ADC Commercialisation Bulletin #5

FRESH GREEN BEANS

Marketing

1
Markets

The European Union is the major market for fine and bobby beans produced in Africa. Europe?s imports of fresh beans from non-EU sources have grown significantly over the past eight years, largely a result of increased production of high value fine, extra-fine, and bobby beans in such countries as Kenya, Zimbabwe, and Morocco. France and Holland are the largest European importers of fresh beans, although UK imports are not far behind and are expanding at a much faster pace. German imports from non-EU sources are relatively low, but significant imports from the Netherlands also make it an attractive market.

2
Customers

Most importers who deal with Africa handle fresh beans. Importers in Europe are extremely picky about quality and should be asked for their product specifications in advance of trial shipments. More and more pre-packed, pre-cut beans are being shipped to European supermarkets, which normally requires a large investment to upgrade hygienic conditions at the farm/packhouse.

3
Volumes

The EU imported 57 thousand MTs of fresh beans from non-EU sources in 1996, up from 44 thousand MTs in 1994 and from 35 thousand MTs in 1988. Fresh beans are the largest vegetable (in value terms) imported from Africa by Europe. France, the Netherlands, and the UK accounted for 84 percent of total EU imports from non-EU sources in 1996. However, reexports to Germany, particularly from the Netherlands, also makes it an important market.

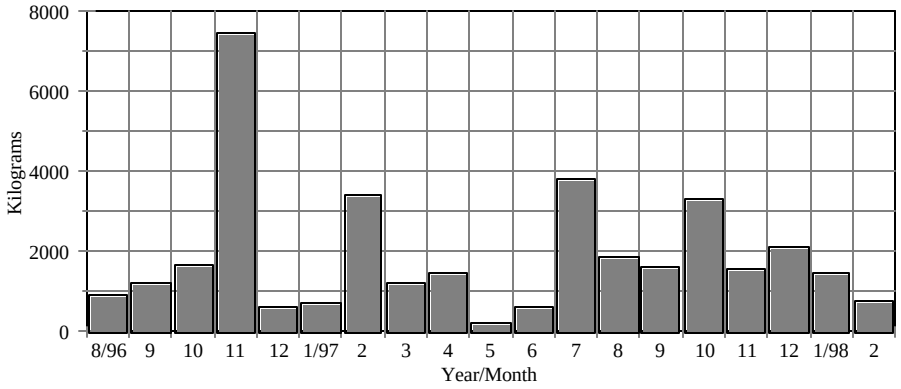
Table 1: EU Imports of Fresh Beans from non-EU Countries (1998-1994, MTs)

Importing Country	1988	1994	1996
France	11,927	15,077	15,054
The Netherlands	13,995	15,121	18,116
United Kingdom	3,975	7,552	14,663

Germany	2,415	2,354	2,640
Other EU	2,663	4,039	6,569
Total EU	34,975	44,143	57,042

Source: EUROSTAT

Ugandan Exports of Fresh Beans
Aug 96 - Feb 98, kilograms



Beans are a traditional crop in Uganda, but most of the ones produced are not of export varieties. Exporters have grown fine beans for export to the UK market on a small scale for the past five years. A commercial farm producing bobby beans began production in 1997 and is now exporting to the UK supermarket trade. Monthly Ugandan bean exports are given in Figure 1.

4
Prices

Table 2 shows the average European importers**?** selling prices for fresh beans over the period January 1997 through February 1998. Prices are often much lower during the summer months when domestic production is available from Spain, France, the UK, Italy and others. Prepacked fine and extra-fine beans are available on the market (primarily from Kenya) and earn a premium price. To estimate CIF cost from the numbers in the following table, reduce prices by 15 to 20 percent for importer handling and markup.

5
Competition

Many players have entered the fine and extra-fine bean market in Europe of the last five years. Kenya remains the leading supplier, but other supplies also enter from Zimbabwe, Burkina Faso, Mali, Senegal, Morocco, Cameroon, Madagascar, Kenya, Zimbabwe and Morocco. Many of these countries have invested heavily in this sector because fresh beans are a profitable crop for which there is a year-round demand. Kenya is one of the few overseas suppliers which also ships prepacked produce. Domestic production in France and Spain cause prices to drop in the summer months and many suppliers pull out of the market during this period.

For bobby beans, Egypt is the main competitor, with lesser amounts entering from Kenya, Gambia, Senegal, and Ethiopia. Much cheaper domestic product produced in the UK, Spain, and Italy will also compete with Ugandan product if shipped during the summer months. Table 3 shows the top suppliers to selected EU markets in 1996. Table 4 shows seasonality of French and British imports from these suppliers. Note that during the period July-September, very few fresh beans are imported from overseas suppliers.

Table 2: Average European Importer Selling Prices for Fresh Beans
(January 1997 - February 1998, US$/kg, average of low and high prices)

Type	Importer	Avg Price (year round)	Avg Price During Off-Season (October-June)	General Price Range	Reported Suppliers
Fine	France	2.43	2.61	1.10-3.61	Mali, Burkina Faso, Kenya, Senegal, France, Morocco, Spain
	Germany				(no reporting)
	Netherlands	3.59	3.60	3.33-3.74	Kenya
	UK	3.89	3.92	3.02-4.75	Kenya, Zimbabwe
X-Fine	France	3.26	3.31	1.64-4.68	Kenya, Madagascar, Mali, Burkina Faso, France, Morocco, Senegal, Cameroon
	Germany	3.77	3.81	3.39-4.09	Kenya
	Netherlands	3.83	3.84	3.64-4.04	Kenya
	UK	4.98	4.98	4.41-5.90	Kenya, Zimbabwe (irregular reporting)
Bobby	France	2.30	2.40	0.65-3.05	Senegal, Egypt, Ethiopia, Italy, Spain
	Germany	2.45	2.45	1.59-2.92	Kenya, Egypt, Senegal, Ethiopia
	Netherlands	2.30	2.30	1.60-3.20	Egypt, Senegal
	UK	2.90	2.96	1.49-3.93	Egypt, Gambia, Spain, UK, Ethiopia, Kenya, Italy, Senegal

Source: ITC Market News Service

Table 3: Major Suppliers to Selected EU Markets, 1996, MTs

	France	Netherlands	Germany	United Kingdom	Total EU
Kenya	4,431	1,067	474	9,631	17,052
Egypt	532	11,992	1,037	1,433	16,966
Senegal	1,457	2,308	91	7	4,513
Morocco	4,229	87	1	1	4,466
Ethiopia	130	712	360	68	2,820
Burkina Faso	2,038				2,061
Zimbabwe	15	25	21	1,831	1,898
Cameroon	1,091			2	1,093
Gambia	5	229		583	817
Zambia	1		3	491	495

Mali	386	4			393
Madagascar	357				357

Source EUROSTAT

Table 4: Seasonality of Imports of Fresh Beans from Non-EU Sources, 1996, based on volume

	UK	France
January	8%	11%
February	8%	10%
March	9%	9%
April	10%	14%
May	10%	18%
June	9%	6%
July	7%	2%
August	4%	1%
September	5%	2%
October	9%	4%
November	10%	7%
December	10%	14%

Note: Shows percentage of annual imports from top 12 non-EU suppliers that enter during each month. For example, in August in the UK, 4 percent of annual imports entered.
Source: EUROSTAT

Production

6
Method

Soil. Land used should be weed-free and preferably soil-sterilized with methan-sodium or a nematicide such as carbofuran prior to planting. Fairly light soils with adequate humus and a pH of 6.5-7.0 are ideal. Heavy soils and poor root aeration will result in depressed yield. Plants should be kept weed-free during and up until the time of harvesting.

Sowing. Beans are best planted in raised beds. Seeds should be planted in rows 30 cm apart with 8-10 cm between the plants. A plant density of around $32/m^2$ is a good target. A sowing rate of 60-70 kilograms of seeds per hectare is average. The seed rate for recent trials in Uganda was 62 kg/ha. Sowing depth is usually at 3-5 cm.

Weed Control. If weeds are controlled by hoeing, this should be done carefully and close to the surface because any damage to roots will cause wilting and possible fungal infection. Chemical control with herbicides such as Glyphosate, Monolinuron, Arresin, and Bentazone can be done effectively but should be done on a trial basis to determine the most effective and least damaging chemical.

7
Varieties

There are many commercial varieties of fresh green beans available, but only a limited number are acceptable to the European market. Trials sponsored by the ADC in 1996/97 concentrated on the Masai, Xavo, and Longio varieties of fine beans and Naitex, Endurance and Celtic varieties of bobby beans. Masai had the best yields and was the best-received by UK importers for the fine beans. Of the bobby beans, Naitex showed the most promise, as Endurance possessed too many curved pods and the yields for Celtic were quite low.

8
Yield

Table 4 indicates the marketable yield per square metre and per hectare for fine and bobby beans trialed in 1996. Low yields for bobby beans are partly explained by the season not being right for these beans and Naitex variety seed was originally taken from a field productions area and not a crop specifically grown for seed production.

More recent trials indicate that the Paulista variety can give a marketable yield of 6-9 tonnes per hectare under commercial conditions

Table 3: Marketable Yield per Hectare for Fine and Bobby Beans

Variety	Area Planted (m^2)	Marketable Yield (kg/m^2)	Marketable Yield (kg/net ha(6,400 m^2)
FINE BEANS			
Masai	1,280	.78	4,992
Xavo	1,344	.65	4,180
Longion	1,376	.40	2,560
BOBBY BEANS			
Naitex	1,248	.34	2,176
Endurance	672	.71	4,544
Celtic	704	.36	2,304

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Time to First Harvest/Seasonality

The average time from planting to first harvest is about 55 days. The cropping period is generally around 19-26 days. Beans can be planted and harvested year-round in Uganda.

10
Pests and Disease Prevention

Major insect pests can be controlled by drenching with Vydate one week after germination followed by (as and when necessary) applications of Decis, Malathion, and Super Ambush. Rust will probably be the main

threat to achieving optimum yields in Uganda. During heavy rains, rust can be a very big problem. With a good chemical control program, rust can be contained but not entirely eliminated. Table 4 lists some disease problems and how to control them. It should be noted that new EU regulations impose strict controls on the level and type of chemicals which can be applied to produce destined for the fresh market.

Table 4: Diseases of Fresh Beans and Their Prevention

Disease	Description	Control
Damping Off	caused by poor drainage	efficient seed bed preparation and by treating seed with Thiram/Carbendazim
Grey Mould (Botrytis)	mould appearing on stalks and pods resulting in softening and rots	spray with Benomyl and Carbendazin
Rust (Uromyces)	light brown/dark brown raised spots on leaves, stems and pods - problem in areas of high humidity	crop rotation, application of Zineb
White Rot (Sclerotinia)	white mold on stems followed by formation of black pin head sclerotia	adequate plant spacing and disciplined crop rotation, spray with Benomyl/Carbendazin
Thrips (Thysanoptera)	silver spots on undersides of leaves, leaves dry up and fall - flower buds fail to open and abort	spray with Diazinon, Parathion, Pyrethroid
Halo Blight (Pseudomonas)	water-soaked spots with yellow halo, spots dry up and leaf withers, grease spots produced on pods.	plant only certified seed and use resistant varieties - no efficient chemical control but copper oxychloride or colloidal copper sprays may reduce spread of infection
Anthracnose (Colletotrichum)	dark brown sunken spots on pods	use resistant varieties and spray with Zineb, Maneb
Virus diseases	leaves curl and mosaic symptoms	use only resistant varieties
Bean Stipple Streak	brown stripes along leaves cause by Tobacco Necrosis virus	effective crop rotation to prevent buildup of virus in soil - remove and burn all infected plants

11
Fertilizer Requirements

Approximately 60-120 kg of nitrogen per hectare should be given as a split application prior to sowing and at flowering. A single application is liable to cause plant damage. Beans have a high phosphate requirement and 150-200 kg of P_2O_5 should be given. A light application of magnesium is beneficial but fertilizers containing chlorine compounds should be avoided, as these can cause leaf damage. Under intensive production, applications of NPK and TSP will also be necessary at levels determined after soil analysis.

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Water Requirements

Irrigation is necessary if dry conditions prevail at flowering and pod setting. Under Ugandan conditions 40 to

50 m^3 is required per hectare during the dry season. Irrigation may also be necessary during dry spells in the normal rainy season.

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Product Specifications

Harvest Maturity and Harvesting. Beans should be hand-harvested by repeatedly picking young immature pods before seeds develop. Picking should be done in the morning before it becomes hot. After picking, beans should be placed carefully in a basket and covered with a wet cloth to prevent desiccation and kept in the shade. Recent experience in Uganda shows that one person can grade, pick, transport and wash about 34 kilograms of beans per day but that if these tasks are separated, one person can pick 50-60 kilograms per day. Picking rates vary depending on the weather, and the amount picked per day will decrease after the first two pickings as good quality beans become harder to find.

Grading/Sorting for Export. Beans should be sorted according to size. Fine beans should be between 10 and 13cm in length and 6-9mm in diameter. Bobby beans should be between 12 and 16cm in length and 8-12mm in diameter. Beans should be fresh, firm and snap, rather than bend, when folded. Beans should be straight and without excessive seed development, and free of taints and odors, fungal infections, insect contamination, mechanical damage, excessive scarring, surface moisture, as well as decayed, bruised, or broken pods. Dead flowers should be removed from the ends and the stem attachment should be removed from the stem of the pod. Importers generally have strict product specifications to which they expect suppliers to adhere.

Fungal Control. Major fungal diseases can be controlled by the application of Antracol, Baycor, Kocide 101, Dithane, Macozeb and Saprol. Table indicates disease problems and controls.

Cold-Chain and Storage. Precooling and maintaining product cool temperatures is essential for green beans in Uganda. After packing, beans should be cooled to around 6-8^{o}C. Maintaining a cold chain is essential in ensuring bean quality. One UK importer says flesh temperature on receipt should be between 5^{o}C and 8^{o}C, with 6^{o}C being optimal. Hotter temperatures will cause beans to wilt.

Shelf-Life. Beans chilled to 6-8^{o}C will have a shelf life of six to ten days.

14
Packaging

Fresh beans are sent to Europe in a 5-kg boxes. Boxes should be clearly labeled, identifying the product, the exporters**?** name and address, and the net weight. Packaging materials should be new, clean, and designed to avoid causing internal or external damage to the produce.

Investment

15
Cost of Production

Table 5 illustrates estimated costs of production and transport for a producer/exporter shipping 39,000 kg of fresh bobby beans per month (7,800 boxes per month, or 13 shipments of 600 boxes each).

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Profitability

A 15-hectare bobby bean farm, producing on 8 hectares at any given time and with costs as shown in Table 5, has projected net margin it its first year as illustrated in Table 6.

Table 5: Costs of Production and Transport for Fresh Bobby Bean Exporter (Ushs per 5-kg carton)

Description	Ushs
Packaging	950.00
Planting Material	26.00
Documentation	84.00
Telecommunication	28.35
Chemicals	218.68
Grading/Packing/Picking	500.00
Indirect Costs (labor, electricity, etc.)	841.00
Handling	400.00
Transport	131.25
Airfreight (US$1.16/kg x 5.5 gross carton weight)	6,380.00
Total Costs per Carton	9,559.28

Table 6: Projected Gross Margin for 15-hectare Bobby Bean Farm, US$
(8 hectare in production at any given time)

Total Revenue	39,000 kg x 10 months x $2.35/kg	916,500
Total Costs	7,800 cartons per month x 10 months x $9.56/carton	745,680
Gross Margin		170,820

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Investment Requirements

Estimated investment costs for a 15-hectare farm (producing on 8 hectares at any given time) are shown in Table 7.

More Information

Additional information on fine and bobby bean production, postharvest handling, and marketing are available from ADC.

Table 7: Estimated Investment Costs for a 15-Hectare Bobby Bean Farm in Uganda, US$

Land	*15 hectares x US$2,500/ha*	50,000
Seeds	*$670/ha x 8 hectares*	5,360
Chemicals (soil fumigation)	*$750 per hectare x 8 hectare x twice per year*	12,000
Chemicals (operations)	*$700/ha x 8 hectares*	5,600
Packhouse Building	*$30 ft2 x 5,000 sq ft*	150,000
Packhouse Equipment		30,000
Cool Room		70,000
Truck	*2nd hand delivered*	32,000
Irrigation	*$69,000 for first 8 ha, $3,000/ha for last 7ha*	90,000
Total		444,960

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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