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Response of Sweet Corn and Snapbean to Grow-Plex Humate 97-07

George J. Hochmuth[1]

Materials and Methods

The objective of this research was to evaluate the effect of Grow-Plex SP humate (Earthgreen Products, Inc., Dallas, TX) on sweet corn and snapbean early plant vigor and yield. Snapbeans and sweet corn were fertilized with several rates of N to determine if use of humate would result in reduced N requirement. The trial was conducted at the University of Florida's Horticultural Research Unit in Gainesville, FL. The soil for the test was an Arrendondo fine sand which was plowed and disced on 11 April 1997. Soil tests (Mehlich-1) showed the soil was medium in K, and high in P, Mg, Ca, and micronutrients. Nitrogen from ammonium nitrate and K from potassium sulfate were incorporated in the soil in beds at 20 lbs per acre each. Beds were formed on 4-foot centers with a combination rototiller and bed press. Beds were 24 inches wide across the top and 6 inches in height.

Following bed shaping, plots were marked off, 20 ft for snapbean and 30 ft for sweet corn. Two grooves were pressed in the bed surface 12 inches apart for the crop rows. Snapbean and sweet corn seeds were dropped mechanically into the furrows. Cultivars used were 'Caro' snapbean and 'Festival' sweet corn (both Asgrow Seed Co., Kalamazoo, MI).

Grow-Plex SP humate was suspended in water with Earthgreen Synfactant (Earthgreen Products, Dallas, TX) and sprayed in the seed furrow at 0, 1, or 2 lbs humate per ace. A starter fertilizer solution, ammoniated monopotassium phosphate (LidoChem, Hazelet, NJ) was sprayed into the seed furrow to achieve 10 lbs P_2O_5 per acre. Applications of humate and fertilizer solution were made with a backpack CO_2 powered sprayer with a fan nozzle delivering 30 gal/A at 30 PSI pressure. Seeds were immediately covered with soil after humate application and experimental areas were irrigated with overhead sprinkler to moisten the soil surface.

Each crop received two side dressings of N (ammonium nitrate) formulated to provide several seasonal rates of N as a proportion of the base recommended rate of N for each crop (90 lbs N/acre for snapbean and 150 lbs N/acre for sweet corn). Treatment N rates were 0, 25, 50, 75, 100% of the base N rate. Potassium (potassium sulfate) was applied with each side dressing to achieve 50 lbs K_2O per acre with each side dress application.

The first side dress was made on 1 May when the snapbeans had the first trifoliate leaf just emerging and the sweet corn plants were 2 inches tall. The second side dress

[1] George J. Hochmuth, Professor, Horticultural Sciences Department, University of Florida, IFAS, Gainesville, FL 32611

application was made on 12 May when the snapbeans were 4 inches tall and the corn plants were 6 inches tall. All side dress applications were made in a furrow in the bed center between the rows of plants.

Plant vigor was rated on one occasion for snapbean (prior to trifoliate leaf emergence) and on two occasion (2 and 4 leaf stages) for sweet corn. Rating was made on a scale of 1=yellow, very small plants to 5=dark green, vigorous plants.

Crops were irrigated with sprinklers to maintain soil moisture in the soil at -10 cb on a tensiometer with the ceramic tip placed 6 inches deep in the root zone. Pests were managed with timely applications of labeled pesticides.

Snapbeans were harvested once on 9 June and sweet corn was harvested once on 25 June. All data were statistically analyzed by analysis of variance.

Results

Snapbean results are summarized in Table 1. During herbicide application to sweet corn, some herbicide was accidentally applied to the snapbeans causing loss of about 20% of the plots. With excessive loss of plots, a detailed analysis of variance was not made. Means for yield with N treatments ranged from 160 boxes per acre with 0 N to 276 boxes with 100% of base N (90 lbs N per acre). Yields with 75 and 100% ob base N were similar. Humate appeared to have little effect on snapbean yield or early plant vigor.

Eight sweet corn plots were lost due to poor seedling emergence but the data analysis was completed successfully with those missing plots (Table 2). Neither nitrogen rate nor humate had significant affects on early plant vigor but both treatments affected sweet corn yield. There was no interaction of N rate and humate rate for effects on sweet corn. Sweet corn yield increased with N rate to 100% of base rate (150 lbs N/acre) with an extremely good yield of 454 boxes/acre. Humate at 1 lb/acre increased yield over sweet corn without humate. Increasing humate to 1 lbs/acre slightly reduced yield compared to yield with 1 lb humate per acre.

These results indicated a possible positive effect for humate used in the seed furrow for sweet corn, but no effects were observed for snapbeans. Trials should be repeated to confirm these results since missing plots created uncertainty about conclusions.

Table 1. Effects of Grow-Plex humate on snapbean, Gainesville, FL. Spring 1997.

Nitrogen % of base[z]	Grow-Plex lbs/acre	Plant Vigor[y] unifoliate stage	No. Plants[x] Per Plot	Number 30-lb boxes/acre
0		2.7	59	160
25		3.7	72	177
50		4.3	64	257
75		3.5	55	272
100		3.8	64	276
	0	3.5	63	222
	1	3.8	50	231
	2	3.5	65	228

[z] Base for snapbean is 90 lbs N per acre.
[y] Vigor is rating of 1=yellow, small, 5=vigorous, dark green.
[x] Number plants in plot are of 10 ft by 4 ft with two rows of snapbeans.

Table 2. Effect of Grow-Plex humate on sweet corn, Gainesville, FL. Spring 1997.

Nitrogen % of base[z]	Grow-Plex lbs/acre	Plant Vigor[y]		No. Plant[x] Per Plot	Number 42-lb boxes/acre
		2-leaf	4-leaf		
0		1.7	2.3	49	36
25		3.0	2.8	42	183
50		2.8	2.0	49	179
75		3.0	2.6	52	405
100		3.4	2.5	60	454
		NS	NS	NS	**
	0	2.8	2.2	48	225
	1	3.1	2.7	56	380
	2	2.8	2.5	48	286

[z] Base for sweet corn is 150 lbs N per acre.
[y] Vigor is rating of 1=yellow, stunted, 5=vigorous, dark green.
[x] Number plants in plot are of 30 ft by 4 ft with two rows of sweet corn.