Texas Rice

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Texas A&M and USDA Scientists Host Multi-National Rice Meeting

During the Gramene workshop, participants received hand-on experience using the new database.

More than 350 scientists representing 10 countries gathered in Houston in late February to attend the 31st Rice Technical Working Group biennial meeting.

"I think this was one of the most successful events we've had so far," said Dr. Garry McCauley, secretary of the event. "We had scientists, consultants, manufacturers, county agents and farmers in attendance."

The meeting began with a mini-symposium on the opportunities and risks associated with transgenic crops. One of the topics was Golden Rice, which has been genetically engineered to have beta-carotene in the endosperm. According to Dr. Michael Gruzak, with the USDA Children's Nutrition Center in Houston, its developers created Golden Rice with the hope that it would alleviate vitamin A deficiency in Third World countries, but lack of public acceptance has delayed its release.

Much of the public is concerned genetically engineered food has risks, but advocates point out that each transgenic is carefully scrutinized, and the government will not allow a release if it isn't deemed safe. Dr. Pam Ronald with the University of California-Davis noted that worldwide 30 to 40 % of crops are lost due to pests and disease, and much of this loss could be prevented with genetically engineered crops.

Following the biotech symposium was a workshop highlighting the Gramene database, a joint project designed to provide the research community with information on maps, markers, genes and literature from the major crop grasses.

Breakout sessions during the four-day event covered topics in breeding and genetics, rice culture, plant protection, weed control and economics. Many Texas A&M scientists presented information for these sessions.

"One of the objectives for this event is to get rice researchers together to share information," McCauley said, "because this prevents overlap of work and also stimulates new ideas. It is also a means to get research information out to our stakeholders."

To achieve this objective, look for articles on conference presentations in this, and future issues of *Texas Rice* newsletter.*

From the Editor...

This issue of *Texas Rice* highlights research presented at the 2006 Rice Technical Working Group (RTWG) meeting held in The Woodlands. The international meeting was attended by over 300 scientists from across the U.S. and from a smattering of countries across the world. From all indications, this year's meeting was one of the very best ever. Dr. Garry McCauley, who is located at our Eagle Lake Station, has the honor of being the RTWG Secretary, and did yeomans' work overseeing the organization and general flow of the meeting. In 2008, Garry will receive further recognition for his service to our national program by being honored as the RTWG President. A very large number of the Center's faculty and staff also worked hard planning the meeting and making sure everything went smoothly.

Another member of our Center, Dr. Mo Way, also recently received recognition. Late last month, Mo received notification that he was being promoted to Professor of Entomology, effective this upcoming September. Among his recent accomplishments are his success at competing and receiving a number of USDA competitive grants, working with Drs. Gene Reagan and Ben Legendre with the Louisiana State University.

The Beaumont/Eagle Lake Center is proud to announce the addition of two new scientists to our Center. In January, Dr. Francis-Reay Jones joined the Center as a post-doctoral fellow. Francis joined our Center after having received his Ph.D. from the Lousiana State University, during which he conducted a serious of experiments identifying how to better manage the Mexican Rice Borer, a recently introduced stem boring pest of sugarcane and rice. During his first three months at the Center, he has worked with Mo Way determining the impact of pesticide controls and fertilizer management on rice water weevil infestations.

Dr. Ming Chen is the latest addition. Ming was hired by the USDA-ARS to serve as the Center's Cereal Chemist. A long-term and important component of her research is the evaluation of rice grain quality of new rice genetic material from across the U.S. An additional major focus of Ming's program is the study of the antioxidant ability of specialty rice varieties. Antioxidants hold tremendous potential for fighting human cancers.

In the previous issue of *Texas Rice*, we highlighted the Federal government's recommendation to close selected USDA-ARS unit across the U.S. If enacted as proposed, it would result in the closing of our USDA-ARS unit at Beaumont. In response to the recommendation, representatives of major rice industry groups walked the halls of Washington D.C., meeting with our government leaders to convince them that such a closure would be detrimental to the U.S. rice industry, as well as the Texas rice research program. The message I received was that the congressmen who were met were uniformly supportive of maintaining a strong USDA presence at the Beaumont Center. I also understand the delegation presented a proposal to add two new research positions to the Center to strengthen our ability to conduct research. I remain convinced that our USDA partners will remain a member of the Beaumont Center.

Please continue to send your recommendations for further articles.

Sincerely,

L. T. Wilson

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

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Farming Rice

a monthly guide for Texas growers

Providing useful and timely information to Texas rice growers, so they may increase productivity and profitability on their farms.

Do Early Season Nitrogen Applications Offer Value?

Achieving rapid early season vegetative growth on clay soils is often difficult. A common practice for many midsouthern USA rice producers is to apply N when rice reaches the 1- 3 leaf growth stage. Growers, extension personnel, and certified crop advisors have utilized this practice as a management tool with the goal of promoting enough vegetative growth so that a flood can be established as rapidly after emergence as possible.

Researchers have noted differences in the appearance of rice treated with early season N (ESN), but seldom have detected any measurable differences in rice grain yield. In MS and AR, when 180 lb of N is recommended for a variety, an additional 20 lbs/ac is often applied the 1-2 leaf stage. One aspect of our work is aimed at determining how much of that 20 lb early application can be counted toward the total recommendation.

Studies were conducted on Sharkey clay soils in AR, MO, and MS, in 2005 to quantify the effects of an early season N application. Three ESN sources ammonium sulfate (21-0-0-24), diammonium phosphate (18-46-0), and urea (46-0-0), as well as a non-treated control, were combined with three preflood N rates (90, 120, and 150 lb N/acre). The ESN treatments were applied at a rate of 20 lb N/acre to 1 - 2 leaf Cocodrie rice and flush-incorporated within 2 days after application.

Rice seedlings at the 4 and 5 leaf stage, with urea applied, just prior to permanent flood.

When rice reached the 5-leaf stage, the preflood N rates were applied as urea and flooded within 2 days after application. When plant height was measured at the 5-leaf stage, ESN increased plant height at all locations. In MO and MS, no differences were detected among ESN sources; however, when averaged across all sources and compared to the non-treated, plant height was increased by 1.9 and 2.2 inches for MO and MS, respectively. In AR, when plant heights were measured at the 5-leaf stage, differences among ESN sources were detected. Diammonium phosphate and ammonium sulfate provided plant heights that averaged 2.0 and 1.7 inches greater than the non-treated, respectively. In MS, diammonium phosphate and ammonium sulfate produced 8162 and 8015 lb/acre when 90 lb N/acre was applied preflood, compared to 7443 and 7479 lb N/acre for urea and the non-treated, respectively.

These studies will be repeated in 2006 at all locations; however, these data indicate that the greatest benefit to ESN applications is increased plant height at the 4 - 5 leaf stage. This may allow producers to establish a flood 5 - 7 days earlier, which obviously could mean potential herbicide savings.

It is unclear at this point how much of the ESN can be counted toward the total N budget, but this information should be available after the 2006 growing season. These studies were supported by growers in AR, MO and MS through check-off funds. *

Article by Timothy W. Walker, Mississippi State University Delta Research and Extension Center; Rick Norman, University of Arkansas; and Brian Ottis, University of Missouri. For more information email twalker@drec.msstate.edu

Regulatory Oversight of Transgenes in Crop Plants in the United States and Abroad

The regulatory oversight of agricultural biotechnology is well established in many nations. As early adopters of the technology, the US, Canada and Argentina have supported commercial development with coordinated frameworks based upon existing legislation for food, feed and environmental safety. In nations where new legislation is enacted, the progress for commercial application has been slower. New legislation has been drafted to recognize issues raised by public acceptance discussions (e.g. EU and Brazil) or to conform to the Cartagena BioSafety Protocol - Convention of Biological Diversity (BSP) (e.g. Japan, Korea and Mexico), even when previous legislation was in place. An example is Japan, engaged in the re-registration of products previously approved. In addition, there are some ratifying nations that do not have a regulatory process in place, have yet made provision for the BSP, and are faced with existing trade patterns that may not be in compliance with the BSP. The landscape of regulation is diverse and complex, there are national, regional and international laws and treaties that must be considered.

In 1996, the first products of ag biotechnology were being grown by farmers in Canada and the US. By 1999, the global production of biotech crops was 40 million ha, and a growing gap between the number of products approved for commercial use in North America and Europe was creating strain on trade between these regions. As the EU implemented its new regulations in Spring 2004, world wide production of biotech crops reached 80 million ha. In 2005, six European nations were growing biotech crops on 0.1 million ha or less. As member states in the EU are taking these first steps, the rest of the world is reporting 90 million ha of biotech crops in cultivation. The growth recorded is a fifty-fold increase in the first decade of adaptation of the technology.

In a broad sense, there are two schools of thought for the oversight of transgenes in crop plants. The US-style is based upon the premise that any oversight required to ensure the environmental and safety assessment on the new biotech crop can be conducted under the existing laws and using the existing risk evaluation criteria, and then it can be determined if the biotech crop presents any additional concerns.

The more cautious EU-style takes into account the possibility that "unknown and unanticipated" risks may not be identified by the risk assessment, and thus post-market monitoring and consumer-based product labeling are necessary to protect the public interest. Post-market monitoring and product labeling may be required in the US when the risk assessment warrants. The development of the two schools of regulatory oversight are said to be influenced by the confidence the public has in their respective governmental agencies. The resulting escalating requirements for generating the safety data package and the post-market responsibilities have driven the price for a product registration in the EU to be more than 10 million dollars, a prohibitive cost for products benefiting smaller markets.

For the industrial nations, agricultural biotechnology for commodity crops has provided productivity enhancements. Insect resistant and herbicide tolerant soybean, canola, cotton and corn have been registered and are widely grown. The slower introduction of biotechnology into other crops, like wheat and rice, has been influenced by market and trade considerations. However, for nations with developing economies, the products of agricultural biotech are becoming increasingly viewed as contributing to the goal for a secure food supply through increased domestic production. In these nations, the food and feed derived from ag biotech crops is supported by the governments and accepted by the consumers. As an example, Bt rice is being developed by a number of public institutes. Iran reports commercial scale planting of Bt rice in 2005 following government review and approval. Commercial approvals for China's first biotech rice are anticipated in 2006 and include transgenes for Xa21 and Bt. It is anticipated that biotech rice will be approved in the Philippines within two years of a successful commercial launch in China.

The advancement of biotech rice in Asia demonstrates that when domestic supply and food security is important, registrations for domestic use are being accomplished and new products are being locally grown. Many of these products developed by national research programs are not intended for export to nations with more demanding requirements. *

Article by Donna H. Mitten and Ali Scott.

Researcher in the News...

Growing up a carpenter's son with a love for science, Mike debated on which would be his career, and which would be his hobby.

Dr. Michael Grusak at the USDA-ARS Children's Nutrition Research Center

In the end, he decided on career in plant science, but his skill for building things is evident in his 11th story greenhouse laboratory in downtown Houston. Mike came to the Children's Nutrition Research Center (CNRC) in 1990 as their first plant physiologist. One of his first purchases in setting up the new lab was a tablesaw, because he knew the research he intended to conduct would require innovative designs, not something you could order ready-made in a catalogue. His greenhouse workshop is replete with power tools, hand tools, PVC fittings, and drawers and cabinets filled with hardware. If he can conceive of an idea for an experiment, he can build the set-up to carry it out.

Mike often goes outside on the walkway surrounding his 11th floor rooftop greenhouse to check for structural damage and leaks, or to just admire the Houston skyline.

Mike grew up near Gary, Indiana, the oldest sibling with a brother and two younger sisters. He played basketball in school, and was very active in Boy Scouts, attaining the top rank of Eagle Scout. He began his advanced schooling at Bates College in Lewiston, Maine (among other reasons, because he liked the cold weather!). After obtaining a BS in Biology, he took off a year to work as a cabinetmaker's apprentice.

He decided on the University of California at Davis for his higher degrees, and completed both MS and PhD in Botany in only 5 years. Right after turning in his thesis, Mike gave in to the yearning to drive nails, and worked in carpentry again for 6 months. His major professor was livid over Mike's decision, and finally convinced him to come back to Davis to work as his postdoc. Following this he received fellowships that allowed him to continue his training at the Physics and Engineering Laboratory in Lower Hutt, New Zealand, the Université de Poitiers in France, and the USDA/ARS Plant, Soil and Nutrition Laboratory at Cornell University. Mike's postdoctoral training primarily focused on isotope technology and plant nutrient transport.

These are bean plants being grown hydroponically, using heavy water to label the hydrogen molecules.

As the Director of the CNRC Plant Growth Facility, he has developed an interdisciplinary program that links plant science and production agriculture with human nutrition concerns. Mike designed and developed equipment and methodologies that has allowed his team to label plants with stable isotopes of various elements. (See sidebar on page 6) These labeled foods are used in clinical investigations to study the bioavailability and subsequent metabolism of essential and/or health-promoting minerals and

continued on next page

Researcher in the News continued..

phytonutrients.

He is particularly interested in learning how beta-carotene from plant sources is absorbed by the body and converted to vitamin A. His work with Golden Rice is well known, and this year he will begin large scale studies in China. (See article on page 7.) To take the concept a step further, Mike is currently collaborating with Dr. Peter Beyer at the University of Freiburg in Germany to stack multiple micronutrient/bioavailability traits into Golden Rice at a single genetic locus. This is so rice breeders around the world can incorporate these enhanced traits into their indigenous varieties.

Mike's wife, Jo Ann Fleischhauer, is an artist and sculptor, with a downtown studio near their home. Their son Dakota is ten years old and enjoys horseback riding, soccer and playing the drums. Mike said his son got his mom's artistic tendencies, as well as his dad's analytical mind. When asked what his pastimes were, Mike said Dakota and his work, which makes him an ideal father *and* research scientist. *

Growth chamber for growing Golden Rice with labeled hydrogen. The setup includes an air conditioning unit, fan, CO2 supply and sensor, a dehumidifier and water-free air tank.

Stable Isotopes in Human Studies

Stable isotopes are nonradioactive forms of elements that naturally occur within the environment. For a given element, such as iron (Fe), different stable isotopes exist that have differing atomic masses (e.g., Fe-54, Fe-56, Fe-57, and Fe-58), with each isotope acting chemically in an identical manner. The various isotopes of an element can be separated by mass and quantified using an instrument called a mass spectrometer. Stable isotopes vary in their natural abundance or percentage in nature, and most nutritionally significant elements have at least one low-abundance stable isotope (e.g., only 0.28% of all Fe occurs as Fe-58).

In human nutrition studies, low-abundance, stable isotopes are used to trace the absorption and metabolism of nutrients from a specific food source. For instance, by growing a plant on an enriched source of a low-abundance, stable isotope, the plant will incorporate the isotope into its tissues and edible organs and will contain a higher percentage of this isotope, relative to all other foods. We say that the plant has been "labeled" with this stable isotope. Following consumption of the labeled plant food by a human subject, the analysis of isotope amounts in blood, urine, or fecal samples enables the researcher to determine how much of the nutrient was absorbed from the specific food in question. It should be noted that because stable isotopes are nonradioactive, their use is entirely safe in human studies.

Although much of the existing stable isotope work has focused on mineral nutrients, it also is possible to label phytochemicals with stable isotopes of carbon (C) or hydrogen (H). This is important for a molecule like beta-carotene, which is entirely composed of C and H atoms. The approach we have taken has been to generate labeled beta-carotene by replacing several of the H atoms with the low-abundance, stable hydrogen isotope, H-2. This isotope also is called deuterium, and occurs naturally at 0.015% of all hydrogen atoms. By replacing eight of the 56 H atoms in a beta-carotene molecule with deuterium atoms, a labeled beta-carotene with an atomic mass of 544 will be generated. By comparison, a beta-carotene molecule containing no low-abundance isotopes has an atomic mass of 536. These two forms of beta-carotene are referred to as isotopomers of the molecule.

In order to label beta-carotene, plants can be grown hydroponically using a nutrient solution enriched with heavy water, or deuterium oxide. Plants absorb both heavy water and normal water via the root system. Using this approach, we have successfully grown vegetables and rice, and have achieved a labeling of the beta-carotene pool with a high yield of the M + 8 isotopomer. Because deuterium atoms are inserted randomly throughout the molecule, a range of isotopomers is produced; however, we can quantify any or all of these isotopomers with a mass spectrometer.

From an article by Michael A. Grusak in the peer reviewed *Trees for Life* journal, 2005, 1:4. For more information email mgrusak@bcm.tmc.edu. The complete electronic version of this article can be found online at: http://www.tfljournal.org/article.php/20051201123813474

Update on Golden Rice

Golden Rice is a transgenic product that was developed to enable the synthesis of beta-carotene in rice grains. Beta-carotene is a yellow-orange carotenoid that can serve as a precursor for vitamin A. Vitamin A deficiency (VAD) is a significant nutritional concern, especially in developing countries where rice is eaten as a staple food crop. For those areas, it is hoped that Golden Rice could increase the dietary supply of carotenoids, and reduce the incidence of VAD.

The original proof-of-concept version of Golden Rice (Science 2000; 287:303-305) succeeded in the synthesis and accumulation of beta-carotene and other carotenoids in the endosperm, with total carotenoids reaching 1.6 ug/g DW. More recently, scientists at Syngenta developed a new transgene construct in which a maize gene for phytoene synthase replaced the original daffodil gene (Nature Biotechnology 2005; 23:482-487). This new product, now known as Golden Rice 2, has resulted in grain carotenoid concentrations as high as 37 ug/g DW, and with beta-carotene representing as much as 84% of the total carotenoids. At these levels, it is estimated that 50% of a 1-3 year-old child's RDA for vitamin A (300 ug) could be met with 72 grams of dry rice (a child's typical portion is 60 grams of rice, and this amount is usually eaten more than once a day). This estimate assumes a 12:1 factor for the conversion of beta-carotene to vitamin A.

Although Golden Rice technology works, there are still other issues that need to be addressed. What is the safety of the transgenic product as a human food source? What is the nutritional value of beta-carotene when delivered in a rice endosperm food matrix? And what means are available to transfer this technology to elite cultivars throughout the world? A number of approaches have been used to assess any adverse impacts of transgenic products, including animal-based allergenicity studies, in silico analyses of the allergenicity of predicted peptide fragments from the expressed proteins, safety evaluation of marker genes, and an evaluation of the risk of toxic intake of the synthesized product. In this presentation, we will discuss how these approaches have been used in the case of Golden Rice.

Dr. Michael Grusak at the USDA-ARS Children's Nutrition Research Center in Houston examining plants of Golden Rice 2 in his 11th floor greenhouse laboratory.

An evaluation of the nutritional value of Golden Rice is currently under investigation using stable isotope technologies. Beta-carotene is a long-chain hydrocarbon that can be readily labeled with deuterium, a non-radioactive, stable isotope of hydrogen. We are growing Golden Rice in hydroponic media that contains heavy water (deuterium oxide), and have successfully labeled beta-carotene in the grains for use in clinical feeding trials in China. We will provide an overview of these studies, including how they will be conducted and the type of information we hope to gain. We also will discuss the requirements that must be met (e.g., Internal Review Board approval) to establish and ensure safety and informed consent for this type of clinical trial.

Finally, there are several efforts underway to move Golden Rice technology into diverse rice lines throughout the world. The Golden Rice Humanitarian Board (www.goldenrice.org) has primary oversight for this undertaking, through the collaboration of National and International breeding programs and breeding centers, and various International research projects. We will continue to investigate the current activities in this area, and the types of approaches being used to move nutritionally enhanced rice into the consumer arena. *

Article by Michael Gruzak, Guangwen Tang and Robert Russel.

L to R: Conventional rice, Golden Rice 1, and Golden Rice 2.

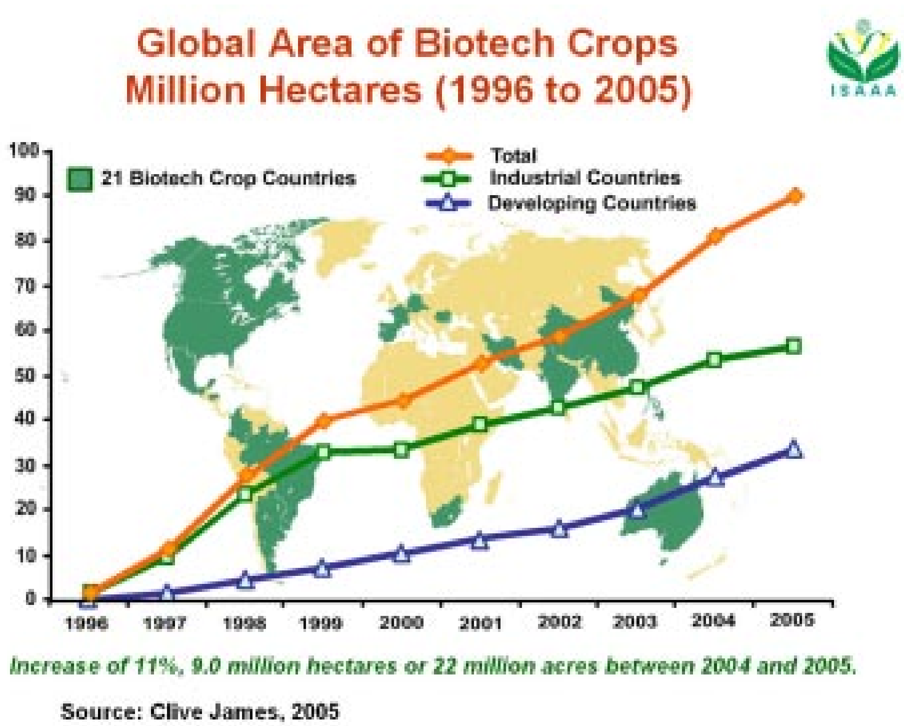
Decommodified Crops: The Case of GM Traits in Emerging Markets

Among the many outcomes of the industrial era of the 19th and 20th centuries, one of the most profound was the commodification of agricultural goods. No longer a local good, the advent of generic, largely unprocessed, agricultural goods, such as with corn, wheat, milk, as well as meat products, created a currency for financial markets that could be traded through time and space. Trade, regulatory, and economic policy have been built around the concepts inherent in agricultural goods that meet the uniform and consistent standards of the commodity.

Among the many 21st century challenges in agricultural and food systems, one of the more pervasive is the ability to cope with the decommodification of agricultural goods. The most notable criteria suggested to differentiate agricultural goods include geography through country of origin labeling, production methods, such as the USDA's certified organic program, and genetics, such as certified Angus beef. An emerging criteria for differentiating crops has been the presence of a transgene, rendering the resulting commodity crop distinguished from the traditional as being genetically modified (GM), or identified as a genetically-modified organism (GMO).

Soybeans, corn, and cotton were among the first commodity crops differentiated by the presence of a transgene, nearly all inserted to render the host plant some advantage over production pests which added value for the crop producer. GM soybean and corn have been discriminated in some international trade situations, usually discounted or not allowed as compared to the synonymous non-GM commodity. Rice is among the first crops with the potential to distinguish GM versions with traits targeting added value for the consumer. Enhanced vitamin content and plant-made pharmaceuticals are but two of the market-ready types of rice developed to date.

History clearly indicates that the burden of successful decommodification rests with the innovator, and has followed a consistent pattern. First, a system of identity preservation must be developed. The USDA has required the segregation of one crop type from another at every stage from production and processing to distribution. They have required a certification process performed through audits and site visits which provide independent third-party verification of the segregation. Second, a regulatory framework must be established to verify and allow claims (if any) of the decommodified crop's benefit. Lastly, based on the balance of costs/benefits, trade and economic policies are established that are ultimately driven by consumer demand.



Given the new classes of rice targeted at consumer benefits, coupled with the worldwide production and consumption patterns, it appears the decommodification of rice is attracting an unprecedented amount of public attention. Political intervention is certain; both in the regulatory framework and cost/benefit analyses as GM rice is introduced in Asia and the US. Each case will be unique, but all will be instructive as we continue the future challenge of decommodifying agricultural crops for the benefit of both producers and consumers. *

Article by John Gardner, University of Missouri.

What Does the Rice Genome Sequence Mean for Rice Improvement?

The availability of rice genome sequence creates many new challenges for the rice breeding and genetics community. It brings new people into the field of rice research, it allows new questions about basic biology to be addressed using rice as a model organism and it paves the way for novel applications in rice improvement.

To take advantage of the possibilities that the sequence represents requires enhanced flexibility and a desire for engagement on the part of the entire rice research and production communities. The promise of sequencing the rice genome was always to generate knowledge that could be translated into improved productivity, into higher quality products using more economically and environmentally sustainable production systems.

Even when all the pieces are in place, it takes energy, intelligence, and commitment to align and integrate them into a coherent whole, especially one that is greater than the sum of the parts. The parts themselves are fascinating and worthy of study, and there are those who will focus an entire career on characterizing and understanding the pieces. There are emerging dictionaries of rice genes and proteins that tell us what each one does and how it works. Along with the dictionaries are manuals showing how different genes and proteins interact inside a living system.

There will be those who have no interest in rice, but find its sequence intriguing because it lends insight into the mysteries of evolution or the cryptic syntax of genes. Learning to use this kind of information to assemble or re-assemble the parts into new rice varieties or new production systems will capture the imagination of many, and the ability to integrate and synthesize parts into working "whole" systems with novel features will catalyze many new enterprises.

The challenge confronting us all is to share the knowledge that we derive from the rice genome sequence, to use that knowledge to build better rice plants and more sustainable production systems, and ultimately to improve the lives of people with whom we interact. *

Article by Susan McCouch, Cornell University.

Disaster Relief for Farmers

As part of an emergency supplemental bill, the Senate Appropriations Committee passed disaster relief for farmers on April 5. The $106 billion bill, primarily aimed to fund wars in Iraq and Afghanistan and provide Gulf Coast hurricane relief, allocates some $4 billion to farmers.

Aimed at lessening the impact of higher input costs, the $4 billion will provide 30 percent of a direct payment for farmers enrolled in the farm program for the 2005 crop. According to reports, it will also provide USDA grants to states to provide agricultural market and economic assistance.

The amendment also provides crop production loss assistance in a manner similar to previous disaster programs, including a payment rate of 50 percent of the established price of the crop if a farmer suffered a yield loss of at least 35 percent.

The bill "isn't perfect," said Sen. Mark Pryor, D-Ark., in a conference call with reporters following the committee vote. "But the goal is to keep farmers in business for another year. Producers are in great distress. Last year was terribly difficult. There was a drought, hurricane damage and barge disruption issues, high energy prices, and low commodity prices. Unlike most businesses, farmers can't pass these costs on to others. They're on a commodity market price, and what they get is what they get."

Pryor said he'd heard from farmers, banks and lending institutions across Arkansas urging such assistance. "It's almost impossible for a farmer to make ends meet given last year's economics." While the effort to get farmers disaster relief was bipartisan (24 senators, both Democrat and Republican, were involved) Pryor said there's no guarantee the bill will pass the House. "I need to tell you, in very plain English, the lay of the land. I don't mean this to be a criticism of President Bush, but it's the truth. In my opinion, if President Bush wants this relief for farmers, they'll get it. If he doesn't want the relief, they won't get it. It's that simple. It's in his hands.

"I feel confident it can pass through the Senate. I doubt it will pass the House unless President Bush says he wants it to. That's because behind the scenes, the White House has been very persistent in not helping farmers get relief. I'm very disappointed in that, but I have to call it like I see it."*

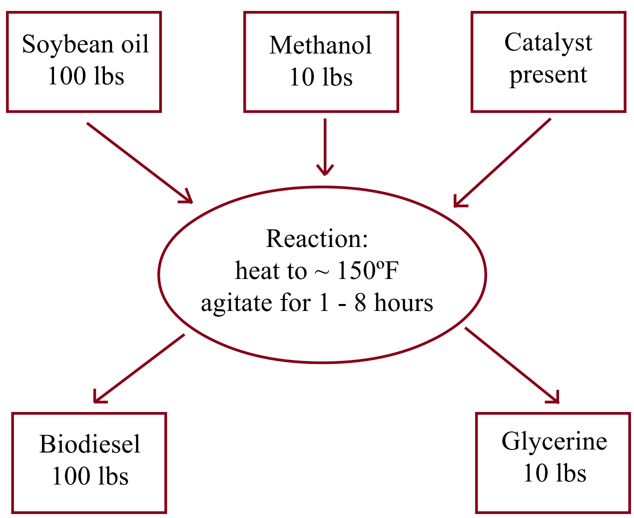
Excerpted from an article by David Bennett, Delta Farm Press

Biodiesel Plant Coming to Dayton

Agribio Fuels, LLC, announced in March that they are locating a biodiesel manufacturing plant in Dayton, Texas. After 18 months of looking for a location, narrowing the search to six different sections of the gulf coast area, the final choice was Dayton. The plant will be a $35,000,000 capital investment and employ 45 workers. The company plans to be in production by early 2007.

Agribio fuels is a subsidiary of Imperial Petroleum Recovery Corporation based in Houston. IPRC is the developer of Microwave Seperation Technology which optimizes crude oil production and refining, lessens environmental hazards, and enhances biodiesel production.

Biodiesel is manufactured from virgin crop oils, and other fats. There are over 350 different crops that yield anywhere from as low as eight gallons per acre to as high as 635 gallons per acre, and there is a crop suitable to almost any climate. The Agribio Fuels Biodiesel plant in Dayton will require over 30,000,000 gallons of feed stock oils annually to support its production requirements.



Initially, the company will ship crop oil in from the Midwest, but eventually would like to purchase local product as it becomes available. Rice is one of the crops that is a potential source of oil for the production of biodiesel fuel. However, at this time, Agribio Fuels does not plan to process the raw material, simply purchase the oil once it is extracted. At a press conference in Dayton, they expressed hope that other companies would form to carry out the extraction process.

The Energy Policy Act of 2005 calls for growth in the U.S. biodiesel market from the current 196 million to 8 billion gallons per year by 2012. The reason for this is to promote sustainable energy, lessen our dependance on foreign oil imports, and to protect the environment. Biodiesel is a cleaner burning fuel compared to petroleum diesel, with 20% less carbon monoxide emissions, 30% less unburned hydrocarbons, 22% less particulate matter, and 20% less sulfate emissions. Plus, it is considered a renewable fuel, which benefits the communities where it is produced.

Dayton Mayor Steve Stephens says, "Only time will tell the magnitude of economic impact Agribio Fuels will have on the City of Dayton, the community, and our farmers. I refer to Neil Armstrong's famous quote, and paraphrase it by saying one small step for man, one giant step for Dayton. Agribio Fuels, LLC, is making a major investment here which will create permanent jobs, temporary jobs, work for vendors, and local craftsmen. This is an exciting time for our city, and it is only the beginning."

Alan Springer, CEO and Board Chairman of IPRC said, " We are pleased to announce the start of this new venture in cooperation with the community in Dayton. This is an opportunity for farmers who will have additional markets for their products, and the tremendous sense of pride that comes from helping our nation turn from oil dependence to oil independence. The Dayton Community Development Corporation under the leadership of Sue Priddy has been and continues to be instrumental in making this venture happen."

James Hammond, Board Member of Agribio Fuels LLC, said, " This is just the first of many steps toward the completion of a biodiesel plant in Dayton. We look forward to strengthening this relationship as we continue the process of building the biodiesel facility."

Sue Priddy, Executive Director of the DCDC, adds, "This has been an exciting project, and working with Jim Hammond and David Schermock, Director of Alternative Fuels, has been a pleasure, as well as fun. To have been a part of a alternative fuel solution for our country has been very exciting." *

For more information contact Sue Priddy at 936-257-0055 or email sdpriddy@daytontx.com

State, National and International News...

Vietnamese Rice Gets BT Boost

Rice is an important cereal grain crop worldwide. In Vietnam, it is cultivated on 5.9 million hectares, and provides 80% of the carbohydrate and 40% of the protein intake of the average Vietnamese. Rice production has increased in the country, but insect pests, such as the yellow stem borer, lead to severe crop losses.

Pest control measures using pesticides are largely ineffective, since the insect larvae feed inside the rice stem. Attempts to incorporate resistance to yellow stem borer to rice by conventional breeding methods have failed due to lack of suitable genes in the rice gene pool. The transfer by genetic engineering of the Bt toxin gene (cry) from the soil bacterium Bacillus thuringiensis offers therefore an alternative solution. Bt toxins are highly specific to certain insect species larvae.

Scientists are now developing two-toxin Bt crops to slow down any resistance insects may have to the Bt toxin. This "pyramiding" technique also results in hybrid toxins with increased potency. The group, led by N.H. Ho, is composed of scientists from Vietnam's Institute of Tropical Biology, the Louisiana State University AgCenter, the International Rice Research Institute, and the Campus International de Baillarguet, France.

Scientists used a Bt fusion gene, which translates a single Cry1Ab-Cry1B fusion protein, and they introduced the transgene into cells of Vietnamese rice cultivars. They then confirmed the presence of the fusion protein in transgenic plants, analyzed the progenies for the presence and stability of the transgene; and assessed the efficacy of the transgenic plants against yellow and striped stem borers. The authors report that the Bt fusion gene confers 100% mortality of yellow and striped stem borer larvae within one week of infestation with no negative effects on yield.

Zero Tillage Manuals

Two new publications about no-till, or zero tillage, are available for free downloading. Access the *Zero Till Production Manual* and *Advancing the Art* through the Manitoba-North Dakota Zero Tillage Farmers Association website at http://www.mandakzerotill.org/

Click on the *Archives* button, then click on the publication of your choice. These publications are good references for both the beginner and experienced zero tiller. Zero tillage is an economical, viable alternative to the conventional methods used to manage soils. Anyone looking for practical methods to reduce soil erosion while, at the same time, rebuilding organic matter will find this manual contains a wealth of information - information from those who have used zero tillage for a significant period of time.

RiceTec Creates Business Development Group

ALVIN - RiceTec Inc. has created a new group to focus on business planning and development and has named Richard Long as Vice President of the new division. For the past two years, Long has served RiceTec as Vice President of Communications, Planning and Marketing. In his new role, Long will be responsible for strategic planning and development of RiceTec's business units - including planning, reporting and overall business development.

Long joined RiceTec in 1992 from JMS Specialty Foods, a division of the J.M. Smucker Co. He has a master's degree in business administration from the University of Wisconsin and broad experience in the food industry, with emphasis in marketing and strategic planning.

Jim Walker, RiceTec's director of human resources, and Melanie Roebuck, director of information technology, will join Long in the newly formed business planning and development division.

RiceTec Inc. is an integrated rice company specializing in the breeding, development, production and marketing of high-value rice products. Headquartered in Alvin, Texas, the company operates the primary rice research center for RiceTec AG, an international rice technology venture.

RiceTec Inc. is the first company to commercialize hybrid rice seed in the United States. The company is also a leading producer, miller and marketer of specialty consumer rice products sold in more than 20,000 supermarkets in North America. The company has 180 employees.

For more information contact Julie C. Robbins at (501) 376-0321 or email julie@manganholcomb.com

Rice Leadership Meets with Elected Officials

Lubbock - Late last month Texas Rice Producers Legislative Group joined many other Ag groups and individuals to raise $120,000 at a fundraiser held for Senator Chambliss, who chairs the Senate Ag Committee. The day after the event TRPLG Chairman, L.G. Raun, joined 16 other Ag organizations in a round table presentation to Chairman Chambliss, Congressman Conoway (House Ag Committee), and Congressman Neugabauer (House Ag Committee).

Chambliss re-emphasized that he will not tolerate disarming agriculture by cutting domestic support without real and meaningful increases in market access in a WTO agreement. He said that there are no reconciliation orders in the Senate's '07 budget, so the Senate is not endorsing the President's budget. Chairman Chambliss said that Congress will write the next farm bill, not the White House and he will have more influence on the next farm bill than anyone else.

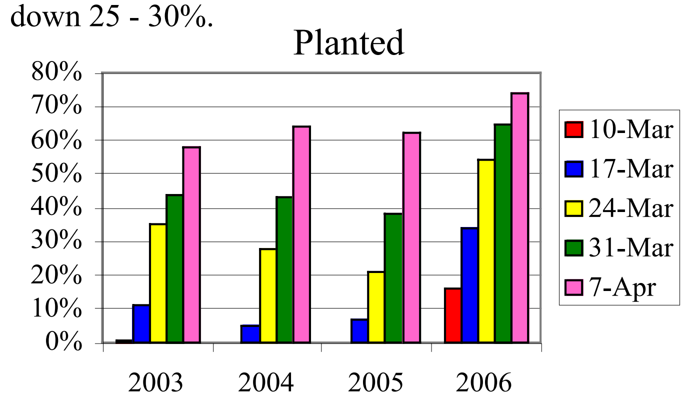
At the same time Billy Hefner, Kenny Danklefs, Steve Balas, & others organized a tour and dinner for Congressman Hinajosa, who represents Colorado County and has shown a lot of interest in learning about rice issues and helping the rice industry. The folks from Colorado County also gave $1000 to the Congressman. PAC money will be extremely important as we move forward in the next farm bill. The TRPLG would like to extend thanks to everyone who has contributed to their PAC fund.

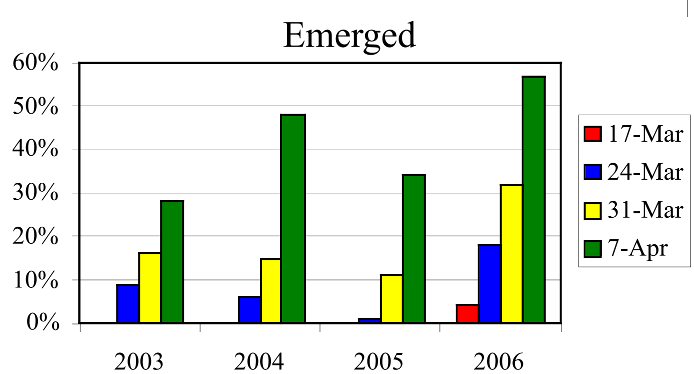
To learn more about the TRPLG go to their website at http://www.usriceproducers.com/trplg.htm or contact L.G. Raun at 979-543-4950 or email lgraun@swbell.net

Rice Crop Update

Things are off to a rough start this year. After a lot of rice emerged there was one night with a 33ºF low across a wide area of the rice belt, followed by another night when it dipped to 32. And there were several days with daytime temperatures in the 30s and 40s, which stunted rice.

Most growers are fighting weeds and there are also problems with stand establishment. Some people are having to replant parts of fields. Because the weather was so dry early, we actually started planting a week or two earlier than normal, but cold conditions set rice back so much that we're only three to five days ahead of average. According to the Rice Crop Survey conducted from the Beaumont Center, acreage will be down 25 - 30%.





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