0	219	153	30	70	0	0	0	70	0	8	1.051
	63	307	220	28	70	1	0	0	72	1	8	1.056
	125	343	241	30	64	6	0	0	70	6	11	1.058
	250	213	151	29	68	3	0	0	71	3	5	1.057
Morning Gold												
	0	235	169	28	53	19	0	0	72	19	20	1.065
	63	332	262	21	63	14	2	0	79	16	15	1.066
	125	412	357	13	56	29	1	0	87	30	8	1.063
	250	262	220	16	64	18	1	0	84	19	4	1.067
Fabula												
	0	301	258	14	39	37	9	0	86	46	9	1.056
	63	397	340	14	38	37	10	0	86	47	11	1.061
	125	431	389	10	29	43	18	0	90	62	8	1.060
	250	356	322	9	38	37	16	0	91	53	7	1.057

Florida Table 34 (cont'd). High nitrogen efficiency potato trial. Yield, marketable yield, percentage of yield by grade, size distribution, percent culls and specific gravity of eight potato varieties grown at different nitrogen rates at Hastings, FL. - 2001.

Variety	Nitrogen Rate (lb) /A	Total Yield (cwt/A)	Marketable Yield ¹ (cwt/A)	Size Distribution by Class (%) ²					Size Distribution (%)		% culls	Specific Gravity
				1	2	3	4	5	2 to 4	3 to 4		
Season-100 days												
Divina												
	0	172	145	16	76	9	0	0	84	9	6	1.056
	63	234	192	18	69	13	0	0	82	13	5	1.063
	125	179	143	20	71	8	1	0	80	9	11	1.062
	250	152	129	15	72	13	0	0	85	13	1	1.061
Caesar												
	0	236	198	16	77	7	0	0	84	7	7	1.060
	63	298	241	19	74	7	0	0	81	7	7	1.064
	125	275	220	20	77	3	0	0	80	3	10	1.066
	250	224	183	18	75	6	0	0	82	6	2	1.058
AF1615-1												
	0	232	187	19	63	18	0	0	81	18	14	1.066
	63	380	326	14	62	21	3	0	86	24	9	1.068
	125	398	328	18	43	37	2	0	82	39	14	1.068
	250	344	286	17	58	25	1	0	83	25	9	1.070
<i>LSD</i> ³		<i>101</i>	<i>92</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>ns</i>	<i>*</i>
<i>P Value</i>		<i>0.0298</i>	<i>0.0103</i>	<i>0.9535</i>	<i>0.4978</i>	<i>0.7947</i>	<i>0.3694</i>	<i>0.5329</i>	<i>0.8786</i>	<i>0.4829</i>	<i>0.2311</i>	<i>0.0402</i>

Planted on March 6, 2001, N fertilizer rate was as noted plus 36 lbs P and 150 lbs K per Acre, harvested on June 14, 2001.

¹ - Marketable Yield: size classes 2 to 4

² - Size classes: 1 = <1 7/8", 2 = 1 7/8 to 2.5", 3 = 2.5 to 3.25", 4 = 3.25 to 4", 5 = >4"

³ - Means separated within columns by Waller-Duncan's *k*- ratio t test.

Florida Table 35. High nitrogen efficiency potato trial. Average tuber characteristics over all treatments of eight potato varieties grown at different nitrogen rates at Hastings, FL -2001.

Tuber Characteristics ¹						
Variety	IFC	SC	ST	TS	ED	APP
Atlantic	1	6	6	2	6	7
La Chipper	1	8	8	2	6	7
Mondial	2	7	7	5	8	5
Morning Gold	3	7	7	2	6	5
Fabula	2	7	8	2	7	6
Divina	2	7	9	5	6	6
Caesar	2	7	8	4	8	6
AF1615-1	1	6	8	2	7	6

¹ - See rating system outlined in Florida Rating Code Table.