COFFEE PULP

AS MANURE ON SWEET POTATO

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INTRODUCTION

Coffee is grown in many areas of Papua New Guinea. It is one of our most valuable cash crops. Sweet potato is also grown in many parts of the country and is one of the most important of our major food crops. Both of these crops are contributing a great deal toward the well being and advancement of the people of Papua New Guinea.

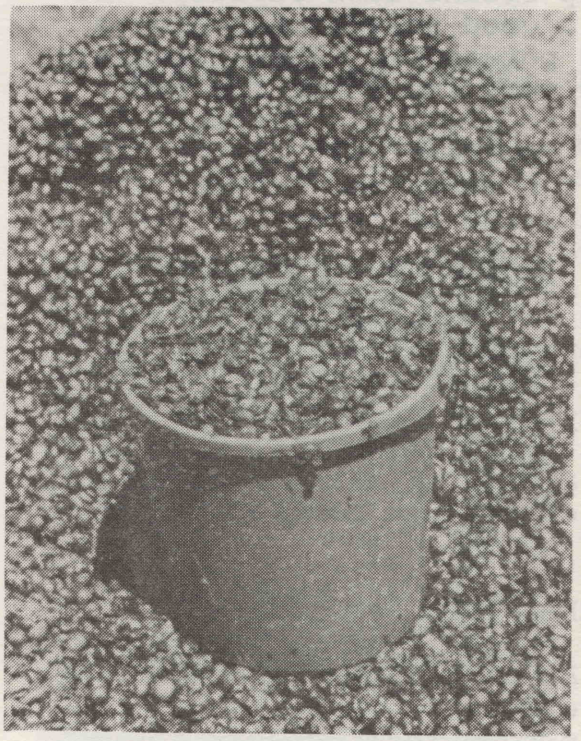
Coffee growing and sweet potato growing go well together. For example, sweet potato gives energy to the people who produce coffee while coffee helps bring in money for the grower who can then use some of it to buy tools and equipment to improve his sweet potato garden.

Most of our rural people are not yet familiar with new, intensive agricultural techniques, and even those subsistence farmers who grow coffee cannot afford artificial fertilizers.

One of the cheapest ways in which coffee can contribute to improving yields of sweet potato and other food crops is by the use of one of its by-products, coffee pulp, directly as an organic fertiliser or manure. Plants have been observed to grow very well on areas where coffee pulp is dumped or where it has been placed in gardens.

COFFEE PULP

Coffee pulp is the soft and succulent outer skin of the fresh ripe fruit (or cherry, as it is usually called). It is separated from the coffee bean, or wet parchment, by using coffee pulping machines or by other methods such as biting between the teeth or rubbing between flat stones.



Coffee pulp

This article was first published as Highlands Agricultural Experiment Station Technical Bulletin No. 8.

Coffee pulp is produced on large plantations, small holdings and settlement blocks throughout the country. It is therefore available in large quantities. Most of this coffee pulp is wasted by being dumped into rivers and creeks which causes pollution of good drinking water.

In some coffee-growing parts of the highlands, subsistence farmers do use the coffee pulp in their gardens, especially on food crops such as bananas, sugar cane and taro, which are usually planted near their houses. People from coastal areas and from other parts of the highlands, however, are not yet aware of the value of coffee pulp as an important fertilizer.

When left on the ground, coffee pulp breaks down rapidly. It is a good source of nitrogen and potassium. These elements are very important for sweet potato growing. Nitrogen plays an important part in the growth of the vines and leaves, while potassium is necessary for tuber development.

The coffee pulp also helps to improve the structure of the soil making it lighter and more airy. The tubers can develop better in light soil with plenty of air in it than in heavy soil which may get too wet.

EXPERIMENTS

At Aiyura, three experiments were carried out with coffee pulp to determine what effect it has on sweet potato yield in the highlands. In these experiments, six rates of coffee pulp were applied. They were 0, 15, 30, 45, 60 and 75 t/ha of fresh pulp. In all trials, the application of coffee pulp significantly increased the marketable tuber yield (Table 1) but digging the pulp into the soil gave higher tuber yields than spreading it on the surface (Table 2).

TABLE 1. EFFECT OF RATE OF COFFEE PULP APPLICATION ON YIELD OF MARKETABLE TUBERS.

Rate t/ha	Yield* kg/ha
0	9 300
15	12 100
30	13 000
45	12 900
60	15 800
75	15 600

**Mean of three experiments using both methods of application given in Table 2.*

TABLE 2. EFFECT OF METHOD OF PLACEMENT OF COFFEE PULP ON YIELD OF MARKETABLE TUBERS.

Placement	Yield* kg/ha
Surface	13 200
Dug into soil	14 500

**Mean of three experiments using all rates of application shown in Table 1.*

Although the experiments described here were carried out under highland conditions, the coffee pulp could also be safely used in coastal areas, especially where arable cropping is becoming more intensive.

The varieties in this trial gave higher yields with coffee pulp than without it, but some varieties may give lower yields. This is because coffee pulp contains a lot of nitrogen which causes some varieties to produce a lot of leaf but stops

them from forming tubers. Because of this effect, it is a good idea for a grower to try out the coffee pulp on his varieties in a small area before using it on the whole garden.

Half of a bucketful of pulp is dug into each mound.

APPLICATION OF COFFEE PULP

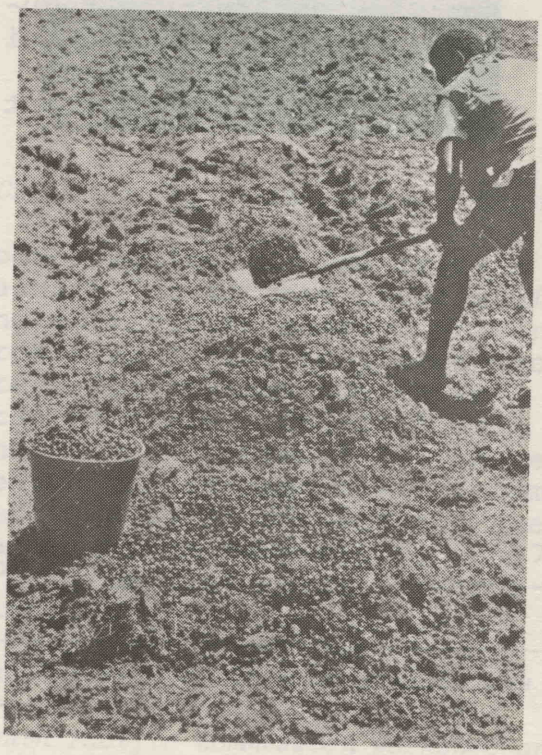
The amount of coffee pulp a gardener should apply depends on how much he has available. The lowest rate which should be used is 15 t/ha which is about 3 kg or half a bucketful of pulp per $2m^2$ mound. If planting is done on ridges, this rate works out as one bucketful to every four metres along the ridge (assuming the ridge to be about 1 m wide).

Because there is a lot of work involved in applying the coffee pulp to a garden, it may be that the gardener will only want to use this minimum of 15 t/ha. More can be applied, however, if it is available and if he can spare the time to apply it. The pulp should be dug into the soil of the ridge or mound. If the coffee pulp is well mixed with the soil then it is fairly safe to plant sweet potato vines on the same day. However, it may be safer to leave the planting for one week after applying the pulp.

This is because a heavy application of organic matter, like coffee pulp, can cause a temporary shortage of nitrogen in the soil while it is breaking down. This will stop the plants from growing well. If the kau kau plants do not start to grow well for some weeks after planting, then the time between digging in the pulp and planting the kau kau should be made longer next time.

COST OF MATERIAL AND TRANSPORT

The use of coffee pulp saves the gardeners and the country money



One bucketful of pulp is dug into each 4 m of ridge.

which would be spent on buying artificial fertilisers imported from overseas. The main cost involved for those who grow sweet potato in large areas, is in transporting the pulp from the factory to the garden site and in applying it.

However, in subsistence gardening, the farmer uses his own labour in getting the coffee pulp from his trees and applying it to his garden. Other costs involved are in buying spades and containers, but old sacks and baskets made of any local material can be used instead of buckets. Overall, the benefits in terms of improved plant growth and increased yield are very great.

SUMMARY

1. Coffee pulp is a valuable fertiliser and people should be encouraged to use it as much as possible on their sweet potato and other food crops.

2. Applying coffee pulp regularly will improve the soil structure by building up the organic matter content.

3. Application of coffee pulp will increase the yield of the crop.

4. If more coffee pulp is used as fertiliser instead of being dumped in rivers and creeks, we will have cleaner water and a cleaner environment.

Owners of large coffee plantations should be advised to dump their coffee pulp in areas from which it can easily be taken away to fertilise food gardens.

If plantations have no immediate use for the pulp, people from nearby villages, schools, corrective institutions and other organizations should be allowed to collect it, either free or at a nominal price, to fertilise their gardens.