



Crop Recommendations for Sugar Cane

Carry out **two applications** by spraying on the sugar cane crop (leaves and soil), **preferably in ratoon cane** (after the first harvest), **each at 1 to 1.5 liters per hectare** (cumulative dosage rate of 2 to 3 liters per hectare), the first application between 30 and 45 days after harvest, and the second application within 30 days after the first.

With less priority, apply to plant cane (first year crop), with the same dosage rates and methods previously quoted, the first application at around 60 days after planting and the second at 30 days later.

The final solution or volume of water plus Vitazyme solution per hectare should be sufficient for a good spray coverage, equivalent, in ground application, to around 200 liters per hectare in the first application and 300 liters per hectare in the second.

Vitazyme can be tank mixed with all farm chemicals, including herbicides, insecticides, fungicides, and fertilizers.

Below, results of Vitazyme in sugarcane in Cuba, Mexico, Indonesia and Viet Nam, are shown.

VITAZYME IN SUGARCANE, CUBA AND MEXICO.

Juan C. Díaz^a, Isel Creach^b, Rafael Zuaznabar^b, Martin Morales^b, Fidel Hernández^b, Inoel García^b, Omara Rojas^b; Juan Cruz Castañeda^c and Agustín Peralta^c. ^ajc Diaz1949@yahoo.es, Ag Biotech Inc. Latin America; ^bINICA, Cuba; ^cQuimica Lucava, Mexico.

SUMMARY

From 32 field trials conducted in eight sugar estates of six provinces between 2004 and 2008, in a cumulative area of 518 hectares of ratoon sugarcane treated with the natural biostimulant Vitazyme and 218 hectares of untreated control areas, an average cane yield increase of 15.69 t/ha, with an annual range between 11.02 and 17.04 t/ha, associated to increases in stalk length, diameter and weight, were recorded, resulting in mean profits of US\$ 535/hectare, and a cost-benefit ratio (profit/costs) of 3.5, at a sugar price of only US\$ 0.20/lb. Initial results of two other trials from Estipac, Jalisco, Mexico, in 2012-2013, showed a similar yield increase with Vitazyme: 15 t/ha. Greater yield increases were recorded in ratoon cane (after first harvest) than in plant cane. Best programs were two to three foliar sprayings, with one month interval from 30-60 days after previous harvest, each at 1 to 1.5 L/ha, for a cumulative 2 to 3 L/ha. Alternately, the possibility of reducing fertilization between 25% and 50% when Vitazyme is applied, and producing similar to higher yields, was observed in two trials. No differential yield response by soils or varieties and no effect on sugar content were observed.

Keywords: Vitazyme, biostimulant, sugarcane.

VITAZYME EN CAÑA DE AZÚCAR. A partir de 32 ensayos de campo realizados en ocho empresas-ingenios de seis provincias entre 2004 y 2008, con un área acumulada de 518 hectáreas tratadas más 218 hectáreas de testigo no tratado, la aplicación del bioestimulante natural Vitazyme en cañas de soca (retoño) produjo un aumento promedio de rendimiento de caña de 15.69 t/ha, con rango anual entre 11.02 y 17.04 t/ha, asociado a aumentos de longitud, diámetro y peso de los tallos, resultando en utilidades (ganancias) de US \$ 535/hectárea, y costo-beneficio (utilidades/costos) de 3.5, a precio del azúcar de sólo US\$ 0.20/lb. Resultados iniciales de otros dos ensayos en Estipac, Jalisco, México en 2012-2013 mostraron un aumento similar de rendimiento de caña con Vitazyme: 15 t/ha. Se observó mayor incremento de rendimiento en socas (después de primera cosecha) que en plantilla. Los mejores programas resultaron entre dos y tres aspersiones al follaje, con intervalo mensual, desde 30-60 días de la cosecha previa, a dosis cada una entre 1 y 1.5 L/ha, para un acumulado de 2 a 3 L/ha. Alternativamente se observó en dos ensayos la posibilidad de reducir la fertilización entre 25% y 50% cuando se aplica Vitazyme y producir similar o mayor rendimiento de caña que el testigo no tratado con 100% de fertilización. No se observó respuestas diferenciadas de rendimiento por suelos ni por variedades ni efectos sobre el contenido de azúcar.

Palabras claves: Vitazyme, bioestimulante, caña de azúcar.

INTRODUCTION

Vitazyme is a natural biostimulant (with OMRI and BCS certifications), produced by a fermentation process that works through multiple active agents and multiple modes of action. It is a concentrated liquid, microbiologically produced from plant and marine materials, stabilized for long life. The main active ingredients are the high molecular weight alcohol 1-Triacontanol, the brassinosteroids homobrassinolide, dolicholide, homodolicholide and brassinone, Vitamins B1 (thiamine), B2 (riboflavin) and B6 (pyridoxine) and an important glycoside. Vitazyme improves nutrition efficiency and reduces multiple stresses. To increase photosynthesis, more CO₂ from the air is fixed into the tissues of the plant. The energy-rich compounds produced in the leaves through the mechanism are transferred to the root system and soil rhizosphere, where millions of bacteria, algae, fungi, protozoa and other organisms feed on this energy, which in turn, release stimulators and mineral nutrients for growth, which are taken up by the plant in a symbiosis. Thus, plant stress and limitations to growth and yield are reduced.

Vitazyme is manufactured by Vital Earth Resources, in Gladewater, Texas, is marketed internationally by Ag Biotech Inc. (www.agbioinc.com), of Lakeville, New York, both of USA, and is bottled and distributed in Mexico exclusively by Química Lucava, S.A. de C.V., Panamerican Highway km 284, 2nd Fraction Crespo, Celaya, C.P. 38110, Guanajuato, Mexico, phone 01800-7527478, with representatives by zones.

MATERIALS AND METHODS

Three small plots replicated trials were conducted during 2003-2005, of which two were in ratoon cycle, one in Dos Rios sugar company, Santiago de Cuba, in second ratoon cycle, starting with harvest in March 2003, variety C140-81, on dark Sialitic Plastogenic (Cambisol or Haplustert) soil; and another in España Republicana sugar company, of Matanzas province, in second ratoon cane of variety C323-68, on red Ferralitic (Ferralsol) soil, also starting in March 2003. According to the recommendation of the Fertilizers and Amendments Recommendations Service (SERFE) for ratoon cycle, in Santiago de Cuba was applied only 75 kg N/ha as 100% fertilization control; while in the trial of Matanzas the control with 100% fertilization received 130 kg/ha N (nitrogen) and 100 kg/ha K₂O (potassium). A third replicated trial, but in plant cane, was established in June 2003 in the Provincial Cane Sugar Research Station of Santiago de Cuba, Dos Rios, Palma Soriano, in C86-12 variety and same dark Sialitic Plastogenic (Cambisol or Haplustert) soil, without any fertilization.

The small plots were 64 m² (10 m x 4 rows) with rows spaced 1.6 m, except the trial of Matanzas where these were 2660 m² each. The trial layout was randomized blocks with four replications, except in that of Matanzas, with three. Assessments were made of the length, diameter and number of stalks in the two central rows. Also were determined at harvests the indexes Pol

(sucrose), Brix (soluble solids), and crop yields, which were submitted to simple classification ANOVA.

Simultaneously a total of 31 demonstration trials were conducted, including 29 between 2004 and 2008 in eight sugar companies in six provinces of Cuba, which totaled 518 hectares, and 218 hectares of untreated control, plus two demonstration plots in Estipac, Jalisco, Mexico in 2012-2013 (Guadalupe Torres and Eusebio “Adrian” Sánchez farms) in three treated and two untreated control hectares (see table). Each demonstration plot comprised between one and four fields, and adjacent had other untreated control fields of the same variety, crop cycle, age and soil conditions, where all other farm operations were the same, except the application of Vitazyme.

Sugar Company	Province	Small plots	Demonstration	Treated ha
Dos Ríos	Santiago	2	9	191.4
Chile	Santiago		1	43.7
Cristino Naranjo	Holguin		2	79.3
Fernando de Dios	Holguin		1	40.0
España Republicana	Matanzas	1	2	32.7
Héctor Molina	Havana		11	90.3
Carlos Baliño	Villa Clara		1	20.5
Uruguay	Sancti Spiritus		2	20.13
Subtotal eight companies	6 provinces	3	29	518,0
Estipac	Jalisco, Mex.		2	3.0
Total			31	521

RESULTS AND DISCUSSION

In initial trials on small plots during 2003-2005, in ratoon cycle, when Vitazyme was applied in three applications of 1 L/ha each, in Santiago de Cuba, on dark Sialitic Plastogenic soil, in combination with 50% and 100% of recommended fertilization, increased crop yields compared with 100% of the recommended fertilization without Vitazyme of 18.96 and 25.19 t/ha, respectively, were recorded, associated to increases in stalk length, diameter and weight (Table 1); and in Matanzas, on red Ferralitic or calcic Ferralsol soil, when Vitazyme was applied in combination with a 25% reduction of the recommended fertilizers (nitrogen and potassium) an increase in yield of 7.22 t/ha compared to the 100% fertilizer control was obtained (Table 2). These preliminary trial results suggest the possibility that Vitazyme can replace between 25% and 50% of the recommended fertilization, equaling or exceeding the yield of the control with 100% of the recommended fertilization. However, the highest yields were recorded with the application of Vitazyme combined with 100% fertilization (Table 1), therefore in all subsequent demonstration plot trials only the latter combination was used.

Under the same type of dark Sialitic Plastogenic Cambisol or Haplustert soil and in Santiago de Cuba locality, yield increases were lower in plant cane (first year) in comparison with ratoons. Thus, Vitazyme in three applications of 1 L/ha each (the best treatment) reached a 8.67 t/ha cane crop yield increase compared to the untreated control, much smaller than in ratoon (Table 3). It was also observed that a greater number of applications, up to five, did not improve the result.

As a result, the initial recommendations for commercial application since 2004 involved three sprayings of 1 L/ha each, to the foliage of sugarcane, mainly in ratoon cycle, and without change of fertilization. However, practical experience from 2004 until around 2006 showed several trial areas in which the third application, and sometimes even the second application were not possible due to delays in the availability of the product (mainly due to late payments) and consequent "close in" of the field rows of sugarcane, which prevented the transit within the field of the tractor sprayer and even manual backpacks sprayers. Also arose concerns, as the extent that the applied areas increased, that the requirement of spraying equipment by Vitazyme competed with the spraying of herbicides during the same spring-summer period. Table 4 summarizes all demonstration plots by harvest seasons from 2005 until 2008. Fortunately the harvests of 2005 and 2006 showed that fewer sprayings (two or even one) also produced marked increases in yield. As a result, since the spring of 2006 (harvest of 2007) recommendations added the option of two sprayings, each of 1.5 L/ha, in addition to the initial recommendation of three spraying at 1 L/ha, both programs with a cumulative total of 3 L/ha. Results with the new program during the harvests of 2007 and 2008 were similar to the previous three applications. However, the subsequent introduction of Vitazyme in sugarcane in Central America and Mexico suggested the need to simplify the recommendation to a single program, which has been two sprayings at 1.5 L/ha each, which carries lower application cost (sprayer, fuel and labor) and is more likely to finalize before the field "closes in".

The economic analysis of the effect of Vitazyme in ratoon cane showed (Table 5) profits of US \$ 535 per hectare and cost-benefit ratio (profits/cost) of 3.5, at a sugar price of only \$ 0.20/lb. For every 1000 hectares treated with Vitazyme an additional net profit of US \$535 450 would be achieved. Another advantage, which has not been included in the present analysis, is the effect that a more vigorous and earlier growth crop with Vitazyme has on an early field "close in" and consequently on the reduction of yield losses due to weed competition and on the decrease in costs for weed control.

A comparison of the effects on cane yield produced by Vitazyme and by the Cuban bio-stimulant Fitomas-E in the only two provinces of Cuba (Holguin and Santiago de Cuba) in which both have coincided in the same harvest (2007) showed increases over their respective untreated control areas greater with Vitazyme in 11.25 t/ha (17.04 t/ha vs. 5.79 t/ha), and greater with Vitazyme in 7.04 t/ha over the average of all the provinces in which Fitomas was applied (17.4 t/ha vs. 10.0 t/ha) (Table 6).

CONCLUSIONS

- The application of the natural biostimulant Vitazyme produces marked increases in sugarcane growth and yield in comparison to untreated control areas and to the Cuban biostimulant Fitomas, in various sugarcane varieties and types of soils.
- Such increases are higher in ratoon cycle (after the first harvest) than in plant cane cycle, although in both occur.
- You can reduce the fertilization between 25 and 50% in combination with the application of Vitazyme and obtain similar to higher yields than an untreated control with 100% fertilization, but the largest increases yields and profits are obtained when Vitazyme is applied with 100% of the recommended fertilization.
- Best application programs are between two and three sprayings to the foliage, with monthly interval, from 30-60 days after last harvest, at a rate between 1 and 1.5 L/ha, for a cumulative total of 2 to 3 L/ha.

RECOMMENDATIONS

It is recommended to carry out two applications in sugarcane, preferably in ratoon cycle (after the first harvest), each at 1.5 liters per hectare (cumulative dose of 3 liters per hectare), the first between 30 and 45 days after the previous harvest, or 60 days after planting in plant cane and the second application at 30 days after the first. Apply with a backpack sprayer using cone nozzle, preferably in bands, or with tractor sprayer, applying on sugarcane leaves.

The final solution or volume of water plus Vitazyme solution per area should be sufficient for a good spray coverage, equivalent to around 200 liters per hectare in the first application and 300 liters per hectare in the second.

Table 1. Yields and their components in Santiago de Cuba, ratoon cane trial, on dark Sialitic Plastogenic soil.

Treatments	Rate (L/ha)	Stalk length (cm)	Stalk diameter (cm)	Stalk population x 1000/ha	Stalk weight (kg)	Cane yield (t/ha)	Pol (sucrose) % cane	Pol yield (t/ha)
Absolute Control (without fertilizer and without Vitazyme)	-	210	2.68	70.9	1.17 c	82.99 b	14.40	11.95 c
Recommended fertilization (75 kg N/ha) without Vitazyme	-	214	2.85	67.8	1.29 bc	87.70 b	13.92	12.21 c
Vitazyme + 50% fert. (37.5 N/ha)	3 x 1	214	2.81	64.4	1.43ab	106.66a	14.11	15.05b
Vitazyme + 100% fert 75 kg N/ha	3 x 1	216	2.87	75.3	1.49a	112.89 to	14.62	16.50a
Standard error		2.57	0.072	2.32	0.055	4.59	0.345	0.53

Table 2. Cane yields in Matanzas, ratoon cane trial, on red Ferralitic soil.

Treatments	Cane t/ha
Control with 100% of fertilization (130 kg/ha N + 100 kg/ha K ₂ O)	54.27
Vitazyme + 75% fertilization (97.5 kg/ha N + 75 kg/ha K₂O)	61.38
Standard error	5.33

Table 3. Results Santiago de Cuba, plant cane trial, on dark Sialitic Plastogenic soil.

Treatments with rate and number of applications	No. applications	Cumulative rate (L/ha)	Stalk population X 1000/ha	Stalk length (cm)	Stalk diameter (cm)	Stalk weight (kg)	Cane yield (t/ha)	Pol yield (t/ha)
Control	-	0	53,28	184.75	3.50	0.94	49.64 b	7.79 b
1 L/ha monthly	3	3	55.47	214.25	3.59	1.05	58.31 a	9.25 a
1 L ha monthly	5	5	53,28	217.50	3.77	1.08	57.81 a	9.13 a
0.5 L/ha monthly	3	1.5	54.14	209.25	3.64	1.06	57.22 a	8.79 ab
0.5 L /ha monthly	5	2.5	55.23	210.25	3.74	1.01	55.79 ab	9.00 ab
2.5% + 1 L/ha at 30 & 69 days.	3	7	54.06	216.00	3.70	1.05	56.44 ab	8.75 ab
Standard error							2.94	0.49

Table 4. Cane yields of Vitazyme demonstration plots by harvests, from 2005 to 2008.

Cane yields, Dos Rios company, Santiago de Cuba, 2005 harvest, demonstration plots:

Province or variety	Company and # Vitazyme applications	Vitazyme			Control			Differ. (t/ha)
		Area (ha)	Production (t)	Yield (t/ha)	Area (ha)	Production (t)	Yield (t/ha)	
C87-51	1 x 1 L/ha	6.03	237,64	39,41	6.03	169,14	28,05	11.36
C87-51	1 x 1 L/ha	7.89	408,54	51,78	7.89	284,83	36,1	15.68
C1051-73	2 x 1 L/ha	3.76	197,70	52,58	3.76	147,47	39,22	13.36
Total 2005		17.68	843,89	47,73	17.68	601,44	34,02	13.71

Cane yields, Vitazyme demonstration plots in 5 provinces, 2006 harvest:

Santiago	Dos Ríos ^a	125,8	4346,9	34,56	38.2	641,1	16,78	17.78
Holguin	Cristino Naranjo ^b	34.1	1637,3	47,99	11.4	370,2	32,55	15.44
Havana	Hector Molina ^c	90.3	3200,5	35,46	56.8	1473	25,96	9.51
Matanzas	España Republic. ^b	32.2	2328,8	72,31	21.5	1227,4	57,17	15.14
Villa Clara	Carlos Baliño ^b	20.5	661,9	32,35	11.3	349,9	31,05	1.3
Total 2006		302,9	12175,4	40,20	139,2	4061,6	29,18	11.02

^a 1-3 sprayings at 1 L/ha; ^b 3 sprayings at 1 L/ha; ^c 50% 3 sprays at 1 L/ha and 50% 2 sprays at 1.5 L/ha.

Cane yields, Vitazyme demonstration plots, Holguin and Santiago de Cuba, 2007 harvest:

Holguin (50% at 3 x 1 L/ha and 50% at 2 x 1.5 L/ha)	Fernando de Dios	40.0	2386	59.7	20	785,3	39,3	20.4
	Cristino Naranjo	44.7	3334,8	74.6	6.8	476	69,7	4.9
	Subtotal Holguín	84.7	5720,8	67.5	26.8	1261,3	47	20.5
Santiago de Cuba (2 x 1.5 L/ha)	Chile	43.7	2834,5	64.9	2.2	111.1	51,7	13.2
	Dos Ríos	47.2	3199,6	67.8	11.6	653,6	56,4	11.4
	Subtotal Santiago	90.9	6034,1	66.4	13.8	764,7	55,4	11
Total 2007		175,6	11754,9	66,94	40.6	2026	49,90	17.04

Cane yields, Vitazyme demonstration plots, Uruguay sugar company, Sancti Spiritus, 2008 harvest:

Total 2008 Uruguay(2x1.5 L/ha)	20.13	1057,54	52,54	20.13	784,6	38,98	13.56
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Overall Cuba 2005-2008:	516,31	25831,73	50,03	217,61	7473,64	34,34	15.69
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Table 5. Economic analysis of cumulative 3 L/ha Vitazyme in ratoon cane.

Additional cane (t/ha)	Additional sugar (t/ha)	Additional cost over control (US\$/ha)			Additional income ³ US\$/ha	Profits US\$/ha	Cost / Benefit Ratio
		Harvest and processing additional cane ¹	Vita-zyme ²	Total			
15.69	1,569	54,92	100	154,92	690,36	535,45	3.5

1. Cost of harvesting and processing of cane: 3.5 US\$/t of cane.
2. Cost of each application at 30 US\$/liter: US\$45/ha of Vitazyme x 2 applications = 90 US\$/ha + US\$10/ha of two backpack operations.
3. At sugar price of 0.20 US\$/lb (440 USD/t or 22 US\$/50 kg bag).

Table 6. Cane yield comparison Vitazyme vs. Fitomas.

Provinces	Biostimulant	Biostimulant			Untreated control			Difference with control (t/ha)
		Area (ha)	Production cane (t)	Yield (t/ha)	Area (ha)	Production cane (t)	Yield (t/ha)	
Holguin	Vitazyme	84.7	5720.8	67.54	26.8	1261.3	47.06	20.48
	Fitomas	74.3	4143.8	55.77	18	927.9	51,55	4.22
Santiago de Cuba	Vitazyme	90.9	6034.1	66.38	13.7	764.6	55.81	10.57
	Fitomas	117.8	6451.9	54.77	12.6	582.6	46.24	8.53
Total 2 provinces	Vitazyme	175.6	11754.9	66.94	40.6	2026	49,90	17.04
	Fitomas	192.1	10595.7	55.16	30.6	1510.5	49.36	5.79
12 provinces	Fitomas	1303.8	58696.7	45.0	570.8	20008.3	35.1	10.0

Table 7. Cane yield, Guadalupe Torres Farm trial, Estipac, Jalisco, 2012-13.

	t/ha
Vitazyme: 2 applications at 1.5 L/ha each	153
Untreated control	138
Difference	15



The Vitazyme treated sugarcane leaves (right) are larger and of darker green (more chlorophyll). Uruguay, Sancti Spiritus (left) and Dos Rios, Santiago de Cuba (right) Sugarcane Estates.



Larger Vitazyme-treated plant cane root system. Carlos Baliño, Villa Clara (left) and Dos Ríos, Santiago de Cuba (right) Sugarcane Estates.



Greater ratoon cane growth and yield, Uruguay, Sancti Spiritus (above) and Cristino Naranjo, Holguín (below) Sugarcane Estates.



Greater overall growth in sugarcane treated with 1.5 L/ha Vitazyme sprayed on the foliage (left), as compared to an untreated control with two more irrigations (right). Eusebio “Adrián” Sánchez Farm, in Estipac, Jalisco, Mexico.



Greater overall growth in sugarcane treated with 1.5 L/ha Vitazyme sprayed on the foliage (left), including larger and more vigorous tillers (below left) as compared to the untreated control (right), resulting in 15 t/ha increased yield. Guadalupe Torres Farm, Estipac, Jalisco, Mexico.



Indonesia



Control area leaves of this Indonesian sugar cane study are typical for producers. Compare them with leaves having Vitazyme treatment in the right-hand photo.

Vitazyme treated sugar cane leaves are wider and longer, with more of them per plant. A stem number and stem diameter increase of 83% led to a yield improvement of 49%.

Researcher: Adhe

Research Organization: PT. Aneka Pangan Bermutu

Location: Dusun Barsari, Prigan - Pasuruan, East Java

Variety: Bulu Lawang

Soil type: Andosol

Planting date: November 29, 2011

Experimental design: One hectare of a sugar cane field was divided into a control (5,000 m²) and a Vitazyme treated area (5,000 m²), to determine the effects of the product on sugar cane growth and yield.

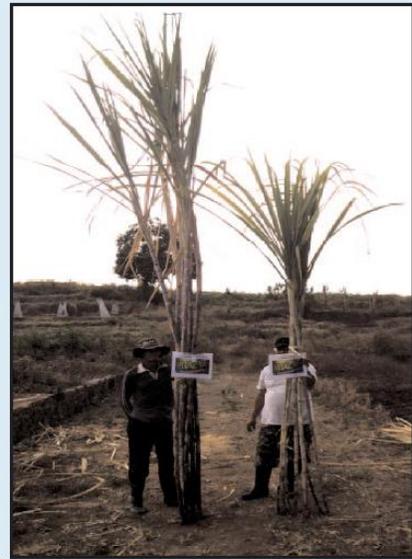
1. Control

2. Vitazyme

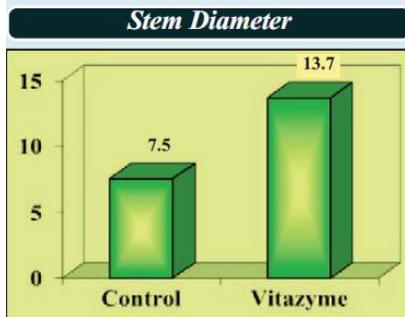
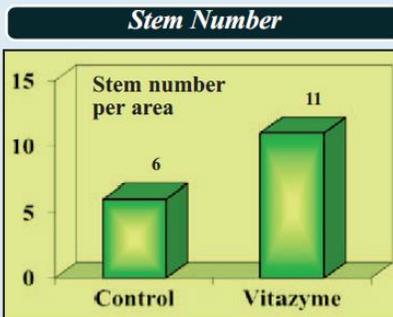
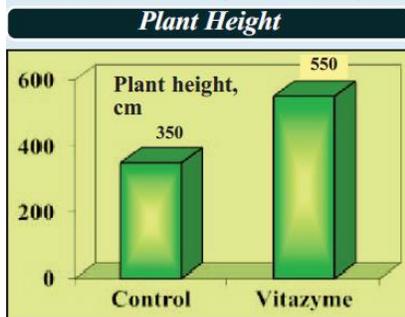
Fertilization: normal for the area

Vitazyme application: at planting, a 1% solution on the seed pieces; 1 liter/ha on the plants and soil on December 21, 2011 (about 1 month), and on March 30, 2012 (about 4 months)

Crop characteristics: Evaluations were taken near harvest time, the end of September, 2012. Values are an average of several plants. All plant growth parameters were markedly improved by Vitazyme.

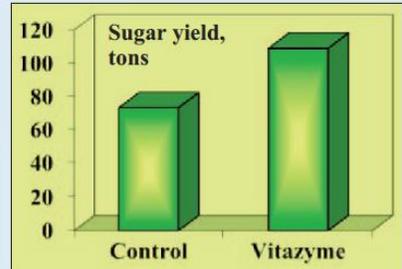


Cane plants harvested near each other in adjacent trial plots reveal remarkable differences in height and total biomass ... a 57% height difference.



Sugar Cane Yield

Treatment	Cane yield	Yield change
Control	73.20	—
Vitazyme	108.89	35.69 (+49%)



Increase with Vitazyme

Plant height 57%

Stem number 83%

Stem diameter 83%

• Increase in yield with Vitazyme: 49%

Continued on the next page

Sugar cane yield: Harvesting was completed on September 28, 2012, 10 months after planting.

Conclusions: This sugar cane trial in East Java, Indonesia, compared Vitazyme treatment (on the seed pieces, and two subsequent soil and foliar applications) with an untreated control. The Vitazyme treated cane grew more aggressively, greatly outdoing the control in terms of height (+57%), stem number (+83%), and stem diameter (+83%). Yield of the cane was dramatically increased (+49%) with Vitazyme, showing the great utility of this product to improve sugar cane culture in Indonesia.



The roots and stems of the untreated control were typical for the plantation, as shown in the photo above. Compare these with the treated plants in the photo to the right.



Vitazyme applied to these sugar cane plants, harvested near those plants in the photo on the left, show remarkably improved stem diameter (+ 83%) and root development.

Viet Nam

Researcher: unknown

Farmer: Nguyen Dire Tinh

Location: Ea Po—Cir Jut District, Viet Nam

Variety: unknown

Age of cane: two years

Experimental design: A sugar cane field was divided into a Vitazyme treated and an untreated control area, each being 0.7 ha, to determine the effect of the product on cane yield.

1. Control

2. Vitazyme

Fertilization: unknown

Vitazyme application: 3 liters/ha, applied at the beginning of the rainy season on April 18, 2012, and again on June 18, 2012

Yield results: The field was harvested on January 20, 2013. Vitazyme, using two foliar applications, gave a very high 33% increase in sugar cane yield.

Income results: Extra cost from Vitazyme: 2,520,000 VND/ha

Added income from the crop: 12,780,000 VND/ha

Return On Investment: 5.07:1

Conclusions: This sugar cane trial in Viet Nam revealed that two Vitazyme applications produced a 33% yield increase over the untreated control. This increase netted the farmer nearly 13 million VND/ha more income, and resulted in a 5.07:1 Return On Investment. This program is proven to be excellent for use with sugar cane in Viet Nam.

Researcher: Yen Thao Tran

Farmer: unknown

Location: Mekong Delta, Viet Nam

Experimental design: A recently harvested sugar cane field was divided into a Vitazyme treated and control portion to investigate the effect of the product on sugar yields and profits for ratoon cane.

1. Control

2. Vitazyme

Fertilization: standard for the area and soil type

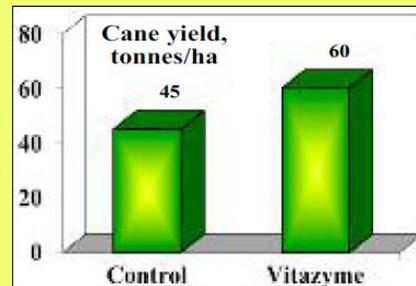
Vitazyme application: three applications: (1) 2 liters/ha, using 0.5 liter in a 200 liter barrel of water, with four barrels per hectare, applied when the first sprouts appeared with rains after harvest; (2) 2 liters/ha, using the same method as for (1), after one month; (3) 3 liters/ha, using 0.5 liter in a 200 liter barrel of water, with six barrels per hectare one month after the second application.

Yield results: See table and graph at right.

Income results: The price of sugar cane is about 970 VND/kg. Increased income for this trial is 13,000 kg/ha x 970 VND/kg = 12.61 million VND/ha

Conclusions: A ratoon sugar cane trial in Viet Nam, using three applications, provided an excellent 21% yield increase (13 tons/ha), which gave 12.61 million additional VND/ha. This result is consistent with previous studies with Vitazyme on sugar cane in Viet Nam.

Sugar Cane Yield



Increase in cane yield with Vitazyme: 33%

Sugar Cane Yield

Treatment	Cane Yield tons/ha	Yield Change tons/ha
Control	62	—
Vitazyme	75	13 (+21%)

Increase in cane yield with Vitazyme: 21%

