

## Vital Earth Resources

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# 2014 Crop Results

## Vitazyme on Black Beans (*Phaseolus vulgaris* L.)

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Research organization: University of the Caribbean

Location: Cul-de-sac Farm, Damien, Haiti

Planting date: December 27, 2012

Variety: Sequia 342-87

Seeding rate: 240 seeds/plot

Experimental design: A black bean field experiment was laid out having four treatments, in a randomized complete block design (four replicates), with the purpose of determining the efficacy of Vitazyme to improve the growth and yield of the beans. Commercial fertilizer, manure, and an organic fertilizer were evaluated along with Vitazyme.

1. Vitazyme

2. Supermagro

3. Manure

4. Fertilizer

Fertilization: none

Vitazyme application: (1) Seed treatment (rate unknown); (2) foliar and soil application (rate and timing unknown)

Supermagro application: Supermagro is an organic fertilizer made from anaerobically composted manure from manure of the central unit at Damien. Rate and timing of applications are unknown.

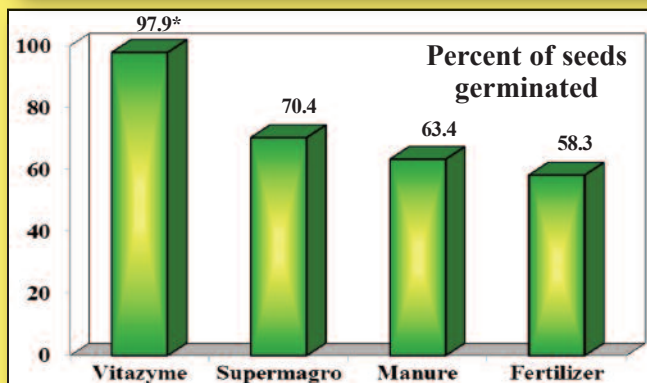
Manure application: Rate and timing are unknown.

Fertilizer: An application of 12-12-20% N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O was made, presumably shortly before planting, and the rate is unknown.

Statistical analysis: An analysis of variance was performed on the collected data of each parameter.

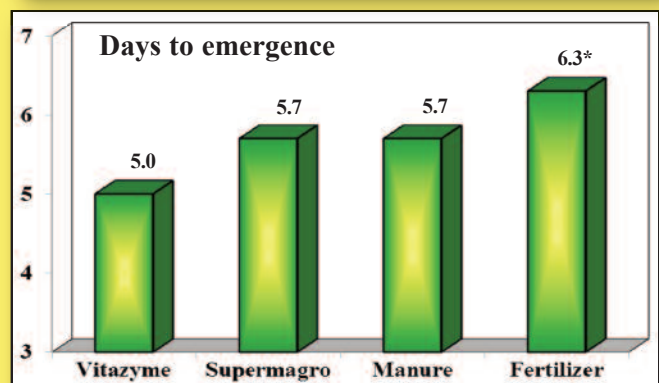
Bean growth results: Comparisons are made between Vitazyme and the commercial fertilizer values to obtain comparison values.

### Percent Germination



\*Significantly greater than the other treatments.

### Time to Emergence



\*Significantly greater than the other treatments.

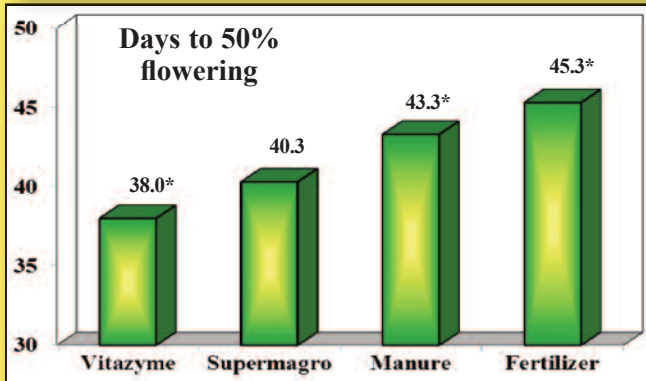
**Increase in germination with Vitazyme: 39.5 percentage-points**

Vitazyme greatly improved germination compared to the other treatments.

**Reduced time to emergence with Vitazyme: 1.3 days**

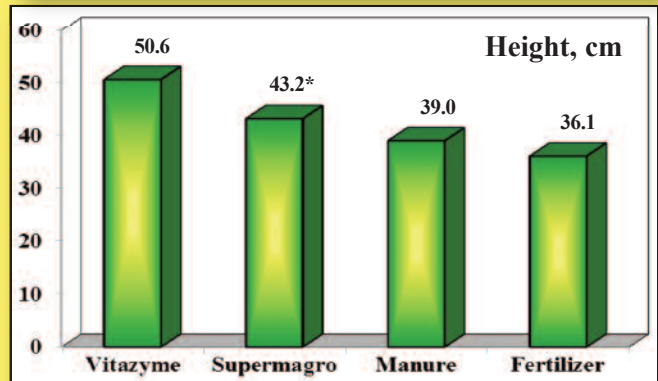
Compared to the other treatments, Vitazyme greatly increased growth rate and reduced the days to emergence.

**Days to 50% Flowering<sup>1</sup>**



<sup>1</sup>The days from planting to when 50% of the plants begin to flower.  
\*Significantly greater than the other treatments.

**Plant Height at 52 Days<sup>1</sup>**



<sup>1</sup>The height to the top leaves of 24 plants.  
\*Significantly greater than the other treatments.

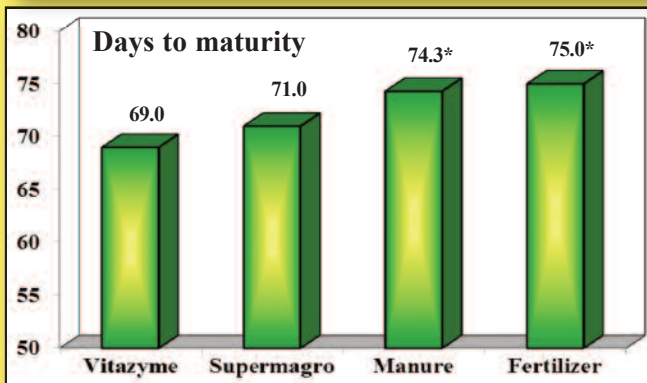
**Reduced time to 50% flowering with Vitazyme: 7.3 days**

Vitazyme treatment greatly reduced the time to flowering, especially compared to manure and fertilizer.

**Increase in plant height with Vitazyme: 40%**

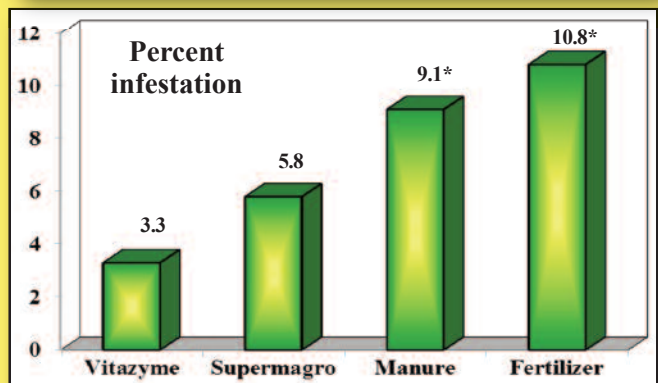
The Vitazyme and Supermagro improved plant height, at 52 days after planting, considerably above fertilizer alone.

**Days to Physiological Maturity**



\*Significantly greater than the other treatments.

**Insect Infestation<sup>1</sup>**



<sup>1</sup>Plants infestation by white flies (*Bemisia Tabaci*)  
\*Significantly greater than the other treatments.

**Reduced time to physiological maturity with Vitazyme: 6 days**

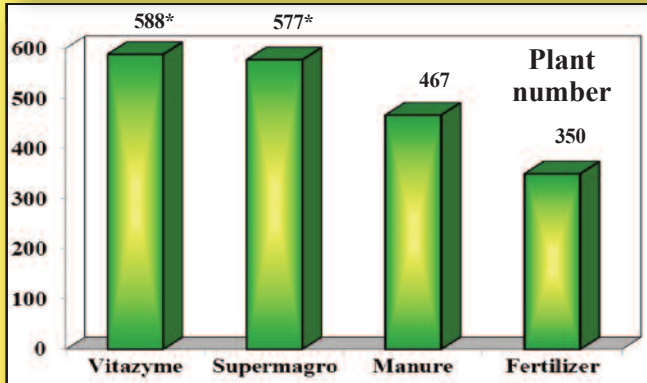
**Reduced insect infestation with Vitazyme: 7.5 percentage points**

Both Vitazyme and compost reduced the time to maturity of the plants, by 5.3 to 6.0 days.

Vitazyme and Supermagro repelled insects significantly better than did fertilizer and manure.

*Bean yield results:* Vitazyme results are compared with the fertilizer treatment.

### Plants Harvested<sup>1</sup>



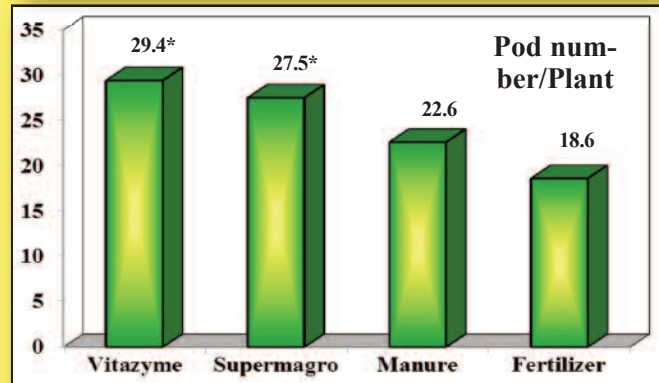
<sup>1</sup>Harvestable plants per treatment (3 reps).

\*Significantly greater than the other treatments.

**Increase in plants harvested with Vitazyme: 68%**

There was a great increase in plants that survived to harvest with Vitazyme and Supermagro.

### Pods Per Plant

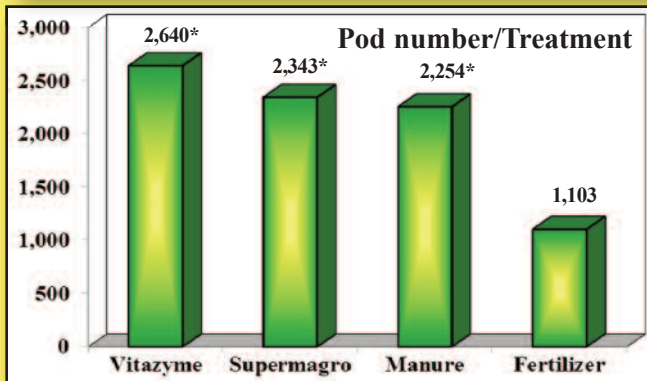


\*Significantly greater than the other treatments.

**Increase in pods/plant with Vitazyme: 42%**

Not only were there more plants with Vitazyme, but the pod number was greatly increased (42%).

### Pods Per Treatment

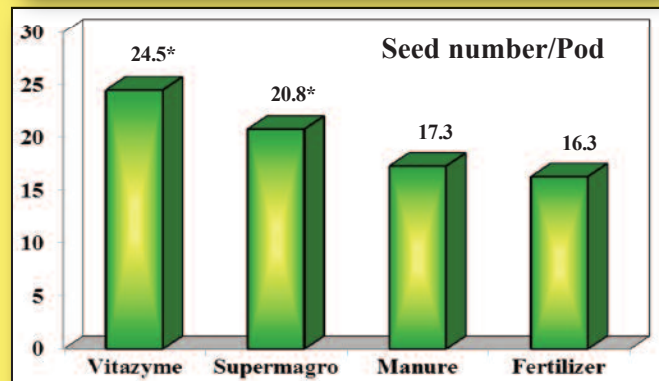


\*Significantly greater than the other treatments.

**Increase in pods/treatment with Vitazyme: 139%**

Because of fewer plants and fewer pods/plant, the Vitazyme, Supermagro, and manure plots had many more pods than the commercial fertilizer treatment.

### Seeds Per Pod

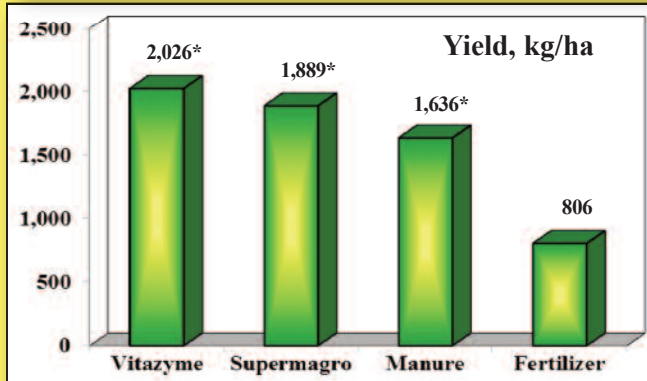


\*Significantly greater than the other treatments.

**Increase in seeds/pod with Vitazyme: 50%**

Besides having more pods/plant and more plants/plot, the Vitazyme treated plants had significantly more seeds in each pod, as did the Supermagro treatment.

## Final Yield

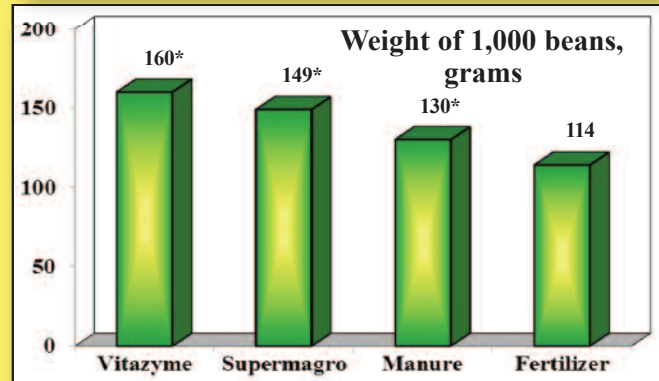


\*Significantly greater than the other treatments.

## Increase in bean yield with Vitazyme: 151%

Vitazyme, Supermagro, and manure all produced much greater yields than did fertilizer, with Vitazyme exceeding Supermagro yield by 7%, and the manure by 24%.

## 1,000-Bean Weight



\*Significantly greater than the other treatments.

## Increase in 1,000-bean weight with Vitazyme: 40%

All three organic treatments increased the bean weight significantly above the fertilizer treatment, with Vitazyme producing the heaviest beans,

**Conclusions:** A black bean trial in Haiti, comparing Vitazyme with a compost product (Supermagro), manure, and commercial fertilizer revealed that Vitazyme produced the best overall growth in terms of germination (+39.5 %-points), time to emergence (1.3 fewer days), days to flowering (7.3 fewer days), height at 52 days (+40%), days to maturity (6 fewer days), insect infestation (7.5 %-points), plants harvested (+68%), pods per plant (+42%), pods per treatment (+139%), seeds per pod (+50%), and 1,000-bean weight (+40%) compared to the fertilizer treatment. All of these factors worked together to give a 151% yield improvement above fertilizer alone, a 7% yield increase over Supermagro, and a 24% yield enhancement above manure. While the three products compared to Vitazyme are not similar in composition or mode of action, even so Vitazyme proved to be the superior plant growth and yield enhancer in the Haitian study.