

"In view of the fact that these Rubiaceae plants with nodule-bearing leaves occur in many parts of the tropics, and that in India the value of their leaves has long been recognized, and considering the importance of nitrogen-fixing legumes as soil enrichers, the suggestion of Faber that we may have in these trees and shrubs plants of positive agricultural value deserves the serious consideration of tropical planters. If they can be grown as subsidiary crops beneath plantations of rubber, cacao, coffee, or other important tropical cultures, and their leaves allowed to accumulate upon the ground to serve as a mulch and as nitrogenous fertilizer, they may have great value. They differ from the leguminous cover-crops in that they are perennial in habit, and will not need to be replanted every year. It might be possible to prune them severely every year and utilize the clippings as fertilizer. The subject is one which opens up a new field in connection with tropical agriculture, and one which offers remarkable possibilities."

As the Rubiaceae are well represented in this part of the world it will be of interest to ascertain if any local representatives are provided with these leaf nodules.

T. F. C.

Paper.

The sources from which paper pulp can be obtained are continually being discussed especially with a view to seeing what products of tropical forests or open country that are at present wasted can be turned to good account. The results of investigations on bamboos, grasses, etc. are given in Bulletin No. 16 of the Philippine Bureau of Forestry.

The following interesting account of the manufacture of paper pulp from "lalang" or "blady grass" (*Imperata arundinacea*, Cyr.) is taken from the Queensland Agricultural Journal, Vol. XII, November 1919. "It takes three tons of green blady grass to manufacture 1 ton of crude pulp, while it takes, at least, 7 to 8 tons of sugar-cane to make 1 ton of brown sugar. Delivered in the Southern Paper Mill, the pulp is worth, at least, £21 per ton a value equal to that of one ton of sugar. Under present conditions the cost of manufacturing the pulp is greater than that of making sugar, owing chiefly to the fact that chemicals are dear and the machinery and appliances have not been perfected; but Mr. Campbell can show not only how to make good use of local crude alkalis, but, also, how to bring the application of his method up to sugar mill standard, thus greatly decreasing the cost of manufacture. This would mean that a higher price should be paid for the grass—in fact, a price equal to that of sugar cane, say £2 per ton green—making 1 ton of hitherto useless blady grass (considered a pest and a curse by the cane-farmer) growing without cultivation, equal in value to 1 ton of the best cultivated sugar-cane.

"We (Queensland Agricultural Journal) shall be very pleased to hear that Mr. Campbell's experiments achieve such a result, as it would be of exceedingly great value to Australia generally; and it would doubtless give rise to an extensive business in Papua, where there are large tracts of land on navigable rivers notably the Kemp Welsh River, covered with a luxuriant growth of this hitherto pest of the planters. And it must not be forgotten that native labour in New Guinea is cheap, plentiful and reliable."

There are no doubt many in Malaya who will also be interested to hear of further results in this direction.

T. F. C.

A Remedy for Bean-Fly.

In the last issue of the Garden's Bulletin page 205, mention was made of a beetle attacking the Lima Beans in the Economic Gardens. Other material was collected and forwarded to the Imperial Bureau of Entomology. In his reply the Director states:—"The fly is *Agromyza phaseoli*, Coq. a widely distributed pest of beans. The beetle belongs to the family Eumolpidae, the species being *Patria flavopustulata*, Baly.

"With regard to the methods for dealing with bean-fly, the remedies of which I enclose particular have been adopted with success in Australia.

"The action of an appliance for destroying *Agromyza phaseoli* depends upon a habit which this fly has of making a rapid upward flight when disturbed. In its simplest form it consists of a sheet of window glass set in a light wooden frame, with a curtain of calico about 6 in. wide attached to three of its sides, and a pair of wooden handles on the upper side. The under side of the glass is lightly sprinkled with kerosene, which spreads into a thin film over the glass. The frame is then carried over the young bean plants with the open side in front, and about 9 or 10 in. from the ground, the rear part of the glass just clearing the young plants. The advancing sheet of glass passes over the flies before they rise, and as they do so directly upwards, they strike the glass, become saturated with kerosene and die instantly.

"A larger horse-drawn apparatus, constructed on a similar plan, is suitable for larger areas. After about nine days the flies are less destructive, and as they prefer young beans, a good trap may be prepared by sowing a row of beans in the near vicinity 9 or 10 days after the crop is planted.

"The rows of beans should be covered about four days after planting the seed with a light layer of sawdust, which should then be wetted with kerosene emulsion applied with a watering-can. When the plants are in the second leaf, a second dressing with this emulsion should be given. It should be made with 1 lb. ordinary soap dissolved in about 2 gals. of boiling water. When