

# ENTOMOLOGY BULLETIN: NO. 27

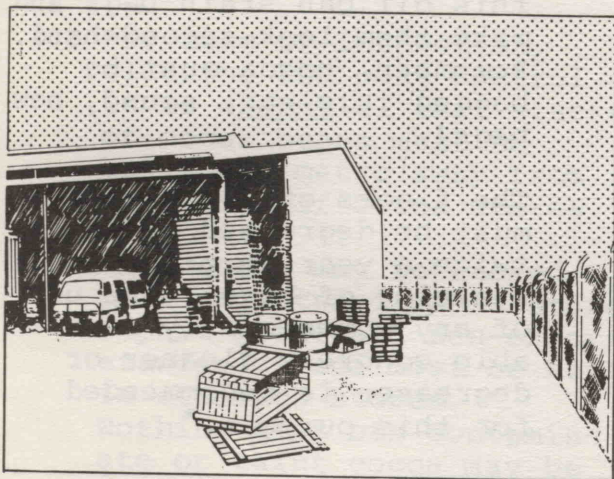
## A CODE OF PRACTICE FOR HYGIENE IN REGISTERED COCOA STORES

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### INTRODUCTION

The quality of cocoa beans is partly affected by the way they are stored after fermentation and bagging. Dirty and untidy cocoa stores provide food and shelter for rats, mice, insects and birds. All of these can damage and reduce the quality, and value of cocoa. Cocoa kept in stores which are not properly waterproof and are poorly drained can get wet and may be completely spoiled by moulds and insects.

This code of practice sets out the basic requirements for hygiene and pest control in registered cocoa stores in Papua New Guinea.



A strip 3 metres wide all around the cocoa store should be kept clear. DO NOT leave packing cases, pallets, etc. in the strip - as shown here.

### 1. EXTERNAL HYGIENE

- 1.1 The area immediately surrounding the cocoa store should be kept clean and tidy.
- 1.2 A strip 3 metres wide all around the store should be kept free of grass and weeds.
- 1.3 No materials of any kind, such as machinery, packing cases, or pallets should be kept in this strip. This should remove any shelter where rats and mice may breed.



Oil drums, packing cases and other rubbish make good breeding areas for rats and mice. Keep the store free of rubbish!



## 2. INTERNAL HYGIENE

2.1 Make sure that the structure of the building is waterproof and properly drained. The roof and walls should be checked regularly for cracks and holes. Water leaking through a small hole in the roof can wet and spoil a lot of cocoa if it is not noticed in time.

2.2 Cocoa stores should be thoroughly cleaned every 3 months when there are no stocks in the store or when only small quantities of cocoa are held in stock. This should be a routine procedure.

Particular attention should be paid to horizontal ledges, and the overlaps of galvanised iron sheeting where cocoa dust and other residues collect. These areas provide shelter and food for the stored products insects which attack cocoa.

After the roof, walls and structural frames have been brushed down, the floor, especially at the angle with the wall, should be swept clean. The corners formed by pillars or buttresses should also receive special attention. The use of an industrial vacuum cleaner to remove dust and residues from difficult corners, cracks and crevices is encouraged.

2.3 All the sweepings and cocoa residues collected should be bagged up at once, removed from the storage area and burnt or buried.

2.4 Bags of cocoa very often become stained with oil when they are stacked on



*All sweepings and cocoa residues should be collected, removed from the storage area, and burnt or buried.*

the floor without pallets, or pushed along the floor by fork lifts. This oil staining can be a reason for rejecting Papua New Guinean cocoa overseas.

The floors of cocoa stores become oily because engine oils fall onto them from fork lifts and trucks. Also when cocoa beans are crushed on the floor they produce a lot of fat. All this oil can stain bags and make them look second-hand. Remember, cocoa must be bagged in clean, sound, new bags!

The floors of cocoa stores must be degreased at least twice a year to prevent oil staining of bags. The use of any commercially available concrete cleaner or degreaser is recommended for this purpose.\*

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\* Belltek Laboratories, KK Kingston and the petroleum companies supply concrete cleaners.



2.5 Any cracks in the concrete floor should be thoroughly cleaned out to remove cocoa residues, and then sealed with a bitumastic or other sealing compound. This will prevent stored products insects breeding in these places.

2.6 All pallets used in the store should be thoroughly brushed clean every time they are exposed. Where necessary, scrape them to remove crushed cocoa bean residues.

2.7 In the interests of good cocoa store hygiene, machinery used to sort and screen cocoa beans or nibs, should not be housed in the same building or room as export cocoa stocks.

Special attention must be paid to the regular cleaning of any such machinery. It is suggested that this should be carried out daily or at the very least weekly, using an industrial vacuum cleaner.

Wherever possible cyclone dust extractors should be fitted to all cocoa cleaning machinery.

2.8 For ease of inspection, cleaning and pest control it is essential that stacks of cocoa beans must be built one metre away from the walls of cocoa stores.

2.9 Only cocoa may be stored in a registered cocoa store. Export grade and non-export standard cocoa must be kept in separate stores. Nothing that can contaminate or taint cocoa may be stored in a registered cocoa store. Fuel oil, grease, fertilizers, and pesticides are prohibited.

### 3. PEST CONTROL

It is essential that chemical pest control measures are only carried out after the recommendations made in section 2 of this code of practice have been implemented. IN COCOA STORES AN INSECTICIDE IS NO SUBSTITUTE FOR A BROOM!

3.1 The internal structure of the store should be sprayed at least four times a year after it has been cleaned (see 2.2) using fenitrothion (Sumithion). This should be applied as a 1% spray. To prepare this, mix:

200 ml Sumithion 50 ec\*  
10 litres water.

This mixture should be sprayed onto the cleaned structure (roof, walls, etc.) of the store at a rate of 5 litres per 100 m<sup>2</sup> of surface.



*In cocoa stores, an insecticide is no substitute for a broom!*

\* Sumithion 50 ec is available from  
Harcros Trading (PNG) Ltd, Lae.



Apply the mixture to run-off. The mixture should not be allowed to come into contact with any cocoa beans in the store. All stacks should be covered with waterproof sheets whilst the spraying is carried out.

- 3.2 All pallets should be sprayed after they have been cleaned (2.6) using the same mixture as for spraying the structure of the store.

3.3 Fogging and space sprays

Regular fogging or space spraying of cocoa stores is recommended to control moths and other insects infesting stored cocoa beans. To obtain the best effect these treatments should be carried out at dusk (also at dawn).

- 3.3.1 For fogging or misting, a preparation containing 0.8% natural pyrethrins synergised with 0.8% piperonyl botoxide\* formulated in odourless kerosene should be used.

When using a mechanical or cold fog generator this should be used at a rate of 0.5 litres per 500 m<sup>3</sup> of store space.

When using a thermal fog generator, use 0.5 litres to 1500 m<sup>3</sup> of store space.

- 3.3.2 Space spraying can also be carried out using automatic or semi-automatic equipment which discharges a dose of insecticide calibrated in relation to the volume of the store in which it is installed.

These systems can be programmed to discharge daily (at dusk and at dawn).\*

Natural pyrethrins should be used when these automatic systems are installed in registered cocoa stores.

3.4 Surface spraying of bag stacks

Stacks of bagged cocoa may be sprayed fortnightly on a routine basis, using 0.8% synergised natural pyrethrins at a rate of 1 litre per 55 m<sup>2</sup> of stack surface.

4. GENERAL

Sometimes when there is no more space available in a store, bag stacks are built up to the roof. This practice is unacceptable because the cocoa beans in the bags at the top are overheated and become brittle.

Steel shipping containers should not be used as temporary stores for cocoa unless they are well shaded from the sun. Cocoa stored in containers exposed to the sun will sweat and be spoilt.

Further information about cocoa storage and construction of cocoa stores is available from:

The Cocoa Board of PNG  
P.O. Box 532, RABAUL

OR Entomology Section  
Department of Primary  
Industry  
P.O. Box 417, Konedobu

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\* In Papua New Guinea, C.I.G., P.O. Box 93, Lae, can supply a complete system to be used with 'Pestigas' which contains 0.4% natural pyrethrins and 2% piperonyl butoxide together with a propellant in cylinders. These can also be operated manually for space spraying.

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\* This formulation is manufactured by Wellcome Australia Ltd., 53 Phillips Street, CONCORD, NSW.