

LOSS OF COPRA DUE TO DELAYED PICKING AND PROCESSING OF COCONUTS IN FIJI

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ABSTRACT

Barring a very few estates, coconuts in Fiji Islands are not regularly harvested as in most other countries, but ripe and

rievie the shed nuts efficiently from the thick undergrowth. The rainfall is quite heavy, about 2,500mm distributed practically throughout the year. Hence, some of the overmature nuts start ger-

tion in the quantity and quality of fresh kernel and copra. Perhaps it affects the quantity and quality of the oil as well. A random sample of 782 shed nuts were collected from some blocks of the Wainigata Research Station of Fiji and sorted out into different groups according to whether they developed a shoot or not. Weights of kernels from 25 fruits of each category were recorded. Compared to the kernel content of unsprouted good nuts, the sprouted nuts lost kernel upto 43.01%. Kernel of randomly selected 25 fruits from each of the groups was sundried and converted into copra. Loss of copra (about 6% moisture) between categories was also estimated. Fruits with the largest sprouts, as expected, lost the maximum of 45.92% copra. Such an alarming proportion of the loss in national wealth has to be prevented. To achieve this, regular harvesting of ripe coconuts should be encouraged. Simultaneous steps to eradicate the weeds also should be taken. A week devoted to "Operation Weeds" may be adopted throughout coconut areas, and the weeds eradicated at least once a year.

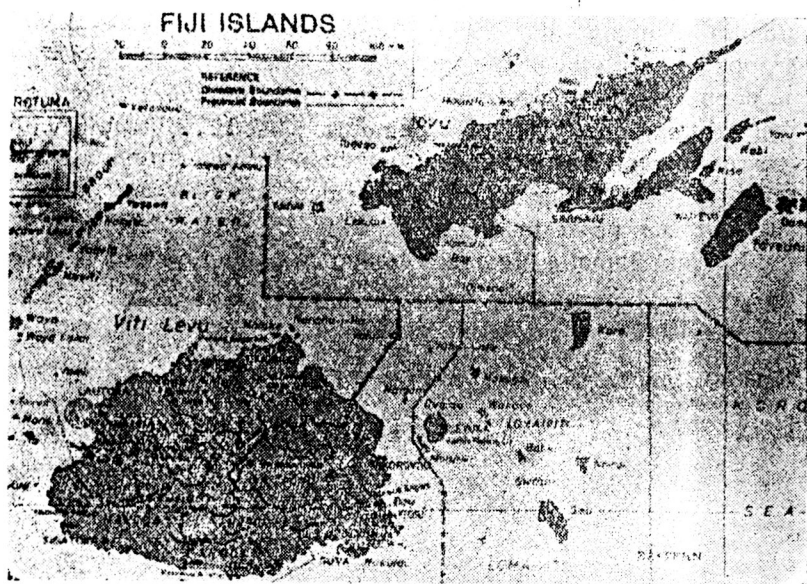


Fig. 1. Map of the Fiji Islands

over-mature nuts are allowed to drop by themselves which are collected periodically. Weeding is not at all a regular practice in Fiji, and so, it is difficult to ret-

minating even before they are shed from the palm crown. Some others develop a shoot as they remain on the ground for long durations. Sprouting of nuts causes a reduc-

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Fig. 2. Coconut fruits bearing a large sprout at the time of their collection from field for processing (category 1)

COCONUT HARVESTING PRACTICES IN VARIOUS COUNTRIES

The methods of harvesting coconut in different coconut growing countries vary. In most Pacific islands including Fiji, coconut is not harvested, but the ripe nuts are allowed to shed and collected periodically. In many estates of Sri Lanka and in a few in Java, palms are harvested with the help of bill-hooks attached to bamboo poles and the bunches chopped by professional harvestors who operate from the ground. The length of bamboo poles varies according to the height of the palm. Two or more such poles are also screwed together to reach the crown of very tall palms. Workers who use poles for harvesting are generally experts in distinguishing mature fruit bunches from immature ones at the crown. In some ASEAN countries like Indonesia, Malaysia and Thailand, even sturdy monkeys, mostly *Macaca nemestrina*, are employed for harvesting co-

conut. Because of the inherent hazards in climbing and since better jobs are easily available for young people in recent years the number of traditional palm climbers is getting reduced. Hence, wherever possible, monkeys are trained to make good the deficiency. In West Sumatra Province

of Indonesia, over 80% of the coconuts are being harvested by the simian climbers. In Bangkok, there is even a school opened for training coconut harvesting monkeys. In other countries, man climbs the palm either for harvesting fruits or for tapping the palms for the palm wine (toddy). Especially to help the toddy tappers who require to reach the crown of coconuts at least twice daily, bamboo-ways and rope-ways are provided for between palms. With such a facility, the tappers need only to walk horizontally between crowns on the bamboo poles or the rope-way, and thus avoid the strenuous climbing. However, each tapper requires the assistance of another person to receive and deliver the toddy let down in pots through ropes. In Sri Lanka, rope-ways are popular while in the Philippines, bamboo-ways are commonly used. Where neither bamboo-ways nor rope-ways are provided the climber shins up and down each palm either by using an ankle ring and/or a waist

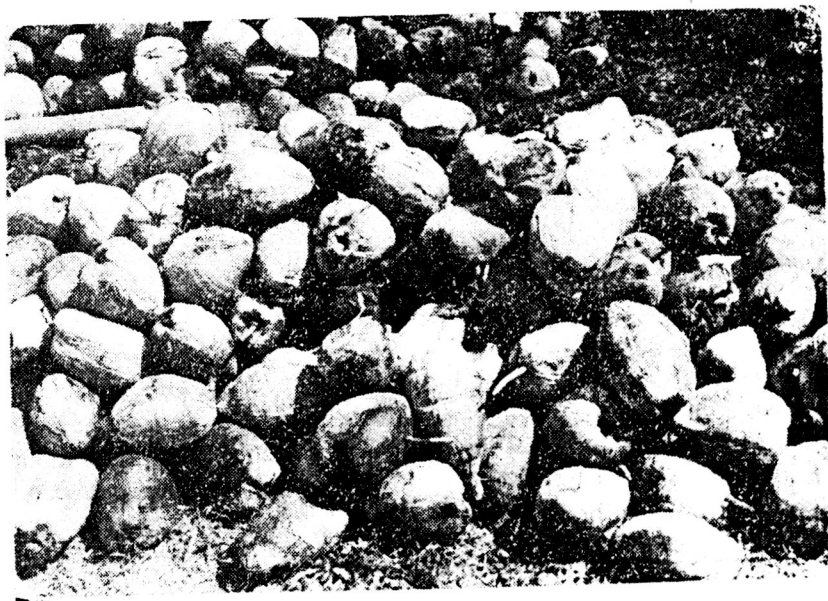


Fig. 3. Fruits that have produced a small sprout (category 2)

ring. Some use a short stick or a piece of rope between hands for negotiating stouter trunks. In some countries like Indonesia, steps are cut on the stem to help easy climbing for persons who do not use an ankle ring. Steps are also provided on the stem by tying coconut husk-splits or stones. Smooth trunks are climbed by expert climbers either by using an ankle ring or without any aid. Most climbers in Kerala climb coconut palms without any accessories which is similar to the way the monkeys scale the stem.

SHARE-HARVESTING OF COCONUT

Especially in Indonesia, share-harvesting the coconut is a common practice, particularly in the swampy areas of Sumatra and Kalimantan. Even in some non-swampy areas of Java and Sulawesi, this practice is in vogue. According to this system, the person (not the owner of the garden) who harvests the palms also processes the nuts into copra and looks after the garden by cleaning the weeds and preventing cattle trespass. He receives 50% of the cost of copra for all these services. Where the palms are short and highly productive, one makes good money by share-harvesting. But the percentage of their share will be increased where the palms are very tall or less productive.

In Fiji too, there exists a different form of share-harvesting. A sizeable area out of the about 65,000 ha of coconut are in estates, owned by people who live either in foreign countries or in big cities or towns of Fiji like Suva and Lautoka, far away



Fig. 4. Groups of unspouted nuts and those that bear a small sprout

from their coconut gardens. Caretakers manage the estates and give a portion of the copra

or their value to the absentee-landlords. Such farm owners gradually lose interest to manage the gardens efficiently. This situation leads to the decline in fruit production. Thus, poor management and neglect to harvest the palms on time are the two major factors responsible for the declining coconut industry of Fiji.

LOSS OF COPRA DUE TO SPROUTING OF NUTS

Lack of trained palm artisans, poor monetary incentive for climbers, and the traditionally passive outlook in life encouraged the inhabitants of Fiji to be indifferent to their dependence on coconut. Even Fijians of Indian origin are not very interested in coconut culture, presumably because their ancestors emigrated mostly from North India where coconuts do not exist. Nevertheless, they are more interested in growing sugarcane as the four



Fig. 5. Scientifically prepared coconut nursery bed at the Wainigata Research Station at Savusavu

factories in the islands produce about 5,000 tonnes of sugar every year valued at over F\$ 200 million.

Since the coconut palms are not harvested, mature fruits remain in the crown for longer periods. As the rainfall is fairly high and distributed over a long period, the nuts start sprouting in the crown and are shed at irregular intervals. Also unsprouted, ripe nuts drop on the ground and remain entangled amidst lush green weeds on wet soil. Gathering the shed nuts in most gardens is done once in 3 or 4 months. By this time, many nuts produce one or two laminate leaves, and when such nuts are processed for copra, the yield of kernel is reduced considerably. Fortunately, there are about 30-40 estates accounting for about 15% of the coconuts in the islands where the palms are maintained reasonably well. Here the shed nuts are gathered once every month and without delay processed into copra, thereby reducing the loss of copra considerably.

We made a preliminary study to estimate the loss of copra sustained by approximately 85% of coconut area of Fiji where the gardens are not well-maintained and where the shed nuts are collected only at irregular intervals. This spot study was undertaken at the Wainigata Research Station of the Department of Agriculture, Fiji in 1985. This study requires to be extended covering more areas and involving more fruits so that the conclusions could be more reliable.

WAINIGATA RESEARCH STATION

This Station was established in 1960 at Savusavu by the Department of Agriculture, and by 1969 it was taken over by the Research Division of the Department. Out of the 288 acres that constitute this farm, 80 acres are under coconut. Research and service to the farmers relating to coconut, cocoa and goat husbandry are the main concern of this Research Station. By far, coconut is the most important commodity of research significance. Investigations in the fields of breeding, agronomy, nutrition, and control of pests and diseases are being pursued at Wainigata. Loss of fresh kernel and copra because of not harvesting the palms has been estimated at this Station in December 1985 when Prof. Davis briefly visited Wainigata for the first time.

THE EXPERIMENTAL PROCEDURE

Gadlets to help climbing the coconut palms, such as the

Swiss forest tree climber, and the climbing spike were experimented with for some time at the Wainigata Station. But, unfortunately, they had no impact on the farm workers to harvest the coconuts periodically. Therefore, even at this government Research Station, the practice prevalent in the country of periodic gathering of shed nuts is being followed.

782 shed nuts gathered from different blocks were separated according to the following categories:

1. Nuts that produced a long sprout bearing one or more laminate leaves;
2. Fruits bearing a small sprout that is visible outside the husk; unsprouted nuts were dehusked and the nuts separated into three groups they are
3. Nuts just sprouted;
4. Unsprouted good nuts; and
5. Barren nuts/damaged nuts.

Numbers of fruits falling under the above categories are shown below:

Category	Number of nuts	Percentage on the total
1. Nuts with large sprout	92	11.76
2. Short-sprouted nuts	226	28.90
3. Sprout within husk	226	28.90
4. Unsprouted good nuts	201	25.70
5. Damaged nuts/barren nuts	37	4.73
Total	782	100.00

Only about one-fourth the fruits sampled remained good and unsprouted.

25 fruits each of the first four categories of fruits were drawn randomly and fresh kernel from them was removed and weighed. The respective weights are given in Table 1.

If the above nuts are processed into copra without further delay thus preventing further deterioration, the sample of 782 fruits will have lost fresh kernel to the value of 18.86%. This is indeed a great loss, more so because most of this loss is avoidable. By timely harvesting and processing of nuts alone, the income of the coconut farmers can be raised from the value of four nuts to about five nuts.

The fresh kernel removed from 25 fruits in each of the four categories were sun-dried and converted into copra containing about 6% moisture. Their values are given in Table 2.

The first three categories have lost copra in the order of 45.72%, 24.33% and 8.02% respectively. The weight of copra to fresh kernel ratio for the good nuts is 57.54%. However, categories 2 and 3 yielded 64.32 and 62.55 percents of copra. Copra yield for Category 1 is much low (54.86%).

Recovery of oil from copra made from the four categories of nuts was also estimated. Nuts bearing large sprout has the least recovery of oil as per data shown in Table 2.

WEEDING

Clean weeding will decidedly increase nut production and the cost of extra nuts produced should be able to cover more than the cost of weed control operation. Climbing palms by providing steps on the trunk as well as pole-

harvesting the coconut should be encouraged. Initially a few experienced climbers and pole-harvestors should be invited from other countries to give demonstration to the local farmers. Field Days should be organised to popularise these practices. If these two measures are followed with success, coconut can be a lot more profitable crop to grow. Moreover, when superior quality, high-yielding planting materials become available and when better agronomic managements are adopted, the benevolent coconut will be a real profitable foreign exchange earner.

ACKNOWLEDGEMENT

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TABLE - 1

Weights of fresh kernel of 25 fruits

Category	Wt. of kernel	% loss compared to unsprouted nuts
Nuts with long sprouts	3.7 kg	43.01
Nuts with small sprouts	4.4 kg	32.31
Nuts just sprouted	5.5 kg	15.38
Unsprouted good nuts	6.5 kg	—

N. B. Freshly shed unsprouted nuts were used for category 4.

TABLE - 2

Weights of copra from different categories of nuts

Category	Wt of kernel of 25 fruits	Wt of copra from 25 fruits	% oil
Nuts with large sprout	3.7 kg	2.03 kg	67.35
Nuts with small sprout	4.4 kg	2.83 kg	69.00
Nuts just sprouted	5.5 kg	3.44 kg	69.18
Unsprouted good nuts	6.5 kg	3.76 kg	70.15