

RAMIE CULTURE IN THE PHILIPPINES

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Introduction

Ramie (*Boehmeria nivea* (Lin.) is a fiber-yielding plant indigenous to China. It is known as "China grass" in that country and elsewhere. From China it has been introduced into other parts of the world, namely, Japan, Sumatra, India, United States, England, Java, Borneo, and the Philippines. In these Islands, it is grown extensively in Davao and Cotabato, and lately in Albay, Camarines Sur, Agusan, Laguna, Tayabas, Mindoro, Negros Occidental, Negros Oriental, and other provinces. In 1940 the Philippines produced a little over half a million kilos of fiber valued at about half a million pesos. The prospects of ramie in the postwar period are bright and the industry is bound to expand.

Varieties

Of the commercial varieties known, Saikoseishin, Chuma, and Guiran Taipan No. 1 are the most important. Other varieties of secondary importance are Guiran Taipan No. 2, Taiwan Hakuki, Kagui Hakucho, Kohai Guiran, and possibly Amrai. It is hard if not impossible to distinguish one variety from another based on the external appearance of the plant alone. For practical purposes, however, the above three commercial varieties may be briefly described as follows:

Saikoseishin.—This is the most popular and widely grown commercial variety. It is a monoecious shrub about one to two meters high, with erect stems seldom branching out, with hairy petioles, practically identical leaves, coarsely pointed, with the upper surface green and rough, the lower surface silvery white and the

veins covered with white hairs. This variety is hardy, being drought resistant. It matures in about 65 days and yields more and better quality of fiber than the other varieties.

Chuma.—This variety resembles Saikoseishin in practically all respects but does not grow as tall. The petioles are of pinkish color throughout, gradually disappearing towards the tip. Like Saikoseishin, it is also drought resistant but produces less fiber. It matures in about 55 days.

Guiran Taipan No 1.—This variety possesses morphological characters greatly akin or similar to that of Saikoseishin with the exception of the presence of light and green-colored petioles and a light pinkish coloration near the base of the leaves and midribs. It matures in about 80 days and produces less fiber.

All the above-mentioned varieties fall under the species of *Boehmeria nivea* (Linn.).

The other less popular variety is known as "rhea" or simply called *Boehmeria nivea* var. *Tenacissima* (Rexb.). Both surfaces of the leaves of rhea are green and the plant possesses other characteristics similar to the commercial varieties of *Boehmeria nivea*.

Soil and climatic requirements

Ramie thrives best in deep rich loam soils which are fairly well drained. The presence of sufficient organic matter in the soil is an important requisite as this promotes rapid growth and insures a good crop. Ramie raised on poor lands produces fiber of inferior quality. In places like Davao, Albay, Camarines Sur, Samar, and Leyte, old and fertile abaca lands have

been found suitable for ramie growing.

Ramie grows best in places with a uniform distribution of rainfall throughout the year, without any marked dry and wet season with rare or no destructive typhoons and floods. Davao, parts of Cotabato, Lanao, Agusan, Zamboanga, Surigao, and Mindoro have been found suitable for the cultivation of this fiber crop. Of late it has been found that ramie also grows well in some parts of Albay, Camarines Sur, Samar, Leyte, Laguna, Tayabas, and Negros Oriental, although these places are less suitable due to the prevalence of destructive typhoons and floods.

Preparation of land

Old agricultural lands should be plowed deep and the soil thoroughly pulverized. This should be done ahead of actual planting in order to give time for the complete destruction of weeds and organisms harmful to the young plants. In the Philippines ramie lands are usually prepared during the later part of September in time to be ready for planting from October to December.

On newly-opened lands ramie plantations may be established by kaingin system. In this particular case underbrushing, cutting and logging big trees, threshing, and burning will come in order. The cleared area is allowed to rest about a week before properly spaced holes are dug by means of pointed wood or any suitable farm implements.

Fertilizer requirements

The plantation should be top-dressed annually with a commercial fertilizer, preferably ammonium sulphate at the rate of from 250 kilos to 500 kilos to the hectare. Organic fertilizers like guano and barnyard manure may also be applied at the rate of from 500 to 1,000 kilos to the hectare.

The leaves, stalks, ends, and butts removed from the plants should be returned to the plantation as these improve the physical condition of the soil, keep down weeds, and reduce the cost

of fertilization.

Planting

While ramie can be propagated by seeds, cuttings or rootstocks, the last-named should be preferred for practical purposes. When seeds are used, they are first sown in well-prepared beds or seed boxes. The seedlings may be transplanted to the field when they are from two to three weeks old. Because of the extra cost of labor in the care of seeds and in the preparation of seedbeds or seed boxes and the wide range of variability of the resulting plants, this method of propagating ramie is not recommended for commercial purposes.

In the propagation of ramie by cuttings care should be taken to use only mature brown stems, preferably the size of a lead pencil, containing three or four nodes and about one-half to one foot long. The cuttings may be set horizontally on the ground or at an angle of about 45 degrees, one to two inches deep in the furrows and gently covered with soil. Stem cuttings properly prepared and planted will give from 80% to 90% germination.

The best method of propagating ramie is by rootstocks or rhizomes. The lateral roots that are uniform in size with numerous nodes and the smooth tuber-like roots are classified as rootstocks, but only the former should be used for planting purposes in order to get more percentage of germination. Each cutting should be from five to six inches long with three to four buds. All tube-like roots should be cut off for obvious reasons. One sack of lateral rootstocks weighing about 40 kilos will contain around 1,000 pieces, and a year-old hectare of such rootstocks is capable of supplying planting material for about eighty hectares of land. Planting materials intended for distant places should be properly packed in moist sawdust or sphagnum moss and then wrapped in gunny sacks.

The seedlings, stem cuttings, and rootstocks should be set in the field at a distance of from 30 to 40 centimeters in the row and from 80 to 100 centi-

meters between the rows. About 25,000 to 42,000 seedlings, cuttings or rootstocks per hectare are required if the proper distance between plants is followed.

If propagated by rootstocks the plants begin to appear above the ground a week after planting.

Care

The field must be very well cultivated to control the weeds and to promote the rapid growth of the young plants.

The effects of strong winds or storms may be minimized by judicious planting of windbreaks around the field.

The effects of drought may be reduced by clipping off some of the side branches and scattering them around the base of the plants. Talahib or cocon may also serve the purpose. These materials serve as surface mulch by preventing the rapid evaporation of moisture from the soil.

Where there is water available, the plantation should be irrigated at least twice a week.

At the end of every fifth year the plantation should be partly rejuvenated by judicious pruning of the lateral roots to promote rapid growth, maintain high yield, and give a new life to the plantation.

Harvesting

The date of maturity or the period of harvesting depends upon such factors as climate, care given to the plantation, presence or absence of diseases and pests, etc.

The presence of brown patches on the bark of the stem and the brown color of the majority of the panicles of the clusters indicates maturity. The plants in no case should be allowed to overmature if a maximum yield and good quality of fiber are desired.

The growth of ramie during a long period of dry spell is generally arrested and the plants mature late.

Improperly kept plantations produce plants of a very poor stand which have a tendency not to mature on time.

When the plants are attacked heavily by pests or diseases they do not develop a normal stand and they mature early as the general tendency of the plants under such conditions is to reproduce their kind before they die.

Under ordinary circumstances the preliminary cutting may be made from two to three months after planting. Usually the stalks from the preliminary cutting are not decorticated due to the low yield and inferior quality of fiber. A sharp bolo, knife or scythe may be used in harvesting, care being taken not to harm or injure the lateral roots under the ground. The whole plants and sprouts are cut close to the ground and spread between the rows where they are allowed to decay. Incidentally, this practice is aimed at producing a uniform stand for the succeeding harvests.

The harvested stalks are piled in bundles in the field along the road and hauled to a nearby shed by sleds, carts or trucks ready for extraction. Only the butts and the rhizomes are left behind.

The stalks should be decorticated as soon as they are harvested, because delay means difficulty in extraction and the production of poor quality fiber.

Extraction of Fiber

Ordinarily, ramie fiber is extracted by a 2-H. P. decortivating unit. In actual practice only two men are needed to keep the unit constantly at work with a daily output of from one to two piculs of dry fiber. The feeder takes hold of a handful of well-arranged stalks and inserts their tips into the receiver of the decortivating machine. The revolving knives inside take the stalks inward and remove the fiber from the stalks. With a jerk the feeder pulls the ribbon off the machine with most of the pulp already removed. Taking hold of ribbon and winding it around his hand he now inserts the undecorticated parts or butts into the receiver of the machine and pulls them off again after they have passed

through the revolving knives as before. The ribbon or fiber itself is now properly arranged and set by hand on a nearby rack where it is combed to remove the remaining pulp dirt, and other materials. The fibers are tied in small bundles about three to four inches in diameter and are further hung in the sun to dry. In the warehouse the small bundles are graded according to length. They are then folded and bundled in bales of from 30 to 60 kilos ready for the market.

In extracting the fiber on a big scale a much more complicated and elaborate decorticating unit is used. Big plantation owners or companies ordinarily make use of a series of decorticating machines connected together to a common shaft driven by a more powerful motor engine. The principle involved in the preparation of the fiber remains the same. In some cases, however, further treatment of the decorticated fiber is necessary in order to improve its quality and increase its market value. This treatment consists of subjecting the hanging fiber to the action of a smoke of sulphur powder from an inclosed chamber made for the purpose.

For highly industrialized uses, the gummy material commonly found in ramie fiber should be removed as it interferes with the spinning of the fiber and the weaving of the yarn into cloth. This phase of the works is not ordinarily done on the farm due to lack of necessary materials and the extra cost of labor involved. To remove the gum, a hank of fiber is first soaked in a dilute solution of caustic soda and then treated with a solution of bleaching powder. The fiber thus treated is immersed in a dilute solution of sulfuric acid and further washed in clean water until the gum is completely removed.

For the extraction of fiber on a small scale and where no decorticating machine of any type is available stripping or retting may be resorted to.

In stripping, the surface of the stem is pared off with a knife or a piece

of bamboo to facilitate the extraction of individual fibers. These are dried in the sun, collected, and bundled ready for the market.

In retting, the whole stalks are soaked in water until the outer layers can be washed off. The stalks may be immersed in fresh or salt and stagnant or running water. A concrete tank or a big vat provided with an outlet may be used if a stagnant pool or running stream is not available. Fresh stalks put in water ret from 5 to 10 days.

As soon as the outer surface of the stalks shows signs of decay the fiber should be separated from the woody portion of the plants. With a wooden paddle or a piece of board a handful of stems is beaten slowly and the fiber in the form of ribbons is pulled off. The ribbons are then tied in bundles and struck against the water until the outer dead bark is removed. The remaining dead bark and any dirty material adhering to the fiber are scraped off by hand with the aid of a sharp stick or knife. The fiber should be carefully washed in fresh water. If the stalks are retted in salt water all traces of salt should be removed to facilitate drying. The fiber is then hung in racks in the sun and as soon as thoroughly dried, it is collected and bundled.

Yield

The yield of ramie is variable depending upon such factors as varieties planted, soil and climatic conditions, time and method of planting, methods of preparing the fiber, presence or absence of pests and diseases, etc.

A yield of from three to five piculs of fiber per hectare from the first harvest is considered fair disregarding the preliminary cutting. In subsequent harvest a yield of from seven to eight piculs of fiber per hectare may be obtained. In general, the annual yield of well-organized and established ramie plantations ranges from 30 to 50 piculs per hectare of clean fiber.

Enemies of ramie

The larvae and adults of a moth known as *Cocytodes coerulea* (Guen.)
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for their information and approval.
Carried unanimously.

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THE MAURA. . .

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any, subject to the Royal Decree of November 12, 1889, or in the municipal tribunal which may be constituted in accordance with these provisions. The *barrios* of the City of Manila are excepted.

4. Contracts bidden for at public auction or awarded at the time of the publication of this Decree in the *Gaceta de Manila*, involving the revenues which are to form the "Income or Funds of the Towns," are declared to be in force until their legal expiration.

The income which the local funds may derive from these contracts shall be distributed among the treasuries of the "Income of the Towns" in the manner which the Governor-General may consider most equitable.

Given in the Palace this Nineteenth Day of May, 1893.

MARIA CRISTINA
ANTONIO MAURA Y MONTANER
Colonial Minister.

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feed on the leaves of ramie. The adults are easily attracted to light and may be killed by using a device described briefly as follows:

A piece of board about one foot square is nailed on one end of a bamboo pole about five feet long to form a platform. This is placed in the center of the field. A hurricane lamp or torch is then put in a basin of water or oil and placed on top of the platform. Attracted to the light, the flying insects are caught in the oil or water where they perish.

Another method is the use of fermenting coconut sap or tuba. This is put in an open vessel and placed over a pan of water to which sufficient kerosene or crude oil has been added. The whole thing is placed on a platform in the middle of the field. The odor of the co-

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ment service for the first time, insofar as the right to retire under Act No. 2589, as amended, is concerned. The length of his previous service may not be added to that rendered upon reinstatement, because, aside from the forfeiture previously referred to, the requirement of "continuous" service provided in Act No. 2589, as amended, would not be met. (*Idem.*)

Applying the above principles to the case of Mr. Diño, it becomes evident that he may not retire under Act No. 2589, as amended, inasmuch as the length of his service since his reappointment after the liberation is less than the six-year minimum period prescribed for retirement under said Act. The services rendered by him prior to his resignation on June 15, 1938, may no longer be considered, the benefits thereof having been forfeited upon his resignation on said date. Moreover, the requirement of "continuous . . . service for at least six years" would not be satisfied. (Sec. 1, Act No. 2589, as amended.)—*3rd Ind., Nov. 4, 1946, of Sec. of Justice.*

Coconut tuba attracts large numbers of moths, thus reducing infestations. This method has been verified by the plant pest and disease control division of the Bureau of Plant Industry to have given good results in Mindanao. A spray of 60 grams of lead or calcium arsenate for every petroleum can of water (approximately 19 liters) sprayed on the leaves of the plants will reduce the number of the insects and minimize crop damage. Lead or calcium arsenate mixed with equal parts of *gawgan* or starch may also be dusted on the leaves of the plant with equally good effect.

The leaf spot diseases caused by *Cercospora boehmeriana* (Wor.) which are common among plants in a poor soil and under unfavorable climatic conditions may be identified by the presence of rusty brown spots scattered on the leaves with a grayish center surrounded by a circular structure. It may be controlled by clipping off and burning the affected parts, and by clean

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according to the records, is the registered holder or lessee of a stall or stalls, booth or booths, in the public market is found to be in reality not the person who is actually occupying said stall or stalls, booth or booths, the lease of such stall or stalls, booth or booths, shall be cancelled, if upon investigation such stall holder shall be found to have sub-leased his or her stall or stalls, booth or booths to another person or to have connived with such person so that the latter may for any reason be able to occupy the said stall or stalls, booth or booths.

Sec. 8. *Appeals.*—Any applicant who is not satisfied with the adjudication made by the city or municipal treasurer or the Market Committee of the stall applied for by him, may file with the Secretary of Finance an appeal therefrom, thru the Mayor concerned, who may submit such comment and recommendation as he may desire to make on the matter. The decision of the Secretary of Finance in such cases shall be final.

Sec. 9. *Duties and Powers of the City Municipal Treasurer.*—The city or municipal treasurer, as the case may be, shall exercise direct and immediate supervision and control over public markets in accordance with local ordinances. He shall have direct administration, control and supervision over market personnel, except those whose duties concern the maintenance of sanitary conditions of the market premises. In the case of cities, the city treasurer shall exercise the power herein conferred upon him, subject to the general executive supervision and control of the Mayor of the city.

“Sec. 10. *Market Committee.*—There is hereby created a Committee in each city and municipality to be designated as Market Committee, whose duty it shall be to conduct the drawing of lots and opening of bids in connection with the adjudication of vacant or newly created stalls or booths in the city or municipal markets as prescribed in this Order, and to certify to the city treasurer or municipal treasurer, as the case may be the result thereof. In the chartered

cities, the committee shall be composed of the City-Treasurer, as Chairman, a representative of the Mayor, a representative of the Municipal Board or City Council, a representative of the Secretary of Finance, a representative of the City Fiscal and a representative of the Market Vendors to be appointed by the Secretary of Finance, as members. In the municipalities, the municipal treasurer shall be the Chairman, and a representative of the Mayor, a representative of the Council, and a representative of the market vendors to be appointed by the Secretary of Finance, as members. In any case in which the deliberation of the Market Committee results in a tie vote, the decision of the city or municipal treasurer shall prevail. (As amended by Dept. Order No. 42, dated March 12, 1947, of Sec. of Finance.)

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culture and fertilization of the plants. In severe cases the plants may be sprayed with a solution of Bordeaux mixture consisting of copper sulphate, calcium oxide, and water depending upon the degree of infection.

Uses

Ramie has a variety of uses comparable to abaca, cotton, and silk. As a textile material the yarn can be woven into cloth equal to that of flax and linen. It can be blended with cotton and woven into ramitex, a cloth much stronger, more elastic and more lustrous than the ordinary tropical drill. It can be used in the manufacture of parachutes, fishing cords, lamp mantles, laces, fancy handbags, belts, lalyards, naval cordage, tire cords, opaque papers, surgical pads, dressings, bandages, and operating gowns. Mixed with wool it can be woven into greatly improved cloth which may be comfortably and elegantly worn. The ramie fiber is said to be 30% to 60% stronger when wet than when dry and that it dries more rapidly than cotton and flax. If the fiber is treated and the spun yarn well woven, the finished fabric does not shrink unlike cotton and silk.