A LEAF SPOT DISEASE OF *CROTALARIA* SPP.

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A leaf spot disease of *Crotalaria* spp. caused by *Pleiochaeta setosa* (Kirchn.) Hughes is described in detail and methods are suggested for its control. The disease appears to be a serious limiting factor in the cultivation of Crotalarias as a green manure and cover crop in tea plantings in certain districts.

A leaf spot disease of *Crotalaria* spp. was first described by Gadd in 1935, and the fungus responsible for the disease was later identified as *Ceratophorum setosum* O. Kirchn. (Gadd 1935; 1936). Severe outbreaks of the disease occurred recently in a few estates in the Kandy and Dimbula Districts and also in some experimental plots in a cover crop trial at St Coombs. This prompted a re-examination of the disease and the results are reported in this paper.

The causal agent has now been re-named *Pleiochaeta setosa* (Kirchn.) Hughes and is considered to be identical with the fungus causing Brown Spot Disease of lupins in temperate countries (Hughes 1951; Du Plessis and Truter 1953.)

DISEASE SYMPTOMS

Since the disease has not been adequately described before, a detailed description of the symptoms are given here to enable growers to identify it readily.

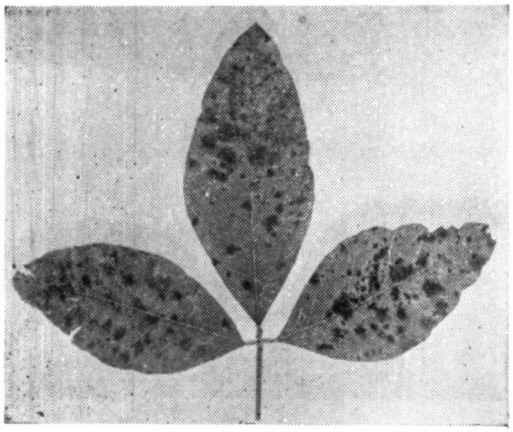
The earliest noticeable symptoms begin as tiny black specks, about the size of a pin-head. Under favourable conditions, these specks enlarge to form spots of irregular shape, the size ranging from 1-8 mm. Occasionally several spots may coalesce to form large necrotic patches; these are often seen along the margins or at the tips of leaflets. Lesions can also appear on the petioles and stem. Old lesions are generally surrounded by chlorotic tissue and the larger spots often have a greyish centre. Leaflets with necrotic patches may show puckering and distortion of the edges and on such leaflets small cracks may develop in the affected areas. Diseased leaflets are readily shed leaving the petioles bare (Fig. 1).

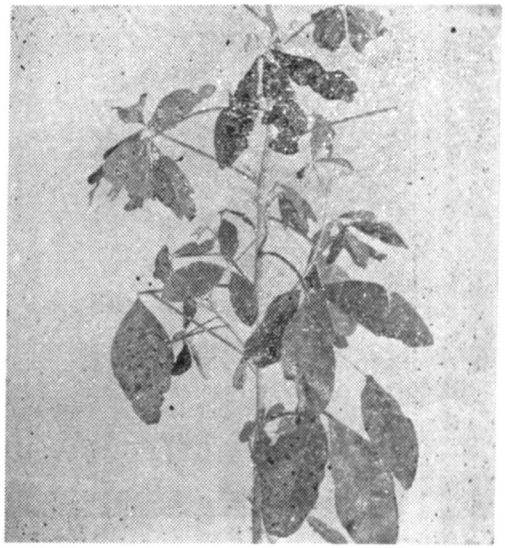
Both young and old plants are susceptible to attack, although the damage on young plants is generally more severe. If persistent wet weather occurs, seedlings and young plants can be killed off completely, due to defoliation and die-back (Fig. 2).

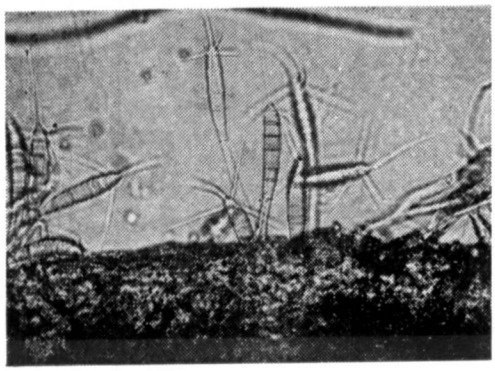
THE FUNGUS

Multiseptate conidia are produced readily on diseased tissue incubated in moist chambers (Fig. 1). The conidia are borne either singly or in pairs on short condiophores on both surfaces of the leaf and along the edges of infected patches. Conidiophores are simple or, occasionally, forked in a dichotomous-like branching habit. Conidia are dark, 5-8 septate, mostly 7-septate, cylindrical to ellipsoid, sometimes slightly curved. The middle cells of the spores are thick-walled and have dark contents, while the end cells are hyaline and thin-walled. The apical cell is pointed and bears one to four long, slender, hyaline seate.

Measurements of conidia collected from infected leaves incubated in a humid chamber for two days, averaged 84 × 21 microns (mounted in 50% glycerine). The apical seta was 62u long and the lateral setae 53 microns.







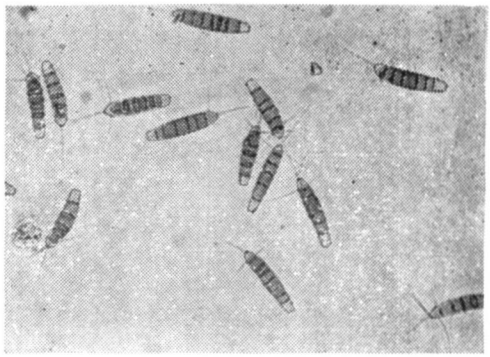


FIGURE 1—*Typical symptoms caused by* Pleiochaeta setosa *on a leaf (Top, left) and shoot (Top, right) of* Cotalaria anagyroides

Conidiophores (Bottom, left : x 120) *and conidia (Bottom right :* x 120 *of* P. setosa *produced on host tissue*

FIGURE 2—*Right—Young plants of* Crotalaria anagyroides *inoculated with* Pleiochaeta setosa
Left—Control

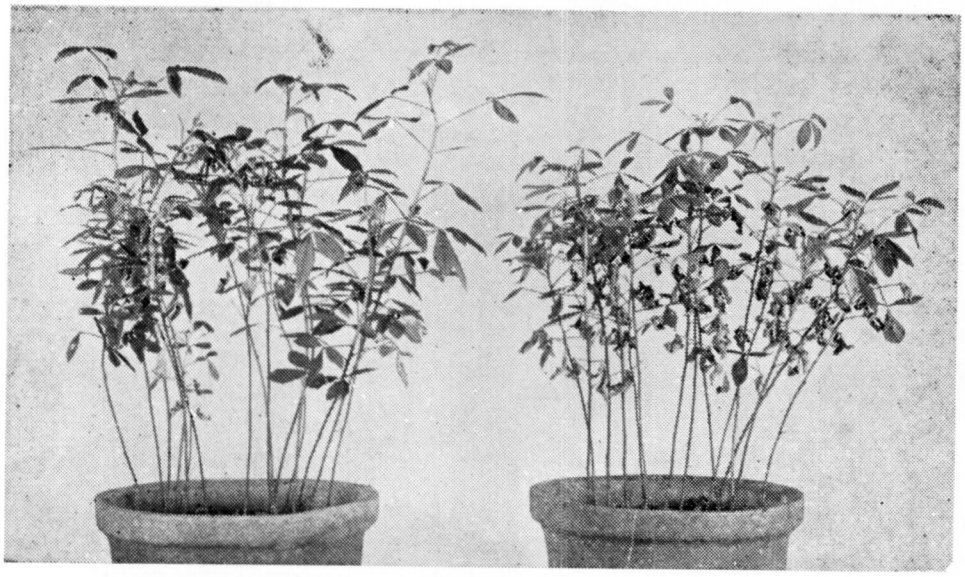


FIGURE 3—*Young plants of* Crotalaria anagyroides *inoculated with* Pleiochaeta setosa
Right—Sprayed with a copper fungicide 24 *hours before inoculation*
Left—Untreated

The fungus grew well on Difco potato dextrose agar at 25°C, but growth on Czapek-Dox agar was slow. On potato dextrose colonies were dark, circular, flat, radiately ridged and with a filamentous edge. Colonies on Czapek-Dox agar were white turning black, wrinkled and with an entire edge. No sporulation took place on these media.

PATHOGENICITY OF THE FUNGUS

Initial symptoms appeared on inoculated plants 48 hr after spraying with a conidial suspension and placing in a humid chamber for 24 hr. No wounding was necessary to induce infection. Typical disease symptoms appeared four days after artificial inoculation. Conidiophores and conidia were produced on lesions within 48 hr after infected leaves were placed in a moist chamber.

SUSCEPTIBILITY OF DIFFERENT CROTALARIA SPP.

Inoculation tests in the greenhouse and field observations have shown that *C. anagyroides* is the most susceptible species. *C. usramoensis* and *C. brownei* are also highly susceptible but are not as bad as *C. anagyroides*. *C. striata* is moderately resistant, compared with the above species, while *C. clarkei* is highly resistant.

CONDITIONS FAVOURING THE DISEASE

Persistent wet weather and misty conditions like those experienced during the early part of the South West Monsoon are ideal for disease outbreaks and spread.

CONTROL

In the greenhouse spraying with a copper fungicide (50% cuprous oxide) prior to inoculation reduced disease incidence markedly on artificially infected plants (Fig. 3). Spraying has, however, not shown good results in the field, especially with young plants in prolonged wet weather.

DISCUSSION

Since many affected leaves eventually die and drop off, the disease could, under favourable conditions, become quite serious in *Crotalaria* plantings. Under prolonged wet conditions, the disease often proves fatal to young plants and attempts to replant affected areas in such weather have always resulted in failures. Experience shows that frequent spraying with copper fungicides at this time is also not very effective. The disease is therefore a serious limiting factor in the successful growing of Crotalarias as a green manure and cover crop in certain districts. When plants are well grown, about 10 inches or more in height, damage is often not serious and the plants recover when fine weather sets in. Thus, one method of control appears to be the correct timing of sowing of seeds. In areas receiving the South West Monsoon, plants should be well established before the onset of the monsoon; if this is not possible, sowing of seeds should be delayed until after the peak of the monsoon.

Spraying *Crotalaria* plantings seems impracticable on a field-scale, besides being expensive. Moreover, it is unlikely to be very effective during the early part of the monsoon.

The fact that some species appear to be less susceptible than others suggests that some of the less common species like *C. striata* and *C. clarkei* may be worth trying. A species that can be recommended strongly is *C. clarkei,* because of its high resistance to the disease. Estates intending to plant Crotalarias as wind-belts will find this species rather unsuitable due to its low, prostrate habit, but as a ground cover it appears excellent.

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