

## Transmission of *Helminthosporium maydis* Race T by Infected Corn Seed

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### ABSTRACT

*Helminthosporium maydis* Race T was recovered from 25% of corn seed of a 1969 remnant commercial lot. When this seed was planted in soil and maintained in a controlled environment chamber, *H. maydis* grew along with the seedlings and sporulated on the base of stems above the ground level. Leaves of healthy plants in the vicinity of diseased seedlings became blighted. Corn seedlings from the same infected seed lot planted in a garden plot some distance from any corn fields were also blighted by *H. maydis*. The data obtained indicate that *H. maydis* Race T is seed-borne, and that infected seed may be a factor in transmission of the fungus to healthy corn plants in the field. *Phytopathology* 61:747-748.

*Additional key words:* southern corn leaf blight.

*Helminthosporium maydis* Nisik. & Miyake (*Cochliobolus heterostrophus* Drechs.) does not commonly attack the ears of the corn plant, but has been reported from time to time (2). A recently described race of this pathogen, *H. maydis* Race T, blackens and rots the ears and affects seed production (1). Although the fungus is known to be seed-borne and to interfere with seed germination and seedling development, there is no reported evidence that infected seed may be responsible for spread of the fungus in the field. The following observations reveal that this fungus sporulates on seedlings above the soil, and that this source of inoculum may be of importance in spread of the pathogen in the field.

Specimens of blighted corn leaves from several locations in the northeastern United States were submitted for diagnosis in 1970 and were found to be infected with *H. maydis* Race T. One of the specimens was from a varietal test plot; others were from large plantings in growers' fields. A single commercial hybrid was common to both the test plot and to several of the field locations. Remnant seed of this hybrid, grown in Minnesota in 1969, was obtained. A sample of this seed, already treated with a chemical, was soaked for 5 min in a commercial solution of sodium hypochlorite and placed on moist filter paper in petri dishes. *Helminthosporium maydis* was identified from 24% of this seed (Fig. 1-D).

Seeds from the same remnant sample were planted, 100 seeds in each of two experiments, in sterilized soil

in small plastic flats and kept at 18 C in darkness for 10 hr and 23 C at 2,000 ft-c for 14 hr in a controlled environment chamber. Germination of the seed was good (93%), but 25% of the seedlings were stunted. Leaves of the stunted seedlings showed elongate necrotic lesions, particularly along the midrib, and several of the seedlings became hydrotic and wilted (Fig. 1-A). No fungus was recovered from the upper portion of these seedlings. A single seedling from an equal number of noninfected seed planted as a control also was stunted, but no *H. maydis* was recovered from it.

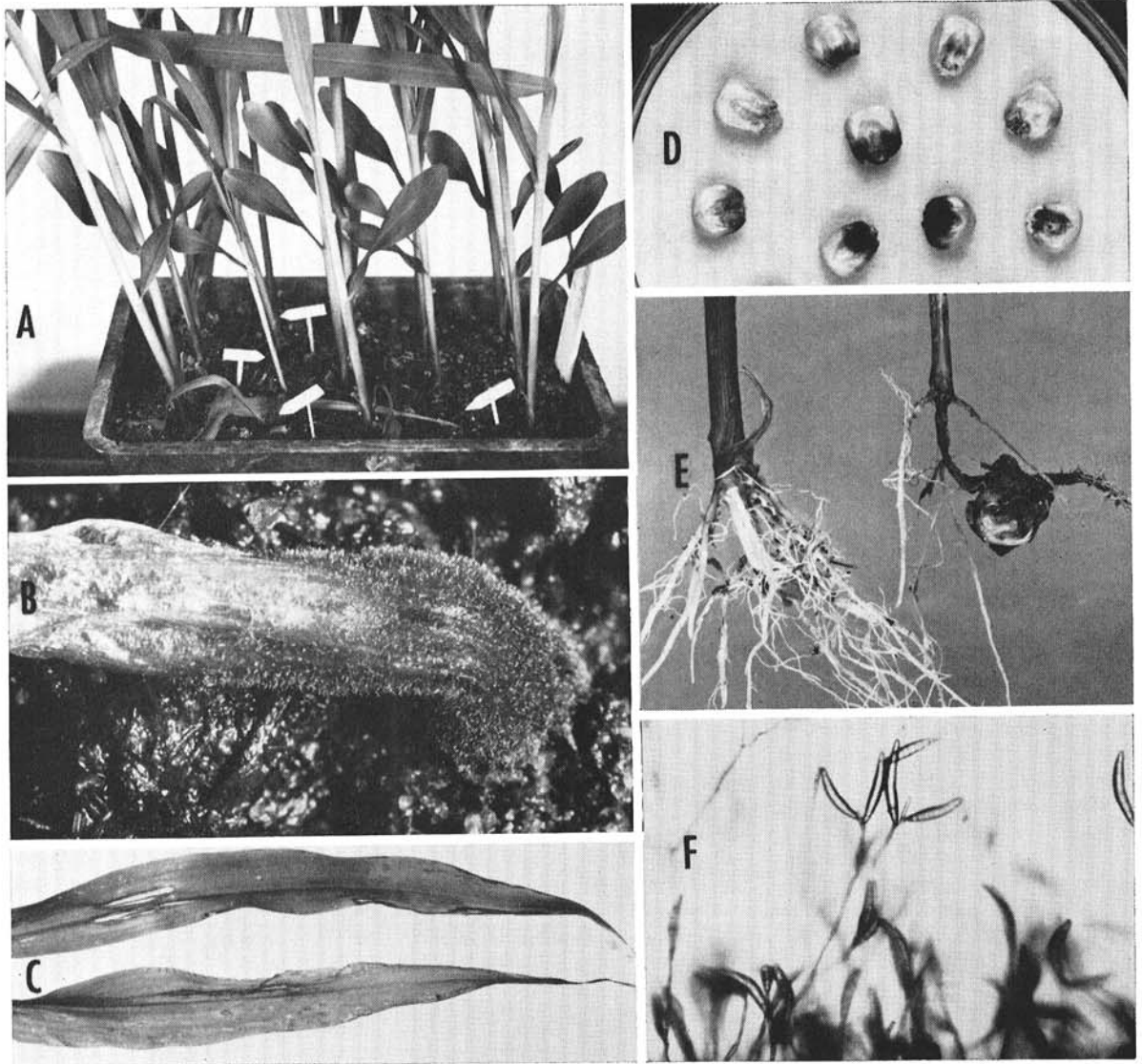
A gray, then black, sporulating fungus appeared at the base of several of the diseased seedlings above the soil line (Fig. 1-B). A dark mycelial growth was present on some seedlings in the mesocotyl area below the surface of the ground (Fig. 1-E). The fungus from the mesocotyl area and from the base of the seedling above ground was morphologically the same as that observed on the seed (Fig. 1-F). Conidia from diseased seedlings were misted in a water suspension onto inbred corn plants with normal cytoplasm (W182BN) and on those with Texas male sterile cytoplasm (W182BN<sup>T</sup>). The latter became severely blighted, the former lightly spotted, when inoculated with spores from both sources, indicating that the inoculum represented Race T of *H. maydis*.

Young corn plants, grown for another purpose, near the seedlings grown from infected seed were found to have a few necrotic spots on the lower leaves about 2 weeks after termination of the first seedling test. *Helminthosporium maydis* was recovered from these spots. It is believed that spores from the adjacent diseased seedlings were splashed onto these plants.

An additional 100 seeds of the remnant sample, plus 100 noninfected seeds of a different hybrid susceptible to *H. maydis*, were interplanted in the fall of 1970 in a small garden in a residential district in Ithaca, N.Y., several miles from any corn fields. The lower leaves of many of the seedlings of both hybrids became spotted and blighted (Fig. 1-C), and *H. maydis* Race T, identified by reaction of inoculated inbreds as above, was isolated from the affected leaves. It is unlikely that airborne spores from distant fields could have been responsible for the disease in this isolated plot. No detailed examination was made of the seedling stems, but it is assumed that conidia developed on the base of some seedlings from diseased seed, and that these conidia were transported by splashing water to the seedling leaves of both hybrids.

### LITERATURE CITED

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**Fig. 1.** Southern leaf blight of corn. **A)** Stunting and damping-off of diseased seedlings. **B)** *Helminthosporium maydis* Race T sporulating on base of diseased seedling. ( $\times 10$ ) **C)** Leaf spots on young corn leaves. **D)** *Helminthosporium maydis* growing on infected corn seed. **E)** Healthy and diseased seedling from A. ( $\times 3$ ) **F)** Conidia and conidiophores of *H. maydis* in slide culture. ( $\times 200$ ).