

Simplot FUSN™ Fertilizer Potato Trials

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Introduction:

Managing nitrogen (N) is essential in potato farming, as it affects yield, tuber size, and tuber shape. FUSN™ is a fairly recent arrival on the market. It chemically fuses ammonium sulfate and ammonium nitrate to produce a new, highly stable fertilizer.

Challenge:

As growers reduce use of ammonium nitrate in favor of urea, research is needed to compare the effects of FUSN and urea on yield and tuber quality in Russet-type potatoes.

Research:

Tyler J. Hopkins, Jared Williams, and Bryan G. Hopkins conducted two trials on Russet Burbank and Russet Norkotah potato fields at BYU-Idaho's Hillside Farm in Rexburg, Idaho, in 2015. A broadcast fertilizer was applied pre-planting. Impacts on the field from weeds, disease, and insects were successfully managed.

Methodology:

The team divided the field into 12' × 40' plots. The control plots received no treatment. The other plots received either urea or FUSN at 70, 140, or 210 lbs N/ac. Each treatment had six replicates in a randomized complete block design.

Cut seed was planted in early May and harvested in late September. Tubers were weighed and then graded for quality, size, specific gravity, and defects. Normalized Difference Vegetation Index (NDVI) was measured every 7–14 days.

Results:

Only the lowest rate of application created a significant change in yield. All plots treated with FUSN experienced an increase over plots treated with urea in total yield and potatoes graded U.S. No. 1. Tuber size increased with FUSN, though not significantly. Additional plant growth may have resulted in lowered petiole NO₃-N concentrations in FUSN-treated plots.

Practical Applications:

FUSN is an effective fertilizer for potato fields and may result in better tuber quality when compared to urea.

Table 2. Russet Burbank yields (cwt/ac)

Trt #	Fertilizer	N rate, lbs N/ac	----- U.S. No. 1 -----				----- U.S. No. 2 -----		Marketable	Total
			All	4.0-7.3	7.3-9.5	>9.5				
1	N/A	0	246 b	149 b	60	37	4	250 b	337 b	
2	Urea	70	319 a	177 ab	55	87	7	326 a	412 a	
3	Urea	140	324 a	146 b	92	86	7	332 a	386 b	
4	Urea	210	318 a	143 b	78	96	7	325 a	373 b	
5	FUSN	70	343 a	197 a	61	86	3	346 a	427 a	
6	FUSN	140	320 a	166 ab	77	77	4	325 a	392 ab	
7	FUSN	210	317 a	149 b	83	86	19	336 a	394 ab	
<i>P-values</i>			0.014	0.026	NS	NS	NS	0.047	0.008	

Table 3. Russet Norkotah yields (cwt/ac)

Trt #	Fertilizer	N Rate, lbs N/ac	-----U.S. No. 1-----				----- U.S. No. 2 -----		Marketable	Total
			All	4.0-7.3	7.3-9.5	>9.5				
1	N/A	0	231 ab	94	44	94	7	239 ab	300 b	
2	Urea	70	195 bc	92	39	64	10	206 b	341 ab	
3	Urea	140	235 ab	103	63	69	20	255 a	380 a	
4	Urea	210	190 bc	93	53	44	16	206 b	334 ab	
5	FUSN	70	228 ab	99	43	86	13	241 ab	382 a	
6	FUSN	140	251 a	122	47	82	10	261 a	373 a	
7	FUSN	210	166 c	86	28	52	15	181 b	317 b	
<i>P-values</i>			0.038	NS	NS	NS	NS	0.012	0.027	

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