CULTIVATION AND PREPARATION OF GINGER AND TURMERIC

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MIXED cultivation is perhaps the most general form of cultivation practised in village holdings in the Central Province. Cocoa, coffee, jak, arecanuts, coconuts, kitul, sapu, kekuna, plantains, kapok, vegetables, etc. grow together in a haphazard fashion; most of the village holdings in the Katugastota Range are of this type. It would appear that the possibility of introducing on an extensive scale annual crops requiring no shade is rather remote. Ginger and turmeric, however, can be grown under medium shade and these two crops can therefore be cultivated extensively in the mixed gardens in Harispattu.

During the last few years special efforts have been made to stimulate and extend the cultivation of ginger and turmeric in these village holdings. The results have been encouraging. Practically every village garden has a few plants for domestic uses. Ginger is extensively cultivated in the Kandy district, particularly in villages between Kadugannawa and Peradeniya, and is one of the most paying minor crops. The cultivation of ginger in the Katugastota Range was rapidly spreading but received a severe check during the severe drought in 1935, followed by the malaria epidemic when all available ginger was used up for the preparation of medicines, etc. The subsequent price of ginger, which rose from Rs. 2·50 to Rs. 80·00 per cwt., prevented the villager from growing it owing to the high cost of seed ginger. The cultivation of turmeric is, however, quite popular with the average villager.

Gravelly, stony or stiff clay soils are unsuitable for these two crops; deep free working loamy soils are best. The cultural operations for both are similar. Rainfall is of little importance if irrigation is possible. Ginger and turmeric are extensively cultivated in the Poona District in India under irrigation with a rainfall of only about 25 inches per annum distributed chiefly from June to October.

Ginger and turmeric are well suited for mixed cultivation. The long upright turmeric leaves stand above the level of the ginger and thus get abundant light and air. They give to the ginger beneficial shade. Turmeric as a mixed crop with ginger gets the same treatment as the latter. Cultivation is identical.

The secret of success in cultivation is to have a friable, loose layer of soil to a depth of at least five inches in which the rhizomes can form easily. The soil should be turned over to a depth of nine to twelve inches about two months prior to planting, and left exposed to weathering. Level contour drains should be cut and the excavated soil bunded up on the upper side and well rammed down to form effective embankments against erosion. Any wash which may take place is caught up at the bund and thus starts the formation of terraces. The distances between drains will depend on the slope. The second turning of the soil should be done about two months later. A third turning over and the final preparation of soil are done soon before planting. If the land is free from stumps and sufficiently level to admit implements, it is more economical to do the preliminary tillage operations with the plough and the harrow.

A well-drained soil is essential for these crops, especially on flat lands. In such cases the land may be prepared in three different ways: (*a*) The bed method where beds 12 ft. $\times$ 6 ft. are made. (*b*) Ridge and furrow method in which the ridges are made 24 inches apart with a furrow between them; the rhizomes are planted on the sides and top of the ridges. (*c*) The broad ridge method where ridges with flat tops 3 to 4 feet wide with an 18-inch furrow between them are prepared.

The ridges and furrows can be constructed with a plough. Ginger and turmeric can be grown together, as mixed crops, with yams as a subsidiary crop. The ginger can be planted along the borders of the beds or broad ridges, 12 to 15 inches apart. If the crop of ginger is planted on the slopes of hills as is usually done in the Kandy district, the turmeric can then be planted along the bunds of the drains or in contour rows about 15 to 20 feet apart.

It is a common practice for cultivators to grow *Dioscorea* yams at the foot of trees so that the vine can be trained to twine round them. *Dioscorea* and *Colocasia* yams can be grown as subsidiary crops in a mixed field of ginger and turmeric. The yams can be grown at the ends of the beds and broad ridges or spaced 15 to 20 feet apart. The creeping varieties can be trained on supports of bamboos, arecanuts or jungle posts. This system of cultivation of ginger, turmeric and yams mixed has been successfully demonstrated at the Nugawela Ginger Station (see Plate I). In the Kandy district, owing to the scarcity of spare land for village expansion, intensive cultivation on the lines suggested should be remunerative.

PLANTING

Good plump rhizomes from the previous crop with two or three eyes or buds are used for planting. The method practised by the villager is to plant large whole hands (about 3 ins. by 5 ins.). By this method of planting, the hands that develop from a single set are small in size and are bunched together with numerous small fingers. This is disadvantageous for curing. The bunches that develop from small sets, on the other hand, appear to be larger in size, are much less bunched together and separate easily. They are decidedly superior to the bunched hands for curing. 1,200 to 1,500 lb. of seed ginger are required to plant an acre. In the Kandy district, ginger is best planted about the middle of March. After planting the main crop, the subsidiary crop may be planted. The whole area should next be covered with a thick mulch of dried leaves, paddy husks or straw. A mulch of straw at the rate of about 4,500-5,000 lb. per acre has been found to be

Plate I.—Nugawela Ginger Station

very effective. This serves not only to conserve the moisture in the soil and to check weed growth but the chemical and physical effects of the decomposed straw increase the yield of the crop. When the market is good, mulching with straw and manuring with artificials have been found to be remunerative. A mixed fertilizer is advisable but an application of 200 lb. per acre of sulphate of potash or muriate of potash alone will be beneficial if followed by straw mulching.

Two weedings are essential, but a third may be necessary.

HARVESTING

Normally, ginger is lifted in December-January. When the crop is ready the leaves start drying up. Harvesting can be delayed if rainy weather interferes. Small holders as a rule do not lift the entire crop at once. The harvesting is done in stages according to the market fluctuations. Ginger can be stored for a long time in a cool, well-ventilated room. Before storing, the rhizomes should be sorted and any decayed portions rejected. The ginger is then built up in heaps $2\frac{1}{2}$ to 3 feet in height. The heaps are covered with ginger or turmeric leaves which are sprinkled with water. The heaps are examined once a fortnight or oftener. If the ginger at the middle is found to be heated, the heap is broken up and any decayed or rotten pieces removed. After three or four days the ginger is again heaped up. During very hot weather the stored ginger should be carefully examined regularly. The prompt removal of decayed pieces is absolutely necessary. Ginger can be stored in this manner for 7 to 8 months. During storage, the ginger loses weight and also a certain proportion may get rotten. This loss may be as much as 40 per cent. when it is not carefully stored, but is usually about 20 per cent.

Normally the yield is about four fold, but with good cultivation and manuring six to eight fold can be expected.

The cost of cultivation of an acre of ginger is about Rs. 225·00. The cost of seed ginger has to be added and may be Rs. 300·00 or more depending on the prevailing price of raw ginger.

COST OF CULTIVATION OF AN ACRE OF GINGER

		Men @ 50 cts. per day	Women @ 30 cts. per day	Rs. Cts.	Rs. Cts.
1.	Clearing shrub jungle ..				10 00
2.	Contour draining, 24″ × 18″ with all earth bunded on the upper side and rammed in, 28 chains @ 60 cts. per chain ..				16 80
3.	Turning over soil : 1st turning @ 35 cts. per square of 25′ × 25′			24 50	
	2nd turning @ 25 cts. per sq.			17 50	
	3rd turning and crushing clods @ 25 cts. per sq.			17 50	59 50
4.	Marking with the marker for planting	2			1 00
5.	Planting ginger : Holing ..	8		4 00	
	Planting ..		6	1 80	
	Covering ..	6		3 00	8 80
6.	1,500 bundles of straw @ Re. 1·50				22 50
	Spreading straw ..	1	2		1 10
7.	3 weedings @ Rs. 15·00 per weeding				15 00
8.	Harvesting : Digging the crop	15		7 50	
	Cleaning and transporting ..		40	12 00	19 50
9.	Rent of land for one year ..				10 00
10.	Construction of temporary watch hut, cost of tools, etc. ..				15 00
11.	Wages for a watcher for 3 months				45 00
					224 20

A ratoon crop of ginger is obtained by leaving in the soil from year to year a portion of a rhizome containing an " eye." This develops in the normal way giving rise to a crop in the next season. Ratoon ginger is smaller and more fibrous than an ordinary crop and deteriorates steadily from year to year,

CURING OF GINGER

If the crop is to be cured it should be lifted in stages and not all at once. A good supply of clean water and a continuous spell of dry weather are essential for successful curing. If ginger in the curing stages is exposed to wet conditions, it becomes dark in colour, mildew develops and may give a musty odour and bad flavour. February and March, which are usually dry, are suitable for curing. It is best to harvest at one time only the quantity that can be dealt with on the same day. The ginger, after the removal of the fibrous roots and the adhering earth, is thrown into a tank of water and thoroughly washed. The water is then drained off and the ginger allowed to soak in a fresh supply of clean water. The soaking facilitates the removal of the outer skin which is scraped off with pieces of bamboo improvised as knives. Special knives for peeling ginger have been made. These consist of a thin iron blade about half an inch broad at the base and tapering to about a tenth of an inch at the tip and about four inches long. One face of the blade is flat, while the other has a bevelled edge. The knife scrapes but does not cut. It has the advantage that it can scrape in either direction.

The operation of peeling is a delicate one if carried out in the proper manner, the object being to remove the skin without destroying the cells immediately below it as these cells contain much of the oil on which the aroma of the best quality of ginger depends. As the rhizomes are peeled they are thrown into water and washed. The more carefully the washing is done the whiter will the resulting product be. The peeled ginger is allowed to remain in water overnight. The following morning it is washed again in lime water. The lime water should first be strained before introducing the ginger into it. The quality of the lime makes a difference in the appearance of the finished product. The purer the lime the better the product. One bushel of lime has been found to be sufficient for 3 cwt. of raw ginger. Ginger treated with lime keeps better. After treatment it is spread out on sacks or coir matting or on a cement barbecue to dry in the sun. It should be turned over frequently whilst being dried, particularly on the first day, to ensure uniform drying. The

drying should proceed for 5 to 6 days accompanied by frequent turning. If the ginger is not sufficiently white in appearance, it should be bleached again by washing in water and drying again for a further period. Ginger should not be bagged until it is thoroughly dried or it is liable to become mouldy. Six pounds of green ginger will produce one pound of cured ginger. When thoroughly dried, ginger should be rubbed on a coarse sacking, to remove any skin not previously removed by scraping. The peeling may be rough or clean; rough peeling is less expensive and suits the local demands. A woman can ordinarily rough peel about 25 to 28 pounds per day. The finished ginger is graded according to colour and size of the "hands."

The local variety of ginger is not very suitable for curing. It develops small hands and has generally numerous fingers which necessitate breaking the ginger into small pieces before curing. Peeling is difficult and expensive. Cochin ginger has fewer fingers, is less fibrous and more plump. Surat ginger is the best, being large and plump, and free from fibre, while its roots are easily removed and the cured product is of a good aroma, flavour and fracture.

THE PREPARATION OF TURMERIC FOR THE MARKET

The best rhizomes are reserved for seed. The rest are cleaned and the roots removed. Dry or green leaves of turmeric are placed inside a pan used for boiling the turmeric. The turmeric is then placed inside the pan and water poured into it until the level is about three inches below the rim of the pan. The pan is then covered with turmeric leaves and plastered with cowdung to prevent the escape of vapour. It is then boiled over a slow fire for about three or four hours and allowed to cool while standing over the fire. On cooling the plaster cover is removed and the water thrown away. The turmeric is then taken out and spread out in the sun to dry. It is collected at night and covered over to protect it from dew. While drying, it should be stirred over three or four times a day to ensure even drying. When thoroughly dry it should be trampled with the feet on a bed paved with rough stones to remove the outer skin when it will acquire the usual turmeric colour. The product is then ready.

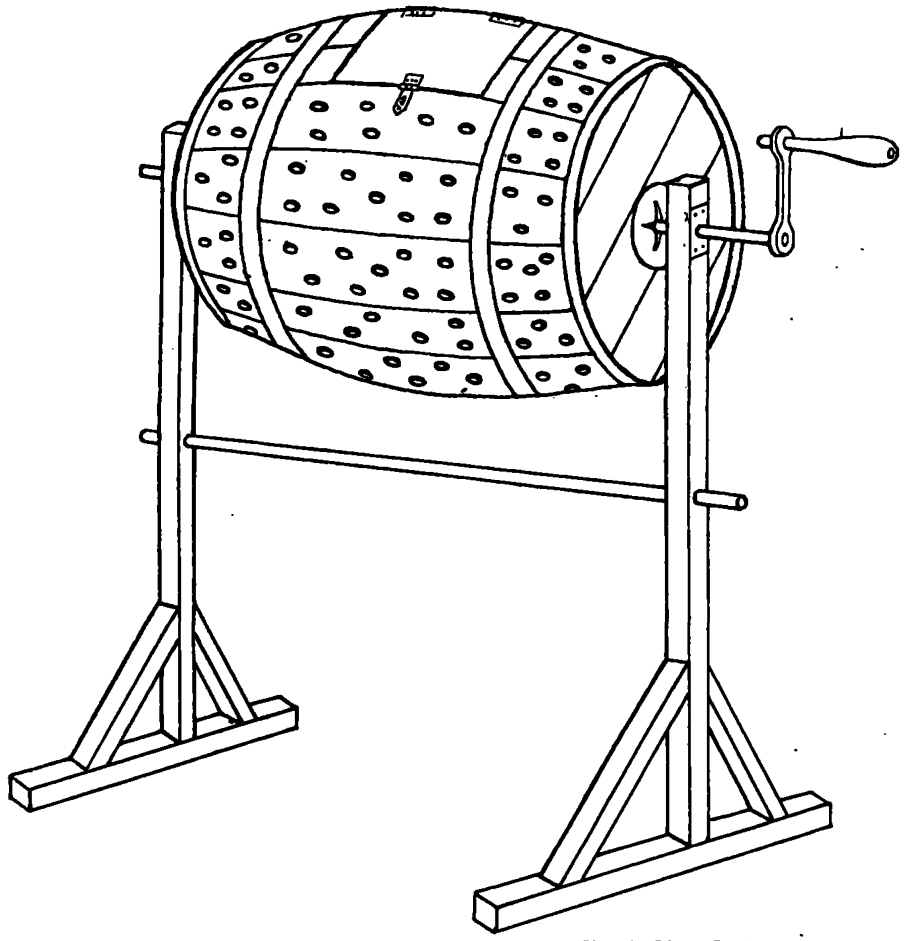

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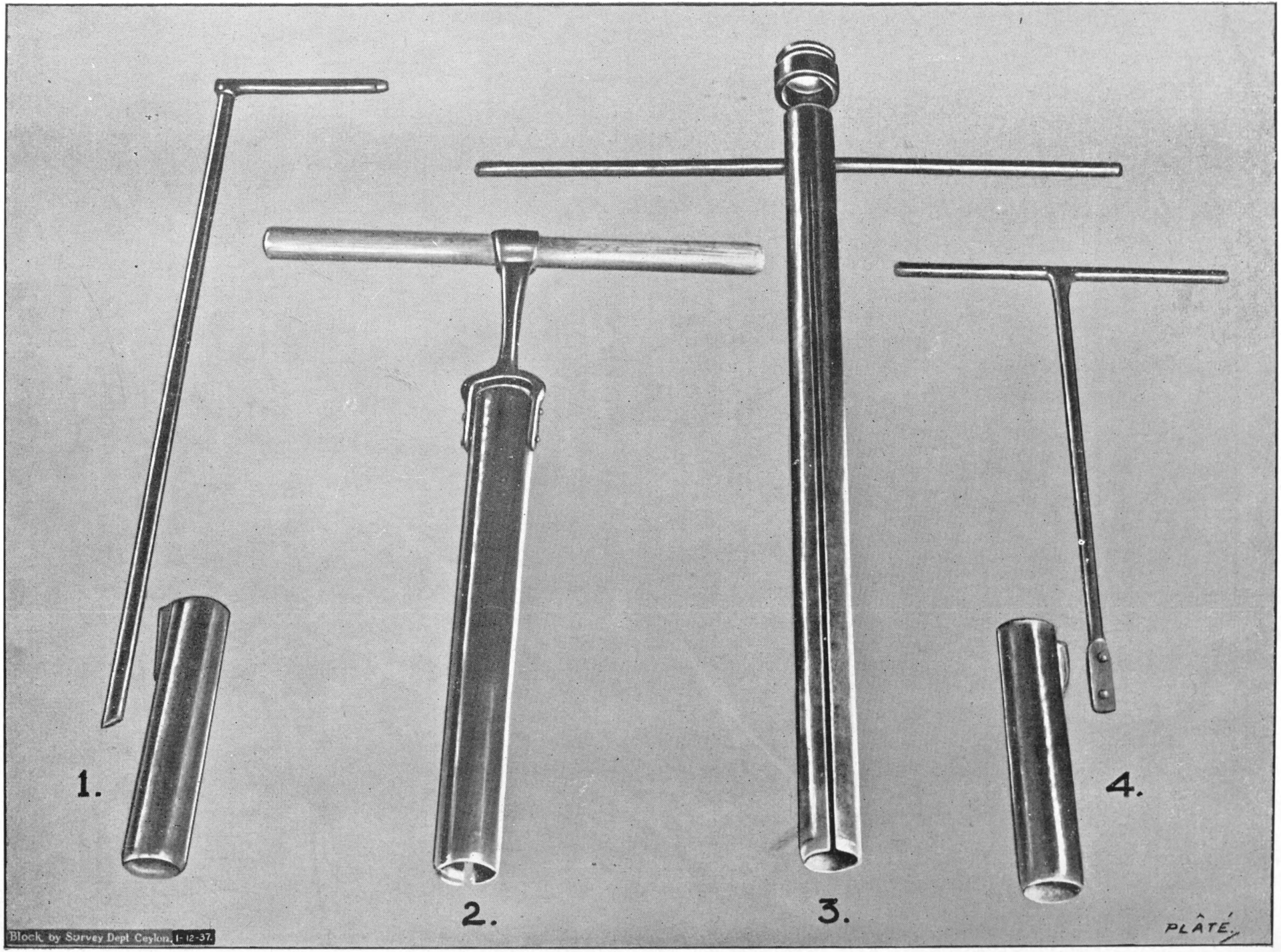
Plate II.—Turmeric Polisher

The process of rubbing on a rough surface is rather laborious and turmeric can be polished more economically by using a simple and cheap polisher (Plate II). This is made out of an empty cask with closed ends, fitted with an iron axle which runs through the cask. A wooden handle is attached at one end of the axle. A small door about nine inches long and six inches wide is provided on the barrel, and is fixed in position by means of two small hinges. The barrel is mounted horizontally on two wooden posts and is turned by means of the handle. About a dozen small wooden lugs are fixed on to the inside of the barrel to increase friction. Dry turmeric is put inside the barrel till it is nearly half full, and the barrel is rotated or swung to and fro in a semicircle. A few sharp stones placed inside the barrel helps the cleaning. It is convenient to bore small holes about a quarter of an inch in diameter for the escape of the dust. To intensify the colour some water may be sprinkled on the turmeric before the charge is ready. A polisher of this type can be made by a village carpenter or blacksmith at a cost of about Rs. 3·00.



A Soil-Borer for Rapid Sampling