

Experiment Info:	
Exper.:	ACL-1402
Planted:	2-July-14
Variety:	Heritage Broccoli
Population:	26,136 (12" spacing)
Plot size:	3.3 ft x 40 ft
Replications:	Four
Harvest:	9/29 & 10/7

Soil Test Values (ppm):	
Soil	Sandy Loam
pH:	7.6
CEC:	6.8
%OM:	1.0%
Bray P1:	37 ppm
Bicarb P:	-
K:	49 ppm
S:	72 ppm
%K:	-
%Mg:	20.80%
%Ca:	75.30%
%H:	-
Na:	2.10%
Zn:	0.7 ppm
Mn:	1.0 ppm
Fe:	5.0 ppm
Cu:	0.6 ppm
B:	0.3 ppm

**Objective:**

Determine the impact of a 20% reduction of nitrogen on broccoli yields and whether current or experimental AgroLiquid products can be used to maintain or enhance yields.

**Materials & Methods:**

- On July 2, 2014, the plot was established in a sandy loam soil near Guadalupe, CA. Telluride head lettuce was planted in plots 39" wide and 40 ft. long plots with 12" in-row spacing. The planting rate was approximately 26,136 plants per acre. Each plot was replicated four times in a randomized complete block design.
- A pre-plant treatment of 6-24-24 (300 lb/a) was incorporated prior to planting along with drip application of 17-0-0 prior to planting. For all treatments 17-0-0, eNhance or N-14 were applied at thinning and every other week after that. Crop growth and yield characteristics were measured. Stand counts were not significantly different between treatments and crop vigor was very good for all treatments. See Table B1 for details.
- Remote sensing equipment was used to objectively measure leaf greenness (NDRE) and canopy coverage (NDVI). Each measurement increased as the season progressed, indicating healthy growth. Canopy Chlorophyll Content Index (CCCI), a measure of the greenness of the actual canopy present was also determine over the course of this trial.
- Broccoli heads were harvested on two different dates (9/29/14 & 10/7/14) and separated by size on each date. Heads were classified as large, medium or small.

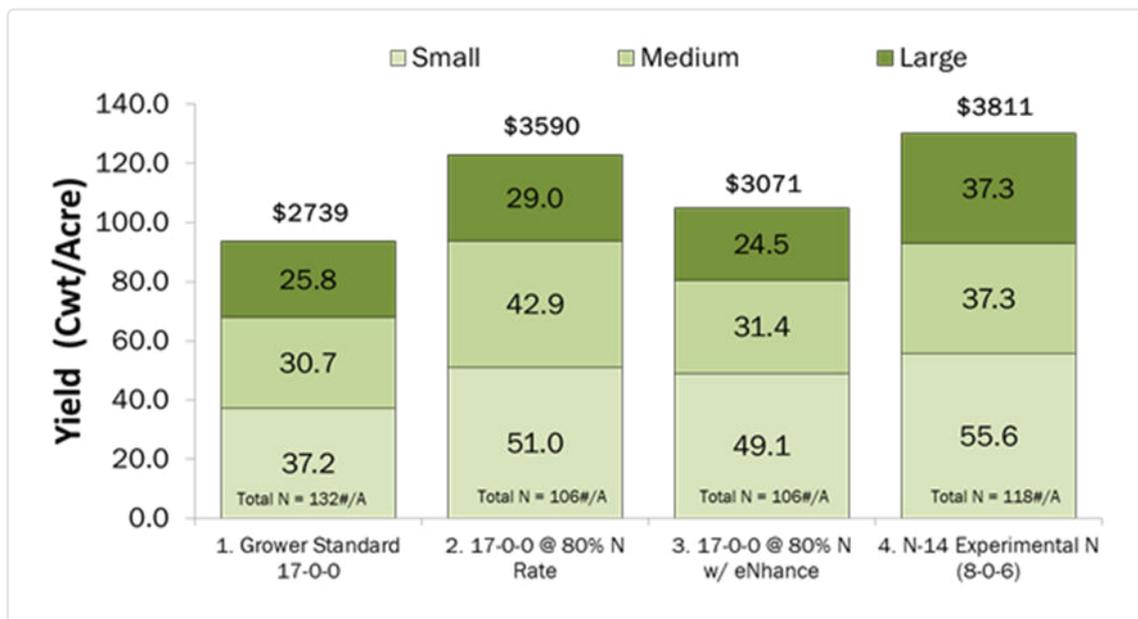


Figure L1. Effect of nitrogen fertility program s on the size and yield of broccoli, data are the combination of two harvests, 89 & 97 days after planting. Market values are based on local prices at the time of harvest for each grade of broccoli.

Table B1. Nitrogen fertility program comparisons for broccoli production, Guadalupe, CA 2014

Trt No.	Treatment Name	Form Conc	Form Unit	Form Type	Appl Description	Rate Rate	Appl Unit	Appl Code	*Value \$/Acre
1	6-24-24	6 %		GR	Preplant Incorp	300 lb/a		A	\$2,739
	17-0-0	17 %		L	Preplant Drip	21 gal/a		B	
	17-0-0	17 %		L	At Thinning	10.1 gal/a		C	
	17-0-0	17 %		L	BiWeekly Post Thin Drip	10.1 gal/a		DEF	
	Conventional - Grower Standard								
2	6-24-24	6 %		GR	Preplant Incorp	300 lb/a		A	\$3,590
	17-0-0	17 %		L	Preplant Drip	16.8 gal/a		B	
	17-0-0	17 %		L	At Thinning	8.1 gal/a		C	
	17-0-0	17 %		L	BiWeekly Post Thin Drip	8.1 gal/a		DEF	
	80% Nitrogen								
3	6-24-24	6 %		GR	Preplant Incorp	300 lb/a		A	\$3,071
	17-0-0	17 %		L	Preplant Drip	16.8 gal/a		B	
	eNhance	0 %		L	Preplant Drip	16.5 fl oz/a		B	
	17-0-0	17 %		L	ATTHIN	8.1 gal/a		C	
	eNhance	0 %		L	ATTHIN	8 fl oz/a		C	
	17-0-0	17 %		L	BiWeekly Post Thin Drip	8.1 gal/a		DEF	
	eNhance	0 %		L	BiWeekly Post Thin Drip	8 fl oz/a		DEF	
	80% Nitrogen w/ eNhance								
4	6-24-24	6 %		GR	Preplant Incorp	300 lb/a		A	\$3,811
	N-14	8 %		L	Preplant Drip	45.2 gal/a		B	
	N-14	8 %		L	At Thinning	25.8 gal/a		C	
	N-14	8 %		L	BiWeekly Post Thin Drip	25.8 gal/a		DEF	
	N-14 = Experimental Nitrogen								

\*Gross income per acre based on grades and local market prices at the time of harvest

## Conclusions:

- Crop values were determined based on local market prices for the central coast of California during the week this trial was harvested. The N-14 treatment (#4) yield estimated a gross returns of \$ 3811/Acre or \$740 more per acre than the eNhance-treated plots on average (Trt #3).
- The grower Standard fertility program (Trt #1) had the lowest yield and gross value (\$2739/A) of any treatment in this trial. Despite using 20% less nitrogen, treatment #2 had a much higher gross value per acre, \$3590/A. The full nitrogen program (Trt #1) produced greenest broccoli (data not presented), but the application rate was in excess of plant needs and consequently reduced total yields.
- The use of eNhance with nitrogen solutions would improve the nutrient usability and provided more plant available nutrition to the crop. The nitrogen availability with this program reduced the yields compared to the 80% program (Trt #2), but not as low as the 100% rate of the grower standard. Had the nitrogen rate been pulled back even lower when eNhance, yield levels may have been maintained or improved over the 80% program.
- Differences in head size can be tied to crop maturity, so difference in fertility may have also influenced crop maturity. Therefore, it will be important to monitor changes in maturity when adjusting nitrogen fertilizer products.
- Additional details for the remote sensing data collected for this trial as well as weather and specific irrigation information are available upon request, these pages are intended to summarize key points from this contract research trial by Pacific Ag Research, San Luis Obispo, CA