

Does Nitrogen Source Impact Sugar Yield and Quality?

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Location: Saginaw Valley Research and Extension Center	Tillage: Conventional with light S-tine at sidedress
Planting Date: April 5, 2012 (Harvest 10/5/12)	N Sources: See below
Soil Type: Clay loam; 2.9 OM; 7.8 pH; 40 ppm P; 183 ppm K	Population: 4 ¼ in. spacing
Variety: Hilleshog 9042 Roundup Ready	Replicated: 4 replications

N Trt. (Total lb. N/A)	Sidedress (2-4 lf) Lb. N/A	RWSA	RWST	Tons/A	% Sugar	% CJP	NH2	Amino-N
120 ^a	80 - Urea	9165	282	32.5	19.3	94.3	183	11.0
120	80 - AS	9607	292	32.9	19.9	94.3	207	12.4
120	80 - ASN	8634	284	30.4	19.4	94.2	202	12.1
120	80 - ESN (PRE-PLANT)	9120	285	32.0	19.5	94.1	324	19.2
LSD_(0.10)^b	----	----	8	NS	0.4	NS	NS	NS

^a All plots received 40 lbs. N/A as 28% applied 2x2 starter.

^b LSD, least significant difference between means within a column at ($\alpha = 0.10$).

Comments/Summary: Trial was conducted to determine the effects of urea, ammonium sulfate (AS), ammonium sulfate-nitrate (ASN), and polymer-coated urea (ESN, Environmentally Smart Nitrogen) as N sources for sugarbeet production. All treatments received 40 lbs. N/A as 28%, 20 lbs. P₂O₅/A, 50 lbs. K₂O/A. and 2 lbs. Mn/A as starter placed 2x2 on April 5. Sidedress N applications of urea, AS, or ASN were completed on May 14 and were followed by a light cultivation to avoid N volatilization. Due to the slow-release N of ESN, this product was applied pre-plant on April 5. The AS and ASN fertilizer applications provided 91 and 43 lbs sulfate-S, respectively. Nitrogen source had little effect on total yield and minor effects on % sugar and RWST. Although statistically not significant, the slow-release ESN product did result in high levels of soluble N impurities. This may be due in part to the extremely dry summer 2012 soil moisture conditions preventing N release until later in the season when rainfall occurred. Past research has shown N source (ammonium or nitrate) to affect the sugarbeet amino-N content. Data from the current study show little influence of N source on soluble N impurities but rather a larger influence from N release rate.