

A MULCH ROLLER FOR THE MANAGEMENT OF COVER-CROPS

A M Ajith Fernando
Kohombe Estate, Kakkapalliya

A leguminous cover-crop is particularly important on rubber and coconut estates. It helps conserve moisture in the soil below the surface mulch; it contributes the nitrogen equivalent of several hundreds of kilograms of urea each year to the soil, and helps control other obnoxious weeds by shading them out of existence. It protects the soil from erosion and shades it from the severe heat of the tropical sun, and provides organic matter which is an essential component in the structure of the soil.

But cover-crops also need to be kept under control - throughout the year - if they are not to become weeds themselves. An over-grown cover-crop results in several inconveniences to the coconut grower; it results in great difficulty to collect fallen and plucked nuts; it provides a medium for the breeding of serpents and causes great difficulty to the pickers who harvest the coconuts as it impedes their movement between trees, a task already made difficult by having to balance a heavy pole all the while.

Of the one million acres of coconut plantation in Sri Lanka, some 70-80% are owned by small-holders with very limited income and on which production costs need to be kept as low as possible. These small-holders cannot afford to purchase (or even rent) tractors and related machinery to control surface cover-crops which might otherwise grow rampant all over their lands. Most of them permit the surface cover-crops to be over-grazed by cattle and goats as a cheap method of weed-control, but by so doing they also deny themselves the great advantages to be derived from the retention of cover-crops.

Some progressive planters use the (twin) animal-drawn buffalo or bullock harrow equipped with eight discs in two gangs of four each which can be angled to promote more aggressive action of the discs against the soil and surface vegetation. Such animal-drawn disc harrows were earlier imported from Britain, and more recently have been manufactured locally, using imported discs. These disc harrows, while performing an excellent job when used correctly, are still somewhat expensive at about Rs. 20,000 each, so have been used only on 'estate' sized holdings.

The observation above 'when used correctly' is important for if the harrow is used when soil conditions are very dry, or if the discs are incorrectly angled, the cover crops are damaged irretrievably and soil left exposed to the ravages of the sun. Further, when next it rains, the weed-seeds usually get a 'head-start' on the covers and soon the estate is inundated with destructive weeds.

Yet other estates have used herbicides to control weeds and usually succeed in destroying their cover-crops too.

A low-cost alternative for regulating cover-crops and controlling other weeds is therefore a very much needed tool on small coconut properties.

Construction of the chopping roller

1. The roller consists of a tree trunk, one meter long and about 50 cm (2') in diameter. The wood must be in good condition so that it does not split or break up. Make six saw cuts along the length of

the tree trunk, about 6 cm (2") deep, spaced equally around the circumference of the trunk (Fig. 1a).

2. The knives are made strips of hardened steel, eg. leaf springs of a motor car. They should be about 1 m long and about 12-14 cm (about 5") broad (Fig. 1b).
3. The axle is made of two 40 cm (15") lengths of steel shafts, 2 cm (less than 1") in diameter.
4. Hammer one steel knife into each of the slots in the trunk. The knives should be fastened by two metal hoops at either end of the trunk.

Drill holes about 20 cm (8") deep in the ends of the trunk. The holes should be slightly smaller than the diameter of the axle. Drive the steel shaft into each hole with a heavy hammer (Fig. 1c).

5. Wooden blocks should be inserted into the axle as bearings. The roller can now be fitted to the frame with flat steel bars.

A local blacksmith can turn out the required steel bars. A small wooden platform can be mounted on the chassis and a seat for the operator could be fixed on the platform, at a point directly above the roller, so that the weight of the operator would keep the roller steady and firm. As necessary, additional weight can be kept on the platform for firmer chopping (Fig. 2 a; completed roller and 2 b; details of bearing and support system).

Use of the chopping roller

The roller can be drawn by a pair of draught animals. It can be easily constructed by a village blacksmith using local materials at a cost of about Rs 5,000/-. A major advantage is that it can be maintained and repaired by the village blacksmith. Performance-wise, it comfortably 'manages' about 120 coconut squares (about 2 acres) each day without excessive exhaustion for either the animals or the operator.

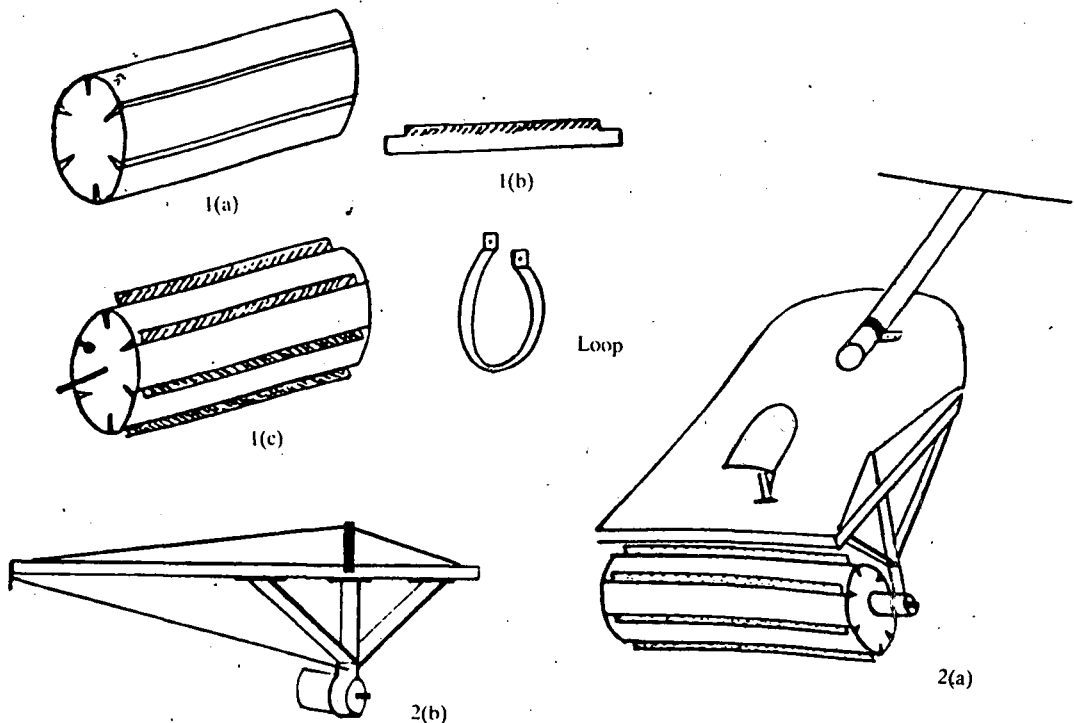


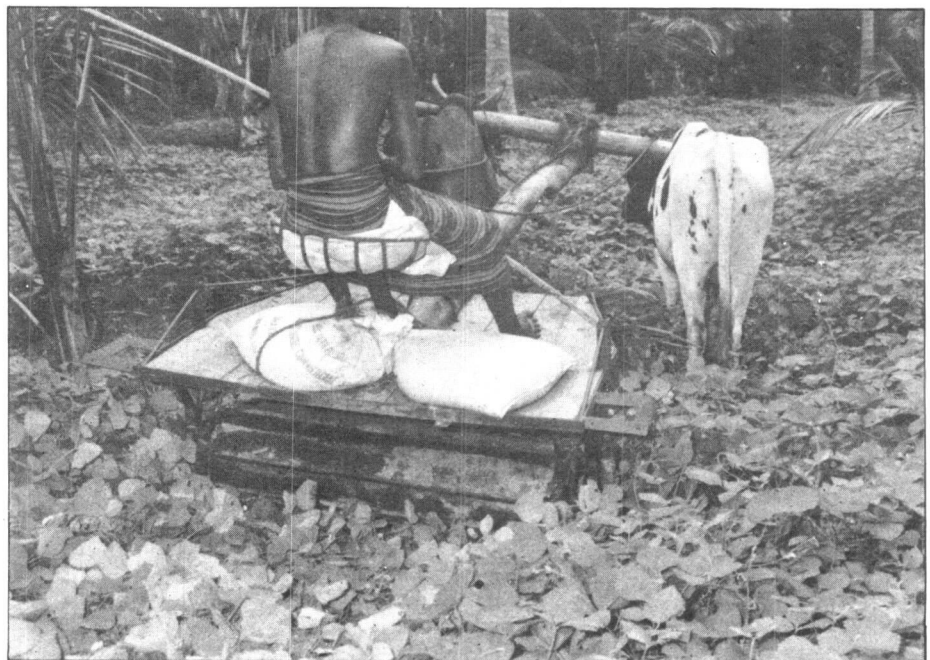
Fig.1 - Parts of mulch roller 1(a),1(b),1(c)

Fig.2 - Completed roller
(a) full view (b) details of bearing and support system



(a)

*Mulch roller drawn by a pair of drought animals
(a) side view (b) rear view*



(b)