

Rice Research and Promotion Board
Progress Report for Rice Breeding and Genetics (2030)
James W. Gibbons
2005

- A. Develop semi-dwarf long and medium grain rice cultivars: We released two semi-dwarf Rice Cultivars in 2004. “Medark” is a medium grain with an improved disease package and grain quality characteristics compared with Bengal the commonly grown medium grain cultivar. “Cybonnet” is a long grain semi-dwarf with excellent grain quality traits and improved disease package compared to Cocodrie the most popular semi-dwarf grown in Arkansas. Seed producers had both cultivars for multiplication and will sale as registered and certified seed in 2005.
- Over 450 F1 and F2 populations from over 242 single and triple crosses are planted in Stuttgart this year. Nine hundred and four (185 medium grain) individual plants from 87 crosses were selected and will be planted as F2 space plants in 2006. This compares to about 344 F2 populations planted in 2005. One thousand three hundred sixteen (339 medium grain) F2 plants from 69 crosses were selected and sent to Puerto Rico for advance. About 4400 F4 and F5 rows from over 100 crosses were planted in 2005. Of these, 693 will be advanced to F5 rows, and 423 bulks will be tested for quality and pathology in winter and be planted in preliminary yield trials next year. The semi-dwarf Stuttgart Initial Test and the Preliminary Yield Trial have about 160 entries from 56 crosses in 2005. Both trials are planted at Stuttgart, Rohwer, Pine Tree Blast nursery, and straighthead evaluation trial. The Rohwer trial this year was compromised due to hurricane Rita, but data were obtained for lodging. The best yielding lines selected from these experiments will be advanced to the ARPT and URRN for 2006. The Arkansas Rice Performance Trials were conducted at 3 locations by my project in 2005 including 2 farmers’ field locations in Jackson and Clay Counties, and at the Northeast Branch Experiment Station at Keiser. Seven promising lines from 2004 Prelims are planted in the Disease Monitoring Plots in 2005. Results from the yield trials are pending.
- B. Broaden genetic base: Indica varieties identified by Dr. F. Lee as highly tolerant to blast and sheath blight were used as parents in the crossing program. Breeding lines derived from these lines are in the F4 and F5 generations this year and have shown good blast disease resistance in the field at Pine Tree. Especially encouraging are medium grain crosses that combine blast tolerance and good grain quality. Another group of medium grain lines show a good level of straighthead tolerance. The recent outbreak of a blast isolate capable of overcoming resistance provided by the Pi-ta resistance gene has highlighted this effort in making available sources of resistance to pathogen variation.
- C. Conduct plant breeding studies: Our emphasis has been on evaluating lines for straighthead and cold tolerance. In the long term, both of these traits, combined with other disease and quality traits, should help in maintaining sustainable rice production. A Chinese indica variety introduced by Dr. Rutger appears to be very tolerant to straight head. Long grain F4 and F5 lines from this line were selected in 2003 and were being evaluated for yield and straight head tolerance in 2005. The second year of a milling yield by cultivar by harvest date study was planted in 2005. Results confirm the value of using our delayed harvest method for determination of milling yield stability. Results will be presented at the RTWG in 2006.
- D. Regional cooperation: The Uniform Regional Rice Nursery was conducted at Stuttgart in 2005. Results are pending.
- E. Maintain high quality and pure head row and breeder seed. Breeder head rows of Medark were planted and harvested in 2005.