

2012 Onion Fertilizer Trial

Rob Wilson, Center Director/Farm Advisor; Don Kirby, Superintendent of Agriculture; Darrin Culp & Kevin Nicholson, Staff Research Associates. University of California Intermountain Research & Extension Center, 2816 Havlina Rd. Tulelake, CA. 96134 Phone: 530/667-2719 Fax: 530/667-5265 Email: rgwilson@ucdavis.edu

Introduction:

In recent years, Tulelake growers expressed interest in investigating the influence of nitrogen application timing on processing onion yield. Onion growers are also interested in fertilizer additives, biological products, and specialty fertilizers. This study evaluated applying supplemental nitrogen at different rates and application times in addition to IREC's normal onion fertilizer program. The study also evaluated compost, compost teas + fish emulsion, humic acid, and specialty products when used in combination with IREC's normal onion fertilizer program.

General Trial Information

Location:	Tulelake, CA
Soil Type:	Tulebasin mucky silty clay loam 4.2% organic matter
Planting Date:	April 28 th , 2012
Harvest Date:	October 2 nd , 2012
Irrigation:	Solid-set sprinklers
Plot Size:	6 ft (2 beds) by 30 ft
Bed (row) Spacing:	36 inches; 4 seed-lines per bed spaced 6 inches apart
Trt Replication:	6 replications; RCB design
Onion Seed Source:	Olam (87% germination)
Seeding Rate:	1200 seeds per plot (348,500 seeds per acre)
Herbicides:	Prowl H20, Goal 2XL, Outlook
Fungicides:	Folicur, Bravo Weather Stick, Manzate
Insecticides:	Radiant, Movento, Lanate, Lorsban 60

Fertilizer Application Methods:

Fertilizer treatments are detailed in Table 1. Shortly before planting, a liquid fertilizer blend consisting of 64 lb N/A, 62 lb P2O5/A, 20 lb K2O/A, and 19 lb of S/A was applied in three bands placed 2 inches below and to the side of the onion seed rows 1 week before planting. Supplemental nitrogen was applied as granular urea broadcast over each plot. Supplemental nitrogen, compost, compost tea, and humic acid applied at planting were broadcast and then rototill incorporated into the top 2 inches of the bed 1 day before planting. Nitrogen applied after planting was broadcast and then immediately irrigated with 1 inch of water for incorporation. Postemergent liquid compost tea, fish emulsion, humic acid, and specialty products were applied with a CO₂ backpack sprayer at 45 GPA. Plots were irrigated within 24 hours after treatment according to manufacturer recommendations. Organic and plant-

available nitrogen released from compost and fish emulsion was not included in nitrogen application rate calculations.

Onion Stand Count, Onion Vigor, and Onion Yield:

Onion stand density was measured by counting the number of green onions in every plot at the 5-leaf stage. A visual evaluation of onion stand and vigor was estimated in each plot on June 20th and August 14th using a 0 to 10 scale. 0 = 100% stand loss and 10 = highest stand and vigor in the trial (Fig 2). Yield was measured by harvesting and weighing all onions in each plot on 10/4/2012.

Table 1. 2012 Fertilizer Trial Treatment List & Application Times

Trt #	Fertilizer treatment	Product rate/A	Pre-Plant Application lbs N/A ¹	Total lbs N/A through season ¹	At planting	Every 2 weeks from emergence until 8-15	2-leaf stage	3-leaf stage	Every 2 weeks from 5-leaf until 8-15	6-leaf stage	9-leaf stage	11-leaf stage
1	Normal Fertilizer Progam (untreated)		X- 64 lb N	136 lb N								
2	Compost	3 ton	X- 64 lb N	136 lb N								
3	Compost	10 ton	X- 64 lb N	136 lb N								
4	Compost Tea (foliar) Compost Tea (foliar) Fish Plus Organic (foliar)	10 gallon 5 gallon 2.5 gallon	X- 64 lb N	136 lb N	X	X X						
5	Compost Tea (foliar) Fish Plus Organic (foliar)	5 gallon ³ 2.5 gallon	X- 64 lb N	136 lb N				X X				
6	Compost Compost Tea (foliar) Compost Tea (foliar) Fish Plus Organic (foliar)	10 ton 10 gallon 5 gallon 2.5 gallon	X- 64 lb N	136 lb N	X X	X X						
7	Humic Acid Blend	10 gallon	X- 101 lb N	173 lb N	X		X				X	
8	Additional 30 lb N/A (planting) ²		X- 94 lb N	166 lb N	X							
9	Additional 60 lb N/A (planting) ²		X- 124 lb N	196 lb N	X							
10	Additional 120 lb N/A (planting) ²		X- 184 lb N	256 lb N	X							
11	Additional 60 lb N/A (2-leaf) ²		X- 64 lb N	196 lb N			X					
12	Additional 60 lb N/A (6-leaf) ²		X - 64 lb N	196 lb N						X		
13	Action Bio-Forge Nitro + 9 Root Power	1 pint 1 pint 5 gallon 1 pint	X- 64 lb N	136 lb N				X		X	X X	X X

Treatment Notes:

¹ All treatments received 64 lbs N/A shank-injected preplant. An additional 73 lbs N/A was split applied from June 21 to August 11th as UAN 32 applied via chemigation. Plant available and organic N released from compost and fish plus organic were not included nitrogen calculations.

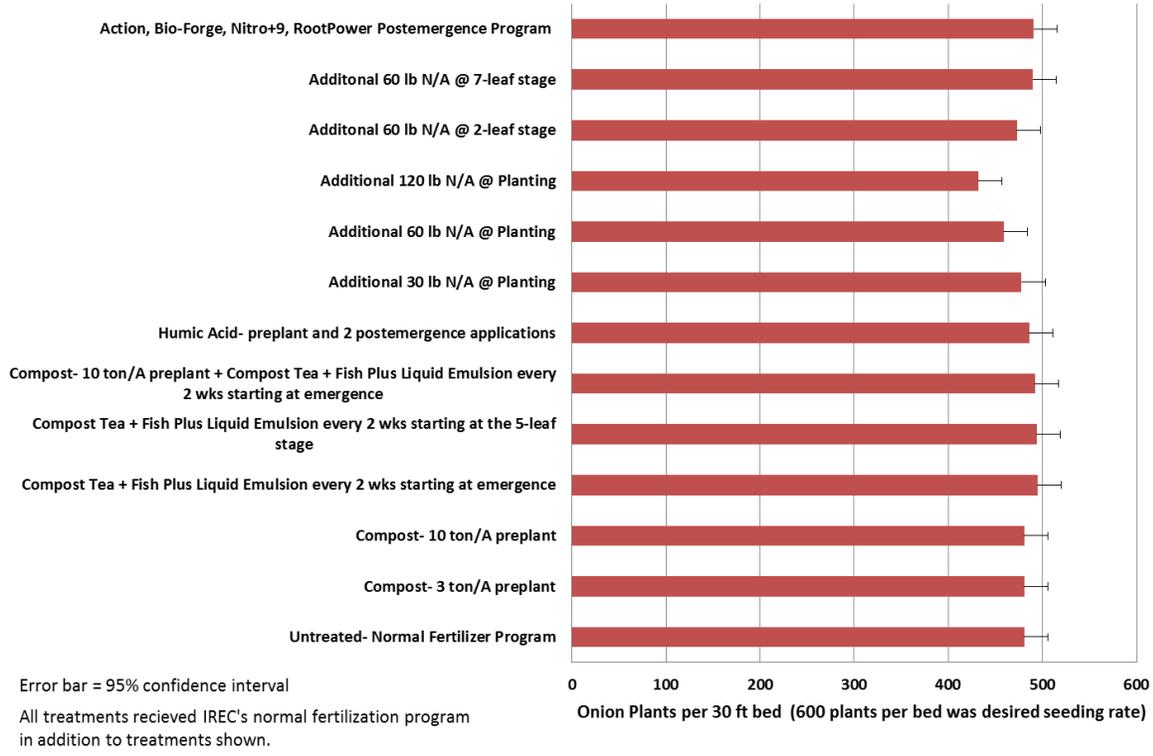
² Supplemental nitrogen applications for treatments 8-12 were applied as granular urea on top of the bed and then immediately irrigated with 1 inch water for incorporation.

³ 1st application of compost tea was 10 gpa, subsequent applications were 5 gpa.

Results:

Onion stand did not differ between treatments except treatments 9 and 10 (60 lb N/A and 120 lb N/A at planting). Applying 60 or 120 lb nitrogen per acre on top of the onion bed at planting in addition to preplant fertilizer reduced onion stand compared to the untreated control suggesting the additional nitrogen was phytotoxic. Visual vigor ratings at both evaluation times were similar across all treatments. Onion yield was similar across treatments. One year results suggest early season supplemental nitrogen and tested biological and specialty products did not benefit onion growth and onion yield when used in combination with normal fertilization practices. Applying supplemental nitrogen at planting did not increase onion yield and reduced onion stand at rates ≥ 60 lb N/A.

Influence of Fertilizer and Biological Products on Onion Stand at the 5-Leaf Stage at IREC in 2012



Influence of Fertilizer and Biological Products on Processing Onion Yield at IREC in 2012

