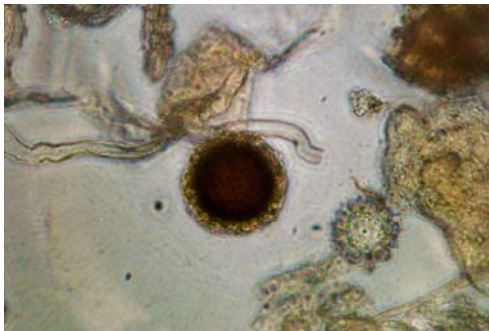


The Impact of Tillage on Movement of Teliospores from a Point Source

Tom Allen and Charlie Rush, TAES-Amarillo/Bushland

BACKGROUND

Karnal bunt, or partial bunt, of wheat is caused by the fungus *Tilletia indica*. The disease was first observed in the United States in 1996. Karnal bunt causes wheat kernels to be replaced with fungal propagules, which are referred to as teliospores. Each diseased kernel can produce many reproductive spores and aid in the spread of the disease to other wheat fields on infected wheat. Bunted wheat can have an impact on flour quality by causing a fishy odor. Since Karnal bunt was found in the U.S., restrictions have been implemented on wheat farmers in several regions, including two regulated regions in Texas. Specifically, a four-county region near Olney that includes Archer, Baylor, Knox, Throckmorton and Young counties, and a two-county region near San Saba that includes McCulloch and San Saba counties. Teliospores of the fungus survive in infested soils. When wheat plants reach the boot phase and environmental conditions are favorable, the fungus will produce a secondary structure, known as a sporidium, that will attach itself to the wheat surface and infect the susceptible heading wheat plant.



T. indica teliospore.



Bunted wheat kernels with teliospores bursting through the seed coat.

OBJECTIVE

- Determine the impact of multiple tillage operations on the spread of *T. indica* teliospores from a concentrated point source in a wheat field.

RESULTS/ BENEFITS

Results of this research demonstrate that as the number of tractor passes increase, teliospores are distributed to a greater distance from the initial point source location.

Learning how tillage can impact the distribution of teliospores from a single point source will allow us to make predictions about rate of disease spread in newly infested fields.

By increasing our understanding of the movement of teliospores in the soil profile, we can apply this knowledge to natural distributions of teliospores and make estimations of how and when the pathogen was first introduced into an individual field. Such information will be useful to regulatory agencies.