

QUEENSLAND.

Bureau of Sugar Experiment Stations
Division of Pathology

FARM BULLETIN No. 8.

Dwarf Disease of Sugar-cane

by
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Dwarf Disease of Sugar-cane.

ARTHUR F. BELL, Pathologist.

DWARF disease is a new and very destructive disease of sugar-cane which was discovered in the Mackay district in 1930. Fortunately the outbreak was discovered by officers of the Bureau in its very early stages, and by prompt circularisation of symptoms and methods of control the possibility of the outbreak assuming large proportions was prevented. This disease is quite unknown in other parts of the world, and so far has not been reported in any part of Queensland other than a section of the Mackay district. Although the reason for the sudden appearance of the disease in sugar-cane is a mystery, it could be explained on the assumption that it was transmitted to the cane from adjacent weeds or cultivated plants, such as occurs in the case of mosaic disease.

The initial discovery of dwarf disease was in the variety P.O.J. 2714 (a variety susceptible to most diseases), but it has since spread into the varieties P.O.J. 213, H.Q. 426 (Clark's Seedling), and possibly E.K. 28. The infection of these other varieties must be viewed with alarm, as it demonstrates that the disease is not peculiar to P.O.J. 2714, but may spread into other standard varieties. Furthermore, the number of farms on which the disease has been found has increased to eleven, and, while it has since been apparently eradicated on some of these farms, there are doubtless other unreported cases.

Symptoms.

The symptoms here described are as found in the variety P.O.J. 2714, which is the most commonly affected variety, but it should be appreciated that the symptoms may be found to vary somewhat in other varieties.

The leaves, and especially the younger leaves, of diseased canes do not have the normal uniformly green colour, but are marked with narrow, yellowish stripes, running in the direction of the veins of the leaf—that is, at an angle to the midrib. These stripes usually range from $\frac{1}{2}$ to 2 inches long, but may often be as much as 6 inches in length; the normal width is about $\frac{1}{16}$ of an inch, but several stripes may run together to give moderately wide yellowish bands, especially at the margins of the leaves. They are always more numerous towards the base of the leaves, and are usually not evenly distributed on both sides of the midrib. As the leaves become older the markings become less distinct, and may have disappeared entirely in the oldest leaves. The photographs reproduced in Plates I. and II. illustrate the size, shape, and distribution of these stripes very well.

Following the infection of a stalk, growth soon ceases, the stalk rapidly tapers off to a point, and the leaves stand out stiff and erect, giving a fan-like appearance to the top (see Plate III.). As the disease progresses the youngest leaves become somewhat twisted and deformed, yellowish in colour, and frequently have scalded margins: the stunted stalk is soon outgrown by surrounding healthy stalks and eventually dies.

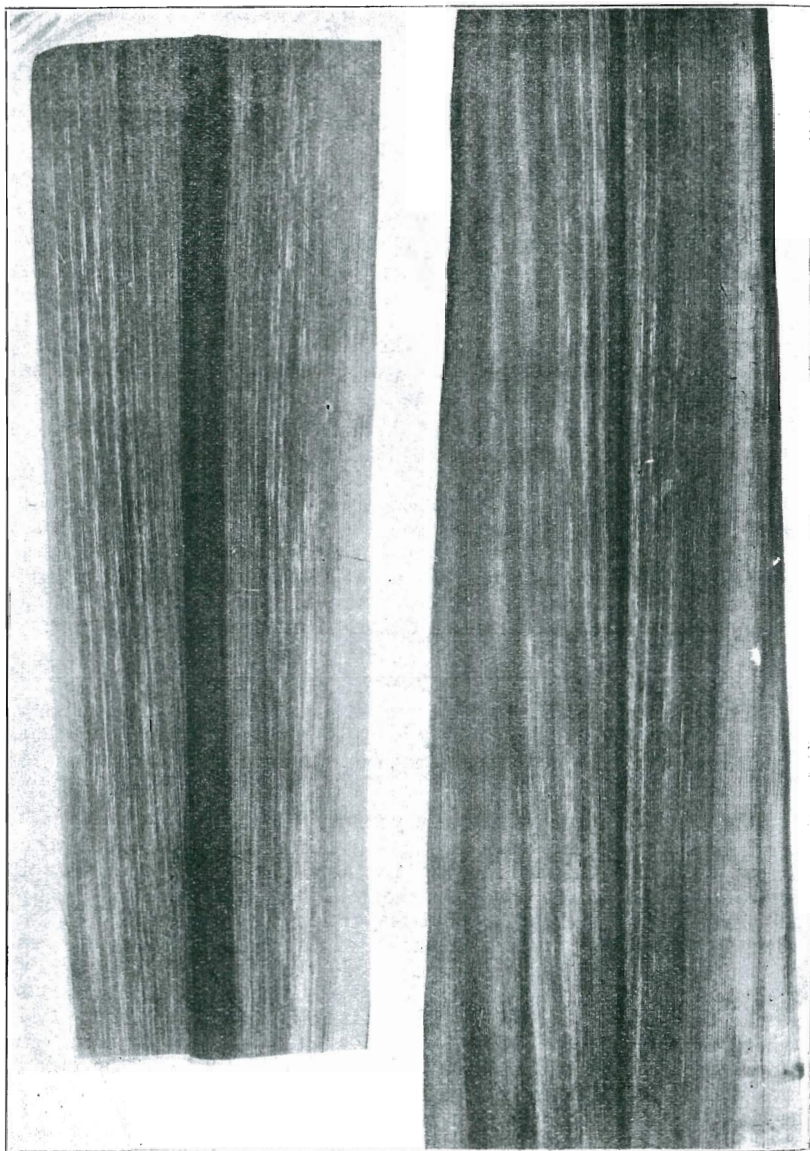


PLATE I.

Leaves of diseased P.O.J. 2714, photographed by transmitted light. Streaks on left-hand leaf more closely resemble those of streak disease than is usually the case. Note uneven distribution of streaks in right-hand leaf and presence of yellowish marginal band on both leaves.



PLATE II.

Similar to Plate I. but photographed by reflected light.

When diseased cuttings are planted, or diseased stools ratooned, the resulting stool is a grasslike cluster of stunted shoots which form no cane and represent a total loss. The small, stunted leaves bear the typical yellowish leaf streaks described above and figured in Plates I. and II., but as a rule they soon develop brownish margins and become frayed and torn. Two typically stunted stools resulting from the planting of infected cuttings are illustrated in Plate IV. These stools and the healthy stools in the adjoining row were nine months old at the time of photographing.

In general appearance all stages of infection are very similar to the corresponding stages in Fiji disease, with this difference—that the leaf galls of Fiji disease are replaced by the yellowish leaf streaks. Anyone familiar with Fiji disease should therefore have little difficulty in recognising dwarf disease.

Control.

Owing to the complete failure of growth of diseased cane, and the fact that the disease has slowly spread into several varieties, the dwarf-disease situation is potentially very serious, and its control demands the sympathetic co-operation of all concerned. Infected farms have been placed under quarantine, and a row-to-row survey of all such farms is now being carried out by officers of this Bureau, who will also supervise the digging-out of all diseased stools found. The survey will later be extended to all other farms in the affected areas. The question of the mode of transmission of the disease is also receiving the attention of the resident entomologist.

The following measures for the control of the disease have been drawn up for the guidance of farmers generally:—

1. Make a careful study of the symptoms of the disease described and illustrated herein, in order to be able to recognise it in the field.
2. Be continually on the lookout for diseased stools when traversing the various fields on the farm, and immediately dig out any diseased stools found.
3. Carefully inspect, or request the nearest field officer of this Bureau to inspect, any field which it is proposed to use as a source of planting material, especially in the case of P.O.J. 2714, P.O.J. 213, H.Q. 426, and E.K. 28. If a single dwarf-disease stool is found, the source should be abandoned for planting purposes.
4. P.O.J. 2714 has so far proved the most susceptible variety, and should not be planted on diseased farms if it can be avoided.
5. Q. 813 appears to be quite resistant, and its planting is recommended.
6. Keep fields and headlands as free from weeds as possible.
7. In the event of finding the disease or any suspicious symptoms in either cane or other plants, report the occurrence to the nearest officer of the Bureau of Sugar Experiment Stations.



PLATE III.

Stalk of P.O.J. 2714, illustrating production of fanlike top following secondary infection.



PLATE IV.

Two typically stunted stools of dwarf-diseased cane resulting from the planting of infected cuttings. These stools and the tall healthy cane in the background are nine months old.

FARM BULLETINS PREVIOUSLY ISSUED.

- No. 1.—FARM FERTILITY TRIALS, 1930 SEASON.
No. 2.—PAPERS ON CANE CULTURE, DISEASE AND PEST CONTROL.
No. 3.—FARM FERTILITY TRIALS, 1931 SEASON.
No. 4.—THE CHILDERS CANE BEETLE.
No. 5.—SOILS IN THEIR RELATIONSHIP TO SUGAR-CANE CULTURE.
No. 6.—PAPERS ON VALUE OF DIFFERENT FORMS OF LIME, AND INTENSIVE CANE PRODUCTION.
No. 7.—FARM FERTILITY TRIALS AND REVIEW OF THE WORK OF EXPERIMENT STATIONS, 1932 SEASON.