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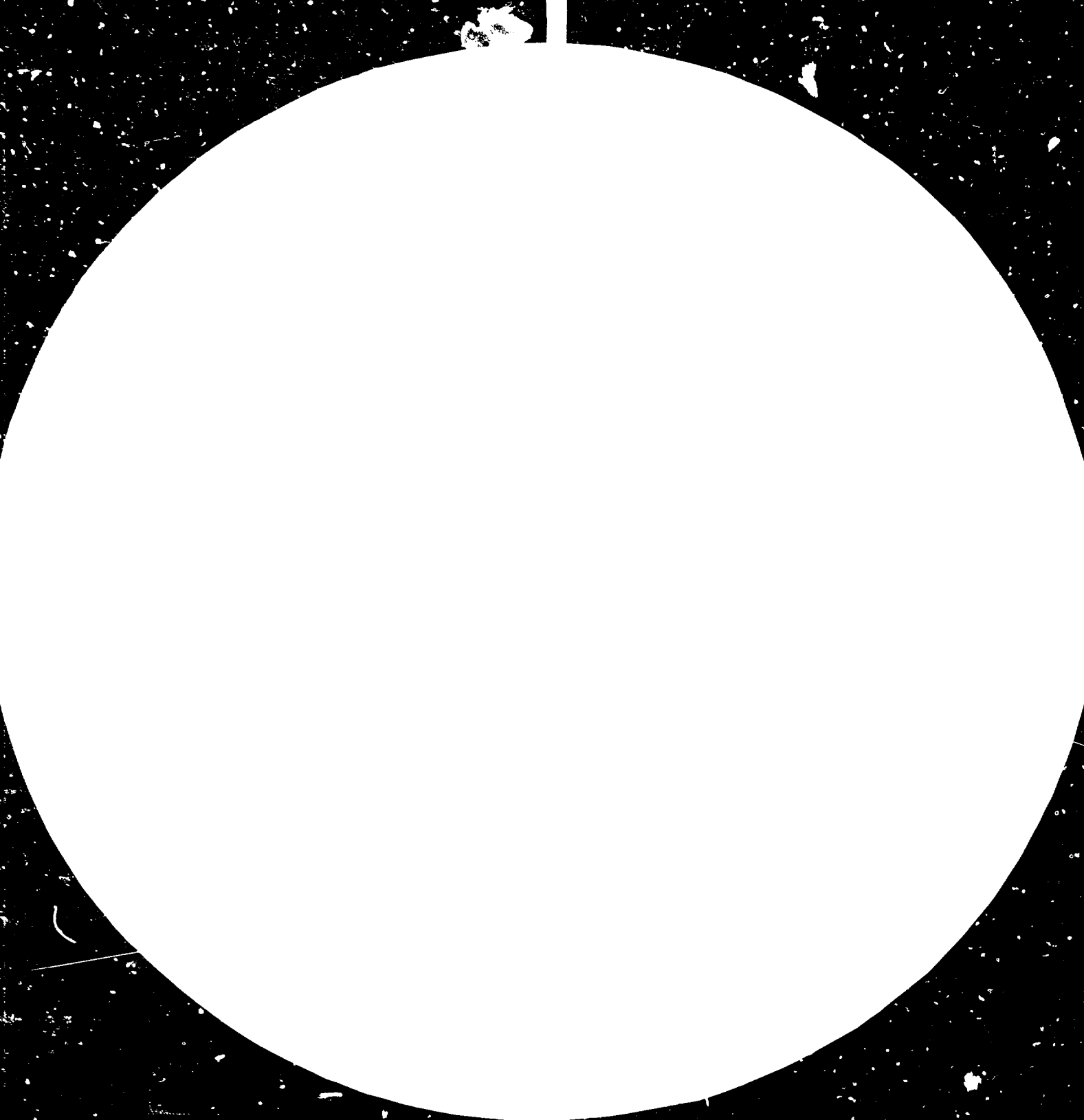

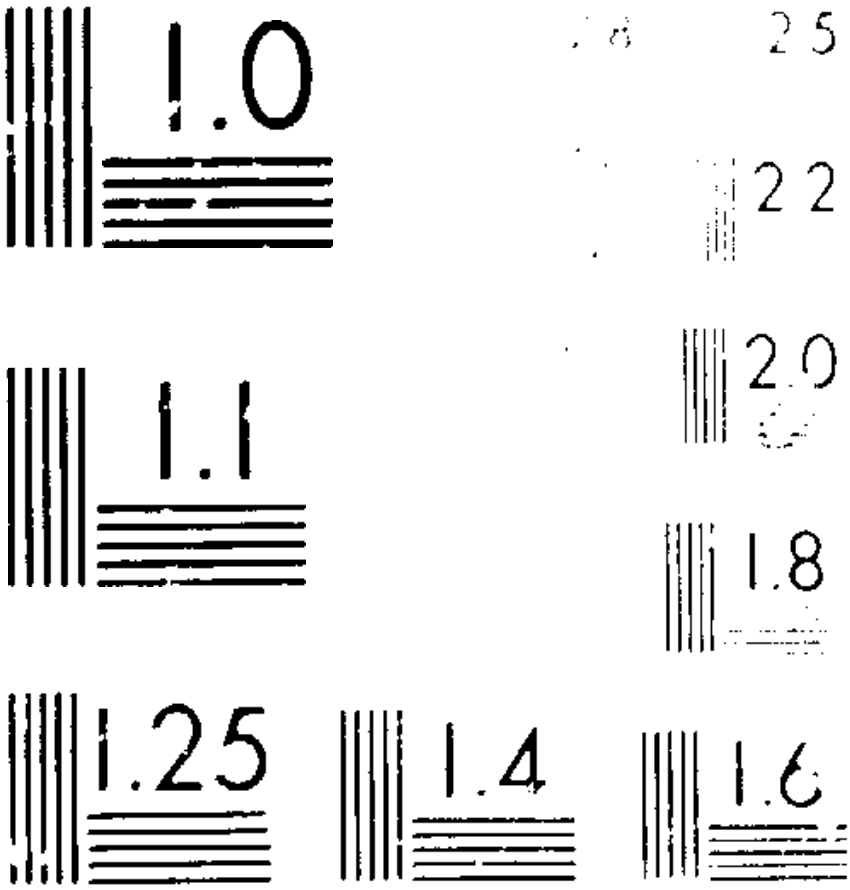
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REVITALIZING THE RAMIE INDUSTRY IN THE PHILIPPINES

SI/PHI/82/801

PHILIPPINES

Technical Report*

Prepared for the Government of the Philippines
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

Based on the work of Min Li Lai,
Expert in Ramie Fibre Production

United Nations Industrial Development Organization
Vienna

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Explanatory Notes

Local currency value:	1 Peso (₱) equals $0.11
Abbreviations	
P T R I	Philippine Textile Research Institute
R A M I T E X	Ramie Textiles, Inc.
R A M C O R	Ramcor Farms, San Miguel Corp.

A B S T R A C T

The project was to assist the Government of the Philippines in developing a programme for revitalizing the ramie industry in the country. The expert served a period of three (3) months which started on October 1, 1982 to December 28, 1982 in cooperation with Dr. Chien Chu, expert in ramie processing and finishing. Five (5) organizations coordinated in carrying out the experimental work of the project.

1. The Philippine Textile Research Institute, for fiber degumming and fiber quality tests;

2. The Ramie Textiles, Inc. for engineering service and machine shop work on special equipment for soil fumigation and supply of farm chemicals;

3. The Ramcor Farms of San Miguel Corporation for ramie experiments and hog feeding test;

4. The central laboratory of San Miguel Corporation for analyzing samples of soil and ramie leaves, etc.;

5. The Institute of Plant Breeding, the University of the Philippines for ramie breeding.

Main Conclusions

1. The demand for natural fiber is increasing, and world production of ramie and flax are not sufficient to meet the demand. The market potential for the ramie fiber will be assured.

2. In 1981, the area of ramie in Philippines was around 2,440 hectares, and produced raw fiber 4,444 metric tons, as compared with 1978, which produced raw fiber 1,647 metric tons, the raw fiber was increased 168% (see Table 2).

3. The Ramcor Farms, San Miguel Corporation produces the ramie raw fiber, cost per Kg is up ₱10.93 which is too high. These high costs are due to ramie varieties were mixed; lack organic matter to put into the field; most ramie waste, leaves and hog manure have not been utilized and some laborers were wasted in brushing, grading and sun drying.

4. The excellent ramie variety "Miyazaki 112" have big stem, wind resistant fast growing and high yield of fiber. When compared with "Green slender" variety, the raw fiber from "Miyazaki 112" showed increased yield at 38% 1,488 kgs/ha/year with a value ₱16,368/ha/year based on ₱11/kg.

5. Ramie field used composed 10 tons/ha with urea 150 kgs/ha, the ramie have high and big stem, high yield of fiber. When compared with the fiber yield from common chemical fertilizer, the raw fiber was increased 19% (720 kgs/ha/year with a value ₱7,920/ha/year). The cost of fertilizers decreased ₱640/ha/year. The total benefit is ₱8.560/ha/year.

6. The Ramcor Farms should use more organic matter, like green manure, hog manure, compost, ash and ramie leaves, etc. into the ramie field. Every year, the cost of limestone (Caco 3) (around ₱75,076) will be saved.

7. The new ramie plantation in Ramcor, if the size of every plot changed as 4 m x 100 m, the area of ramie planting will be increased 10%.

8. Ramie leave content has high crude protein and crude fat, it can be used for hog feeding. In Ramcor, hog manure is around 120 tons/day, ramie waste is 22 - 25 tons/day, and the ramie forage is 10 - 15 tons/day. Ramie waste mixed with hog manure will be good compost.

9. Spread the hog manure at 100 tons per day into the ramie field (2 hectares). The remaining hog manure at 20 tons per day can be mixed with the ramie waste 22 - 25 tons, ramie leaves 10 tons to make compost at 20 tons per day.

Recommendation

1. The Ramcor Farms, the soil is sandy loam, don't apply limestone into the ramie field. Large amount of organic matter should be applied into the field to increase the fiber yield and fiber quality by the following measures:

a) Planting sesbania and sunn hemp as a green manure crop;

b) Spreading the hog manure on ramie field after ramie harvest;

c) Apply the compost 10 tons/ha on ramie field as main fertilizer, after ramie harvest;

d) Apply grass or wood ash on ramie field after ramie harvest, special during rainy season.

2. Making ramie seedbed, selecting the rhizomes of "Miyazaki 112" from the ramie field and planting in the seedbed for propagation. The ramie fiber yield and fiber quality will be improved.

3. After ramie harvest, apply the compost at 10 tons/ha and urea at 50 kgs/ha, after one month, apply urea at 100 kgs/ha. It will increase the fiber yield and decrease the cost of fertilizer.

4. In Ramcor Farms, during the dry season, after ramie harvest, the ramie field should have sprinkle irrigation within one week, then apply the fertilizers. If the ramie field has spread hog manure, sprinkle irrigation must be followed.

5. Ramcor operations have ramie waste 22 to 25 tons per day, fresh ramie leaves 10 to 15 tons per day. The piggery department has pig 15,000 head, there produced pig manure at 120 tons per day. The fresh ramie leaves can be used as feed for pig. A large amount of ramie leaves can be returned to the field as fertilizer. But the fresh ramie waste is acidic, don't put it on ramie field. Piggery manure is the main organic matter in Ramcor Farms. It not only can be spread in ramie field but also can make fine compost by mixing with ramie waste.

6. Ramcor Farms need a large compost mill, to use the piggery manure, ramie waste, ramie leaves and ramie pith, etc. as raw materials to make compost.

7. In Ramcor Farms, the ramie planting fields were 2 m. wide and 100 m. long to keep good drainage. The planting field should be changed to 4 m. wide and 100 m. long, the drainage is still good. It will increase the ramie planting field by 10%.

8. In Ramcor Farms, during the first year of ramie planting, the field grass must be weeded clean, using the "nut grass" tool. Missing holes need replanting with large plant.

9. In Davao ramie plantation, the ramie varieties were mixed. This should be changed to the "Miyazaki 112" variety for planting. There are interplanting cassava with ramie as a harvest mark tree. To keep up soil fertility, the mark tree should be changed to planting leguminous sunn hemp as a ramie harvest mark plant.

10. For a long range plan of ramie industry in the Philippines, a ramie research center at PTRI should be established, a model ramie plantation at Ramcor Farms, San Miguel Corporation should demonstrate modern ramie farm management. Research project on ramie cultivation will be carried out there. Ramie breeding should be made at the Institute of Plant Breeding, University of the Philippines.

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INTRODUCTION

1. The ramie as a fiber crop

The ramie plant is grown mainly as a fiber crop, but its full value becomes evident when it is cultivated as a dual purpose crop, with the leaves used as a source of nutritious green feed for animals. The leaves, in contrast to the stems, have a low fiber content, and are rich in protein, minerals and carotene, which puts it ahead of alfalfa in these factors. The foliage is palatable and has proved to be of particular value to poultry and pigs. It can be used either fresh or ensiled together with molasses, or artificially dried to leaf meal.

Ramie is now the generally accepted designation for plant and fiber obtained from the bark of any species of the genus Baehmeria. Bahmeria nivea is the species of which the leaves have silvery-white undersides, while the leaves of the species Baehmeria tenacissima have a green underside. Only the species Boehmeria nivea, white ramie, is cultivated on a commercial scale, and among it, the varieties Saikeiseisin and Formosa are considered the best. The ramie plant is a pernnial which sends up large number of straight slender stalks. This grows to a height of up to 250 cm. and diameter varying from 12 to 20 mm. depending on the growing conditions. The leaves, which appear on the upper part of the stalks are approximately heart-shaped, about 50 to 130 mm. wide and 100 to 150 mm. long. The edges are finely serrated. The upper part of the leaf is brilliant, medium green and the underside is silvery white. The flowers have been described as greenish-white in color, borne in declinate clusters in the axils of the leaves. Pistillate and staminate flowers are generally found on the same stalk, the former on the upper part of the stalk and the latter on the lower part. The seeds are produced in great numbers, are very small, said to average 7 millions per kilogram. The root system of the plant consists of storage roots, small fibrous roots, and rhizomes.

Ramie is a perennial crop, but needs replanting every six to eight years. A field of ramie usually reaches its period of

highest yield during the third or fourth year after planting and will continue to do so until the sixth year. After the sixth year, the root becomes too dense which will result in smaller stalks and a corresponding decrease in fibre yield. This can be remedied by application of a larger quantity of compost and nitrogen fertilizer or by pruning of the rootstock by either cutting out the older parts of the root system or by cutting the roots which appear near the surface of the soil. After this operation, the field will produce a satisfactory yield for another two years, after which it has to be replanted.

Ramie forage constitutes about 40% of green plant. It is well known for its high value as animal feed.

Ramie shive amounts to about 70% of dry ramie stalk. It is a waste from extraction of ramie bast fiber but can be used to grow mushroom or to make compost preferably with hog or cattle manure.

World production of ramie was estimated at 130,000 tons in 1975 by Tropical Institute of England. China accounted for production of 100,000 tons of crude fiber per annum in 1981. In Brazil, ramie fiber production dropped and only less than 2,000 hectares remained.

In the Philippines, 1981 ramie production revived to 2,440 hectares. With six crops a year in the Philippines, one hectare of ramie can produce about 2 to 2.5 tons of crude fiber.

2. Project Background

The ramie plant was commercially grown in China and to a limited extent in tropical South American continent.

The Philippines ramie industry gained economic importance immediately after production began in 1930 due to the easy availability of the required inputs and the suitable climate conditions

for the propagation of the plant. The growth of the industry was hampered by the outbreak of World War II, but gained renewed prominence in the 1950's. In 1955, a total of nearly 4,000 hectares was given over the production of ramie. In the following year, exports surpassed 1,000 metric tons. Peak production was achieved in 1963 - 65 with maximum production of 5,500 metric tons in 1965 and exportation of 4,500 metric tons in 1964. In 1981, a total of nearly 2,440 hectares was given the production of 4,444 metric tons and exportation of 845 metric tons to Japan.

The climatic conditionin Padag, Mindanao from 1956 to 1965 is as follows: The temperature (average) was 27.6°C, the rainfall (average) was 2,104 mm. per year. In Ramcor Farm (Buluan, Maguindanao) as follows: In 1982, the temperature (average) was 31.04°C; in 1981, the rainfall was 1,085 mm.

The soil in Davao and Maguindanao are sandy loam. The pH value is from 3.7 to 6.7, most land is very acidic. In Ramcor, almost all the soil samples analyzed showed lack of potassium and magnesium. Most field has too high phosphorous content.

Ramie is a perennial fiber crop. In Belle Glade, Florida, U.S.A., ramie growth in peat soil was over thirty years. In some field of Ramcor Farms, the ramie growth was over twenty years. With proper care and management, a farmer can produce as much as 12 piculs or 760 kilograms of crude fiber per hectare in one harvest. Ramie is at the peak of its production, when it is three to five years of age. In Davao during dry season, the ramie field has no irrigation. Here, the farmer produces 7 piculs of crude ramie fiber per hectare in one harvest. While in Ramcor Farms, the production of ramie was unstable, the fiber quality is inferior to the fiber from Davao.

The demand for natural fiber is increasing, and world production of ramie and flax are not sufficient to meet the demand. The market potential for the ramie fiber will be assured.

Many farmers and Ramcor Farms planted ramie varieties introduced from Japan and U.S.A. twenty to thirty years ago.

Some varieties were mixed. Both the ramie yield and fiber quality could not be improved. Collecting and choosing the excellent varieties of ramie through breeding will be necessary.

The Government of the Philippines has sought UNIDO's assistance in order to identify the areas where more serious research efforts should be concentrated, and to prepare a development plan for the revival of the industry.

3. Official Arrangements

The request for United Nations assistance by the Philippine Government was made in early 1981 under SIS project. The project was approved in November 1981 and became operational in June 1982 for two ramie experts to serve three months. The mission was represented by Mr. Min Li Lai, the ramie production expert and Dr. C. Chu, the ramie processing expert. Mr. Lai reported on October 1, 1982 whereas Dr. Chu on September 8, 1982. Both experts were scheduled to last three months. The cooperating agency was the Philippine Textile Research Institute assisted by the Ramie Textile, Inc., a private enterprise engaged in ramie textile production. RAMITEX helped on special equipment for soil fumigation and supply of farm chemicals. The San Miguel Corporation, Ramcor Farms helped on ramie experiments and hog feeding tests. The Institute of Plant Breeding, the University of the Philippines carried out ramie breeding.

4. Contributions

UNIDO contribution was:

Project personal experts on	m/m	1982
1. Ramie production	1/3	$15,600
2. Ramie processing and finishing	1/3	15,600
Official travel	2/3	3,200
T o t a l		$34,400
Project Fellowship (including airfare)		1983
a) Ramie processing	1/3	$ 9,000
b) Ramie finishing	1/3	9,000
UNIDO Total Contribution		$52,000

Government Contribution in Kind (in Pesos)	1982
Counterpart personnel	₱21,751
Facilities	15,000
Sundries	6,000
Miscellaneous	9,180
T o t a l	₱51,931

Counterpart Contribution in Kind by Private Sector (in Philippine Pesos)	1982
Counterpart personnel	₱10,000
Facilities	6,000
Sundry	3,000
T o t a l	₱19,000

5. Objectives of the Project

a) Development objective

The development object of the project is to contribute to the attainment of the national development objectives of the Philippine government, which includes the maximization of employment opportunities and income generation, especially in areas where ramie can be grown profitably, dispersal of industrial, self-reliance in vital products made from indigenous materials and import substitution through the manufacture of exportable products.

b) Immediate objective

The immediate objective of the project is to assist the government in the following:

- to identify existing problems and research need of the local ramie industry;
- to render ad hoc technical advice on the various aspects of ramie production and production and processing;
- to identify possible areas where further foreign technical assistance (in the form of technical expertise, foreign training and/or equipment) will be required for the revitalization of the ramie industry.

6. Training

Fellowship training for two trainees, production, processing and ramie finishing techniques, will be provided by UNIDO. The trainees will receive three months technical training abroad.

7. Work Plan

I. Improving the Management on Ramie Field
(Ramcor Farms, Maguindanao, Cotabato)

a) Seed Bed

1. Prepare land and planting
2. Weeding
3. Transplanting the seedlings

b) Fertilizer Observation

1. Fertilization on old ramie field
2. Ramie harvesting on old ramie field
3. Fertilization on old ramie field
4. Preparation of bed and planting on new ramie field
5. Transplanting ramie seedling on the new ramie field
6. Interplanting of mongo beans on new ramie field
7. Fertilization on new ramie field
8. Ramie harvesting
9. Mongo bean harvesting

c) Fertilizer Test

1. Soil sample analysis
2. Preparation of bed and planting
3. Weeding and fertilization
4. Ramie harvesting

II. Maximum Utilization of Ramie By-Products
(Ramcor Farms, Piggery Department)

a) Using the ramie leaves as piggery feeds

b) Collecting the piggery waste for compost

III. Choosing the Excellent Varieties of Ramie through Ramie Breeding (Institute of Plant Breeding, Los Baños, Laguna)

I. Recommendation

1. An optimum pH range of 4.8 to 6.5 should be adopted for ramie cultivation (Medina, Dempsey). Few fields of Ramcor Farms has pH under 4.8. In Davao, the ramie field pH is 4.3; it shows acidic. Ramcor Farms has applied limestone ($CaCo_3$) at 2.5 to 5.0 tons per hectare to increase the soil pH value in every five years. In 1966 and 1970/71, 407.41 hectares has been applied, the limestone 3,351.62 tons, it costs ₱750,763. Every year, the cost of limestone was ₱75,076.

Don't apply limestone to the ramie field. The soil of Ramcor Farms is sandy loam. It should have large amount of organic matter as compost for the soil to increase the fiber yield by the following methods:

a) Planting sesbania and sum hemp as a green manure crop
b) Spreading the hog manure on ramie field after ramie harvest
c) Apply compost at 10 tons/ha on ramie field after ramie harvest
d) Apply grass or wood ash on ramie field after ramie harvest, especially during rainy season.

2. Ramie varieties in Ramcor Farms were introduced from Japan and U.S.A. twenty to thirty years ago. Their ramie varieties are as follows: "Green slender", "Miyazaki 112" and "Murakami". The former two varieties are predominant, but the varieties were mixed. The mixed ratio on "Green slender" and Miyazaki 112" are 65:35 from the investigation of ramie seedbed. The "Miyazaki 112" have big stem, resist wind and fast growing with high yield of fiber. While the "Green slender" variety with small stem easily falls down by wind.

Making ramie seedbed, selecting the rhizomes of "Miyazaki 112" from the ramie fields and planting in the seedbed for propagation will increase ramie fiber yield.

3. After ramie harvest, apply compost at 10 tons/ha and urea at 50 kgs/ha. After one month, apply urea at 100 kgs/ha. It will increase the fiber yield and decrease the cost of fertilizer.

4. In Ramcor Farms, during the dry season after ramie harvest, the ramie field should have sprinkle irrigation within one week, then apply the fertilizers. If the ramie field has spread hog manure, sprinkle irrigation must be followed.

5. Ramcor operations produce ramie waste 22 to 25 tons per day, fresh ramie leaves 10 to 15 tons per day. The piggery department has pig 15,000 head, they produced pig manure at 120 tons per day. The fresh ramie leaves can be returned to the field as fertilizer. But the fresh ramie waste is acidic, don't put it on ramie field. Piggery manure is the main organic matter in Ramcor Farms. It not only can be spread in ramie field but also can make fine compost by mixing with ramie waste.

6. Ramcor Farms need a large compost mill, to use the piggery manure, ramie waste, ramie leaves and ramie pith, etc. as raw materials to make compost.

7. In Ramcor Farms, the ramie planting fields were 2m. wide and 100 m. long to keep good drainage. The planting field should be changed to 4m. wide and 100 m. long, the drainage is still good. It will increase the ramie planting field by 10%.

8. During the first year in ramie cultivation, the field grass must be weeded clean, using the "nut grass" tool. Missing holes need replanting with large plant.

9. In Davao ramie plantation, the ramie varieties were mixed. This should be changed to the "Miyazaki 112" variety for planting. There are interplanting cassava with ramie as a harvest mark tree. To keep up soil fertility, the mark tree should be changed to planting leguminous sunn hemp as a ramie harvest mark plant.

10. For a long range plan of ramie industry in the Philippines, a ramie research center at PTRI should be established, a model ramie plantation at Ramcor Farms, San Miguel Corporation should demonstrate modern ramie farm management. Research project on ramie cultivation will be carried out there. Ramie breeding should be made at the Institute of Plant Breeding, University of the Philippines.

II. Objective of the Project

a) Job Description

Purpose of the Project

To assist the government of the Philippines in developing a program for revitalizing the ramie industry in the Philippines.

b) Duties

The expert on ramie fiber production will be based on the Philippine Textile Research Institute (PTRI). The expert will coordinate activities with the expert on ramie fabric processing. Specifically, he will be expected to:

1. Conduct a survey on the research needs of the ramie industry;

2. Prepare a program to accelerate the development of the ramie industry in the Philippines;

3. Provide the technical advice on ramie production and processing to the appropriate government and private counterpart staff;

4. Make recommendation and give solution to the existing problem and bottlenecks encountered in the development of the industry.

III. Activities

1) October 3, 1982 at Manila Garden Hotel - meeting with Mr. Martin Minke, UNIDO Headquarters, Dr. Chu, UNIDO Consultant, Mr. Aristeo T. Ycasiano, Vice President, Mill General Manager, Mr. Bernardo, Vice President, Mr. Eligio T. Chavez, Asst. Vice President and Division Manager; Mr. Nicamor R. Bencho, Vice President, Production, RAMITEX and Ms. Evelyn, Research Staff, PTRI.

2) On the same day, afternoon visit - Fil-Fibers Mfg., Inc. Plant, with Mr. Minke, Dr. C. B. Tagannatha Rao, Dr. Chu met Ms. Jane Y. Wallare, General Manager.

3) October 4, 1982 - visited the PTRI with Mr. Minke, Dr. Chu, met Dr. Eduardo P. Villanueva, Director, PTRI, Mr. Alfone, Acting Director, Mrs. Reyes, Chief at RDD, Ms. Evelyn and Clair, Research Assistants. Brief Account of PTRI was held. PTRI have made a good contact with the RAMITEX and the Institute of Plant Breeding, University of the Philippines.

4) On the same day, afternoon visit - Ramie Textile, Inc. Mill, met Mr. Ycasiano, Mrs. Urgel, Headquarters at Fiber Quality Control, RAMITEX, Mr. Bencho and Mr. Jose Antonio D. Olives, Asst. Vice President, RAMITEX, Brief Account of RAMITEX was held.

5) October 5, 1982 - visited Mr. Ramon H. Davila, President RAMITEX with Mr. Minke, Dr. Chu, Mr. Ycasiano.

6) October 6, 1982 - visited the Institute of Plant Breeding, U.P., the Philippine Council for Agriculture & Resources Research (PCARR) with Ms. Clair and Rosario, PTRI, met Mr. Juanito L. San Pedro, Assistant, IPB, U.P. and Dr. Ponciano A. Batugal, Asst. Director General.

7) November 12 and 23, 1982 - visited IPB, U.P. again with Ms. Evelyn, Clair and Dr. Chu. Met Dr. Rodolfo P. Cabangbang, Program Leader, IPB, U.P. They have planted some ramie varieties in pot which were introduced from Davao Exp. Sta. to develop nematode resistant varieties and mutants.

8) October 7, 1982 - visited Bureau of Plant Industry, Bureau of Soil, Bureau of Soil Service Laboratory with Ms. Clair, PTRI, got some reports of soil samples analysis and water table levels in Davao.

9) October 11, 1982 - visited RAMITEX with Mr. Ross H. Milley, Resident Representative, Asst. UNDP in the Philippines, Mr. I. Pluhar, Senior Industrial Development, Field Adviser UNIDO and Miss Betel Tassew, UNIDO in the Philippines, Dr. Chu met Mr. Ycasiano, Mrs. Urgel, Mr. Bencho and Mr. Jose, Brief account of Ramitex was held.

10) October 12, 1982 - two visits were made to Davao ramie farms and Davao ramie fiber production and trading firms. The current situation of ramie growers was reviewed.

11) October 13 - 24, 27 to November 3, 1982 - visited the Ramcor Farms with Dr. Chu, Mr. Florendo D. Pal-lays, Jr. Ramitex Inc. Met Mr. Amador C. de Mesa, Plant Manager, Engr. Solomon C. Ines, Engineering, Mr. Danie A. Ventura, Agronomist, Mr. Carlito de la Cruz, Ramie Production Counterpart, Mr. Gerardo A. Villareal, etc. Carried out the ramie field experiments and test on hog feeding with ramie forage.
October 23 - a meeting was held in Ramcor Farms with the above persons.

12) October 25 - 26, 1982 - visited the Ministry of Agriculture Regional Office, Davao City and Davao Exp. Sta. with Dr. Chu, Mr. de Mesa, the main crops are fruit crop, vegetable and abaca, etc., ramie work has been transferred to the Ministry of Trade Industry, Philippine Textile Research Institute.

October 26th - visited the above Institute with Mr. de Mesa, met Mr. Ricardo C. Alfonso, Asst. Director. Visited Davao Fiber Producer's Cooperative, Inc. with Mr. de Mesa. Met Mr. Catauno P. Mendez, Manager. The raw ramie fiber is all exported to Japan. The ramie farms have some problems; the soil became acidic, due to the ramie has been planted 10 to 20 years, the fiber yield decreased.

13) November 4, 1982 - President Davila, RAMITEX and Vice President Ycasiano of RAMITEX, Mr. Arturo V. Cucio, San Miguel Corporation and Dr. Chu arrived Ramcor Farms. Staff meeting was held upon their visit.

14) November 15, 1982 - As both RAMITEX and Ramcor Farms are subsidiary organizations of San Miguel, a meeting with the President of San Miguel, Mr. Ernest Kahn was made with Mr. Davila, Mr. Ycasiano and Ms. Evelyn and Canlas, PTRI and Dr. Chu. New ramie fabric samples were presented with a brief statement of our review on the Philippine ramie industry. Mr. Khan expressed keen interest in modernizing the ramie industry with emphasis on growing ramie as intercrop with coconut trees.

IV. Achievement of Immediate Objectives

Ad Hoc technical advice on ramie field experiments and test on hog feeding with ramie leave at Ramcor Farms were made. Ramie breeding at the Institute of Plant Breeding, U.P. was carried out during October 12 - December 28, 1982.

1. An observation of ramie silage was made by using fresh ramie leaves with 2% molasses.

2. Ramie seedbed was planted with rhizomes. The germination was good, but two ramie varieties were found mixed, after one month. The "Miyazaki 112" had plant height 40 cm. 10.3 tillings per plant and 7.4 cm. on diameter of stem. It is fast growing, while the "Green slender" only had plant height 16 cm. 8.2 tillings per plant and 4.4 cm. on diameter of stem. The ratio of mixture are 35:65. The seedling of "Miyazaki 112" has been transplanted to the field for ramie experiments.

3. Observation on fertilizer of ramie - old ramie planting field.

Chemical fertilizers, compost and liquid fertilizer (Hikai) were applied on the ramie field. After 51 days, harvest was made. All ramie stalks had been decorticaled on Corona machine to strip the fiber. Every harvest, applying compost at 10 tons per hectare and urea 150 kgs/ha gave the best combination.

The ramie have plant height 1.84 m., 13.7 cm. on diameter of stem. The yield of fiber is estimated at 760 kgs/ha, much higher than check plot with common chemical fertilizer. The fiber yield increased 19% (720 kgs/ha/year). It's worth ₱6,920/ha/year (at ₱11/kg), the cost of fertilizers decreased at ₱640/ha/year, the total benefit is calculated to reach ₱8,560/ha/year.

4. Observation on fertilizer of ramie - New ramie planting field.

Selected plots were planted and transplanted. After weeding, the chemical fertilizers and compost were applied on the ramie field. The intercrop mungo bean was sowed between the ramie rows. Its growth was nice.

5. Ramie fertilizer test

Selected plots were planted and transplanted. Large plants were used to replant missing holes. After weedings, the chemical fertilizers were applied. Before planting, the soil samples were checked and analyzed as pH 6.78, O.M. 3.67%. The soil is deficient in potassium.

6. Experiment on hog feeding with fresh and dehydrated ramie forage.

This experiment was started in November 3, 1982, common feed, fresh ramie leaves and dehydrated ramie leaves were used and weight gain of each hog was recorded every week. The hogs are in good health under all feed tests. The feeding test with fresh ramie by replacing 25% of common feed, the hog weight are little light than that with common feed in initial period.

7. Application of ground limestone ($CaCO^3$) in Ramcor Farms.

In Ramcor Farms, the desired soil pH has already attained (around pH6), the ground limestone ($CaCO^3$) were applied in 1966, 1970/71, 1976 and 1981. In 1966, 1,847.97 tons limestone were applied on 372.82 hectares. In 1970/71, the area was 441.99 hectares which received 1,505.83 tons limestone.

The total cost of limestone in above ten (10) years was ₱750,763 (limestone with ₱224/ton), or ₱75,076 per year.

8. Pure line selection among ramie varieties was made. Harvesting the "Miyazaki 112" and "Green slender" were compared. "Miyazaki 112" has plant height 1.48 m., 15.5 cm. diameter of stem, the yield of fiber was 896 kgs/ha. These values are higher than "Green slender". The fiber increase reached 38% (1,488 kgs/ha/year). The fiber would be worth ₱16,368/ha/year based on ₱11/kg.

9. Ramie leaves and tops were analyzed by the central laboratory, San Miguel Corporation; Both showed high crude protein (24.9%) and high crude fat (8%).

10. Ramie Breeding

The Institute of Plant Breeding, U.P. has tested fumigated soil fumigation with dowfume MC-2, and sowed the ramie seed in the fumigated pots. Introducing the ramie seeds of excellent varieties has been made. The seeds from Taiwan, Republic of China will arrive soon.

V. Further Technical Assistance

1. Further technical assistance in propagating the rhizomes of "Miyazaki 112", using the ramie stem for cutting. All 650 hectares in the Ramcor Farms should be planted with the excellent varieties. The yield of ramie fiber will be greatly improved.

2. Ramcor Farms needs a modern compost mill to produce a large quantity of compost, as main fertilizer on ramie. Both the yield of ramie fiber and the fiber quality will be improved.

3. The research project on ramie cultivation should be carried out in Ramcor Farms for ramie production in the future.

4. For long range technical assistance, establishment of ramie research center at PTRI is recommended. Advising

research program especially in ramie breeding, the Institute of Plant Breeding, U.P. has joint research project with PTRI.

VI. Utilization of Project Results

1. Ramcor Farms will stop to use limestone. They have planted the sesbania on 800 m^2 area on October 29, 1982 and one hectare on November 17, 1982, to collect the seeds for green manure crop. From November 25 to December 31, 1982, two hog manure spreaders have been used to spread the hog manure in 24 hectares.

2. More compost will be made from ramie waste and hog manure. Part of the ramie field in Ramcor Farms has been filled to apply compost.

3. The excellent ramie variety "Miyazaki 112" will be segregated from the mixed field. Their propagating by rhizomes and cuttings in the near future at Ramcor Farms will be made.

4. Ramie breeding has been started in the Institute of Plant Breeding. After receiving the excellent seeds of ramie varieties from Taiwan, Republic of China, the mutation breeding will be carried out soon.

5. Ramcor Farms will change the new plot size from 2 m. wide to 4 m. wide in order to increase the area of ramie planting. Some management on ramie field, like weeding, sprinkle irrigation, replanting missing holes, etc. will be improved.

VII. Finding

1. Ramie seedbed

One plot 2 m. wide, 50 m. long, th[illegible]city was 30 cm. x 20 cm., the length of rhizomes w[illegible]. After one month growing, select the uniform [illegible]ransplant on the field.

2. In the first year, mungo bean w[illegible]an intercrop

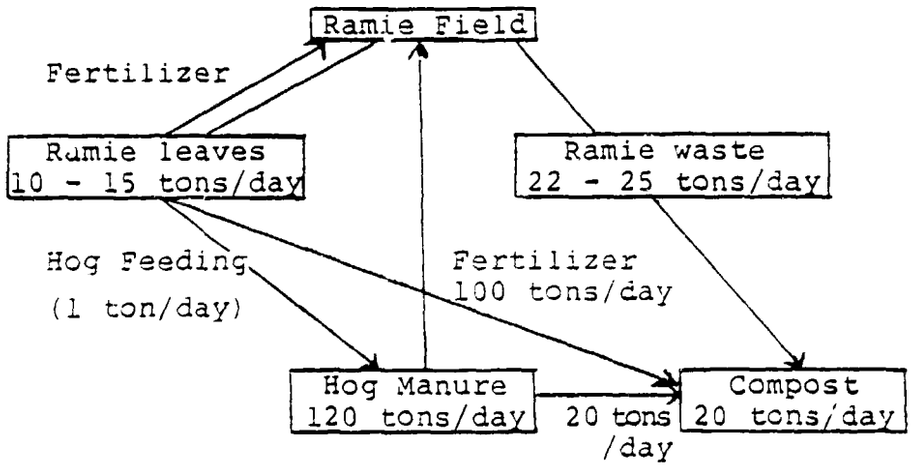
with ramie. The distance between the rows was 37.5 - 50 cm. The quantity of sowing seed was 15 kgs/ha. It controlled the weeds and improved the soil fertility.

3. The best treatment in fertilizer application of ramie was compost at 10 tons/ha with urea at 150 kgs/ha (N-P_2O5-K_2O = 114 kgs/ha-26 kgs/ha-33 kgs/ha). At harvest, the stem was very high and big. The fiber was graded RD-A or RD-1.

4. Ramcor Farms has mixed the following two varieties as follows:

Varieties	Seedling	Leaf	Height(M)	Diameter of stem (cm)	Yield of Fiber(kgs/ha)
Miyazaki 112	grow fast	big	1.48	15.5	896
Green slender	"	slowly	middle 1.73	12.9	648

5. The chart of maximum utilization of ramie leaves, ramie waste and hog manure in Ramcor Farms.



VII. Annexes

1. International Staff

Mr. Min Li Lai, Republic of China, expert in ramie fiber production, mission period was September 29, 1982 to December 28, 1982.

Dr. Chien Chu, Republic of China, expert in ramie processing technology and fabric finishing, mission period was September 9, 1982 to December 7, 1982.

2. Senior Counterpart Staff

Dr. Eduardo P. Villanueva, Director, Philippine Textile Research Institute (PTRI), Bicutan, Taguig, Metro Manila. Ms. Cecilia C. Reyes, Chief, Research & Development Division.

Ms. Zenaida I. de Guzman, Sc. Research Specialist IV, RDD

Ms. Rosario E. Canlas, Sc. Research Specialist III, RDD

Ms. Evelyn L. Llamas, Sc. Research Specialist I, RDD

Ms. Clarita Chan, Sc. Research Assistant II, RDD

Mr. Aristeo T. Ycasiano, Sr., Vice President & General Mill Manager, Ramie Textiles, Inc., Bagbaguin, Valenzuela, Metro Manila

Ms. Pura G. Urgel, Chief, Quality Control, RAMITEX

Mr. Amador C. de Mesa, Plant Manager, Ramcor Farms, San Miguel Corporation

Mr. D. A. Ventura, Chief, Field Dep., Ramcor Farms, San Miguel Corporation

Mr. Carlito de la Cruz, Assistant, Ramcor Farms, San Miguel Corporation

Dr. Rodolfo P. Cabangbang, Program Leader, The Institute of Plant Breeding, U.P., Los Baños

Mr. Juanito L. San Pedro, Assistant IPB, U.P., Los Baños

3. Fellowship Awarded

Name	Field	Place	Duration of Study
Evelyn L. Llamas	Textile finishing	Korea & U.S.A.	3 months
Pura G. Urgel	Textile processing	Korea & U.S.A.	3 months

TABLE I

MEAN MONTHLY TEMPERATURE AND RAINFALL OF VARIOUS RAMIE PRODUCING AREAS

	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	Average or Total
IRI, S. Korea, lat. 35° 49' N.3 crops annually													
Temp. (°C)	2.5	0.1		11.3	17.2	21.8	26.1	26.3	20.8	14.2	7.6	2.0	12.9
Rainfall (mm)	20	26		72	78	150	230	236	126	44	47	36	1,114
Kumamoto (Kyushu), Japan lat. 32° 48' 3 crops annually													
Temp. (oC)	5.0	5.6		14.0	18.3	21.7	26.1	27.5	23.9	17.2	12.3	6.4	15.6
Rainfall (mm)	65	68		162	166	368	314	163	174	112	70	59	1,852
Tokushima (Shik ku), Japan lat. 34° 36' 3 crops annually													
Temp. (°C)	5.3	5.6		13.6	18.1	22.0	26.1	27.2	23.9	18.1	12.8	3.9	15.4
Rainfall (mm)	51	62		128	154	198	174	196	316	187	88	60	1,715
Tainan, Taiwan, lat 22° 57' N.4 crops annually													
Temp.(°C)	15.3	16.1		21.4	24.7	27.0	28.9	28.5	28.5	27.2	23.3	17.8	23.0
Rainfall (mm)	95	135		133	176	222	222	221	207	139	106	73	1,837
Ping-Tung, Taiwan, lat. 22° 40' N.5 crops annually with irrigation													
Temp. (°C)	19.2	20.0		24.7	27.2	27.8	28.3	28.1	27.8	26.1	23.3	15.3	25.6
Rainfall (mm)	28	12		81	169	480	415	567	251	34	32	12	2,118
Curitiba (Parana), Brazil lat. 25° 31' S.3 crops annually													
Temp. (°C)	21.7	21.4		16.9	14.7	12.8	13.3	13.9	15.0	17.2	19.2	19.4	17.1
Rainfall (mm)	176	168		81	99	99	64	84	119	135	127	145	1,404
Pandag (Mindanao), Philippines, lat 6° N.6 crops annually with irrigation													
Temp.(°C)	27.2	27.5	28.1	28.6	28.3	27.8	27.2	27.2	27.3	27.5	27.5	27.3	27.6
Rainfall (mm)	22	64	84	156	218	253	326	218	290	174	201	98	2,104
Belle Glade, Florida, USA, lat 27° 15' N.3 crops annually													
Temp.(°C)	17.0	19.1	21.1	21.7	21.7	26.0	26.7	27.0	26.3	24.3	20.3	16.1	22.2
Rainfall (mm)	41	42	75	85	110	241	209	212	128	132	60	38	1,[illegible]2

a. Blocked areas denote principal growing period

Table 2. PRODUCTION OF RAMIE FIBER IN THE PHILIPPINES (1978-81) Unit = kg.

Year	Castillo E.I.	Davao F. P.	Ramcor Farms	Minided	TAG Cotabato	DAX Davao	Total
1978	937,500		709,125				1,646,625
1979	1,250,000	475,000	692,875				2,417,875
1980	1,614,862	825,000	607,125	756,625	86,250		3,889,862
1981	1,536,300	875,000	1,010,000	968,950	23,625	30,125	4,444,004

Source = Ramitex, Castillo E.I., Davao F.P., Ramcor Farms.

Raw fiber = RD-1 C.I.F. Japan US $1.392/kg. RD-2 C.I.F. Japan U.S. $1.3025/kg.

Fiber worth (1981) = U.S. $5,788,315.

Table 3. COMPARE ON FIBER QUALITY OF RAMIE (1979-1982)

I. Tensile strength in KM.

Ramcor	Year	Decorticated RD-1	Decorticated RD-2	Degummed RD-1	Degummed RD-2	Mintrade	Decorticated RD-1	Decorticated RD-2	Degummed RD-1	Degummed RD-2	Castillo	Decorticated RD-1	Decorticated RD-2	Degummed RD-1	Degummed RD-2
	1979	27.3	24.4	31.4	35.8		29.0	28.3	30.4	29.9		28.6	28.7	30.6	30.5
	1980	25.2	26.0	28.4	29.0		27.3	28.4	31.5	29.4		28.8	28.7	30.3	30.1
	1981	24.8	25.4	26.8	27.0		30.6	28.8	28.7	29.2		30.3	29.7	29.7	29.1
	1982	-	21.8	-	25.0		26.4	27.7	28.7	28.6		30.9	28.0	28.2	29.2
	Average	25.3	28.3	29.2	26.7		28.3	28.3	29.8	29.3		29.7	28.8	29.6	29.7

II. Denier

Place	Degummed RD-1	Degummed RD-2
Ramcor	5.43	5.01
Mintrade	5.06	5.09
Castillo	5.12	4.89

III. % Noncellulose Content

Place	Degummed RD-1	Degummed RD-2
Ramcor	2.20	2.01
Mintrade	2.02	2.23
Castillo	2.15	1.96

IV. % Moisture Content

Place	Decorticated RD-1	Decorticated RD-2	Degummed RD-1	Degummed RD-2
Ramcor	10.25	10.13	6.97	7.32
Mintrade	10.24	10.43	6.91	7.30
Castillo	10.15	10.32	6.98	7.10

V. % Oil Content

Place	Degummed RD-1	Degummed RD-2
Ramcor	0.70	0.65
Mintrade	0.70	0.78
Castillo	0.77	0.73

Source = Fiber quality control and Research Laboratory, Ramitex

Table 4. COST OF RAMIE PRODUCTION

Item	Cost = ₱/Ha	%
1. Land Preparation	2,060	25.84
2. Seed Procurementation	2,560	32.11
3. Fertilization	616.50	7.73
4. Pest and Disease Control	433	5.43
5. Weed Control	600	7.52
6. Ratooning	300	3.76
7. Fertilization and Pest Control	723	9.07
8. Harvesting	680.97	8.54
Total	7,973.47	100

Source: L. L. Castillo Ent. Inc. Ramie Culture

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BRIEF ACCOUNT OF SAN MIGUEL CORPORATION RAMCOR FARMS

- December 1982 -
- oOo -

HISTORY -

In the early part of 1950's Don Vicente Araneta concretised his vision to establish a farm to cultivate ramie in the country. He transported tediously the best farm machineries available then and went on to establish and operate what was to be known as RAMCOR - The Ramie Corporation of the Philippines, which decorticated fiber product is to be exported to Japan.

LOCATION -

Ramcor Farms is located at Buluan, Maguindanao in Central Mindanao, 150 kilometers south of Davao City, 100 kilometers north of General Santos City and 100 kilometers south of Cotabato City.

CLIMATE -

In 1981 the rainfall in Ramcor Farms was 1085mm; in 1982 the average temperature was 31.04°C, no typhoon damage but some times have strong season's wind in October. Rainfall is well distributed in the area of the plantation during the months of June to November. On the dry months, December to May. The Company uses an overhead irrigation system with rainbird sprinklers.

SOIL FERTILITY -

Most fields in Ramcor Farms are sandy loam, some field are loam or sandy clay loam. The pH value (acidity and all-salinty) ranges from 3.7 to 6.7; most of the fields are already acidic. When the desired pH is already attained (around pH 6) a new rate of fertilizer application can be followed. Application of ground limestone (CaCo3) is done after plowing and then mixed by harrowing in order to insure a thorough incorporation in the soil. The limestone is applied five or two and half tons per hectare every five years. It was started in 1966. All the fields are low in potassium

Brief account of San Miguel Corporation Ramcor Farms, contd...

content as can be expected from sandy soils; most field has too high phosphorous content and on some fields, the aluminum toxicity could be a problem.

AREA AND MAIN AFFAIR -

The land area is 992 hectares, with 450 hectares planted to ramie and the rest for feeder roads, canals, buildings etc. and another 200 hectares being fallowed to be planted eventually to ramie making a total of 650 hectares ramie plantation. The hog farm occupies around ten (10) hectares with a population of 15,000 heads. Ipil-ipil planting was started in 1977. Its vast leaf feed and trunks fuel potential suit well in progressive Ramcor Operations where ramie waste and hog manure are utilized in recycling process. The ramie leaves are being fed to the hogs as roughage to take care partly of the concentrate requirement. The hog manure is being utilised in the soil amendment program of the famie fields. The solid manure is hauled to the field for soil incorporation and the liquid is passed through overhead irrigation to help in the fertiliser program of the farm. Further, a pilot project on methane gas generation is being undertaken to utilise in energy program.

PRODUCTION-

Ramie fiber production was six hundred to one thousand M.T. per year from 1978 to 1981. All ramie fiber were sold to Ramitex. In 1980 was 669,950 kgs., in 1981 was 838,250 kgs.. Piggery Department in 1980 produced 42,347 heads; sales 25,089 heads. 1981 produced 38,891 heads; sales 24,338 heads,

STAFF MEMBERS -

Ramcor Farms have 29 staff and 889 laborers with a total employees of 918 as of 1982.

Table I. RESULT OF SOIL SAMPLE ANALYSIS IN RAMOOR FARMS

No. of Field	PH	O.M. %	T.N. %	P. PPM	K	CA	MG	CEC	MN	AL	FE
					me/100g soil				PPM.	me	%
1	5.9	3.06		44	0.39	8.24	4.61	17.52	44.0	trace	0
2	5.8	1.59		45	0.18	7.71	2.56	13.20	41.0	"	0
3	6.5	3.03		30	0.38	4.80	1.17	9.45	40.0	"	18.0
4	5.1	2.56		46	0.08	4.41	0.43	11.32	12.0	0.65	3.0
5	5.2	2.67		102	0.46	2.55	0.50	11.62	7.8	1.01	17.0
6	5.0	2.90		102	0.38	4.22	1.13	14.96	3.0	0.91	0
23	6.1	2.19		13	0.35	4.93	1.80	10.64	2.5	trace	0
25	6.1	1.89		17	0.12	5.24	2.64	10.64	21.3	"	0
27	6.7	2.55		15	0.43	8.41	4.30	16.94	trace	"	0
30	5.7	3.75		70	0.46	4.76	0.96	11.62	0.8	"	0
32	5.9	2.32		30	0.13	5.55	0.76	12.21	trace	"	0
34	5.7	1.49		34	0.08	8.83	1.33	8.66	12.2	"	0
39	6.7	3.67	0.19	181	0.46						
55	4.0		0.02	122	1.73	0.32	0.02		1.0		0.44
63	4.2		0.34	200	1.15	0.25	0.03		1.0		0.40
69	3.7		0.02	363	1.41	0.32	0.03		1.0		0.26
71	4.1		0.03	326	1.13	0.32	0.03		1.0		0.20

Remarks Field No. 1-6, 23, 25, 27, 30, 32, 34 were analyzed in July, 1981. Field No. 39 was analyzed in October, 1982. Field No. 55, 63, 69, 71 were analyzed in July, 1975.

Table 2 - RAMIE FIBER PRODUCTION IN RAMCOR FARMS
(1979 - 1981)

Year	Fiber Production(kg)		Area harvested(ha)		Fiber yield/ha./year	
	Corona	Raspador	Corona	Raspador	Corona	Raspador
1979	61,878	600,248	674.83	933.01	550	3,960
1980	90,125	523,375	658.04	1,078.19	564	2,912
1981	15,000	1,000,000	245.40	2,072.50	361	2,898

In Ramcor Farms, ramie harvest are six times per year. In table 2, every ramie field was:

(1) Area of real harvest (ha.) = Area of harvest ÷ 6
(2) Fiber yield/ha/year = Fiber production ÷ Area of real harvest
(3) Area of real harvest % per year = Area of real harvest ÷ 440 x 100 = 371.22 ÷ 440 x 100 = 84.37 %

Table 3 - RAMIE FIBER PRODUCED AND COST OF PRODUCTION (1979-1981)

Year	Fiber production (kgs)	Cost of Production (P)	Cost per kilogram (P)
1979	692,875	7,572,208	10,93
1980	612,250	10,255,992	16.75
1981	1,010,000	11,078,485	10.97

Note; Information taken from the summary of Operating Report.

Table 4 = EQUIPMENT OF RAMCOR FARMS

Department Location	Machineries Description and Capacities	Capabilities/or Rated Performance
Engineering Shop -		
	Welding Transformer Mach. 500 Amp.	
	Welding Machine Daiden 400 Amp.	
	Transformer Welding Mach. Dynaweld	
	Welding Machine Daiden 500 Amp.	
	Precision Lathe Machine Luh Cheng	
	Lathe Machine Meuser	
	Lathe Machine Myford	
	Shaper Machine Prema	
	Grinder Double Shaft 3/4 HP	
	Power Saw (Japan)	
	Drill Press Flott	
	Air Compressor 5 HP Delco	
	Centrigugal Pump 3 Motor	
	Circular Power Saw	
	Squeese Roll Machine	
	Cement Mixer 1-bagger	
	Valve Master Refacer	
	12/77 Fire Fighting Equipment	
	Bender 3 Roller	
	60 Ton Hydraulic Press Takudo	
	2-Floatable Fire Pumps	
	AC/DC Welding Converter 40C	
	1 - Kilowatt Meter	
	1 - Honda Generator 10HP	
Engineering Power Plant -		
	1 - Fairbanks Morse Gen. Set 42HP 359 KVA	
	2 - Modag Generating Set 200 KVA	
	1 - 15 KVA Generating Set "Wert"	
	Sump Pump 20HP Reliance Motor	3,009 pm
	1 - 12 KVA Generating Set GE 10HP motor	
	2 - Blower 36 blades 3/4 HP	
	HOR Tubular Boiler	150 Boiler HP
	Fuel Day Tank 24 x 10 x 5	
	Blower 2.2 KW Bauknecht Motor	
	Steel Oil Tank 6 dia. x 6 H.	

Table 4 - Equipt., etc. contd...

Field and Maintenance -

Tractor 2nd hand Ford 4 cylinder	42 bhp	
Tractor major 4 cylinder	-do-	
2-Fordson major 6 cylinder	-do-	
Fordson tractor 6 cylinder	78 bhp	
Tractor Ford 4 cylinder	42 bhp	
6-Tractor 4 cylinder	42 bhp	
Tractor 6 cylinder	78 bhp	
"Crane" Crawler	78 bhp	
Backhoe Tractor	45 bhp	
Lamborghini Tractor R704	78 bhp	
2-Lamborghini tractor R704	78 bhp	
4-Deepwell 21,29,68,71.	800 gpm	
6-Shallow Well 4,10,33,37,49,59	300 gpm	
6-Irrig. Pump UD282engine 6 cyl.(43.33 has)	800 gpm	
2-Well Pump Fordson 6 cylinder engine	78 bhp	
Diesel Ford Engine 4 cylinder	42 bhp	
Well Pump S#D-135812 engine (junked)	43.33 has.	78 bhp
2-Irrig. Pump Ford	43.33 has.	78 bhp
3-Pump Pomona Junked		
Well Pump Hytech/2 engine assy.	800 gpm	
1-Lot Aluminum Pipes & Accessories		
2-Rotaspreader Howard		
Irrig. Pump #20 K-Lewis (Junked)		
Leaf converter (junked)		
Replotting Equipment		
Lawn Mower - Bushog		
Back end Scraper Fordson tractor		
2-Lamborghini Plow	18 blades/2 rows	
2-John Deere Plow with 4 disc.		
2-Lamborghini Disc Harrow	18 blades/2 rows	
2-Plow with 3 disc Fordson tractor	16 blades/2 rows	
Harrow with 20 disc. International (Junked)		
Lamborghini Farrower		
2-Plow with 3 disc. Fordson tractor		
Harrow with 16 disc John Deere		
Harrow with 18 disc John Deere		
Steel Tank Oval shaped		
Front end Dozer Fordson tractor (junked)		
Trailer #24 for pest control		

Table 4 - Equipment, etc. contd...

Trailer #27 2 wheels	
2-Trailer #21, 22 for fertilizer	
2-Trailer #35,40 Dump type	
Farrowing Equipment	
Bomford Express Flair Mower	
Disc Harrow John Deere 7H-03	
2-Wheeled tank trailer	
2-Wooder trailer #25, 29	
2-Wheeled trailer # 28	
3-John Deere Disc Plow 805	16 blades/2 rows
Steel water tank 8 x 8 x 4	
2-Steel stake trailer FDS.	
5-Hauling Trailer #45-#49	

Piggery Unit-1 & 2 -

Turbine Pump Well	1,000 gpm
CAT engine Prime Mover	120 bhp
Fordson Engine 6 cylinder Primemover	78 bhp
FM-6 Fordson Tractor 4 cylinder	42 bhp
FE-13 UD-282 with booster pump	800 gpm
98KW 120 HP Generating Set (Junked)	
1-Portable welding transformer	
3-Hammer Mill	
3-Feed Mixer	
2-Amano Bundy Clock	
1-Steel Power Sprayer	

Production -

Electric Hoist	
3-Diesel Engine	8 bhp each
Van trailer #30	
2-Electric Motor 3450 rpm	10 bhp
3-Electric Motor 1750 rpm	10 bhp
1-Electric motor 1765 rpm	10 bhp
1-Electric Motor 1755 rpm	10 bhp
1-Electric Motor 1800 rpm	10 bhp
22-Hauler trailer #1,18,20,31,33	
Stake hauler trailer	
5-Push trailer #1,2,3,4 & 5	
2-Baby trailer #1,2,&3	
3-Push cart shop fabricated	
11-Raspador w/6 heads & Prime Mover	21.8 piculs/day rated capacity/head

Table 4 - Equipt., etc. contd...

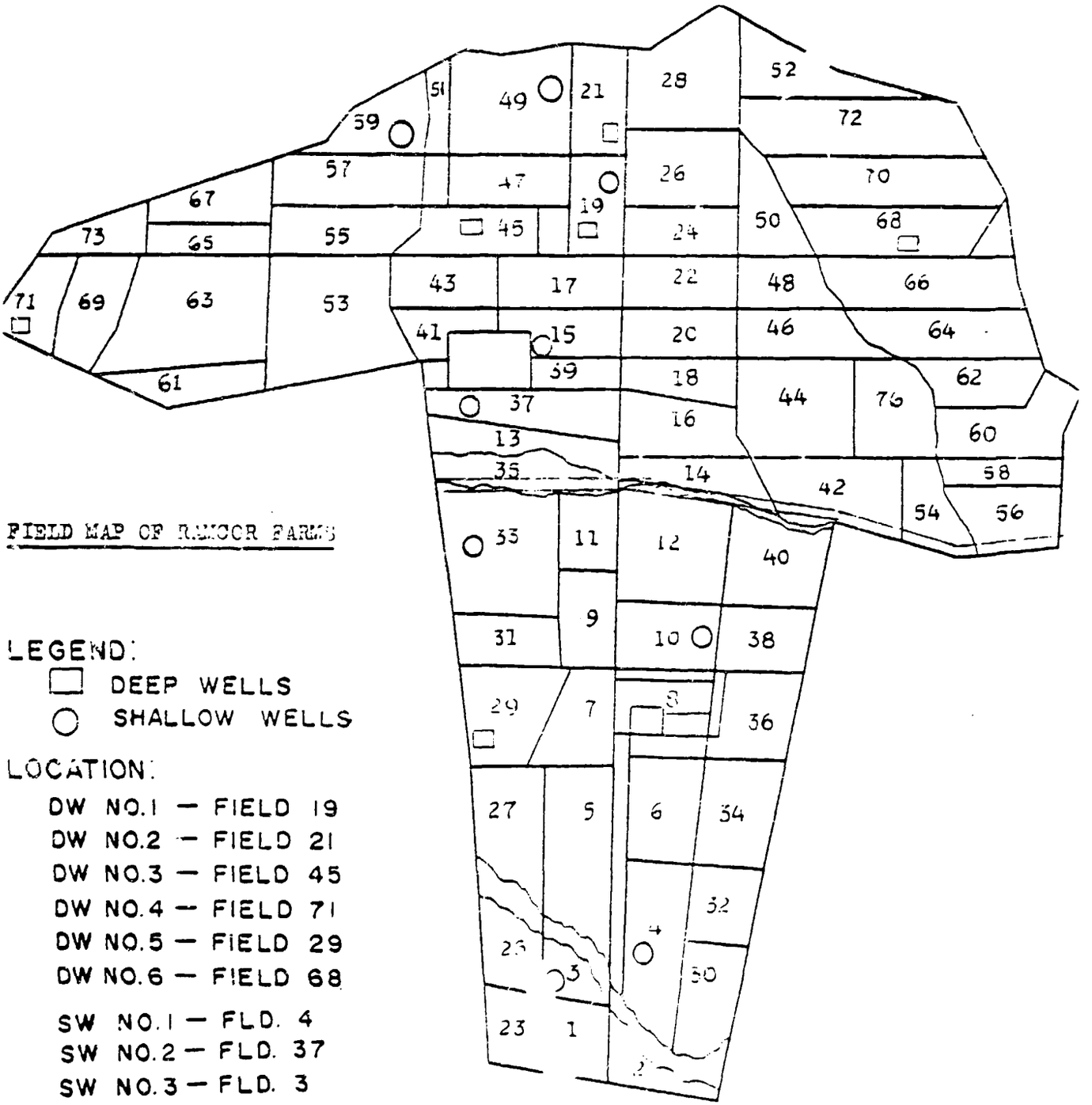
2-Raspador w/6 heads & Motor Prime Mover	
Sump Pump 14.5 kw Garbe motor	300 gpm
Sump Pump 10 Hp brush motor	300 gpm
Sump Pump 15 Hp F-Morse motor	300 gpm
Sump Pump 7.5 Hp Bauknecht	300 gpm
Deep Well # 19 (junked)	
Shallow Well # 19	300 gpm
Brusher 4 & 6 drums with 2 motor	9.9 piculs each/day
2-Blower 36 blades 3/4 Hp motor	
Ribboner & Softener Machine	100 piculs/day
Baling Press Logeman	100 " " "
Travelling Hoist 1/2 Ton Capacity	
3-Fairbanks Morse Scale 500 kg. cap.	
1-Fairbanks Morse Scale 500 kg. cap.	
2-Weighing Scale	
14 pcs. Wooden baling boxes	
48 pcs. Fermenting basket (junked)	
Flight conv. Ramie waste	
Wet fiber brusher 15 horse power	9.9 piculs each/day
Water Presser from Ramitex	
4-Cent. Pumps 4 x 3 w/7.5 horse power	300 gpm
2-Sump Pump 10 horse US motor	-do-
Travelling crane	
Waste conveyor 15Hp motor	
Centrifugal pump	300 gpm
Electric pump	300 gpm
Main Pipe lines 4"Ø	
Main Feeder lines	
Defoliating Machine Local (junked)	
Motor 6 Hp Bauknecht 4.6 KW	
Electric motor 10Hp	
Electric motor 40Hp	
Cooling water tank	
8-Water Softener Drums (Transferred to Ramitex)	
3-Water Softener Tank	
Niagara Pump engine 4 cylinder (junked)	
Air Blower 8" dia. #3 Hp motor	
2-50 KVA transformers	
Motor 2.2 kw 3 HPASEA	
Blower 7.5 Hp motor Belt Drive	
1-unit Decorticator Mohegan (junked)	
2-Hydraulic Press with 1 and 2 Hp	

Table 4 - Equipment, etc., contd...

3-Rolando Strecher Machine #2909,2910 & 2855 - 1 picul/day
Mechanical Dryer Hunter 15 SEC 32 piculs/day
Rectilinear Softener SLMA (junked)
Water presser (junked)
4-Cent. Pumps 4 x 3 w/7.5 horse power 300 gpm
Elevated Water Tank
200 KVA transformer

Administration -

2-Dump truck Izusu DH100 gK-470,471 8 tonner
Izusu Cargo Truck DH-100 10 tonner
MacArthur Jeep J-77-37F Owner type
Mitsubishi Station Wagon L-34056N - pick-up
Toyota Jeep Land Cruiser F-549193 - Service
Mitsubishi Jeep JH4-3113659 - Owner type
Toyota Jeep 2R-665534 - Pick-Up type
5-Thames Dump truck D-55 4.5 tonner
Perimeter Lightings
SSB Transceiver RF-201-3-01



FIELD MAP OF RANCOR FARMS

LEGEND:

- ☐ DEEP WELLS
- ○ SHALLOW WELLS

LOCATION:

DW NO.1 — FIELD 19
DW NO.2 — FIELD 21
DW NO.3 — FIELD 45
DW NO.4 — FIELD 71
DW NO.5 — FIELD 29
DW NO.6 — FIELD 68

SW NO.1 — FLD. 4
SW NO.2 — FLD. 37
SW NO.3 — FLD. 3
SW NO.4 — FLD. 33
SW NO.5 — FLD. 15
SW NO.6 — FLD. 49

JUSTIFICATION FOR EXTENSION OF THE RAMIE PROJECT

Project Title: Development of a Program for Revitalizing the Ramie Industry in the Philippines

Project Activities:

A. Development Objectives:

The development objective of the project is to contribute to the attainment of the national objectives of the Philippine Government, which include the maximization of employment opportunities and income generation, especially in areas where ramie can be grown profitably, dispersal of industrial activities, self-reliance in vital products made from indigenous materials, and import substitution through the manufacture of exportable products.

B. Immediate Objective:

The main objective of the project is to assist the government in the following:

- to identify existing problems and research needs of the local ramie industry;
- to render ad hoc technical advise on the various aspects of ramie production and processing; and
- to identify possible areas where further foreign technical assistance (in the form of technical expertise, foreign training and/or equipment) will be required for the revitalization of the ramie industry.

Project Implementation:

The project expert Dr. Chien Chu specializing in ramie processing started on 9 September 1982. The project expert Mr. Min Li Lai, specializing in ramie fibre production started on 1 October 1982.

For fibre production, Mr. Lai advised improvement of fertilizer application, featuring transplant and intercrops, proper utilization of ramie leaves for hog feed by silage and demonstration of ramie compost from shives by combination with hog manure. Also steps have been secured to introduce improved varieties of ramie from Taiwan, R.O.C. and the United States for finer fibre and higher yields. Field work at Ramcor Farms has been started. Mr. Lai identified potassium deficiency in ramie cultivation. Development of high yielding variety at the Plant Breeding Institute of the University of the Philippines has been arranged.

Dr. C. Chu has made experiments on degumming fresh ramie ribbons and tests on improvement of corona decortication featuring pre-treatment of stalks without leaves for higher capacity and less fibre loss. Integration of degumming with field fibre ribboning was proposed.

Meanwhile harvesting integrated with fibre ribboning was introduced with a design of fibre separator for stapled stalks.

Improved degumming and fibre bleaching process were demonstrated at RAMITEX. Strength tests of the degummed fibres by PTRI showed improved quality and less cost than the two stage fermentation - chemical degumming at RAMITEX.

Introduction of twistless spinning or ramie from U.S.A. and Holland has been made with ramie roving from RAMITEX. Weaving tests has been made at PTRI with silk filament warp of fine yarn and cotton warp yarn for coarse yarn. Fabric finishing for both fabrics showed soft handle and promising results with elimination of fabric hairiness. Further weaving tests with spun silk as warp has been arranged with a private silk Weaving Mill Fil-Fibres Mfg. Inc. Further spinning tests with European and Australian firms have been in progress.

Justification for Extension:

The work on fibre production involves long time of growth period. Various field experiments in progress cannot be finished within this year. Extension of the project would secure some results on fertilizer effect, forage feed for hogs and compost evaluation on fibre yield.

On the processing side, application of in-line degumming in Ramcor Farms and construction of a fibre separator designed for stapled stalks need more time.

Mill tests at RAMITEX with fresh degummed fibre and improvement of spinning, weaving and finishing have not yet been carried out.

Several spinning tests to be made overseas will take more time for processing and subsequent weaving and finishing tests with several textile mills.

Ramie has contributed more than ten million dollars of foreign exchange from export of various ramie products and the potential for even much larger exports is great. The tremendous future of ramie cultivation for rural economy is great, especially when ramie is intercropped with coconut trees. Such a set-up would certainly redound to the amelioration of a great number of coconut planters.

On account of the most favorable climatic conditions in Mindanao particularly, the production cost of degummed ramie fibre with proper technology can be reduced to a level competitive with cotton. The existing textile industry with 172 mills can use more degummed ramie in their blends with synthetic fibres.

A private business group in Davao has requested PTRI for technical assistance for establishing a new textile manufacturing company for ramie in Davao. Consultation with the two experts forinvestment on the industry will pave the way for revitalization of ramie industry in the Philippines.

PHOTOGRAPH OF EXPERIMENTAL RAMIE CULTIVATION IN THE PHILIPPINES

M I N L I L A I, UNIDO Consultant

Field of Ramie Experiments
in Ramcor Farms

Ramie Seedbed in Ramcor Farms

Compare on Fresh Ramie Stem Height of Fertilization Observation

Compost & Urea	Chemic. Fer.	(CK) Chemic. Fer.	Liquid Fer.

Sundrying of Corona Decorticated Fiber from Experimental Plots

Compare on Ramie Stem Diameter of Variety

Miyazaki 112 (left) Green Slender (right)

Feeding Hogs with Fresh Ramie Leaves

Ramie Field in Davao

Ramie Interplant with
Coconut Trees in Davao