Diffuse Yellow Leaf Spot of Arabica Coffee in Papua and New Guinea

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ABSTRACT.

A diffuse yellow leaf spot whose cause is unknown is recorded on Arabica coffee in Papua and New Guinea. It is somewhat similar to "weak spot" of Arabica coffee in Kenya, although apparently there are some dissimilarities. It is of no known economic importance.

A DIFFUSE yellow leaf spot of Arabica coffee has been recorded in Papua and New Guinea since 1958; it could, of course, have occurred earlier than this but been undetected.

It is found on both Typica (*Coffea arabica* L. var. *arabica* (syn. *C. arabica* var. *typica* Cramer) and on Bourbon (*C. arabica* var. *bourbon* (B. Rodr.) Choussy) in all the Arabica coffee growing areas in the Territory. It is inconspicuous and can be easily overlooked, especially as the number of spots per plant is usually small.

The spots on the upper surface of the leaf are pale yellow with a diffuse edge grading into the deep green of the normal leaf tissue. They are usually roughly circular in outline, from 1 mm. to 8 mm. in diameter, but sometimes covering larger areas when the spots are confluent. On the lower surface the spots are not so distinct because of the paler green of the underside of the leaf. On the under-surface of each spot, minute pimples from one to many occur, the maximum number counted to date being 34. The pimples are opaque under the stereomicroscope, and are up to 0.2 mm. in diameter. Although these raised areas do not occur on the upper surface, their position is usually indicated by a minute pale spot about 0.1 mm. wide. The plates show the appearance of four yellow diffuse spots on the upper surface (A) and the appearance of the same spots on the under surface of the leaf (B).

Sections through a pimple parallel to the lower surface reveal that the white opaque core extends from the lower epidermis at least through the spongy mesophyll.

The condition was investigated when first encountered, and at various times since, in case the spots indicate the infection courts of fungal invasion, especially, perhaps, a resistant reaction to rust. This, however, has not been demonstrated. Miscellaneous fungal spores are often found on the upper leaf surface, but no appressoria which might account for the reaction of the plant cells have been detected in the region of the spots. No mycelium has been detected microscopically in sections of the spots, but leaf tissue with spots cultured on potato dextrose agar after surface sterilization with mercuric chloride usually yielded *Gloesporium* sp. One of these isolates produced the perfect state in culture, and was confirmed by Dr. Mordue of the Commonwealth Mycological Institute, England, as *Glomerella cingulata* (Stonem.) Spauld. & Schrenk. The isolate, however, did not produce diffuse yellow spots when inoculated on to young Arabica coffee leaves. If the fungus were not the cause of the condition, it is possible that it was present as a latent infection, such as Rayner (1948) reported in coffee in Kenya. In his experiments he obtained species of *Colletotrichum*, *Phoma* and *Phomopsis* from practically every piece of healthy coffee tissue cultured on prune agar after surface sterilization, but found that the isolates from leaves never appeared to cause disease symptoms. He concluded that the fungi were present in healthy leaves at latent infections.

The spots are somewhat similar to the illustration of 'weak spot' of Arabica coffee in Kenya described in the Atlas of Coffee Pests and Diseases (Anon. 1965). The cause of 'weak spot' is unknown, although it is suspected that

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the spots contain fungal mycelium. No minute pimples, however, have been described for " weak spot ".

Mr. J. H. Barrett, formerly coffee entomologist in the Highlands, did not consider that the spots were the result of insect attack, although he thought that the possibility of damage by Collembola had not been completely eliminated.

The spots on New Guinea coffee leaves do not develop into necrotic areas, and as far as can be ascertained, do not cause any debilitation of the plant or premature defoliation, and are of no known economic importance.

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ACKNOWLEDGEMENTS.

Dr. Mordue of the Commonwealth Mycological Institute, England, is thanked for the identification of the culture. The photographs were taken by the Department of Information and Extension Services.

REFERENCES.

ANON. (1965). *Atlas of coffee pests and diseases.* Coffee Board, Kenya. Page 101.

RAYNER, R. W. (1948). Latent infection in *Coffee arabica* L. *Nature.* 161 : 245-246.

Plate A.—Diffuse yellow leaf spot (upper surface). (x5)

Plate B.—Diffuse yellow leaf spot (lower surface) showing minute raised areas. (x5)

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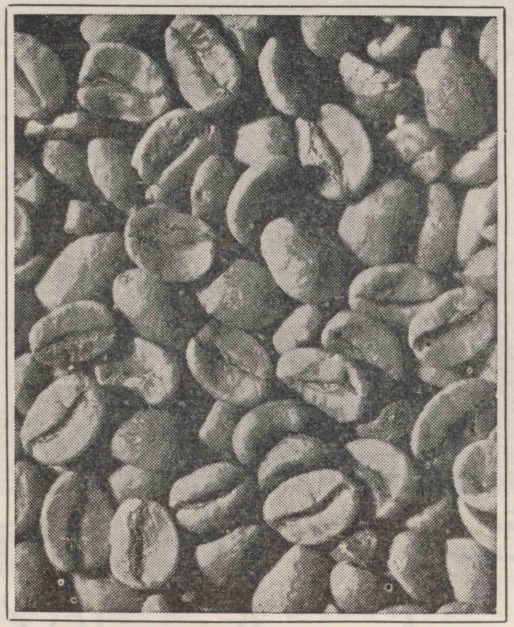

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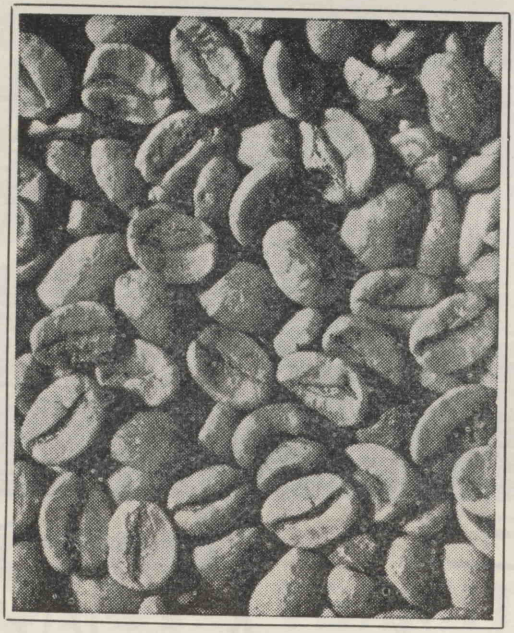

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