Graduate students play a vital role for the Texas rice industry. Faculty members are occupied preparing grants, writing scientific papers and reports, presenting data at research and extension meetings, designing and conducting experiments, satisfying stakeholder requests, and meeting professional, departmental and university responsibilities. So, faculty members often have little time to personally conduct long-term research which can have very significant ramifications and benefits for stakeholders and academicians. This is where graduate students can and do make a difference, they conduct research on a very specific topic requiring concentrated effort over a period of several years (typically, an MS degree takes 2-3 years, while a PhD degree takes 4-5 years). The sponsoring faculty member, who is the off-campus research adviser, generally provides through grants the student’s research assistantship stipend which ranges between about $22,000 and $28,000 annually, depending on the university, department within the university, and the type of degree (MS or PhD). Clearly, a graduate student represents a major investment in money and time, so the student selection process is quite rigorous. Prospective students apply to a given university and department (e.g., Entomology, Plant Pathology and Microbiology, Soil and Crop Sciences, etc.) within the university. They must pass the Graduate Record Exam (GRE) which measures academic aptitude and ability, submit their academic transcript to the university and department for scrutiny, provide a narrative describing their reasons for applying to graduate school, and for foreign students, pass the Test of English as a Foreign Language (TOEFL), which measures the ability to use and understand English. If the student passes this screening process and is admitted to the university and department, then the student meets with faculty members who have mutual research interests. Finally, the student finds a “home” with a faculty member and begins an arduous path towards the desired degree. Usually, the research adviser chooses the student’s specific research topic and mentors the student who works with the faculty member to designs and conducts the experiments and analyzes and interprets the findings generated by the investigations. The results of these studies are published as a thesis or dissertation as well as papers in academic journals. Information is also reported in extension and outreach publications and presented at scientific and stakeholder meetings. Thus, the student learns hands-on the scientific “trade” of being a professional researcher. The student also has an on-campus faculty co-adviser who helps direct and monitor the student’s class and academic progress. The student must take selected classes and seminars at the university to satisfy departmental graduate degree and graduate committee members’ requirements. The student must excel in the basic knowledge of his/her discipline and be able to think, speak, and write.
From the Editor ...

The Importance of Grant Funding to U.S. Agricultural Research

Welcome to the October issue of Texas Rice! October found a number of us at the Center in the midst of writing grant proposals to expand the research we do for Texas, the U.S., and the world. External grants have become increasingly important as state governments have shifted away from fully supporting the research infrastructure that has for so long been the foundation for untold improvements to agricultural production and management. While Texas A&M was at one time a state-supported institution, it is now more appropriate to label us as a state-assisted institution. And, while a significant amount of our funding continues to be provided by the state government, an increasing percent is now provided through grants.

Grants are funds that are provided to an institution such as ours, to do what is essentially contract research. External grants are provided by agencies or organizations that are external to the university or state. Many external grants are competitive in nature, which means that a number of scientists are vying for the same pot of money. For about every 10 competitive grant proposals that are submitted, an average of around 1 is funded. This number is low. A successfully written grant requires lots of planning and a major commitment of time. If you continue working to improve your writing every time one of your proposals is submitted, the quality of your proposal will improve and your chance of being funded will increase. Grant writing is certainly not for the easily intimidated. While you might never get above a 25% funding success rate, even being funded one out of every four attempts represents a major accomplishment.

For the most part, external funding has historically been comprised of local, state, and federal grants. Local grants from agricultural groups, such as the Texas Rice Research Foundation (TRRF), are the glue that provides cohesiveness for our scientists to address the most important needs of our agricultural clientele. For example, funding from TRRF allows our scientists to address a number of important task, such as developing improved rice varieties, more efficient water and fertilizer management, and better insect, weed, and disease control. Grants from chemical companies often focus on evaluating the efficacy of new insecticides, with the goal of our scientists being improved control and increased yield. Grants from federal agencies that support the more basic aspects of science often focus on improving our understanding of what makes the rice plant tick so that we can make fundamental improvements that have the potential to revolutionize rice production and management sometime in the future. In other words, grants allow our scientists to build on the research that is made possible by funding from our state government to produce far more research and benefits to society than would otherwise be possible.

Rice industry funding is the reason why Texas A&M has a research center at Beaumont, and it is the reason why our focus is on rice production and management. The Texas rice industry continues to
Biofortification refers to the natural enhancement of nutritional value of grain and their subsequent food products. This can be accomplished through traditional breeding and selection for plants that accumulate more nutrients in their edible portions. Biofortification that does not use genetic engineering or synthetic additives is acceptable to many consumers. Furthermore, biofortified crops are able to acquire organic certification if grown under organic field conditions.

Rice is gluten-free, making it hypoallergenic. This is one reason that rice is often the first grain added to a baby’s diet. Rice is valued as an energy source and a thickening agent in baby foods. Rice that is biofortified to contain increased amounts of calcium, iron, or potassium would be of particular interest for the baby food market. According to the World Health Organization, more than half of the world’s population suffers from some form of nutrient deficiency, largely attributed to the relatively poor nutritional value of food grains. With about half of the world’s people dependent on rice as their main food source, improving the nutritional value of rice grains could also have a major impact on global human health.

Nutrient Uptake, Translocation, and Remobilization

To get a nutrient mineral from the soil to the grain, it must be taken up by the plant’s roots and transported to the shoot. Sometimes a plant will exude chemicals from its roots to increase its ability to contact and take up certain soil nutrients. Most minerals enter through the root hairs, which are projections of the outer layer of root cells, known as the epidermis. The more root hairs a plant has, the more minerals it can extract from the surrounding soil solution. For a mineral to fully enter into a root cell, it must cross a semi-permeable membrane that contains two layers of lipids (fats). Since lipids do not dissolve in water, it can be difficult for the water-dissolved minerals to pass through the lipid layers without assistance from proteins that are interspersed with the lipids in those membranes. The proteins are known as “channels” or “transporters” because they help transport the nutrients from the outside of the membrane into the cytosol of the cell. The transport of nutrients by the channels typically requires energy. The amount of a nutrient that can potentially be taken up by a plant depends on the number of nutrient channels in its roots, the processes that regulate the opening and closing of the channels, and the availability of sufficient energy. After a nutrient enters the cytosol of the root’s epidermal cell, it then gets passed to the root’s endodermis (inner cells), then mostly into the xylem, which is the water-driven system that carries nutrients and water upward from the root to the shoot. Once in the shoot, minerals often get translocated into leaf tissues where they may be stored for later relocation to the grain or other plant tissues. Nitrogen and carbon are examples of nutrients that can be stored in leaves during a plant’s vegetative stage. As the plant matures, the older leaves die, but before they do, much of the nitrogen and carbon in those leaves is exported to other plant tissues such as new leaves or developing panicles and grain. In contrast to remobilizable nitrogen and carbon, other elements...
may be largely chemically or physically bound in leaf tissues and no longer available for export to other plant tissues. Iron, for example, is used in making the molecular “machinery” that captures light energy through photosynthesis. In rice, the iron in the leaves often is not well remobilized to other parts of the plant because this photosynthetic “machinery” and other iron storage forms are not disassembled as leaves die, or because a compound needed to carry the iron throughout the plant is in short supply. For elements that are bound in leaves rather than remobilized (such as iron, calcium, and manganese), in order for a rice plant to pump such minerals into the developing grain, it must be actively taking the mineral up through its roots during grain fill. Minerals must pass through a membrane to enter the grain, and this membrane is selective, it does not allow all elements and molecules to cross. The selectivity of the membrane has importance if attempting to enhance the nutrient content of grain because it often limits the transfer or “grain loading” of a desired nutrient.

Clearly, there are many points within the plant where genetic and physiological changes can result in the production of rice grain having enhanced nutritional value. Learning where the critical genes are within the rice’s genetic makeup (set of 12 chromosomes) is a critical first step toward understanding how those genes can be most effectively manipulated by breeders to produce new varieties with improved grain nutritional value.

Research on Genes affecting Grain Nutrient Concentration

Drs. Shannon Pinson (USDA-ARS Rice Research Unit) and Lee Tarpley (Texas AgriLife Research and Extension Center), both in Beaumont, TX, along with Drs. David Salt and Min Zhang at Purdue University, and Dr. Mary Lou Guerinot at Dartmouth College, have received funding from the National Science Foundation to conduct a research project to identify genes that can be used to enhance the nutritional value of the rice grain. This research includes both increasing the accumulation of nutritional elements such as calcium, zinc, potassium, and iron, and reducing the accumulation of elements that can be

Fig. 1. Marker-trait associations found in two rice mapping populations, suggesting the location of grain-element genes. Associated element(s) are indicated by the standard abbreviations. Subscript T or L indicates the parent whose gene increased that element. Dashed lines indicate the chromosomal region significantly associated with that/those traits. Blue font indicates associations detected only among plants grown in flooded fields. Brown font indicates associations detected only among plants grown in unflooded fields. Black font indicates associations detected in plants grown under both growing conditions.

Continued on the next page
detrimental to human and animal health, such as arsenic and cadmium. Because calcium and copper also play a role in protecting plants from pests, diseases, and environmental stresses, genes that increase plant uptake of these elements from soil can also increase the nutritional health of the rice plants, which in turn would increase yield potential and/or stress tolerance.

Drs. Pinson, Tarpley, Salt, Zhang, and Guerinot studied two rice gene-mapping populations to identify genes affecting the concentrations of 16 elements in brown rice grain. To increase understanding of the grain element genes, one of the populations was grown under two field conditions - flooded and unflooded. Flooding alters soil chemistry, it converts some elements into forms more available for plant uptake, and converts others to less available forms. So it was anticipated that some of the genes may be observed acting differently under the two field conditions. Furthermore, rice roots grow differently under flooded versus aerated soil conditions. More surface roots are produced in flooded than unflooded rice plants. Another difference is that the roots of flooded rice plants become covered with an iron plaque, which is essentially a layer of iron “rust” that oxidizes on the outer surface of the rice root as oxygen seeps out of the roots. The iron plaque, which forms at different rates and thicknesses on different rice varieties, is known to prevent the uptake of some mineral elements. By including rice grains obtained from plants grown under both flooded and unflooded field conditions, we were able to study how the grain element genes acted the same or differently under two very different environmental conditions.

From this study, we identified 127 genes associated with the concentrations of individual elements in the rice grain, it was shown that rice accumulates a higher concentration of Zn in the embryo than in the rice endosperm.
Finding Genes ...

rice grains. The genes clustered, however, into 40 genomic regions, with up to 11 elements associated with each genetic region or location. Figure 1 shows an example of multiple elements mapped to the same genomic region, which depicts just one of the 12 rice chromosomes. Three elements, cadmium (Cd), magnesium (Mg), and molybdenum (Mo) mapped to the bottom region of chromosome 2, whereas higher on the same chromosome, there is a region associated with 11 different elements (from As [arsenic] to Fe [iron] and S [Sulfur]). Interestingly, this genomic region also contains genes affecting grain shape and plant height. The present study does not provide enough detail to determine if these 40 grain-element regions are an actual cluster of genes each affecting the uptake or transport of a single element, or if they are due to a single gene affecting multiple elements. But it is reasonable to assume that at least some of these regions contain a single gene altering a plant mechanism that affects more than one element. For example, a single gene increasing the number of root hairs could affect the uptake of multiple elements. Means by which a gene might alter the number of root hairs on a plant’s root system include increasing root branching and root length, or increasing the development of root hairs per unit surface area. Alternatively, plants are known to exude organic acids that alter the availability of minerals in the root zone by chelating the minerals, which makes them more soluble, and by altering pH of nearby soil. A single gene increasing or decreasing the release of acids from rice roots would also be expected to impact the uptake of more than one element.

In contrast to the gene clustering described, Figure 1 also shows one of the copper (Cu) genes that was not closely linked to genes for other elements. Several genes that affect transporters specific for Cu uptake and transport in the non-crop plant Arabidopsis thaliana have been reported. It is possible that the Cu-only gene identified here on chromosome 2 is the rice equivalent of one of these Arabidopsis Cu-transporter genes.

Grain shape was included in the study because it is known that some elements are more concentrated in the bran or embryo than in the starchy endosperm, and grain shape can significantly affect the bran: endosperm ratio of grains (Fig. 2). Taller plants are thought to have more leaves per culm or stem, and leaf number is anticipated to have a potential relationship with grain element concentration since minerals can be either stored or bound in leaf tissues. However, this study indicated that grain shape, heading time, and plant height have much less direct influence on rice grain mineral concentrations than was anticipated.

At present, the study has identified 40 genomic regions associated with the accumulation of one or more of 16 elements in rice grain, and opens opportunities for a variety of future studies. One planned study will investigate if differences in root architecture are associated with these grain-element genes. Another study addresses if the Cu-gene identified on rice chromosome 2 is similar to one of the known Arabidopsis Cu-transporter genes. Other studies are underway or are planned for the future based on the findings from the present study. The study presented here has taken a major step forward toward the identification of genes that control nutrient availability in rice grain, ultimately enabling the efficient biofortification of rice for multiple mineral nutrients.

* Article by Shannon R. M. Pinson, Lee Tarpley, Min Zhang, Brett Lahner, Elena Yakubova, Mary Lou Guerinot, and David E. Salt.

Graduate Students ...

Continued on the next page
Graduate Students ...

which enhances academic reputations and often leads to further faculty collaboration. After completing the required research, the student must write a thesis or dissertation and present a defense of this work in a public setting such as a departmental seminar. Finally, the graduate committee must review and approve the thesis/dissertation which may require numerous revisions including the possibility the student having to redo, expand, or conduct new experiments. Before graduation, the research adviser may require the student to submit research papers to peer-reviewed journals. These papers are produced from the thesis/dissertation. Also, by the time the degree is awarded, the student has given a number of presentations based on his/her research to academic and stakeholder audiences.

Obviously, this entire educational process is laborious, time-consuming, and very challenging because it is meant to prepare the student for the rigors of the scientific world which demand honesty, impartiality, and perseverance. Many questions and problems facing our society are best answered and solved by science, not by emotional or anecdotal evidence. For Texas, the US, and the world to continue to progress and improve, we need young, talented, dedicated scientists to replace those who are nearing retirement and to fill new positions created by new technologies and opportunities. These young scientists will face difficult and daunting problems, but the rigorous training they received as a graduate student will help them make novel and significant discoveries for the betterment of society.

On a more local level, graduate students at the Beaumont Center and the David R. Wintermann Rice Research Station at Eagle Lake have contributed much to the success of our rice industry. However, in general, conducting graduate research at an off-campus center can be more difficult logistically than on-campus. For example, a Texas A&M University student must commute between College Station and the Beaumont Center, which is a round trip distance of about 300 miles. This commute is typically done when classes are in session during the fall, winter, and spring. At this time of the year, the student may be harvesting plots, sampling the ratoon crop, or planting experiments. Once classes end in the spring, the student usually resides at the Beaumont Center’s dormitory, which has a community kitchen and laundry facilities (Fig. 1). Two apartments next to the dormitory allow for students with spouses and their family to live at the Beaumont Center. For the students who live in either the dormitory or apartment of the Beaumont Center, the cost is very reasonable and the student saves money and time because there are less travel expenses.

Graduate students have and continue to make significant contributions to the research programs at the Beaumont Center and David R. Wintermann Rice Research Station at Eagle Lake. The following is an incomplete list of relatively recent former graduate students, along with their research topics, who have

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contributed to the success of our rice industry.

- Dr. Rodante Tabien - adviser Dr. Jim Stansel; Department of Soil and Crop Sciences, Texas A&M University; mapped blast resistance genes from Lemont x Teqing recombinant inbred populations; currently Associate Professor and Rice Plant Breeder at the Beaumont Center

- Dr. Guowei Wu – adviser Dr. Ted Wilson; Department of Entomology, Texas A&M University; determined how different plant traits (leaf production, tillering, partitioning of mass to different organs, potential leaf growth rates, etc.) affect rice growth and development, and yield; developed a physiological rice plant model that predicts the growth and development of different rice varieties, and determined how the timing and amount of injury by the rice water weevil affects rice grain yield; currently a Senior Statistician with Merck Pharmaceutical

- Dr. Omar Samonte - adviser Dr. Ted Wilson; Department of Soil and Crop Sciences, Texas A&M University; compared diverse rice genotypes and estimated quantitative relationships among yield and yield-related traits to help breeders with selection criteria for high grain yield; showed the importance of non-structural carbohydrates which move from the stem to the panicle after heading; and nitrogen content and nitrogen use efficiency among genotypes was estimated and correlated to grain yield; currently Associate Research Scientist and Hybrid Rice Breeder at the Beaumont Center

- Dr. Abdul Razack Mohammed - adviser Dr. Lee Tarpley; Molecular and Environmental Plant Sciences, Texas A&M University; conducted the first comprehensive high night time temperature study on rice; developed a specific set of plant growth regulator chemicals to negate the detrimental effects of high night time temperatures; and studied the effects of ultraviolet-B radiation on rice and other crops, and found current levels of this radiation are reducing crop yields but responses vary with the crop; currently Assistant Research Scientist in the Physiology Project at the Beaumont Center (Fig. 2)

Fig. 2. Dr. Abdul Razack Mohammed, Assistant Research Scientist in the Physiology Project at the Beaumont Center; former graduate student of Dr. Lee Tarpley.

- Dr. Brian Ottis - advisers Drs. Garry McCauley, Mike Chandler, and Bill Park; Department of Soil and Crop Sciences, Texas A&M University; conducted some of the first work on herbicide-resistant CLEARFIELD rice identifying proper rates and timings of imazethapyr; showed red rice is actually at least three different species of rice through DNA fingerprinting; currently Marketing and Client Support Manager, RiceTec, Inc.

- Becky Pearson - adviser Dr. Mo Way; Biology Department, Lamar University; discovered aquatic beetle as a stand reducer in water-seeded rice; currently Research Assistant in Entomology Project at the Beaumont Center

- Dr. Luis Espino - adviser Dr. Mo Way; Department of Entomology, Texas A&M University; revised the economic thresholds for the rice stink bug and quantified susceptibility of stages of rice maturation to this insect; these data helped gain

Continued on the next page
Graduate Students ... 

rice labels for Tenchu 20SG; currently Farm Adviser in the California rice belt 

• Dr. Jiale Lv - adviser Dr. Ted Wilson; Department of Entomology, Texas A&M University; developed panicle injury and economic impact data for stalk borers on rice; developed stalk borer damage model including parasitic wasp component; also found stalk borer damage can affect adjacent non-infested culms; currently Research and Extension Entomologist in China 

• Aaron Turner - advisers Drs. Scott Senseman, Mike Chandler, and Garry McCauley; Department of Soil and Crop Sciences Texas A&M University; evaluated hybrid rice tolerance to imazethapyr; currently Research Scientist with Monsanto in Mississippi 

• Dr. Luis Avila - advisers Drs. Scott Senseman, Garry McCauley, and Mike Chandler; Department of Soil and Crop Sciences, Texas A&M University; red rice control, enzyme activity effects, and photolysis of/with imazethapyr; currently Professor at Universidade Federal de Pelotas, Brazil 

• Dr. Alvaro Roel - advisers Drs. Garry McCauley and Mike Chandler; Department of Soil and Crop Sciences, Texas A&M University; compared water usage in continuous, pinpoint, and flush-flood management systems; currently Research Scientist with Instituto Nacional de Investigacion Agropecuaria in Argentina 

• Dhananjay Mani - adviser Dr. Rodante Tabien; Department of Soil and Crop Sciences Texas A&M University; characterized a very high tillering dwarf mutant and found this trait was controlled by a recessive gene; currently a PhD student at the University of Minnesota 

• Aditi Kondhia - adviser Dr. Rodante Tabien; Department of Soil and Crop Sciences, Texas A&M University; investigated drought response of high biomass rice and identified lines producing high biomass with minimal soil moisture; currently a PhD student at South Dakota State University 

• Dr. Bandara Ratnayake - adviser Dr. Mo Way; Department of Entomology, Texas A&M University; developed and evaluated artificial diets for the rice water weevil; found females lay eggs in water and roots; also found larvae can move through mud between root masses; currently works for the United States Environmental Protection Agency 

• Elliott Rounds - adviser Dr. Lee Tarpley; Molecular and Environmental Plant Sciences, Texas A&M University; identified agrochemical applications to alter the movement of non-structural carbohydrates from the stem to the

Fig. 3. Elliott Rounds, a former graduate student of Dr. Lee Tarpley, rating his experiments at the Beaumont Center. 

Fig. 4. Maxwell Handiseni, current graduate student with Dr. Shane Zhou, working on sheath blight in rice.

University; developed and evaluated artificial diets for the rice water weevil; found females lay eggs in water and roots; also found larvae can move through mud between root masses; currently works for the United States Environmental Protection Agency 

• Elliott Rounds - adviser Dr. Lee Tarpley; Molecular and Environmental Plant Sciences, Texas A&M University; identified agrochemical applications to alter the movement of non-structural carbohydrates from the stem to the
The following is a list of current graduate students.

- Edinalvo Camargo - advisers Drs. Garry McCauley, Scott Senseman, and Mike Chandler; Department of Soil and Crop Sciences, Texas A&M University; evaluating weed control, tolerance, absorption/translocation, degradation, and adsorption of saflufenacil (new rice herbicide)

- Maxwell Handiseni - adviser Dr. Shane Zhou; Department of Plant Pathology and Microbiology, Texas A&M University; managing sheath blight using cover crops as biofumigants (Fig. 4)

- Chersty Harper - adviser Dr. Rodante Tabien; Department of Plant and Soil Science, Texas Tech University; obtaining an MS degree in plant breeding through on-line courses and serves as Dr. Tabien’s Research Assistant at the Beaumont Center

- Ben McKnight - advisers Drs. Scott Senseman and soon to be Garry McCauley; Department of Soil and Crop Sciences, Texas A&M University; evaluating hybrid rice tolerance and rice recovery after clomazone injury

- Ratnaprabha Ratnaprabha - advisers Drs. Lee Tarpley and Shannon Pinson; Molecular and Environmental Plant Sciences, Texas A&M University; evaluating rice root phenotypical and physiological traits to identify genes that control nutrient content in grains (Fig. 5)

- Suhas Vyavhare - adviser Dr. M. O. Way; Department of Entomology, Texas A&M University; quantifying redbanded stink bug damage to soybeans and developing economic injury levels for this pest (Fig. 6)

In summary, graduate student training is an integral and essential component of rice research at the Beaumont Center and at the David R. Wintermann Rice Research Station at Eagle Lake. Former and current students have and are conducting

Continued on the next page
Graduate Students ...

research in all phases of rice production. Results have and will continue to provide useful genetic tools, best management practices and agronomic improvements for rice clientele. As evidenced by the above abbreviated list of former graduate students, many go on to serve the rice industry as university, government, or private industry scientists, which clearly illustrates the link between the past, present and future. Former students become the rice research leaders of today and tomorrow. Thus, investment in graduate student training is imperative for our rice industry to thrive and prosper in a future that will most certainly present new challenges and opportunities.

*Article by Mo Way, Texas A&M AgriLife Research and Extension Center at Beaumont, Texas.

Editorial ...

serve as a beacon, which has kept us on track focusing our efforts on developing improved varieties of rice and superior production and management systems that has paved the way for the industry’s historic financial success.

On another topic, Mo Way and I met today with a representative of USDA’s Plant Protection and Quarantine Division (PPQ). This gentleman presented us with the official decision and paperwork by PPQ reclassifying the panicle rice mite as a non-actionable pest. In a nutshell, this means that PPQ has agreed to remove the federal quarantine on this organism. For the past 5 years or so this mite has been classified as an actionable pest, which has required that it be quarantined. I have been particularly vocal in pointing out why a quarantine of this pest would not work. Unfortunately, fear of the “unknown” and a poor understanding of previous research on mites that are injurious to crops led to excessive concern, a significant amount of misinformation, and considerable effort aimed at attempting to eliminate a pest that previous records have shown had already been present in at least parts of the U.S. rice belt for over 40 years.

This reclassification is a good thing and removes unnecessary costs and burdens from our growers and from our scientists. Moving plant material from our winter nursery in Puerto Rico will no longer be as onerous of a job as it had become following the quarantine being put in place.

Please be aware that individual states have the option of maintaining restrictions on movement of rice plant material. And, regardless of which state you call your home, never transport plant material that is from a questionable source or that has insect or disease symptoms that are unknown to you. Although the panicle rice mite was a political pest and not an economic pest for the U.S. rice belt, there are a large number of insect and mite pests that would cause serious economic loss to the U.S. rice industry were they to become established here. When in doubt, use caution when transporting plant materials.

In the current issue of Texas Rice, Mo Way discusses the importance of graduate student training to our Center. Non-university types often do not have a clear understanding of the role Centers play in teaching, training, and mentoring university students. Mo’s article describes how our scientists have worked with and trained students through the years. A number of us have extensive experience mentoring students by serving as members of their graduate committee, and by mentoring post-docs and research scientists who often conduct advanced research at our Center. A large number of graduate students received their training from one or more of the scientists located at Beaumont or Eagle Lake. And, while Mo did not talk about our role in teaching formal graduate and under graduate courses, a number of us have extensive classroom teaching experience as well. As Mo did say, students are our future leaders. The more of them that receive training at our Center, the greater the likelihood they will develop a broad understanding of the more applied aspects of cropping systems research.

The second article in this issue focuses on...
fascinating research by Shannon Pinson, Lee Tarpley, and colleagues from Dartmouth, Purdue, and a university in Scotland. These authors address the uptake of a number of critical minerals by rice under both flooded and upland rice growing conditions. The authors discovered differences in the ability of plant from different areas of the world to take up nutrients from the soil. They also discovered that at least some of these differences appears to be genetically controlled. The potential value of this research is immense, particularly from a children’s nutrition perspective.

As a closing point, the next issue of Texas Rice will discuss USDA’s decision to relocate its scientists and staff members at the Stuttgart, Arkansas Center.

Please keep sending us your comments and suggestions.

Sincerely,

L.T. Wilson
Professor & Center Director
Jack B. Wendt Endowed Chair in Rice Research

Rice Crop Update

As of October 15, 2011, about 11% of the rice ratoon crop acreage in Texas had been harvested (PD) (Figure at right). In comparison, about 6, 6, 6, 4, and 1% were harvested as of October 15 in 2006, 2007, 2008, 2009, and 2010, respectively.

Weekly updates on the acreage and percentage of rice grown in Texas that are in the various growth stages are available at our website at http://beaumont.tamu.edu/CropSurvey/CropSurveyReport.aspx.