

**STUDIES ON THE FUNGUS SPHACELOTHECA SORGHI
(LINK) CLINTON.**

1. EFFECTS OF POSITION OF INOCULUM AND STAGE OF DEVELOPMENT OF THE GERMINATING SEED ON INFECTION

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SUMMARY

Maximum infection occurred when teliospores were placed on the testa of ungerminated seed, or on the germinating seeds when the coleoptiles were not greater than 5 mm in length. A trace infection only was recorded when inoculation was delayed until the emergence of the primary leaf through the coleoptile.

Introduction

It is generally accepted that infection by *Sphacelotheca sorghi* (Link) Clinton occurs early in the development of the seedling, but no precise observations appear to have been made in this connection. In the most recent review of the literature on this fungus, Tarr (1962) concluded that if invasion by *S. sorghi* is to occur it must do so during the relatively short period, under warm wet conditions a few days only, between germination of the seed and emergence of the seedling above soil level.

Materials and Methods

In the first determination, seeds of the grain sorghum variety Martin were surface-sterilized with 95% alcohol and washed in sterile water. Some seed was inoculated before germination while other seed was germinated at 25°C and inoculations were made with teliospores when the coleoptiles were approximately 2 cm in length. The spores were transferred with a moistened, finely pointed camel-hair brush and care was taken to confine the inoculation to the chosen area. The possibility of contamination occurring elsewhere with such a technique cannot, however, be ignored.

Four replications of the treatments shown in Table 1 were sown in the glasshouse in 7-in. earthenware containers of washed river sand, and the experiment arranged as 5 x 4 randomized blocks. The plants received a low-nitrogen complete nutrient solution until maturity. The summarized results are shown in Table 1.

TABLE 1
EFFECT OF POSITION OF TELIOSPORES ON INFECTION.
Variety Martin

Site of Inoculation	Incidence of Disease
Testa of ungerminated seed	12/36
Root tip	1/29
Coleoptile tip	2/32
$\frac{1}{2}$ cm behind coleoptile tip	2/38
Ungerminated seed: not inoculated	0/34

Three further examinations were made, using the variety Pink Kafir. Successive sowings of alcohol-sterilized seed were made at 25°C in germinating trays containing a fine sandy clay in order to provide a suitable range of stages of development for simultaneous inoculation. The germinating seeds were washed from the trays through a sieve, the appropriate stages separated, and inoculations made by puffing teliospores from a pipette over all plant parts. The seedlings were then sown in a low-nitrogen clay soil in the glasshouse together with ungerminated seeds similarly inoculated. The results from these determinations are shown in Table 2.

TABLE 2
RESULTS OF INOCULATION WITH TELIOSPORES AT VARIOUS
STAGES OF SEEDLING DEVELOPMENT
Variety Pink Kafir

Stage Inoculated	Incidence of Disease
Ungerminated seed	11/20
Coleoptile 2-3 mm in length	6/14
Coleoptile 4-5 mm in length	8/16
Coleoptile 9-10 mm in length	2/8
Ungerminated seed	5/17
Radicle just emerging	0/7
Coleoptile not > 2 cm in length	2/95
Primary leaf emerged not more than 2 cm through coleoptile	1/24
Various stages of above: not inoculated ..	0/15
Ungerminated seed	5/62
Radicles 1-2 mm through testa	0/12
Primary leaf $\frac{1}{2}$ -1 cm through coleoptile	0/58
Primary leaf 1 $\frac{1}{2}$ -2 cm through coleoptile	0/75
Primary leaf 2 $\frac{1}{2}$ -3 cm through coleoptile	0/36
Ungerminated seed: not inoculated	0/61

Discussion

A total of 543 plants was grown in the glasshouse following seed inoculation or inoculation of the germinating seed in various stages with teliospores of *S. sorghi*.

No infection was produced in 110 uninoculated control plants maintained during the course of the examination.

The ideal position for infection to occur, using ungerminated teliospores, was on the testa of the seed at sowing. Significant infections were recorded when inoculation was delayed until the coleoptiles were up to 5 mm in length, but subsequent to this stage inoculation was only rarely successful.

REFERENCE

- TARR, S. A. J. (1962).—“Diseases of Sorghum, Sudan Grass and Broom Corn”. (Commonwealth Mycological Institute: Farnham Royal).

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