

TITLE: Site-specific IPM using multi-disciplinary models and real-time delivery.

DEPARTMENT: Plant Pathology

LEADER: Drs. Turner Sutton and David Jordan.

| Project Objectives                      | Year 1 | Year 2 | Year 3 | Year 4 |
|---|--------|--------|--------|--------|
| 1 <b>Create database for map layers</b> | XXXX   |        |        |        |
| 2 <b>Create weather-based models</b>    | XX     | XXXX   | XXXX   |        |
| 3 Integrate map layers                  |        | XXXX   | XXXX   | XXXX   |
| 4 Field verification of predictions     |        | XXXX   | XXXX   | XXXX   |
| 5 Training of stake holders             |        |        | XXXX   | XXXX   |
| 6 Deployment of Products                |        |        |        | XXXX   |

It is with sadness we report the tragic and untimely death on April 12, 2002 of Dr. Jack Bailey. He will be greatly missed but his work continues. Drs. Turner Sutton (Plant Pathology, NCSU) and David Jordan (Crop Science, NCSU) will replace Dr. Bailey as the project principal investigator. Dr. Sutton is an epidemiologist and has been involved in the development of forecasting models throughout his career. Dr. Jordan is actively involved in cropping systems research and the development of integrated pest management systems in peanuts.

Prior to his death Dr. Bailey appointed Dr. Mark Boudreau (part-time, commenced February) and Dr. Roger Magarey (full-time, commenced April) to the project team. Dr. Boudreau is a faculty member at Warren Wilson College and an experienced plant pathologist and researcher, with specialization in ecological systems and models. Dr. Magarey is a specialist on microclimate modeling and decision support systems. Significant progress has been achieved on the first objective to create databases for map layers. Dr. Rob Gilliam and other collaborators at the NC State Climate Office have developed scripts that enable historical or forecast weather data to be displayed graphically or retrieved for a specified location. Dr. Gilliam is developing a weather database that will be a composition of surface observations, radar and satellite imagery. This simulated dataset will be the primary input to peanut disease models that can function without need for any on-farm weather instrumentation.

Progress has also been made on the second objective. The existing model template, although highly successful for site-specific management of some peanut diseases and pests, was found to be cumbersome and unsuitable for others. Research has begun to examine methods to create more flexible modeling systems that can be easily adapted to any disease or pest of peanut. Work has begun on a validation of a model for *Aspergillus*. The model is being run from historical weather data provided by the State Climate Office and compared to existing disease and aflatoxin records. Other models, including an enhanced early leaf spot model will follow. Plans for web-based deployment of the models are in the preliminary design phase. Funds spent this quarter went to salary and travel for Drs Magarey (travel - hotel stay after arrival from Australia)

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