ADC Commercialization Bulletin #8

Apple Banana

Marketing

1

Markets

Banana is the most important fruit in international trade. The value of world trade in bananas is higher than all other tropical fruit combined. Unfortunately for Uganda, the market is supplied exclusively with bananas of the Cavendish group of cultivators which have long storage properties and can be shipped around the world by sea in refrigerated ships for a fraction of the transport costs from Uganda. Cavendish bananas are about the same size as 'bogoya' but more curved and uniform in shape, which also makes them easier to pack in boxes.

Cavendish bananas are hardly grown in Uganda, but the small 'ndiizi' or apple banana is grown in more volume than in any other country, and is attractive as an 'exotic' banana to an increasing number of consumers. Market surveys have also shown that European consumers would prefer to buy smaller bananas if they were readily available. In theory this presents a fantastic opportunity for Ugandan ndiizi growers, but sales are currently limited by the very high price of air freight, which makes ndiizi three to four times more expensive than Cavendish bananas. Lack of organised production and packing facilities are also major obstacles to obtaining sales contracts for ndiizi in Europe. For Uganda the closest and most accessible markets are Europe, the Middle East and South Africa.

2

Customers

Not all fresh produce importers are banana buyers or distributors. The reason is that bananas are normally bought green by the importers and ripened by application of ethylene gas, under refrigeration in purpose-built rooms. They are then distributed around the country at various stages of ripeness determined by the weather and other customer requirements. Because of import tariffs, distributors in the European Union must also obtain a banana licence, which is only available to experienced traders (see below). Lists of licenced banana distributors are available at the ADC.

Consumers of ndiizi are still predominantly 'ethnic' customers who are familiar with it and prepared to pay a higher price than for Cavendish, but Europeans are also being introduced to it by supermarkets who promote the 'better flavour of baby bananas' and get a better return on shelf space for the higher-priced fruit.

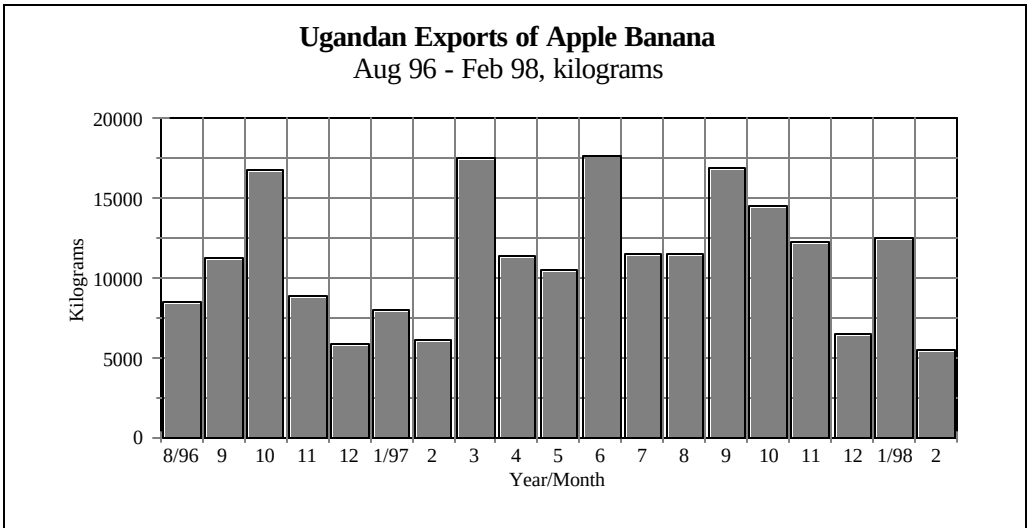
In the UK, the ethnic specialist wholesaler is estimated to have 50 to 60 percent of the current import market, characterized by non-banana specialists often without ripening facilities. Fruit for this market are generally packed in large (5-20 kg) cartons and are not gassed artificially. This is a low value, less stringent market and is not expected to expand. All Ugandan apple banana currently enter this market at present. The multiple retailers have an estimated 40 to 50 percent of the current UK market and are characterized by premium quality fruit handled by banana specialists. Fruit are packed in small units (2 kg net) and unitized further in packs of six for added protection. Fruit are gassed artificially and sorted to control marketing. Fruit may be prepacked in punnets or repacked in polythene bags for retailing. The retailers have renamed the fruit 'baby

banana'. The multiple market is a high value, stringent quality market with significant expansion expected.

3

Volumes

World import demand for bananas is projected by FAO to reach 12.2 million tonnes in 1999. The EU imports 27 percent of this, equivalent to 3.3 million tonnes or 9,000 tonnes per day. If only 1 percent of this could be converted to apple banana it would provide a potential market of 33,000 tonnes per annum. Consumer demand almost certainly exists for this amount but the barrier is price.



Current imports of apple banana are estimated by the ADC (official statistics not available) at 400 tonnes into the UK, the main market for Ugandan exporters, and 1,500 tonnes into Europe. There is also a significant demand from South Africa and the Middle East. Uganda exported 143 tonnes of apple banana in 1997, equivalent to 35% of the UK market, and exports appear to be increasing (see Figure 1).

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Prices

UK wholesale prices during the period January 1997 through March 1998 have ranged between $5.04-7.63 per kilo, with Colombian apple banana selling for a premium over Kenyan product (see Figure 2). Prices in the rest of Europe are generally similar to UK prices. Price fluctuations are less evident than for many export fruits and vegetables, since apple banana is not grown in any European country in commercial quantities, and there are few established suppliers.

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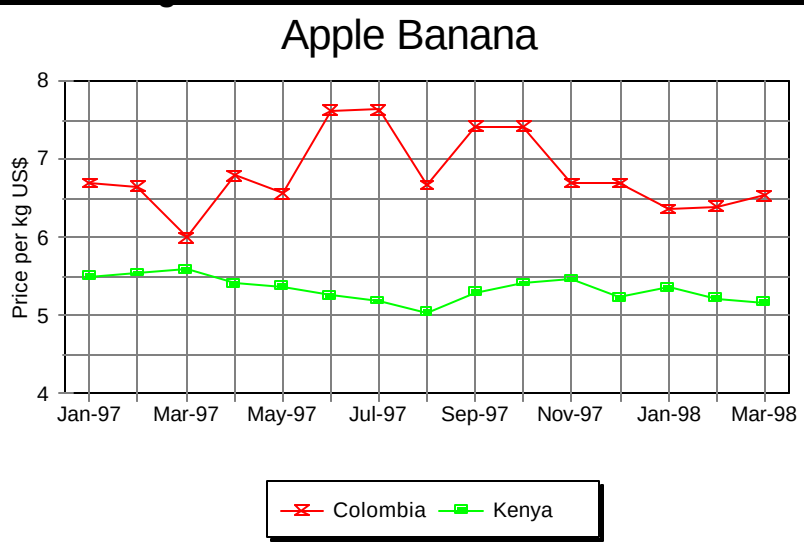
Competition

UK imports of apple bananas are sourced from Colombia, Kenya, Uganda, Mexico, and Malaysia. Kenyan fruit are though to be sourced primarily from Uganda and transhipped. Ugandan shipped an estimated 140 tonnes to the UK in 1996, giving it an import market share of 25 to 30 percent. Colombia is still the dominant supplier and receives a premium for its better quality product. If Uganda's quality and supply issues are resolved, it should be able to be very competitive with Colombia, which itself is hampered by limited product supply, limited cargo space, and high freight rates.

According to price reports, suppliers to mainland Europe in 1997 include Colombia, Kenya, Mexico, Cote d?Ivoire, Thailand, and Mauritania, Cameroon, Venezuela, and Ecuador.



Production

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Method

Production. Commercial production guidelines have not been developed for the production of export quality apple banana in Uganda. ADC is in the process of developing a technical package that will cover:

- Planting patterns and spacing;
- nutrient supply;
- sucker management to obtain optimum yield of appropriate size fruit;
- leaf pruning to avoid fruit rub; bunch sleeving to reduce fruit blemish;
- bunch anchoring to produce a vertical bunch, in turn producing fruit in vertical alignment with the stem;
- pest and disease control using minimal chemicals; and
- weeks to maturity.

Bananas require rich soils with good drainage. Nutrients depleted by the plants must be returned to the soil through the application of fertilizer (NPK) as needed. Bananas do not also do well in drought, so plant trash should be spread over as much of the soil surface as possible to keep the soil moist as well as to prevent soil erosion. Suckers or corms from existing healthy plants are used as planting material. There are various recommended arrays and spacings for planting fields; typical spacing are 7 ft x 8 ft (777 plants per acre) or 8 ft by 8 ft (680 plants per acre). At higher elevations, spacing should be further apart.

As the plants grow, additional suckers will sprout from around the plants. Remove all unwanted suckers (from the growing point about 2-3 inches below the surface), leaving the strongest one as the follower. If there are more than one follower, the main plants will take more time to grow, bunches will be smaller, and production will be delayed.

Control of weeds is best controlled by initially planting suckers in a weed-free field, growing a thick leaf canopy, and mulching.

Leaf pruning will be required so that no leaves rub against the fruit and obstruct the growth of the bunch. So as to not attract insects and birds to the new fruit, remove the flowers from the ends of the fingers by lightly brushing with a hand. This disflowering must be done early in the fruit development stage or the fruit may get

stained with latex, preferably in the afternoon and when there is no rain. Sleeves may be placed over the bunches to reduce fruit blemish. Prop up the plant with poles to prevent it from collapsing.

Harvest Maturity and Harvesting. As a luxury, high value, air-freighted fruit, the apple banana must be allowed to mature on the plant as fully as possible so as to develop good flavour and sweetness. This need is counterbalanced by the need for the fruit to arrive at the premises of the importer in green condition allowing the importer to control the timing of ripening by gassing with ethylene and manipulating ripening rate with temperature.

Ideal stage of maturity is best determined by the angularity of the fingers. Fruit could be denoted to be at the ¾ mature stage, characterized by the fruit looking only slightly angular in cross section. This stage is reached about two to three weeks before peel colouring will take place on the plant. Some basic research would be useful to confirm the duration of bunch development so that bunch tagging could be used to guide maturity assessment more accurately.

Maximum time before shipment is 24 hours, ideally on the day of shipment of an evening flight. Harvest should take place in the early morning from 6.00 am when fruit are cool. Harvesting teams require the following equipment:

- cutlass for cutting banana stems
- sharp dehanding knife
- carrying trays
- banana leaves

The stems of selected bunches are partially cut so as to allow the bunch to be lowered gently to head height. The bunch should not fall to the ground. The stem can be propped if the stem cut was too severe. At head height the lowest hand is cut from the main stem by cutting above its crown. On detachment the hand is held crown down and away from latex drips from the remaining intact stem. Latex contamination of fruit causes fruit staining which shows up on ripening. This must be avoided. The hand is placed on a banana leaf laid on the ground in the shade such that its crown overlays the midrib. Latex will drain from the cut crown for 5-10 minutes. Subsequent hands are cut from the stem and dealt with in the same way. Care must be taken whilst dehanding to avoid pricking, cutting or damaging the fruit in any way. The fruit may be left to drain for twenty minutes whilst further bunches are brought down and dehanded.

Postharvest Handling. Once fully drained, the hands can be loaded onto trays. Do not allow any fruit crown to lay directly on fruit below. Latex contamination and fruit damage will result. Padding with leaves and layering fruit consecutively provides a stable load and avoids rubbing and falls. Fruit should not be piled more than two layers deep. At the packhouse the trays may be rested on the floor or better, placed on racks to await selection.

Selectors should be knowledgeable about the fruit quality specification as this stage determines what fruit are accepted. See ?Product Specifications? below. Hands should be cut into clusters with a minimum of four fingers per cluster and a maximum of six. After checking a hand for quality, it is then cut with a dehanding knife to best use the acceptable fingers available. Second grade fruit should be placed aside to be dealt with later or by a second line of handlers. The first grade fruit is placed into a bowl or tank of clean water to complete latex release. Clusters should remain in the water for a further five minutes.

All Cavendish bananas are treated with a fungicide to prevent rotting of the crown during ripening. At this stage, it is wise to assume ndiizi will be affected similarly. After emerging from the delatexing tank the clusters can be dipped directly into a second water tank containing a fungicide solution containing either of the active ingredients, thiabendazole (500ppm) or imazalil (100ppm). Mertect 20S is a soluble form of thiabendazole which is recommended for this application. Fruit can be dipped briefly in and out of the solution without delay. Rubber gloves should be worn and hands washed before eating. These two fungicides are the only ones allowed for postharvest use on bananas entering the UK market. Clusters emerging from the fungicide solution should be rested on a draining table covered in 1-inch mattress foam.

Once dry, the fruit can be packed. See 'Packaging' below for information on packaging and counts/weights. After packing the cartons are weighed and labeled, they may be unitised, and then are transferred to the airport. If feasible, the product can be precooled before shipped.

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Varieties

Several cultivars of ndiizi appear to be in production in Uganda, differing in fruit size, shape and yield. They are currently being characterised by NARO and data should be available during 1998.

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Yield

Annual yields in Kenya are reported at 8 tonnes per hectare but 13 - 15 tons per hectare should be possible with intensive management. Trials are currently being carried out by the ADC in conjunction with NARO and commercial growers.

9

Time to First Harvest/Seasonality

Apple banana is ready to harvest when the fingers are three quarters full maturity (approximately 15-18 months after planting, 6 to 8 weeks after flowering).

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Pests and Disease Prevention

Apple banana is very susceptible to Panama disease, a fungal wilt which is on the increase in Uganda. Once land is infested by the fungus, it can be considered useless for the production of all susceptible bananas thereafter. Considerable care is required in sourcing clean planting material for any intended expansion.

Other possible pests and diseases include banana weevils and nematodes (best prevented before planting by using either a hot water or chemical treatment on the planting material) and leaf spot (best prevented by using intensive cultural practices: weeding, mulching, pruning, deflowering, etc.).

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Fertilizer Requirements

Banana plants deplete the nutrient content of the soil, which needs to be replenished in order to encourage good plant growth and good yields. Occasional applications of NPK fertilizer should be applied as needed. Many banana plantations in Uganda show symptoms of nitrogen and potassium deficiency, due to prolonged cropping without adequate fertilisation.

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Water Requirements

Bananas require good drainage to prevent waterlogging. Bananas also perform poorly in dry soils, so to enable moisture retention farm trash (leaves, fronds, etc.) should cover as much of the bare soil in the field as possible. This will also reduce soil erosion.

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Product Specifications

ADC has developed three export market specifications for apple banana: during harvest/packing, pre-shipment, and for market arrival. They are available at ADC offices in Kampala.

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Packaging

For supermarket buyers, fruit should be packed in one layer. Individual bagging of clusters in perforated polythene bags is recommended. This reduces weight loss, promotes good peel colour on ripening and reduces abrasion of one fruit on the next.

Using the two piece mango carton (400 x 300 x 120mm), two packing arrangements have been developed, one of 3kg net and another of 3.5kg net (details are available from ADC). The 3kg pack is suitable for 9 clusters of larger (12-15cm length) fruit, whereas the 3.5kg pack is achieved with 12 clusters of shorter fruit (10-12cm length). The final packs should be tight to reduce fruit movement in transit but not be forced so as to cause damage during the packing process. All cartons should be weighed and be of standard weight and count.

Handwritten labeling should be minimized early on by printing information during carton manufacture or through the use of adhesive labels. Required information is included in the ADC product specifications for apple banana. Minimizing, simplifying and encouraging careful handling of this product throughout the chain will be important. Two possibilities exist. Strapping cartons in twos or threes encourages upright stacking, discourages throwing and prevents pilferage. More expensively, but more reliably, the use of smaller 2-3kg packs placed inside a ‘mother’ carton with a total weight of 10-15kg will achieve the same results. Strapping is recommended initially. It is essential with this product that cartons are handled horizontally and not tipped. Tipping cartons sideways will damage fruit.

The ADC has been discussing the possibility of pre-packing semi-ripe fruit with UK supermarkets, which could add sufficient value to overcome part of the air freight cost constraint, but this will require additional investment in good packing and handling facilities.

Investment

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Cost of Production

Costs of production for export production of ndiizi are not available at present although the ADC should have data available during 1998. However, most growers regard Ush300/- per kilo as a fair price.

Examples of a packer/exporter's variable costs are shown in Table 1.

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Profitability

Costings for exporting apple banana are based on cost estimates obtained during an ADC trial shipment in June 1997. See Table 1. Using an estimated CIF price of US$4.00, net margins look excellent at between US$1.50 and US$1.70 per kilogram for shipment to multiples. Note that shipments to ethnic specialist wholesalers would earn a lower, yet still acceptable, net margin pf US$0.84 per kg.

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Investment Requirements

For an exporter, who purchases product from outside producers and who rents a packhouse, US$5,000 to US$17,000 will be needed as an initial investment in order to attain an export level of 4 MTs/month. US$5,000 will be required to cover negative cash flow during the first four months, while $12,000 will be required to purchase a truck (2 ton pick-up), equipment ($500), and communications equipment ($800).

More Information

Additional information on production, postharvest handling, and marketing of apple banana is available from ADC/IDEA, including:

Export Marketing of Apple Banana (Ndiizi). Agribusiness Development Centre, Kampala. June 1997. 49 pages. Provides information on marketing, postharvest handling, packaging, product specifications (harvest, preshipment, and supermarket), financial analyses for producers and exporters, as well as reports on the results of several trial shipments to the UK in 1997.

Banana Growers' Manual. Windward Islands Banana Growers' Association. 1993. 107 pages.

Proposal for Production and Packaging of Apple Bananas from Kenya for the UK Market. Cranfield Institute of Technology. May 1991. 65 pages.

ADC/IDEA also publishes weekly wholesale price reports for apple banana in major European markets.

Table 1: Net Margin Calculation for Apple Banana Shipment to the UK, per kilogram
(Ushs unless otherwise marked)

Item	Rate	3-kg carton	3 kg carton	3.5-kg carton
Shipment volume		1,000 kg	1,000 kg	1,000 kg

Table 1: Net Margin Calculation for Apple Banana Shipment to the UK, per kilogram
(Ushs unless otherwise marked)

Item	Rate	3-kg carton	3 kg carton	3.5-kg carton
Farmgate Price		200	300	200
Fruit packing		400	500	400
Carton	1,020	340	340	255
Polybags	11 each	33	33	38
Kraft Liner	40 each	-	-	13
Transport	30,000	30	30	30
Loading	10,000	10	10	10
Airway Bill	15,000	15	15	15
Handling	70/kg	70	70	70
Phytosanitary Certificate	4,000	4	4	4
Gate Fee	4,100	4	4	4
Clearance	50,000	50	50	50
FOB Cost per kilogram		1071	1171	1004
Freight Rate per kilogram	1,250	1,417	1,417	1,393
Total Cost CIF per kilogram		2488	2588	2397
Price UK US$ per kilogram		4.00	4.00	4.00
Net Margin Ushs/kg		1512	1412	1603
Net Margin US$/kg		1.51	1.41	1.70

ADC Commercialisation Bulletins are published by the Agribusiness Development Centre of the USAID-funded Uganda?s Investment in Developing Export Agriculture (IDEA) Project. The bulletins provide potential investors with a quick reference to production and market characteristics for various nontraditional export crops. For additional technical details, contact:

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