Using Stimplex and Acadia LSC in watermelon production to reduce nitrogen usage

Gerald Brust, IPM Vegetable Specialist
University of Maryland
2005 Largo Rd Upper Marlboro, MD 20774
jbrust@umd.edu
September 2008

Objective: Evaluate Stimplex and Acadia LSC on yield of watermelon under two fertilizer regimes at two different sites.

Material and Methods: There were two sites for the study, one at the Lower Eastern Shore Research and Education Center (LESREC near Salisbury, MD) and the other at the Central Maryland Research and Education Center-CMREC (located just north of Upper Marlboro, Maryland). Treatments at LESREC were: Nitrogen applied at planting at the rates 100 and 150 pounds/acre and Stimplex and Acadia LSC applied at 1.5 quarts/acre 2 weeks after transplant (June 10), at bloom (June 20), at fruit set (July 1) and approximately two weeks after fruit set (July 11) and 4 weeks (July 24) after fruit set. At CMREC nitrogen was applied at 100 and 150 lbs/acre and Stimplex and Acadia LSC were applied as above (June 17, June 26, July 8, July 18 and July 25). There were 6 rows of plastic 100 feet long with drip irrigation in each rep. There were 5 reps. Transplants of "Crimson sweet" went to the field at LESREC on May 28 and at CMREC on June 3, 2008 at a 3 ft spacing, 33 plants/row. Nitrate-N petiole-sap readings were taken with a Cardy meter starting on June 30 and every 7-10 days through July until harvest from each row. Plants were treated with Bravo three times at LESREC and twice at CMREC for foliar disease. Yields were taken on August 1 at LESREC and August 5 at CMREC and consisted of weight and number of melons. Data were analyzed using ANOVA and Orthogonal Contrasts to separate means (SAS, 2008).

Results/discussion: This summer we had good rainfall and plants grew quickly at both locations. Little foliar disease was observed at either study site, however, at CMREC some plants started to show signs of yellowing and wilting at the time of flowering. They were found to have fusarium crown and root rot (*Fusarium oxysporum*) a soil disease commonly found in cucurbit growing areas. By July 7 and 14, there were significantly ($P \leq 0.05$, orthogonal contrasts) more plants in the non seaweed treated plots that died from this disease than in the seaweed treatments (Table 1). By late July 30% of the watermelon plants were dead in the non seaweed treated plots.

Table 1. Percentage of watermelon (*Crimson Sweet*) killed by crown rot in seaweed treated and non-treated plots at CMREC

	Percent Plants Killed by Crown Rot		
Treatment Date:	July 7	July 14	July 21
No seaweed	20.6 a	27.3 a	30.2 a
Stimplex	5.4 b	7.6 b	10.1 a
Acadia LSC	4.6 b	6.1 b	9.8 b
Means within a column with different letters are significantly different at the $P \leq 0.05$ level.			

Nitrate petiole sap readings in the 100 lbs. of N+seaweed plots gave readings (Nitrate-N ppm) similar to the 150 lbs. of N treatments. Nitrate readings at CMREC were unusually 20% greater than LESREC's until the July 30 readings. Acadia LSC and Stimplex gave similar readings at the 100 and 150 lbs of N Fertility Levels.

Table 2. Nitrate-N concentration (ppm) taken from petiole sap in watermelon treated and not-treated with seaweed.

Treatment:	100lbs. N		150lbs.N		100+Stimplex		100+Acadia		150+Stimplex		150+Acadia	
Location:	LESREC	CMREC	LESREC	CMREC	LESREC	CMREC	LESREC	CMREC	LESREC	CMREC	LESREC	CMREC
Date												
July 1	1000	1350	1200	2000	1350	2000	1250	2050	1400	2400	1550	2500
July 15	800	1500	950	1750	1000	1850	1150	1950	1200	2000	1250	2100
July 30	500	800	800	1000	800	1300	850	1150	1000	1300	1000	1350

Yields of watermelon were greatest in the Stimplex +150 lbs of N compared with any other treatment other than Acadia LSC +150 lbs. at both sites (Table 3). Using 100 pounds of nitrogen was not enough to produce adequate yields at either site. However, by adding either seaweed product to 100 lbs of N produced yields equivalent to adding 150 lbs of N with no seaweed. This result was observed at both sites. The number of watermelon fruit did not differ between treatments (Table 3).

Table 3. Watermelon Yields (weight in lbs) in Seaweed and Non-Seaweed Treated Plots

Treatment	Pounds of Watermelon [1]		Number of Watermelons[1]	
	LESREC	CMREC	LESREC	CMREC
100 lbs	201.4a	263.8 a	21.3a	18.75 a
150 lbs.	257.1 b	304.2 bc	19.7a	18.31 a
Stimplex + 100	269.7 b	287.3 ab	20.6a	19.88 a
Acadia LSC + 100	283.2 bc	297.3 b	21.2a	19.22 a
Stimplex +150	326.3 d	345.9 d	22.4a	19.75 a
Acadia LSC + 150	311.2 cd	327.5 cd	23.2a	20.25 a

[1]Means with different letters within a column are significantly different from one another at the $P < 0.05$ level, orthogonal contrasts.

Summary: One hundred pounds of N alone was not enough to produce good yields; however, with 100 lbs of N and the addition of either seaweed product, yields increased significantly giving results equivalent to using 150 lbs. of nitrogen. By using the seaweed extract it is possible to reduce nitrogen applications and yet increase yields. Using either product seemed to compensate for the poor soils at LESREC as this site produced yields equivalent to the CMREC site when seaweed was used.