Fertilizer Source Comparisons on Yield of Head Lettuce. Pacific Ag Research. Arroyo Grande, CA

Experiment Info:	
Planted:	07/09/15
Harvest:	09/15/15
Yield Goal:	50,000 lb/A
Target Fert.:	140-72-72
Variety:	Telluride
Population:	26,136
Row Width:	40"
Prev. Crop:	
Plot Size:	1 row x 70'
Replications:	4

Soil Test Values (ppm):	
pH:	6.1
CEC:	10
%OM:	1.1
Bray P1:	
Bicarb P:	
K:	
S:	
%K:	
%Mg:	
%Ca:	
%H:	
Zn:	
Mn:	
B:	

Objective:

Evaluate effects of different fertilizer rates and sources for effect on growth and yield of head lettuce.

High value crops like head lettuce require ample fertilization to enable top production. Finding ways of improving fertilizer performance and efficiency while maintaining yield would be an asset in growing crops in a more environmentally responsible manner. One commonly used fertilizer for growing vegetables and other horticultural crops in CAN-17, or calcium ammonium nitrate (17-0-0-8.8Ca). The nitrogen is derived from ammonium nitrate and calcium nitrate. The fertilizer additive eNhance has been shown to improve nitrogen efficiency while maintaining yield, even with 20% reduction in nitrogen application rate. This experiment evaluated CAN-17 at the full rate, 20% N reduced rate, and 20% reduced rate with eNhance added. Additionally, an experimental liquid fertilizer, N-14, was included for comparison. N-14 has an analysis of 8-5-2 and was also applied at approximately a 20% reduction rate of nitrogen. Results are in the following table.

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6-24-24 fertilizer at 300 lb/A was broadcast and incorporated before planting (A) to all plots. (18 lb-N/A)

Application and harvest data (all values are *per acre*):

	fertilizer	gallons	timing*	yield: lbs	cartons**	% large	% medium	% small	gross returns***
1	17-0-0	20.6	B	47,667	953.3	32	47	21	$17,160
	(total 140N)	12.05	C,D,E						
2	17-0-0	16.5	B	48,877	977.5	40	45	15	$17,596
	(total 112N)	9.07	C,D,E						
3	17-0-0/eNhance	16.5	B	50,811	1016.2	37	47	16	$18,292
	(1 oz eNhance/gal)	9.07	C,D,E						
	(total 112N)								
4	N-14	44.3	B	49,185	983.7	41	46	13	$17,707
	(total 116N)	25.9	C,D,F						

* Application timing: A: 07/06 B: 07/07 C: 08/04 D: 08/18 E: 09/02 Note: liquids through drip irrigation.
** Carton weight is 50 lb of lettuce.
*** Gross returns based on $18 per carton.

ANOVA determined no significant differences in any of the evaluations.

Conclusions:

- Although there were no statistically significant differences obtained, the numerical trend was for increased yield with reduction in N applied N rate.
- Treatments with reduced N rates also resulted in a higher % large head lettuce.
- The yield and size grade gave the highest gross return to the reduced CAN-17 rate with eNhance.
- The N-14 performed as well as the other commercially available fertilizer treatments.
- Although performance varies year to year, it appears that the amount of N applied here was too high. Further testing could identify the minimum application rates at which optimal yield is obtained to see if addition of eNhance or a new product would be beneficial.