

DEVELOPMENT OF THE LATANYÉ BROOM INDUSTRY IN SAINT LUCIA (WEST INDIES)



Contributing Authors-

Donatian Gustave, Lyndon John, Michael Andrew, Brent Charles, Margaret Severin, Monica Hyacinth, Lench Fevrier, Julius James, Anita James, Cornelius Isaac and Rebecca Rock.

October 19 2006

Background

Latanyé (*Coccothrinax barbadensis*) is a palm native to Saint Lucia. Its leaves are used to make craft and brooms. Latanyé is generally distributed throughout the Windward and Leeward Islands, including Trinidad and Tobago. Latanyé's natural habitat ranges from "littoral and scrub woodlands near the coast, from sea level to 200 metres elevation". (L. John 2001). The morphology of the leaves makes the plant resistant to strong wind currents. As it can grow on marginal soils, and appears to be tolerant against pests and diseases, Latanyé may be considered as an ideal plant for soil conservation works to reduce the rate of land degradation in St. Lucia.

Figure 1 Photo of a Latanyé Plant



Traditional Harvest of Latanyé Leaves

In an ideal sustainable harvesting system, the older or mature Latanyé leaves are harvested and that the remainder of the plant regenerates and produces new leaves. 5 to 7 Latanyé leaves and a sturdy broom handle are used to make large brooms. (L. John 2001). Figure 2 illustrates how brooms are made.

Figure 2 Phases in the production of a Latanyé Broom

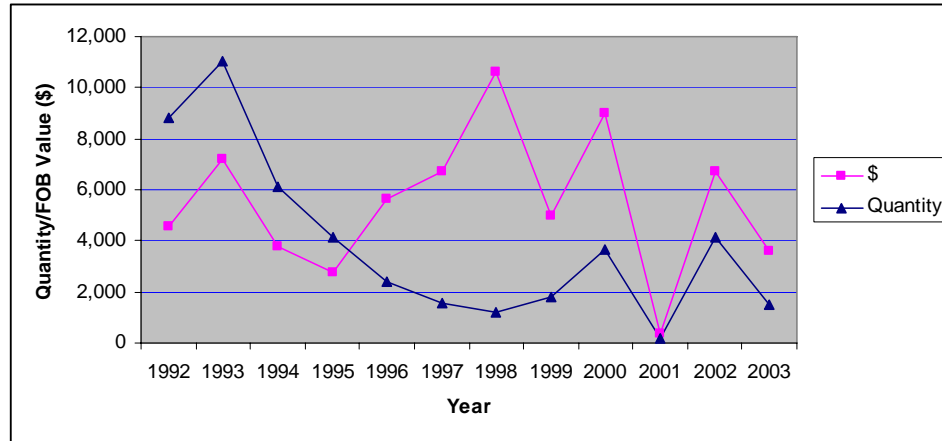


Lyndon John (2001) described the broom industry in a socio economic context in 2001. The study revealed that Latanyé wild stocks were harvested "year round" to maintain livelihoods of rural people because of the available market and high demand for leaves for making brooms. In addition, there was "no active cultivation of the plant" (L. John 2001) and harvesters used the younger leaves of plants as materials to tie parts of the broom. These activities resulted in a decrease in the availability of Latanyé (L. John 2001).

Figure 3 illustrates the decrease in the availability of brooms sold from 1993 to 2003. One may observe the trend of the decrease in the quantity of brooms exported from 11000 in 1993 to less than 2000 brooms in 2003.

Noteworthy is that the number of brooms exported decreased to 181 in 2001. A local exporter of brooms to Barbados explained that wildfires and the unavailability of shipping resulted in the production and sale of fewer brooms for that period. (Personal communication: S. Bailey 2004)

Figure 3: Total Annual Values Free on Board (FOB) and Quantities of Brooms Exported from Saint Lucia, 1992 to 2003



(Source Saint Lucia Government Statistical Department 2004)

The Market

The Latanyé brooms are produced for the local market and for exportation. Table 1 details the countries to which brooms were exported from Saint Lucia for the period 1992 to 2003. (D. Gustave *et. al* 2004)

Currency (rate 1 US=2.70 E.C.)

Table 1: Total Value and Quantities of Brooms imported from Saint Lucia by country, 1992 to 2003

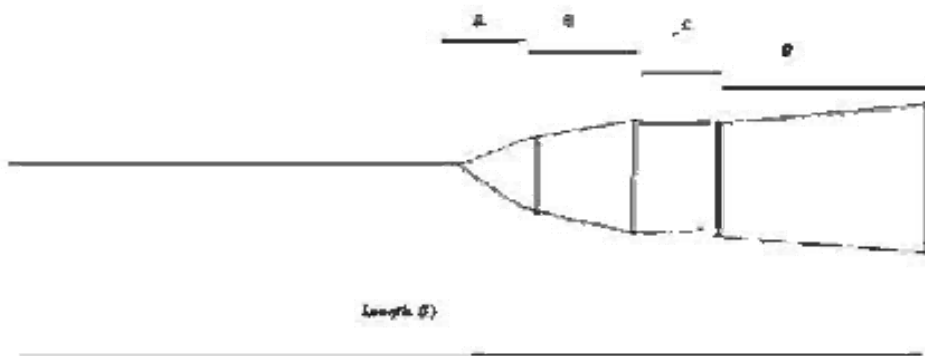
Country	F.O.B. (US \$)	Quantity
BARBADOS	4682.66	7587
SAINT MAARTEN	183.39	59
SAINT VINCENT AND THE GRENADINES	19256.83	38341
UNITED STATES VIRGIN ISLANDS	153.14	23
VENEZUELA	101.48	550
Total	24377.49	46560

(Source: Saint Lucia Government Statistical Department)

The average number of brooms produced locally on a monthly basis was between 2080 and 2300 and the average monthly range of income by respondents was US \$ 369. (L. John 2001).

Due to the demand for Saint Lucian Latanyé Brooms there was the over-harvesting of the leaves and the consequent use of smaller and un-mature leaves. Brooms built with un-mature leaves had varied standards of measurements and did not last as long as the once built with older leaves (*Personal communication: P. Ferdinand*). The Forestry Department confirmed the disparity in dimensions of brooms produced in an island wide survey of 34 brooms in January 2004. The length and diameter of the brooms were measured using a tape and diameter tape respectively. Four parts of the broom were measured: the parts A, B, C, and D as indicated in Figure 4. That survey quantified that there was greater variability in the length of the parts A, B and D than the part C. (D. Gustave *et. al* 2004)

Figure 4: *Parts of broom studied in survey of 34 Brooms*



Latanyé as a defacto Free Resource

The total land area of forest and other types of natural vegetation in Saint Lucia is 21765 hectares, equivalent to 35% of the total area. 7388 hectares (34%) of this portion of vegetation is government Forest Reserves and 428 hectares (2%) is Crown Lands (G.O.S.L. 1998). Although the Forest Reserves and Crown Lands are protected the Forest, Soil and Water Conservation Ordinance of 1946, amended in 1957 and 1983, (L. John 2003) there was no control of activities occurring on private lands. (L. John 2001) Latanyé was a defacto resource as:

- 1) Some land owners were expatriates and not in St. Lucia
- 2) Some land owners did not object to harvesting of Latanyé (L. John 2001)
- 3) There was no regulation/ the absence of legislation for the protection of Latanyé
- 4) There was the challenge of praedial larceny.

Response from the Forestry Department to the above Problem

Given that scenario of over-harvesting of Latanyé to meet the demand for brooms- locally and regionally, the variability in the quality of brooms produced, the absence of legislation for the harvest/use of Latanyé, the threat of bush fires and more importantly, the potential loss of livelihoods and extinction of Latanyé in Saint Lucia, the Forestry Department intervened and developed a species recovery strategy for the conservation and the sustainable use of Latanyé.

The basic idea was to propagate Latanyé in the nursery and to establish plantation for the harvesting of the leaves.

Management of Latanyé

1) Propagation of Latanyé seeds:

90% germination of seeds was obtained when the seeds were washed of the fleshy material surrounding the seed and soaked overnight. The seeds were then sown directly into a germination bin. (L. John 2002) using a substrate of river silt. Uniform germination occurred in 2 to 3 months. The plants were left in the bin for 5 months. Seeds were transplanted into 8 x 10 inch pots. 8 months were necessary to obtain mature plants for transplanting to plantation (D. Gustave et. al 2004)

2) Plantation Establishment

Two types of plantations were established pure and mixed stands. The spacing of plants depends on whether the plantation was a mixed or a pure stand. Intercropping of Latanyé was done with Mauby (*Colubrina elliptica*). Table 4 and 5 detailed the various plant densities used in plantation and the other agronomic practices for production in pure and mixed stands with Mauby. 90 to 100% plant survival rates were achieved on farmers' holdings. Table 6 in the appendix details the activities in the nursery. (D. Gustave *et. al* 2004)

Figure 5: Photos of various phases in the Production of Latanyé.



a) Latanyé Seeds b) 3 - 4 months c) 6 months d) 2 years e) 3 years old

The Forestry Department with Extension services has translated maintaining livelihoods in the successful establishment of 35 plantations of pure and mixed plots of Latanyé on farmers' holdings. The average size of a plantation is 1 acre. (See figure 8 in the appendix)

3) Harvesting and regeneration- experiments and recommendation

Central to the success of Latanyé Broom Industry was the need for a sustainable harvesting system for the leaves. Preliminary observations using a sample of 28 plants on a farmer's holding at La Pointe Mon Repos indicated that leaves can be sustainably harvested. That plantation was established in 2001, and the first harvest was on March 18 2004. The second harvest was in June 2004, three months later. The farmer used a 40 % harvest of the leaves present on the day of harvesting. Consequently an experiment was designed and implemented at another farmer's holding at Dennery, to test the hypothesis that Latanyé leaves can be sustainably harvested every three months. (D. Gustave *et. al* 2004)

The experimental design- random complete block was used to capture the variability of the land in terms of aspect, slope and fertility based on the soil profile of the site. Four treatments were applied in each block:

- Removal of 30% of the initial number of leaves present.- treatment number 1 (t1)
- Removal of 40% of the initial number of leaves present.- treatment number 2 (t2)
- Removal of 50% of the initial number of leaves present.- treatment number 3 (t3)
- Removal of 60% of the initial number of leaves present.- treatment number 4 (t4)

In data analysis, the treatments and blocks were used as independent variables, and the dependent variables were the number of leaves present in September 2004 and the difference in the number of leaves present in January 2005 (No. of Leaves present September 2004 - No. of Leaves present in January 2005). (D. Gustave *et. al*. 2005)

Results from Preliminary research:

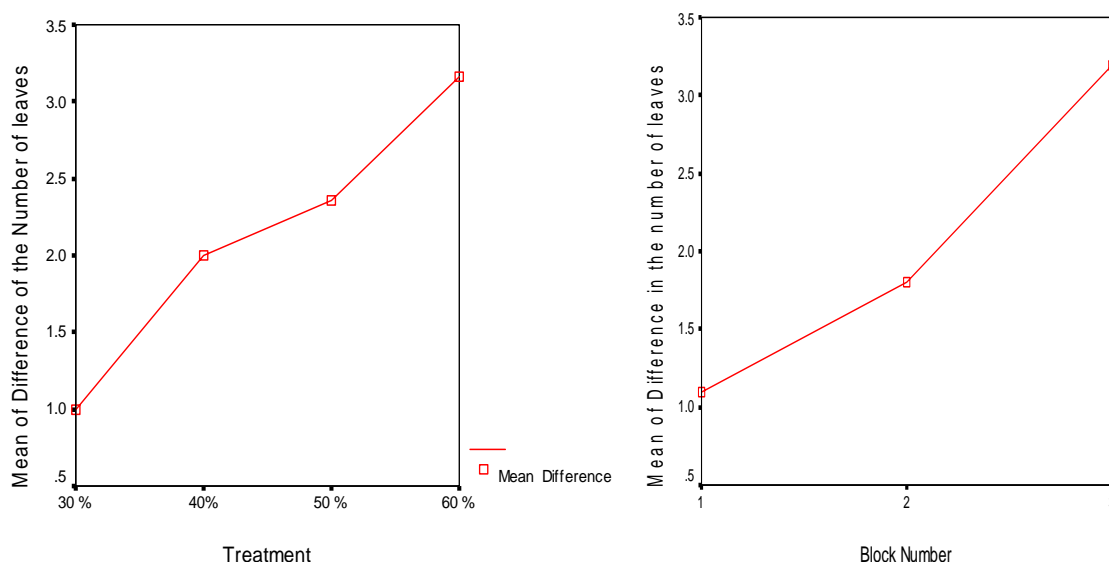
The analysis of variance (ANOVA) detected significant differences in the number of leaves present from harvesting for the period ($P= 0.04$) and significant difference amongst the blocks ($P=0.00$) There was a clear trend with higher removal of leaves leading to less leaves in 2005 and greater productivity in blocks where there was greater exposure to light. Figure 6 illustrates the trend of higher removal of leaves that lead to less leaves. For the 30% treatment there was on average one additional leaf present in January 2005. For the 40 and 50 % treatments there were 2 more or less (+/-) leaves than the initial number of leaves in January 2005. In the case of the 60% treatment, there were on average 3 leaves less than the initial number of leaves present in 2004

One notable aspect of this 2.5 acre Latanyé plantation was a progressive decrease in exposure to light from Block 3 to Block 1 owing to shading.(see table 2) The productivity of the number of leaves re- grown decreased from Block 3 to 1. This was evidenced by the increase in the average number of leaves re-grown in January 2005: on average 3 leaves in Block3, 2 leaves in Block 2 and 1leaf in block 1. (See figure 6)

Table 2 Percentage of shading of Block

Block	Shading from overhead trees (%)
1	40
2	20
3	10

Figure 6 Graphs of the Mean of the Difference in the Number of Leaves (September to 2004 January 2005)



The data collected to date, confirmed the recommendations that “Latanyé leaves can be sustainably harvested every three months” (*Personal communication: P. Ferdinand.*) Moreover, this research to date indicated that, Latanyé in the plantation setting required partial shading in the first year but needed more sunlight in the second and third year. (D. Gustave *et. al* 2004)

4) Longevity and storage experiments and recommendation

There was also preliminary research to examine longevity and storage of Latanyé brooms.

1) Brooms can be stored for at least 6 months without treatment. Beyond 6 months, leaves should be treated with fungicide and insecticide. Neem (*Azadirachta indica*) leaves were used for this purpose. 1lb of fresh leaves were macerated and soaked in one gallon of water overnight. Fresh Latanyé leaves were soaked in this solution the following day, and the leaves were then air dried. (G.O.A. 1999)

2) Brooms used on a smooth concrete surface can last for 6 months before they reach the condition shown in figure 7).

Figure 7 Broom used after 6 months



Economic aspects

Apart from the research and determination of the appropriate agronomic practices, the Latanyé project also examined the economic aspects of production. In collaboration with the Corporate Planning Unit of the Ministry of Agriculture, cost benefit examined the economic feasibility of the production of Latanyé leaves and sale of Latanyé brooms from one acre of land. In these analyses Lench Fevrier assumed that the Latanyé crop needed three years until the first harvest. He also capitalized the cost of establishing an acre of Latanyé and amortized the cost for 5 year harvesting period (L. Fevrier 2005). The cost to establish 1 acre of Latanyé in 2 years was US \$ 1370.85 and the annual net profit per acre was US \$3800.99 (see Table 3 and 4)

Another economic aspect in Latanyé production investigated was nursery production. It costs US\$0.35./per plant. (See Table 6)

Table 3 Cost Benefit Analyses in Latanyé (values in US \$) (Fevrier 2005)

Cost Item	Unit cost	Quantity/ acre	Total Cost per acre	Cost per Acre per year
	\$		\$	
Total costs				2017.46
Annual Revenue From Sales	2.21	876 brooms	1939.483	5818.45
Annual Net Profits				3800.99

Successes of the Latanyé Project

A Latanyé Task Force was formed in 2001 to address the issues in Latanyé production. The task force had terms of reference for its operation, and the representatives included: the Forestry Department, Corporate Planning, and Extension Services from the Ministry of Agriculture, Ministry of Social Transformation, Ministry of Commerce, Saint Lucia Bureau of Standards, Broom Producers and Exporters, and Non Governmental Organizations and Latanyé broom exporters, producers and planters.

One objective highlighted by the broom producers was to produce better quality Latanyé brooms through the formation of a registered broom association. With the assistance of

the Latanyé Task Force, a Latanyé broom group, “Superior Broom Producers”, was officially formed and registered with the government of Saint Lucia on June 21 2005. The group has a constitution and a membership of 19 members. With the guidance from members of the Latanyé Task Force, the group formulated a conservation strategy and proposal to establish a Latanyé nursery to produce 10000 plants annually for the cultivation of 10 acres of Latanyé at one of the “heavy utilized area” for harvesting of Latanyé wild stocks- La Pointe Micoud. (L. John 2001). This group is currently seeking funding from a small grants project of UNDP GEF to undertake the afore-mentioned project.

Outstanding activities of the Latanyé Task Force include:

- Collaboration with the Propagation Unit, Forestry Department and Latanyé Farmers to establish an ex situ germplasm of Latanyé seeds from all over the island.
- There is a need to do research on storage conditions for Latanyé seeds.
- Develop a program for the identification (ID) of broom producers and Latanyé planters, and marketing of brooms at local outlets.
- A draft copy of the standards for producing brooms was prepared by the Bureau of Standards, but this has to be finalized and regulations developed for the certification of Latanyé Farmers Broom Producers

Bibliography

- 1) Bailey Steven, 2004, Broom Exporter, (Personal Communication)
- .2) Ferdinand Paulina, 2004, Latanye Broom producer and Latanye Planter (Personal Communication)
- 2) Fevrier Lench, 2005, Cost Benefit Analysis for Latanyé (*Coccothrinax barbadensis*).
- 3) G.O.S.L., Government of Saint Lucia, Ministry of Agriculture, Forestry and Fisheries, 1999, Biodiversity Country Study Report of Saint Lucia.
- 4) G.O. A., Government of Antigua, Ministry of Agriculture, Lands and Fisheries, St. John’s Antigua , July 1999, How to Prepare and use Neem seeds for Crop protection.
- 5) **Gustave Donatian, Charles Brent and Severin Margaret, 2004, The Latanyé Broom Industry in Saint Lucia,**
- 6) Gustave Donatian, Charles Brent and Severin Margaret, 2004, Determination of the Optimum Harvesting Regime in a Latanyé Plantation.
- 7) James Julius, 2005, Proposed Saint Lucia Standard for Brooms for House Hold Use- Latanyé Specification.
- 8) **John Lyndon, 1999, The Latanyé (*Coccothrinax barbadensis*) Craft Industry in Saint Lucia.**
- 9) **John Lyndon, Optimum conditions for the Germination of Latanyé Seeds., 2002.**
- 10) John Lyndon, 2003, Consultancy for Ministry of Agriculture, Forestry and Fisheries Saint Lucia Biodiversity Enabling Activity Project- Assessment of Biodiversity in Saint Lucia- Forest Ecosystems.

Appendix

Table 4 Cost of Production for the establishment of 1 acre of Latanyé

Activity	Unit	Unit Cost (US \$)	Description	Quantity	Percentage of Total Cost	Total Cost
					(%)	(US \$)
Land Preparation	Acres	184.50	1 Fortnight	1	13	184.50
Digging Holes	Holes	0.20	15 days	1,210	20	276.75
Planting	Plants	0.20	15days	1,210	20	276.75
Fertilizer	bags	20.30		3 bags	5	60.90
Fertilizing	Acres	18.45/day	each plant		1	18.45
			4 oz			0.00
Maintenance	Acres	553.51	(each yr 276.75)	twice for two years	40	553.51
						1370.85

Table 5 Spacing used in the establishment of Plantations.

	Spacing (ft x ft)	Spacing (m x m)	No of Trees/ha	No of Trees/acre
Pure stand	6 x 6	1.8 x 1.8	3086	1249
Mixed stand a): Mauby to Mauby	12 x 12	3.7 x 3.7	1543	624
Mixed stand b): Latanyé to Latanyé	12 x 12	3.7 x 3.7	1543	624

Figure 8 Distributions of Latanyé Farmers in St. Lucia

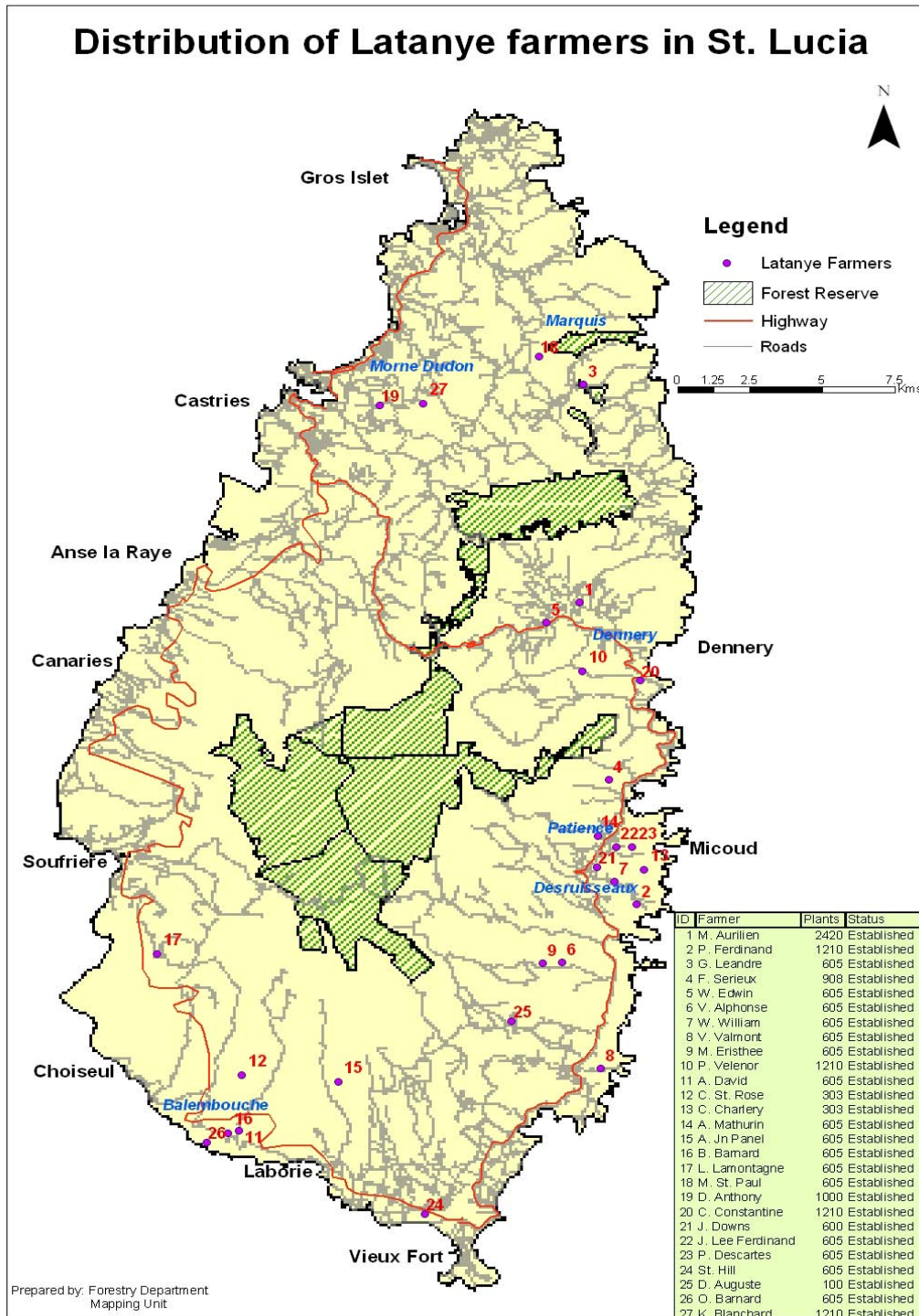


Table 6: Cost of Production in Nursery of 10000 Plants of Latanyé

ITEM/OPERATION	Unit	Unit Price	Quantity	Total Cost Yr.1 (US \$)
CAPITAL COST				
Seeds	g	0.03	5500	184.50
Soil Preparation:				
Mixing soil	5 batches		15	241.77
1 batch of top soil	2 loads	239.85	1	479.70
Materials & Chemicals				
Plant bags	bags	0.00	10000	309.96
Fertilizer: Nutru Leaf	Packet	6.64	1 packet	6.64
Labour:				
Filling bags	300 plants/man day	18.45	10000	608.86
Moving pots	1000 pots/ man day	18.45	10000	184.50
Transplanting	2000 plants per man day	18.45	10000	92.44
Fertilizing	10000 plants/ 2 hrs	18.45	10000	4.61
Weed Control	12 man days	18.45	10000	221.40
"	12 man days	18.45	10000	221.40
"	12 man days	18.45	10000	221.40
Watering	2 hrs/day		1 month	756.46
GRAND TOTAL				3533.65