PYTHIUM APHANIDERMATUM AND COTTON SEEDLING AND ROOT DISEASE

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Abstract

During the 2000 growing season, cotton field soils (Lufkin fine sandy loam) in the College Station, Texas area were found to be infested with oospores of *Pythium aphanidermatum*. Seedlings from wheat bran + peat moss coated seed suffered nearly 100% damping-off, but seedlings from nontreated seed rarely showed symptoms of the disease. Seed treatment with wheat bran + peat moss biocontrol preparations of *Trichoderma virens* appeared to control the disease. However, in soil amended with 1% wheat bran + peat moss just prior to planting, the biocontrol seed treatments were ineffective. Soil amendment with 1% ground corn stalks or cow manure did not enhance disease development as well as wheat bran did. Wheat bran amendment of field soil not infested with *P. ahanidermatum* oospores did not enhance seedling disease development. Assay of water extracts of soil, corn stalks, cow manure or wheat bran for effect on *P. aphanidermatum* oospore germination showed that only treatment with wheat bran extract significantly stimulated germination of oospores. Planting of cotton seed immediately after amendment of infested soil with wheat bran resulted in almost 100% kill of the seedlings. However, if wheat bran amended and infested soil was incubated at 25ºC for 3-5 days prior to planting, very little seedling disease was observed. Observation of the growth and development of cotton plants in soil infested or not infested with *P. aphanidermatum* but with equivalent fertilization, showed that plant growth was much better in noninfested soil than in soil infested with the pathogen. Plate assay of roots of cotton plants harvested from infested soil showed colonies of *P. aphanidermatum* growing from them, while roots of plants taken from non infested soil did not.

The results of this work indicate that infestation of cotton soils with *P. aphanidermatum* oospores does not result in significant increases in cotton seedling disease unless the seed are treated with preparations containing certain kinds of organic matter, or the soil is amended with them. This appears to be related to stimulation of *P. aphanidermatum* oospore germination by the organic component. Under conditions where seedling disease incited by this pathogen does occur, biocontrol agents used to control cotton seedling damping-off incited by *Rhizoctonia solani* or *Pythium ultimum* do not appear to be particularly effective. Cotton seedling disease incited by *P. ahanidermatum* can be effectively controlled by soil amendment with wheat bran 3-5 days prior to planting. This appears to be due to stimulation of pathogen oospore germination by organic matter and the subsequent destruction of pathogen mycelium by the soil microflora prior to planting. Seed treatment witn Apron or soil treatment with Terrazole can also control the disease. Subsequent infection of the roots of more mature cotton plants later in the growing season by *P. aphanidermatum* may be one of the limiting factors on growth, development and yield of the cotton plant.

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