

Ipil-Ipil—A Firewood Crop Prospectus

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Ipil-ipil (*Leucanea glauca* (L.) Benth.) is a small leguminous tree found scattered widely throughout the Philippines in second-growth and grass areas. It is an excellent species for primary planting in grass areas, is of extremely rapid growth and has a high value for fuel, especially in regions where wood is scarce.

In addition to the name ipil-ipil, the name Santa Elena is in very common use throughout the country. Other common names for the species are agoho (Panay), datels (Leyte), comcompitis (Ilocos Sur), cypress (Quezon), in some provinces (Savite, Pampanga, Aizal, Nueva Ecija, etc.) erroneously called ipil which properly belongs to *Intsia bijuga*.

As a fuelwood, it is well known to owners of bakeries. Previous investigation shows that a cubic foot of dry wood (moisture free) of ipil-ipil found in Laguna produces 93,447 calories of heat while this volume at 30 per cent moisture content will produce 88,514 calories. Its percentage of ash is lower than that of any other firewood. Bakers claim that it is easier to remove the residue of ipil-ipil from the oven than that of bacauan.

It is a recognized fact in commerce that firewood is not an elastic commodity. It always has a ready market. In almost all districts of the City of Manila wholesalers and retailers of firewood occupy large and expensive establishments. But though an inelastic commodity in commerce the supply of firewood is subject to exhaustion thru unwise management.

Private landowners have been shy to venture in planting trees with the object of producing fuel as an industry, because it has

not been definitely demonstrated that a firewood plantation, say of ipil-ipil, is a secure and profitable enterprise.

As in any commercial undertaking, the profitableness of fuel production should be figured out before planting on a large scale. The results of the estimate will serve as good guide in handling the enterprise.

MANAGEMENT

Planting:

Ipil-ipil is not a difficult species to establish in areas covered with cogon grass, as the seeds retain their viability for long periods. Those seeds which do not germinate at once may remain in the soil for several months and, if not destroyed by rodents or birds, will eventually germinate at the beginning of the rains.

If it is not desired to obtain a stand of ipil-ipil the first year and if seeds can readily be obtained, broadcasting will be found to be a successful method of propagation. If broadcast sowing is practised, it should be carried out at the beginning of the rainy season and the grass area which it is desired to plant up should be burned over at the last possible moment before the rains set in. The amount of seeds necessary to successfully broadcast one hectare is from 45 to 50 liters. Following the above practice, a good stand should result at the end of about three years. At the end of the first year the number of trees per hectare would amount to approximately 1,000 but, as the species begins to shed seeds at the end of the first year, the stand rapidly closes up and by the end of the third year should fairly dominate the area and be well started toward the production of the first crop of firewood.

Much better and quicker results could undoubtedly be obtained if the area to be sown were plowed over just after the grass is burned off. This would prevent the quick return of the cogon in the early stages of the crop and would do away with competition between the small plants and quick-growing cogon which often sets the crop back a year or more. Plowing would also prepare a much better seed bed for the species and would result in a greater number of young plants at the start. For small reforestation projects and for commercial plantations this practice is recommended, although it would probably be too expensive for any large reforestation project.

The successful reforestation of cogon areas, of course, depends entirely upon adequate fire protection for the first three years after sowing. Fire, which is so commonly occurs in cogon areas during the dry season, will absolutely destroy the crop at any time up to the end of the third year at which time the stand should be dense enough to prevent the entrance of fire.

In some places the success of young plantations is endangered by field mice and rats which seems to relish the tender bark and soft roots of the young plants and sometimes eat up the freshly sown seeds. All that can be done to protect young seedlings from such attacks is to spread poison throughout the area to be planted some two or three months previous to the time of planting. Where the seeds are only eaten, the damage may be prevented by soaking the seeds for half an hour in a two per cent solution of carbolic acid. A 10 per cent solution will kill the embryo of the seeds.

The Planting Plan:

1. Area:—Public Land. 2,500 hectares of arable, cogon and open land, rolling in topography, where tractor plowing can be employed. Condition of area is similar to that obtaining in Novaliches, Rizal.
2. Objective:—To establish Ipil-ipil Plantation to produce firewood as a crop.

3. Organization of Area:—

- a. To allow 100 hectares as non-plantable or otherwise to be devoted to other uses for administrative purposes of the plantation, leaving a net area of 2,400 hectares for plantation purposes.
 - b. To divide the area into eight (8) annual planting units of 300 hectares each. Availability of planting materials (seeds) is a great limiting factor at the start to plant up to the third annual planting units. Seeds for the fourth annual planting unit can very well be obtained from the established plantation.
4. Preparation of Ground:—To plow and harrow the planting units twice with the use of a tractor.
 5. Planting Materials:—At the start, to use seeds at the rate of 15 gantas to a hectare.
 6. Method of Planting:—Broadcast sowing by hand (manpower).
 7. Period of Planting:—300 hectares a year. For the total area of 2,400 hectares, in 8 years.
 8. Protection of Plantation:—This is an important phase of the planting plan, especially during the first three or four years, particularly from grass fires and animals. For protection from grass fires, animals and trespassers, constant patrol will be necessary and the establishment of fire lines, width depending upon risks, dividing the plantation into protection units. Grazing animals should be kept out of the plantation because they feed on the young plants.

The Cutting Plan:

The management of ipil-ipil, once a close stand has been obtained, is very simple. The only rules necessary for the successful management of such stands are to cut the stumps to the lowest practicable height, preferably 10 centimeters or less, and to make

the cuts as clean and smooth as possible to the end that there will be no damage to the bark. Apparently, stands may be cut over on as large areas as desired, for stool shoots develop at once and grow rapidly enough to preclude the entrance of undesirable weed species. To avoid fire danger, ipil-ipil stands should be harvested only during the rainy season as fire is practically the only enemy of the crop and ipil-ipil is thoroughly fire resistant when uncut. However, when stands are cut over at the height of the dry season, the chances of fire running over the area and charring the stumps and killing the seedlings upon which reproduction depends would be very largely increased, and the probability of the entrance of undesirable weed seedlings after such a fire would amount to a certainty.

Once a stand of ipil-ipil is established, no care is necessary leading to the reproduction of such areas as are cut over, other than the exclusion of fire from the areas. The species is a most vigorous sprouter and the stools apparently retain their vitality for several rotations. However, the number of seedlings constantly on the ground underneath the main stand is sufficient to take the place at once of any stool which becomes exhausted.

1. Rotation:—Six (6) years after sowing is already a profitable age of the stand. It is therefore expected to harvest the first planting unit in the seventh year after sowing. For sprout stand, the rotation is five (5) years.
2. Yield:—With a rotation of six (6) years, which is the age of the stand after sowing, the yield per hectare is 144.5 cubic meters of stacked firewood.
3. Harvesting:—The crop will be harvested in the seventh year. The first planting unit will be harvested in this year, the second unit in the eighth year, etc.
4. Management After the First Rotation:—The regeneration after the first rotation comes from coppice and

seeds. The resulting stand is composite. During the second rotation, the period of harvesting may be shortened, as the coppice (sprouts) grows faster than those trees coming from seeds. No cost on formation will be incurred. Consequently, the net income in the succeeding rotations will be considerably increased.

FIXED INITIAL INVESTMENT, OPERATING EXPENSES AND PROBABLE RETURNS

In reckoning the investment and probable returns for plantations of ipil-ipil which are to be managed on a six-year rotation, it is necessary to figure on the cost of establishment of one annual planting unit of 300 hectares and on the yield of the same area as the annual return.

Fixed Initial Investment:

1. Machineries:		P33,500.00
a. Two—Westrak tractor, Crawler type, 36-40 h.p., @ P14,000.00		P28,000.00
b. Two — Three-disc plow with 28" discs @ P1,550.00		3,100.00
c. Two—6'x8" cut, cover type harrow (16-22" discs) at P1,200.00		2,400.00
	Total	P33,500.00
2. Buildings:		14,000.00
a. One — Mixed material administration building, (tool room, bodega, tractor garage, etc.)		P 6,000.00
b. Ten — Laborers' quarters		8,000.00
	Total	P14,000.00
3. Animals:		P 1,050.00
a. Three — Horses for patrol @ P350.00 with saddle		P1,050.00
4. Office equipment, furniture and fixtures		5,000.00
	Total	P53,550.00
Pro-rated cost per hectare (53,550.00 ÷ 2,400)		22.31

Personnel:

One—Plantation foreman	₱2,580.00 p. a.
One—In charge of office	1,200.00 p. a.
Four—Tractor drivers @ ₱5.00 daily	20.00 daily
Four—Tractor driver helpers @ ₱4.00 daily	16.00 daily
Three—Plantation guards @ ₱3.00 daily	9.00 daily
Six—Laborers @ ₱3.00 daily	18.00 daily

Operating Expenses:

A. Cost of formation per hectare	₱86.10
1. Twice plowing and harrowing per hectare	₱60.00
a. Basic data:	
(1) Two tractors	
(2) 25 working days a month	
(3) 5 hectares daily once plowed ground	
(4) 10 hectares daily once harrow- ed ground ..	
(5) 17 days once plowing a month —85 hectares	
(6) 8 days once harrowing a month—85 hectares	
(7) Twice plowing and harrowing— 42.5 hectares a month	
b. Daily expenses:	
(1) Diesel fuel, 32 gal. @ ₱0.60	₱19.20
(2) Lubricating oil, 2 qt.	2.00
(3) Grease, 1 lb.	0.80
(4) Four tractor driver helpers @ ₱4.00 a day	16.00
(5) Four tractor drives @ ₱5.00 a day	20.00
(6) Six laborers @ ₱3.00 a day .	18.00
(7) 20% depreciation on machin- eries	22.33
(8) 4% interest on cost of machin- eries	3.67
Total	₱102.00
c. Cost per hectare:	
(1) Cost of twice plowing and har- rowing per month (25 x 102.00)	₱2,550.00
(2) Cost per hec- tare (2,550 ÷ 42.- 5)	60.00
2. Cost of seeds per hectare	₱22.50
3. Cost of transporting seeds per hectare	1.00
4. Cost of broadcast sowing per hectare	2.00

5. Cost of firelines per hectare	0.60
Total	₱86.10

Cost of formation per unit (300 x 86.10)	25,830.00
Cost of formation from the fourth year per unit (source of seeds being from planta- tion)	25,530.00

B. Cost of administration, yearly 10,340.00

1. Plantation foreman .	2,580.00
2. In charge of office .	1,200.00
3. Tools, supplier and accessories	2,000.00
4. 20% depreciation on buildings and office equipment	3,800.00
5. 4% interest on cost of buildings and of- fice equipment	760.00
Total	₱10,340.00

The cost of adminis-
tration is prorated
on the number of
planting units es-
tablished and main-
tained yearly.

C. Cost of protection, yearly ₱3,537.00

1. Three men @ ₱3.00 for 365 days	₱3,285.00
2. 20% depreciation on cost of animals ...	210.00
3. 4% interest on cost of animals	42.00
Total	₱3,537.00

The cost of protec-
tion is constant
yearly for each
planting unit.

Total yearly expenses

Probable Returns:

A. Cost of producing the crop from seed (stumpage price):	
1. Pro-rated cost of per- manet improvements per hectare	₱22.31
2. Cost of formaton per hectare	86.10
3. Cost of administra- tion and protection per hectare	46.26
4. Rotation	6 years
5. Rate of interest 4%	
6. Cost per hectare	₱421.30
B. Cost of producing the crop from sprout:	
1. Cost per hectare	₱250.96
2. Cost per cubic meter	1.74

C. Cost of harvesting per cubic meter	4.18
D. Cost of transportation to market per cubic meter	3.91
E. Net Income:	
1. Stand from seed:	
a. Per cubic meter	P0.99
b. Per hectare	143.06
c. Per unit	42918.00
2. Sprout stand:	
a. Per cubic meter	P2.17
b. Per hectare	313.56
c. Per unit	94,068.00

As may be seen from the attached table, net income is realized in the 7th year, but this income is still not enough to cover the operating expenses for that year. Beginning from the 9th year, however, the net income more than pays for the operating expenses for that year.

The total cumulative net income up to the end of the 14th year is substantially above the corresponding total cumulative operating expenses and the difference will more than pay for the fixed initial investment. From the 15th year, therefore, the plantation will be operating on clean profit:

FORMULA FOR DETERMINING STUMPAGE PRICE:

$$Ivn = Sc(1.op)^n + C(1.op)^n + \frac{e}{.op}(1.op^n - 1)$$

Where:

- Ivn = Total cost value
- Sc = Porated cost of permanent improvements
- C = Cost of formation—preparation of ground, planting, cost of seeds, etc.
- e = Net annual expense—administration and protection
- .op = Rate of interest (4%)
- n = Rotation (6 years)

COST OF HARVESTING AND MARKETING

Harvesting per cubic meter:	P4.18
a. Felling, cutting and stocking	P2.00
(one man at P4.00 a day can easily make one talaksan a day).	
b. Transportation to roadside to be picked up by truck	2.18
(To use tractor hauling 16 cu. m. a day costing P34.96)	
Total	P4.18
Transporting to market (Manila) per cubic meter:	3.91
a. Equipment—(To be purchas-	

ed in the 8th year):

Basis of calculation:

One 3-ton Chevrolet truck	P8,000.00
Two deliveries a day	2	
20 working days in a month		
Load: 8 cu. m. per delivery		
		16 cu. m. per day
Personnel: — One driver	P150.00 a month	
	(P150.00 ÷ 20)	7.50 daily
Two helpers at	P4.00	8.00 daily
b. Truck operation (daily)		
80 liters of gasoline at	P0.24	19.20
Grease 1/2 lb		0.40
Lubricating oil, 1 qt.		1.00
9 tires yearly at P315.00	(2,835.00)	11.81
	240.	
20% depreciation (1,600.00)		6.66
	240.	
c. Loading on truck (daily)—		
2 men at P4.00 a day to help truck helpers and to do other work while not loading		8.00
d. Total daily expenses:		
1. Truck personnel		P15.50
2. Truck consumption		32.41
3. Loading		8.00
4. Depreciation		6.66
Total		P62.57
5. Per cu. m. (62.57) ÷ 16		3.91

Cost of seeds:	P22.50
To sow 15 gantas to a hectare		
15 x 300 = 4,500 gantas of seeds yearly need		
Cost per ganta pick-up Los Baños		P1.50
Cost of seeds per Hectare (1.50 x 15)		22.50
Cost of transportation of seeds:	P1.00
To hire 2-1/2-ton truck which can load 45 sacks of 25 gantas each or 1,125 gantas		P70.00
Cost per ganta (70.00) ÷ 1,125		0.62
Cost per hectare (15 gantas)		1.00 (rounded)
Cost of Broadcast sowing:	2.00
To hire skilled laborer at P4.00 a day who can sow two hectares in a day		
Cost of broadcasting per hectare		P20.00

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said they came to explore possibilities for importing timber and plywood products from the Philippines.

The executives were Henry T. Dessauer, president of Pan Pacific Overseas Corp. and Far Eastern representative of Pan American Trade Development Corp. in New York, and Warrick G. Pearse, sales manager of Minney-Allen Co. of Darwin, Australia.

Dessauer, who came by Pan American Airways plane, said his firms were interested in importing quantities of Philippine mahogany and plywood in view of the increasing demand for them in the United States.

He said he planned to contact a number of local hardwood firms to make inquiries regarding his mission and to find whether he could appoint one of them to represent his company here.

Dessauer, who is on a three-month trip to the Far East, said his firms had been importing some five to 10 million square feet of plywood from Japan each year. This quantity would be augmented by imports which he planned to draw from the Philippines, he said.

Pearse, who is enroute back to Australia from a business trip in Hongkong, said he would confer with officials of Philippine Terminal Co. during a week-long visit.—*Manila Bulletin*, July 14, 1955.

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SACRED BUDDHIST TREE NOT DYING

CALCUTTA, June 30 (AFP)—Fears that the sacred Bodhi tree which the world's 150,300,000 (M) Buddhists venerate is dying were allayed here today by leading Indian botanist Dr. K. P. Biswas, who spent a week examining the tree at Bodh Gaya.

Dr. Biswas told the *Agence France-Presse* that the 2000-year-old tree, under which Sidharta Gautama, the Buddha, attained enlightenment, is "full of vigor."

He pointed out that because its growth eastward had been blocked by a temple, the tree is expending its energies in developing westward. Some of its branches sag nearly to the ground.

Biswas recommended that some of its lopsided branches be pruned and others propped up. However, he said, it is impossible to get anyone willing to take the risk of "profaning" the tree by pruning it.

He admitted he himself was unwilling to undertake this task. In India pibal trees such as the sacred Bodhi tree and which botanists call *ficus religiosa* are venerated by Hindus and Moslems alike.

The only damage done to the tree, Biswas said, has been caused by pilgrims breaking twigs as sacred relics. Bonfires have also scorched its bark, branches and leaves, he added.

"Unless natural calamity overtakes it," Bis-

B. F. NOTES . . .

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still very willing to serve the bureau. I feel, in spite of my age, that I am still strong and healthy to render that service, he said.

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SEC. ARANETA ORDERS SPEEDING UP OF TREE FARM LEASES

Agriculture Secretary Salvador Araneta today ordered the speed up of the granting of leases for tree farms on bare denuded public lands under the jurisdiction of the bureau of forestry. In a conference with Director Felipe R. Amos of forestry and Forester Nicolas P. Lansigan, he called for faster action on these leases as the people have to start planting with the rainy season.

Araneta explained that the tree farm lease is one of the most generous steps the government has taken to help out the needy, especially the *kai-ñgineros* and squatters in public forest lands. Ordinarily, he pointed out, the squatters have to be ejected from the land and for the government to reforest the area. Under the lease terms, however, the leasee can have possession of the land for twenty-five years, renewable for another twenty-five years. The land will be used for the raising of agricultural crops like coffee, cacao, citrus and others that live from year to year.

Secretary Araneta also disclosed that the lease may be granted only for areas that are presently bare or covered with grass. "The idea," he said, "is to have a tree vegetation on these bare lands. We can not depend on the government alone, with its limited funds, to reforest over five million hectares of cogonales. But with these leases the people, while being helped with land to till, will also be helping the government establish a tree vegetation. This will check soil erosion and regulate water flow."

Persons interested in tree farm leases are advised to see the nearest forestry official or headquarters.

IPIL-IPIL . . .

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Cost of constructing fire lines:	0.60
To use two tractors in two days to construct fire lines	₱204.00
Cost per hectare (204)	0.60 (rounded)
	300

was declared, "the tree will continue to grow and flourish for several years to come."—*Daily Mirror*.