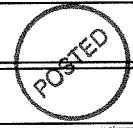


U.S. Department of Agriculture Work Unit Description AD-416 U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month/Day/Year) 12/21/2011
1. Accession No.	Agency Identifiers		5. Work Unit/Project No.
	2. NIFA	3. LA.B	LAB94121
7. Title Epidemiology and Management of Foliar Corn Diseases (Southern Corn Rust, Common Rust, Northern Corn Leaf Blight)			6. Status A = New Project
8. Performing Organization 0647 - 2010 Plant Pathology & Crop Physiol Agricultural Experiment Sta, Louisiana State Univ		9. Cooperating Departments within State Performing Institution	
10. Multistate Project No.		11. Cooperating States	
12. Investigator Name(s) Last Name and Initials) 1. Hollier, C.A.			sent via BITNET/INTERNET electronic mail systems Date: 12-21-11
13. Project Contact Last Name and Initials: Hollier, C. A.		Phone: 225-578-4487 Fax: 225-578-1415	
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14. Project Type Hatch	15. Contract/Grant/Agreement No.	16. Amount	17. FY
18. Award Date (Month/Day/Year)	19. Start Date (Month/Day/Year) 11/01/2011	20. Termination Date (Month/Day/Year) 10/31/2016	
Goals/Objectives/Expected Outputs Objectives: 1. To study the development and spread of foliar corn diseases. 2. To determine foliar corn disease impact on yield. 3. To determine thresholds/management strategies for foliar corn diseases. Outputs from this project will be the conducting and analyzing of experiments, surveys and assessments of corn hybrid experimental plantings for southern corn rust, common rust and northern corn leaf blight incidence and severity and the possibility of mentoring of a master's level student. Field days and training of students, Extension Agents and consultants are planned during the rust development season. Products of this work will be three refereed journal articles, an Extension corn rust comparison publication, three fact sheets on corn rust, demonstration plots for Extension agents.			
Methods Development and spread of corn foliar pathogens will be investigated by laboratory, greenhouse and field experiments. Laboratory and greenhouse experiments will be designed to investigate the inoculum storage, inoculum quality (germination potential, infection potential and process), and disease development in controlled conditions followed by field investigation of the same influenced by field/environmental variables. Environmental conditions will be monitored by in-field envirologic-data collectors. These data will be used to better understand the environmental conditions that influence the rates of southern rust development toward developing thresholds for fungicide application. Field investigations will include the inoculation of isolated corn hybrid tests to determine the disease severity and disease reaction of hybrids grown in Louisiana. Comparing these reactions and yields to uninoculated tests will provide some data toward developing a foliar disease threshold and toward measuring yield loss from the disease. The first yield loss measurement technique to be used is the single inoculated plant method in which plants are identified and marked for evaluation. Disease will be assessed on a large number of individual plants with a wide variety of disease severities. With this technique disease assessments are made weekly and yield is determined at maturity. For the southern rust loss study, individual stalks will be collected and grouped by disease levels to obtain a mean yield for that group. The ears will be harvested and all harvest components will be determined. Additionally, disease severity and yield are taken on each plant and these data are compared to those of other plants within a population and are assessed by regression. Another yield loss determination technique is the use of conventional replicated field experiments in which fungicides are used to delay or stop epidemics. The test will be set up in a randomized complete block design replicated four times. The applications will delay epidemics at various intervals to provide information on the effect of the initiation of epidemics at stages of the crop's development. Likewise, the ending of an epidemic			



will allow measurement of early, but short-lived epidemics on yield. Disease development data are taken at weekly intervals during the study giving rise to disease progress curves. Standard yield will be taken at harvest. Corn hybrid tests will be rated for all diseases but especially southern rust. Disease ratings will be the standard rating system for each disease. Currently-labeled and potential new corn fungicides will be evaluated for foliar disease management. Field testing will be conducted on plots large enough to be harvested by a small plot combine to obtain representative yields. Harvest samples will be collected and processed to determine quality. Treatments will be replicated at least four times. A randomized complete block design will be used for most tests. Foliar disease management strategies will be determined by the compilation of data on hybrid susceptibility, application thresholds, yield loss estimates and environmental measurements.

23. Non-Technical Summary

The main goals of corn pathology research have been to identify diseases in the crop, understand the impact and development of each major corn disease and to develop cost-effective disease management strategies. The proposed research will look at the epidemiological aspects of the southern rust pathogen as they pertain to development, spread, associated yield loss and management.

24. Keywords

southern corn rust; corn rust; corn; rust; yield loss; disease management; rust management; common corn rust; northern corn leaf blight

**** The Original signed document is on file at this institution. ****

Signature	Title	Date
Dept: Admin: <i>David S. Mauson</i>	Associate Director	12-21-11