Rice

U.S. Department of Agriculture **Accomplishments Report AD-421** U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month, Day, Year) 03/20/2012
1. Accession 0217904	Agency Identification No. 2. SAES 3. LA.B	5. Work Unit/Project No. **LAB03976**	6. Status **Annual Report**

7. Title

Genetic Improvement of Grain Nutritional Quality of Southern U.S. Rice

12. Investigator Name(s) (Last Name and Initials)

Wenefrida, I.

20. Termination Date 12/31/2013	40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011

Outputs:

This project developed two outputs: 1) Advanced high protein lines derived from Louisiana cultivars Cocodrie and Cypress had preferable yield potential and grain quality and; 2) Amino acid profiles were developed for advanced lines. This project also has generated one book chapter, one annual report, four published abstracts, one poster, and one oral presentation at a national meeting. Three laboratory presentations were presented to groups of scientists, administrators and legislators, growers, and groups of college students.

Outcomes/Impacts:

Among advanced high protein lines evaluated in the preliminary yield trial at the Rice Research Station, five had yield potential similar with the parental cultivars. Grain appearance looks normal with milling quality comparable with their original parents. There were slight variations in phenotypic performance (plant height, leaf type, vigor, and heading date) when compared with parental lines. Cooking quality and cereal chemistry including gelatinization temperature type determined by alkali spreading value is currently being analyzed. These five lines will be tested in commercial advanced trials. The newer generation of high protein lines composed of 271 lines derived from Cocodrie and 249 lines from Cypress were analyzed in replicated headrow tests. A total of 55 Cocodrie-derived lines and 46 Cypress-derived lines were selected based on their row yield, vigor, height, and plant type. The 10 most promising lines will enter preliminary yield trials in 2012. Amino acid profiles based on nine selected high protein lines showed variable increase levels in their essential amino acids. Only one line (CCDR09138011) showed an equal magnitude of increase in its individual essential amino acids. Improved protein content in rice provides the basis for developing high nutritive value varieties that could potentially be used to support functional foods. The future market that is driven by a better knowledge of nutrigenomics will demand that each food product is to carry unique nutritional value to support a healthier life style.

Publications:

Wenefrida, I., Linscombe, S.D., and Utomo, H.S. 2011. Nutritional enhancement project and mutational breeding. Rice Field Day poster (Abstract).

Wenefrida, I., Linscombe, S.D., and Utomo, H.S. 2010. Rice nutrition enhancement project: High protein line development and grain nutritional quality. Ann. Res. Rpt., Rice Research Station, La. Agri. Exp. Stn., LSU AgCenter 101:79-91. (Printed in 2011.)

Participants:

Ida Wenefrida, (PI), Herry Utomo and Steve Linscombe, LSU AgCenter.

Target Audiences:

Target audiences included other scientists in similar fields of science, rice producers, extension agents, and farmers.

Project Modifications:

Nothing significant to report during this reporting period.

Approved (Signature)	Title	Date