EKO GEA's BCx Treatment
ON TOMATOES (for local Kenyan market)

Onesmus Mutiso, Ing. Agr.[1]
Christopher Mumo, Trustee, Farmer[2]
Jürgen W. Freidel, Dr. Sc. Agr.[3]

INTRODUCTION

Seaweed extracts are increasingly of interest as agriculture inputs; particularly for fresh produce. They are known in Europe and other parts of the world including tropical countries for their efficiency to stimulate plant growth, improve soil life (fertility), to balance soil nutrients as well as to support the plant's immune system; in short: they improve plant health and lead to better productivity with reduced pesticide input.
The increasing demand for healthy food combined with stiffer regulations from importing countries on pesticide residues and an emphasis on good agricultural practice (EUREPGAP) highlights the need for environmentally-friendly products like those from the EKO GEA range of products, namely BCx and BCx-Root Concentrate. This product line could have a substantial positive effect on the Kenyan export balance of trade.
The EKO GEA product range was introduced into the Country in 1997 and is established in improving production in mainly export commodities like pulses (French beans, sugar snaps, garden peas, runner beans), Asian vegetables, and organic farmed products, but also finds increased interest in locally marketed vegetables.
For the purpose of this trial, collaborators and extension agents of the University of Nairobi, Kibwezi Campus conducted a series of tests with Out-Growers on the efficiency (production, crop health) of products (BCx, BCx-Root Concentrate) on Tomatoes. The results are as follows:

METHODOLOGY

The trial was conducted at Kibwezi / Athi River at a farmer's field – the farmer is considered an outstanding performer.
The experiment started in March 2003.

1. Seed Bed
The seed bed was prepared with 30% compost added to sandy, clay soil.
At the 2-leaf stage, BCx liquid was applied with a knapsack sprayer at a concentration of 0,2%.
At a height of 4-6 inches (about 10-15 cm) the plantlets were transplanted; one day ahead the seed bed was trenched with a solution of 1% BCx-Root Concentrate. The seedlings were also dipped before planting into a Root Concentrate solution of 5%

2. Field
The first application of BCx was 2 days after transplanting at a rate of 2 litres in 500 litres of water per Ha.
The second application was given at the same rate two weeks later.
Two more sprays of BCx were done in a monthly interval at a rate of 1liter / HA.
The field was watered (furrow irrigation) twice a week.
The first weeding took place two weeks after transplanting and two more in a two weeks interval.
3. Field size and Parameters
Since the trial was an applied research approach, the entire field of ½ acre was split into two halves of each ¼ acre - equivalent to 1048 m^2.

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[1] University of Nairobi, Kibwezi Campus
[2] Athi River Self Help Group, Trustee, Chairman Out-Grower Group Initiative, Athi River and Kibewzi
[3] Biological Environment Systems & Products Ltd.

For practical reasons, the conversion from ¼ acre to Ha was done as 1:10 and the figures in table 2 converted and presented on the basis of 1 HA.

The parameters checked were:

1. Days till transplanting
2. Days till flowering
3. Days till harvest
4. Duration of harvest
5. Yield per total $^{1}/_{10}$ of HA
6. Shelf live

4. Physical Results

The **treated** plants could be transplanted ten days earlier and did not suffer the common transplanting shock (usually 15% loss with need for replanting). They continued with a more vigorous and healthy growth that further explains the earlier flowering and 15 day earlier start of the harvest; the harvesting period was also extended to 55 days, compared to 40 days at the untreated plot.

(Table 1: physical parameters).
The **increased yield of 15,000 kg is equivalent to 34% increase** compared to the standard production procedure.
A **better shelf life** was obtained in terms of 3-4 days compared to the untreated fruits.

Table 1: physical parameters

Development Stage	**days from planting**		**days**
	treated	**untreated**	**diff.**
germination	4	4	0
transplanting	18	28	10
flowering	35	45	10
harvest start	65	80	15
harvest end	120	120	0
harvest period in days	55	40	-15
YIELD (KG)	**60.000**	**45.000**	**-15.000**

5. Economic Evaluation (cost benefit analysis)

In spite of the savings for pesticides and foliar feed, the production costs of the **treated crop** were clearly higher compared to the untreated. This is explained by the **higher yield** and the related transport costs. However, the increased yield of marketable produce and its better price due to the longer shelf live translates into a **40% economical benefit to the farmer** that represents an additional income of 311,850.- KShs per HA or 31,185.- KShs per ¼ acre.
Due to the adopted scouting and monitoring of pests and mainly diseases, 3-4 spray rounds could be saved compared to the untreated field (equivalent to 3,600.- KShs).

6. Discussion

The plants at the **treated** field came earlier into production with a 15 days longer harvest period; rendering the plants more productive with an increased yield by 34%.
The input costs were higher at the treated field, mainly due to harvest and transport costs. However, the income increase by 40% has clearly proven the economical benefit of the product in the short term aspect for the farmer with Tomatoes for the local market supported by a better sales price due to the better shelf live.
The reduced use of mildew pesticide brings the farmer's produce closer to the standard requested for healthier food, with less exposure to chemicals for the farmer.

Table 2: Economic evaluation

item	unit	unit cost KShs	quantity per HA	total KShs	unit cost KShs	quantity per HA	total KShs	total KShs
YIELD	kg	17.00	60,000.00	1,020,000.00	15.00	45,000.00	675,000.00	345,000.00
		plus	15,000.00					34%
INPUT								
machinery								
ploughing	ha	2,000.00	2.00	4,000.00	2,000.00	2.00	4,000.00	0.00
ballowing	ha	2,000.00	1.20	2,400.00	2,000.00	1.20	2,400.00	0.00
subtotal				6,400.00			6,400.00	0.00
agrochemicals+seeds								
seeds	kg	7,600.00	0.50	3,800.00	7,600.00	0.50	3,800.00	0.00
Bio-complex	lts	1,200.00	5.00	6,000.00	1,200.00	0.00	0.00	6,000.00
Root Concentrate	lts	800.00	1.00	800.00	800.00	0.00	0.00	800.00
Foliar Feed	lts	250.00	0.00	0.00	250.00	5.00	1,250.00	-1,250.00
CAN	bags	1,200.00	8.00	9,600.00	1,200.00	8.00	9,600.00	0.00
MOP	bags	1,200.00	4.00	4,800.00	1,200.00	4.00	4,800.00	0.00
Manure	tons	1,000.00	11.00	11,000.00	1,000.00	11.00	11,000.00	0.00
Pesticide (EC)	lts	1,200.00	8.00	9,600.00	1,200.00	10.00	12,000.00	-2,400.00
Pesticide (WP)	kg	400.00	0.00	0.00	400.00	3.00	1,200.00	-1,200.00
Fuel (pump)	lts			25,000.00			25,000.00	0.00
subtotal				70,600.00			68,650.00	1,950.00
labour								
Spraying	MD	100.00	50.00	5,000.00	100.00	50.00	5,000.00	0.00
fertilizer	MD	100.00	50.00	5,000.00	100.00	50.00	5,000.00	0.00
manure	MD	100.00	50.00	5,000.00	100.00	50.00	5,000.00	0.00
nursery	MD	100.00	0.00	0.00	100.00	0.00	0.00	0.00
planting	MD	100.00	50.00	5,000.00	100.00	50.00	5,000.00	0.00
weeding	MD	100.00	100.00	10,000.00	100.00	100.00	10,000.00	0.00
irrigation	MD	100.00	80.00	8,000.00	100.00	80.00	8,000.00	0.00
harvest	MD	100.00	60.00	6,000.00	100.00	48.00	4,800.00	1,200.00
transport / marketing	to	2,000.00	60.00	120,000.00	2,000.00	45.00	90,000.00	30,000.00
subtotal				164,000.00			132,800.00	31,200.00
Total				241,000.00			207,850.00	33,150.00
Gross Margin				**779,000.00**			**467,150.00**	**311,850.00**
cost per kg				4.02			4.62	net benefit
net benefit per kg				12.98			10.38	**40%**

harvest* => untreated crop less produce to be harvested => 20% less labour

Note: 311,850 Kenyan Shillings = 2,819 Euros in today's currency (Sept. 2009)
1 Kshs = 0.009 Euros