Dr. Farman Jodari, of the California Cooperative Rice Research Foundation in Biggs, CA, visited the IRRI facilities, in Manila, Philippines, August 1-6, 2006. While there, he visited with Dr. Melissa Fitzgerald, Director of the IRRI rice quality lab, for 3 days.

This visit was recommended by the RiceCAP scientific advisory board. The purpose of this trip was to explore the possibility of using an automated digital imaging system (CERVITEC) from FOSS Company, for detection of grain fissures in long-grain brown rice for the RiceCAP project.

Dr Fitzgerald's lab is equipped with 2 cervitec units that are being used for long and medium grain rice. A selected number of MY1 samples that were already phenotyped for fissuring resistance were tested with this imaging system. Color images of fissured kernels can be obtained with this instrument from long grain brown rice samples. Further calibration is underway to quantify the percentages of fissured grain. This instrument is currently calibrated to measure grain dimension, chalkiness and fissure counts of medium grain white rice. Once the calibration and hardware modification for brown rice is completed, this instrument can be a valuable tool for rice breeding programs. Dr Fitzgerald and her staff at IRRI have already developed a number of useful applications and hardware modifications in conjunction with the FOSS Company.

Dr. Farman Jodari, of the California Cooperative Rice Research Foundation in Biggs, CA, visited the IRRI facilities, in Manila, Philippines, August 1-6, 2006. While there, he visited with Dr. Melissa Fitzgerald, Director of the IRRI rice quality lab, for 3 days.

This visit was recommended by the RiceCAP scientific advisory board. The purpose of this trip was to explore the possibility of using an automated digital imaging system (CERVITEC) from FOSS Company, for detection of grain fissures in long-grain brown rice for the RiceCAP project.

Dr Fitzgerald's lab is equipped with 2 cervitec units that are being used for long and medium grain rice. A selected number of MY1 samples that were already phenotyped for fissuring resistance were tested with this imaging system. Color images of fissured kernels can be obtained with this instrument from long grain brown rice samples. Further calibration is underway to quantify the percentages of fissured grain. This instrument is currently calibrated to measure grain dimension, chalkiness and fissure counts of medium grain white rice. Once the calibration and hardware modification for brown rice is completed, this instrument can be a valuable tool for rice breeding programs. Dr Fitzgerald and her staff at IRRI have already developed a number of useful applications and hardware modifications in conjunction with the FOSS Company.

---

In the Philippines, rice polishings—the bran (tiki-tiki)—is extracted and used as an excellent source of Vitamin B to prevent and cure beriberi. In Malaysia, The Medicinal Book of Malayan Medicine prescribes boiling the rice "greens" as an eye lotion and for use with acute inflammation of the inner body tissues. The book also recommends applying a mixture of dried, powdered rice on certain skin ailments.

---

**Rice Facts & Folklore**

---

**Inside this issue:**

- Transgenic Material 2
- Research Updates 3
- People 4
- Outreach 5
- Events 6
Transgenic Material Found Unexpectedly in U.S. Grown Rice

The U.S. rice community was shocked by the recent announcement that genetically engineered LibertyLink® rice was detected at low levels in commercially grown samples of long-grain rice. Although at least two types of LibertyLink rice have been licensed and approved for commercial production in the U.S., the transgenic event in question, LL601, was not approved. The transgene in LibertyLink crops originates from a Streptomyces bacterium and presence of the gene confers resistance to the herbicide Liberty (glufosinate). The transgenic lines were originally developed by Aventis, which later became part of Bayer CropScience. Despite being present at a low level, the material seems to be widespread among the rice growing states of Arkansas, Louisiana, Mississippi, Missouri, and Texas. Transgenic material has made up about 0.06% of the total in most positive samples, and was confirmed to be present in stored grain from the 2005 crop and in samples taken throughout the southern U.S. rice-growing region. Thus far, the presence of the transgene seems to be confined to one or a few long-grain cultivars. In spite of having the regulatory approval to commercialize some LibertyLink rice varieties, Bayer CropScience has not publicly released this seed for sale due to hesitance by growers and major rice consumers to purchase transgenic rice. However, the same transgenic LibertyLink trait has already been commercialized for several years in other food crops such as corn, soybean and canola.

The news is especially of concern to growers, who saw prices of rice futures drop significantly in the days following the initial announcement on August 18th, 2006. The potential for decreased crop values, along with calls for bans on import of U.S. long- and medium-grain rice shipments, have prompted several large lawsuits to be filed against Bayer CropScience and others. It seems likely that more lawsuits could follow. It is still not clear how the spread of the transgenic material has occurred, but the USDA-APHIS, Bayer CropScience, and respective state agencies are working at determining the extent and origins of the release of LL601 into rice crops. Even though the transgenic grain makes up a small proportion of only some samples, this incident marks the first release of transgenic rice in the U.S. over a large area. The unintentional release of LL601 could have an important impact on the development and commercialization of transgenic rice varieties in the U.S. for years to come.

The developing events surrounding detection of LibertyLink rice in commercial grain have been followed with great interest by rice researchers in the U.S. Although the RiceCAP project is not involved with the production of transgenic lines for commercialization, use of transgenic rice plants is a tool that is being used to determine how certain genes affect milling yield and sheath blight resistance.

For more information on the release of LibertyLink rice, see the items listed below.

Richard Bell, Secretary of the Arkansas Department of Agriculture, discusses in an interview the events and implications surrounding this news.


The original news release from USDA contains information on LibertyLink rice and their initial response to the situation, along with a link to a fact sheet containing basic information on transgenic rice.

http://www.usda.gov/2006/08/0307.xml

USDA VERIFIES PERFORMANCE OF TEST KIT TO DETECT UNAPPROVED BIOTECH RICE

At the request of Strategic Diagnostics Inc., the U.S. Department of Agriculture's (USDA) Grain Inspection, Packers and Stockyards Administration (GIPSA) has validated a strip kit to detect the Liberty Link 601 protein. The detection limit is at a 2% sensitivity level and takes about 10 minutes to complete.

USDA is not involved in commercial distribution of this test kit.

Read the news release at http://www.usda.gov/wps/portal/lut/p/7_0_A/7_0_1OB?contentonly=true&contentid=
Progress on the SB2 Population in Louisiana

Submitted by Don Groth

The evaluations and harvesting of the SB2 population in Louisiana are done. There should be enough seed to send to anyone needing to conduct sheath blight screening studies and milling studies if needed in 2007. Sheath blight ratings ranged from 8.0 to 2.7 on the 0-9 scale with Cocodrie rating an 8.0 and MCR01-0277 rating a 4.3. Plant height ranged from 75 to 108 cm with Cocodrie measuring 98 cm and MCR01-0277 measuring 88 cm. Heading occurred over an 18 day period 77 to 95 days to 50% heading with Cocodrie heading in 84 days and MCR01-0277 heading in 89 days. The results appear to be consistent between years on maturity, height, and disease reaction. It does not appear that the entire population will need to be tested for sheath blight next year in Louisiana since there is a very good correlation between sheath blight ratings in the two years. We may select several lines that were not consistent between the 2005 and 2006 studies to test in 2007.

Ten panicles have also been collected, dried, and placed in storage from each row of the SB3 population if needed at a later date. We should have at least 320 entries in SB3. The rows looked very uniform.

Missouri RiceCAP

Submitted by Donn Beighly

The Missouri RiceCAP project has thus far included attending the molecular marker training that was held at the Noble Foundation in June of 2006 and then sampling and submitting samples for marker analysis from selected populations in our 2006 panicle row nursery. Attendance at the molecular marker training was most beneficial in helping to further build and reinforce knowledge base with respect to using molecular markers as a selection tool in the breeding program. It is an alternative means in determining the presence/absence of particular traits in the experimental lines currently coming through the program. Some of the traits utilize markers such as blast resistance which are not easily observable in field plot populations, so we do not have a means to regularly screen for them in the early generations without markers.

Brian Scheffler and Walter Solomon have provided the sampling protocol and sampling of select populations from the MO 2006 panicle row nursery was completed on August 11. Those samples were then shipped to Brian Scheffler early the week of August 15. RiceCAP educational efforts for the local rice producers and public include posters, brochures as well as Donn Beighley’s variety presentation at the 2006 Annual Missouri Rice Research Farm Field Day held on August 23, 2006.

CO-EXISTENCE MAPPED FOR BT, CONVENTIONAL MAIZE

Most markets allow a 0.9% threshold of adventitious presence for genetically modified (GM) organisms. At what distance should GM crops be planted from conventional ones to keep within the threshold? In “Pollen-mediated gene flow in maize in real situations of coexistence,” Joaquima Messeguer and colleagues from various research institutions in Barcelona and Girona, Spain conduct the first study on cross-fertilization between Bt and conventional maize in real situations of coexistence in two regions in which Bt and conventional maize were cultivated. Their findings appear in the latest issue of Plant Biotechnology.
As many of you know, Leisha Vance has opted to pursue a multidisciplinary Ph.D. in Environmental Dynamics at the University of Arkansas. Leisha started working with the RiceCAP project in October 2004 and was instrumental in many aspects of the project, most visibly, the design and construction of the RiceCAP website. Her background in computer science, agricultural economics, and her M.S. degree in Horticulture from the University of Arkansas brought many skills to her roll as the RiceCAP project manager. Her efforts on the logistical aspects of the project, including the numerous reports and documents developed over the past two years, outreach efforts, and RiceCAP workshops have been exemplary. Leisha has agreed to continue to provide some input on the RiceCAP project during a transition phase as she begins the pursuit of her Ph.D. Please take a minute to thank Leisha for all of her efforts on RiceCAP and wish her well with her new endeavor.

Dr. Bishwajit Prasad started as a post-doctoral associate with the RiceCAP project on September 1st. He will be working with Dr. Georgia Eizenga on the project entitled “Development of mapping populations using sheath blight resistant wild species”. The objective of this research is to identify novel QTL for sheath blight resistance in wild Oryza species. Dr. Prasad recently finished his Ph.D. at Oklahoma State University in Crop Science with an emphasis on Plant Breeding and Genetics. His dissertation title was “Spectral signature in winter wheat: Potential indirect selection criterion for yield and biomass”. In addition to his Ph.D. research, Bishwajit looked at the molecular diversity in winter wheat cultivars grown on the Great Plains over the last 50 years using microsatellite markers. Before coming to the U.S., Dr. Bishwajit Prasad

Welcome Dr. Bishwajit

Dr. Bishwajit Prasad
within. There was significant segregation between rows to indicate good population diversity for plant type, maturity, and other traits to ensure an adequate population for marker screening. We did not inoculate the rows with sheath blight.

Many thanks to everyone that helped harvest and thresh the populations in the hot muggy weather and the mud.

**Outreach**

**RiceCAP Flip Chart**

A new RiceCAP flipchart, designed by Peggy Lemaux and Barbara Alonso, was used by Rick Cartwright at Rice Field Days in Arkansas in August (pictured). Cartwright plans to use the chart at fall meetings, to better explain the goals and tools of the RiceCAP Project. Overall response to the flipchart was positive. Attendees seemed better able to grasp the RiceCAP concepts and commented on the effectiveness of the flipchart illustrations.

Please contact Rick Cartwright if you would like to use the flipchart in your presentations.

The flipchart contents are available on-line at: [http://www.uark.edu/ua/ricecap/pdfs/flipextract.pdf](http://www.uark.edu/ua/ricecap/pdfs/flipextract.pdf). A downloadable poster, based on the flip chart, is also available on-line at: [http://www.uark.edu/ua/ricecap/pdfs/flipchart_poster.pdf](http://www.uark.edu/ua/ricecap/pdfs/flipchart_poster.pdf)

**Welcome Dr. Bishwajit Prasad (continued)**

Dr. Prasad spent four and a half years as a rice breeder at the Bangladesh Rice Research Institute in Gazipur, Bangladesh. In addition to his experience as a rice breeder, Bishwajit’s Master’s thesis was entitled “Character association, stability analysis and screening against sheath blight in some rice genotypes”. Dr. Prasad’s experience with sheath blight, rice breeding and SSR marker analyses are an asset to the RiceCAP project.

***
### Calendar of Events

#### September 2006

<table>
<thead>
<tr>
<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
<th>Sat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
</tr>
</tbody>
</table>

#### October 2006

<table>
<thead>
<tr>
<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
<th>Sat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
</tr>
<tr>
<td>29</td>
<td>30</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**RiceCAP**

A coordinated research, education, and extension project for the application of genomic discoveries to improve rice in the United States. A project supported by the National Research Initiative (NRI) of the Cooperative State Research, Education and Extension Service (CSREES).

We're on the web!  
www.uark.edu/ua/RiceCAP