# HORTICULTURE
# FIELD DAY REPORT - 1998

**TEXAS A&M UNIVERSITY AGRICULTURAL**
**RESEARCH and EXTENSION CENTER**
**at OVERTON**

**Texas Agricultural Experiment Station**
**Texas Agricultural Extension Service**
**Texas A&M University**

**June 18,1998**

**Research Center Technical Report 98-2**

---

# CARPRAMID AS A NUTRIENT ABSORPTION ENHANCER DID NOT IMPROVE GROWTH, YIELD, OR PHOTOSYNTHESIS OF MUSKMELON OR BELL PEPPER

J. T. Baker, F. J. Dainello, and D. R. Earhart

**Background.** Carpramid is the active ingredient of a product known as AmiSorb® manufactured by Amilar® International from ingredients found in the Nutrasweet® sweetener. This compound is a long-chained polymer, polyaspartate. It is currently being marketed as a soil- or irrigation water-applied growth enhancer for vegetable crops. Preliminary tests at other locations have indicated yield increases of 10 to 15%, as well as reducing time to maturity by seven to ten days for several vegetable crops including cabbage, celery, lettuce, peppers, potatoes, and tomatoes. Proposed physiological mechanisms behind these effects include enhanced nutrient uptake due to greater root growth and/or the long-chained polyaspartate molecules adhering to the roots and acting as extensions of the root hairs in nutrient uptake. To date, we know of no refereed reports of studies that substantiate these claims. Our objective was to evaluate the growth, yield, and leaf photosynthetic responses of muskmelon and bell pepper to a range of carpramid application rates in both field and greenhouse experiments.

**Research Findings.** For the greenhouse experiment, measured growth parameters were unaffected by carpramid treatments for muskmelon or bell pepper (data not shown). Shown in Table 1 are total yield and fruit numbers across carpramid treatments for the muskmelon and bell pepper in the field experiment. No significant differences were detected among these comparisons and tests of the linear relationship between yield or fruit numbers and carpramid treatment indicated that none of these slopes were significantly different from zero. Although carpramid treatment had no effect on light saturated leaf photosynthetic rate ($A_{max}$), $A_{max}$ was roughly doubled from the first to about the 6$^{th}$ leaf on the vine (Fig. 1). Entry of solutes into the xylem is metabolically regulated by the plant and does not occur freely from the soil solution in large amounts. Given this metabolic control of nutrient uptake by the plant and lack of significant carpramid treatment effects on plant responses, we conclude that under our experimental conditions (e.g. optimal water and fertilizer application, adequate pH, etc.) the plants had sufficient access to soil nutrients.

**Application.** Carpramid treatments did not result in increased growth, yield, or leaf photosynthesis. We conclude that this product should be tested under nutrient limiting conditions as well as possibly at higher rates before being recommended as a nutrient absorption enhancer for commercial growers.

Table 1. Effect of AmiSorb treatment on yield of muskmelon and bell pepper.

| AmiSorb treatment ppm | Muskmelon | | Bell pepper | |
|---|---|---|---|---|
| | Total fruit no. 1000s/acre | Total fruit wt. t/acre | Total fruit no. fruit/plant | Total fruit wt. lbs/plant |
| 0 | 7.0 a[z] | 19.9 a | 10.6 a | 2.2 a |
| 500 | 6.5 a | 19.4 a | 9.2 a | 1.5 a |
| 1000 | 6.2 a | 19.4 a | 10.7 a | 2.2 a |
| 1500 | 6.8 a | 21.7 a | 10.6 a | 2.0 a |
| 2000 | 6.7 a | 19.0 a | 9.8 a | 1.5 a |
| $\beta_1$ | NS | NS | NS | NS |

[z]Mean separation within columns by Duncan's multiple range test, $P \leq 0.05$.
NS, *Nonsignificant or significant ($P \leq 0.05$) slope ($\beta_1$) for testing $H_o: \beta_1 = 0$.

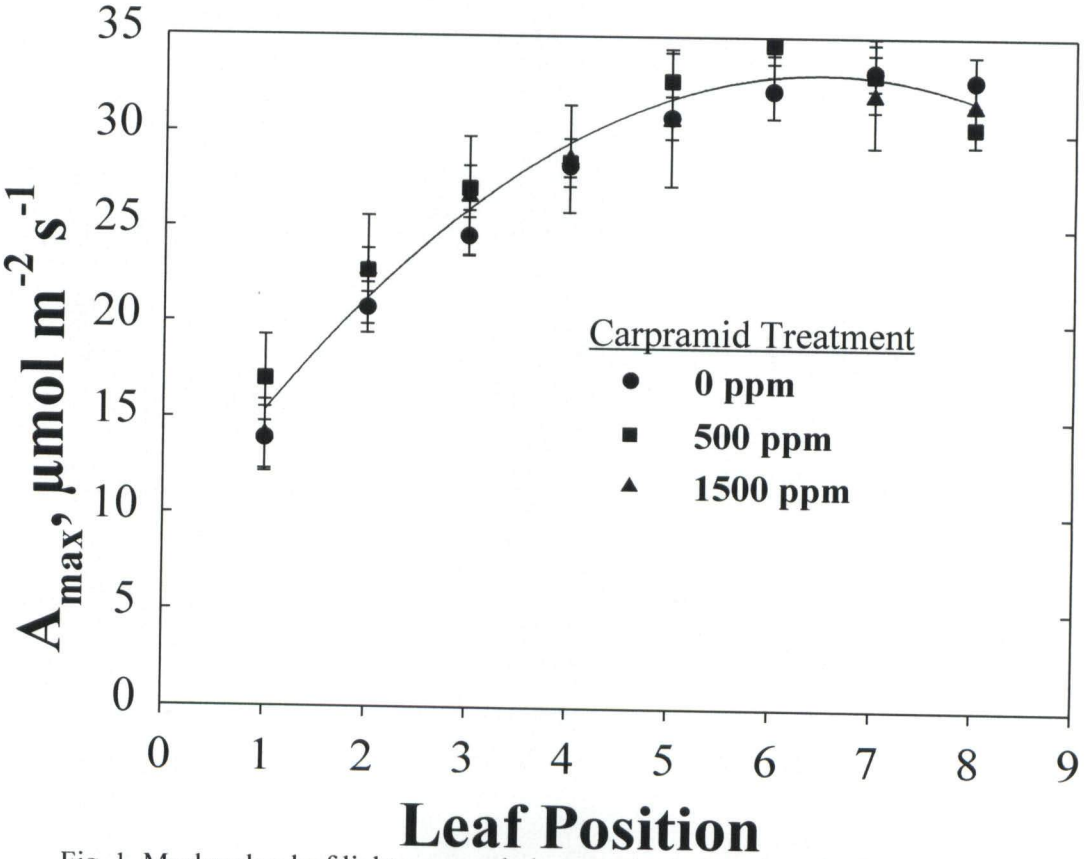


Fig. 1. Muskmelon leaf light saturated photosynthesis ($A_{max}$) vs. leaf position on the vine. Vertical bars are ±SE.