EFFECT OF COMMERCIAL FERTILIZERS AND NUTRIENT MANAGEMENT PRODUCTS ON SUGARBEET YIELD AND QUALITY DURING 2017 GROWING SEASON

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Introduction

Trial results of different fertilizer combinations, biologicals and nutrient management aids were evaluated.

Materials and methods

Roundup Ready sugarbeet cultivar with a good disease resistant package was planted on April 29 and May 4, 2017 at Downer and Ada, respectively. Field plots were laid out in a randomized complete block design with four replications. Individual plots measured 11 ft wide and 30 ft long. Sugarbeet was placed 1.25 inches deep with 5 inch row spacing. A 22 inch row spacing was used. The trial was planted in wheat residue and a fairly wet soil seedbed. Roundup herbicide was applied twice for weed control. Recommended NPK fertilizers were applied and N rate was adjusted to residual soil NO_3-N of 4 ft soil depth. The middle two rows were harvested using a mechanical harvester and sub sample sent to Crystal Sugarbeet Quality lab at Grand Forks. Downer and Ada plots were harvested on 19th September and 9th October, respectively.

Table 1. Initial soil properties

	NO_3-N (lb/ac)			Olsen-P (ppm)	K (ppm)	Soil OM%	Soil pH
Depth	0-6”	6-24”	24-48”	0-6”	0-6”		
Downer	19	21	30	10.5	97	3.1	8.6
Ada	16	21	16	9	74	3.6	8.1

Table 2. Mean sugar yield and quality parameters in response to different commercial products.

Trial-Agrispon (Biostimulant), Agricultural Sciences Inc. at Downer, MN				
Treatments	**Tons/ac**	**Sugar%**	**RSA (lb/ac)**	**Gross ($/ac)**
1. Recommended NPK	40.9	19.5	15123	2195
2. 100%N+Agrispon@13.2oz/a @30 and 60 DAP	39.9	19.1	14422	2052
3.90%N+ Agrispon@13.2oz/a@30 and 60 DAP	40.4	19.2	14768	2120
4.85%N+ Agrispon@13.2oz/a@@30 and 60 DAP	38.5	19.5	14355	2100
5.80%N+ Agrispon@13.2oz/a@@30 and 60 DAP	39.2	19.6	14580	2130
P<0.05	NS	NS	NS	NS
LSD	3.54	0.86	1395	257
Conclusion- In-season side-dress twice with Agrispon at 30 and 60 DAP with 80% recommended-N had no significant difference with 100% recommended N without Agrispon application.				
Trial- Anuvia Plant Nutrients. SymTRX20S product (16-1-0-20S) and SymTRX12S were compared with MAP as replacement at Ada, MN				
1. No P and S check	32.89^{B}	17.9	11105^{B}	1469.76^{C}
2. MAP (Full rate-105 lbs product)	38.88^{A}	18.1	13387^{A}	1810.22^{A}
3. 105 lbs MAP + 83 lbs AMS	35.20^{AB}	17.9	11988^{B}	1602.41^{BC}
4. 105 lbs MAP + 100 lbs SymTRX20S	38.48^{A}	18.2	13386^{A}	1830.17^{A}
5. 42 lbs MAP + 165 lbs SymTRX12S	39.14^{A}	17.8	13271^{A}	1765.04^{AB}
P<0.05	0.04	NS	0.01	0.003
LSD	4.04	0.54	1260	177.6
Conclusion- Phosphorus and sulfur had significant postive effect on yield, recoverable sugar and gross return.				
Trial- Pursell Agri-Tech (Coated urea with three rates) at Ada, MN				
N source-Urea	35.80^{B}	17.64^{B}	12025^{B}	1582.69^{BC}
N source-ESN	36.44^{B}	17.98^{A}	12515^{AB}	1687.87^{AB}
N source-Coated urea with 2% Zn (44.5-0-0)	38.66^{A}	17.64^{B}	12999^{A}	1713.02^{A}
N source-Resin coated urea (43.7-0-0)	37.40^{AB}	17.30^{C}	12273^{AB}	1572.66^{C}
N source- Coated urea (44.5-0-0)	35.67^{B}	17.86^{AB}	12169^{B}	1629.62^{ABC}
N rate-90 lb N/ac	35.85^{B}	17.52^{B}	11946^{B}	1557.88^{B}
N rate- 120 lb N/ac	36.57^{AB}	17.79^{A}	12407^{AB}	1651.08^{A}
N rate- 150 lb N/ac	37.95^{A}	17.75^{A}	12837^{A}	1702.55^{A}
N Source	0.03	<0.01	0.08	0.05
N rate	0.03	0.03	0.01	0.01
N- Source×rate	0.57	0.01	0.78	0.57
Conclusion- Coated urea with Zn had potentital to increase yield but need more experiment to validate the finding. Significant increase in sugar and return was observed with increasing N rate from 90 to 120 lb N/ac but no difference was found between 120 and 150 lb N/ac.				