

INSECT PESTS ON STORED COPRA

By F. C. COOKE.

Director, Coconut Research Scheme

Measures to Prevent Copra Becoming Infested with Insects During Storage and Shipment

THE reduction of insects, associated with commercial copra, must commence at the kiln by ensuring that heat is applied to the raw coconut meat, without delay, immediately after the nuts have been split open, and that thereafter drying proceeds continuously and uniformly until the moisture content of the product has been reduced to about 6 per cent.

If there is a long cold period during the process of manufacture, some decomposition of the product is inevitable because insect infestation of copra in storage is primarily due to previous decomposition of the raw meat or half-dried copra by yeasts, bacteria, and moulds during such cold periods.

Certain insects are attracted to raw coconut meat as soon as it commences to deteriorate ; others are associated with half-dried coconut meat and may even be seen on such copra while it is being dried, if the kiln is defective or overloaded; and others are found on commercial copra during storage. Some of the insects associated with copra do not consume the copra, but instead break down the moulds, burrow into the copra to lay their eggs and in so doing produce a large amount of frass or copra dust. Others are parasitic on these insects in that they consume the grubs which emerge from the eggs laid down in the copra. A minority of insects consume the oil in copra and in so doing produce a great deal of residual dust from the solids—not fat—which they reject.

Thus under-dried copra is attacked by a succession of insects, depending on its condition. Copra of poor quality, if stored for a long period, will degenerate gradually into a riddled mass of small broken copra, brown-skin, frass and fine dust. The initial burrowing of the soft, wet copra is effected by the large insects. Smaller insects consume their grubs and finally when the copra is dry, mites and ants attack the tissue, richest in oil, which is near the testa over brown skin. That is why pieces of clean skin are often to be found in very low-grade copra.

The prevalence of insects in a copra store is intimately connected with the quantity of mouldy, degenerated copra, present in that store ; insects are almost entirely absent in stores where hard, dry, white, mould-free copra is stored. Thus, assuming that copra is properly dry and does not get wet in transit it should arrive at its destination in good condition and free from insects. If it is mixed or blended with pieces of less dry copra, or if it is deliberately wetted by unscrupulous dealers in order to make weight, then good copra will become liable to deterioration by mould and the associated attack by insects.

A great deal of work has been done on the problem of sterilising, bleaching, and fumigating copra, more especially low-grade copra. The use of fumes of sulphur or sulphur dioxide has been suggested, but the chief draw-back to this is that, if the extracted oil is

later to be hydrogenated for edible purposes, the nickel catalyst is liable to be "poisoned" and rendered ineffective. Generally speaking, for a low-priced commodity such as copra, the use of bleaching agents, even if effective, or of various sterilising agents is impracticable and unlikely to be accepted by the trade. The only way to ensure the production of copra which will not deteriorate and be subject to serious attack by insects is by education in improved methods of manufacture and in the prohibition of the export of low-grade copra. In other words, the best remedy lies in the production and purchase of dry copra.

Apart from this, even good copra can be attacked to a minor degree by insects which are normally associated with stored rice. Consequently an important measure is to render sacks which have been used for the transport of rice and also rice stores, if they are to be used for copra, free from insects. This may be accomplished by immersing the sacks in boiling water for two minutes to kill all insects within the sacks. The sacks after immersion should be turned inside out, cleaned of all rice and other debris, which should be burnt, and the sacks then thoroughly dried. Another method is to subject the sacks to a dry heat by suspending them from the rafters above the platform of the copra kiln, for one or two hours.

Either of these methods is more suitable than fumigating the sacks in a fumigatorium, using a fumigant, such as carbon bisulphide, which is expensive, volatile, poisonous, explosive and highly inflammable and so requires great care in its use.

The following measures are accordingly recommended so as to ensure that commercial copra will arrive at its destination free from insects :—

- (1) The copra should be carefully prepared and contain not more than 7% of moisture.
- (2) Second-hand sacks, if used, should be freed from insects.
- (3) Copra stores on estates and warehouses at the port of shipment should be kept scrupulously clean and free from hidden accumulations of broken copra and dust.
- (4) Bags of rice should not be stored in the same place as copra.
- (5) The accumulation of large stocks of copra on estates and at the port of shipment should be avoided.