ADC Commercialisation Bulletin #3

Dried Bird?s Eye Chillies

Marketing

1
Markets

Most Bird?s Eye chillies are processed to extract the oleoresins for sale to the food and pharmaceutical industries.
The market demands top quality and consistent product. Drying and grading operations needs to be maintained at high standards.

2
Customers

There are specialized brokers in Europe, North America, the Middle East, and Asia. Lists of buyers are available from the ADC.

3
Volumes

Since trade statistics do not differentiate well between different types of chilli products, it is difficult to obtain an accurate figure for world trade in dried high-pungency chillies. The European Union, the United States, and Japan are the largest markets of high pungency dried chillies. Estimated demand in 1992 stood at 620 MTs each for the EU and the United States (composed of 400 MTs whole chillies, 70 MTs ground chillies, and 150 MTs of unmet demand for the extraction market) and 200 MTs for Japan. Exports from Uganda were less than 50 MTs in 1997.

4
Prices

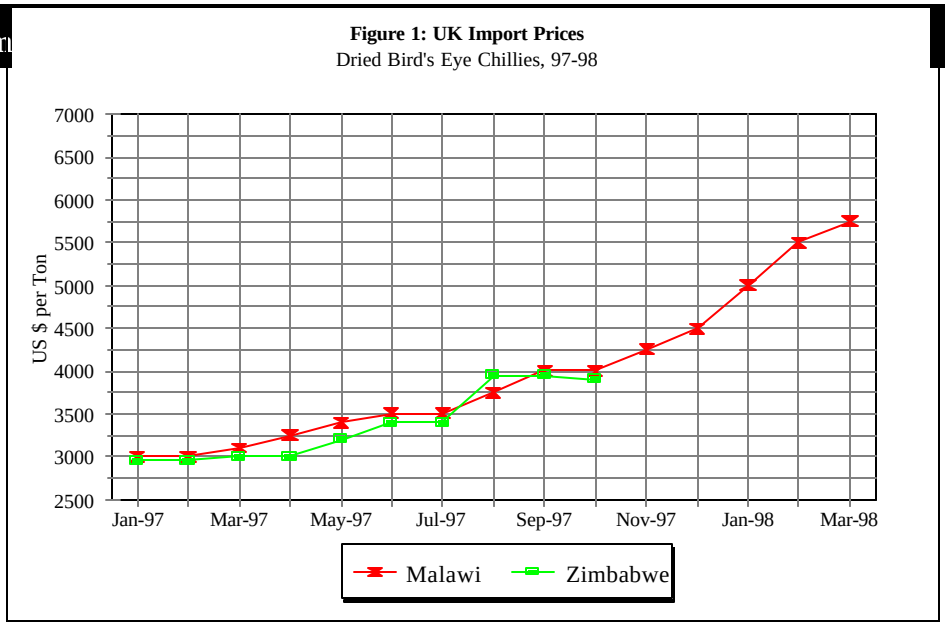
Prices began increasing rapidly in early 1997 as supply could not fulfill demand. CIF prices in the UK went from US$3,000/MT in January 1997 to US$4,000/MT in August 1997. Prices have continued to increase, with March 1998 UK CIF prices being quoted at US$6,000/MT. See Figure 1.

Ugandan producers should not expect that prices will remain at these levels. Prices for dried

chillies are relatively unstable. Producers are known to rapidly increase acreage in times of market shortages (high prices), resulting in an eventual oversupply of product and falling prices. Prices between 1985 and 1996 ranged between US$1,200/MT and US$4,600/MT FOT Africa. In the early 1990s, prices ranged between US$1,700/MT to US$3,200/MT FOT Africa. In mid-1996, UK CIF prices were quoted at US$2,950/MT for Bird?s Eye from Zimbabwe and Malawi, while Dutch importers were quoting US$3,000/MT CIF for product from Zimbabwe.

Exporters of high pungency (capsaicin) chillies are paid a premium for high quality product.

Figure 1: UK Import Prices
Dried Bird's Eye Chillies, 97-98



5
Competition

Malawi, Zimbabwe, Papua New Guinea, and China are the largest suppliers to the European Union. Mexico supplies most U.S. import demand with lesser amounts entering from China, Chile, and India. Most Japanese imports are sourced from China.

Production

6
Method

The Bird? s Eye chilli plant is a small bush that can grow to a height of 4 feet with a life of two to three years. A recommended Bird? s Eye chilli production schedule is given below:

Year 1

January (early): Prepare ? collective? seedling beds, incorporating animal manure, and sow chilli seeds (about 20 grams of seed should give at least 500 good plants)

February/March: Spray for pest control if necessary

March (late): Transplant to farmers? fields. Recommend spacing is 1 m (within rows) by 2 m (between rows) for monocrop/pure stand production, 2 m by 2 m for intercropped production. For most farmers it is acceptable to intercrop with bananas, cassava, and other crops.

June-August: Harvesting/drying (overlaps with the third season of the 1995-1996 crop, which probably has low production by this time)

September: Remove two-year-old/diseased plants

Year 1-Year 2
December-May : Harvesting/drying

January (early): Prepare ? collective? seedling beds and sow chilli seeds ...

7
Varieties

The Uganda Bird? s Eye Chilli (UBEC) is considered to have one of the highest pungency levels of any chilli in the world. However, in Uganda, there are many different types of Bird? s Eye chillies. Small red types are required by the market. It is essential to select for these plants. During harvest, remove off-type plants (those with two large of fruits or with a yellow immature fruit color) from the field. When selecting seed for planting, only select seed from the recommended types.

8
Yield

Well-managed farms should be able to yield at least 300 grams of fresh chilli per plant per year or 180 grams of dried chilli. At a density of 10,000 plants/ha this gives a yield of 1.8 tonnes/ha, equivalent to an ex-farm value of more than $5,000/ha for grower-exporters at March 1997 prices (none exist in Uganda at present).

9
Time to First Harvest/Seasonality

Production peaks during the periods June-August and November-January. For new plantings, the first harvest is approximately 5 to 7 months from sowing of the seeds.

10
Pests/Disease Prevention

For the most part, agro-chemicals are not widely used in Uganda for chilli production. Specific recommendations are not available although proper application of aphicides would probably be very cost effective since virus infection is a major factor in reducing the productive life of commercial chilli fields..

Mulching will help to reduce weeds, reduce insect populations, and maintain healthy plants which can resist infection. The planting area should be kept free of weeds. Furthermore, it is important to: (1) remove suspected virus-diseased plants (mottled leaves, stunted) from the field; (2) remove plants that reach the age of one and a half years as plants of this age witness deteriorating yields; and (3) rotate chilli with other crops (eg. tubers and legumes).

If required, the following treatments are recommended for nursery plants:

Aphids. Chilli solution with OMO soap as a wetting agent is effective in controlling aphids. Proportion is 0.5 kg of dry chilli fruits pounded in a mortar added to 20 litres of water and a little OMO soap solution. Apply once every two weeks when aphids are seen in the field.

Thrips, Mites, Whitefly. A solution of Karate EC (30 mls/20 litres of water), applied bi-weekly during periods of high mite populations (generally at the end of the dry season), will control mites as well as thrips and

whitefly.

Traders supplying seed should disinfect seed against viruses with tri-sodium phosphate.

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Fertilizer Requirements

Application of mulch and animal manure is traditionally used, but chilli will also benefit from application of balanced inorganic fertilisers.

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Water Requirements

Irrigation is not used in Uganda for chilli production, since smallholders can obtain reasonable yields under rain-fed conditions. However, it is possible that larger scale commercial plantings would produce high yields and good returns under drip irrigation. No trial data are available at present.

13
Harvesting

Harvesting is the most labour intensive activity in chilli production. It is essential not to plant more bushes than you can easily harvest. It is far more profitable to harvest all the fruit from a few plants than half of the fruit from many plants. The need for seasonal labour and good labour management has been a deterrent to large scale production of birds eye chilli.

Harvest mature, deep red fruits only of length not more than 2 cm. Chillies should be picked without stalks. Damaged, overripe, or green chillies should be dropped in the field and not taken to the dryer. The fruit should be picked early in the day after dew evaporates from the plant.

14
Drying

Do not dry chillies on the ground. Do not dry directly in the sun/open to avoid rain damage and sunburn.

Construct a polythene-covered stand with two racks for drying the chillies. Spread chillies in a single layer on each rack with each rack holding chillies harvested on the same day. Locally made mats are preferable to polythene so as to allow free air flow. After two days, each batch should be moved from the top rack to the lower rack. Drying takes 4 to 7 days. Fruits should be shriveled yet not brittle (moisture content of 7.5 to 8 percent).

After drying, chillies should be stored in a covered basket or sack and kept in a dry place off the ground. On the bottom of the bag, place some small pieces of charcoal wrapped in a cloth. We discourage on-farm storage without adequate storage facilities.

Prior to export packaging, it is essential that the chillies be packed in bags or containers that allow for adequate air circulation.

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Market Specifications

Fruit must be red, not more than 2 cm in length, have less than 8 percent moisture content, and have a high capsaicin content. Capsaicin content (pungency) is the largest determining factor of chilli quality. Exporters will earn premiums for chillies with a higher capsaicin content (pungency).

16
Packaging

Chillies for export are typically packed in jute bags with 35 kilograms of chillies per bag.

Investment

17
Cost of Production

Small growers have traditionally produced chilli with no cash investments. However, better returns are obtained if growers construct simple solar drying racks to accelerate drying, keep the product off the ground and protect from rain. This requires an investment in plastic sheeting, nails and wood of less than Ush25,000/- for a grower with up to 500 bushes.

Larger growers could undoubtedly benefit from irrigation and more sophisticated drying and handling facilities but no growers of this type exist in Uganda at present.

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Profitability

Small growers, using no cash inputs and only family labour, can realize ?cash profits? equal to their gross sales revenue. Gross margins for a small holder using some basic levels of inputs are given in Table 1. For larger commercial growers (as illustrated in Table 1), on-farm net revenue is estimated at about Ushs 600,000 per hectare per year.

Table 1: Projected Gross Margins for Ugandan Producer of Dried Bird? s Eye Chilli (Ushs/acre)

Revenue		
Yield[1] (kgs/ha)	1,800	
Sales Price (Ushs/kg)	1,600	
Total Revenue		2,880,000
Expenses		
Seed/Plants[2]	50,000	
Land Cultivation[3]	100,000	
Fertiliser[4]	30,000	
Chemicals[5]	100,000	
Labour[6]	448,500	
Processing[7]	200,000	
Total Expenses		928,500
GROSS MARGIN		1,951,500

[1] The yield is a conservative estimate using good seed and basic level of inputs and weed control.

[2] Select own seed.

[3] Two times tractor ploughing plus bed making @ Ushs 25,000/each

[4] 6 heaps of organic manure @ Ushs 5,000/each

[5] 6 kgs of Dithane + 4 litres of Ambush @ Ushs 12,000 per kg or litre

[6] Nursery management (Ushs 15,000 for 21 days); spraying (Ushs 7,500, 5 days @ Ushs 1,500/day); fertiliser application (Ushs 12,000, 8 days @ Ushs 1,500); slashing (Ushs 10,000 per acre); clearing field ditches (Ushs 6,000, 2 times @ Ushs 3,000 each); irrigation (Ushs 12,000 per season); weeding (Ushs 18,000, 12 day @ Ushs 1,500/day); harvesting (Ushs 150,000, 100 days @ Ushs 1,500/day)

[7] Grading (Ushs 15,000, 10 days @ Ushs 1,500/day); Drying (Ushs 30,000, 20 days @ Ushs 1,500/day). Miscellaneous 5 percent of revenue (Ushs 64,000 per acre).

Table 2 provides an estimate of exporter net revenue for a sample 7-ton container shipment of dried bird? s eye chillies from Kampala. Table 3 shows the effect on net revenue with varying raw material unit prices and FOT Kampala sales prices.

Table 2: Net Revenue Estimate for 7-ton Container Shipment (FOT Kampala, Ushs)

	Unit	Unit Price	Total	
Raw Material (kg)	7,000	1,000	9,100,000	87.3%
Packaging (bags to hold 35 kg)	200	1,650	330,000	4.1%
Direct Labour (resorting/grading/handling)	7,000	35	245,000	3.1%
Transport to Kampala	7,000	50	350,000	4.4%
Fumigation by SGS (tons)	7	2,000	14,000	0.2%
Loading Supervision by SGS	7,939,000	1.00%	79,390	1.0%
TOTAL COST			8,018,390	100.0%
FOT Kampala Sales Price	7,000	2,000	14,000,000	
Net Revenue			5,981,610	
				42.7% of sales price

Table 3: Net Revenue Estimates with Varying Raw Material Costs and FOT Prices (7-ton container shipment, FOT Kampala, Ushs)

FOT (Ushs/kg)	Raw Material Cost (Ushs/kg)			
	750	1,000	1,250	1,500
1,500	4,249,110	2,481,610	714,110	-1,053,390
1,750	5,999,110	4,231,610	2,464,110	696,610
2,000	7,749,110	5,981,610	4,214,110	2,446,610
2,250	9,499,110	7,731,610	5,964,110	4,196,610
2,750	12,999,110	11,231,610	9,464,110	7,696,610
3,000	14,749,110	12,981,610	11,214,110	9,446,610

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Investment Requirements

Chilli is a crop that can be grown with minimal investment. It is an excellent crop for small growers who can intercrop and use their own labour. Under these circumstances, capital investment for the grower is minimal; the only real investment required is about Ushs 20,000 for construction of the drying racks. For traders, some investment is required in stores and transportation.

More Information

For additional information on production and marketing of dried Bird? s Eye chillies, contact ADC/IDEA.

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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