CHEMONICS

INTERNATIONAL
CONSULTING
DIVISION

6750012 62
PN-AAX-454
ISN-50673

# Project Profile

# Profitable Export Potential for Guinea Fresh Pineapple Sold in Western Europe

**Prepared under the**
**Guinea Private Agribusiness**
**Preparation Project**

**Project No. PIO/T-0212-3-40001**
**Contract No. LAC-0212-C-00-5014-00**

Prepared by Jack Larsen, Chemonics International, December, 1985

2000 M St., N.W.
Suite 200
Washington, D.C. 20036

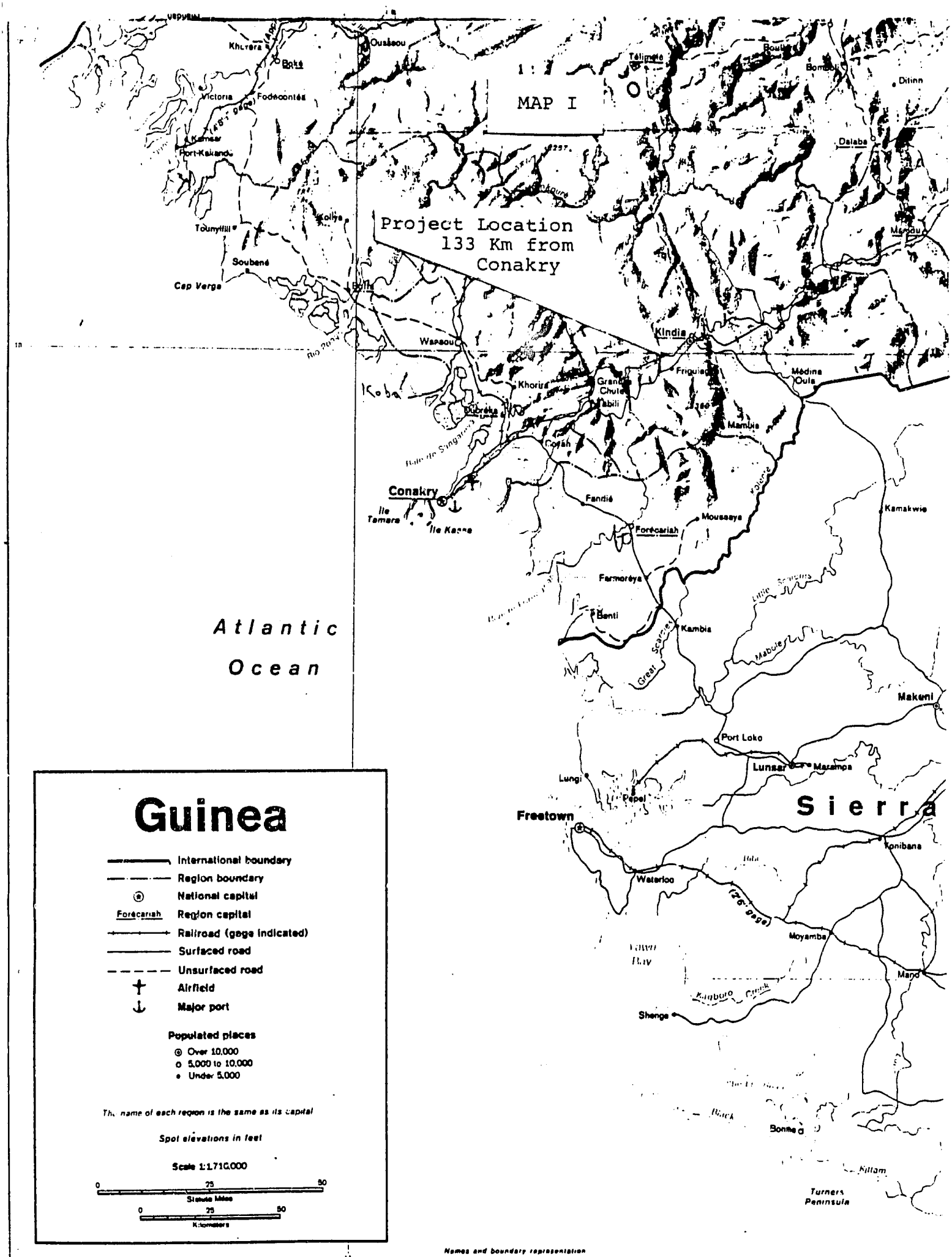
(202) 466-5340
Cable: CHEMONICS, Wash., D.C.
ITT Telex: 440361 CHNC UI

# A Preliminary Evaluation

# of the Profitable Export Potential

# for Guinea Fresh Pineapple

# Sold in Western Europe

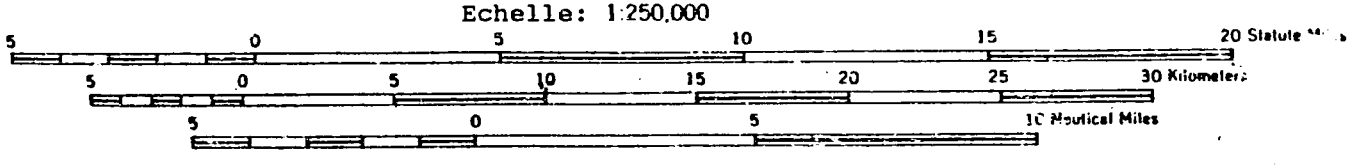

MAP I
Project Location
133 Km from
Conakry
Atlantic
Ocean
Sierra
Guinea
Conakry
Freetown
Kindia
Mamou
Dalaba
Dinguiraye
Boke
Kamsar
Port-Kakandé
Tounyfillé
Soubené
Cap Verge
Wassou
Khorira
Grand Chute
Friguiagbé
Médina Oula
Mambia
Gaoual
Fandié
Forécariah
Moussaya
Kamakwie
Farmoréya
Benti
Kambia
Makeni
Port Loko
Lunsar
Marampa
Lungi
Pepel
Waterloo
Konibana
Moyamba
Mano
Shenge
Bonthe
Turners Peninsula
Guinea
International boundary
Region boundary
National capital
Forécariah Region capital
Railroad (gage indicated)
Surfaced road
Unsurfaced road
Airfield
Major port
Populated places
Over 10,000
5,000 to 10,000
Under 5,000
The name of each region is the same as its capital
Spot elevations in feet
Scale 1:1,710,000
0 25 50
Statute Miles
0 25 50
Kilometers
Names and boundary representation are not necessarily authoritative

Map II

One square = 10,000 ha

25,000 acres

Echelle: 1:250,000




CONTOUR INTERVAL 50 METERS
WITH SUPPLEMENTARY CONTOURS AT 25 METER INTERVALS

# TABLE OF CONTENTS


| | Page No. |
|---|---|
| EXECUTIVE SUMMARY | 1 |
| I - PROJECT DESCRIPTION | 10 |
| A. Project Concept | 10 |
| B. Project Structure | 12 |
| C. Role of Project in Guinea's National Development Plan | 16 |
| II- MARKETING | 18 |
| A. Demand Analysis | 18 |
| B. Market Structure | 21 |
| C. Marketing Plan | 26 |
| III - PRODUCTION AND PROCESSING | 30 |
| A. Site | 30 |
| B. Overall Site Suitability | 31 |
| C. Fresh Fruit Packing and Layout Sketch | 34 |
| D. Environmental Conditions | 37 |
| E. Assessment of Environmental Conditions | 38 |
| F. Production Methodology | 42 |
| G. Processing Plant Size | 48 |
| H. Equipment Requirements | 49 |
| I. Inputs | 52 |
| J. The Daboya Project | 53 |
| K. Quantitative Relationships | 55 |
| L. Labor | 57 |
| M. Other Operating Costs | 58 |
| IV - NUCLEUS ESTATE AND OUTGROWER RELATIONSHIPS | 63 |
| A. Potential | 63 |
| B. Needed Inputs | 64 |

V - PROGRAMING AND CONTROL 65

A. Suggested Implementation Plan 65
B. Material Flow Schedule 66
C. Quality Control Plan 67

VI - ORGANIZATION AND MANAGEMENT 68

A. Structure 68
B. Relationships to Government of Guinea 69
C. Personnel Requirements 70
D. Estimated Personnel Costs 73
E. Organization Chart 73
F. Management/Marketing Contracts 74

VII - CAPITAL COSTS 76

A. Location and Facilities 76
B. Field Equipment 77
C. Capital Expenditure Schedule 78
D. Initial Working Capital 79

VIII - FINANCIAL PLAN 80

A. Financial Structure 80
B. Financial Projections (in text of attatchments) 81
C. Financial Evaluation 83

## LIST OF MAPS AND CHARTS


| Map No. | | Page No. |
|---|---|---|
| I | Map of Coastal Guinea Showing Project Location<br>Scale: 1/1,716,000 | Frontispiece |
| II | Map of Project Area Surronding Friguiagbe RR Station<br>Scale: 1/250,000 | " |

| Chart No. | | |
|---|---|---|
| 1 | Schematic Diagram of Friguiagbe Packing Station | 36 |
| 2 | Production Project Organization Chart | 74 |

LIST OF TABLES


| Table No. | | Page No. |
|---|---|---|
| 1 | Fruitiere CIF Fresh Pineapple Prices and Volume in France Oct.'83-June'84 | 85 |
| 2 | U.S. Fresh Pineapple Consumption 1982-'84 | 86 |
| 3 | Estimated World Production of Processed Pineapple | 87 |
| 4 & 4a | Kindia Weather Data National Meteorology Service of Guinea 1982-'84 | 88 &89 |
| 5 | Fulaya Station Monthly Rainfall in mm 1982-'84 | 90 |
| 6 | Four Guinean Fertilizer Practices Compared | 91 |
| 6a | Proposed Fertilizer and Ag-chemical Practices for the Nuclear Estate and Contract Growers | 92 |
| 7 | Estimated Capital Expenditures for Field Equip. | 93 |
| 7a | Estimated Capital Expenditures for the Friguiagbe Packing Station | 94 |
| 8 | Current World Prices for Fertilizer and Ag-chemicals and Subsidized Prices in Guinea | 95 |

| | | |
|---|---|---|
| 9 | Equipment Service Rates for Field Equipment | 96 |
| 9a | Service Cost Distribution into Three Primary Operating Accounts | 97 |
| 10 | Cameroon Field Operating Costs and Labor Requirements | 98 |
| 11 | Guinea Labor Requirements for Harvesting, Hauling and Packing at 40 MT/ Shift | 99 |
| 12 | Estimated Costs Summary for Harvesting, Hauling and Packing | 100 |
| 13 | Estimated Annual Indirect Costs Summary | 101 |
| 13a | Breakdown of Indirect Costs for Expates, Office and Other Indirect Costs | 102 |
| 14 | Estimated Monthly Cash Flow Projections | 103 |
| 15 | Estimated Direct and Indirect Operating Costs and Profit | 104 |
| 16 | Summary Profit and Loss Projections | 105 |
| 17 | Projected Sources and Uses of Funds | 106 |
| 18 | Projected Balance Sheet for Fresh Pineapple Production and Marketing | 107 |

# EXECUTIVE SUMMARY

## Present Export Volume

A limited volume of fresh pineapple from Guinea is currently available for export to Europe by air. There is approximately 30 MT per week export capability via scheduled flights on UTA and Air Afrique leaving bi-weekly for Paris. Any significant increase in export tonnage to Europe must depend on new production organized and coordinated from field to market via refrigerated containers. Country-wide production has been estimated at 5,000 MT for 1985-86 with a small percentage of this (<10%) being flown to European markets. This tonnage estimate excludes 1,700 tons grown by SALGUIDIA for processing.

## Fruit Quality and Markets

Guinean pineapple has excellent flavor and bright yellow color when properly harvested during the seven month season falling between mid-October and mid-May. This fruit commands a premium price over the paler pineapple from Ivory Coast now dominating the Western European market. It is reported that over 100,000 MT of fresh pineapple will enter Western Europe from Ivory Coast in 1985-86. This volume will cause a serious retail price erosion which will be disastrous when reflected back to the growers. As a result, estimated export tonnage from Ivory Coast for 1986-87 has been reduced by 50%.

More detail must be gathered on alternative markets and historical pineapple price trends in Western Europe. For this study, an average annual fresh fruit price C.I.F. Marseille has been used in the financial projections,

which are believed to be conservative.

Fruit Price in Guinea

An improved purchase price to Guinean growers is needed to stimulate pineapple production beyond current levels. In 1984 the National Agency for Fresh Fruit Exports (FRUITEX) paid the growers only 15 Sylis per kg. By contrast, the "parallel" export market to neighboring countries (Senegal, Sierra Leone, Liberia and Guinea Bissau) was organized by private merchants who purchased fruit at fieldside for 30 Sylis/kg. No figures are available on total pineapple exports to neighboring countries but it is estimated that approximately 2,500 MT is sold in this manner with most of the balance being consumed domestically at variable prices.

Processing Capabilility

The SALGUIDIA cannery facility at Bokaria estimates processing approximately 1,700 MT in 1985-86, most of which will be grown under irrigation in nearby company fields. The cannery also has a policy of purchasing grower fruit at the factory gate for 15 Sylils/kg, but have actually bought only small quantities from the various grower cooperatives in the past.

The processing facility is inadequate and obsolete. To become a factor in Guinea pineapple processing expenditures of at least $400,000 in new machinery, detailed engineering and construction costs will be required to renovate the facility and increase processing capacity. SALGUIDIA now manufactures two can sizes (6-oz. and 2-Tall sizes). With adequate pineapple tonnage, the company could justify adding two more can sizes (2-1/2 and #10) and could also begin to generate export earnings on

required to renovate the facility and increase processing capacity. SALGUIDIA now manufactures two can sizes (6-oz. and 2-Tall sizes). With adequate pineapple tonnage, the company could justify adding two more can sizes (2-1/2 and #10) and could also begin to generate export earnings on the international market from solid pack items and juice concentrate.

Investment Opportunity

In order to stimulate Guinean exports of fresh pineapple to Western Europe, it is proposed that a group of selected planters in the Kindia/Friguiagbe area be given financial and agronomic assistance. The best growers must be selected and suitable terrain identified before a definitive program can be organized. It is believed that the most rapid and least expensive means to generate long-term reliable production would be to organize a privately funded production unit surrounded by small growers who would be contracted to produce pineapple for export commencing in the first year of the project. Eventually the Nucleus Estate areas would be expected to contribute two-thirds of the proposed 6,000 MT annual export production, while one-third would be purchased on contract from neighboring growers.

These growers would be supplied with all necessary agricultural materials and given complete agronomic support by experienced pineapple specialists. The planters could be organized on production incentive contracts that would mandate a coordinated schedule for chemical forcing and harvesting between mid-October and mid-May.

Outgrowers could either deliver fruit to a Friguiagbe station or have fruit picked up at field side by trucks from the Nucleus Estate.

Production Options

It is proposed that production areas totaling 400 hectares of land be identified in the vicinity of Kindia and Friguiagbe, preferably with minimum blocks of 8 to 10 hectares of field area. These fields could be prepared and controlled as a production unit by the Nucleus Estate and/or subdivided among several small growers who would be given specific boundaries within these designated field areas. Alternatively, individual farmers could be contracted to make scheduled deliveries of fruit from their own fields to Friguiagbe station. This depot would be reactivated as the primary hub and link to Conakry port facilities.

Agricultural Requirements

Each crop cycle would require 36 months composed of one planting and growing year, a six month period for fruit maturation, a second year for planting material development and a final six months for soil preparation. Only a single plant crop is harvested when following West African cultural practices that require a long period for planting material production In most other pineapple production areas of the world, a plant crop and a first ratoon harvest can be taken in 36 months.
Yields over a 3-year period are considerably higher under the double cropping system, often reaching 130 MT compared with 30 to 50 MT yields anticipated for these project areas. The yield levels estimated above are

now being attained without irrigation by small planters . The Fulaya Research Institute has reported yields up to 70 MT per hectare with irrigation and a complete fertilizer, herbicide and insecticide regime which follows well established cultural practices. Adequate practices are not now being pursued by the small growers so that their crops could be suffering from a host of cultural problems and not just a lack of irrigation. It is believed possible to improve current low yields by correcting serious nutrient deficiencies and insect infestations prevalent in the region. Remedial action is further required in order to avoid additional yield reduction which will jeopardize any future Guinea fresh pineapple export opportunity.

The Daboya Project

A cursory examination of current Daboya operations and facilities and reviews of the original World Bank Project proposal as well as the June 1982 Final World Bank Project Evaluation Report clearly show that the project, as organized and instituted, was conceptually unrealistic in its development program. Primarily lacking in market analysis and a reliable transport system to the Western European markets, the project also failed in operational management. Thus it had only a small chance of achieving the original production projections. Subsequent revised production plans continued to be unrealistic. Rather than try to resurrect the Daboya project with a considerable investment in new capital, it was determined more feasible to relocate in the selected area and plan on growing the crops without irrigation. The use of properly organized smallholders was considered crucial to a successful project as proposed here.

Transport System

The proposal is to re-establish Friguiagbe station as the hub of transportation activities. These present buildings and ruins will have to be rehabilitated, improvements made to the area road network, packing equipment installed for an expenditure total of $221,000. The present railroad system includes two aluminum ventilated wagons that run twice weekly to Kindia and gather vegetables for the Conakry market. These cars have a capacity of 30 tons each and are seldom filled. Space would be available for semi-weekly shipments of pineapple to Conakry and railroad executives stated a willingness to add five new ventilated cars to meet expected volume expansion. Rail is the preferable method for inland transport because of the smoother ride and reduced incidence of fruit bruising.

From the beginning it is proposed to utilize SAGETRA as the inland transport agent on part of the export tonnage at an estimated contract price of 5,000 Sylis per MT in increments of 30 tons. This price includes hauling both directions between Conakry and Kindia; the back haul would be utilized to bring in agricultural materials and other needed supplies to the project site. More important, SAGETRA is willing to construct and operate a holding pad for refrigerated containers at their port warehouse to service refrigerated containers in anticipation of ship departure dates. Storage of two days has been estimated as the average waiting period at Conakry port. This SAGETRA alternative backstops Port Authority plans to construct and operate a holding pad for up to 25 twenty-foot refrigerated containers within the next 12 months.

Several shipping companies are currently exploring the possibility of expanding their back haul of fresh produce from West Africa to alternative Western European ports. They are eager for the potential business but also fearful that delays in loading the reefer containers unduly lengthen their return schedules. Executives of one shipping company stated that free port entrance and exit permission were pre-requisites before they would consent to even a 4 or 5 hour pickup stop on their thrice monthly return voyages from Lagos to various European ports. Currently ships servicing Conakry must pay exorbitant fees which cannot be supported by exports of several hundred tons of pineapple. The expected 10 to 12 day travel time would be ideal, thus ocean transport falls within the realm of project feasibility if port charges can be eliminated for these short stops.

Marketing Options

Marseille is the primary entrance point into France for bananas and pineapple; the port can be "flooded" on occasion when excessive shipments arrive from Ivory Coast.

Several factors combine to make Northern Europe a good potential market for fresh pineapple.It is very likely that pineapple prices there would average higher than in Marseille where pineapple prices are already under intense pressure from Ivory Coast and Cameroon, both of which ship unrefrigerated fresh pineapple in banana boats . Pineapple losses under this method of shipping have been stated to average 30%. For this analysis, loss

estimates have been reduced to 15% because of refrigeration and a potentially more rapid voyage to Europe.

It is not clear at this point where the best market for fresh pineapple will be, but reduced competition in Northern Europe would seem to make it the preferable sales region if reliable production and regular shipping schedules can be developed. A thorough analysis of alternative market prices and volumes during the seven month season must be made before a definitive answer can be found on the export profitability of Guinean fresh pineapple.

Projected Financial Implications

As conceived, the project would require a $1.5 million capital investment to be 40% equity and 60% financed. Terms have been proposed for a $900 thousand 13% seven year loan with interest only for the first two years and the last five years used to amortize the principle. Profit and loss projections on the proposed volumes of export fruit show that cash flow becomes positive in the third year and continues positive with a sustained profit of over $700 thousand annually for the remaining years of the 10 year project life. Annual dividends of $600 or $700 thousand could be paid from the fourth year on.

The internal rate of return has been calculated on two assumptions; no income taxes to be paid for the entire 10 year project, and taxes of 30% on income after the fifth year. In both scenarios the IRR is 30% and 27 % while the return on equity is 43% and 36% respectively.

This preliminary analysis indicates that a reasonable profit can be achieved by the project as outlined, providing contract growers can be organized and properly coordinated into a privately directed agro-industrial complex that is granted special export privileges.

# I - PROJECT DESCRIPTION

## A. Project Concept

The history of fresh pineapple exports from Guinea began after WWII when French banana planters started growing this secondary crop to be included with their banana shipments to France. By 1950 almost 400 metric tons (MT) of pineapple were exported. This increased to over 1100 tons by 1956. During the same period between 200 and 400 tons of pineapple were processed annually in Guinea (1). After independence in 1959, fresh pineapple exports were funnelled entirely to the Soviet Union and Eastern bloc countries. By 1965 exports had reached 5,400 tons and continued increasing to 12,600 tons by 1972 (2). There was little Guinean interest in expanding sales to the Eastern block nations any further because payment had been negotiated in counter-trade that did not meet the hard currency needs of the economy.

Unfortunately, the expanding West European market demand was for higher quality pineapple than was being sold in the Eastern block. Competition from the Ivory Coast increased steadily with Ivorian shipments rising from 4,460 to 39,260 tons between 1965 and '72. Ivory Coast production appears to have peaked at about 110,000 tons in 1985/86. This volume has resulted in excess shipments during the season creating in turn a price decline in the French market which has been reflected in much lower prices to farmers. Because of these poor prices, it has been projected that the Ivory Coast's export volume will be reduced by half in 1986/87 (1,3).

In the mid-sixties a Guinean pineapple agro-industrial complex was

organized by a Swiss/French company, COFICOMEX, which operated a cannery at Bokaria under the acronym SIFRA. The operation was sold in the mid-seventies and is currently owned jointly by the Governments of Guinea and Libya (51/49% respectively); it is operated under the acronym SALGUIDIA.

The original plan for SIFRA operations was to process 40,000 tons annually, mostly grown on irrigated land near the cannery. This production was never realized due to management's inability to solve substantial agronomic and processing problems(4,5). By 1974 cannery production had declined from a 5,000 ton peak to 1,500 tons and continued at this level or lower until 1985/86. Current estimates by SALGUIDIA management indicate a processing level of 1,700MT rising to 8,500 within three years. A cursory look at the cannery facility revealed that such an increase will not be possible without substantial investment in modern pineapple processing equipment.

Reactivation of a fresh pineapple project is proposed to stimulate exports of Guinean pineapple to Western Europe. This preliminary evaluation indicates that a reasonable profit can be made on annual shipments totaling approximately 6,000 metric tons (MT) at full operation in the fourth project year. These shipments would be predominantly by refrigerated container departing Guinea twice or three times a month to several Northern European ports and Marseille during a seven-month harvest season from mid-October to mid-May. There could also be air shipments on regular scheduled airlines departing Conakry twice weekly, but space available currently limits volume to less than 30 tons per week.

Conakry management staff at UTA and Air Guinea did not have any cost figures for leasing entire aircraft for freight shipments to and from West Europe but they felt that costs would be higher than on the small air freight capacity now supplied in passenger jets bound for Europe. The passenger jet freight rate for fresh produce is preferential, and only possible when passenger traffic supports the major portion of flight costs. Experience from other West African countries shows that the gross margin for air delivered fresh pineapple is lower than that for ocean shipments although the air flown fruit commands 1.7 times the European wholesale price.

An essential element in this proposal is utilization of some of the refrigerated containers now being returned empty from other West African ports to Europe by several shipping lines. These ships would have to make a container pickup stop at Conakry which is not currently being done because of its high port charges. This proposal assumes that this issue can be resolved favorably to capitalize on the long range opportunity for stimulating Guinea's tropical fruit and winter vegetable exports to Western Europe.

B. Project Structure

The fresh pineapple export project would utilize selected growers now cultivating pineapple in the Kindia/Friguiagbe region. These outgrowers would be the essential source of fruit during the first two years of the project. It is proposed to start by purchasing 1300 tons the first year and double this volume the second year

At project start these growers would be expected to continue fruit production on their scattered small plots of land, and at harvest carry it to roadside as they do now when selling to private merchants. A project truck would gather and transport grower fruit to the resurrected Friguiagbe railroad station for grading and packing. Experience from other areas indicates that 75% of field production can meet export specifications while the balance would be sold on the domestic fresh fruit market or to SALGUIDIA for processing at Bokaria.

It is proposed that the Estate offer a grower purchase price of 45 sylis/kg to be above that now being offered by private merchants (30 sylis/kg). This should secure the best fruit available and allow for strict quality standards even before growers can be signed on formal production contracts. Once signed, the grower would be trained in improved cultural methods (a necessary step to guarantee stable future production). Outgrowers would be advanced agricultural supplies against future deliveries of fruit. In this evaluation, all supplies (fertilizers, pesticides, other ag-chemicals and packing materials) carry full import prices (world prices) and not the current subsidised rates. Such subsidies are considered unrealistic when privatization of the economy is being stressed by the central government.

A Nucleus Estate would also be established to operate eventually on approximately 400 hectares (ha) of land parcels leased within the general region of Kindia/Friguiagbe. No irrigation would be used. At full operation the Estate lands would produce two-thirds of the required tonnage and the growers would be relied upon for the other third to achieve 6,000 MT for export. At this volume several production and logistic limits come into play and are detailed in a later section.

It is imperative that a Nucleus Estate be organized as rapidly as possible, initially to plan and coordinate the scheduling of fruit for the bi- or tri-monthly export shipments. As conceived, at least two highly qualified expatriates on employment contracts would be required to organize the agro-industrial project. These principal staff members include an experienced pineapple agronomist and an equipment supervisor knowledgeable in the repair and maintenance of farm machinery. . The Project Director/Agronomist would initially select the growers, establish the cultural practices best adapted to the area and conditions, and assist the growers in developing their agronomic skills and crop scheduling.

High quality standards would be applied as regards grading and packing the fruit at the resurrected Friguiagbe railroad station, which would be established as the hub for inland transport by rail or truck to the port of Conakry. The boxed fruit would be loaded into ventilated railway wagons of 30 ton capacity (20MT of pineapple), and transported to Conakry. Upon arrival the boxes would be transferred into containers hooked to the power grid or privately owned generator. The fruit would thus be cooled within 36 hours of harvest and would remain refrigerated at dockside for an average of two days before being loaded for the 10 to 14 day voyage to various ports in Western Europe.

As an alternative to the rail system, it is proposed to contract with SAGETRA as the inland shipping agent for part of the tonnage. Although truck transport is more expensive than rail, SAGETRA management has

expressed a willingness to construct and operate a refrigerated container facility at its port warehouse should export volume justify it. Such an alternative is necessary in the interim. By 1987, the Port Authority plans to construct a holding pad for up to 25 twenty-foot refrigerated containers.

Twelve to sixteen days is a considerable time period for pineapple to be held before retail sales can begin. Under ideal conditions, mature fruit has a storage life following harvest of approximately 20 days. For this project it is suggested that the fields receive a double Ethral treatment preceding harvest so that by the time it reaches Europe the green mature fruit will have a completely yellow shell -- a desirable marketing objective.

If production and shipping schedules are met as outlined above, the fruit will be under refrigeration within 36 hours after harvest and then continuously all the way to market. This system offers a significant fruit quality advantage over the unrefrigerated fruit exported by the Ivory Coast and Cameroon; pineapple exported by the latter also requires an additional two days of shipping time between field and market. Because of the enhanced transportation mode, product loss estimates have been reduced from the customary 30% for Ivory Coast pineapple to 15% for Guinean exports.

It is anticipated that the Nucleus Estate and packing facility would be controlled by a private investor group well versed in the production and/or marketing of fresh tropical produce in the EEC. While no detailed market analysis has been made for this preliminary evaluation, it would be required before arriving at a definitive assessment of project profitability.

C. Role of Project in National Development Plan

This project clearly fits the major national goal of developing hard currency export products by utilizing the established infrastructure, agricultural land and less than favorable climatic conditions to produce goods that can compete internationally. Bringing additional labor into the wage earning framework and training personnel in advanced management and technical skills are considered important functions of privatizing the economy.

Pineapple exports to Western Europe could initiate the expansion of other tropical fruits exports for which European produce markets have already expressed interest. Such additional tropical fruits include mango, avocado and Solo papaya which can be grown and exported during other times of the year. Solo papaya is a variety type from Hawaii that is becoming very popular in US produce markets. It has growth potential as an export crop into Western Europe. Winter vegetables and melons may also find export markets once a reliable supply system is established. The domestic transport network must have national support. Agricultural roads, rail and highway systems all need repair and maintenance, which is now being planned. To support export activities, the government has already formulated plans to construct chill storage facilities at both the port and airport. Within two years this will provide for produce storage to supplement refrigerated containers. However, port charges must be modified to stimulate the use of Conakry port as the last and most efficient pickup point for fresh tropical produce bound for European markets.

Western European suppliers now export hundreds of refrigerated containers each month loaded with meat, poultry and frozen fish destined for West African markets. Most of these containers now return empty; the so-called back haul is thus an expense rather than a revenue-generating item for the European suppliers. This offers an economic solution for transporting chilled produce from Guinea to outlets thousands of miles away. Domestic production and logistic obstacles are relatively minor compared to establishing a refrigerated overseas transport link. The shipping companies have expressed interest in utilizing this equipment on a back haul to Europe and are willing to work with quasi-government and/or private operators to increase their productivity and profit.

## II - MARKETING

### A. Demand Analysis

Fresh pineapple import and marketing statistics must be accumulated for the European countries where major sales are anticipated. Accurate current data are not readily available in the US and reliable market estimates will require more international data evaluation than can be done in this preliminary analysis.

Prices for fresh pineapple sales obtained for this study were supplied by Fruitiere, a major French produce supplier and importer of fresh pineapple into Marseille from Ivory Coast and Cameroon. These figures (Table 1) show monthly average prices per kg and the tonnages purchased by Fruitiere during the period from October '83 through June '85. This company presently handles approximately 30% of fresh pineapple imports into France.

Fruitiere reports that CIF ship import prices for fresh fruit were at a high of 6.3 French francs per kg in the autumn of '83 and a low of 4.2 in January '85. (These French CIF prices should be multiplied by 1.7 for shipments arriving by air). A weighted average for the entire period was 5.16 Ff per kg or 258 Sylis /kg at a conversion rate of 50 to 1. This is equivalent to US$ 645 per MT. The weighted average price is used in all financial projections in this study while operating costs are based on both CFA and Sylis being convertible to US dollars at 400 / 1. (To allow for an average 15% shipping loss of product, the $645/MT value has been discounted to $548/MT for this project).

Because sales volumes and prices are not known for the relatively under-supplied Northern European cities, the potential for sales expansion there will be equated with the US market. In 1984 US fresh pineapple consumption by the 239 million population was .64 kg per capita to total 153,000 MT. This is low compared with fresh peaches, a short season fruit, for which US per capita consumption in 1977 was 2 kg. The EEC, Switzerland and the Scandinavian peninsula have a total population of 340 million. If per capita consumption of pineapple in Europe were similar to the US, it would equate to 218,000 MT per annum. This is almost twice the estimated volume imported annually by ship from West Africa, Martinique and Brazil and supplemented by other minor European suppliers such as the Azores, Kenya and South Africa who continue to ship or fly in relatively small quantities of fruit. Table 2 details the production sources for the 1982-'84 US fresh pineapple consumption, but more precise European import data are needed to confirm European projections. Based on US consumption figures, Western Europe has substantial unfulfilled market capacity for good quality pineapple. Only a small percentage of this potential volume would be supplied from Guinea under the parameters of this proposal.

The world supply of canned pineapple fluctuates cyclically and presently is at a peak causing low prices and high inventories of finished product for the large processors (See Table 3). This is not a good time to promote canned pineapple; but if history is prologue, within two or three years supplies should again be in balance with demand and prices higher and firm. An opportunity might then exist for export of canned pineapple from Guinea. Unfortunately, grower prices for processed fruit are usually

lower than for the fresh market because fruit for processing can be handled more severely and finished product prices must remain competitive internationally.

Dole and Del Monte corporations produce between 40% and 45% of the world supply of processed pineapple. The two cannot, however, control the price because the relatively static world market can be destabilized by over supply from other sources. The single most disruptive supplier is Thailand where a multitude of small private canneries produce acceptable product that must be sold in order to pay for purchased fruit and packing supplies. It has been reported that the world market in 1985 has been flooded with low priced consumer items from Thailand (6). This required annual inventory liquidation puts pressure on prices whenever the market is soft and is corrected only when international processors sufficiently reduce their packs in succeeding years.

World production of processed pineapple is considerably below the total available as raw fruit which is used for both fresh sales and canning. Thailand is the prime example of a country that grows tremendous quantities of fruit with seasonal price cycles the inverse of the quantities produced. The fresh market price regulates the tonnage sent to processing. Currently many small canneries pack only during the low priced peak season. Within any 18 month period (the cultivation cycle from planting to harvest) between 100 and 200 thousand tons of additional pineapple can be sent to processing in Thailand, thereby depressing both the local market and international canned pineapple prices. Canned pineapple production for export is not considered to be economic at this time, but processing serves

an important function in Guinea and is discussed in more detail below. (See section III)

B. Market Structure

It is proposed that the investment group assembled for this project include individuals or corporations familiar with marketing requirements in the EEC-- the primary market. This is a critical partner (either an individual or corporation to be located in Europe) because without a strong partner interest in the marketing area, the Guinea producer (either an individual, quasi-public group or corporation) would be at the mercy of European produce brokers.

It is common knowledge that shipments of produce from distant areas are often subject to spoilage losses, complete discards or reductions at retail which all reflect back to price concessions by the producer in the form of replacement product, a percentage loss on tonnage delivered, market price reductions in a glut, etc. Spoilage problems, damaged product, and product gluts are real enough marketing factors to make it impossible for the production operation to question loss reports without being a part of the marketing organization and having intimate knowledge of marketing conditions.

In order to equalize the leverage and protect both producer and marketer, it is proposed that one corporation with two subsidiaries be formed so that 30% of the production subsidiary would be held by the marketing partner and 30% of the marketing subsidiary would be held by the production partner. Under this corporate arrangement, marketing and production subsidiaries would have directors on each other's boards and

hopefully full knowledge of problems affecting each other's profits or losses which would be shared on a 30/70 split. Only with an active, knowledgable partner on the ground would the productoin entity have protection against unscrupulous brokers.

The boxed fruit would be sold by the marketing partner on contract or letter of credit to European produce brokers or major produce supply houses either CIF or FOB Conakry before ship departure. A reliable telex system between European buyers, shipping companies, Conakry and the project office at Friguigabe would be essential to success of the project. A broker sales commission of ten percent has been estimated for the marketing function. It varies between 8 and 10% for US produce brokers.

Standard refrigerated containers of the various shipping companies are 6.06 meters long and have a volume of 24 cubic meters that will hold approximately 6.5 MT of boxed fruit (383 cartons of 17 kg each). Although the container volume is approximately 24 cubic meters, need for air circulation reduces the usable space. At full operation in the fourth year, approximately 1,000 tons of fruit would be shipped monthly (mid-October through mid-May) to European ports, i.e., about 300 tons packed into 45 containers per ship. The ships could drop off a specified number of containers at each regularly scheduled destination.

Within the next 12 months at least three shipping companies--Rhein Mass+Sec, Deep Sea Shipping Company (DSS) and Grimaldi--will be returning empty refrigerated containers to European ports. The first two firms are already making stops at Rouen, Shoreham, Antwerp, Rotterdam,

Amsterdam, Bremen, Hamburg, Flushing, Sheerness and Range; the latter will dock at Marseille and Genoa. Voyage transit time varies between 10 and 15 days. Upon arrival the produce brokers, who have contracted for the fruit, will either break down the container load for retail distribution at port of arrival or dispatch entire containers to major produce outlets.

The European market demands high quality fruit. Historically, fresh pineapple from Africa has been sold during a seven-month season between October and May or June at the latest. During the remainder of the year quality declines as a result of monsoon conditions in West African production areas. Excess rainfall and low sunlight contribute to reduced flavor and flesh color. The wet season fruit is also more fragile and subject to heavy bruising when harvested from June-September. To avoid these deleterious factors, chemicals are used to force the plants to fruit during the more desirable October-May period. The summer decline in fresh pineapple prices in Europe may also be influenced by the abundance of other fruits. The October-May harvest cycle has been used in this study although experience over time may show that refrigerated transport can extend the harvest period of acceptable quality pineapple. .

However, a refrigerated transport system is complicated and many problems remain to be solved. Within the last two years there have been several unsuccessful attempts by two shipping companies working with private exporters to pack refrigerated containers for trial fresh fruit shipments to Europe. Inland transport delays, over mature fruit, overloaded containers, poor cartons and lack of proper temperature controls all contributed to complete loss of product.

Guinea exports to Western Europe have been by air for the last several years and Fruitex was the primary marketing agent according to their annual statistics seen below.

Guinea Pineapple Exports to Europe

| Export Season | Air Shipments-MT |
|---|---|
| 1980-81 | 1,287 |
| 1981-82 | 748 |
| 1982-83 | 383 |
| 1983-84 | none |
| 1984-85 | 477 |

Discussions with airport authorities and the UTA freight traffic manager revealed that Fruitex is not the the only air exporter of pineapple. They stated that in '83-'84 at least 200 tons were flown out of Guinea but gave no specifics on shipper or destination. It appears that 500 to 600 tons are exported annually by air and that another 1500 to 2000 tons may find their way into neighboring countries via private merchants.

Fresh pineapple is currently shipped in several carton sizes that range in weight from 10 to 20 kg and contain different numbers of fruit depending upon market demand. The figures below show the established classes of fruit by weight now being exported by Ivory Coast and Cameroon and the approximate fruit size distribution (Reported by Fruitex for their 28 MT air shipments to France during March-June 1985).

Fruit Weight Distribution by Class

| Fruit Class | Weight Range in kg | Approximate Distribution-% |
|---|---|---|
| A1 | 1.8-2.2 ) | 4 |
| 2 | 1.5-1.8 ) | |
| B1 | 1.3-1.5 ) | |
| 2 | 1.1-1.3 ) | 37 |
| C | .9-1.1 | 51 |
| D | .7- .9 | 8 |
| Total | | 100 |

A weighted average fruit size for this distribution shows 1.13 kg per fruit which is low for a field average but would allow for 10 to 20% of the larger fruit to be sold domestically where it is preferred both for fresh market and processing.

To simplify calculations, it is assumed that the various cartons will average 17 kg of fruit and that packaging a ton of pineapple will require 59 cartons. The history of Fruitex cartons has been poor with many complaints of damaged fruit from collapsed cartons. The Fruitex price of 35 Sylis per unit is a subsidized figure. Even the 150 Sylis paid at SALGUIDIA for canned fruit cartons imported from Spain is too low because fresh fruit requires heavier board and divider compartments. Therefore an estimated price of 250 Sylis per unit has been used in this study. Spain is the most likely source of suitable cartons and prices are lower than in Cameroon. Industry protection policy against imports in the latter country has forced current prices there to 350 CFA per 20 kg unit.

C. Marketing Plan

At full operation in the fourth project year, 6,000 MT of fruit would be packed for export to Western Europe. This would represent 75% of total field production, 4,000 tons from Estate fields and 2,000 from contract growers. During the harvest season there would be occasions when some fruit would be too ripe for the lengthy ocean shipment. In that event, air freight would be used when logistically possible, but probably less than 5% of production would go by air. The more usual case would be for over-ripe, off-size, multiple crown, damaged crown or bruised fruit to be sold domestically. This volume would amount to 2,000 tons representing 25% of total production. In a sense off-grade fruit would be the by-product of the export project.

Present estimates indicate that approximately half the 5,000 ton annual Guinea production is purchased for export. Five hundred tons are exported by air shipments and 2,000 by private merchants to bordering countries while the remaining production is absorbed in the domestic market. ( An additional 1,500 to 2,000 tons are grown for processing by SALGUIDIA).

Farm gate prices vary inversely with high and low production months. March is the usual peak. Prices can drop as low as 20 Sylis for a 1.5 kg fruit or $33.30 per MT. This would be below cost if world prices were paid for fertilizer and other chemicals as planned for the project, but with subsidies and unpaid personal labor, most growers can show a positive cash flow. However, in recent years the return on pineapple production in Guinea has been marginal. Fewer growers are now cultivating the crop and total production has declined.

Since July '84 the government minimum wholesale price has been 15 Sylis per kg (up from 9 Sylis/kg for the previous 5 years). Fruitex plans to pay 25 Sylis/kg in 1986, an increase of 60%. The record for SALGUIDIA and Fruitex has been one of slow pay and poor reliability for timely provisions of subsidized materials. Cooperative leaders and growers claim that the private merchant pays the highest price (30 Sylis/kg) in cash for export fruit and brings cartons to field side where fruit is boxed, loaded and hauled away.

Serious losses arise when fruit cannot be sold at any price as was the case when the Daboya Project fruit overwhelmed marketing outlets. Between 1980-'82 300 to 700 tons per annum was reported as rotten in the fields (7). Undoubtedly many small growers suffered undetermined losses during the same period. Some of the problems associated with the Daboya project are discussed in a later section.

It is proposed that grower contracts for fruit be written for 45 Sylis per kg or $112.50 per MT. This is a reasonable price for quality hand-harvested fruit and covers advances made to the grower for agricultural chemicals, project coordination and other equipment all to be charged at cost. Grower advances would amount to about $1,625 per hectare so that his net per ton would vary with his yield as shown below.

Estimated Contract Grower Net at Three Yields

| Yield in MT per Hectare | 30 | 40 | 50 |
|---|---|---|---|
| Export Purchase Price Sylis/kg | 45.0 | 45.0 | 45.0 |
| Less advances @ 650,000 Sylis/ha | 21.7 | 16.3 | 13.0 Sylis/kg |
| Grower margin over advances | 23.3 | 28.7 | 32.0 Sylis/kg |

At minimum production levels the grower's cash advantage would be with the private merchant but as yields increased he would be better off on contract with a steady outlet for 75% of his production. The remaining 25% of field fruit would be sold on the domestic market or to private merchants as described above. The price for this 25% segment would be negotiated with the grower who would harvest and handle the fruit. It would be subject to the cash advance lien from the Estate. To simplify the revenue projection on this 25% increment, the tonnage has been credited to the operation at 40 Sylis per kg or $100 per ton. As yields improve, a further incentive for the grower could be increased income per hectare. (In the first two years only export fruit would be purchased from the growers).

Part of the 25% "byproduct fruit" would not meet fresh market quality but could be utilized for processing into juice or crushed pineapple. It is important that the operation at SALGUIDIA be equipped to handle several hundred tons a week as an emergency outlet for over production or cancelled shipments. New processing machinery must be added to the cannery to increase processing capability to at least eight tons of raw fruit/hour. This could be accomplished by adding two high speed Ginaca machines and related ancillary equipment for a rough estimate of several hundred thousand dollars. At maximum the plant can now process about one ton of pineapple an hour but 12 tons/day are reported to overwhelm the facility. Juice processing equipment is in better condition than the machinery for solid pack pineapple, but the facility lacks juice concentrating capability. The plant buildings, small can making operation and utilities are functioning well. With new processing machinery, the operation could become a potential source of export earnings when the international market turns around.

The Soviet Union and Eastern block countries remain a large potential market for fresh pineapple. The Eastern block may negotiate difficult counter-trade terms, but they are reported to be in search of a reliable fresh pineapple supply. The numerous ore ships leaving Conakry each week directly for Russia via the Black Sea offer an opportunity for establishing a reliable transport link to the Soviet Union that should be carefully nurtured once a consistent fruit supply is developed.

The proposed 8,000 MT production has enough potential outlets available in Western Europe and Guinea to offer the project a reasonable chance for success. However, prudence would dictate that a thorough marketing study in Western Europe is needed to define the limits on sales volume and prices of fresh pineapple before initiating the project. It is possible that Guinea pineapple may command a price advantage over the Ivory Coast and Cameroon fruit because carefully controlled refrigeration and a shorter transportation time to market would translate into longer shelf-life at retail.

## III - PRODUCTION AND PROCESSING

### A. Site

The Kindia/Friguiagbe area has been selected as the preferred location for the fresh fruit project for the following reasons:

(1) The area has a history of producing excellent pineapple without requiring irrigation.

(2) Growers in the region have many years' experience with pineapple cultivation and have indicated an interest in getting back to production if a market can be assured.

(3) The region has a suitable climate for producing high quality pineapple.

(4) Areas highly suitable for mechanical cultivation are available within a reasonable operating distance of the Friguiagbe station.

(5) Soils promise to be amenable to continuous cultivation, providing they are properly fertilized.

(6) The national railroad is linked to the Friguiagbe station and the national trunk highway ties into a network of existing field roads throughout the area.

(7) The Friguiagbe complex already includes several structures that can be utilized with minimum repair costs.

(8). The Fulaya Research Institute will have the capability of providing research assistance to the project once its level of crop expertise has been improved.

In years past bananas were a big crop in the region. The Friguiagbe

station was the rail hub for transport to Conakry and onto special ships for Europe. Large field areas surrounding the station and up the highway toward Kindia have been in both banana and pineapple cultivation over the last 30 years (see maps). There is no standing jungle on the better land and minimum clearing would be required to return it to cultivation. Most of the terrain is slightly rolling to rolling with established drainage channels running between the gentler slopes. Crop lines would be laid out across the slopes to retard heavy runoff during the summer but still ensure adequate drainage, a most critical element in pineapple cultivation. These natural drains tie into perennial streams that would function as permanent water sources coursing through the proposed Nucleus Estate and small grower areas. This water would be used to make up spray solution and for other requirements, but is not needed for irrigation as the crop is proposed to be grown on a natural moisture basis.

B. Overall Site Suitability

It is proposed that the crop areas lie within a radius of 5 to 7 km around the packing facility. The smaller radius would encompass almost 8,000 hectares, and at 7 km, over 15,000 hectares (see lined circles on Map 1). Excellent crop land can be found within either of these areas and, by using minimum operating costs as an important field selection criteria, transport distances would be minimized. The distance from Kindia to Friguiagbe is 20 by road, most of it paved highway. Staff housing in Fulaya or Kindia and an office in either town would minimize staff transport problems. Telex communications would be installed at the town office with a phone link to the fruit packing station

Small growers who are now scattered about this region would provide the first source of fresh fruit and would continue to supply the project with pineapple even after the Nucleus Estate reached full production. At that time parcels of land varying from 8 to 50 hectares would make up the total 400 ha of Estate crop area with 10 to 15 percent of it being occupied by roads, ditches and field edges. Several idle parcels of 50 or more hectares were seen along the 7 km gravel road running between the trunk highway and Frigulagbe station. Many other areas that were once in banana production are now lying idle and can be leased at 1,000 Sylis per hectare per annum from the government.

The main highway is joined to these divers parcels of land by field roads which in some cases need maintenance and culvert repair or new fords before they can support regular truck traffic from the fields to Frigulagbe station. It is planned that soil preparation equipment be utilized on road maintenance during the slack season. Laterite gravel found in abundance throughout the area would supply the road repair and surfacing material. Pits of this gravel could be softened by bulldozer and shoveled by hand into the dump truck that would spread it for leveling and packing by bulldozer as road maintenance dictated. These basic infrastructure repairs would certainly qualify for central government support although it might be expedient to carry out the renovation work as the project is assembled and later seek recompense from the government. The estimated road repair cost has been capitalized in the first year at $40,000 but is continued at a lesser amount in subsequent years as an operating expense.

The primary link to Conakry would be by rail. The Friguiagbe station and spur are serviceable but the buildings and utilities in the area need `repair.Capital requirements of $65,500 have been estimated for refurbishing and making operational improvements at Friguiagbe. The principal packing structure was built in the early fifties to store and load bananas onto rail wagons. It now needs new girders and a tin roof estimated to cost $35,000. A truck dock, approach roads, a new roof over the rail loading dock, paint and minor repairs to other station buildings make up the balance for the packing site.

Currently Fruitex has stored in a Kindia warehouse three rotary fruit weighing machines that classify fruit by size . These are seldom if ever used. It is proposed that these units be moved to Friguiagbe and used initially by the project. Some rental or lease arrangement could be worked out with Fruitex. Facilities for the packing operation would require estimated capital of $80,400, assuming a rental agreement is concluded with Fruitex. New conveyors, three new Bostitch carton staplers (one standby), hand trucks and $28,800 for wooden crates make up the balance for the packing facility equipment.

There is insufficient volume from the fresh fruit project to justify any kind of processing operation at Friguiagbe and waste disposal would not be a problem. Any fruit not of export standard would be sold locally on the fresh market or be sent to SALGUIDIA for processing. An investment in processing equipment would have to depend on production expansion at SALGUIDIA and would require a separate economic study

The present rail system does not have the equipment to handle more than 3,200 MT during the seven month season, but rail authorities confirm their intention to purchase additional ventilated wagons to meet any future volume demand. In conjunction with rail shipments, SAGETRA shipping agents would handle half the tonnage on contracts that include back haul of supplies to Friguiagbe and loading and maintaining refrigerated containers of fruit at the port. The higher cost of truck hauling and the services rendered are recognized in the financial analysis.

C. Fresh Fruit Packing and Layout Sketch

Fruit would be harvested in field by hand and carried to roadside where another man would carefully load 15 kg of pineapple into wooden crates. The crates would be picked up by the Estate truck and loading crew and stacked 5 high on the truck. An 8-ton truck would pull a 5-ton trailer which could transport 555 15-kg crates, enough to supply the plant for over 1.4 hours when packing at full shift capacity. Difficult-to-reach grower fields might require a single truck unit or tractors with trailers.

At Friguiagbe station the stacked crates would be unloaded by hand truck onto the dock. During peak operations crates could be stored in the open until needed at the weighing wheels inside the packing plant. Contract grower fruit would be handled the same way, except that all grower crates would be identified in order to give each grower credit for fruit delivered. Quality and weight checks would be a part of the fruit receiving function.

A man at each weighing station will empty 2 to 3 crates a minute onto the wheel. Each wheel will weigh fruit, at 30 to 40 per minute, into

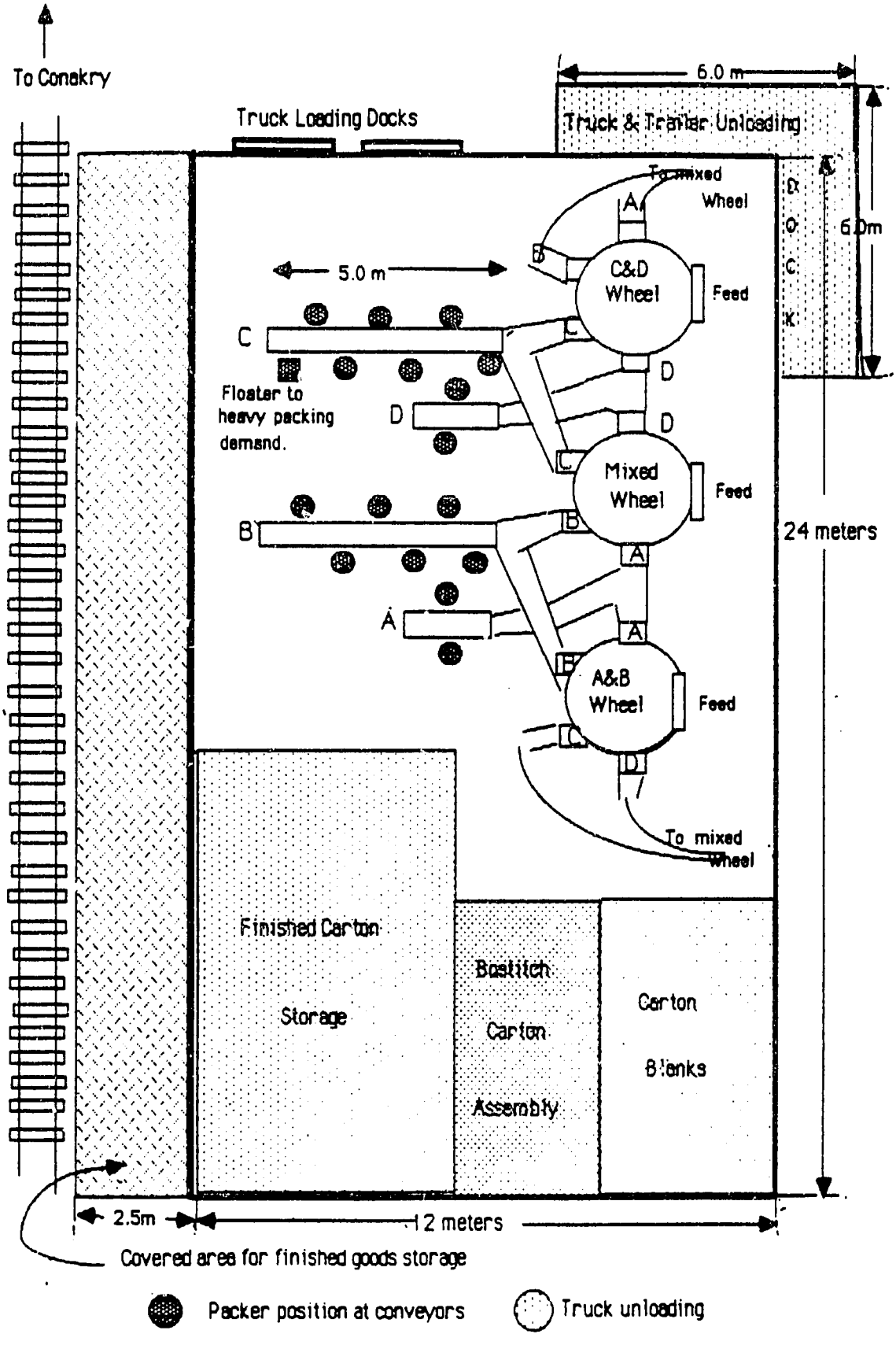
four size categories: A,B,C or D. The weight categories can be adjusted according to fruit size and market demand. The wheels turn in opposite directions to place the same size class opposite its counterpart on the adjoining wheel when possible. Each wheel should put out 1.5 to 2.5 MT of fruit an hour or 45 tons a shift from the three units. To meet special 300 MT shipments, the operation could pack on three shifts.

The four fruit sizes would be accumulated in separate chutes that slide fruit down onto packing conveyors manned by 17 packers standing on both sides. (Schematic drawing of packing area on the following page). This arrangement puts the majority of packers on B and C, the heavy volume sizes where 70 to 80 percent of the fruit will be packed. The less popular A and D lines can be packed by only 25 percent of the labor. Packers would be responsible for maintaining market standards, removing over and under ripe, damage, etc-- a very critical job.

After filling, the cartons would be stacked five high at the end of each conveyor. Hand trucks give flexibility to the operation by being able to move stacks of finished goods to the rail or truck loading docks for storage whenever transport is not standing by for direct loading They can be used throughout the packing floor to take grade-outs from the two outside weighing wheels to the opposite sides of the weighing area.

The schematic diagram on the following page shows a packing layout for the Friguiagbe facility with functional areas designated.

Schematic Diagram of Friguiagbe Packing Station



An alternative method for loading and unloading rail cars might include a hand-operated pallet mover that could take a full pallet (800 kg, or 40 cartons) into the rail car. The rail could be emptied the same way by moving pallets of cartons into the containers at the port. The pallets would be returned to Friguiagbe.

D. Environmental Conditions

Most of Guinea suffers from excessive rainfall during the summer and extreme drought during the winter. In the project environs, the dry period is somewhat moderated by sporadic rain showers in November and February but, more important for pineapple crops, the winter is noted for its constant morning fog and cool temperatures beginning in November and extending into mid-March --the heart of the dry season. Morning temperatures commonly drop as low as 8 degrees centigrade during this period although these minima are not reflected in the average monthly lows. Under these conditions (low temperatures and morning fog), heavy dew results; and pineapple plants can actually be supplied moisture sufficient for growth from heavy dew even though no moisture will be recorded at the rain gauge.

In addition to being a xerophyt (a plant capable of surviving in a hot, dry climate), the pineapple plant is structured in the shape of a funnel, gathering dew which runs down the trough-like leaves surrounding the heart of the plant. Aerial roots wind around these leaf bases and take up the moisture there to satisfy the metabolic demand of the plant. When pineapple plants are fertilized by boom sprayer, these nutrients are also absorbed through the aerial roots, obviating the need for soil nutrition. It is a well known phenomenon in Hawaii that pineapple growth benefits from

dew moisture and has been an operating practice among unirrigated growers in Guinea from the beginning of their pineapple experience.

Rainfall data at Kindia, obtained from the National Meteorological Service of Guinea (Tables 4 &4a) and from Fulaya Research Institute (Table 5) confirm the extreme wet and dry seasons that cause agricultural problems for other crops,but do not document the important dew factor that allows for production of unirrigated pineapple. The Institute practices irrigation on its experimental plantings in the belief that it benefits yields. At maximum the Institute has produced up to 70MT per hectare, but commonly harvests yields of 50 to 60 tons. There can be many factors other than irrigation contributing to good yields including: selected planting material, proper fertilization, insect control, weed control and a host of other critical activities.

E. Assessment of Environmental Conditions

Many years ago pineapple production was established and controlled by a French group of tropical fruit experts in Kindia (Institut Francais de Recherches Fruitieres -IFAC) who departed at independence without leaving behind personnel trained in scientific crop management. Unfortunately, many of their research backed cultural practices were discarded over the years resulting in a disintegration of production and loss of practical operating knowledge on the farms. In addition, the present shortage of scientific data at the Institute and the absolute absence of it among the growers makes one aware that farming practices today are no longer scientifically based.

The lack of soil analytical data in Guinea is profoundly shocking and

leads one to question the value of a Research Institute that does not supply growers with basic information even when they farm adjacent to the research facility. Upon inquiry at the Institute Soil Laboratory, it was learned that they did not have information on levels of soil calcium or magnesium because the Institute lacked chemical reagents for analysing these elements.

Critical Nutrient Levels for Pineapple Crops Grown in Hawaiian Volcanic Soils

| Nutrient Levels | | | Low | Medium | High |
|---|---|---|---|---|---|
| ppm | P | | < 8 | 9-12 | 13 > |
| " | K | | <130 | 130-200 | 200 > |
| " | Ca | (red soil) | <100(hv.rain) | < 100 | 100 > |
| " | Mg | | < 25 | 26-74 | 75 > |
| " | Mn | | (Sufficient if measured) | | |

At the Ministry of Agriculture, National Soil Laboratory in Conakry, soil data from Kindia, Fulaya and Daboya was grouped together to show average levels of P and K but only total base exchange was calculated for the other minerals.( The average of the data showed 17.2 and 58.0 ppm for P and K respectively). Critical levels in Guinea should be comparable although soils are different and the weathering and pH would make a difference in nutrient availability. However, the critical minima should hold true in both locations.

It is probable that calcium and/or magnesium are critically low in many cropped soils in the region. K is obviously low throughout Guinea and is the primary mineral supplied to pineapple by all farmers. Unfortunately,

neither information nor proper fertilizer materials are available to the growers. Therefore it is impossible to say what effect irrigation, fertilization or insect control now plays on crop yield.

The heavily subsidized fertilizers, now available from the grower cooperatives, are being offered at approximately 12,000 sylis per ton ($30 per MT) while the world price for the same material runs between $250 and $350 per ton. (It is specious to estimate fertilizer costs at this low subsidized price, so world prices have been used in the proposal). The majority of growers apply heavy amounts of the two materials available, ammonium sulphate and sulphate of potash, at two and one tons per hectare per cycle respectively. Potassium and nitrogen may not balance with plant needs but without data on current plant or soil nutrient levels it is impossible to identify or remedy the imbalances.

Most of the soils observed in the region are laterite which was reported to be 75 to 85% granite sand cemented together with a 15 to 25% clay/loam fraction-- enough to give some water holding capacity but not comparable with high clay tropical soils. The bottom lands paralleling streams show dark brown to black soils which appear to be higher in clay and organic fractions with better water holding capacity. These soils generally made up the old banana area. The sandy laterite soils tend to crust over, are quite erosive, are high acid with low base exchange capacity, and need careful cultivation and fertilization to ensure their continued cropping.

Fortunately, pineapple is very tolerant of high acid soils that would be deleterious to many other crops. Soil data from the Kindia region commonly shows 4.1 to 4.8 soil pH--more acid now than when originally farmed. Heavy applications of ammonium sulfate are known to increase soil acidity over the long term and the practice should be curtailed. Regular monthly applications of urea by boom sprayer can supply plant nitrogen more efficiently than two or three heavy applications of ammonium sulphate by hand as practiced by the growers. Monthly spray applications can also be used to carry herbicides and insecticides as required. Iron sulphate should be included on a test basis in the monthly spray program as done in many pineapple growing countries. Yields may benefit from it.

Table 6 compares the average grower's fertilizer program with current fertilizer policy used at the three scientifically based operations: the Fulaya Research Institute farm, SALGUIDIA agricultural program and the Daboya Project. The comparison clearly shows that the growers are unaware of plant nutrient requirements and do not have proper fertilizer materials available; therefore their crop yields suffer.

The major differences between the "scientific operators" and the growers is seen in the use of preplant applications of phosphate fertilizer and dolomite to supply phosphate and magnesium. Calcium is also present in both materials thereby putting all three base minerals, P, Mg and Ca into the soil for plant uptake. Without more reliable data from soil analysis, nutrient availability is speculative. IFAC agronomists advised addition of these minerals in each crop cycle and it was an established practice years ago.

It is obvious from the variability of fertilizer programs and yields that an expert pineapple agronomist will need to set cultivation practices for both Estate fields and contract growers. He will make decisions on soil preparation, planting material programs, fertilizer policy, pesticide programs for insects, weeds and plant disease control programs, and techniques for forcing fruit in the proper season. Agronomic decision making is an especially important function at project start. Once cultivation policy is established and becomes routine, a capably trained staff should be able to maintain it. The first few years will be the most difficult while the outgrowers are being trained in the revised cultivation practices required to improve yields and produce higher quality fruit of the proper size.

F. Production Methodology

Smooth cayenne pineapple clone is used throughout the international processing industry and over the years has proven unbeatable in quality and yield. It is also accepted as an excellent fresh fruit variety but has variety competitors in several countries. Guinea pineapple production started with smooth cayenne and it was expanded by the IFAC group of experts. The Baron de Rothschild clone is similar to smooth cayenne in flavor and color, but has three to six slips (plant sprouts growing around the base of the fruit on the peduncle) which can be removed for planting material. Smooth cayenne, by contrast, commonly produces suckers rather than slips. The Baron clone is less drought resistant than smooth cayenne and has very spiney leaves and crowns creating difficulties when hand cultivation and harvesting methods are used.

The large number of slips around the fruit base reduces fruit size and total yield. Since the Baron variety is cultivated only in Guinea, obviously there are better clones and varieties prevalent in the world. The Guinea smooth cayenne has no slips while only one to two suckers grow from the mother plant stalk. Since it produces much more planting material per cycle, the Baron variety has increased rapidly in percentage, replacing smooth cayenne as the common clone. All Guinea pineapple areas now have a mixed population that runs 15 to 20 percent smooth cayenne with the balance Baron de Rothschild. It appears that the Baron variety is good as a fresh fruit but may lack something in processing. There is no known comparative work on slice recovery between these two clones so any estimated processing differences would be speculative. SALGUIDIA is now cleaning up its planting material to get back to pure smooth cayenne production. It will take time but may be worth the effort since their long-range goal is to export to the international market.

It is suggested for this proposal that only smooth cayenne planting material be purchased from the growers at project start. The current price for mixed plants is 1.5 sylis each and may run higher for pure cayenne although many growers are anxious to sell plants. A purchase price of three sylis per plant has been estimated in the financial projections to purchase the required planting material, amounting to 3.0 and 6.0 million for the first and second years with subsequent years being supplied from the Estate fields. (3.0 sylis per plant or $7.50 per 1,000 is a reasonable price for plants.) All plants would be dipped in fungicide and insecticide before being used in field planting.

In the European fresh fruit market the two clones may be indistinguishable since they will be treated with Ethral to produce a full yellow shell color at market. It is not deemed feasible to start a new variety program from foreign clones because of the expense and prolonged period for building up the plant population. A steady effort over time to clean up the Guinea mix among the growers is advocated as the most practical approach to planting material improvement.

Land preparation in Guinea is notable for its shallow plowing (15 to 25 cm) and lack of subsoiling. A fundamental change for the project would be to practice deep tillage, either subsoiling or plowing to 50 cm in all crop areas to allow roots to utilize the soil moisture reservoir now lying idle for lack of root penetration. Deep subsoiling should be a late preparation operation following the required heavy harrow rounds. A final light harrowing pulling a leveling bar would complete soil preparation after the subsoiler. Under certain conditions final preparation with a rotary hoe may be required to break up clods.

Plant knockdown would be the initial preparation operation for recycled areas following removal of planting material. This is accomplished by chopping up the plants with heavy discs. The plant residue is left on the surface to dry during the winter months and then burned.the trash blanket. All residual unburned material would then be disced under and planting would commence upon the availability of suckers. Crop areas would be knocked down before the wet spring and the chopped plant material left to rot. The dry autumn offers the chance to burn the trash blanket. Preparation would continue during the winter and all recycled areas would be available for planting as soon as suckers for planting material are removed from early harvested fields. In practice, some of the crop area would be recycled within the four year period

thereby reducing total crop area to below 400 hectares at any one time.

No use of plastic mulch or fumigation is planned during the first cycles of pineapple production. Eventually, when the nematode population builds up, the economics of moving crops to new land or using fumigation on recycled areas can be compared .

Field layout would entail blocks of 25 bed blocks each. Double plant-line beds 1.2 meters apart center to center make the block 30 meters wide. Every block would be separated by a 3-meter road. Blocks must be laid out on contour across the slope to minimize soil erosion during heavy rain and ease the travel of spray and harvest trucks by avoiding steep roads.

Plant-bed marking would indicate planting pattern and would be accomplished with a spike-tooth roller. Planting density is planned for 59,540 plants per hectare.

$$\frac{10{,}000 \text{ sq.m./ha}}{1.2 \text{ m lines}} = \frac{8{,}333 \text{ m of bed}}{\text{ha}} \times 2 = \frac{16{,}670 \text{ m of plant line}}{28.0 \text{ cm spacing}}$$

$$= 59{,}540 \text{ plants per hectare}$$

This density is higher than currently used by growers, but the new crop practices planned should increase fruit size beyond the expected market preference. Fruit size can be reduced by increasing density. Dole and Del Monte in Hawaii plant over 70,000 plants per hectare for fresh fruit production.

Planting would be done by hand. A good worker should eventually plant 3,000 pieces per day. Experience in Hawaii shows that a skilled worker can plant up to 10,000 crowns in eight hours but with larger plants in Guinea a somewhat lower rate would be expected. The planter would use a specialized hand spade to open the ground and set the plant. He would also carry plants into the block and spread them along the lines. In Guinea

planting is now done with three men in a team who together plant only about 2,000 plants a day. The labor requirements in this analysis are based on Cameroon workers who perform similarly to Guineans. Anticipated new methods of soil preparation, plant supply and planting technique can be expected to increase labor efficiency. Plant removal is charged at 1,700 plants per day based on Cameroon experience.

It is common in West Africa to assign a daily task job which may be completed in 5 or 6 hours of labor. If the worker prefers to start at 5:00 AM and can finish his task by 11:00 AM he will still receive a day's pay. Packing and shipping schedules will demand more coordination between field, packing and shipping than this system of individual preference suggests. An improved wage level should assist in establishing some revised work practices and schedules.

Weed control would begin with a boom sprayer application of 4 kg/ha of Hyvar X soon after planting followed by a total of 8kg of Karmex split in two applications 3 and 6 months later. Any subsequent weeding would be by hand hoe.

Fertilization by hand and boom sprayer are planned for applying crop nutrients. Preplant application of phosphate and/or dolomite would be broadcast from a tractor. The first application of potash/urea by hand would follow within two months. Subsequent N and K applications would be sprayed on. A reversion to hand application could be used in case of mechanical sprayer breakdown. Soil and plant tissue analysis must be used to verify nutrient levels and make necessary adjustments. Sufficient N, P, K and Mg are planned to satisfy nutrient requirements and costs have been estimated accordingly for this proposal.

Insecticides will be used as a prophylactic treatment to prevent a

buildup of ant species and mealy bugs (Dysmicoccus neobrevipes) rather than to attempt eradication. Chemicals presently cleared for such treatment include Parathion, Malathion and Diazinon. These chemicals can be added as required to the monthly fertilizer spray program.

Forcing will be carried out with a double application of calcium carbide at 7 kg in 1,500 liters per hectare applied two days apart approximately six months before anticipated harvest. On paper forcing is a precise mechanism to regulate fruiting. In practice the time at which fruit matures can be lengthened or reduced by prolonged cool or hot weather during the six month maturation period; at best the time until harvest becomes an educated guess.

Crown gouging is a manual operation performed on all fruit soon after it emerges (about three months following forcing). The practice reduces crown size on mature fruit and is done as a marketing ploy that costs less than $10 a hectare.

Ethral applications are planned before harvest to ensure that all fruit will have a full yellow shell color at the time of retailing. It is expensive, increasing operating costs by $250 per hectare but is reported to be a marketing necessity.

Harvesting will be done by hand and at an estimated average rate of 700 kg per manday including the carry to fieldside. A second worker will place the fruit in 15 kg crates and stack them in readiness for truck loading. The crates are to be stacked five high, suitable for unloading by hand truck at the station platform.

Growers will be supplied wooden crates for this purpose and will be expected to have their fruit crated and ready for loading according to a predetermined shedule. The Estate truck will visit many small farms to

retrieve crated fruit and cannot wait for one tardy grower.

Hauling the crated fruit to the station will be over the gravel roads that connect grower's and Estate fields to Friguiagbe. Hauling will be primarily by 8-ton truck, or 13 ton double unit when the 5-ton trailers are used. A full double load of crated fruit has a lower bulk density than the equipment capability and will total less than 10 tons. it is possible that night loading, hauling and packing could be used to meet critical export shipment schedules as long as sufficient crated field fruit is stacked at roadside during the daytime harvest shift. Night harvesting is not considered practical.

G. Processing Plant Size

Processing fruit from the project would be in too small a volume to justify a cannery. At maximum the 25% unexportable fruit amounts to 2,000 tons of which 1,500 would be sold fresh domestically while 500 tons falling below fresh standards would go to SALGUIDIA. Cannery facilities cannot be justified to process 500 tons of annual production. In the event that forcing is off schedule, or precocious fruiting occurs, bringing a high peak of production in a short period, it is conceivable that a heavy surplus of pineapple could overwhelm the local market. Alternatively shipping delays might cut off exports for a period. To help protect against such eventualities, SALGUIDIA processing capability should be expanded to at least 60 tons a shift or reliably between 4 and 6 tons an hour as a standby outlet for surplus pineapple. This would mean installing two ginaca machines and related equipment that would fit into the present cannery building. The minimum required processing equipment should include the items listed below.

Processing Machinery and Prices from HONOMAC Inc.

Honolulu, Hawaii (Prices @10/85 in US$)

| Equipment ID | Unit Price | No. Required | Total Cost-$ |
|---|---|---|---|
| Grader assembly | 12,200 | 1 | 12,200 |
| Ginaca | 62,500 | 2 | 125,000 |
| End-Cut Eradicator | 6,500 | 2 | 13,000 |
| Ginaca cylinder guide | 1,200 | 2 | 2,400 |
| Single knife slicer | 12,500 | 2 | 25,000 |
| Minimum Processing Equipment Cost for Two Ginacas | | | $177,600 |

The prices include export packing but another 10% should be added for ocean freight. Experience from process engineers indicates that installation doubles the machinery cost. This estimate assumes that existing packing tables, conveyors, refuse discharge, can feeding, etc., would be tied into the new ginaca units for a minimum facility upgrade cost estimate of about $400,000. The economics of this proposal would turn on how much more total fruit would be processed at SALGUIDIA, the plant operating costs and the costs of a marketing program outside of the EEC and US markets which are now over supplied with canned pineapple. A definitive answer on the economics of this investment requires a thorough processing and marketing study.

H. Equipment Requirements

Truck requirements for fruit hauling have been minimized by organizing most of the pineapple production in the old banana areas near Friguiagbe station. Three 8 MT ton trucks are needed at full operation. Each would pull a flatbed trailer of 5 MT capacity, creating a double unit of 13 MT weight capacity. The anticipated load of 555 15 kg crates would total 8.3 MT.

Truck &trailer decks:

2.3 m x 5.45 m x 2 = 25 sq.m. = 111 crates x 5 layers = 555 crates

.224 sq.m./crate (Detailed below)

The unknown factor in all equipment requirements is the amount of down time needed for repair and maintenance. One extra truck is provided in this proposal to compensate. One of the 8-ton units is a dumper to be used for road repair and backup fruit hauling.

Wooden crates of 15 kg capacity have been estimated at $3.00 each-- the precut wood cost in the US. They measure 56 x 40 x 33 cm to give .224 sq. m. of bottom area. This standard pineapple crate can hold 25 kg of processing fruit or 15 kg of crowned fresh fruit. At full operation packing 6 tons an hour, 3,200 crates would be used in eight hours. Experience in other areas has shown that a fruit handling system requires three times the number of crates used per shift to allow for delays, transportation, empty and full crate storage and repair and maintenance. A capital requirement of $28,800 has been estimated for 9,600 crates. After the initial purchase, crates would be charged annually as operating supplies since their life expectancy is short.

One boom sprayer is the critical operating unit in this project. Two spray supply trailers can be pulled by truck or tractor and are less prone to breakdown than the boom sprayer-- a specialized machine too expensive to be backed up with a standby. However, when down for repairs, critical fertilizer spray and other solutions could be applied by manual knapsack sprayers which have been included in miscellaneous hand tools totaling $1,000 per annum. Growers would continue to apply agricultural chemicals as needed by knapsack sprayer because many of their crop areas would not be accessible to boom trucks.

A crawler tractor equipped with an angle blade and rooter bar is the most expensive capital item based on the cost of a John Deere 850 in the US plus 10% contingency for export shipment. Less expensive comparable units may be available in Europe.

Preparation implements include a subsoiler, Rome disc plow, light harrow and a rotary hoe. Various minor pieces of equipment including a road roller, line marking wheels, and fertilizer and chemical applicators would be purchased out of the 10% contingency allowance and are not detailed.

Rubber-tired tractors would be used for several operations. The largest unit (Brazil make, 118 hp) is required to operate a rotary hoe. Four Renault units (45 hp) would be used to pull spray supply tanks or with trailers to haul fertilizers and chemicals to the fields, and to gather scattered fruit from grower's or Estate fields when the large trucks were occupied elsewhere. At morning labor turnout these tractors could be used with trailers to transport labor gangs to their assigned work areas for the day.

Three movable water pumps are needed to lift spray make-up or domestic water out of various streams and complete the major field equipment list which is itemized in Table 7. The table also gives the estimated ten year capital requirement and depreciation schedules for the project. Table 7a details the expenditures for capital required on the repair and construction of the packing station and several other ancillary facilities.

1. Inputs

Imported materials used in the project have been costed based on world prices obtained from SEMAPE and identified in Table 8. Costs have been estimated for cartons as already described. Motor fuel is the only product used in the financial projections at its Guinean subsidized price because of its wide impact on the public and private transport system and the likelihood of its remaining subsidized. These materials would be stored at Frigulagbe in one of several existing buildings. Transport from Conakry would be by rail or truck. Imports would be ordered from the international market 6 to 12 months in advance of requirements to take advantage of volume price breaks. Growers would be charged at actual product cost plus warehousing and handling. With proper storage none of these materials is especially perishable and no loss in quality is anticipated. In the early phase of the project smaller inventories would prevail.

Equipment service rates have been calculated for all field equipment units and have been used for estimating operating costs. Hourly rates are based on the purchase price of each unit divided by the estimated hours of life multiplied by 80% to come up with an hourly rate for repair and maintenance plus the fuel used by the unit. These service rates are summarized in Table 9 while Table 9a compiles equipment usage in three major operating areas, soil preparation, road construction and cultivation accounts. Depreciation is not included in the service rate to simplify cash flow calculations.

Fresh fruit to be purchased by the project would be supplied by the three grower cooperatives in the region; these include the most active pineapple planters in Guinea. Operating statistics on these three cooperatives are summarized below.

Principal Pineapple Grower Cooperatives

| Headquarters Location | No. of Members | Ha. of Pineapple | Estimated MT per Year 85/86 | 86/87 | 87/88 |
|---|---|---|---|---|---|
| Kindia | 134 | 80 | 2000 | 1500 | 1200 |
| Friguiagbe I | 105 | 50 | 660 | 660 | 660 |
| " II | 65 | 40 | 530 | 530 | 530 |
| Totals | 304 | 170 | 3190 | 2600 | 2390 |

It was pointed out by the cooperative members and their officers that additional fruit production could be scheduled for the future if there were an established market for it. Coop members cultivate parcels varying between a few thousand plants and five hectares. Only 75% of their projected tonnage would be exportable, but this still amounts to 65% of the grower fruit estimated in 1985. It has been proposed that almost half of the export quality fruit from these three cooperatives be purchased to meet project requirements during the first two years.

J. The Daboya Project

Two cursory visits were made to the Daboya fields, pumping facilities and headquarters area. The General Director, Mr. M.K. Souare, was extremely cooperative in assisting in the evaluation and candid in his analysis of past problems. He has served as General Director from inception of the project in 1976. He felt that Daboya would need additional financing very soon or the Central Government would elect to close down operations without harvesting the remaining crops.

Fruit production estimates place 1986/87 tonnage at 1,000 and 87/88 at 1,200 MT from the 40 hectares of 1985 plantings. The tonnage estimates are based on yields of 40 MT per ha of export fruit as experienced earlier but presume adequate irrigation for the cycle. These

yield estimates are not realistic unless major investments are made in mobile field equipment and rehabilitation of the irrigation system. Souare estimates that $100,000 in replacement irrigation equipment would be needed to reactivate the system that cost about $3.0 million when installed in 1977-80 (8). He was not prepared to estimate mobile equipment needs nor the costs of agricultural materials for the 30 hectares just planted and the 25 ha that will be fruiting from February to April '86. (200 tons) and from November '86 to April '87 (800 tons).

At first glance it would seem that several hundred thousand US dollars could put a private operator in position to control 2,200 tons of pineapple over the next two years. The tragedy of the enterprise is that irrigation is required for optimum growth in this area and labor is difficult to find during the dry season when local farmers are busy with their own crops.

It has been proven impractical to transport daily labor from Kindia and Frigulagbe.Trucking is the only transport to Conakry for pineapple produced at Daboya. At a rough estimate $1.5 to $2.0 million would be required to restore the operation to a profitable level, and serious agricultural and personnel problems would still remain. The estimated costs to rehabilitate the operation are shown below

Expense Estimate to Rehabilitate the Daboya Project

| Capital Cost | Estimated US $(000) |
|---|---|
| Repair irrigation pumps;purchase new equipment | $100 |
| New field machinery (Only one tractor works) | 600 |
| Renovate buildings and construct staff quarters | 50 |
| Build minimum labor housing (100 men @ $2,000 ) | 200 |
| Subtotal Capital Costs | $950 |

Operating Costs

| | |
|---|---|
| 2 Expat employees: Manager & Crop Specialist. | 150 |
| Agricultural chemicals @ $75/MTx 4,000 tons | 300 |
| Working capital 4 mo. (assume some crop revenue) | 150 |
| Annual interest @13% on $1.6 million | 210 |
| Subtotal Operating Costs | $810 |
| Estimated Minimum Cost to Renovate | $1,760 |

More than the initial investment, the problem of selling the fruit remains. The market is not defined clearly enough to justify producing 8,000 tons per annum, which would probably be necessary to earn a profit on these extensive operations (7,8). Worker housing is required to attract enough regular employees for continuous operations. Labor shortages have plagued the project from the start and have resulted in lost crops and missed schedules. Staff housing improvements are needed to attract able expatriate management employees.

K. Quantitative Relationships

The scope of the proposed project at Kindia/Friguiagbe is constrained by several transport and cargo handling limits which include the following:

(1) Inadequate knowledge of the primary market locations and an established means to supply them from Guinea.

(2) Some capacity limits with regard to the refrigerator sea bridge, composed of several firms, limits currently standing at 78 containers per voyage for Rhein Mass, 10 for DSS and a year hence, high volume container space will be available to Marseilles and Italian ports via Grimaldi Shipping Co.,

(3) The unknown quantity of containers available in Conakry for filling with fruit while the ships make their way to

other West African ports to drop their frozen cargoes before returning to Europe.

(4) The actual availability of a port storage refrigerator facility to hold a maximum of 25 containers to be established within two years.

(5) A proposed contract with SAGETRA to build and maintain a holding facility for 20 refrigerated containers at Conakry as part of a volume guarantee on pineapple shipments.

It is believed that this proposal offers a prudent approach by setting a maximum of 45 containers per shipment. This volume will fit the two planned port storage facilities, can be transported easily by established rail and trucking services, should fall within Conakry container capacity limits of several shipping firms, and can be processed at the Friguiagbe packing operation. Any higher volume would entail expanded packing facilities, additional port storage, more containers per ship and increased marketing problems in Europe. These handling and transport limits actually set the parameters for the 6,000 ton volume being used as the annual marketing goal. At full operation, three 300-ton export shipments per month in a seven month season would total 6,300 tons, the maximum under the constraints discussed above.

The point needs to be reemphasised here that negotiation of a fresh pineapple export agreement with the Russian ore fleet, which departs Conakry every few days and may have idle refrigeration space on board, would open up access to an entirely new market. The Russians are understood to be currently seeking a fresh pineapple source. This supply opportunity, because of the established shipping bridge to Russia, should be worth the extra effort in organizing such an operation. Packing for these ships could be done during off peak periods at Friguiagbe. The

potential pineapple crop area in the project region is not constrained nor is the capability to expand agricultural operations at minimum expense.

L. Labor

Unemployment is high in the project region and labor is abundant. There is a tradition of agricultural work that fits the project requirements. SALGUIDIA pays 125 sylis per day for agricultural labor so this figure has been used in these projections although agricultural labor in the region is now paid a daily rate of 75 sylis. Equipment operators receive 10% to 20% more depending on size of machine.

Field labor requirements total 465 man-days per hectare for growing the pineapple crop, based on Cameroon experience with some modifications in cultural practices for Guinea. Labor requirements are shown in Table 10.

Harvesting, hauling and packing labor requirements in Guinea are itemized in Table 11. These operations differ considerably from the Cameroon methods which total 380 man-days per hectare.

The packing facility would utilize 110 workers and 6 cadres for each shift at full operation. Even with this work force, the labor costs for packing 40 MT per shift total less than one dollar per ton and are detailed in Table 12. Labor costs amount to a minor part of direct production costs although the man-day requirements for this project are high by international agro-industrial standards. Labor fringe benefits in Guinea are 21% of wages and salaries vs 27.4% in Cameroon. These and several other indirect costs are summarized in Table 13 and detailed in Table 13a.

A first line supervisor would earn 5,000 sylis per month (1.65 times the base rate of 3,000) and would be in charge of a 20-man gang. The cost of first and second line cadres combined totals 12% of wage payroll.

No cost estimate has been made for grower labor since each grower would be working for himself and utilize family or cooperative members on an exchange basis.

Office staff and technical jobs can be filled by candidates from the Fulaya Research Institute. They may require specific training in new methods but could be selected for their background familiarity with science or accounting. The estimated indirect costs for the office functions are summarized in Table 13. Details for most of the indirect accounts are given in Table 13a along with project costs for maintaining the two expatriate management employees. Rented office facilities can be found in Kindia or Fulaya as well as adequate housing at moderate rates for the expatriates.

M. Other Operating Costs

This financial projection assumes achieving full operation in the fourth year when the Nuclear Estate will contribute 4,000 and the growers 2,000 for the total 6,000 MT export goal. It is deemed necessary for the Estate to produce the bulk of fruit to ensure quality and proper timing of harvest to meet precise operating schedules between planting and export. The Estate would also be better able to withstand cyclical price declines than the average small grower. All contract growers will need to comply with the Estate cultural program and new practices in order to fit into this demanding production schedule.

Estate crop production costs are not realistic for the long term until full operation is achieved because most operating costs are accumulated in the first six months of the cycle while there is no revenue until 18 months after planting. As soon as planted area and fruit

production are in constant balance, total annual variable costs divided by the tonnage will be an accurate reflection of direct costs per ton which will vary inversely with yields. Full monthly operating costs during the first year are detailed in Table 14 to reflect the monthly cash demand at project start. Even though $707 thousand in revenue is estimated from export sales of grower fruit, there is need for an additional $120 thousand in working capital during the first 12 months.

International prices for all purchased materials were deemed more realistic for long-range financial planning than heavily subsidized import prices. This does raise project fruit costs far above current grower production costs. Table 8 shows that the actual international purchase price for four principal fertilizers is almost ten times the subsidized price currently charged small growers.

Utilities requirements at the packing station include a low power demand from small electric motors on packing wheels and staplers. Station lighting for night operations will be the heaviest demand but is covered readily by the proposed 100 KVA generator. Water is readily available and can be pumped to the station from several nearby perennial streams.

Repair and maintenance activities will be carried out in one of the adjacent buildings now standing idle near Frigulagne station. The expatriate Equipment Supervisor will have the experience and ability to repair and maintain all field and packing equipment. One of his primary functions will be to train support personnel. Part of the $60,000 spare parts capital budget will be spent on tools and repair facilities which will

include a pickup truck equipped for mobile repairs to service both field machinery and the packing station. Repair costs are budgeted in the equipment service rates shown in Table 9 while salary for the expatriate Equipment Supervisor is included as project management overhead in the Table 13a detail of administrative and office costs

Depreciation is a major fixed project cost and is detailed at the bottom of the capital budget in Table 7 Most field equipment must be acquired in Year One in order to complete the first 50-hectare planting and road repairs including those to growers fields which often have poor truck access. Land clearing requirements are minimal with most of the crop area now composed of savanna or light brush interspersed with trees. A judgment was made not to capitalize any field preparation or land clearing since these costs can be expensed annually rather than amortized on a four year crop cycle.

Interest rates have been estimated at 13% on borrowed capital forecast for 60 percent of total capital requirements of $1.5 million with the 40 % balance of $600 thousand in interest free equity participation This rate of interest is believed adequate to also cover the 1% project insurance cost offered by OPIC (Overseas Private Investment Corporation) as insurance against nationalization or other disaster situations detrimental to the financing of the project. The project operating costs and profit and loss projections for the first five years are detailed in Table 15 and summarized in Table16 The minor discrepancies between these annual profit and loss figures are due to differences in rounding in the various supporting schedules Sources and use of funds are documented

in Table 17. Working capital requirements peak in the second year and may require a short term loan to bridge the shortage in cash at this point.

Agricultural land rents have been stated by the government to be 1,000 sylis per hectare/annum. This figure is used in the financial projection even though it seems low. Rent for the Friguiagbe facility has been estimated at 2 times the project land rent or $2,000 per year. Rental for the three weighing wheels from Fruitex has been estimated at $1,500 per year.

Diverse taxes have not been documented for export products nor has the central government tax incentive program for private investors yet been promulgated. Agricultural exports are exempt from customs duties but the various taxes listed below would apply to fresh pineapple exports according to information from Fruitex representatives.

Potential Taxes and Duties on Export Activities

| Taxes and Duties | Rate per Carton- Sylis |
|---|---|
| Port Authority | 36.225 |
| Entrance/Exit | 53.60 |
| Transportation * | 7.90 |
| Total Per Carton FOB Conakry | 97.70 |

$$*\frac{\text{The rate is 3.5 Sylis}}{\text{MT-km}} \times 133\text{km} = \frac{465.5 \text{ Sylis/MT}}{59 \text{ Cartons}} = \frac{7.9 \text{ Sylis}}{\text{Carton}}$$

There may be some concessions on the above charges for the first few years as part of a stimulus to private investors, but the details are not yet

known. If serious, the government could reduce these port charges which would amount to $57 and $86 thousand per annum during the fourth and fifth years respectively. This estimated is based on a total of these three duties which amount to $14.40/MT calculated as shown.

Estimate of Duties on Export Product

$$\frac{97.7 \text{ Sylis} \times 59 \text{ Cartons}}{\text{MT}} = \frac{5{,}764.3 \text{ Sylis}}{400} = \$14.40/\text{MT}$$

New tax ordinances are under review by central authorities with some indication of a probable five year tax holiday on all profits earned in private export enterprises.

Insurance rates are not known in Guinea. Generally insurance would run 1% of the product value on export shipments. This amount has already been included in the 5% charged to the total CIF costs shown in Table 15.

## IV. NUCLEUS ESTATE AND GROWER RELATIONSHIP

### A Potential

Growers belonging to the three cooperatives already mentioned and a few outsiders would be contracted for the 2,000 tons purchased annually. An unsuccessful attempt was made to acquire a selected list of the most able growers who might be interested in contract production but only the total membership of 304 from all three cooperatives was made available thereby leaving the job of grower selection to the future.

Assuming that grower yields would equal those of the Estate (40 export tons/ha), because cultural practices would be specified by the Project Director/agronomist, the 2,000 tons would be harvested from 50 hectares probably cultivated by 50 growers or fewer. These would be the larger growers farming several hectares in various stages of crop cycle.

The remaining 25% or 10 tons per hectare of non-export grade fruit would be harvested and crated by the growers, then graded and sold domestically by the Estate. The profits from this additional tonnage, estimated to average 45 sylis per kg ($112.50/MT), could be divided in an equitable manner between grower and Estate. However, the first money from export sales would go to pay off the Estate liens held against each grower's crop. Pro-rated costs of management, road repair, warehousing and handling would be charges in addition to the actual materials purchased by each grower. This schedule of charges would be negotiated before contract signing. It is essential that these charges be clearly understood in advance by each grower.

B. Needed Inputs

It is proposed that 45 sylis per kg be the grower contract price based on current material prices and estimated production costs. The cost breakdown of import materials is given in Table 6a ($1400.80/ha divided by grower advances of $1625.00/ha) and shows that 86% of grower advances pay for materials and 14% go for service and related charges. A 40 ton export yield would bring the grower 28.7 Sylis per kg ( Syli breakdown is shown on page 23) after expenses but his major advantage would result from improved yields and a stable outlet for his contracted production.

The observation should be made that a grower price of 45 sylis per kg puts crated fruit at roadside for $112.50 per MT vs equivalent Estate direct field costs of $75.00/MT. Total indirect costs including depreciation, management and support staff detailed in Tables 7 and 13 amount to $332,700 per annum and would add $ 55.45 per ton to the estimated 6,000 tons of export production. The unexportable balance (10 MT/ ha) would represent additional gross profit at whatever the market would bear. If fresh market demand were low, occasional surplus production could be sold for processing at 15 Sylis per ton but an overall average has been estimated at 45 sylis/kg because most of the unexportable fruit would be large and spread throughout the high price period. Yields in excess of project estimates would significantly improve profits and rate of return.

## V PROGRAMMING AND CONTROL

### A. Suggested Implementation Plan

The proposed plan of implementation has been outlined earlier in Chapters II and III, and is illustrated at the top of Table 15. The first two years of exports would be supplied from purchased grower fruit of 1,290 and 2,580 tons in the first and second years respectively. This amounts to almost half of the grower fruit production from the three cooperatives in the region. A price of 45 Sylis/kg should secure the best fruit for these early shipments since private growers are now receiving only 30Sylis/kg at fieldside from the export merchants.

Grower tonnage would continue at 2,500 MT in the third year but decline to 2,000 MT in the fourth and succeeding years. Estate production would commence in the third year at 1,500 tons from the initial 50 hectares planted and increase to a steady 4,000 tons per annum from the 100 hectares planted annually.

It is projected that Estate yields would commence at 30 tons and increase to 40 MT per hectare as cultivation practices were perfected. No increases beyond this are estimated although yield improvements are very possible. Cameroon experience averages 50 tons of export fruit per hectare and in Hawaii an average yield would be over 70 tons from a plant crop harvest and somewhat lower yields from successive ratoons because there is a size bias toward smaller fruit in ratoons.

B. Material Flow Schedule

The first two years of low tonnage production would be used for personnel training and perfecting the operating techniques needed for the planned expansion. Most of the fruit would be sent to Conakry by rail but some would be transported by SAGETRA on an annual contract. SAGETRA management has suggested shipments could be broken into 30 MT increments plus a return haul of equal tonnage for a total price of 5,000 Syli's per MT ($12.50/MT). They have expressed interest in constructing and maintaining a storage platform for refrigerated containers adjacent to their port warehouse on which to store boxed fruit pending ship departures. This would be an additional expense estimated in this study at $10.00 per MT for an average two days port wait before ocean shipment.

In the event that the port authority does not meet its goal of establishing refrigerated storage at Conakry port, SAGETRA would be willing to begin at once handling the entire inland transport and refrigerated port storage activities for the project. SAGETRA would also consider contacting for European produce buyers who could purchase fruit either CIF or FOB Conakry. By utilizing this well-established organization with proven ability to move products inland and overseas, the project expatriate staff could devote their efforts to organizing the grower's program, developing the Estate crops, running the packing facility, and training staff and supervisory personnel. Costs per ton might be higher but SAGETRA involvement would give the project a functioning marketing system to start the flow of pineapple to Europe.

C Quality Control

A fruit marketing expert would have to set the standard of acceptance for fresh fruit packing at the station and expatriate management personnel would maintain this level as the operating norm. Considerable training of packers would be involved and constant vigilance by quality control personnel sampling export cartons. This startup period would be difficult and requires either a partner with marketing experience or continuous advice from proven marketing consultants. Stringent harvesting standards would be used to select quality fruit in the field and vigorous quality would be essential throughout the operation. To achieve reliably high quality would be the goal for the project; the same standard would be applied to Estate and growers' production alike.

## VI - ORGANIZATION AND MANAGEMENT

### A. Structure

There are many combinations of possible corporate structures for the projected fresh fruit operations in Guinea. Rather than deal with the complexities of the twin subsidies already discussed, (a production unit and a marketing unit), for the sake of simplicity it would be logical to operate the production unit as the "Fresh Pineapple Production Corporation" of Guinea and to hire independent European produce brokers to sell the pineapple on contracts. The 10% sales commission is already plugged into the P&L projections (Table 16). This would possibly save the Pineapple Production Corporation considerable profit, when considering that 30% of the production profit would have been paid as dividends to the marketing subsidiary. It is assumed that even with a marketing subsidiary, much of the fruit would still be sold on commission. Broker commissions are estimated at $348.8 thousand plus $270 thousand additional in dividends

The annual profit ofover $700 thousand at full operation beginning in the fourth year does not take into account the likely scenario of having a plethora of independent produce brokers in Europe declare that a percentage of most shipments is off-grade and therefore must be priced lower to compete for sale. There is already a 15% price reduction built into the average European prices (Table 1) used to cover ordinary losses expected in shipments, but this could be only the beginning of serious price erosions unless the European outlets are closely watched by representatives of the production enterprise. The subsidiary idea is being suggested as the best way to insure quality of product at delivery and honest pricing from

the many produce brokers involved. The foundation of the operation is based on delivering a consistent quality product. No better way to guarantee that is to keep a knowledgeable representative in the market place full time

B. Relationship to Government of Guinea

The thrust for privatization of the economy by the central government suggests free rein to a group of private investors owning and operating the proposed enterprise. However, it is deemed prudent to offer a minor percentage of ownership in both the production and marketing subsidiaries to the Central Government of Guinea. Government representatives could utilize this private investment wedge to keep abreast of the vagaries of the European produce market and possibly to expand production and sales of other tropical fruits and winter vegetables there. The government would also gain first hand experience in this very complex field so important to expanding the country's agricultural economy

The suggestion has already been made that the Guinean production subsidiary be held 70% by a private or quasi-private group in Guinea and the balance 30% held by the European marketing susidiary also composed of either private or quasi-private investors. The opposite percentage breakdown would apply to the marketing end of the structure with 30% of the marketing subsidiary held by the production unit. Both subsidiaries would seat representatives on each other's boards, allowing key members to become familiar with the operating details of each subsidiary

The percentage alloted to the government or its named agency is open to negotiation. As an example, CNPIP or Fruitex, which would represent the Government of Guinea, could be a 25% investor in the quasi-private corporation controlling both subsidiaries. If this stock plan were followed, the Guinean government agency would control 7.5% of the marketing subsidiary and 17.5% of the production operation. This would result from an investment of $150,000 as shown below.

Corp. capital = $1.2 million x 40% Equity = $600,000 X 25% = $150,000

Production Sub. 70% x.25 = 17.5% Marketing Sub.30% x 25=7.5%

Upon formation the boards of directors would be assured that both subsidiaries would hold minority seats on each other's boards.

C. Personnel Requirements

The two expatriates already identified for the production phase would be the management personnel assigned to organize the project in Guinea. Outside corporate management and technical consultants would be involved from time to time but not permanently. The marketing phase would need knowledgeable staff to be supplied by the private group (proposed as the market-oriented investor) familiar with the spectrum of marketing problems. Even with this knowledge there would still be a need for an in-depth marketing study beyond the scope of this report.

The other operating staff and personnel required for this project would be recruited in Guinea from government agencies or private enterprises as needed. At full development, a permanent field work force of 116 full-time employees is suggested as the most likely number needed to operate the project. There would be a demand for an additional 390 workers as temporary hires, employed during the 7 month season ( October through May) for planting, harvesting and packing. It is assumed that at full operation the packing shed would function on two shifts requiring 110 wokers and 6 cadres per shift (Table 11).

The 390 semi-permanent workers would be supervised on a 20 to 1 ratio by first-line cadres, many of whom would be upgraded to supervisor status from the permanent work force during the active campaign. This may not fit the traditional work practice in the country of paying supervisors a permanent annual salary. In this project there would be insufficient work opportunity during the 5-month rainy season to justify keeping all the cadres on supervisory payroll. They would be employed in the field or at maintenance and repair activities on: equipment, roads, buildings, etc where the work assignments would be for laborers and craftsmen--not supervisors.

The total number of permanent workers would include equipment operators, mechanics and cadres for the line activities as well as the permanent office staff. During the campaign equipment operators would primarily work 24,600 service hours (Table 9a). This would require at least 15 full-time equipment operators during a 200 day season. Some units would be operated on double shifts.

$$\frac{24{,}600 \text{ service hours}}{8 \text{ hour shifts}} = \frac{3075 \text{ shifts}}{200 \text{ days}} = \frac{15 \text{ equipment operators}}{\text{day}}$$

There would be an additional 5 employees grouped as trainees and backup for absentee operators during critical periods. The mechanic force would be permanent and could be expected to work on equipment and packing station repairs and maintenance most of the off-season. The project workforce is summarized below

Breakdown of Permanent and Temporary Employees

| Assignment | Number of Workers | |
|---|---|---|
| Equip. Operators | 20 | |
| Mechanics/Helpers | 6 | |
| Seasonal Cadres | 20 | |
| Permanent Field Workers | 45 | |
| Superintendents Level | 5* | |
| First-Line Supervisors | 5 | |
| Office Personnel | 15 | |
| Subtotal Permanent Employees | | 116 |
| " Temporary Employees | | 390 |
| Grand Total Peak Season | | 506 |

The temporary employment breakdown is that 190 would work at the packing station on two shifts and 200 on field jobs including planting, cultivation activities, harvesting and hauling. The number of field

---

*Includes the chief accountant and superintendents of the packing and harvesting, planting and cultivation departments who would report directly to the director/agronomist or the adjutant if the director were absent

workers required is based on the Cameroon experience of 1 9 workers per hectare cycle and the approximate 150 ha in Estate production which would utilize 285 workers with the balance in harvesting, hauling and packing

D Estimated Personnel Costs

Field labor cost estimates are based on the Cameroon experience and adjusted for the recommended harvesting, hauling and packing methods The cost estimates are probably close for actual labor, but overstate the cost of fringe benefits that would not reach 21% on temporary employees Supervisory costs may also be too high because many temporary cadre would not receive as high a salary as the permanent employees.

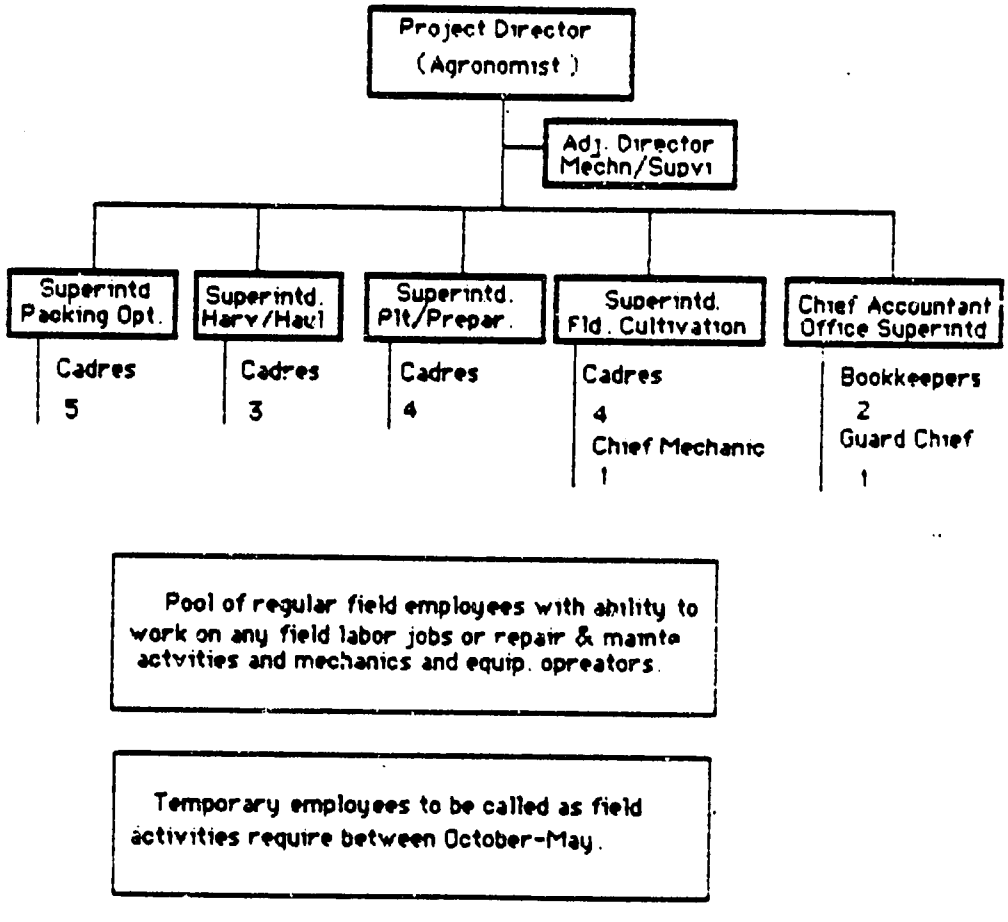
Table 12, D section, summarizes the cost of labor where fringe and supervisory costs are estimated. Labor costs total $6.72 per MT on exported fruit although $3 63 of that amount would apply only to the 4,000 tons grown by the Estate while $3 09 should be charged against the entire 6,000 export tons for a total wage bill of $33,060 Another $4,000 for supervision would bring the wage and salary total to $37,000 per annum.

E. Organization Chart

A corporate structure has been suggested, but the best arrangement for percentage ownership and individual board member assignments on the principal corporation and its two subsidiaries would be decided by the participating partners. The organization chart for the Guinea project operation is shown on the following page

Guinea Production Operation Organization

Chart




F Management and Marketing Contracts

There has been discussion of two options for marketing the production, either to sell entirely through European brokers or to develop a program with the help of the marketing-oriented partner to monitor the

sales and quality of product. No further decision can be made on these or other options until the market is better understood

A management contract to organize and direct the field operation is one means of securing specialized talent and professional support during the very difficult installation phase. Several firms are capable of this type of service and would charge fees in excess of the costs detailed in this report but well within the capability of the project to support.

## VII - CAPITAL COSTS

### A. Location and Facilities

The packing operation has been located at the junction of rail and an established hub of field roads that lead to the best pineapple production areas in the region. As pointed out in earlier sections, a circumference of 5km surrounding the Frigulagbe station encompasses 8,000 hectares of land. The crop areas will be selected for highest yield, potential yield and proximity to the station. An average radius for field distance from the station should be 2.5 km maximum but most likely will be much shorter for the entire 400 hectares eventually cultivated.

Gravel roads and stream crossings of both culverts and fords have been estimated at $40,000 in capital the first year and are itemized in Table 7.

Reconstruction of an old banana warehouse roof and other rehabilitation expenses of other buildings at the Frigulagbe station have been estimated at $65,500. This includes preparing the site for truck service roads, rebuilding the rail dock, and covering it with a tin roof to increase protected storage area for finished cartons awaiting shipment.

Packing station equipment will include the three weighing wheels rented from Fruitex and charged off as a packing expense of $.25 per ton of fruit processed at full operation. Estimated packing costs are broken down in Table 12. New equipment items are detailed in Table 7a and amount to $48,600. The balance of capital items include operating items of short life span like wooden pineapple crates, pallets and other required items not detailed. The first three years of the project are charged twice for wooden

pineapple crates which are depreciated in this period while during the same time they are also expensed at $1.20 per ton processed, as they will be in later years. The total capital cost of the packing facility and equipment has been estimated at $145,900.

Office equipment includes office machines estimated at $3,000 and radio and telex equipment at $12,000. Furniture will have to be purchased from the $20,100 contingency

B. Field Equipment

One crawler tractor (John Deere 850) is required for heavy field preparation work, deep subsoiling and heavy plowing. It will also be used on road construction and repair whenever not working on soil preparation. It is the most expensive equipment item estimated at $115,000 plus ocean freight to be covered by the 10% contingency

Five rubber-tired tractors are projected for various uses detailed in an earlier section. The largest is a Brazilian tractor (118 Hp) that will power the rototiller in special situations. It will also be available for jobs too heavy for the other four Renault tractors of 45Hp. Total tractor costs are estimated at $250,000

Preparation implements are itemized in Table 7 and total $43,000. After some experience in the region, specific needs may require a shift to heavier harrows but for the early phase this battery of implements should suffice.

Truck and trailer equipment is estimated to satisfy the hauling requirements for all raw fruit transport and field agricultural materials trucked from storage in old buildings at Frigutagoe. One of the 8 MT trucks equipped with a dump body will serve as a road repair unit when not

required on fruit hauling. The other two with 5 MT trailers will carry most of the field fruit to the packing station. Tractors and trailers can also be used for fruit hauling during peak periods. Total truck/trailer costs have been estimated at $161,000 and are detailed in Table 7.

Boom sprayer and tank trailers make up the balance of important field equipment amounting to $65,000.

Water pumps and miscellaneous hand tools complete the field capital items. Spare parts have been estimated at 10% ofcapital or $63,000

C. Capital Expenditure Schedule

Total capital expenditures estimated for the project amount to $996.2 thousand but are distributed over three time periods: pre-operating, and the first and second years. This anticipated capital distribution is shown in Table 13, but the itemized capital equipment is detailed in Tables 7 and 7a. The depreciation schedule shown in Table 7 reaches a constant rate in the second year and there remains steady at $178.2 thousand for 10 years of project life.

The large pre-operating capital expenditure is due to the need to purchase the most expensive field preparation and trucking equipment ahead of startup in order to commence operations at the beginning of the fiscal year in August and to be prepared for fruit purchases, trucking and packing in October. The estimated expenditures would be required as follows

| Time Period | Expenditure Amount |
|---|---|
| Pre-operating | $500,000 |
| First Year | 320,000 |
| Second Year | 176,200 |
| Total Capital Expenditures | $996,200 |

No transportation equipment for finished product is recommended for purchase because of the projected use of rail and SAGETRA inland transport to haul finished product to Conakry. The SAGETRA hauling contract would be written to include a back haul of similar tonnage -- more than adequate for all the supplies moving to Friguiagbe. An alternative transport mode would be with Fruitex which has recently purchased four new 8-MT trucks intended for contract inland tranport of agricultural products to Conakry. As discussed earlier, the cost of hauling is not as important as reliability and ancillary services which promise to be best provided by SAGETRA.

D. Initial Working Capital

Pre-operating expenses have been estimated at $81,550 and include some of the costs that could be attributed to working capital such as starting salaries for both expats and some of their living expenses before the first project year. To cover a crop cycle and its main operations in each project year (peak campaign harvest, planting, preparation and cultivation), a fiscal year is proposed to extend from August 1 to July 31.

The estimated monthly breakdown of first-year expenses is shown in Table 14. Working capital peaks at $120,000 in the second month of the first year and declines in the following month when market revenues from growers' fruit commence. By the end of first year, operating expenses of $789,5497 are partially balanced by first-year revenues of $706,800, both of which are itemized by month in Table 14. However, working capital requirements rise to a project maximum during the second year of $170 thousand (See Table 17) and may require a short-term loan, but within 12 months there is sufficient revenue to meet any future short or long-term cash need.

## VIII - FINANCIAL PLAN

### A Financial Structure

Capital investment in the project is estimated at $1.5 million with 40% of this amount to be acquired from a group of private or quasi-private equity partners willing to invest $600 thousand for control of the project. The balance of $900 thousand would be financed by private foreign banks or foreign governments assisting the Guinean Government in various ways. Two government agencies currently involved in Guinea are USAID and the French group, Casse Centrale Corporation Economique (CCCE) Both are manning programs for agricultural development which provide rural and technical training of local personnel.

Project financing is proposed to consist of a seven year loan at 13% interest to be serviced with interest only for the first two years and amortized in equal annual installments of $180 thousand during the last five. This scenario fits the cash flow generated by the project with loan amortization falling well within estimated revenues. If the conservative marketing, cost or revenue projections are not realized, loan extensions are possible. Table17 details the project sources and uses of funds and shows that loan repayments at $180 thousand can begin in the third year but $600 thousand in dividends are first paid in the fourth year. Dividends increase to a sustained $700 thousand annually from the fifth year of the project. Although not shown in the financial schedules, the sixth year will require a refinancing of amortized field equipment of approximately $500 thousand which could be funded from cash surplus

B. Financial Projections

The cost assumptions used throughout the analysis are conservative based on all available information. Cost rationale is paraphrased below and reported in detail in the tables enumerated.

Wages and salary costs are not a significant part of final product costs amounting to only $8.94 at full operation on a product value of $548 per ton or 15 cents a carton of final product. These labor cost figures, which are summarized in Table 13a, are derived from actual Cameroon pineapple experience for labor productivity paid at the high end of the agricultural wage scale in Guinea. Guinea's agricultural sector wages are low by comparative world standards. Since a large part of the wage employees will be temporary workers, they will not receive the more liberal mandated fringe benefit package paid to regular employees. This package plus local supervision makes up 33 percent of the $8.94 cost mentioned above. Wages could double as a result of monetary reform or labor unrest but would still have small impact on final product costs.

Imported agricultural materials compose 54% of total field operating costs. Estimates of these inputs may be high as presented here, but should guarantee adequate plant nutrients for cultivated crops until more precise nutrient levels can be assessed. These figures are detailed in Table 6a where per hectare agricultural chemical applications rates and costs are broken down. All imported agricultural materials are charged off at world prices and not at the fictitiously low rates currently paid by the domestic agricultural industry. All field costs are vulnerable to yield fluctuations and this is especially true of imported materials. Yields in

this project are conservatively forecast at 40 MT which falls 20% below the 50 MT production experience in Cameroon.

Field equipment service rates and their impact on operating costs are detailed in Tables 9 and 9a. The subsidized cost for fuel has been used in developing these rates, but it is not a large part of the service rate which is composed primarily of repair and maintenance costs. This budgeting mechanism of charging hourly service rates for each individual field operation on all equipment utilized allows for charging operating expenses where they occur. This method also properly allocates repair and maintenance charges to the three main field accounts: soil preparation, all other field operations, and road maintenance. The service rates generate a means for paying the costs of mechanics and equipment maintenance that do not show up as a separate item in the cost analysis.

Field equipment depreciation is detailed in Table 7 and remains constant at $178.2 thousand annually from the second through the tenth year. It has been assumed that as each item is amortized it will be relaced and depreciated at the same rate. The cost of equipment will probably increase over time, as will the value of product so that the balance of costs and revenue should stay relatively constant. This relationship based on constant dollars has been used to rationalize the effect of inflation on the project.

Working capital requirements appear to peak at between $170 thousand during the second project year (See Table 17). Table 16 summarizes profit and loss projections for five years. An original idea for this project is that grower fruit for both export and domestic sales would be purchased from the start. It seems more practical to purchase

only export pineapple when growers are farming more or less on their own Once contracts are written and the growers become an integral part of the production enterprise, possibly sometime during the second year, the Estate would then purchase their entire crop as proposed throughout this report. In any event, the purchase of the small increment of grower fruit for domestic sales during the first two years is not financially significant to the project.

C. Financial Evaluation

Positive cash flow is achieved in the third year as shown in Table 16, the summary profit and loss statement. An analysis of the investment and cash flow projections indicates an internal rate of return (IRR) of 30% and a return on equity of 43% based on a 10-year project life. This assumes open income taxes for the 10-year period. If income taxes of 30% are assumed after five years, the IRR drops to 27% and 36% respectively.

Project profitablity is not as sensitive to the operating costs in Guinea as it would be to an increase in the cost of ocean freight or deterioration of shipping conditions Present estimates show that ocean freight amounts to over $170 per MT or 31 % of final cost, while the total costs of direct and indirect operations in Guinea for product FOB Conakry dock would be $143 per MT or 26% of the $548 projected sales price. An increasing percentage of product losses in shipment would be devastating to project profitability. An allowance of 15% has been built into the projected price of $548 per ton but is only a projection and should be confirmed by trial shipments. This creates a dilemma because the entire system must be organized to get mature fruit packed properly into

refrigerated containers and started on their 10- to 12-day voyage to Europe. The project will only work by maintaining careful quality control from field to port. Enough is already known about growing and packing fresh pineapple for European sales that the possibility of product losses can be limited if the operation is performed as outlined above. Serious losses cannot be controlled by the project if shipping containers are not maintained in good conditions or temperature controls are not precisely monitored during the voyage. These concerns are also shared by the shipping firms who have generally accepted the idea as feasible, providing the cost issue for entering Conakry port can be resolved favorably.

It is a complex project that needs excellent coordination from the several parties who are interested in making a legitimate profit on their phase of the proposal. It appears that the project has a good potential for success albeit many interrelated problems need to be resolved.

Table 1. Fruitiere CIF Fresh Pineapple Prices and Volumes in Marseilles
(October '83- June '85)

| | Months | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Annual Ave.& Tot. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1983-'84 | FrenchF/Kg | 6.3 | 6.3 | 6.3 | 5.3 | 5.7 | 6.1 | 4.8 | 4.8 | 5.4 | |
| | Metric Tons | 1,550 | 2,450 | 5,250 | 2,600 | 2,100 | 3,550 | 4,200 | 3,000 | 2,500 | 27,000 |
| 1984-'85 | French F/Kg | 4.9 | 4.9 | 5.7 | 4.2 | 5.9 | 5.9 | 4.9 | 5.7 | 4.6 | |
| | Metric Tons | 2,700 | 5,250 | 5,960 | 2,530 | 3,850 | 4,150 | 4,250 | 4,850 | 4,300 | 29,890 |
| Monthly Average | | | | | | | | | | | |
| French Francs | | 5.60 | 5.60 | 6.00 | 4.80 | 5.80 | 6.00 | 4.90 | 5.30 | 5.00 | 5.44 |
| Metric Tons | | 2,125 | 3,850 | 5,605 | 2,565 | 2,975 | 3,850 | 4,225 | 3,925 | 3,300 | 28,445 |
| Average Sylis/Mo@50/1 | | 280 | 280 | 300 | 240 | 290 | 300 | 245 | 265 | 300 | 272 |

Annual Weighted Average =258 Sylis/kg

Report revenues based on: $\frac{258{,}000 \text{ Sylis}/400}{\text{MT}}$ = $645 x .85 = $548.25/MT of export pineapple.

Source: Telex from Fruitiere, November 30, 1985

Table 2. U.S. Fresh Pineapple Consumption 1982-84

| Point of Origin | 1982 MT (000) | CIF $/MT | 1983 MT (000) | CIF $/MT | 1984 MT (000) | CIF $/MT |
|---|---|---|---|---|---|---|
| Mexico | — | — | 0.60 | 172 | — | — |
| " 15% of Bulk Fruit(1) | 3.20 | — | 2.60 | — | 2.30 | — |
| Honduras | 29.87 | 247 | 29.05 | 275 | 5.99 | 244 |
| Honduras 9 (2) | — | — | — | — | 24.23 | 255 |
| Costa Rica | 1.95 | 442 | 3.71 | 404 | 2.40 | 402 |
| " " 9 | — | — | — | — | 5.24 | 586 |
| Dom. Rep. | 5.49 | 345 | 5.93 | 337 | 0.85 | 352 |
| " " 9 | — | — | — | — | 3.53 | 378 |
| Brazil | — | — | — | — | 0.51 | 441 |
| Chile | — | — | 0.49 | 243 | — | — |
| Columbia | — | — | — | — | 0.14 | 890 |
| Other Countries | 0.64 | 297 | 0.38 | 466 | 0.76 | — |
| Subtotal Foreign Impt. | 41.15 | — | 40.15 | — | 45.19 | — |
| Hawaii (FAS Price) | 107.11 | 429 | 108.00 | 434 | 107.1 | 440 |
| US Poss.Puerto Rico | 0.41 | — | 0.60 | — | 0.30 | |
| Annual Grand Total | 148.25 | | 148.75 | | 152.6 | |

(1) Mexico bulk fruit imports are for processing in Texas with 15% estimated for fresh fruit.

(2) Subheading #9 signifies imports or production by US Co: Dole in Honduras, DelMonte in Costa Rica, United Brands in Dom. Rep.

Source: FTS 246 1982-84 US Imports for Consumption and General Imports TSUS Commodity by Countries of Origin.
1984 Statistics of Hawaiian Agriculture, Hawaii Agricultural Reporting Service, July 1985, Pg.34

Table 3. Estimated World Production of Processed Pineapple-MT of Raw Fruit

| | Estimates by FAO &USStatistics | | | | Compiled: JLL 1/5/86 | |
|---|---|---|---|---|---|---|
| | 1971 | | 1981 | | 1983 | |
| US (Hawaii) | 840 | | 470 | | 396 | |
| Del Monte | | 194 | | 110 | | 35 |
| Dole | | 375 | | 200 | | 194 |
| Maui Pine.& (Others) | | (271) | | 160 | | 167 |
| Philippines | 410 | | 700 | | 604 | |
| Del Monte | | 245 | | 350 | | 285 |
| Dole | | 165 | | 325 | | 283 |
| Others | | — | | 25 | | 36 |
| Thailand | 140 | | 545 | | 483 | |
| Dole | | 18 | | 90 | | 90 |
| Thai. Pine. Co. | | — | | 130 | | 125 |
| Siam Frt. Pack. | | — | | 88 | | 75 |
| Thai F.C. Co. | | — | | 65 | | 55 |
| Siam Agro. | | — | | 40 | | 35 |
| Others | | 50 | | 132 | | 103 |
| EEC Free Imports | 153 | | 330 | | 275 | |
| Kenya (Del Monte) | | 36 | | 120 | | 170 |
| Martinique | | 17 | | 30 | | 25 |
| Ivory Coast | | 90 | | 190 | | 50 |
| Swaziland | | 10 | | 40 | | 30 |
| World Balance | 880 | | 820 | | 815 | |
| Repub. of S.A. | | 135 | | 200 | | 240 |
| Brazil | | — | | 20 | | 50 |
| Mexico | | 75 | | 70 | | 60 |
| Cuba | | — | | 30 | | 30 |
| Japan(Ryukyu) | | 80 | | 90 | | 80 |
| Malay/Singapore | | 315 | | 150 | | 100 |
| Taiwan | | 270 | | 100 | | 90 |
| China PRC | | — | | 20 | | 35 |
| Others & (a) | | 130 | | 140 | | 130 |
| GRAND TOTAL | 2,423 | | 2,925 | | 2,573 | |
| Totals Del Monte | | 475 | | 580 | | 490 |
| Dole | | 558 43% | | 605 40% | | 557 41% |

(a) Australia packs 110,000 tons annually for internal consumption.

Table 4 . National Weather Bureau Data from Dubreka & Forecaria 1982-'84

KINDIA : INSOLATION Moyenne en Heures et Dixièmes.

| Années | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | Somme Annuelle | An | OBSERVATIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1978 | 8.7 | 9.1 | 9.2 | 8.0 | 5.9 | 6.8 | 3.4 | 3.9 | 4.4 | 5.9 | 7.2 | 8.2 | | | |
| 1979 | 8.3 | x | 8.2 | 8.2 | 6.8 | 4.5 | 4.0 | 4.0 | 6.9 | 6.3 | 7.2 | 7.9 | | N.b | Valeurs manquantes Années : 1981 - 1983 - 198 |
| 1980 | 8.2 | 7.9 | 8.9 | 7.8 | 7.1 | 5.0 | 2.8 | 3.0 | 4.8 | 6.3 | 5.6 | 7.8 | | | |
| | | Station de Dubréka : pluviométrie Mensuelle en mm et nombre de jours de pluie. | | | | | | | | | | | | | |
| 1982 | 0 | 0 | 8 | 28 | 147 | 231 | 447 | 1246 | 451 | 548 | | 0 | | | |
| | 0 | 0 | 0 | 2 | 7 | 14 | 21 | 28 | 15 | 13 | | 0 | | | |
| 1983 | 0 | 4 | 0 | 26 | 87 | 473 | 506 | 946 | 943 | 246 | | | | | |
| | 0 | 1 | 0 | 2 | 5 | 15 | 11 | 21 | 17 | 6 | | | | | |
| 1984 | 0 | 0 | 0 | 27 | 165 | 524 | 374 | 605 | 513 | 204 | 55 | 0 | | | |
| | 0 | 0 | 0 | 3 | 10 | 11 | 13 | 15 | 14 | 10 | 4 | 0 | | | |
| | | Station de FORÉCARIAH, pluviométrie Mensuelle en mm et nombre de jours | | | | | | | | | | | | | |
| 1982 | 0 | 0 | 34 | 44 | 200 | 374 | 267 | 804 | 424 | 354 | 10 | 0 | | | |
| | 0 | 0 | 2 | 4 | 11 | 16 | 15 | 24 | 19 | 13 | 1 | 0 | | | |
| 1983 | 0 | 3 | 6 | 15 | 256 | 420 | 634 | 869 | 463 | 155 | 36 | 0 | | | |
| | 0 | 1 | 1 | 2 | 12 | 14 | 20 | 22 | 18 | 5 | 2 | 0 | | | |
| 1984 | 0 | 0 | 0 | 27 | 113 | 240 | 454 | 540 | 324 | 161 | 10 | 0 | | | |
| | 0 | 0 | 0 | 3 | 6 | 11 | 13 | 19 | 14 | 8 | 2 | 0 | | | |

Table 4a. National Weather Bureau Data from Kindia 1982-'84

STATION : Kindia (Températures Max. Min. Moyenne)

| Années | I | II | III | IV | V | VI | VII | VIII | IX | X | XI | XII | Somme Annuelle | An | OBSERVATIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 | 31.6 | 33.8 | 34.9 | 33.4 | 32.0 | 28.5 | 27.5 | 26.2 | 28.2 | 28.6 | 29.8 | 30.3 | | | |
| | 18.4 | 19.7 | 20.9 | 21.7 | 21.4 | 20.8 | 21.5 | 20.6 | 20.9 | 20.0 | 20.5 | 18.7 | | | |
| 1983 | 31.7 | 34.0 | 35.2 | 34.9 | 31.8 | 28.2 | 27.8 | 27.0 | 28.2 | 29.1 | 30.1 | 30.5 | | | |
| | 19.0 | 20.6 | 21.6 | 22.1 | 22.9 | 21.1 | 21.1 | 20.6 | 20.3 | 20.4 | 20.5 | 19.2 | | | |
| 1984 | 31.5 | 33.9 | 35.4 | 34.6 | 30.9 | 28.9 | 27.9 | 28.5 | 28.2 | 29.3 | 30.7 | 30.5 | | | |
| | 18.4 | 19.0 | 21.0 | 21.6 | 21.5 | 20.7 | 20.4 | 20.5 | 20.2 | 20.4 | 20.4 | 19.1 | | | |
| | | | | | | Pluviométrie mensuelle en mm entiers et nombre de jours | | | | | | | | | |
| 1982 | 0 | 0 | 1 | 85 | 150 | 246 | 285 | 528 | 351 | 190 | 7 | 0 | | | |
| | 0 | 0 | 1 | 8 | 11 | 14 | 25 | 28 | 19 | 17 | 4 | 0 | | | |
| 1983 | 0 | 11 | 10 | 24 | 139 | 315 | 334 | 427 | 307 | 189 | 32 | 0 | | | |
| | 0 | 1 | 1 | 2 | 12 | 22 | 23 | 29 | 22 | 15 | 5 | 0 | | | |
| 1984 | 0 | 0 | 4 | 35 | 177 | 274 | 310 | 322 | 333 | 259 | 14 | 0 | | | |
| | 0 | 0 | 1 | 4 | 17 | 17 | 25 | 22 | 19 | 16 | 1 | 0 | | | |
| | | | | | | Humidité Max - Min Moyenne | | | | | | | | | |
| 1982 | 75 | 79 | 84 | 90 | x | 96 | 96 | 96 | 96 | 96 | 95 | 76 | | | |
| | 25 | 17 | 28 | 41 | x | 67 | 68 | 75 | 66 | 63 | 50 | 26 | | | |
| 1983 | 77 | x | 84 | 79 | 92 | 95 | 96 | 97 | 96 | 96 | 96 | 94 | | | |
| | 29 | x | 28 | 36 | 54 | 68 | 70 | 73 | 66 | 60 | 57 | 33 | | | |
| 1984 | 76 | 68 | 84 | 86 | 93 | 96 | 96 | 96 | 95 | 96 | 94 | 76 | | | |
| | 21 | 15 | 25 | 32 | 55 | 64 | 65 | 66 | 68 | 63 | 48 | 26 | | | |

Table 5. Fulaya Weather Station Monthly Rainfall in mm 1982-'84

Station Elevation 380 meters, Latitude 10.03, Longitude 12.52

| | Jan | Feb | March | April | May | June | July | Aug | Sept | Oct | Nov | Dec | Ave.Ann. Totals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1982 mm | 0.00 | 0.00 | 9.00 | 95.50 | 180.10 | 276.20 | 382.60 | 461.70 | 278.60 | 256.10 | 8.80 | 0.00 | 1895.00 |
| R.days | 0 | 0 | 1 | 6 | 9 | 16 | 19 | 27 | 20 | 20 | 1 | 0 | 120 |
| 1983 mm | 0.00 | 10.20 | 43.70 | 28.20 | 204.70 | 441.00 | 380.40 | 453.90 | 291.60 | 236.30 | 23.40 | 0.00 | 2113.20 |
| R.days | 0 | 2 | 2 | 2 | 12 | 20 | 19 | 27 | 20 | 13 | 2 | 0 | 119 |
| 1984 mm | 0.00 | Tr. | 7.30 | 30.20 | 194.00 | 253.40 | 324.50 | 318.50 | 283.40 | 239.60 | 24.70 | 0.00 | 1675.60 |
| R.days | 0 | 0 | 2 | 3 | 14 | 12 | 23 | 22 | 20 | 14 | 1 | 0 | 111 |
| Ave. mm | 0.00 | 3.70 | 20.00 | 68.00 | 192.90 | 323.50 | 344.50 | 411.40 | 284.50 | 244.00 | 19.00 | 0.00 | 1911.50 |
| R.days | 0 | 1 | 2 | 4 | 12 | 16 | 20 | 25 | 20 | 16 | 1 | 0 | 117 |

Source: Fulaya Research Institute, Meteorology Department Data Gathered 11/22/85

Table 6. Comparison of Various Fertilizer Programs in Guinea 1985

| PROJECT IDENTITY | Elem't | % | Kg Per Hectare | Pre-Plant | Fertilizer Timing In Kg per Ha per Bi-Month. 1&2 Mo. | 3&4 | 5&6 | 7&8 | 9-11 | Post Harvest | Nutr't Suppl'd | Nutrient Total Kg/yr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| I. DABOYA PROJECT | | | | | | | | | | | | |
| Dolomite | Mg | 12.5 | 800 | 800 | | | | | | | Mg | 100 |
| | Ca | 22.0 | | | | | | | | | | |
| Raw rock Phosph. | P | 15.0 | 600 | | | | | | | | P | 90 |
| | Ca | 20.0 | | | | | | | | | Ca | 295 |
| Sul. of Potash | K | 52.0 | 2400 | 800 | 800 | | | | 800 | | K | 1283 |
| Sul. of Ammonia | N | 21.0 | 2000 | | 700 | 700 | | | 600 | | | |
| Urea | N | 46.0 | 300 | | Foliar | 60 | 60 | 60 | 120 | | N | 560 |
| II. FULAYA RESEARCH INSTITUTE | | | | | | | | | | | | |
| Dolomite | Mg | 12.5 | 200 | 200 | | | | | | | Mg | 25 |
| | Ca | 22.0 | | | | | | | | | | |
| Superphos. | P | 18.0 | 150 | 150 | | | | | | | P | 27 |
| | Ca | 26.0 | | | | | | | | | Ca | 83 |
| Sul. of Potash | K | 52.0 | 2180 | | Foliar | 90 | 90 | 180 | 180 | | | |
| | | | | Hand | 310 | | 1240 | | | | K | 1134 |
| Sul. of Ammon. | N | 21.0 | 868 | | | | | | | | | |
| Urea | N | 46.0 | 525 | | Foliar | 75 | 75 | 150 | 150 | | N | 518 |
| III. SALGUIDIA | | | | | | | | | | | | |
| Dolomite | Mg | 12.5 | 1,000 | | | | | | | | Mg | 125 |
| | Ca | 22.0 | | | | | | | | | | |
| Trpl. SupPhos. | P | 48.0 | 300 | | | | | | | | P | 219 |
| | Ca | 18.0 | | | | | | | | | Ca | 83 |
| Sul. of Potash | K | 52.0 | 1054 | Foliar | | | 320 | 320 | 640 | | | |
| Potas. Chlo'd | K | 61.0 | 550 | hand | | | | | 390 | 160 | K | 834 |
| Sul. of Amm. | N | 21.0 | 850 | | 150 | | | | | 700 | N | |
| Urea | N | 46.0 | 810 | Foliar | | | 180 | 270 | 360 | | N | 552 |
| V. AVERAGE GROWER | | | | | | | | | | | | |
| Sul. of Potash | K | 52.0 | 2000 | | 500 | 250 | | | | 250 | K | 520 |
| Sul. of Ammo. | N | 21.0 | 1000 | | 1000 | 500 | | | | 500 | N | 420 |
| (or) | | | | | | | | | | | (or) | |
| | | | | | | | | | | | N | 337 |
| Mixed Fert. 15-15-15 Only if Sulphate of Ammonia and | | | | | | | | | | | K | 337 |
| Potash are not available. | | | | | | | | | | | P | 337 |

Table 6a. Proposed Fertilizer and Ag-chemical Program for the Nucleus Estate and Contract Growers

| Materials Used | $/Unit | Per Hecta | | Total |
|---|---|---|---|---|
| Fertilizers | MT | MT | $ | $/ha |
| Superphosphate | 200 | 0.8 | 160 | |
| Dolomite | 185 | 0.6 | 111 | |
| Sulphate of Potash | 357 | 0.9 | 321 | |
| Urea | 380 | 0.9 | 342 | |
| Miscellaneous | 250 | 0.1 | 25 | $959.30 |
| Pesticides | $/kg | kg/ha | $/ha | |
| Hyvar X | 18 | 4 | 72 | |
| Karmex | 6 | 8 | 48 | |
| Mocap | 8 | 6 | 48 | |
| Diazinon | 7 | 5 | 35 | $203.0 |
| Forcing Chemicals | | | | |
| Calcium Carbide(2rds) | 0.5 | 15 | 8 | |
| Ethrel in 3 rounds | 110 | 2.1 | 231 | $238.5 |
| Subtotal Cost of Imported Chemicals | | | | $1400.8 |

Table 7. Estimated Capital Requirements and Annual Depreciation Schedule

| Item | 1 | No. of Units | Approx. Unit Cost | Est. Yrs. of Life | Project Total Capital | Annual Depreo. | Years 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pre Operating Exp. Cap. | | 1 | $81,550.00 | 10 | $81,550.00 | $8,155.00 | $8,155.00 | $8,155.00 | $8,155.00 | $8,155.00 | $8,155.00 | $8,155.00 | $8,155.00 | $8,155.00 | $8,155.00 | $8,155.00 |
| **Tractor Equip.** | | | | | | | | | | | | | | | | |
| JD 850 Crawler 145hp | | 1 | $115,000.00 | 10 | $115,000.00 | $11,500.00 | $11,500.00 | $11,500.00 | $11,500.00 | $11,500.00 | $11,500.00 | $11,500.00 | $11,500.00 | $11,500.00 | $11,500.00 | $11,500.00 |
| Rubber tired (Brazil) 110hp | | 1 | $35,000.00 | 5 | $35,000.00 | $7,000.00 | $7,000.00 | $7,000.00 | $7,000.00 | $7,000.00 | $7,000.00 | $7,000.00 | $7,000.00 | $7,000.00 | $7,000.00 | $7,000.00 |
| Renault 45hp | | 4 | $25,000.00 | 5 | $100,000.00 | $20,000.00 | $20,000.00 | $20,000.00 | $20,000.00 | $20,000.00 | $20,000.00 | $20,000.00 | $20,000.00 | $20,000.00 | $20,000.00 | $20,000.00 |
| Boom Sprayer (Belgian) | | 1 | $45,000.00 | 5 | $45,000.00 | $9,000.00 | $9,000.00 | $9,000.00 | $9,000.00 | $9,000.00 | $9,000.00 | $9,000.00 | $9,000.00 | $9,000.00 | $9,000.00 | $9,000.00 |
| Supply Trailer | | 2 | $20,000.00 | 5 | $40,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 |
| **Preparation Implements** | | | | | | | | | | | | | | | | |
| Ripper | | 1 | $10,000.00 | 7 | $10,000.00 | $1,428.57 | $1,428.57 | $1,428.57 | $1,428.57 | $1,428.57 | $1,428.57 | $1,428.57 | $1,428.57 | $1,428.57 | $1,428.57 | $1,428.57 |
| Roma Plow/ Heavy Disc | | 1 | $15,000.00 | 7 | $15,000.00 | $2,142.86 | $2,142.86 | $2,142.86 | $2,142.86 | $2,142.86 | $2,142.86 | $2,142.86 | $2,142.86 | $2,142.86 | $2,142.86 | $2,142.86 |
| Small Harrow | | 1 | $8,000.00 | 7 | $8,000.00 | $1,142.86 | $1,142.86 | $1,142.86 | $1,142.86 | $1,142.86 | $1,142.86 | $1,142.86 | $1,142.86 | $1,142.86 | $1,142.86 | $1,142.86 |
| Rotoiller | | 1 | $10,000.00 | 5 | $10,000.00 | $2,000.00 | $2,000.00 | $2,000.00 | $2,000.00 | $2,000.00 | $2,000.00 | $2,000.00 | $2,000.00 | $2,000.00 | $2,000.00 | $2,000.00 |
| Flat Bed Trailer - 5 MT (2) | | 3 | $17,000.00 | 5 | $51,000.00 | $10,200.00 | $10,200.00 | $10,200.00 | $10,200.00 | $10,200.00 | $10,200.00 | $10,200.00 | $10,200.00 | $10,200.00 | $10,200.00 | $10,200.00 |
| Flat Bed Truck - 8 MT (2) | | 2 | $35,000.00 | 5 | $70,000.00 | $14,000.00 | $14,000.00 | $14,000.00 | $14,000.00 | $14,000.00 | $14,000.00 | $14,000.00 | $14,000.00 | $14,000.00 | $14,000.00 | $14,000.00 |
| Dump Truck - 8 MT | | 1 | $40,000.00 | 5 | $40,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 | $8,000.00 |
| Water Pumps | | 3 | $2,500.00 | 5 | $7,500.00 | $1,500.00 | $1,500.00 | $1,500.00 | $1,500.00 | $1,500.00 | $1,500.00 | $1,500.00 | $1,500.00 | $1,500.00 | $1,500.00 | $1,500.00 |
| Misc. Hand Tools | | | $2,000.00 | 2 | $2,000.00 | $1,000.00 | $1,000.00 | $1,000.00 | $1,000.00 | $1,000.00 | $1,000.00 | $1,000.00 | $1,000.00 | $1,000.00 | $1,000.00 | $1,000.00 |
| Sub Total Field Equipment | | | | | $430,050.00 | $105,069.29 | $105,069.29 | $105,069.29 | $105,069.29 | $105,069.29 | $105,069.29 | $105,069.29 | $105,069.29 | $105,069.29 | $105,069.29 | $105,069.29 |
| Capital and Spare Parts | 10% | | | 5 | $83,005.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 |
| Contingency | 10% | | | 5 | $83,005.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 | $12,601.00 |
| 3 Expats Vehicles (1) | | | | 3 | $19,000.00 | $6,416.00 | $6,416.00 | $6,333.00 | $6,333.00 | $6,333.00 | $6,333.00 | $6,333.00 | $6,333.00 | $6,333.00 | $6,333.00 | $6,333.00 |
| Annual Totals Field Equipment | | | | | $775,060.00 | $135,687.29 | $121,687.29 | $136,604.29 | $136,604.29 | $136,604.29 | $136,604.29 | $136,604.29 | $136,604.29 | $136,604.29 | $136,604.29 | $136,604.29 |
| **Annual Depreciation - Field** | | | | | | | | | | | | | | | | |
| Frigulagbe Station Repra. | | | | 10 | $85,500.00 | $8,550.00 | $8,550.00 | $8,550.00 | $8,550.00 | $8,550.00 | $8,550.00 | $8,550.00 | $8,550.00 | $8,550.00 | $8,550.00 | $8,550.00 |
| Packing Operation | | | | 5&3 | $80,400.00 | $22,056.00 | $22,056.00 | $22,056.00 | $22,056.00 | $22,056.00 | $22,056.00 | $22,056.00 | $22,056.00 | $22,056.00 | $22,056.00 | $22,056.00 |
| Office Equipment | | | | 3 | $15,000.00 | $5,000.00 | $5,000.00 | $5,000.00 | $5,000.00 | $5,000.00 | $5,000.00 | $5,000.00 | $5,000.00 | $5,000.00 | $5,000.00 | $5,000.00 |
| Road Repairs | | | | 10 | $40,000.00 | $4,000.00 | $4,000.00 | $4,000.00 | $4,000.00 | $4,000.00 | $4,000.00 | $4,000.00 | $4,000.00 | $4,000.00 | $4,000.00 | $4,000.00 |
| Contingency (10%) | | | | 5 | $20,100.00 | $4,020.00 | $4,020.00 | $4,020.00 | $4,020.00 | $4,020.00 | $4,020.00 | $4,020.00 | $4,020.00 | $4,020.00 | $4,020.00 | $4,020.00 |
| Annual | | | | | $221,000.00 | $41,626.00 | $41,626.00 | $41,626.00 | $41,626.00 | $41,626.00 | $41,626.00 | $41,626.00 | $41,626.00 | $41,626.00 | $41,626.00 | $41,626.00 |
| GRAND TOTAL Project Capital & Annual Depreciation | | | | | $996,080.00 | $146,696.29 | $163,613.29 | $178,230.29 | $178,230.29 | $178,230.29 | $178,230.29 | $178,230.29 | $178,230.29 | $178,230.29 | $178,230.29 | $178,230.29 |

(1) 3 Vehicles (Expats & Repair Trk.
Year 1 - $6750
Year 1 - $7500
Year 2 - $7500
---
$23750
$23,750 ÷ .8 = $19,000

2) Flat bed trailer - assumed 1 purchased year 1, 2 purchased in year 2
Flat bed truck - assumed 1 purchased in year 1, 1 purchased in year 2

3) After item is fully depreciated, it is assumed that another asset is purchased at the same rate and is depreciated in the remaining years through year 10

Table 7a. Estimated Capital to Restore Friguiagbe and Build the Packing Station and Other Items.

| Friguiagbe Station | Yrs. of Life | Capital Cost US $ | Annual Deprec. |
|---|---|---|---|
| Repaint&Repr.all Bldg. | 5 | $5,000.00 | $1,000.00 |
| Rebuild Roof& Siding | 10 | $35,000.00 | $3,500.00 |
| Grade Entranc./Egress | 10 | $10,500.00 | $1,100.00 |
| Roof Rail Dock& Reprs. | 7 | $15,000.00 | $2,100.00 |
| Hand Trucks- 20 Units | 5 | $4,000.00 | $900.00 |
| Conveyor 20m@$50/m | 5 | $1,000.00 | $200.00 |
| Bostitch Stapler 3 uints | 5 | $8,100.00 | $1,600.00 |
| Check Scales/Sprayers | 5 | $1,000.00 | $200.00 |
| Manual Pallet Mover | 5 | $1,500.00 | $300.00 |
| 100 KVA Generator | 5 | $18,000.00 | $3,600.00 |
| Elec. Systm. & Instal. | 5 | $15,000.00 | $3,000.00 |
| Wooden Pallets& Miscel. | 2 | $3,000.00 | $1,500.00 |
| Wooden Pine. Crates | 3 | $28,800.00 | $9,600.00 |
| Subtot. Packing Stat. | | $145,900.00 | $28,600.00 |
| **Commu, Office, Roads** | | | |
| Telex & Radio | 3 | $12,000.00 | $4,000.00 |
| Office Machines | 3 | $3,000.00 | $1,000.00 |
| Roads 10k m@$3,000 | 10 | $30,000.00 | $3,000.00 |
| Culverts & Fords | 10 | $10,000.00 | $1,000.00 |
| Subtot. Other Cap. Items. | | $55,000.00 | $9,000.00 |
| Contngency 10% | 5 | $20,100.00 | $4,020.00 |
| GRAND TOTAL PK.STA.& | MISC. | $221,000.00 | |
| ANNUAL DEPRECIATION | | | $41,620.00 |

Table 8. SEMAPE National Purchasing Enterprise of International Materials for Sale in Guinea

RENSEIGNEMENTS SOLLICITES PAR LE CENTRE
NATIONAL DE PROMOTION DES INVESTISSEMENTS PRIVES

| N° Ord. | Désignation | Prix Unitaire à l'Importation | Prix de Cession aux Agriculteur | Origine m/se |
|---|---|---|---|---|
| A | ENGRAIS MINERAUX | | | |
| 1 | Urée [illegible] N | $380/ T | 13.200 T | CEE |
| 2 | Sulfate d'ammoniaque 21% N | $194/T | 7.215 | -"- |
| 3 | Superphosphate 18 % $P_2O_5$ | $200 /T | 12.600 | -"- |
| 4 | Sulphate de Potasse 50 %kg | $357/T | 12.630 | -"- |
| 5 | NPK 15 - 15 - 15 | $294/T | 12.000 | -"- |
| B | PRODUITS | | | |
| 1 | Basudine 60 EC | F.S 19,85/l | 225/l | Suisse |
| 2 | Basudine 10 G | F.S 7,10/kg | 665/Sa. | Suisse |
| 3 | Parathion | DM 10,50/l | 1.700/Bi. | CEE |
| 4 | Karmex | DM 16.169/T | 5.590/sac | CEE |
| 5 | Carbure de Calcium 50/80 mm | $ 498/T | 2.450/fût | CEE |
| C | MATERIEL | | | |
| 1 | Pulverisateur à dos | $ 45,57 | 1.525 | CEE |
| 2 | Atomiseur à dos | $ 226,40 | 5.275 | -"- |

Conakry, le 27 Novembre 1985

LE DIRECTEUR TECHNIQUE

OUSMANE BALDE

LE DIRECTEUR GENERAL

Lt. INONA SANG ARAMOU

Table 9. Schedule of Estimated Service Rates for Mobile Equipment

| Item | Estimated Capital | Hours of Life | Amortized Rate $/hr | R & M at 0.8 | Fuel GPH | Fuel @ 0.28 | Fuel&Lub. +15% | Service Total (Excldes.Deprec) |
|---|---|---|---|---|---|---|---|---|
| JD 850 | $115,000.00 | 10,000 | $11.50 | $9.20 | 9 | $2.52 | $2.90 | $12.10 |
| Brazil 118 | $35,000.00 | 6,000 | $5.83 | $4.67 | 6 | $1.68 | $1.93 | $6.60 |
| Renault 45hp | $25,000.00 | 5,000 | $5.00 | $4.00 | 3 | $0.84 | $0.97 | $4.97 |
| Spray Truck | $45,000.00 | 6,000 | $7.50 | $6.00 | 5 | $1.40 | $1.61 | $7.61 |
| Supply Trailer | $20,000.00 | 5,000 | $4.00 | $3.20 | 2 | $0.56 | $0.64 | $3.84 |
| Prep. Equip. (4 p | $41,000.00 | 6,000 | $6.83 | $5.47 | | $0.00 | $0.00 | $5.47 |
| Truck - Dump | $40,000.00 | 6,000 | $6.67 | $5.33 | 6 | $1.68 | $1.93 | $7.26 |
| Truck - 8MT | $35,000.00 | 6,000 | $5.83 | $4.67 | 6 | $1.68 | $1.93 | $6.60 |
| Water Pump | $5,000.00 | 5,000 | $1.00 | $0.80 | 2 | $0.56 | $0.64 | $1.44 |
| Trailers - 5MT | $17,000.00 | 6,000 | $2.83 | $2.27 | | $0.00 | $0.00 | $2.27 |
| Misc. | $10,000.00 | 10,000 | $1.00 | $0.80 | | $0.00 | $0.00 | $0.80 |
| Total | $388,000.00 | Average | $5.27 | | 4.88 | | | |

Table 9a. Estimated Service Cost per Year
by Operations

| ID | Unit | Hours /Year | Total Ser. Rate/ hr. | Total Ser. $ / Year | <------Equipment------- % | Fld Prep | % | Distribution Rd & Mis | ---by--Operation---> % | Fld. Opt. |
|---|---|---|---|---|---|---|---|---|---|---|
| JD850 | 1 | 1,500 | $12.10 | $18,150.00 | 70% | $12,705.00 | 30% | $5,445.00 | | $0.00 |
| Brazil 118 | 1 | 1,200 | $6.60 | $7,920.00 | 60% | $4,752.00 | | $0.00 | 40% | $3,160.00 |
| Renault | 4 | 4,000 | $4.97 | $19,880.00 | 50% | $9,940.00 | | $0.00 | 50% | $9,940.00 |
| Spray Truck | 1 | 1,200 | $7.61 | $9,132.00 | | $0.00 | | $0.00 | 100% | $9,132.00 |
| Supply Truck | 2 | 1,200 | $3.80 | $4,560.00 | | $0.00 | | $0.00 | 100% | $4,560.00 |
| Prop Equip | 1 | 1,000 | $5.47 | $5,470.00 | 100% | $5,470.00 | | $0.00 | | $0.00 |
| Misc | 1 | 1,000 | $1.00 | $1,000.00 | 30% | $300.00 | 30% | $300.00 | 40% | $400.00 |
| Trks 8MT | 2 | 2,000 | $6.59 | $13,180.00 | | $0.00 | 40% | $5,272.00 | 60% | $7,908.00 |
| Dump Truck | 1 | 1,500 | $7.27 | $10,905.00 | 25% | $2,726.25 | 50% | $5,452.50 | 25% | $2,726.25 |
| 3 Trl. 5MI | 3 | 3,000 | $2.27 | $6,810.00 | 30% | $2,043.00 | 20% | $1,362.00 | 50% | $3,405.00 |
| Water Pump | 1 | 5,000 | $1.45 | $7,250.00 | | $0.00 | 20% | $1,450.00 | 80% | $5,800.00 |
| Misc | 1 | 2,000 | $1.00 | $2,000.00 | | $0.00 | 50% | $1,000.00 | 50% | $1,000.00 |
| Annual Totals | | 24,600 | | $106,257.00 | | $37,936.25 | | $20,281.50 | | $48,039.25 |

Proof: $106,257.00

Table 10. Summary of Cameroon Fresh Pineapple Operating Costs in CFA to US$ and Man-day Requirements

| OPERATION | UNITS | CFA /Unit | Total CFA/ha | Total US$/ha | MANUAL OPERATIONS | Total Man-dy/ha |
|---|---|---|---|---|---|---|
| Cat. Crawler/Rome plow | 30 hr./ha | 20,000 | 600,000 | $1500.00 | Harvest plants | 30 |
| Moving of equip.& suppl. | | -- | 200,000 | $500.00 | Transport " | 30 |
| | | | | | Plant,sort,dip | 125 |
| Agricultrual Materials | | | | | Chem. weed spray | 12 |
| Fert: Urea | 800kg/ha | 125,000 | 100,000 | $250.00 | Fert. by hand | 18 |
| Sul. of Potash | 1000kg/ha | 145,000 | 145,000 | $362.50 | Manual weeding | 140 |
| Fungicide for suckers | | | 10,000 | $25.00 | Forcing with chem. | 36 |
| Insecticides | | | 8,800 | $22.00 | Count plants forced | 12 |
| Calcium carbide | | | 7,500 | $18.75 | Inseticide treatment | 8 |
| Ethral (fruit shell color) | | | 96,600 | $241.50 | Gouging crowns | 30 |
| Fungicide for fruit dip | | | 7,500 | $18.75 | Ethral spray | 24 |
| Herbicides | | | 32,400 | $81.00 | Subtotal Field Opts. | 465 |
| Subtotal Service & Materials | | | 1,207,800 | $3019.50 | Harvest,carry,pack | 380 |
| Subtot Emplye Costs | 2,385,000 | $5962.50 | | | Grand Total M-dys @50T/ha | 845 |
| " Local Cadre | 90,000 | $225.00 | | | | |
| Fringe benf@27.35% | 911,200 | $2278.00 | | | | |
| Expatriot employee (Portion of one man) | 320,800 | $802.00 | | | | |
| | | $9267.50 | / 40 ha | $231.60 | | |
| GRAND TOTAL | | | | $3251.10 | /50MT=$65.00/MT | |

Table 11. Guinea Labor Requirements & US $ Cost for Harvesting, Hauling and Packing

| OPERATIONS | Man-days /Unit | @40MT/ Shift Sylis /Man-day | | US$/Unit @400Sy/$ | |
|---|---|---|---|---|---|
| Harvesting | | | | | |
| Harvest&carry to rd. | 1m-d/.7MT | 125 | | .445 | |
| Crate fruit&stack@ " | 1m-d/.7MT | 125 | | .445 | |
| Hauling | | | | | |
| 2 Trk&trl. 4 Opts. | 4md/40MT | 150 | | 0.038 | |
| Crate loaders 10 | 10md/ " | 125 | | 0.078 | $1.01 |
| Packing Station | | | | | |
| Receiving | M-D/Shift | | | | |
| Hand Trk handlers | 10 | 125 | | 0.078 | |
| Quality checkers etc. | 5 | 125 | | | |
| Dock cleaners&relief | 3 | 125 | | | |
| Lug stackers | 5 | 125 | 2875 | 0.18 | |
| Weighing wheels | | | | | |
| Lug dumpers&relief | 10 | 150 | | | |
| " movers | 3 | 125 | | | |
| Fungi'd spray attd. | 5 | 125 | 400 | 0.025 | |
| Packing tables | | | | | |
| Packers & relief | 20 | 125 | | | |
| Chute atten'd | 5 | 125 | | | |
| Carton coverers | 6 | 125 | 3875 | 0.242 | |
| Carton staplers | 4 | 125 | | | |
| Move empties to pakrs | 5 | 125 | | | |
| Inventory control | 3 | 125 | 1625 | 0.102 | |
| Warehouse & shipping | | | | | |
| Conveyor crtn staker | 6 | 125 | | | |
| Hand trks to transp. | 10 | 125 | | | |
| Cleanup crew | 4 | 125 | | | |
| Guards (per shift) | 5 | 125 | | 0.156 | |
| First line supervisors | 5 | 206 | | | |
| Packing Superintendent | 1 | 900 | 1930 | 0.121 | .904 |
| GRAND TOTALS | 116 | | | | $1.904 |

Table 12. Estimated Cost Summary for Harvesting, Hauling and Packing Operations @ 40MT/Shift

| OPERATION | Labor/Day | MT/Day | $/MT | $Per Day Service | MT/Day | $/MT | Total $/MT |
|---|---|---|---|---|---|---|---|
| Harvest (2 men) | 0.31 | 0.70 | $0.89 | -- | | | 0.89 |
| Loading (10 men) | 10.0 | 40.00 | $0.08 | -- | | | 0.08 |
| Hauling (4 men@$.375) | $1.50 | 40.00 | $0.04 | $68.96 | 40.00 | 1.72 | 1.76 |
| Subtotal H.&H. | | | $1.01 | | | | $2.73 |
| Packing Operations | | | | | | | |
| Labor&Supervis. (116) | $36.00 | 40.00 | $0.90 | -- | | | 0.90 |
| Power&Water ($500/m ) | | | | $23.44 | 40.00 | | 0.59 |
| Weighing Wheel Rent | | | | $10.00 | 40.00 | | 0.25 |
| Miscl. Materials | | | | $6.80 | 40.00 | | 0.17 |
| Wooden Crates | | | | $48.00 | 40.00 | | 1.20 |
| Subtotal Pack Opt. | | | | | | | $3.11 |
| Total H, H, Pk. | | | | | | | $5.83 |

Table 13. Estimated Annual indirect Cost Summary
in US$(000)

| Project Year | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| MT Exported | | 1290 | 2580 | 4000 | 6000 | 6000 |
| Cost Categories | $/MT | | | | | |
| Expate Costs (Tbl.13a) | | $101.8 | $107.8 | $107.8 | $107.8 | $107.8 |
| Office Expenses | | 16.7 | 27.4 | 27.4 | 27.4 | 27.4 |
| Labor Frng.Ben.($/MT) | $1.41 | 1.8 | 3.6 | 5.6 | 8.5 | 8.5 |
| Supervi. Sals.($/MT) | 0.81 | 1.04 | 2.1 | 3.24 | 4.86 | 4.86 |
| Rent for Land & Buildings | | 4.0 | 4.0 | 5.0 | 6.00 | 6.00 |
| SUBTOTAL OPT. INDIRECTS | | $125.4 | $144.9 | $149.1 | $154.5 | $154.5 |
| SUBTOTAL MARKT. INDIRECTS | | | | | | |
| COMM.10% OF REVENUES | | $70.7 | $141.4 | $232.5 | $348.8 | $348.8 |
| TOTAL INDIRECT COSTS | | $196.1 | $286.3 | $381.6 | $503.3 | $503.3 |

Table 13a. Breakdown of indirect Costs for Expates, Office and Other Indirect Costs in US$

| | Dir./Agrono. | Sup./Mech. | Annual Totals |
|---|---|---|---|
| A. Expate Costs | | | |
| Salary/annum | $45,000.00 | $25,000.00 | |
| Annual vacation in Europe (Assume wife & Child) | $4,170.00 | $4,170.00 | |
| Family medical plan | $1,750.00 | $1,750.00 | |
| House rent in Fulaya | $8,400.00 | $7,200.00 | |
| Houseboy & Guard | $300.00 | $300.00 | |
| Contingency 10% | $6,000.00 | $3,800.00 | |
| | --- | --- | --- |
| Subtotal A. | $65,620.00 | $42,220.00 | $107,840.00 |
| B. Office Expenses | | | |
| Rent in Fulaya or Kindia | | $3,600.00 | |
| Auto expense(2) | | $5,400.00 | |
| Telephone &Telex | | $10,000.00 | |
| Office supplies | | $2,500.00 | |
| Office Staff | Syl/yr(000) | | |
| 1 Accountant | 480 | | |
| 2 Bookkeepers | 600 | | |
| 1 Secretary | 300 | | |
| 4 Clerks | 480 | | |
| 8 Guards | 504 | | |
| Tot. 14 Syl/400= | 2364= | $5,910.00 | |
| Subtotal B. | | | $27,410.00 |
| C. Rent for land and buildings. | | | $6,000.00 |
| | | (@4000MT) | |
| D. Labor fringe benefits @ 21% | $/Day | $/MT | $/MT |
| Field labor( at full operatio | $145.30 | $3.63 | |
| Harvest & Haul | | $1.01 | |
| Packing station | | $0.90 | |
| Office & miscel. | | $1.18 | |
| | | --- | |
| Total wage payroll x 21% | X | $6.72 | = 1.41 |
| E. Field supervi 12% of wages | X | | = .81 |
| | | | --- |
| Total Wage & Salary Cost/MT | | | $8.94 |

Table 14. Estimated Monthly Cash Flow Projection
Fiscal Year (Aug 1-July 31)

| | Preoperating 3-5 Months | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | March | April | May | June | July | Annual Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N. Estate no Planted | | | | 4 | 8 | 10 | 4 | 4 | 8 | 8 | 4 | | | 50 |
| Grower MT Purchased | | --- | --- | 100 | 200 | 250 | 100 | 100 | 250 | 200 | 90 | — | -- | 1290 |
| COST CATEGORIES | | | | | | | | | | | | | | |
| Subtotal Proj. Organ(1 | $65000.00 | | | | | | | | | | | | | |
| Expats on Site$45,000/yr | 3750.00 | $3750.00 | $3750.00 | $3750.00 | $3750.00 | $3750.00 | $3750.00 | $3750.00 | $3750.00 | $3750.00 | $3750.00 | $3750.00 | $3750.00 | $45000.00 |
| Hotel & Board | $3000.00 | | | | | | | | | | | | | |
| Expats House & Board | | $1000.00 | $1000.00 | $1300.00 | $1300.00 | $1300.00 | $1300.00 | $1300.00 | $1300.00 | $1300.00 | $1300.00 | $1300.00 | $1300.00 | $15600.00 |
| 2nd Expats $25,000/yr | | $2083.00 | $2083.00 | $2083.00 | $2083.00 | $2083.00 | $2083.00 | $2083.00 | $2083.00 | $2083.00 | $2083.00 | $2083.00 | $2083.00 | $24996.00 |
| Medical Insurance | $1750.00 | | | | | | $1750.00 | | | | | | | $1750.00 |
| Vacation Costs | | | | | | | | | | | | | $4170.00 | $4170.00 |
| Houseboys & Guardians | | $40.00 | $40.00 | $40.00 | $40.00 | $40.00 | $40.00 | $40.00 | $40.00 | $40.00 | $40.00 | $40.00 | $40.00 | $480.00 |
| Contingency 10% | $1175.00 | $820.00 | $820.00 | $820.00 | $820.00 | $820.00 | $820.00 | $820.00 | $820.00 | $820.00 | $820.00 | $820.00 | $820.00 | $9840.00 |
| Subtotal Expats Costs /mo. | | $7693.00 | $7293.00 | $7993.00 | $7993.00 | $7993.00 | $9743.00 | $7993.00 | $7993.00 | $7993.00 | $7993.00 | $7993.00 | $12163.00 | $101838.00 |
| Office & Indir. Expenses | | | | | | | | | | | | | | |
| Vehicle Operating Exps. | $300.00 | $450.00 | $450.00 | $450.00 | $450.00 | $450.00 | $450.00 | $450.00 | $450.00 | $450.00 | $450.00 | $450.00 | $450.00 | $5400.00 |
| Staff Salaries(Short staff) | | $185.00 | $185.00 | $185.00 | $185.00 | $185.00 | $185.00 | $185.00 | $185.00 | $185.00 | $185.00 | $185.00 | $185.00 | $2220.00 |
| Rent Land and Buildings | | $0.00 | $550.00 | $550.00 | $550.00 | $550.00 | $550.00 | $550.00 | $550.00 | $550.00 | $550.00 | $550.00 | $550.00 | $6050.00 |
| Offic Supplies | | $1250.00 | | | | | | $1250.00 | | | | | | $2500.00 |
| Fdge&Lol Supv@Wg$.3/# | $30.51 | | | $122.04 | $244.08 | $305.10 | $122.04 | $122.04 | $244.08 | $244.08 | $122.04 | | | $1525.50 |
| Subtotal Office by Months | | $1885.00 | $1185.00 | $1307.04 | $1429.08 | $1490.10 | $1307.04 | $2557.04 | $1429.08 | $1429.08 | $1307.04 | $1185.00 | $1185.00 | $17896.50 |
| Small Growers Advance | $5625.00 | $5625.00 | $14063.00 | $5625.00 | $11250.00 | $14063.00 | $11250.00 | $5063.00 | | | | | | $66939.00 |
| " " Fruit Purchase | | | | $5625.00 | $5625.00 | $14063.00 | $5625.00 | $11250.00 | $14063.00 | $11250.00 | $5063.00 | | | $72564.00 |
| Subtotal Grower Fruit | $5625.00 | $5625.00 | $14063.00 | $11250.00 | $16875.00 | $28126.00 | $16875.00 | $16313.00 | $14063.00 | $11250.00 | $5063.00 | | | $139503.00 |
| PREOPERATING TOTAL | $81600.00 | | | | | | | | | | | | | |
| Nuclear Estates Opts.$ | $/ha | | | | | | | | | | | | | |
| Land Prep. @$/h | $379.36 | | | | $3793.60 | $3793.60 | $5690.40 | $5690.40 | | | | | | $18968.00 |
| Plant Purchase@$7.5/=60 | $450.00 | | | | | | | $4500.00 | $4500.00 | $4500.00 | $4500.00 | $4500.00 | | $22500.00 |
| Farm Labor@.7x$145.30 | $101.70 | | | | | | | $1017.00 | $1017.00 | $1017.00 | $1017.00 | $1017.00 | | $5085.00 |
| Service Rate@.7x$683.2 | $478.24 | | | | | | | $4782.40 | $4782.40 | $4782.40 | $4782.40 | $4782.40 | | $23912.00 |
| Fert&AgHelr.@.5 | $700.00 | | | | | | | $7000.00 | $7000.00 | $7000.00 | $7000.00 | $7000.00 | | $35000.00 |
| Subtotal Dir$ 1st Yr N.E | $2109.30 | | | | $3793.60 | $3793.60 | $5690.40 | $22989.80 | $17299.40 | $17299.40 | $17299.40 | $17299.40 | | $105465.00 |
| | $/MT | | | | | | | | | | | | | |
| Her,Haul, Pack@$/MT | $4.94 | | | | | | | | | | | | | |
| Cartons@ $.625x69=/MT | $38.88 | | | | | | | | | | | | | |
| Subtotal H,H&Pk | $41.82 | | | $4182.00 | $8364.00 | $10455.00 | $4182.00 | $4182.00 | $10455.00 | $8364.00 | $3763.80 | | | $53947.80 |
| Hnd BRZTrk 60/50 $/MT | $7.96 | | | | | | | | | | | | | |
| Hndl&2dys Store@Port | $10.00 | | | | | | | | | | | | | |
| Subtotal Hndl@Port/MT | $17.96 | | | $1796.00 | $3592.00 | $4490.00 | $1796.00 | $1796.00 | $4490.00 | $3592.00 | $1616.40 | | | $23168.40 |
| GRAND TOTAL FOB@Port | | | | | | | | | | | | | | |
| Total of Dir.& Indirects/Month | | $15203.00 | $23541.00 | $26528.04 | $42048.08 | $56347.78 | $39593.44 | $55830.84 | $56729.48 | $49927.48 | $37042.84 | $26477.40 | $13348.00 | $441615.70 |
| Ocean Freight@$/MT | $170.77 | | | $17077.00 | $34154.00 | $42692.50 | $17077.00 | $17077.00 | $42692.50 | $34154.00 | $15369.30 | | | $220293.30 |
| Plus 5% for Insur&Fees | 0.05 | | | $1328.40 | $2102.33 | $2817.39 | $1979.67 | $2791.54 | $2786.47 | $2496.37 | $1852.13 | | | $18152.32 |
| GRAND TOTAL COSTS On 1290 MT CIF Europe | $81600.00 | $30406.00 | $47082.00 | $44931.44 | $78303.01 | $101857.59 | $58450.11 | $75499.38 | $101208.45 | $86577.85 | $54264.07 | $26477.40 | $13348.00 | $718808.32 |
| PLUS 10% Brokerage Fee | -0.1 | | | $5480.00 | $10960.00 | $13700.00 | $5480.00 | $5480.00 | $13700.00 | $10960.00 | $4932.00 | | | $70692.00 |
| GRAND TOTAL COST of SALES | | | | | | | | | | | | | | $789497.32 |
| GROSS REVENUE @ $/MT | $548.00 | | | ($54800.00) | ($109600.00) | ($137000.00) | ($54800.00) | ($54800.00) | ($137000.00) | ($109600.00) | ($49320.00) | | | ($706920.00) |
| NET CASH FLOW | $81600.00 | $15203.00 | $23541.00 | ($4388.56) | ($20338.99) | ($21442.42) | $9330.11 | $26379.38 | ($22091.55) | ($12062.15) | $9878.07 | $26827.40 | $9328.00 | $121563.32 |
| CUMULATIVE CASH FLOW | $81600.00 | $96803.00 | $120344.00 | $115955.44 | $95618.46 | $74176.04 | $83505.15 | $109885.54 | $87793.99 | $75731.84 | $85607.92 | $112235.32 | $121563.32 | |

Table 15. Estimated Direct and Indirect Operating Costs and Profit & Loss for First Five Years in US$(000)

| Project Year | | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| Annual Production | Total | 1,290 | 2,580 | 5,133 | 8,000 | 8,000 |
| Grower Fruit | in MT | 1,290 | 2,580 | 3,133 | 2,667 | 2,667 |
| Nuclear Estate | in MT | 0 | 0 | 2,000 | 5,334 | 5,334 |
| " " Planted | ha | 50 | 100 | 100 | 100 | 100 |
| MT Exported (75%) | | 1,290 | 2,580 | 4,000 | 6,000 | 6,000 |
| MT Domestic (25%) | | 0 | 0 | 1,133 | 2,000 | 2,000 |
| Revenues ($000's) | $/MT | | | | | |
| Exports | $548.0 | $706.9 | $1,413.8 | $2,192.0 | $3,288.0 | $3,288.0 |
| Domestic | $100.0 | 0.0 | 0.0 | 113.3 | 200.0 | 200.0 |
| TOTAL REVENUES | | $706.9 | $1,413.8 | $2,305.3 | $3,488.0 | $3,488.0 |
| DIRECT COSTS ($000) | | | | | | |
| Growers Advance/Purchase | $112.5 | $145.1 | $290.3 | $352.5 | $300.0 | $300.0 |
| Nuclear Estate Production | $/ha | | | | | |
| Land Preparation | $379.4 | | | | | |
| Planting Material @$7.5*60 | $450.0 | | | | | |
| Field Labor | $145.3 | | | | | |
| Service rate balance | $683.2 | | | | | |
| Fertilizer materials | $959.0 | | | | | |
| Pesticides | $203.0 | | | | | |
| Forcing agents | $246.5 | | | | | |
| (N.E.Tot.Fld$incld Plt.Mat) | $3,062.6 | $153.1 | $306.3 | | | |
| Subtotal N.E. Field Opts. | $2,616.0 | | | $261.6 | $261.6 | $261.6 |
| | $/MT | | | | | |
| Harvest,Haul@ Pack N.E. | 5.48 | 0.0 | 0.0 | 8.2 | 21.9 | 21.9 |
| " " " Growers | 4.94 | 6.4 | 12.7 | 12.35 | 9.9 | 9.9 |
| Cartons @ $.63x59 | 36.88 | 47.6 | 95.2 | 147.5 | 221.3 | 221.3 |
| Subtotal H, H, PK. | | 54.0 | 107.9 | 168.1 | 253.1 | 253.1 |
| Inld Tran. RR/Trk 50/50 ave. | 7.92 | 10.2 | 20.4 | 31.7 | 47.5 | 47.5 |
| Conakry Store 2dys +In&Out | 10.00 | 12.9 | 25.8 | 40.0 | 60.0 | 60.0 |
| Ocean Freight to Europe | 170.77 | $220.3 | $440.6 | $683.1 | $1,024.6 | $1,024.6 |
| Insurance&Govn.Fees Est@ | 5.0% | $11.0 | $22.0 | $34.2 | $51.2 | $51.2 |
| TOTAL DIRECT COSTS CIF EUROPE | | $606.6 | $1,213.3 | $1,571.1 | $1,998.1 | $1,998.1 |
| TOTAL INDIRECT COSTS | (Table 13) | $196.1 | 286.3 | 381.6 | 503.3 | 503.3 |
| OTHER COSTS | | | | | | |
| Interest @13%/yr. | 13% | 98.0 | 108.4 | 105.0 | 81.9 | 58.5 |
| Depreciation | | 163.5 | 178.2 | 178.2 | 178.2 | 178.2 |
| TOTAL OTHER COSTS | | 261.5 | 286.6 | 283.2 | 260.1 | 236.7 |
| TOTAL PROJECT COSTS IN EUROPE | | $1,064.2 | $1,786.2 | $2,235.9 | $2,761.5 | $2,738.1 |
| ANNUAL PROFIT or (LOSS) | | -357.31 | -372.33 | 69.43 | 726.51 | 749.91 |

Table 16. Summary Profit and Loss Projection for the First Five Years in US$(000)

| Fiscal Year | | 86/87 | 87/88 | 88/89 | 89/90 | 90/91 |
|---|---|---|---|---|---|---|
| Production (M/T) | | 1,290.0 | 2,580.0 | 5,333.0 | 8,000.0 | 8,000.0 |
| Small Growers (M/T) | | 1,290.0 | 2,580.0 | 3,333.0 | 2,667.0 | 2,667.0 |
| Nuclear Estate (M/T) | | 0.0 | 0.0 | 2,000.0 | 5,334.0 | 5,334.0 |
| Nuclear Estate (ha planted) | | 50.0 | 100.0 | 100.0 | 100.0 | 100 |
| Tonnage | | | | | | |
| Exported (75%) | | 1,290.0 | 2,580.0 | 4,000.0 | 6,000.0 | 6,000.0 |
| Domestic Sales (25%) | | | | 1,333.3 | 2,000.0 | 2,000.0 |
| TOTAL | | 1,290.0 | 2,580.0 | 5,333.0 | 8,000.0 | 8,000.0 |
| Revenues ($ 000's) | Per M/T | | | | | |
| Exports | $548.00 | $706.9 | $1,413.8 | $2,192.0 | $3,288.0 | $3,288.00 |
| Domestic Sales | $100.00 | $0.0 | $0.0 | $133.3 | $200.0 | $200.00 |
| TOTAL REVENUES | | $706.9 | $1,413.8 | $2,325.3 | $3,488.0 | $3,488.0 |
| Direct Costs ($ 000's) | | | | | | |
| Small Holder Advances/Purchases | $112.50 | 145.1 | 290.3 | 352.5 | 300.0 | 300.0 |
| Nuclear Estate Production Costs | | 153.1 | 306.3 | 261.6 | 261.6 | 261.6 |
| Packing Costs | | 54.0 | 107.9 | 168.1 | 253.1 | 253.1 |
| Transportation to Port & Europe | | 243.4 | 487.2 | 755.4 | 1,133.0 | 1,133.0 |
| Insurance & Govern Fees Est.5% | | 11.0 | 22.0 | 34.2 | 51.2 | 51.2 |
| TOTAL DIRECT COSTS | | 606.6 | 1,213.7 | 1,571.8 | 1,998.9 | 1,998.9 |
| Indirect Costs ($ 000's) | | | | | | |
| Organization Expense | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Administration | | 125.4 | 144.9 | 149.1 | 154.5 | 154.5 |
| Marketing Costs - (10 % of sales) | 10.00% | 70.7 | 141.4 | 232.5 | 348.8 | 348.8 |
| TOTAL INDIRECT COSTS | | 196.1 | 286.3 | 381.6 | 503.3 | 503.3 |
| Total Operating Expense | | 802.7 | 1,499.9 | 1,953.4 | 2,502.2 | 2,502.2 |
| Operating Profit (Loss) | | -95.8 | -86.1 | 371.9 | 985.8 | 985.8 |
| Other Expense | | | | | | |
| Interest | | 98.0 | 108.4 | 105.0 | 81.9 | 58.5 |
| Depreciation | | 163.5 | 178.2 | 178.2 | 178.2 | 178.2 |
| TOTAL OTHER EXPENSES | | 261.5 | 286.6 | 283.2 | 260.1 | 236.7 |
| TOTAL PROJECT COSTS IN EUROPE | | | | | | |
| Net Profit (Loss) Before Taxes | | -357.3 | -372.7 | 88.7 | 725.7 | 749.1 |

Table 17. Projected Sources and Uses of Funds
in US$(000)

| | Pre-Opt. | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|---|---|---|---|---|---|---|
| Estimated Capital Required--$1.5 million | | | | | | |
| SOURCES | | | | | | |
| Equity 40% | 300.0 | 300.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Loan 60% (13% Intr.) | 400.0 | 300.0 | 200.0 | 0.0 | 0.0 | 0.0 |
| Net Profit (Loss)pretax | 0.0 | -357.3 | -372.3 | 71.4 | 726.5 | 749.9 |
| Depreciation | 0.0 | 163.5 | 178.2 | 178.2 | 178.2 | 178.2 |
| Total Sources | 700.0 | 406.2 | 5.9 | 249.6 | 904.7 | 928.1 |
| USES | | | | | | |
| Capital Expenditures | 500.0 | 320.0 | 176.2 | 1.0 | 1.0 | 1.0 |
| Loan Repayment | 0.0 | 0.0 | 0.0 | 180.0 | 180.0 | 180.0 |
| Dividends | 0.0 | 0.0 | 0.0 | 0.0 | 600.0 | 700.0 |
| | 500.0 | 320.0 | 176.2 | 181.0 | 781.0 | 881.0 |
| Increase or (Decrease) In Working Capital | 200.0 | 86.2 | -170.3 | 68.6 | 123.7 | 47.1 |
| Total Uses | 700.0 | 406.2 | 5.9 | 249.6 | 904.7 | 928.1 |
| EOY Working Capital | 200.0 | 286.2 | 115.9 | 184.5 | 308.2 | 355.3 |

Table 18. Projected Balance Sheet for Fresh Pineapple
Production and Marketing
in US$(000

| | Pre Opertg. | Year 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| CURRENT ASSETS | 200.0 | 289.2 | 111.7 | 365.7 | 489.4 | 536.5 |
| FIXED ASSETS | | | | | | |
| Agricultural Machinery | 400.0 | 596.0 | 774.0 | 775.0 | 776.0 | 777.0 |
| Building improvements/Eq. | 100.0 | 221.0 | 221.0 | 221.0 | 221.0 | 221.0 |
| Reserve for Depreciation | 0.0 | -163.5 | -341.7 | -519.9 | -698.1 | -876.3 |
| Net Fixed Assets | 500.0 | 653.5 | 653.3 | 476.1 | 298.9 | 121.7 |
| TOTAL ASSETS | 700.0 | 942.7 | 765.0 | 841.8 | 788.3 | 658.2 |
| CURRENT LIABILITIES | | | | | | |
| Current Maturities L/T Debt | 0.0 | 0.0 | 0.0 | 180.0 | 180.0 | 180.0 |
| LONG TERM LIABILITIES | | | | | | |
| Bank Loan | 400.0 | 700.0 | 900.0 | 720.0 | 540.0 | 360.0 |
| TOTAL LIABILITIES | 400.0 | 700.0 | 900.0 | 900.0 | 720.0 | 540.0 |
| CAPITAL | | | | | | |
| Equity | 300.0 | 600.0 | 600.0 | 600.0 | 600.0 | 600.0 |
| Earned Surplus | 0.0 | -357.3 | -729.6 | -658.2 | -531.7 | -481.8 |
| TOTAL CAPITAL | 300.0 | 242.7 | -129.6 | -58.2 | 68.3 | 118.2 |
| TOTAL LIABILITIES AND CAPITAL | 700.0 | 942.7 | 770.4 | 841.8 | 788.3 | 658.2 |

## XI. BIBLIOGRAPHY


(1) The Culture of Pineapple in Guinea; A Manual for Planting Claude Py, Marc A. Tisseau, B. Oury and F. Ahmadu, IFAC Publication translated to English by Pineapple Research insitute of Hawaii, 1957

(2) L'Anana en Cote D'Ivoire, A. Gugot, A Pinon and C. Py, Extract de Fruit vol. 29 No.2, 1974

(3) Personal Communication with Alain Moreau, Independent Agricultural Consultant, B.P. 71, Doula, Cameroon

(4) Analysis of the Agricultrual Operations of SIFRA Pineapple Plantation, Repubiic of Guinea, Phase I Report Agro-Industrial Associates, Honolulu, Hawaii; J.L. Larsen, March, 1973

(5) Pineapple Production in Africa, Private Report to Dole Company, Honolulu; Dr. J.B. Smith,1970

(6) Personal Communication, Mr. Bishop M. Lawrence, B.M. Lawrence & Company, 233 Sansome Street, San Fancisco, CA. Wholesale Food Brokerage Firm

(7) Project Performance Audit Report, Guinea Pineapple Development Project Document of World Bank Report No. 3960, June 9,'82

(8) Apprisal of Pineapple Project Guinea, Interantional Development Association, Report No. 697a GUI 31 pages & 7 Annexes, June 12, 1975