

First Report of Pink Root of Onion in Sudan

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ABSTRACT

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An outbreak of disease on onion (*Allium cepa*) occurred in Sudan during the planting season of 1978–1979. Symptoms included foliar drying and distinct pink coloration of the root system. The two predominant fungi isolated from root samples were a *Fusarium* sp. and a fungus characterized by dark brown to black, vegetative mycelium with abundant sclerotia and pycnidia. The fungus was identified as *Pyrenochaeta terrestris*, cause of pink root.

During the 1978–1979 planting season, onion (*Allium cepa* L.) cv. Nasei suffered from an outbreak of a strikingly distributed, unusual disease in the locality of the Gezira Research Station in Sudan. Conspicuous aboveground symptoms of foliar drying (particularly at the leaf tips), which is often associated with poor bulb development, as well as distinct pink coloration of the root system were typical of the pink-root disease. The pathogen was so widely and uniformly distributed on this cultivar that almost every single plant was affected in any one field.

In preliminary tests, root samples collected from plants with typical pink-root symptoms were cultured on potato-dextrose agar. Two fungi were predominantly isolated from root samples. One was an unidentified *Fusarium* sp. that formed abundant macroconidia and microconidia. The other, more frequently isolated fungus occurred in the form of

dark brown to black, vegetative mycelium with abundant sclerotia and pycnidia.

Subcultures on potato-dextrose agar, in which were incorporated pieces of sterile wheat stems, produced a bright red coloration in the medium. This was considered positively diagnostic for the identification of the well-known pink-root fungus, *Pyrenochaeta terrestris* (Hans.) Gorenz, J. C. Walker, & Larson (3). The final identification of the fungus as *P. terrestris* was made in the Commonwealth Mycological Institute in the United Kingdom by D. Punithalingam.

The unidentified *Fusarium* sp. and *P. terrestris* isolated from root samples were included in pathogenicity tests. Onion bulbs of Red (a hardy local cultivar) and Nasei that were known to be free from both these fungi were sprouted in sterilized sand in glass containers in which maize meal or malt agar were incorporated. A culture of the *Fusarium* sp. in a water-conidial suspension (5 ml of 2,000 conidia per milliliter) was added to each of five containers; a culture of *P. terrestris* in an equivalent suspension was added to a second set of five containers; and 5 ml of water was added to a third set of five containers, as a control.

Observations of the developing onion roots were made through the glass. In

containers with the *P. terrestris* inoculum, typical pink-root symptoms developed 3–4 wk after inoculation. This was evident on the Red cultivar, which is usually free of pink root, as well as on Nasei.

Soil samples were collected in the field from around the roots of severely diseased onions plants with typical pink-root symptoms. Similarly, samples of soil were also collected from fallow plots adjacent to fields planted to onions. Each lot of soil was placed into large containers (0.5-L petrol tins) and then sown to onion seeds of the cultivar Nasei. The containers were kept in an insect-proof glasshouse compartment and watered regularly. Frequent observations were made.

Almost all of the seedlings grown in soil taken from around the roots of diseased onions exhibited complete foliar drying and subsequent death in less than 1 mo from the planting date. By comparison, the growth of seedlings in the fallow soil was almost free of any symptoms of pink root.

P. terrestris is known to be the causal agent of pink-root epidemics of onion in many parts of the world (1,2). This is the first report of this pathogen in Sudan.

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