Estimate for Painting of Dining Halls and Kitchen of Canteen at R . R . I . I

DETAILED ESTIMATE

Slno	Item	Quantity	Unit	Rate	Amount
	Schedule ' A' (KPWD 2010 Schedule of Rates)				
1)	Painting with ready mixed Plastic Emulsion paint of approved quality and colour, as specified, **one coat ,** to old wall surfaces , after rubbing with sand paper and cleaning the surface, etc. complete at all levels	250	m2	19.40	4850
2)	Whitewashing , 2 coats , on old surface , after cleaning the surface with sand paper and brushes etc. complete, at all levels	400	m2	6.60	2640
3)	Painting with Synthetic Enamel Paint , on old surface of woodwok / ironwork , after rubbing with sandpaper and cleaning the surface etc. complete at all levels	200	m2	23.80	4760
5)	Polishing with French Polish , 2 coats , on old surface of woodwork , using approved quality polish, after rubbing with sandpaper and cleaning the surface etc.	30	m2	14.15	425
	Total Schedule 'A' Add Tender excess @ 50%				12674.50 6337.25 19000.00
	Schedule 'B'				
4)	Painting with ready mixed Plastic Emulsion paint of approved quality and colour, as specified , to old wall surfaces **,for second or for each succeeding** coat , at all levels	250	m2	23.00	5750
					24750.00

Painting Canteen - estimate . xls

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COVER CROPS

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COVER CROPS.

There are a number of cover plants employed to protect the soil and reduce weeding costs on land planted with permanent crops. The list of species cultivated is a large one, but the following selection has so far proved the most useful for general purposes. With the exception of *Mikania scandens*, which belongs to the Natural Order Compositae, all plants described are leguminous.

Calopogonium mucunoides.

A vigorous climbing or creeping herb with trifoliate leaves forming a dense mat of foliage, 1 to 2 feet high. The flowers are produced in short racemes, small, pale blue in colour. The flattened seeds are brown, and number about 34,000 per lb.

This cover will thrive on a wide range of soils, but is of the greatest value on new clearings, where it will cover the land in four months from sowing. When the shade of the permanent crop becomes dense, the growth of the cover weakens and in time dies down. Calopogonium has proved a valuable cover plant in young rubber and oil palm clearings, either sown as a sole cover crop or as a mixture with Centrosema or Pueraria. The advantages of sowing a mixture are seen when the permanent crop matures, as Centrosema is more hardy than Calopogonium, and gradually replaces the latter, while Pueraria will continue to thrive under shade. Although Calopogonium is liable to die down early, natural regeneration occurs under suitable conditions.

Centrosema pubescens.

A twining herb with trifoliate leaves, forming a loose mat of foliage about 18 inches deep on open land. It climbs any support with which it comes in contact. Flowers pale mauve with purple lines in the centre; three to five produced on a raceme. The seeds are flattened, brownish-green with dark green markings. The number of seeds per lb. is about 16,000.

Centrosema makes rather slow growth in the early stages, but when properly established forms an excellent cover. If the soil is sufficiently fertile, or where the permanent crop is manured, this cover plant will remain effective for many years and continue to thrive under shade. Care is necessary to prevent it from climbing young trees or retarding the growth of the permanent crop by excessive vegetation immediately below the trees or palms. For new clearings or replanting of rubber and oil palm areas it may be grown in combination with Pueraria, and a seed mixture consisting of 5 lbs. Centrosema and 2 lbs. Pueraria per acre has been found most suitable for this purpose.

Dolichos Hosei. Sarawak Bean.

A low, creeping, perennial herb of rather weak growth. Leaves trifoliate and slightly hairy. Several small yellow flowers are produced on a short raceme. The seed is brown in colour, blotched with chocolate markings. About 18,000 seeds weigh 1 lb.

The Sarawak bean thrives on a loose porous soil and is of particular value on the lighter types of alluvial coastal clay. It is most difficult to establish on undulating land that has suffered from soil erosion. Further, it is a shallow-rooting, moisture-loving plant, and will thrive under dense shade. It has a particular liking for wood-ashes, and on new clearings with abundant residues from burnt-off jungle, or where wood-ashes are applied to the land, vigorous growth is made. Owing to its prostrate habit, little or no trouble is experienced in preventing it from encroaching upon any permanent form of cultivation. It is an excellent cover crop in the fruit orchard or on flat nursery land.

Indigofera endecaphylla.

A low, creeping herb with dark green pinnate leaves and small purplish-pink flowers. The seeds are minute, light brown in colour and number about 220,000 per lb.

This cover plant thrives on land which has not suffered from erosion and it requires a moist rooting surface. It thrives from sea-level up to considerable elevations and is a suitable cover crop under tea. The plants send out trailers, which produce numerous adventitious roots, thus forming a dense low mat over the land. Indigofera is stated to develop a strong tap-root which assists materially in opening up the soil.

Mikania scandens.

A twining indigenous herb belonging to the Natural Order Compositae. Leaves opposite, 2 inches long. Flowers whitish, small and inconspicuous; produced in heads 2 inches wide. The seeds are so small and light that it is impracticable to collect them. The plant when once established spreads with extraordinary rapidity and owing to its twining habit all weed growth is completely checked.

Mikania will grow successfully on almost all types of soil but has been observed to make the most luxuriant growth on heavy alluvial coastal clays. Under such conditions it will cover open land with a dense mat within one month of planting the cuttings, hence it is called the "mile a minute" plant. Although non-leguminous, a dense mat of decaying organic matter is formed on the land. With present knowledge it is not possible to compare its value with the better known leguminous plants, but owing to its rank vigorous growth it appears to have a depressing effect on the development of young rubber and coconuts, particularly if the cover is not kept well away from the base of the trees.

Pueraria phaseoloides.

A strong twining herb, often attaining a considerable size in the wild state in Malaya. Leaves large, trifoliate, hairy. Flowers in racemes in scattered pairs, mauve in colour. Seeds small, dark brown. The number of seeds per lb. is about 37,000.

This cover plant thrives on the heavier types of soils and has proved successful on the alluvial clays of the coast. When once established, a dense thick cover, several feet high, is formed. The plant will continue to thrive under shade, but growth is less robust. It is a rather shy flowerer, consequently seeds are difficult to collect in quantity. Fortunately, Pueraria may be readily propagated from cuttings, which are lifted with numerous adventitious roots.

Owing to its hard coat Pueraria seed absorbs water irregularly and in consequence germination is spread over a long period. In order to obtain more rapid germination the seed may be soaked in water for three days and at intervals of 24 hours all swollen seed should be removed and sown immediately. A 1/9th inch mesh sieve is suitable for separating the swollen seeds. Alternatively, the difficulty may be overcome by rubbing the dry seed between two sheets of wire mosquito netting or abrading the seed coats in a mortar by mixing it with sand and stirring vigorously. As stated previously, this cover crop is often grown as a mixture with Centrosema on both new clearings and replantings.

Propagation.

The several methods of propagating the cover crops described are detailed below in tabular form. Cuttings may be used when seed is expensive or difficult to obtain.

In planting cover crops, whether from seed or cuttings, advantage should be taken of rainy weather and the land be as clean of weeds as possible. Before planting, the rows are lightly forked or cultivated. In the case of small seeds, an admixture of sand facilitates distribution. Seeds that have a hard seed coat or have been stored for some time will germinate more readily if soaked for a period of 24 hours in water raised to a temperature of 110°F. Seeds so treated should not be allowed to dry before sowing. On soils where erosion has already taken place, the addition of either basic slag or rock phosphate mixed with the seed in the proportion of about 10 lbs. of fertilizer to 1 lb. of seed and the mixture sown forthwith assists in establishing the cover plants.

Upkeep.

The main operations in establishing cover crops are systematic weeding between planting and maturity, and removal by hand of all noxious grasses and other growths that may appear through the cover crops. Further, in order to prevent competition for plant nutrients, it is important that a fair-sized circle round the main crop should be kept free from the cover plant.

Digging in the cover plant at intervals of one or two years may be adopted with beneficial results, but when funds are not available for this operation, slashing down the surface growth is recommended to allow of better aeration of the soil.

Covers Under Shade.

According to the Rubber Research Institute it cannot yet be claimed that a satisfactory technique for the establishment and maintenance of a good leguminous cover on mature rubber areas has yet been obtained. There are a few outstanding

Cover Crop.	Method of Propagation.	Rate per acre.	Remarks.
Calopogonium mucunoides	Seed	3-4 lbs.	Rows 3-5 feet apar
Centrosema pubescens	Seed	5 lbs.	Rows 3 feet apart.
Dolichos Hosei	Seed	5 lbs.	Rows 3 feet apart.
	Cuttings	8 sacks	Rows 3 feet apart.
Indigofera endecaphylla	Cuttings (9 ins. long)	4 sacks	2 ft. x 2 ft. Seed may be use to provide nurseries for cuttings
Mikania scandens	Cuttings (12 ins. long)	2 sacks	5 feet apart.
Pueraria phaseoloides	Seed	3-4 lbs.	Rows 3-5 feet apar
	Cuttings (2 ft. long)	10 sacks	3 ft. x 3 ft. Seed may be use to provide nurseries for cuttings

successes, but these have been generally accounted for by especially favourabl conditions. Experience so far has shown that the important conditions for succes appear to be the elimination of root competition, at least in the early stages o establishment, and the use of phosphatic fertilizers; on sandy soils in particular extra potash may also be required.

Investigations have been carried out by the Institute in the inoculation of see with the appropriate symbiotic organism; in nearly all cases inoculation has bee found to stimulate the rate of establishment of leguminous covers.

References.

Articles on cover crops are obtainable from the Agricultural Economist, Depart ment of Agriculture, S.S. and F.M.S., Kuala Lumpur.

Cover Crops and Green Manures, *Malayan Agricultural Journal*, Vol. XVI No. 7, price 50 cents.

The Effect of Cover Crops on Soil Moisture, *Malayan Agricultural Journal* Vol. XVIII, No. 10, price 50 cents.