

An integrated approach to cotton root rot disease of alfalfa

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Phymatotrichopsis omnivora (Duggar) Hennebert is a destructive root pathogen of many dicotyledonous plants. The disease caused by this pathogen, known as cotton root rot (CRR), is responsible for severe crop losses in Southern Oklahoma, Texas, New Mexico and Arizona. More importantly, the production of Alfalfa, an important forage crop in Southern Oklahoma and Texas, is hindered by the presence of *P. omnivora* as no alfalfa varieties have shown resistant or tolerance to this disease.

An extensive study to understand the interaction of *P. omnivora* with *M. sativa* (alfalfa) and its model relative *M. truncatula* has been initiated by the Consortium for Legume Research. The consortium consists of researchers from the Samuel Roberts Noble Foundation, Oklahoma State University and the University of Oklahoma, who have developed an interdisciplinary program targeted towards understanding CRR disease of alfalfa. The objectives of the consortium are to characterize CRR at the biological, chemical and genetic levels with a long term goal of developing resistant Alfalfa varieties.

As a member of the consortium, our lab is involved in the development of an alfalfa screening procedure to identify resistance or tolerance to CRR disease. We have initiated a screen with *Medicago truncatula* Jemalong A17 and 20 alfalfa cultivars with fall dormancy ratings of 5 and 6. Although we have been able to consistently infect *M. truncatula*, the assay was not as consistent with alfalfa. We have refined the screening procedure with respect to soil type, culture age, culture growth, plant age, inoculation procedure, water regime, and the duration of the assay. We are currently establishing methodology to determine the difference between plants that have escaped disease and those that are potentially showing resistance or tolerance. From this data we have established that some alfalfa plants without symptoms are in fact infected with *P. omnivora*. These plants have been targeted for additional screening procedures that utilize clonal propagation.