

# Texas Root Rot --- How Deep?

Tests Show Fungus Penetrates  
To Depth of At Least 12 Feet

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Plant Pathology

Texas root rot, one of the major plant diseases in the semi-arid Southwest, attacks most of our tap-rooted crop plants, including cotton, alfalfa, deciduous fruit trees, and ornamental trees and shrubs. The disease is caused by a fungus which occurred in our soils before the white man arrived — and very probably before the Indian tribes were here.

It is distributed in a very unpredictable way in many of our soils, often being severe in one field and absent from an adjoining field. While it spreads from 6 to 16 feet a year in irrigated land, it does not ordinarily make long jumps.

## Root Rot Hard to Control

The disease always has been very difficult to control and very costly to eradicate in the special cases where this has been done. The major difficulties have been that we are, in effect, working blindfolded as the exact extent of the infested area cannot be determined accurately — the fungus has always spread beyond the dead and dying plants bounding a "root-rot spot."

Still more indefinite was information available some years ago on how deep in the soil the fungus occurred. This knowledge, of course, is vital to the success of any soil treatment or program to eradicate the parasite.

Our studies of the method of attack on the plant roots showed that the strands of the fungus grew along the surface of the root forming a loose network. Soon, filaments from the strands wedged their way into the outer tissues of the root killing them before invading the woody part. At the same time the fungus spread along the root in both directions.

## Fungus Follows Root

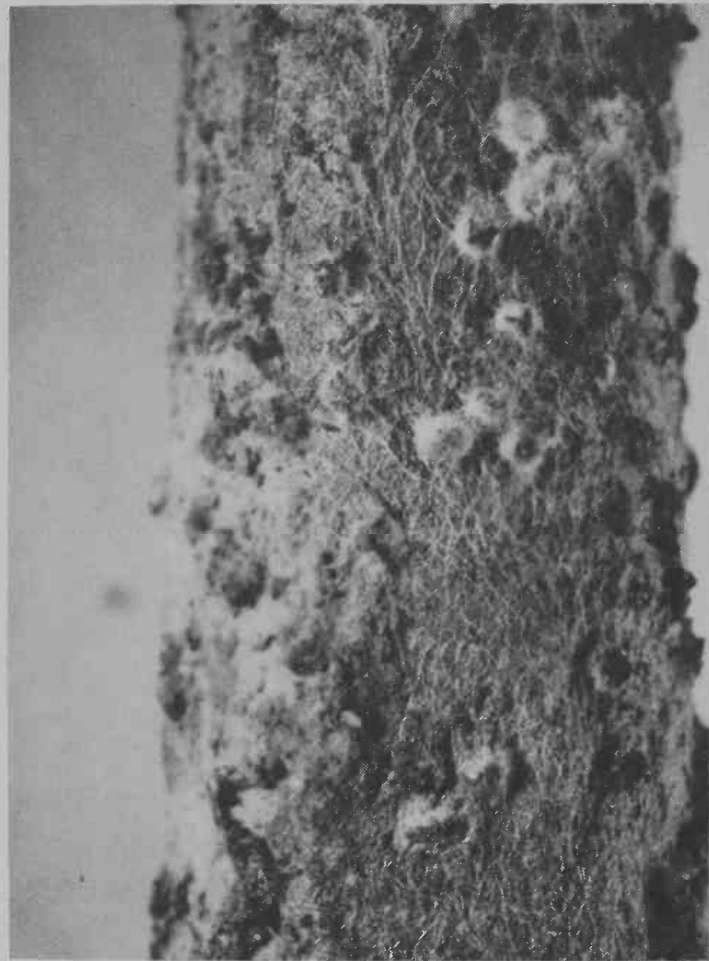
If the root attacked were a lateral one, a foot or two below the surface, the fungus followed it to the end and

grew independently through the soil attacking any susceptible root encountered. In this way it spreads from plant to plant. This checked with field observations that root rot spread across the rows in cotton about as fast as it did down the rows where the plants are closer together.

The other question of depth of penetration was finally solved by digging out the tap-root of affected plants and examining it for root rot. The climax of these experiments was the digging out of the tap-root of a small pecan tree (3-inch trunk diameter) recently killed by root rot. The soil was sandy and moist and dug easily, but the hole kept getting deeper — and still the tap-root showed the strands of the root-rot fungus.

Finally at 12 feet we struck ground water and could go no further. The known record, therefore, stands at 12 feet, but we feel it is very probable that the fungus follows the roots to their very end — which in the case of pecan or alfalfa would mean many feet. Even cotton regularly penetrates over six feet.

The practical importance of this fact is that eradication of root rot is made very difficult by the existence of the fungus so deep in the soil. Treatments to be effective must penetrate three or four feet and it is difficult to find chemicals of fungicidal value which will not react with the soil constituents and lose their tox-



This Cotton root, enlarged 6 times, shows filaments of root-rot fungus on the surface.

icity to the fungus before reaching the deeper layers of soil.

## Chemicals Tested

We have tested several new chemicals each year but none of them has been effective against the root-rot fungus.

Our search for effective control of root rot in cotton, therefore, has centered on production of profitable yields in spite of some survival of the fungus, and around eradication only in the case of small isolated spots.



These exposed roots of a pecan tree with root-rot infection show live roots (light) and dead or infected roots (dark surfaces).