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Date: 29th January.....19...99

**FC/RAF/96/001 - PRODUCT AND MARKET DEVELOPMENT FOR SISAL AND
HENEQUEN - UTILIZATION OF BOLE AND BOGASS AS ANIMAL FEED
CONTRACT NO. 97/100**

Subcomponent B2 - Animal Feed Trials

FINAL REPORT 1998

1) OBJECTIVE

To develop viable animal feed rations using sisal boles using sisal boles fresh and ensiled bogass to test the effectiveness of feeding dairy and beef cattle, goats and sheep.

2) INTRODUCTION

Kilifi Plantations Limited was started in 1923. In 1993 dairy cattle and a few beef were introduced as a diversification from the sisal monoculture crop. The estate is situated 60 KM North of Mombasa on both sides of the main Mombasa - Malindi Road. Total hectares is 2023(5,000 acres):324 ha on Sisal and rest of the land carries 2,500 head of cattle. Most of the soils is sandy loam and sandy clays.

Rainfall is bimodal: falling between April and June (long rains) and October and

Directors: R.O'B WILSON (Chairman) C.D WILSON (Managing) J.J.O.'B WILSON (BRITISH)
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December for short rains. Mean yearly rainfall is 1.150 mm. The lowest mean monthly, temperature is in June at 25C.

The highest as 34C in March. There are a total of 550 personnel at the estate; including 20 senior and middle managers.

3) **Summary of Progress Reports.**

During the year the contractor achieved the following

1) Completion of Conveyors

1) 2 x Drums Conveyors

a) No. 1 Drum to Transverse Conveyor

No. 2 Drum to Transverse Conveyor

b) Transverse Conveyor to Dewatering Roller

c) Dewatering Rollers to Defibreing Squirrel Cage

2) Installation and Commissioning of the Squirrel Cage

3) Installation and commissioning of the Dewatering rollers.

4) i) Construction of the First Phase of Feeding Trial Houses as per original specifications

a) 22 Goat and Sheep Houses

b) 20 Cattle Houses.

ii) Initial ground clearing and foundation laying of the second phase of stock feed trial housing.

a) 62 Goat and Sheep Houses

b) 46 Cattle (Dairy and Beef) Houses

iii). Site selection and Ground Clearing for Bogas Silage Silos.

5. Selection of Animals for Trials.

1. Dairy Animals

2. Beef Animals

3. Goats

4. Sheep

6. We enclose a list of the selected Dairy Animals.

The Goats, Sheep and Beef animals will be animals aged 4 months i.e. at weaning in April, 1999.

7. **Review**

We enclose for the record

1. (a) Report No. 1 Dated 18/04/1998
(b) Report No. 2 Dated 15/07/1998
(c) Draft Final Report Dated 16/10/1998
2. Accounts for 1998
3. Workplan and Budget for 1999

On receipt of the necessary continuation instructions and contract we will action the next phase.

F=FRESH BOGAS						
S=ENSILED BOGAS						
C=CONTROL	COW ID	LACTATIONS	BREED GROUP	D.OF B.		
*	F C357	3	7	Jun-93	PREDOMINANT SAHIWAL	
*	F E019	2	7	Jan-95	PREDOMINANT SAHIWAL	
*	S E745	2	7	Sep-95	PREDOMINANT SAHIWAL	
*	C D475	2	8	Jul-94	PREDOMINANT SAHIWAL	
*	S C393	3	11	Jun-93	PREDOMINANT SAHIWAL	
*	C D027	3	11	Jan-94	PREDOMINANT SAHIWAL	
*	F D625	2	11	Sep-94	PREDOMINANT SAHIWAL	
*	S C395	3	12	Jun-93	PREDOMINANT SAHIWAL	
*	C C503	3	12	Jul-93	PREDOMINANT SAHIWAL	
*	F D721	2	12	Oct-94	PREDOMINANT SAHIWAL	
*	S E095	2	12	Feb-95	PREDOMINANT SAHIWAL	
*	C E109	2	28	Feb-95	PREDOMINANT SAHIWAL	
*	F E395	2	31	May-95	PREDOMINANT SAHIWAL	
*	S D367	2	32	May-94	PREDOMINANT SAHIWAL	
*	C D669	2	32	Oct-94	PREDOMINANT SAHIWAL	
*	F F251	1	32	Apr-96	PREDOMINANT SAHIWAL	
*	S D733	2	34	Oct-94	PREDOMINANT SAHIWAL	
*	C E863	1	291	Nov-95	PREDOMINANT SAHIWAL	
*	F B513	3	913	Aug-92	PREDOMINANT FRIESIAN	
*	S C025	3	913	Jan-93	PREDOMINANT FRIESIAN	
*	C D001	3	913	Jan-94	PREDOMINANT FRIESIAN	
*	F D257	3	913	Apr-94	PREDOMINANT FRIESIAN	
*	F D499	2	913	Jul-94	PREDOMINANT FRIESIAN	
*	S D525	2	913	Jul-94	PREDOMINANT FRIESIAN	
*	C D653	2	913	Oct-94	PREDOMINANT FRIESIAN	
*	F D803	2	913	Nov-94	PREDOMINANT FRIESIAN	
*	S E221	1	913	Mar-95	PREDOMINANT FRIESIAN	
*	F D637	2	914	Sep-94	PREDOMINANT FRIESIAN	
*	S C019	3	923	Jan-93	PREDOMINANT FRIESIAN	
*	C C451	3	923	Jul-93	PREDOMINANT FRIESIAN	
*	S C881	3	923	Dec-93	PREDOMINANT FRIESIAN	
*	C D753	2	923	Nov-94	PREDOMINANT FRIESIAN	
*	F E249	2	923	Apr-95	PREDOMINANT FRIESIAN	
*	S E273	2	923	Apr-95	PREDOMINANT FRIESIAN	
*	C F195	1	923	Mar-96	PREDOMINANT FRIESIAN	
*	C D761	2	933	Nov-94	PREDOMINANT FRIESIAN	

FC/RAF/96/001 PRODUCT AND DEVELOPMENT OF SISAL AND HENEQUEN

Subcomponent B2 - Animal Feed Trials

WORKPLAN AND BUDGET 1999

1. **OBJECTIVE**

To develop viable animal feed rations using sisal boles fresh and ensiled bogass to test the effectiveness of feeding dairy and beef cattle, goats and sheep.

2. **INTRODUCTION**

Kilifi Plantations Limited was started in 1923 as a Sisal Estate. In 1993 dairy cattle and a few beef were introduced as a diversification from the sisal mono-culture crop. The estate is situated 60 KM North of Mombasa on both sides of the main Mombasa - Malindi Road. Total hectares is 2023 (5,000 acres): 324 ha on Sisal and rest of the land carries 2,500 head of cattle. Most of the soil is sandy loam and sandy clays. Rainfall is bimodal: falling between April and June (long rains) and October and December for short rains. Mean yearly rainfall is 1,150 mm. The lowest mean monthly temperature is in June at 25 C. The highest as 34 C in March. There are a total of 550 personnel at the estate; including 20 senior and middle managers.

3. **Activity Plan**

As the chosen contractor Kilifi Plantations Limited has laid the following Activity Plan described in the attached Bar Graph Appendix 1.

3(a). **Complete all Construction Work**

1. **Enlargement of Stock Buildings to house as follows:**

36 Dairy Animals

30 Beef Animals

42 Goats

42 Sheep

2. Bogass Silos

These should be completed by mid February, 1999, to allow all the experiments to start simultaneously

(b) Finalise testing and Commissioning of the Bogass Handling Plant.

With particular attention to.

1. Dewatering Rollers
2. Fibre Removal
3. Dry Decortication and Fibre Washing Procedures

3. Condition of Trials

- a). Number of treatment: 3 (fresh bogass, ensilaged bogass and control)
- b). Types of animals: dairy cows, beef cattle, goats and sheep
- c). Management of experiments: all trial animals will be maintained in the same environment and the same management procedures will be used for the animals fed with the fresh bogass, ensilaged bogass and normal ration (control). The animals will be kept in the buildings and fed in controlled conditions.
- d). Number of animals and total duration of feeding trials

Type of animal	Fresh bogass	Ensilaged bogass	Control	Duration of trials (months)	Starting feed Trial
Dairy Cows	12	12	12	26	April 1999
Beef Cattle	10	10	10	9	April 1999
Goats	14	14	14	6	April 1999

e). Selection of animals

1. Dairy Cows

Cows in the 2nd and 3rd lactation will be selected for starting the trials taking into consideration the lactation records of the animals in order to match all animals used in the trials and to have a group of animals as homogenous as possible. The selection is expected to be based also on productivity stress resistance, disease resistance, nutrition susceptibility

Lactation periods with calving are assumed to be 405 days (including dry period)

2. Beef Cattle, Goats and Sheep

The animals will be selected by the subcontractor based on productivity, stress resistance, disease resistance, nutrition susceptibility and on the subcontractor's experience.

3. All animals (dairy cows, beef cattle, goats, sheep) should be examined and their health condition and suitability confirmed by a Government Veterinarian.

f). Purchase of animals by the project (US\$)

Dairy Cows:	36 x 700	=	27,200
Beef Cattle*:	20 x 100	=	2,000
Goats*	28 x 50	=	1,400

Sheep: 42 x 52 = 2,100

* control animals will be supplied by Kilifi Plantations Limited

The animals purchased by the project will be sold by Kilifi Plantations Limited at the end of each trial period and the revenue transferred to CFC. The revenue from the sales of milk produced by the dairy cows purchased for the project will be collected by Kilifi Plantations Limited and transferred to CFC.

g). Parameters to be measured/controlled

1. Analysis of animal ration. The ration proposed for each animal for starting the trial will be analyzed to confirm that the correct nutritional balances are maintained and also at intervals to confirm these balances or whenever is deemed necessary and appropriate, for instance, during diet changes.
2. Routine veterinary examination will be conducted during the duration of the trials including weekly routine bleeding and screening of the blood for trypanosomiasis, weekly subclinical testing of milked cows for mastitis: constant monitoring of all selected animals for any other diseases, injuries and general health problems. In case of death a post-mortem should be performed and a report written.
3. Parameters to be monitored.
Dairy cows: Milk production, quality of milk
Beef Cattle, Goats, Sheep: gain/loss of weigh

h). Work Plan for 1999 Appendix 1

i). Revised budget Appendix 2

- j). Kilifi Plantations Limited is enlarging the buildings for sheltering the animals for the three treatments envisaged in this experiment.

Budget

Total Budget for 1999 \$ 72,680 (See Appendix 2)

Break Down

1. Stock Purchases	26,600
2. Running Costs	<u>46,080</u>
	\$ 72,680

Please see Appendix 2 for complete Breakdown

All revenues will be collected by Kilifi Plantations and remitted to CFC as collected.

Reporting Procedures

According to the tentatively agreed program Kilifi Plantations Limited will submit two progress reports during 1999 plus a final report.

Payments Procedures for 1999.

These have not yet been finalised and await clarification.

Conclusion

It is envisaged that with the satisfactory conclusion of the data collection system that the experiment can now proceed on schedule.

Items	1998	Jan	Feb	Mar	Apr	May	Jun	BUDGET					Total 1999	Total 2000	Total 2001	Total			
								Jul	Aug	Sept	Oct	Nov					Dec		
I. Capital Items																			
Dewatering press	16,000																16,000		
bogass conveyors(4)	9,000																9,000		
fibre extractor	8,000																8,000		
Dairy building (20 animals)	7,000																7,000		
Beef building (20 animals)	2,000																2,000		
goat building (20 animals)	2,000																2,000		
Sheep building (20 animals)	2,000																2,000		
ensiling pit	6,000																6,000		
Enlargement of buildings																	0		
Dairy building(35 animals)	5,600																5,600		
Beef building (30 animals)	1,000																1,000		
Goats building (42 animals)	2,200																2,200		
Sheep building (42 animals)	2,200																2,200		
Subtotal Capital Items	63,000																63,000		
II. Purchase of stock																			
Dairy cows (36)			25,200														25,200		
Beef cattle (20)	2,000																2,000		
Goats (28)			1,400														1,400		
Sheep (42)	2,100																2,100		
Subtotal stock	4,100		26,600														30,700		
III. Running costs																			
Labour																			
Veterinarian	4,500				900	900	900	900	900	900	900	900	900	8100	10800	4500	27,900		
Supervisor	2,400				300	300	300	300	300	300	300	300	2700	3600	1500	10,200			
Labourers	1,400				200	200	200	200	200	200	200	200	1800	2400	1000	6,600			
Transport costs																			
Pick-up/tractor hiring	3,600				800	800	800	800	800	800	800	800	7200	9600	4000	24,480			
Electricity					180	180	180	180	180	180	180	180	1440	1920	800	4,160			
Office and Administration																			
Communication	780	65	65	65	65	65	65	65	65	65	65	65	780	780	520	2,820			
Analysis	400	100	100	100	100	100	100	100	100	100	100	100	1200	1200	800	3,600			
Food supply costs																			
Dairy animals(sheet 1)					1520	1520	1520	1520	1520	1520	1520	1520	13680	18240	7600	39,520			
Beef animals (sheet 2)					600	600	600	600	600	600	600	600	5400	6000	5400	5,400			
Goats (sheet 3)					210	210	210	210	210	210	210	210	1890	1890	1890	1,890			
Sheep (sheet 4)					210	210	210	210	210	210	210	210	1890	1890	1890	1,890			
Subtotal running costs	13,180	165	165	165	3065	3,065	3,065	3,065	3,065	3,065	3,065	3,065	46,080	48,540	20,720	128,460			
Tech-economic report																			
																	14,500		
Total budgeted costs	80,280	165	26,765	165	3065	3,065	3,065	3,065	3,065	3,065	3,065	3,065	4,645	4,645	4,645	72,680	48,540	35,220	236,680

WORKPLAN FOR FEEDING TRIALS SUBCOMPONENT B2												
Activities	1999				2000				2001			
	1	2	3	4	1	2	3	4	1	2	3	4
Equipment construction												
Ensiling pit construction												
Dairy and Beef building												
Goat and sheep building												
Enlargement of buildings	■											
Ensiling bogass	■											
Selection and Purchase of animals	■											
Dairy cows feed trials		■	■	■	■	■	■	■	■	■	■	■
Beef cattle feed trials		■	■	■								
Goats feed trials		■	■	■								
Sheep feed trials		■	■	■								
Analysis												
Veterinary evaluation												
Collection of data												
Analysis of data												
Tecno-economic analysis												
Reports	■		■	■	■	■	■	■	■	■	■	■
Final report												■
Note:												
■ continuous												
□ discontinuous												