

INSECTS ASSOCIATED WITH DYING CACAO TREES IN WEST NEW GUINEA

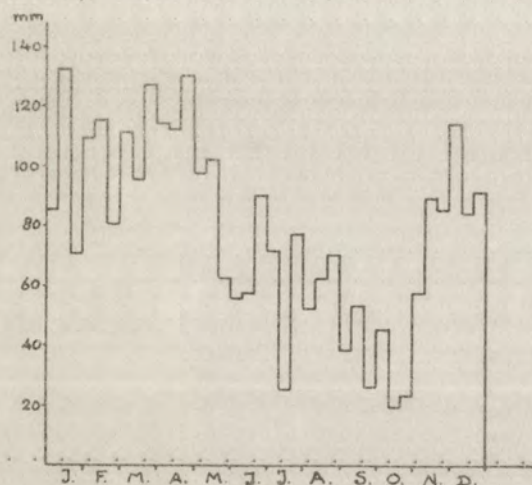
R. T. SIMON THOMAS*.

MANY cacao trees were dying and a number of insects were found in the Wosi Agricultural Experimental Garden, near Mankowari, in West New Guinea. Initially it was uncertain what caused the death of the trees.

Investigations revealed that 38 per cent. of the cacao trees of the clones M4 and M6 † used for generative tests were dead or nearly dead.

These field tests were being carried out on a yellow, lateric loam. In wet conditions the firm lower horizons are very sticky and the soil is hard to till. As a consequence of its firm, moderately pervious lower horizons and being in a flat area, the drainage of the soil is, as a rule, bad (Voort & Wentholt, 1943). Recently, physical tests at the laboratory of the Agricultural Experiment Station at Hollandia confirmed these field observations.

The average annual rainfall is 2,718 mm. (107 inches) and as shown in Figure I the wet season begins in November and continues until the end of May. After this the rainfall decreases until



Average rainfall/decade at Wosi.

FIG. I.—Rainfall recorded at Wosi.

the end of October. This long wet season makes soil conditions very humid for a long period. After heavy downpours water up to 10 cm. deep lies on the ground under the cacao trees for several days.

The high humidity makes conditions very favourable for the fungus *Phytophthora palmivora* Butl. (synonyms: *Phytophthora faberi* Maubl. and *Ph. theobromae* Coleman). This fungus is an omnivorous tropical species, recorded on coconuts and queen palms in Florida (Westcott, 1950), on Hevea brasiliensis (Kunth.) Muell. Arg. in South-East Asia (Heubel, 1940) and on *Theobroma cacao* L. in Africa, Asia and New Guinea. At Wosi, *Ph. Palmivora* Butl. causes black pod and stem canker. After the fungus attack, the cacao trees appear to have symptoms similar to those caused by drought, despite the high humidity.

When the leaves first turn yellow, scolytids appear in the trees. Initially two species of Scolytidae, *Xyloborus discolor* Bldf. var. *posticestriatus* Egg. and *Xyloborus similis* Ferr. are observed. Both species can also attack healthy trees. *X. discolor* var. *posticestriatus* Egg., bores holes in the leaf axils. In 1924 this species was found in cacao twigs in Java (Kalshoven, 1959). *Xyloborus similis* Ferr. was found boring straight holes towards the centre of the branches of healthy cacao trees.

When the trees become unthrifty or die, a large group of insects will secondarily attack the branches and the stems. The following list gives the insects collected from dying and dead trees of *Theobroma cacao* L. in March, 1959:—

Anthribidae :

- Acorynus litigiosus* Pasc.
- Feucus virgatus* Ford.
- Phloeobius gigas* F.
- Plintharia luctuosa* Pasc.

Bostrychidae :

- Xylopsocus capucinus* Fabr.
- Xylothrips religiosus* Fabr.

* Department of Economic Affairs, Hollandia, Netherlands New Guinea.

† Clonal numbers of the cacao used in the Wosi Experimental gardens.

Bremthidae :

One unidentified species.

Cerambycidae :

Clyzomedus fastidiosus Boisd.

Coptops illicata Pasc.

Exocentrus hispidulus Pasc.

Pterolophia duplicata Pasc.

Rondibilis spinosula Pasc.

Scolytidae :

Dryocoetes coffeae Egg.

Dryocoetes sp.

Xyloborus exiguus Walk.

Xyloborus fornicatus Eichh.

Xyloborus perforans Wol.

Xyloborus quadrispinosulus Egg.

Xyloborus semigranosus Bldf. females and possibly male.

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