COMMERCIALIZATION BULLETIN: BANANA

Bulletin #02

INTRODUCTION

India is the largest producer worldwide of bananas, with over 26 million tons produced annually (much of it consumed domestically) followed by China and Philippines each with over 9 million tons; Kenya is ranked 17th with over 840,000 tons. The biggest exporter is Ecuador with over 5 million tons followed by Columbia and Philippines each with slightly over 1.7 million tons; Cote d'Ivoire (over 257,000 tons) and Cameroon (over 254,000) are the largest exporters in Africa. Despite the fact that there are no plantations in Kenya; but due to climatic conditions especially in the coast region there is a big potential for development of plantations to rival those in Cote d'Ivoire and Cameroon; the export prices in the last few years have been declining. The export market is specialty one with the biggest importer being the EU with over 4.5 million tons followed by USA (over 3.5 million tons) and Germany (over 1.35 million tons).

MARKETS

Bananas are mostly consumed locally but an insignificant amount is exported either as matoke (green cooking banana) or ripe banana (apple banana) or even banana leaves in the international markets like UK, UAE, Canada and Switzerland. Strategically Kenya is not well placed to export competitively as there are no banana plantations. Opportunities for value addition of bananas do exist although not fully exploited, like banana crisps, banana flour, banana beer or wine, sun dried banana. Locally, 12 % of all produced bananas are estimated to be consumed in Nairobi town (HCDA).

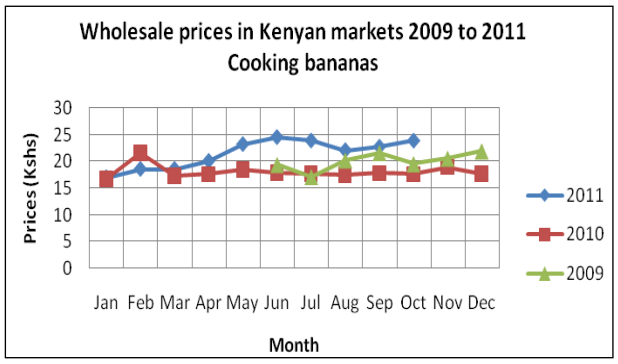
VOLUMES

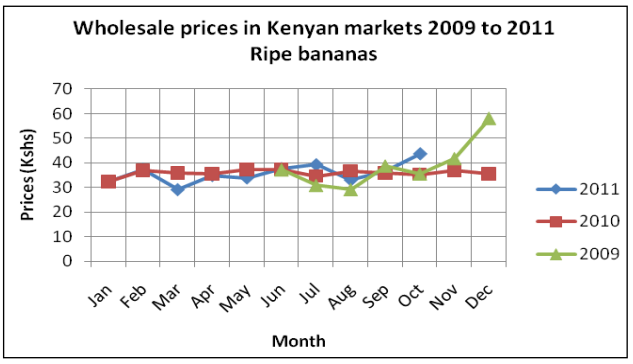
In 2010, over 1.5 million tons were produced and it is estimated that 67 % of that sold locally in municipal markets, supermarkets, kiosks and other outlets as green cooking and ripe bananas. More ripe bananas are consumed than cooking banana possibly on a ratio of 2 to 1. The large volumes are from counties in Nyanza, Eastern and Central regions.

According to a recent study of the Kenya domestic banana market by KHCP, retail sales volumes (tons) in June, July, August and September 2011 for cooking bananas were 26,069; 20,297; 19,089 and 17,975 while for ripe bananas were 45,706; 41,255; 37,313 and 34,091; all these showing a gradual decline in supply over the four months.

PRICES

Bananas are mainly sold in bunches but some areas sell in kilograms. In October 2011, a kilo was being sold at Ksh.15 per kg at the farm level for the green unripe banana. The average wholesale prices for cooking and ripe bananas for 2009 were Ksh 20 and 39; for 2010 were Ksh 18 and 36; and for 2011 (up to October) were Ksh 21 and 36 respectively. At retail points, the prices for ripe bananas range from 40 Kshs in banana growing areas to almost 80 Kshs from non-growing areas. Cooking bananas are sold at the retail point at an average of Ksh 40 per kg; while the sweet banana is Ksh 60 per Kg.





According to a recent study of the Kenya domestic banana market by KHCP, retail sales prices per kg for ripe bananas

for June, July, August and September 2011 have been Ksh 47.65, 45.35, 51.00 and 51.00; while for cooking banana have been 49.50, 45.85, 50.15 and 49.95; all these showing a general increase in price over the four months.

COMPETITION

The major competitors in the European market are countries like Uganda, Canada, US, Japan, Australia and Switzerland. However since majority of the production is consumed locally, the major competition are the big buyers who consolidate the commodity at the regional level like Meru greens, Kamwe and Mount Kenya Greens, Tastic suppliers, Fruit-n-juici and sell into big town markets . Uganda also exports into Kenya. 393 and 87 Tons were exported into Kenya in 2009 and 2010 respectively (KRA).

PRODUCTION AREAS

Bananas are tropical crops that grow best between 0 – 1,800 M above sea level. Optimum temperature for growth is 270C, with growth ceasing below 160C and above 380C. Deep, well-drained loam soils with high fertility and organic matter content are ideal. The soil pH should be between 5.8 and 6.5; acidic soils can be improved by liming which should be applied before planting. There was a general increase in the national hectareage, production and value from 82,518 Ha, 1,237,770 MT and Ksh 16.9 Billion in 2006 to 83,462 Ha, 1,583,143 MT and Ksh 18.99 Billion in 2010 respectively; although there was a decline in 2009 to 76,992 Ha, 1,401,568 MT and Ksh 16.1 Billion. Production of bananas is scattered all over the country and is mainly under rain fed conditions especially in Nyanza regions of Kisii Central, Kisii South, South Gucha, Manga, Nyamira and Masaba; Central regions of Muranga South, Kirinyaga, Kiambu East, Muranga North, Thika and Maragua; Western region of Bungoma North; Coast region of Taveta and Eastern region of Meru, Machakos and Embu. Irrigation is intermittently practiced in various parts of the Eastern province i.e. Mbooni (Machakos) and Mitunguu (Meru).

Table 1: Banana production statistics for period 2006-2010

Province	Area (ha)					Production (MT)				
	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
Nyanza	32,396	26,469	29,157	28,528	30,303	485,940	397,035	583,140	538,212	598,420
Eastern	12,834	13,912	15,315	15,009	15,074	192,510	208,680	306,300	278,932	279,657
Central	15,540	16,784	15,936	9,288	11,888	233,100	251,760	382,464	193,649	272,012
Western	12,645	12,735	12,824	13,426	14,116	189,675	191,025	230,832	234,301	239,972
Coast	5,715	5,613	5,734	8,605	9,448	85,725	84,195	114,680	111,986	138,761
R/Valley	2,870	3,103	3,199	2,028	2,109	43,050	46,545	57,582	35,581	43,882
N/Eastern	476	485	557	523	483	7,140	7,275	11,140	8,642	10,200
Nairobi	42	15	44	39	41	630	225	792	265	239
Total	82,518	79,116	82,766	76,922	83,462	1,237,770	1,186,740	1,686,930	1,401,568	1,583,143

Source: HCDA

BANANA PROPAGATION

Before any production, it is advisable that soil analysis is done one month before in order to determine the fertility levels, pH, soil-borne pests, soil-borne diseases and any inherent challenge that may be in the soil.

Planting Material

Main cultivars are: Grand nain, Williams, Chinese Cavendish, Dwarf Cavendish, Israel, Gross Mitchel, Uganda green, Ng'ombe, Bokoboko, Mkono wa tembo, Goldfinger, Apple banana, Muraru, Kampala, Ekegusii, Bogobogo and Mutahato. For planting material, the narrow leaved suckers (i.e. single shoots or sword shaped) are recommended and they should be removed from the mother plant when ½ to 1 m tall. The pared suckers can be dipped in hot water or a mixture of an appropriate pesticide to control nematodes and weevils. Current production trends show that tissue culture planting materials are used in production. The tissue culture suckers can be available from KARI-Thika, Aberdare technologies, GTL and HCDA. The tissue culture bananas have the advantages of being high yielding, early maturing and the possibility of obtaining pest free planting materials.

Land Preparation

During land preparation, deep ploughing (200 to 300 mm) is recommended and no soil compaction should be left. The normal planting holes should be 60cm × 60cm × 60cm but for dry areas holes of 90cm × 90cm × 90cm are recommended. For tissue culture plants, deeper holes are recommended as the rhizome is often pushed above the soil level early due to rapid and early production of suckers. For the planting mixture, the top soil from 30cm should be mixed with 2 debes of well decomposed manure and 200g of DAP/NPK fertilizer at planting time per hole.

CROP MANAGEMENT

After planting in the hole, the sucker will require a number of management practices before it gives any yield. This includes weeding, mulching, water relations management, de-suckering, removal of dead leaves, fertility management, pest and disease management. In Kenya, bananas are rain-fed but there is a trend towards irrigation especially during the dry season or in dry areas. As the plant grows, de-suckering should be done regularly to have at most three main stems in order to reduce competition for nutrients; also dead leaves should be removed from growing plants and buried or burnt. In certain cultivars especially the tall ones, support or propping of the banana plant is required; but this is not a must.

Pests

The insect pest include banana weevil, banana silvering thrips; also nematodes can be serious problem four major species of nematodes affect banana lesion nematode; burrowing nematodes; spiral nematode and root-knot nematode. These nematodes are mainly problematic in Coast, Western and Nyanza provinces; they affect most banana varieties. Diseases include Cigar End Rot, Panama disease (Fusarium wilt) - quarantine measures to stop banana planting materials from affected to non-affected areas. Xanthomonas wilt, which was first reported in Kenya in 2006, is threatening banana production that has necessitated KEPHIS to put an alert on movement of planting material from one part of the country to the other especially from Western part of the country.

Fertility Management

At least two debes of manure mixed with 200g of CAN per hole every year is recommended; these fertilizers should be applied in two splits during the rainy seasons.

HARVESTING AND YIELD

Time to First Harvest and Seasonality

Flowering takes 8 – 12 months after planting depending on climate and management. The fruit matures in 3 – 4 months after flowering. Fruits should be harvested when they are three quarters round and appear light green and shiny. When harvesting you should have good support for the bunch cutting from the top, using a clean cutting equipment to avoid disease transmission to plants in the orchard. Remember to disinfect the cutting equipment each time you do a cut.

Yields can range from 30 to 100 tons/hectare with good management but the average yield is around 40 tons/ha.

Although export sales are insignificant the peak season is between the months of August to November. Domestic sales are throughout the year and there is no clear high or low supply month.

Post-harvest Handling

After harvesting, banana bunches should be handled carefully to avoid bruises and blackening. Bananas should be dehanded before packing. The bunch is hung on a dehanding rail and using a sharp knife the crown is cut off from the bunch stem. The hands are left to bleed in water for 10 minutes then split into units of 5-6 fingers or depending on the market requirements being may not be split. It is recommended that, the hand splits are dipped in an anti-fungal solution to control crown rot but this may not be a common practice.

INVESTMENT: GROSS MARGIN ANALYSIS

All values in Kenyan Shillings

Table 2: Banana gross margin analysis

Year	Item	Cost (Ksh) - Ha	Cost (Ksh) - Acre
Year 1	Land preparation – initial ploughing	3,750	1,500
	Land preparation – harrowing	2,000	800
	Manure: 10 tons per ha or 4 tons per acre @ Ksh 2,000/= per ton	20,000	8,000
	Digging holes: 104 man days (md) per Ha or 42 md per acre@ Ksh 150/=	15,600	6,300
	NPK 125 kg per Ha or 50 kg per Acre @ Ksh 2500/= per 50 kg bag	6,250	2,500
	Filling holes: 10 md per Ha or 3 md per Acre @ Ksh 150 per md	1,500	450
	Suckers: 625 per Ha or 250 per Acre @ Ksh 150/=	93,750	37,500
	Transplanting: 16 md per Ha or 7 md per Acre @ Ksh 150/=	2,400	1,050
	Top dressing: CAN 125kg per Ha or 50 kg per Acre @ Ksh 2,100/= per 50kg bag	5,250	2,100
	Weeding: 40 md per Ha or 16 md per Acre @ Ksh 150/=	6,000	2,400
	Harvesting: 20 md per Ha or 8 md per acre @ Ksh 150/=	3,000	1,200
	Water for irrigation	10,000	4,000
	Crop protection	15,000	6,000
	Total cost	184,500	73,800
	Miscellaneous accounts - to take care of inflation and unforeseen costs	18,450	7,380
	Gross return: In the first year the suckers gives 1 bunch @ 400 KShs; hence from 625 suckers the gross return will be Ksh 400 × 625 bunches for one Ha or Ksh 400 x 250 bunches for one acre	250,000	100,000
	Gross margin year 1	**47,050**	**18,820**
Year 2	Top dressing: CAN 125kg per Ha or 50 kg per Acre @ Ksh 2,100/= per 50kg bag	5,250	2,100
	Manure: 10 tons per ha or 4 tons per acre @ Ksh 2,000/= per ton	20,000	8,000
	Weeding: 20 md per Ha or 8 md per Acre @ Ksh 150/=	3,000	1,200
	Harvesting: 40 md per Ha or 16 md per acre @ Ksh 150/=	6,000	2,400
	Crop protection	15,000	6,000
	Water for irrigation	10,000	4,000
	Total cost	59,250	23,700
	Miscellaneous accounts - to take care of inflation and unforeseen costs	5,925	2,370
	Gross return: Ksh 400 × 1, 250 bunches per Ha or Ksh 400 x 500 bunches per Acre	500,000	200,000
	Gross margin year 2	**434,825**	**173,930**
Year	De-suckering: 9 md per Ha or 4 md per Acre @ 150/= per md	1,350	600

Table 2: Banana gross margin analysis

Year	Item	Cost (Ksh) - Ha	Cost (Ksh) - Acre
3	Top dressing: CAN 125kg per Ha or 50 kg per Acre @ Ksh 2,100/= per 50kg bag	5,250	2,100
	Manure: 10 tons per ha or 4 tons per acre @ Ksh 2,000/= per ton	20,000	8,000
	Weeding: 20 md per Ha or 8 md per Acre @ Ksh 150/=	3,000	1,200
	Harvesting: 40 md per Ha or 16 md per acre @ Ksh 150/=	6,000	2,400
	Crop protection	15,000	6,000
	Water for irrigation	10,000	4,000
	Total cost	60,600	24,300
	Miscellaneous accounts - to take care of inflation and unforeseen costs	6,060	2,430
	Gross return: Ksh 400 × 1, 250 bunches per Ha or Ksh 400 x 500 bunches per Acre	500,000	200,000
	Gross margin year 3	**433,340**	**173,270**
Year 4	De-suckering: 9 md per Ha or 4 md per Acre @ 150/= per md	1,350	600
	NPK 125 kg per Ha or 50 kg per Acre @ Ksh 2500/= per 50 kg bag	6,250	2,500
	Manure: 10 tons per ha or 4 tons per acre @ Ksh 2,000/= per ton	20,000	8,000
	Harvesting: 40 md per Ha or 16 md per acre @ Ksh 150/=	6,000	2,400
	Crop protection	15,000	6,000
	Water for irrigation	10,000	4,000
	Total cost	58,600	23,500
	Miscellaneous accounts - to take care of inflation and unforeseen costs	5,860	2,350
	Gross return: Ksh 400 × 1, 250 bunches per Ha or Ksh 400 x 500 bunches per Acre	500,000	200,000
	Gross margin year 4	**435,540**	**174,150**
Year 5	De-suckering: 9 md per Ha or 4 md per Acre @ 150/= per md	1,350	600
	Crop protection	15,000	6,000
	Manure: 10 tons per ha or 4 tons per acre @ Ksh 2,000/= per ton	20,000	8,000
	Harvesting: 40 md per Ha or 16 md per acre @ Ksh 150/=	6,000	2,400
	Water for irrigation	10,000	4,000
	Total cost	52,350	21,000
	Miscellaneous accounts - to take care of inflation and unforeseen costs	5,235	2,100
	Gross return: Ksh 400 × 1, 250 bunches per Ha or Ksh 400 x 500 bunches per Acre	500,000	200,000
	Gross margin year 5	**442,415**	**176,900**
	TOTAL GROSS MARGIN FOR FIVE YEARS	1,793,170	717,070

Table 2: Banana gross margin analysis

Year	Item	Cost (Ksh) - Ha	Cost (Ksh) - Acre
	TOTAL YIELD FOR FIVE YEARS (5,625 bunch @ 25 kg per bunch)	140,625	56,250
	MARGIN PER KG	13	13
	AVERAGE MONTHLY INCOME (60 months)	29,886	11,951

NB: From the 2ndto 5th year, the suckers give 2 bunches @ 400 Ksh per bunch

NB: Yield starts declining from the 5th year and hence the gross margin is for five years.

Banana production in Kenya is mainly done by small scale farmers with 0.5 – 2.5 acres of land hence one of the investment requirement is land. The other requirement is the initial capital for the investment and a good source of water for drier areas. A good market should also have been established before starting the investment.

INVESTMENT RETURNS: REGIONAL ANALYSIS

Table 3: Investment returns per region for Banana

Province	Value in Ksh ('000)				
	2006	2007	2008	2009	2010
Nyanza	6,803,160	5,995,525	8,747,100	8,073,180	8,976,300
Eastern	2,310,120	3,130,200	3,063,000	2,816,230	2,824,860
Central	3,263,400	3,021,120	5,736,960	1,318,607	2,461,331
Coast	1,200,150	1,262,925	1,720,200	1,637,351	2,081,415
R/Valley	602,700	698,175	863,730	978,999	1,337,022
Western	2,655,450	2,865,375	3,462,480	1,101,236	1,199,860
N/Eastern	99,960	109,125	167,100	170,665	112,200
Nairobi	8,820	3,375	15,840	7,200	2,868
TOTALS	16,943,760	17,085,820	23,776,410	16,103,468	18,995,856

Source: HCDA 2011

CASE STUDIES

Case Study 1: Mr. Namu, Imenti south, Eastern region, 50 years

Mr. Namu is a banana farmer in Meru with total land acreage of 2.5 acre (1 ha) where he has planted three cultivars of bananas i.e. Grand Naine, William Giant and Cavendish. He obtains his seedlings from own nursery, for the non-tissue culture cultivars, while the tissue culture cultivars are obtained from KARI, Thika and the nearby propagators. On average his banana yield are between 35 – 60 kg per bunch with some producing as high as 65 kg which he sells at 15 Ksh per kg. However the prices do vary from Ksh 10 – 15 depending on the season of production. He sells his bananas through middlemen and the local consumers. The major market destinations are Nairobi, Meru, Embu, Nyahururu and its surroundings; and also to schools. The major source of his water is a borehole which he uses to irrigate his banana farm and he has drip irrigation system. The farmer has challenges of pests which include nematodes and the banana weevil. The farmer uses clean planting material, maintains field hygiene and sprays pesticides such as Actara as a means of preventing pest attack.

Case Study 2: Mr. Duncan, Bungoma County, Western region, 38 years

Mr. Duncan is a farmer with 4 acres of land under banana production. He has planted a total of 1,015 stools. He has a mixture of cultivars which include: Giant Cavendish, Sweet banana, Grand Naine, Israel, Muraru and William Giant. He started with 300 seedlings obtained from HCDA and he has been using the suckers from these plants to expand this production. He has experienced reduced production from these suckers as compared to the mother plant by about 2 – 5 kg per bunch. The highest yield he has ever obtained is 63 kg of a single bunch which was sold at 13/= per kg. His source of water is a borehole but sometimes depends on rain. Harvesting is done every two weeks with approximately 250 bunches sold every two weeks at the peak season. The duration from planting the suckers to harvesting is 13 months. His main marketing channel is through middlemen who sell to major urban markets and directly to exporters. Some of the international markets are; Israel and United Kingdom. International markets fetch higher prices of up to 175% of the local ones. Most of the big bunches lie weigh between 40-55 kilograms, with medium ones weighing 30 – 45 kg and 15 – 25 kg for the small ones; the selling price range between Ksh 9 – 14 per kg. His annual income is approximately Ksh 420,000 which he uses to pay school fees for his son in high school; invest in businesses like construction of commercial residence in Bungoma town. The experiences challenges mainly of pests such as Bacterial wilt, Fusarium wilt, Cigar end rot, nematodes and banana weevil.

IMPORTANT CONTACTS

Service provider	Service	Contact
KARI	Production of planting material	The Director, KARI P.O. Box 57811-00200, City Square, NAIROBI, Kenya Email: Resource.center@kari.org Fax: +254-020-4183344 Tel No(s): +254-020-4183720, 4183301-20 GSM: +254 733 333223/333224, +254 722 206986/206988
Africa Harvest	Production of planting material	Director P.O Box 642-00621, Nairobi, Kenya. Tel: +254 20 444 1113/5 Fax +254 20 444 1121 email: Kenya@africaharvest.org
HCDA	Licenses commercial nurseries with planting material	Director Horticultural Crops Development Authority (HCDA) Nairobi Horticultural Centre Airport Road, Opp. JKIA P.O. Box 42601-00100 Nairobi, Kenya (E.A) Telephone: +254-20-2088469, +254-20-2031560; Fax: +254 -20-3235898; Email: md@hcda.or.ke
Aberdare technologies	Production of tissue culture planting material	The Diretor Aberdare Technologies Kabati, Mitumbiri Road, Thika. P.O Box 418, Kenol - Kenya. Tel: +254-20-2055189 Cell: +254-733-708417/ +254 721294194 +254 727273053 info@aberdaretechnologies.com
GTL	Production of planting material	The Director, Box 47430-00100, Nairobi; Tel: +254204183280

Kenya Horticulture Competitiveness Project

USAID-KHCP is a five-year project designed to increase smallholder farmer incomes through enhanced productivity, crop diversification and improved market access.

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