

YIELD EFFECTS OF HYDRA-HUME, TRAFIX ES CAL EIGHT, AND QHP ON WATERMELON

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Introduction

Humus is the organic component of soil that resists further decomposition. It results from the break down of organic material such as dead roots and other plant residues. Cultural practices that attempt to increase soil organic matter, such as conservation tillage and manure applications, all aim at eventually increasing the level of humus within a particular soil so that productivity can be maximized. Soluble humus present within a soil increases cation exchange capacity (CEC), water holding capacity, and tilth.

Humus is generally classified into three groups based on molecular weights. Humin is high in molecular weight, but insoluble in both acids and bases. Soluble humus includes both humic and fulvic fractions. Humus molecules that are moderate in weight (7000-700,000 Daltons) are humic acids. Humic acids are moderately dark brown in color and soluble in bases. Molecules that are low in molecular weight (700-7,000 Daltons) are referred to as fulvic acids. Fulvic acids are light yellow in color and soluble in acids and bases.

Horizon Ag-Products specializes in the manufacture and formulation of soluble humus products. Previous research has demonstrated that these products are capable of stimulating plant growth and yield in other regions but little information is available from the Southeast. In this experiment, several soluble humus products were applied alone and in combination to watermelon plots located within a commercial field near Tifton, Georgia. The yield and tissue responses were observed.

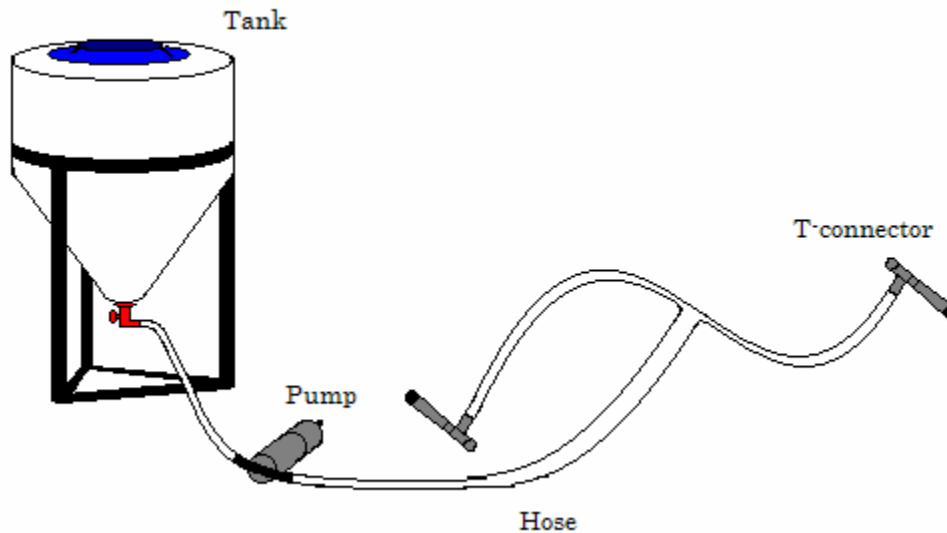
Materials and Methods

Products tested in this experiment were Hydra-Hume (Horizon Ag-Products), Hydra-Hume DG (Horizon Ag-Products), TraFix Es CAL Eight (Horizon Ag-Products), and QHP (Horizon Ag-Products). Hydra-Hume is a 0-0-1 fertilizer that contains high (12%) levels of humic acids in liquid formulation. Hydra Hume DG contains 70% humic acids in dry granular formulation. TraFix Es CAL Eight is a low pH fertilizer containing 5% nitrogen and 8% calcium as well as fulvic acids. QHP is a

new product containing both humic and fulvic acids as well as other organic components.

Products were injected through the field's drip irrigation system. The injection equipment (Figure 1) consisted of a 12 gallon cone tank, small injection pump, and a network of hoses. T-connectors were attached to the end of each hose which were attached to individual drip tape lines in the field in order to enable injection to take place. Injected products were mixed in the tank separately with 6 gallons of water per injection over approximately a ten-minute period. After injection, water was allowed to continue to be pumped through the drip tape in order to allow the injected products to be flushed from the lines and into the test area.

Figure 1



Watermelons were grown in a plasticulture production system. Plants were established in a commercial greenhouse and transplanted to the field March 11 in 6 foot row spacing and 18 inches in-row plant spacing. Pre-plant fertility included broadcast applications of 5-10-15 fertilizer (1000 lb/A), dolomitic limestone (1 ton/A), and gypsum (0.5 ton/A). Also, 20-20-20 fertilizer (5 lb/A) was foliar applied at first harvest (June 8) and two weeks following first harvest (June 22). Plot fertility also included 7-0-7 fertilizer (100 gal/A) and calcium nitrate (50 gal/A), each injected in small amounts throughout the growing season to total the given rates. Standard management practices for pest management and irrigation were followed by the grower.

Experimental plots were laid out in a Randomized Complete Block design consisting of 11 treatments, each replicated four times. Vines were turned back from the row middles on an as-needed basis in order to prevent vines and fruit from growing in adjacent plots. Hydra-Hume, Hydra Hume DG, TraFix Es CAL Eight, and QHP were applied alone and in combination at various rates and timing as shown in Table 1.

Results and Discussion

Data collection involved two harvests, the first on June 24 and the second on June 30. Watermelons weighing an average of 12 pounds were harvested on each date and the total number from each plot was recorded. All collections of data were analyzed electronically by the SAS system, and subjected to the analysis of variance (ANOVA) procedure. The results are presented in Table 2. Watermelon treatments showed no statistical differences when compared to the untreated check. The cool, wet season leading to delayed maturity may have affected the results of this test. Some disease (Gummy stem blight) appeared in the plots just before harvest, and could have been spread within the dense foliage that resulted when vines were turned.

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Table 1. Hydra-Hume, Es CAL Eight, and QHP treatments on experimental plots within a Tifton, GA commercial watermelon field.

Treatment and Description	Rate	Method	Date(s) Injected		
1 Untreated					
2 Hydra-Hume DG	40 lb/ac	Pre-plant broadcast	3/15		
3 Hydra-Hume	1 gal/ac	Inject at transplant	3/15		
4 Hydra-Hume	1 gal/ac/app	Inject at transplant - 3 gal. season long (spoon feed)	3/15	5/10	6/14
5 Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
6 Hydra-Hume DG	40 lb/ac	Pre-plant broadcast	3/15		
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
7 Hydra-Hume	1 gal/ac	Inject at transplant	3/15		
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
8 QHP	1.5 lb/ac/app	Inject every 4 weeks beginning at first flower		5/10	6/14
9 QHP	1.5 lb/ac/app	Inject every 4 weeks beginning at first flower		5/10	6/14
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
10 Hydra-Hume	1 gal/ac	Inject at transplant	3/15		
QHP	1.5 lb/ac/app	Inject every 4 weeks beginning at first flower		5/10	6/14
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
11 Hydra-Hume DG	40 lb/ac	Pre-plant broadcast	3/15		
QHP	1.5 lb/ac/app	Inject every 4 weeks beginning at first flower		5/10	6/14
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30

Table 2. Mean number of marketable melons by date treated with various rates and timings of soil amendments at Tifton, Georgia in 2005.

Treatment	Marketable Watermelons (No.)			Yield (lbs/A)
	24-Jun	30-Jun	Total	
01	11.0 A	14.0 AB	25.0 A	72,600
02	11.5 A	15.3 A	26.8 A	77,827
03	11.0 A	10.0 B	21.0 A	60,984
04	14.0 A	13.3 AB	27.3 A	79,279
05	12.0 A	13.8 AB	25.8 A	74,923
06	10.8 A	11.5 AB	22.3 A	64,759
07	9.8 A	11.3 AB	21.0 A	60,984
08	12.0 A	12.5 AB	24.5 A	71,148
09	13.3 A	13.0 AB	26.3 A	76,375
10	10.8 A	13.3 AB	24.0 A	69,696
11	9.8 A	11.0 AB	20.8 A	60,403
Mean of Test	11.4	12.6	24.0	69,696
L.S.D. (0.05)	4.7	5.1	9.0	
C.V. (%)	28.5	27.9	26.0	

*Means within a column followed by different letters were significantly different (P=0.05, LSD, ANOVA).