Optimizing management of new potato varieties

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We continue to conduct trials to develop data to help Wisconsin potato growers optimize management of new potato varieties. Recent research effort has focused on potato crop growth and development, nutrient uptake, and response to nutrient management. Trials conducted during the summer of 2012 focused on multiple fresh market potato varieties that are commonly grown in Wisconsin, but have

Table. Yield and quality of fresh market and chip potatoes in response to nitrogen fertility levels.

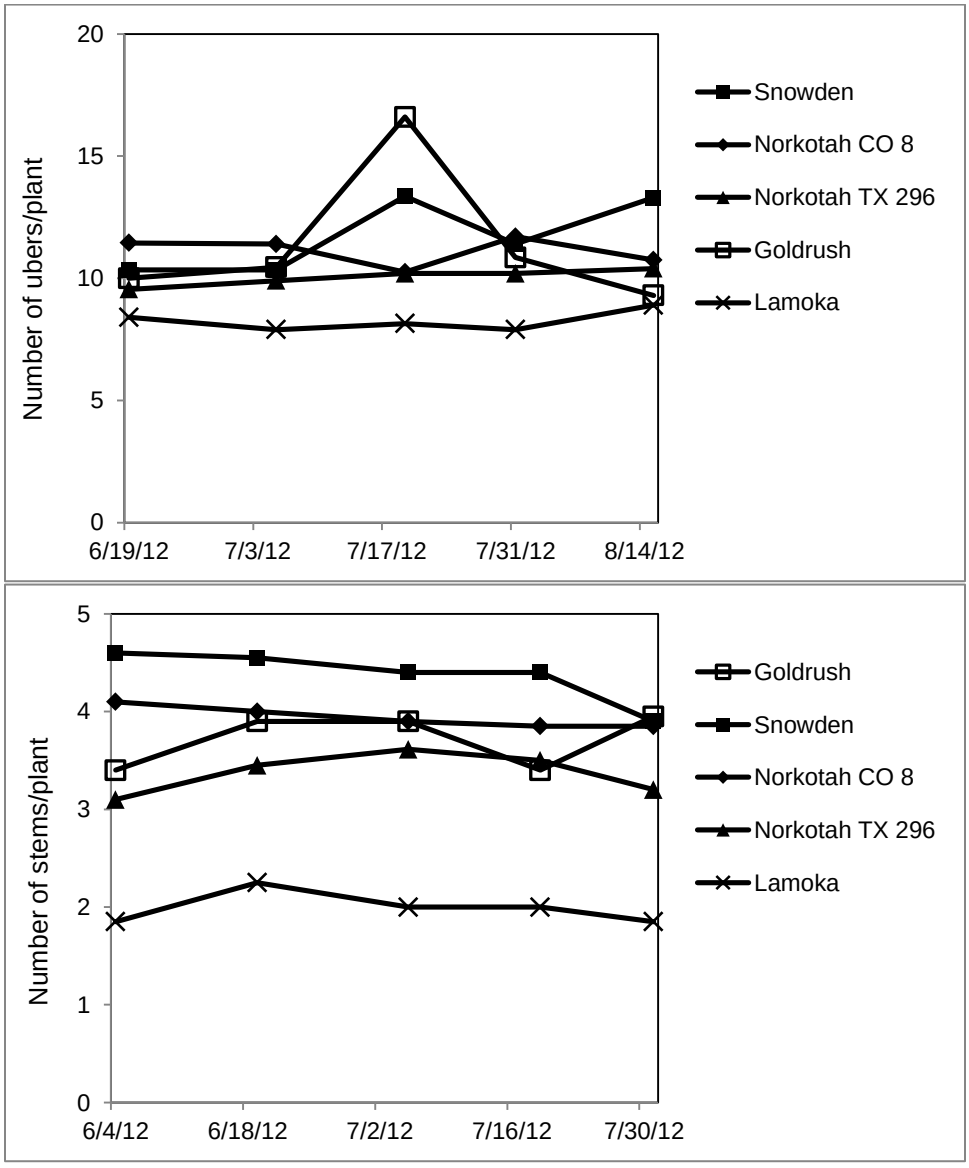
Treatment		Yield (cwt/A)				Yield (% total)		
Variety	Applied N (lb/A)	Total	US #1	B's	Culls	US #1	B's	Culls
Norkotah CO 8		495.6	447.6	22.4	25.6	90.0	4.7	5.3
Norkotah TX 296		561.1	513.7	26.3	21.1	91.5	4.8	3.7
Goldrush		510.4	422.3	43.7	44.4	82.8	8.7	8.6
Snowden		605.2	555.2	32.1	17.9	91.7	5.3	3.0
Lamoka		405.1	382.5	11.3	11.3	94.4	2.8	2.8
	LSD	**37.4**	**36.5**	**4.3**	**7.0**	**1.5**	**1.0**	**1.3**
	180	507.8	459.4	26.4	22.0	90.3	5.3	4.4
	230	529.0	476.4	25.8	26.8	90.1	4.8	5.1
	280	492.2	441.8	30.1	20.3	89.8	6.1	4.1
	330	533.1	479.5	26.4	27.2	90.1	4.9	5.1
	LSD	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Norkotah CO 8	180	494.7	448.6	27.3	18.8	90.4	5.7	3.8
Norkotah CO 8	230	474.6	416.4	22.7	35.4	87.3	4.9	7.8
Norkotah CO 8	280	472.5	425.5	21.5	25.4	90.0	4.7	5.3
Norkotah CO 8	330	540.6	499.7	18.0	22.9	92.4	3.3	4.3
Norkotah TX 296	180	559.4	513.7	23.0	22.8	91.7	4.2	4.0
Norkotah TX 296	230	584.7	538.0	22.6	24.0	92.1	3.9	4.0
Norkotah TX 296	280	513.0	467.8	29.8	15.4	91.1	6.1	2.9
Norkotah TX 296	330	587.2	535.3	29.9	22.0	91.2	5.1	3.7
Goldrush	180	478.5	405.4	41.7	31.5	84.7	8.7	6.6
Goldrush	230	536.7	458.4	38.7	39.8	85.5	7.4	7.1
Goldrush	280	488.3	402.7	48.8	36.8	82.4	10.1	7.5
Goldrush	330	538.2	422.9	45.7	**69.7**	**78.5**	8.5	**13.0**
Snowden	180	592.9	542.2	27.2	23.5	91.3	4.6	4.1
Snowden	230	624.2	566.9	35.2	22.1	90.8	5.6	3.5
Snowden	280	581.5	529.7	38.4	13.4	91.0	6.6	2.3
Snowden	330	622.2	582.1	27.8	12.4	93.5	4.5	2.0
Lamoka	180	413.3	387.0	13.1	13.3	93.3	3.3	3.4
Lamoka	230	424.6	402.2	9.5	12.8	94.7	2.3	3.1
Lamoka	280	405.6	383.2	12.1	10.3	94.6	2.9	2.5
Lamoka	330	377.0	357.5	10.6	8.8	94.9	2.9	2.3
	LSD	**NS**	**NS**	**NS**	**13.9**	**3.0**	**NS**	**2.5**

limiting data to support current management systems. This includes Russet Norkotah CO 8 (standard), Russet Norkotah TX 296, Goldrush, and Silverton (failed plant stand in 2012 so there is no data). In addition we evaluated new chipping cultivar Lamoka. There is great interest in production of Lamoka due to its potential for long-term storage, cold-induced sweetening resistance, and good agronomic characteristics. Snowden yielded greater than Lamoka. Similarly, Norkotah TX 296 out-yielded Norkotah CO 8 and Goldrush by about 50 cwt/a. Yield appeared to be optimized at 230 lb/a N, but was indistinguishable from other nitrogen fertilizer rates. Variability plot to plot made it difficult to determine yield response to nitrogen fertilizer within across the experiment or within a variety.

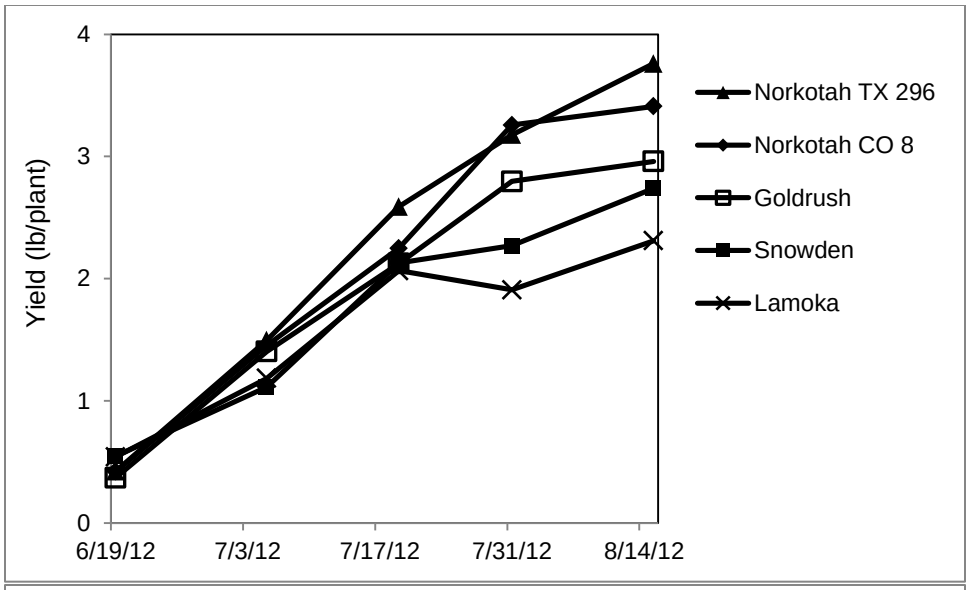
Table 2. Tuber size distribution in response of chip and fresh market varieties to different N rates.

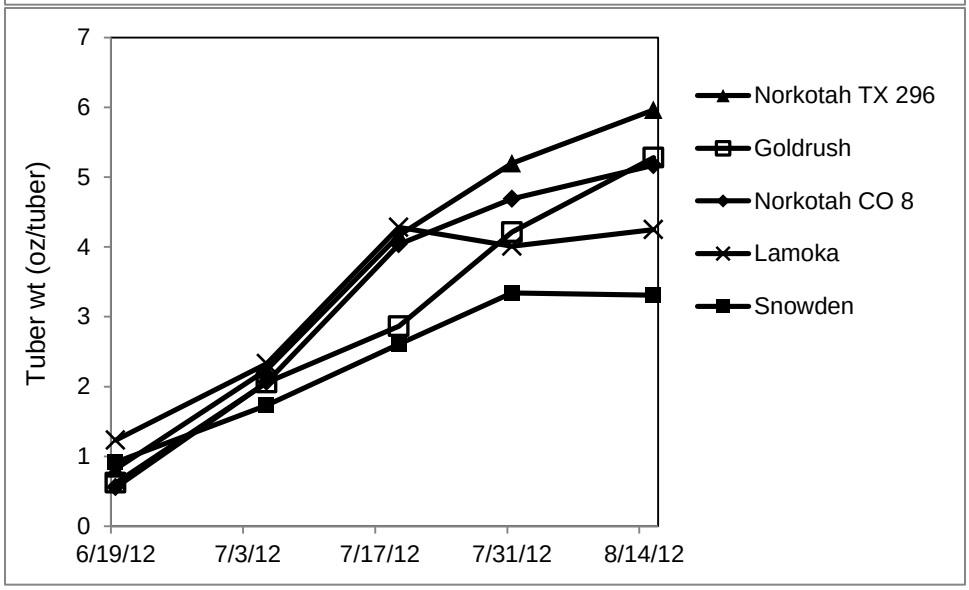
Treatment		% US #1						Specific
Variety	Applied N (lb/A)	2-4 oz	4-6 oz	6-10 oz	10-13 oz	13-16 oz	>16 oz	Gravity
Norkotah CO 8		6.7	14.6	35.9	19.1	13.3	10.4	1.0674
Norkotah TX 296		6.1	15.3	39.5	19.0	11.0	9.1	1.0659
Goldrush		9.5	15.6	42.5	18.2	9.3	4.9	1.0610
Snowden		27.8	29.9	34.5	5.9	1.9	0.1	1.0832
Lamoka		15.1	22.2	38.4	16.4	6.9	1.0	1.0778
	LSD	**2.7**	**2.8**	**3.1**	**3.1**	**2.5**	**2.8**	**0.0022**
	180	13.2	19.9	39.3	14.4	9.1	4.1	1.0703
	230	12.7	20.2	39.4	16.4	6.8	4.4	1.0717
	280	13.4	20.7	39.1	14.5	8.0	4.4	1.0719
	330	13.0	17.3	34.8	17.4	10.0	7.5	1.0704
	LSD	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**
Norkotah CO 8	180	5.6	13.7	37.5	18.0	18.0	7.2	1.0653
Norkotah CO 8	230	8.0	18.2	35.8	18.8	9.9	9.3	1.0680
Norkotah CO 8	280	6.6	15.6	37.7	18.8	10.2	11.1	1.0680
Norkotah CO 8	330	6.7	10.7	32.5	20.8	15.2	14.1	1.0683
Norkotah TX 296	180	6.3	15.3	37.3	20.0	10.9	10.3	1.0660
Norkotah TX 296	230	6.0	15.9	42.1	19.2	9.5	7.3	1.0680
Norkotah TX 296	280	6.7	16.6	43.8	15.8	11.3	5.8	1.0647
Norkotah TX 296	330	5.5	13.3	34.9	20.9	12.2	13.2	1.0650
Goldrush	180	10.7	17.6	47.5	14.1	8.0	2.1	1.0610
Goldrush	230	9.7	15.9	44.4	19.8	6.1	4.2	1.0640
Goldrush	280	9.3	16.1	41.7	18.9	9.7	4.2	1.0610
Goldrush	330	8.4	12.7	36.6	20.0	13.4	9.0	1.0580
Snowden	180	28.9	31.0	34.9	3.8	1.4	0.0	1.0820
Snowden	230	23.9	28.7	36.4	8.6	2.2	0.2	1.0823
Snowden	280	30.0	31.0	32.8	4.5	1.7	0.0	1.0850
Snowden	330	28.5	29.0	33.7	6.5	2.3	0.0	1.0833
Lamoka	180	14.4	21.7	39.5	16.3	7.4	0.7	1.0773
Lamoka	230	16.1	22.3	38.5	15.7	6.2	1.1	1.0760
Lamoka	280	14.2	23.9	39.3	14.7	6.9	0.9	1.0807
Lamoka	330	15.8	20.7	36.2	18.9	7.1	1.2	1.0773
	LSD	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**	**NS**

Tuber size distribution was not affected by fertilizer rate throughout the experiment. Snowden had smaller size distribution than Lamoka likely because Snowden produced many more tubers per plant and therefore had a much heavier set. Norkotah and Goldrush had over 30% of tubers greater than 10 oz in size suggesting that tuber set was not high enough. As a result, yields were likely compromised due to too wide of tuber spacing.



Stem number per plant varied from 2 to 4.5 for Lamoka and Snowden respectively. This led to a change of tuber set per plant from 8 to 12. Fresh market potatoes had stem set of 3 to 4 per plant with subsequent effect of about 10 tubers per plant.





Snowden had much higher yield than Lamoka due to substantially higher tuber set. Lamoka also seemed to stop bulking earlier during the production season compared to Snowden. Norkotah TX 296 appeared to maintain bulking for longer period of time than the Norkotah CO8 and the Goldrush which almost certainly contributed to the higher yields.