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Introduction:

Dry root rot, a disease caused by the soil fungus *Fusarium solani*, has a long history of hindering production of citrus in California. *Fusarium solani* is a weak pathogen that infects only when there is some kind of stress in citrus tree. However, presence in almost all citrus orchards everywhere in the world including California, enhance its quick exploitation of such stresses. Some of the factors that are possible stress include invasion by other pathogens, such as *Phytophthora* and *Citrus Tristeza Virus* (CTV). Other stresses are wounding by gophers/rodents or insects, girdling, asphyxiation especially drowning the tree with too much water, soil nutrient content and fertilization, irrigation, and other cultural practices in the orchard. The pathogen is an opportunist on citrus. With the stress, *Fusarium solani* begins infection by colonizing the cortical tissue of feeder roots, advances into the lower tap root and/or scaffold root, and move up through the bud union into the center of the trunk. Studies over the years have shown that many rootstocks are susceptible and old trees as well as young twigs are not spared of the disease.

Symptoms:

Roots may show reddish-purple to grayish color. Infection leads to dark decay in the bark of large scaffold roots and lower crown of the trunk (Fig 2, 3). Trees become weak and loose ability to produce good fruits. Leaves start to turn yellow and brown; dieback and wilt quickly; and the canopy is lost (Fig 1). The progression of the disease is affected by weather conditions and it is especially faster in hot summer.

Disease Management:

It is important to note that the prevailing conditions should be considered in the management of DRR. The followings are methods to manage DRR: Irrigation should be done with care; there must not be too much or too little amount of water. Attention should be paid to drainage, as water should not be allowed to stand in contact with the tree crown. Movement of equipment helps in the spread of the pathogen, so these should be done with care; equipment should be well cleaned, before moving it between orchards. Proper fertilization will minimize the disease; thus, too much or too little, nutrients should be avoided. Rodent control, careful use of herbicide and other chemical will also be helpful. Sanitation is important, keeping the immediate environment of infected trees as well as wounded trees clean and dry will help to reduce or prevent transmission of pathogen. Total removal of infected trees is not recommended at early stages but that should be done in advance stages. Management of *Phytophthora* should be part of the focus in DRR management.



Fig 1. Dry Root Rot infection on Navel orange in Tulare



Fig 2. Symptoms of dry root rot seen around the crown



Fig 3. Symptoms of dry root rot seen in a cross section of root