

PI: Frances Trail

PI's E-mail: trail@msu.edu

Project ID: 0405-TR-053

FY03 ARS Agreement #: 58-3640-2-138

Research Area: EDM

Duration of Award: 1 Year

Project Title: Colonization of Wheat Plants by *Gibberella zeae* and the Genetics of Perithecium Development.

PROJECT 2 ABSTRACT
(1 Page Limit)

Fusarium Head Blight, caused by *Gibberella zeae* has become a worldwide scourge. Control has been difficult, due to a variety of problems, including lack of strong resistance in the grains affected, economic considerations in developing management practices, and a relatively high tolerance of the fungus to many fungicides. My research is designed to pursue an understanding of the fungal life cycle, especially with regard to inoculum production. Interruption of the disease cycle is one of the most effective control methods for any disease. The goals of the research in my laboratory are to understand (1) the initiation and development of perithecia and ascospores on crop debris and (2) the role that colonization of maturing plant tissue by the fungus has in formation of sexual and asexual spores on crop debris in the field. This proposal aims to initiate research into the effect of light on perithecium development in culture and *in planta*. These are the questions we will begin to address in the coming year:

1. What determines where perithecia are formed in the stem?
2. How does light affect perithecium development in planta?
3. What is the mutation in a strain we isolated that forms ectopic perithecia and will it affect the positioning of perithecia formation on the plant?

We will rely on the newly available genomic sequence to identify genes important to stimulation of perithecium development and use standard molecular genetics techniques to specifically mutate these genes in the fungus. Similarly, complementation will be done to characterize the gene associated with the mutation in strain that produces ectopic perithecia. Although the studies proposed here are quite basic in nature, they are aimed at understanding how the fungus prepares for winter survival, survives winter and initiates its life cycle in the spring.