

MECHANISATION ON SMALL OR RESIDENTIAL COCONUT ESTATES

By A MECHANISED PLANTER

Perhaps it is that the small-holder is now not so small, or that the larger estates are being carved up into smaller units — either way, there has been a noticeable increase in the number of the smaller estates — I refer mainly to those around 100 acres in extent. A particularly encouraging feature of these 100 acre units is the increasing number of residential owners—owners who actually live on their properties. And what could be better for both the owner as well as for his land? And so the era of the 'Gentleman Planter' is launched.

The 'Gentleman Planter', honoured, henceforth in this article by the title 'G.P.', usually takes the greatest personal interest in his property — he is up early acquainting himself with, and frequently personally directing and assisting the work of his labourers — for few of these estates can nowadays afford a Superintendent — or even a Conductor! He soon discovers a shortage of estate labour — higher wages at the local fibre mill or D.C. plant have attracted the better workers away from the land, and the G.P. finds himself unable to carry out the whole of his cultivation programme during the few weeks of favourable weather and soil conditions granted him each year by the monsoons.

He seeks a solution in mechanisation, but finds the conventional tractor rather too big and expensive for his little property. He cannot afford to tie up about Rs. 15,000 unless there are also prospects for hiring his tractor out to neighbours, and sufficient of this to keep his machine gainfully employed for at least 250 days each year. He needs something to fill the gap between bullock and tractor.

The New Mechanisation — Landmaster

A new mechanisation has recently been introduced into the Asian countries to meet just this need, and has very appropriately been named the Landmaster.

Developed in the U.K. and in America for use on small farms and 'market' gardens where the conventional tractor was either too expensive, too uneconomic, or too cumbersome, this new mechanisation has also adapted ideally to the small farm or estate in tropical countries. Amongst the most advanced of these new designs is the Landmaster 150 which has been further developed specially to suit Asian crops and the Asian agro-climatic conditions.

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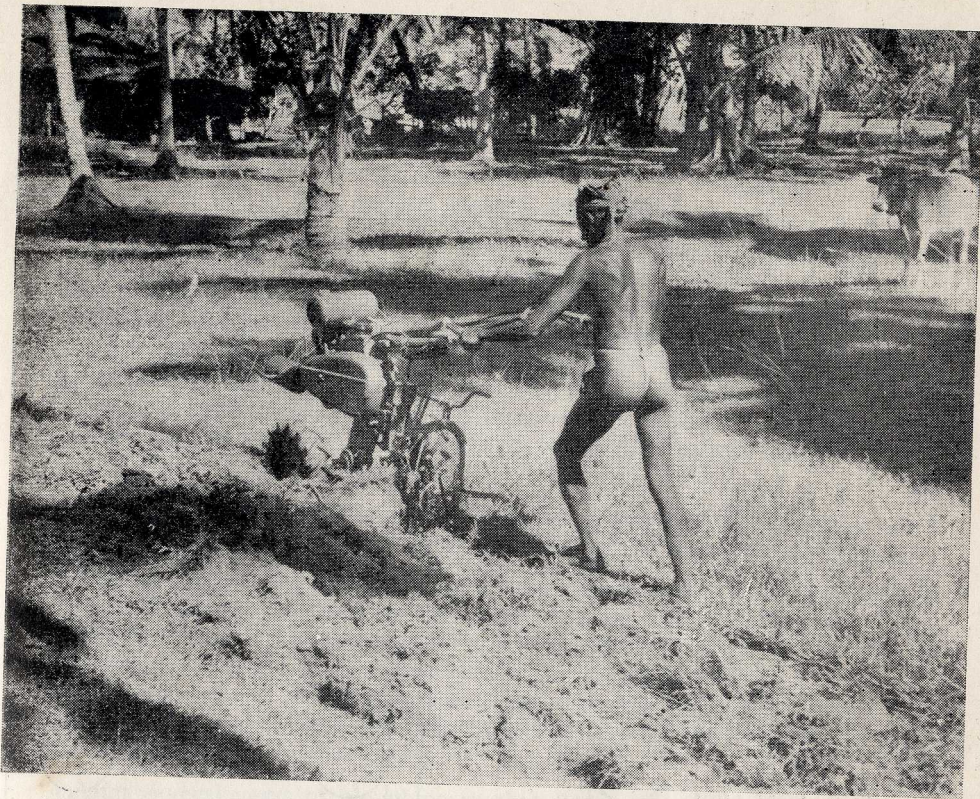


Illustration I — The Landmaster 150 ploughing down the avenues of coconut palms.



Illustration II — The Landmaster 150 mulching fertilizer round the base of a coconut palm, with its cultivating rotors.

A particular feature of the Landmaster is its versatility, thus being capable of gainful utilisation throughout the year, whether under conditions of monsoon rains or sun-baked drought.

Wet Season Uses — Ploughing

For ploughing in the avenues between rows of palms the Landmaster plough can be selected to suit any particular soil condition from soft sand to clayey laterite. Rates of work naturally vary with the condition of the soil, but an average of about two acres a day is usual. Where it is the practice to cultivate no nearer the palm about four feet, it becomes usual to leave unploughed a strip about ten feet wide along each line of palms, and cultivate only the 15 to 20 feet strip between. This is usually selected on the contour and extents of up to four acres a day, thus cultivated are frequently reported.

The depth of ploughing can be varied from 3 to 5 inches, and a good turn of the sod is achieved thus effectively checking the re-growth of weeds.

Various patterns of ploughing have been recommended from time to time and perhaps the best by far is the 'Central-Valley' system illustrated in Figure I. The first cut is taken nearest the line of palms, with the throw of the sod towards the palms. The return trip is made along the opposite side of the avenue, once again throwing towards the palms on that side. And so one continues from side to side, working towards the centre where a furrow is left.

After several years of ploughing in this manner, it will be observed that the soil along the line of palms is about 3 feet above that in the centre of the avenue. Several distinct advantages accrue. One is for the conservation of water and to avoid a run-off down the slope. Another is to drain surplus water away from the feet of the palms. An advantage not expected at the time this system was devised was only discovered when plucking the nuts which then rolled into the furrow at the centre of the avenue and were thus easily collected by the carts travelling along the centre of the avenue.

Frequency of ploughing is much debated. It is argued that excessive cultivation damages roots, leads to loss of organic matter, etc. Certainly where laterite or clayey soils are concerned, research workers in India have discovered considerable crop advantage even from three ploughings per year, fully compensating for the additional costs involved. Provided the spread of the palms ensures adequate shade over the soil, and liberal ground covers or pastures are encouraged, frequent cultivation of these stiff soils results in a decided improvement in texture, and helps absorb moisture better — also liberating nutrients which would otherwise be locked in the soil.

Where the softer soils such as the sands and loams are concerned, these are usually very short of organic content, and cultivation would appear necessary mainly to turn in the surface cover crops. An advantage which the Landmaster has over the tractor in this respect is that cultivation can never be carried out so deep as to cause damage to the roots, whereas

this could be a very real fear in the case of a higher powered machine—particularly in the hands of a relatively inexperienced operator of the 'bash-on-regardless' temperament.

Wet Season Uses — Mulching

Defined as the process of mixing the surface growth and trash into the upper few inches of soil, mulching is an operation which is carried out particularly well by the rotary-cultivator on the Landmaster. This implement can be used in widths from below 20" up to 45" — the wider widths being used on the softer soils — and chops the surface growth with its gang of rotor blades and mixes them gently into the upper three or four inches of soil.

The easy manoeuvrability of the Landmaster makes particular advantage of rotary cultivation as a means for incorporating fertiliser into the soil around the base of the palms. The fertiliser is sprinkled in the required dose in a circle of about 3 to 4 feet radius around the tree, whereupon the Landmaster with the rotors set to about 36" wide, follows along the circumference of the circle, mulching the fertiliser and surface trash into the soil.

Very considerable economies are achieved over the manual method for turning fertiliser into the soil, and several estates report an average of more than 250 palms manured by the Landmaster each day, at an all in cost of no more than 7 cents per palm. Planters on very large estates have found it a distinct advantage to be equipped with several Landmasters primarily for this important job of mulching fertiliser into the soil round their palms. The singular speed of this operation using the Landmaster, and the very low cost involved have enabled the better utilisation of expensive fertiliser by enabling it to be applied in small, frequent doses — applications made twice a year during the more gentle periods of each monsoon, rather than annually or once in two years as was the case when using manual methods of application. One of the distinct advantages of mechanisation is the speed at which such operations can be carried out, thus enabling cultivation during the period of most advantageous climatic and soil conditions.

A number of G.P's find rotary-cultivation preferable to ploughing in the avenues between rows of palms, as they find the gentle stirring action and resulting aeration very beneficial and reflecting profitably in increased crops. Here it is advantageous to operate at the full width of cultivation of 45" thus enabling an avenue to be cultivated completely in four runs.

For the preparation of seedling nurseries, it is of advantage to plough deep first over the entire area, and follow this in a fortnight's time with a run of rotary-cultivation to 'fluff' the bed well in preparation for the laying of the seed-nuts. The well made seed bed results in less damage to roots when the seedlings are removed for transplanting in the field, apart from encouraging good initial development of the seedling.

Dry Season Uses — Weeding

The monsoon rains invariably promote the growth of a variety of weeds all over the estate and these have to be removed before the next



Illustration III — The Landmaster with 36" reciprocating Cutter-bar attachment mows a crop of weeds which have developed in the young plantation.



Illustration IV — With its $\frac{1}{2}$ Ton Trailer attachment, the Landmaster transports a load of Coconut husk from the heap.

season or the undergrowth gets out of hand and hinders the subsequent cultivation operations, quite apart from making the collection of nuts a game of hide-and-seek in which the collector is at a hopeless disadvantage. The herd of cattle usually kept on estates performs this function very well, but cannot be tolerated where a young plantation is being raised as the cattle invariably cause great damage to the seedlings.

The Landmaster range comprises two implements to meet this need, in a reciprocating, self-propelled cutter-bar, and the more recently introduced rotary slasher — also self-propelled. The cutter-bar is preferred where the undergrowth is of a woody nature, or where the surface of the land is relatively level, and a park-like appearance is required. In uneven or gravelly areas the lumps of rock etc., usually cause eventual damage to the reciprocating blade and the need for continual maintenance. This can however, be greatly reduced when an experienced operator uses the Landmaster, and the result is certainly very thorough as all the surface growth is chopped off at its base and laid evenly in the wake of the machine, as a protective mulch over the soil against the destructive effects of direct sunshine. The rotary weed cutter, though better under conditions of uneven growth and inexperienced operation does not produce such a fine finish as the reciprocating cutter-bar. Thus each model has its respective advantages according to the type of terrain upon which it will be used. Operating speeds for both vary between $\frac{1}{2}$ to $\frac{3}{4}$ of an acre per hour.

Dry Season Uses — Transport

A useful attachment is the special trailer used with the Landmaster, capable of hauling loads up to 7 - 10 cwt. at speeds of nearly 9 m.p.h. Whereas the high gear setting on the Landmaster will be found adequate for normal, relatively flat terrain, it may be advantageous to use the lower gear when transporting goods over undulating or rough ground. The operator sits on his trailer while driving the combination for transport, and has the facilities of a foot brake with parking position. Although used on some estates for collecting harvested nuts, the latter function is found to be better accomplished by the traditional bullock carts as the collection has usually to take place at the same time, and there is no time advantage in the use of a faster machine for this operation. Where, however, full loads have to be transported from one portion of the field to another, such as bags of fertiliser, cans of milk, etc., the greater speed and carrying capacity of the Landmaster and trailer can be utilised to better advantage.

Dry Season Uses — Irrigation

A useful attachment which becomes almost essential during the dry weather is the 6,000 gallon per hour, self priming, water pump which is attached to the front of the Landmaster and is driven direct from the engine. One G.P. has recently installed a sprinkler irrigation system for watering his young palms, and reports singular improvement in growth and also in the yield of his mature palms by the elimination of the shortfall in crops usually associated with the dry season between monsoons.

Inter-Cropping

In the endeavour to increase the income from each acre of his estate, the G.P. frequently introduces a variety of intercrops. Grown in the avenue between rows of palms are crops such as pineapples, and a range of vegetables such as Banana, Ladies Fingers, Chillies, Egg Plant, and Onions. All these crops require intensive cultivation which is also beneficial to the palms provided the inter-cropping is itself manured and tended quite apart from that due to the palms. It is in this type of intensive row-crop work that the Landmaster proves a particular boon. For the initial preparation of the beds the plough is invaluable, followed a week or ten days later by the rotary cultivator operating at its full width of

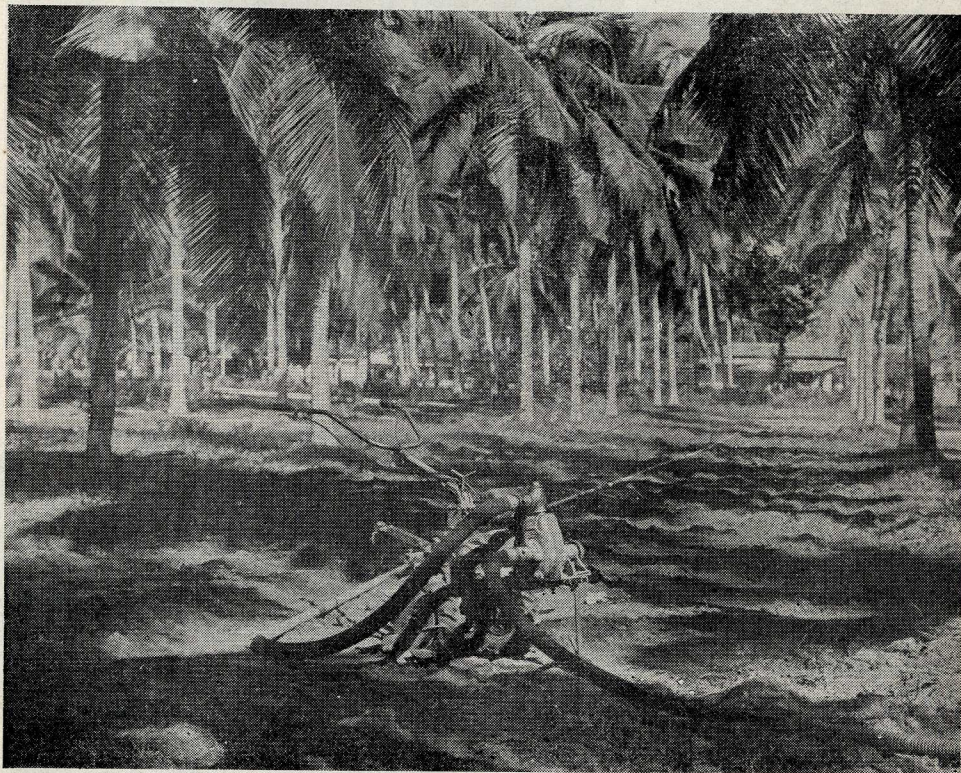


Illustration V — Irrigation with the 6,000 g.p.h. pump attached to the Landmaster 150.

45" to break down the clods and prepare the seed bed. Where the extent being inter-cropped is extensive, the Landmaster seed drill ganged in units of two or four may be used to ensure accurate spacing of seeds both in the row as well as between rows. As the young plants develop the Landmaster rotary-cultivator attachment is again used for inter-cultivation between the rows of plants. The rotors can easily be adjusted to any convenient spacing from 12" up to 45" thus suiting the most economic spacing distance for each crop. Where ridging is necessary such as between rows of sugar cane or maize, the special Landmaster ridging rotors do a combined operation of both inter-culture as well as hilling up.



VI



VII



VIII

Illustrations VI, VII & VIII — The Landmaster used also for inter-cropping is here illustrated inter-cultivating 45" wide between rows of young bananas, cultivating 33" wide between rows of pineapples, and 22" wide between rows of chillies.

Inter-cropping has invariably proved beneficial both as a means for increasing the returns from a limited acreage, as well as to the plantation crop, which responds favourably to the additional cultivation and manuring. The growing of coconuts, hitherto considered an "extensive" crop, thus also adapts well to "intensive" cultivation, which in turn makes more remunerative use of the land available. Particularly is this proved in the coconut areas of Kerala in South India. The limiting factor hitherto has been the labour necessary for the additional work involved. With the correct application of mechanisation this need be a problem no longer.

Rupees and Cents

Of fundamental interest to the G.P. is the question of economic return from his investment in mechanisation. There is of course the very real return which results through higher crops which follow regular and timely cultivation. But this is not enough, and here the 'new mechanisation' has proved itself on several hundreds of estates already.

The capital outlay for a machine like the Landmaster is usually between Rs. 1,800/- and Rs. 3,000/- depending upon the range of implements and attachments purchased. Experience over the past few years of this machine's introduction into Ceylon indicates a useful life of the basic tractor, before major overhaul becomes necessary of about 2,500 hours (considered in terms of a car operating at an average of 20 m.p.h., this is the equivalent of 50,000 miles!) This, then indicates an hourly depreciation figure of around Rs. 1/- per hour.

Fuel costs each hour vary between 70 cents for the petrol model down to 30 cents for the more recently introduced kerosene model. Let's say an average of 50 cents. Add to this a further 20 cents for repairs, spares, etc., and we arrive at an hourly operating average of Rs. 1/70, to which of course labour must be added if the G.P. does not intend operating his own machine. (And here I must break into the story to tell you what a pleasure it is to be ploughing your own land; what pride in feeling the texture of the soil develop under your feet; no matter the exhaustion after a good day's work — you soon get used to it and feel infinitely better for your day in the open air and on clean, well turned soil. The feeling of satisfaction, I assure you, is quite unmatched!)

And now to return from a romance to pennies; what can one achieve for the outlay of Rs. 1/70 per hour? The answer is a quarter to half an acre of ploughing, or 30 palms manured, or half an acre of weeding, or 4 ton-miles of transport. Even adding a further 50 cents per hour for labour, the costs achieved, through the 'new mechanisation' are far lower than has been thought possible hitherto by conventional methods and practices.

The secret of all mechanisation is, of course, utilisation. The more you use your machine — which cannot tire — the more economically you operate.

Conclusion

The Landmaster people have a slogan which goes:—
Farm Cheaper, Farm Faster,
Farm Better with Landmaster
— and what's more it really happens that way too!