



Texas Rice

Texas A&M University System
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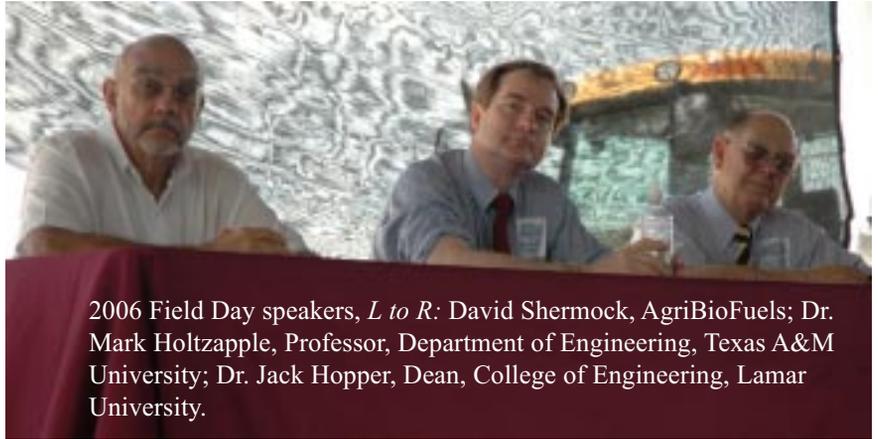
59th Annual Beaumont Rice Field Day a Success

Biofuels for Agriculture was the theme of the 59th Annual Rice Field Day at the Texas A&M Research and Extension Center in Beaumont.

Dr. Ted Wilson, Beaumont Center Director, believes this year's event was one of the most informative ever held. "We began with tours of the research plots, where participants learned about new rice varieties, insect and disease control, ratoon management and advances in molecular genetics," Wilson said.

However, all the production knowledge that exists can't help the farmers if the economic environment is such that they can't make a living. "That's why we decided to do something a little different this year," Wilson added. "We put together a group of experts that provided realistic information on how biofuel production can really give our farmers the boost they need."

The keynote speaker was Dr. Jack Hopper, Dean of the College of Engineering at Lamar University. Dr. Hopper oversees the Texas Centers for Technology Incubation, the umbrella organization for 9 research Centers based at Lamar. One of these, the Renewable Energy Center, is a research, development, technology transfer and education program for the conversion of biomass to fuels and other chemicals.



2006 Field Day speakers, *L to R*: David Shermock, AgriBioFuels; Dr. Mark Holtzapple, Professor, Department of Engineering, Texas A&M University; Dr. Jack Hopper, Dean, College of Engineering, Lamar University.

It is a collaborative project between Lamar, the Texas Agricultural Experiment Station at Beaumont, and Dr. Mark Holtzapple's lab in College Station.

Dr. Holtzapple is a professor in the College of Engineering at Texas A&M University. He and his team of researchers have developed a process that converts biomass, such as rice straw, into mixed alcohols that can be used for fuel. Holtzapple also developed the "super-efficient" StarRotor engine, which has the potential to achieve over 90 miles per gallon given current vehicle technology.

Also on the agenda was David Shermock, an industrial engineer with AgriBioFuels. Shermock has over 35 years of experience in business and industry, and has been the program administrator for projects in agriculture, construction, aviation, electronics and engineering

throughout the US and many other countries.

AgriBioFuels recently announced plans to build a biodiesel plant in Dayton. Shermock said the company hopes to eventually purchase locally produced oilstock, giving Southeast Texas farmers a new market for their crops.

Many of the farmers in attendance expressed a real interest in producing crops as biofuel feedstock. As one young farmer put it, "we are not about to quit growing rice, because that's what we know best, but I think the successful farms of the future will be highly diversified."

There were numerous educational displays and organizations represented, including the Texas Department of Agriculture, the Lower Neches Valley River Authority, and the US Rice Producers Association. *

From the Editor...



Welcome to the July issue of Texas Rice. I would like to take the time to thank all of our growers and agricultural industry businesses that helped to make the field days at Eagle Lake and Beaumont a success. Putting together a field day is a time intensive process involving a tremendous amount of work by many people.

Every year, we solicit funding to help offset the costs of field day preparation, from mail outs that advertise the field day, to field day handouts and inserts that highlight what our scientists are doing for our growers, to display signs that provide detailed information about current research, to supplies that allows us to produce all of these items, and last but not least, to the catered meals that show appreciation to all of our growers. Without your support, our field days would not have near as great an impact.

I would also like to thank all of the faculty and staff at both Beaumont and Eagle Lake for working so hard to get both sites in shape. Without their help and unselfish attitude, the field days would not have been a success. Even so, the Beaumont field tour was uncertain until the very last minute. With nearly 14 inches of rain falling from June 1 to the evening before the field tour, our roads had about as much water as they could hold and still be passable.

As high-points, we had exceptionally strong participation in the field tour at Beaumont and good attendance during the morning program. The topic of biofuels garnered a lot of attention, and the three morning program speakers received a large number of questions from the audience.

The biofuels topic is so critical to Texas agriculture that it is likely that I will be discussing it from time to time during the next several issues. In many states, the biofuels boat is rapidly gaining speed. Some states are providing monetary incentives for businesses to establish production plants. Some states see tremendous value in biofuels research, and are providing broad-based funding to foster research

focusing on increasing ethanol extraction efficiency and for the development of ultra high yielding biofuel crops.

In the Upper Gulf Coast of Texas, groundbreaking for three biofuel plants has occurred during the past few months, with considerable discussion about building a fourth plant, and possibly others as well. The greater the success of these efforts, the less reliant the U.S. will be on foreign oil, which mainly comes from countries with increasingly unstable political environments.

The plentiful rainfall, canal systems and the availability of large tracks of land in the Upper Gulf Coast make this area of Texas ideal for biofuel crop production. For the ‘biomass to fuel and industrial chemicals’ process that Dr. Mark Holtzapple developed, some of the potential crops suitable for this area include rice, sugarcane (or energy cane), sweet sorghum, soybeans and switch grass, to name just a few.

Many of us will have the opportunity to participate in the creation and expansion of a vibrant and economically important biofuels industry.

Please keep sending us your comments and suggestions.

Sincerely,

A handwritten signature in black ink that reads "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.

Flail Mowing for Better Ratoon Yield

Previous research by Beaumont Center scientist, Dr. Garry McCauley, has shown that a reduced cutting height of the main crop increases ratoon production. Recent research by Dr. Lee Tarpley focuses on determining if an increase in ratoon yield is a result of a) a decrease in shading due to removal of upper vegetative material and wind-rowed straw, b) an increase in photosynthetic capacity of the developing ratoon crop, c) a progressive removal of inhibition that is caused by the presence of upper growth on the main crop stems, and/or d) a more optimal proportion of tillers near the base of the plant with good supporting resources and a longer developmental period. The following discussion addresses these questions.

Flail mowing of the main crop was conducted in two different ways in a research-plot study in 2004. For some plots, the grain was harvested by combine as usual. A flail mower quickly followed, with a 2" cutting height. In other plots, the grain was not harvested and the whole plant, including the grain, was cut down to 2" with the flail mower. The panicle was left intact to explore the possibility of an inhibitory signal being sent down from the reproductive tissues that would have a detrimental effect on tiller formation. Although flail moving the rice heads would never be recommended commercially, this treatment could provide insight into factors controlling ratoon crop productivity. Ratoon stand was much poorer for plots in which the grain was not harvested, therefore a low cutting height, by itself, does not guarantee the good ratoon stand that is needed for good ratoon yield.

Several possible factors can explain this difference in stand density and vigor. The additional straw physically or chemically inhibits ratoon crop growth, or the extra material that has to be mowed prevents an effi-



A ratoon field after flail mowing.

Photo courtesy of Mike Jund.

cient chop by the flail mower, somehow inhibiting ratoon tiller growth.

In another research study conducted in 2004, the entire plants, including grain, were flail mowed, but three different cutting heights were used – 2, 4 and 6 inches. The plots cut at 6" had much better ratoon stand, and the stand of the 4"-cut plots was somewhat better than the 2"-cut ones. What was probably happening in this study was that the 6" height was tall enough to be

above the mat of straw.

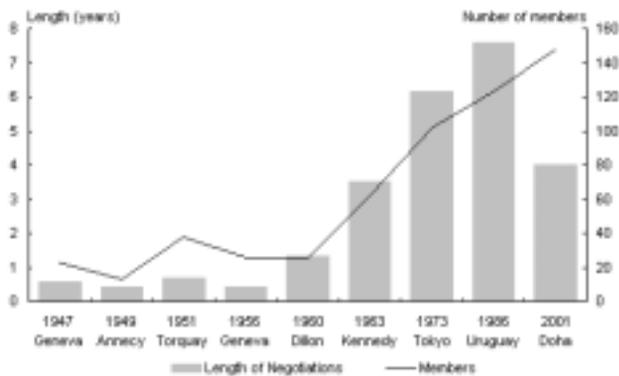
From these preliminary results, the primary advantages of flail mowing for ratoon yield appear to lie in the system, namely a clean low cut with a good chop so that mainly basal tillers are formed (basal tillers typically form a larger panicle but take longer to develop). The good chop helps prevent straw matting and wind-rowing which can either physically inhibit the developing tillers, or can shade them excessively. The clean cut minimizes any harm to the tillers, and also provides a uniform cut to the field. Uniformity indirectly benefits yield in several ways – by allowing relatively good uniformity in grain at harvest, meaning less greens or over-mature grain, and better timing of agrochemical treatments and other management practices.

Some tentative conclusions can be drawn concerning the use of flail mowing following harvest of the main crop as a tool for enhancing ratoon crop yield: 1) if a 6" cutting height performs as well as a 2" or 4" height, then the 6" height would be preferred because it is more tolerant against possible inhibition due to straw matting; and 2) the advantage of using the flail mower to achieve the low cutting height is probably in its ability to minimize the matting.*

Article by Dr. Lee Tarpley

Suspension of Doha Round Trade Talks Will Impact U.S. Agriculture

Participation and Duration of Rounds
U.S. Dept. of Treasury



A suspension of Doha Round trade talks could last for months, impacting global U.S. agricultural trade, a Texas Cooperative Extension expert said. “(The suspension) could last even longer than just a few months,” said Dr. Parr Rosson, Extension economist and director of the Center for North American Studies.

“This could lead to some real pressure being put on the European Union, Japan and others to rethink market access into these countries.” Negotiations ended July 23 in Geneva as talks focused on tariff reductions in agriculture, particularly on high-end products such as beef, Rosson said.

“The U.S. wanted to see tariffs cut by at least 54 percent, but the European Union was willing to only go 48 percent in cuts,” Rosson said. “Many sensitive products, such as beef, would still have 61 percent tariffs even after reduction for the 80 percent tariffs currently in place.” Texas agriculture will be impacted, Rosson said. The potential for more litigation in the World Trade Organization dispute settlement process exists, much like what happened in the cotton case where U.S. subsidies were found to create unfair trade. “There are indications that soybeans, rice and corn policy could face challenges,” Rosson said. “Second, markets will remain closed to U.S. products. With an average global tariff of 62 percent on agricultural goods, it is difficult for U.S. companies to penetrate markets. This problem is especially bad in India, where tariffs on food are 114 percent on average.

European Union export subsidies of \$2 billion annually “will limit trade opportunities for grains, beef and poultry,” Rosson said. “This means lower prices

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Dayton Rice Farmer Hosts Reception to Seek Support for Agriculture

Sunday, July 9, a reception in honor of Congressman Ted Poe was held at the home of Ray and Eileen Stoesser in Dayton, Texas. Attendees included farmers, industry representatives, Texas Agricultural Experiment Station and Texas Cooperative Extension. The purpose of the reception was to give Congressman Poe an opportunity to interact with farmers, and share his views on current events in Washington.

Poe’s strong support of the rice farmers in the past was very much in evidence when discussing the problems we face tomorrow. Congressman Poe has been a vocal supporter of opening markets to countries like Cuba, Iran and Iraq. “I don’t think the United States can ever be in a position where we depend on foreign countries for what we eat,” said Poe.

Congressman Poe, as a member of the International Relations Committee, has spent a significant amount of time visiting border cities to hear testimonials of people’s concern about our open borders, given the near-constant apprehension regarding international terrorism. The concern seems to be that the cartels that are smuggling in people and drugs could be used to smuggle in terrorists.

Regarding alternative fuels, Poe believes the United States must become more independent with regards to our energy resources. This independence requires greater development of alternative fuels. (Read more about alternative fuels in the *Researcher in the News* article on page 5 of this issue.) *



L to R: Neal and Meredith Stoesser, Congressman Ted Poe, Ray, Eileen and Grant Stoesser.

Researcher in the News...

Often called a 'green engineer', Dr. Mark Holtzapple and a team of researchers at Texas A&M University are conducting ground-breaking research that has the potential to make the United States self-sufficient in energy use.

Mark Holtzapple is a professor of chemical engineering in the Dwight Look College of Engineering. Holtzapple holds a bachelor's degree from Cornell University and a Ph.D. from the University of Pennsylvania. He joined the Texas A&M Engineering faculty in 1986 as an assistant professor. From 1981 to 1985, he served in the U.S. Army and rose to the rank of captain. While in the Army, he performed research on water desalination and microclimate cooling, a method for cooling soldiers wearing chemical protective clothing.

One of Holtzapple's current research interests is converting biomass to useful, cleaner-burning fuels. Holtzapple has developed the MixAlco process, which converts biomass into alcohols for use as fuels. His research group operates a pilot plant on campus.

"We can use anything biodegradable," Holtzapple said. "Trees, grass, rice straw, manure, sewer sludge, garbage – if you put it outside and it rots, we can use it."

The process can also use high-productivity feedstocks, such as energy cane and sweet sorghum. "The alcohol fuels produced by processing these crops is produced more efficiently than the ethanol produced by corn. Water hyacinth, a weed that chokes waterways if left to grow uncontrolled, is even more energy efficient as a biomass feedstock," Holtzapple said.

In the MixAlco process, the biomass feedstock, with added microorganisms from sources such as dirt, compost piles and swamps, is treated with lime and then fermented to form organic salts. Water is removed and then the mixture

Dr. Mark Holtzapple

is heated to form ketones, such as acetone, which is an ingredient in nail polish remover. Adding hydrogen to the ketones forms alcohols that can be used as biofuels.

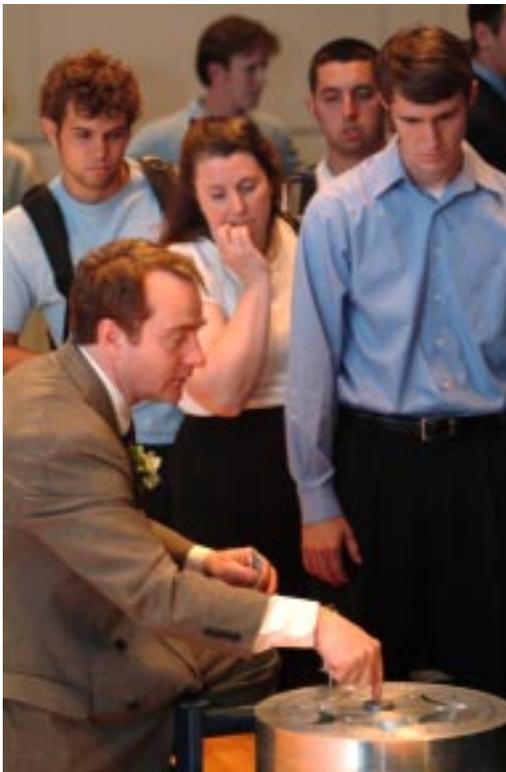
"You've heard of alchemists trying to turn lead into gold," Holtzapple said. "We turn manure into rubbing alcohol. We're turning something that people don't want into something useful."

The process also can convert waste biomass into lower-cost animal feed and industrial chemicals. It's a win-win technology, Holtzapple says. "Many of these materials have a low value – or a negative value if there's a disposal cost," he notes. "Shipping sewage sludge from New York to Texas runs \$500 a ton. Converting waste materials to useful products solves both waste disposal and resource shortage problems."

"If we used only garbage as a raw material, we could replace seven percent of all the gasoline currently consumed," he says. "If we used all the waste biomass available — including forestry and agricultural wastes – we could replace most of the 130 billion gallons of gasoline we use each year."

Biofuels are kind to the environment, too. Combustion of biofuels doesn't contribute to global warming because no net carbon dioxide is released into the atmosphere.

There is another process for converting biomass to fuel alcohol developed by researchers at the University of Florida, which is about to be commercialized by Celanol Corporation at a plant in Jennings, LA. This process is different because it uses genetically engineered microorganisms to break down the biomass, so the process must be carried out in a sterile environment to avoid contamination. According to Holtzapple, in their MixAlco process, all microorganisms are welcome to the table.



Dr. Mark Holtzapple, recent recipient of the Sigma Xi Walston Chubb award for innovation, has given countless lectures and demonstrations on his team's patented new technology.

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Researcher in the News continued...



The MixAlco pilot plant in College Station.

Another interesting aspect of this process is that inputs do not need to be segregated or restricted. In other words, if an operation were utilizing sweet sorghum and manure for the biomass feedstock, rice straw, wood pulp or sugarcane bagasse could be added with no need to alter the production process.

These environmentally friendly biofuels can be used in a second focus of Holtzapple's research, the StarRotor engine. Recent measurements indicate that a complete StarRotor engine would be 58 to 67 percent efficient compared to the 15 to 20 percent efficiency of today's engines. And the more fuel-efficient an engine, the less fuel it needs, meaning less energy cane or sweet sorghum needs to be grown.

Holtzapple is working with Dr. Mehrdad "Mark" Ehsani to hybridize the StarRotor engine. Ehsani is a professor in the Department of Electrical and Computer Engineering and holder of the Robert M. Kennedy Professorship I in Electrical Engineering. "We plan to get 90 miles per gallon in a conventional car equipped with a hybridized StarRotor engine," Holtzapple said. "That means we can drive from New York City to Los Angeles on 31 gallons."

But Holtzapple said the government would

have to help, calling for the same tax credit for all biofuels. Currently, only biodiesel and corn ethanol are eligible for tax credits. He also called for liability protection for those using wastes as feedstocks. Matching funds and loan guarantees could also accelerate the technology commercialization. "I just want a level playing field," Holtzapple said, because "sustainable energy is technically and economically feasible."

Holtzapple's work has been nationally and internationally recognized. In June of this year, he was chosen to receive the 2006 Walston Chubb Award for Innovation from Sigma Xi, the scientific research society. He recently gave the concluding lecture in the 2005-2006 Texas A&M University Distinguished Lecture Series, the first engineering professor to do so in 31 years. His talk, "Sustainable Energy and Transportation: Engineering the 21st Century," took aim at two major factors that will affect the standard of living in the United States – the declining petroleum reserves and global warming – specifically targeting the use of new fuels and improving fuel efficiency. (That lecture can be accessed online at <http://engineering.tamu.edu/research/lectures/>)

Holtzapple has authored nearly 100 technical articles and reports, plus a widely used engineering textbook. Further, he has more than 22 patents, numerous pending patents and more than 80 patent disclosures. He is recognized for his excellent teaching and research and has won numerous awards, including The Association of Former Students Distinguished Achievement Award for Teaching and the Spirit of Innovation Award for Ingenuity.

Some experts predict that oil production worldwide will peak in 2010 or 2020, and the consequences of global warming can no longer be denied. It is imperative that as a society we support and embrace this type of innovative and forward thinking research.*



Inside the fermentation tanks, muck soon to be biofuel.

Article by Lesley Kriewald, Jay Cockrell and Tim Castleman. Photos courtesy of Dr. Mark Holtzapple.

State, National and International News...

Various Biodiesel Projects Underway In Texas

Chevron Technology Ventures LLC, a subsidiary of Chevron Corp., has purchased a 22 percent equity stake in Galveston Bay Biodiesel LP, a 20 million-gallons-per-year (MMgy) biodiesel refinery that recently started construction on Galveston Island, Texas. According to Chevron spokesman Leif Sollid, the oil company's equity stake amounts to an investment of \$3.5 million. The plant is being designed and built to accommodate future large-scale increases in capacity, up to 100 MMgy, Chevron claims. According to Jenny Ligums, vice president of sales and marketing with Galveston Bay Biodiesel, production is expected to begin in November.

GeoGreen Fuels LLC has also begun construction on its 3 MMgy biodiesel production facility east of San Antonio in Gonzales, Texas. "[Our technology is a] CF-series process unit with Active Ion waterless technology and real-time automated control," explained director Kathryn Kartchner.

South of San Antonio, SMS Envirofuels Inc. just finished expansion work at its biodiesel plant in Poteet, Texas, said David Pearce, director of operations at the plant. SMS Envirofuels expanded capacity from 1.5 MMgy to 6 MMgy. Pearce said the project was slated to be complete in early June 2007. The plant uses a "continuous parallel batch" process.

In Roaring Springs, Texas, Sun Cotton Biofuels is expanding its biodiesel production beyond its current 2 MMgy capacity to 4 MMgy,

confirmed part-owner Jerry Wilburn. He also said Sun Cotton Biofuels is expanding its cottonseed crush capacity on-site to ensure feedstock supply for the added biodiesel capacity.

AgriBioFuels, 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.

2005 Texas Ag Production Valued at \$18.5 Billion

Texas agriculture production for 2005 was valued at \$18.5 billion, up from \$18 billion in 2004, according to a Texas Cooperative Extension study. Dr. Carl Anderson, professor emeritus and Extension economist, said total value was calculated surveying production by each Texas county.

"Prices were mostly lower for crops from a year earlier and higher for livestock, but the production value has increased about 33 percent since 1995," Anderson said. Livestock production value exceeded \$10 billion. Primary growth was in the production of broilers, eggs, milk, beef cattle, goats, hogs and honey, according to the report.

Texas is first in the U.S. in sales of cattle and calves, sheep and wool, goats and mohair, and cotton. It also leads in value of farm real estate and number of farms and ranches.

Income to landowners from hunting leases exceeded \$525 million in 2005, up 166 percent in the last decade. Fishing income, estimated at \$78 million, has tripled since 1995, Anderson said. Estimates include crop season values and some on-farm use of commodities, which is typically higher than cash receipts, he said.

The largest growth in the last 10 years has come in aquaculture, horses used for recreation, and hunting and fishing leases, according to the study. The value of farm assets, which includes land, buildings, livestock, machinery, crops and livestock, is estimated to exceed \$115 billion in 2006.

Excerpted from an article by Blair Fannin, b-fannin@tamu.edu

Conservation District Meetings Planned

The Texas Soil and Water Conservation Districts invite the public and any agencies with interest to participate in the Program Development Group meetings. These meetings are led by the local Soil and Water Conservation District in partnership with USDA Natural Resources Conservation Service in each county and provide an opportunity for participation and comments from a broad range of local agencies, organizations, businesses and especially farmers and ranchers that have an interest in natural resource conditions and needs. Each county in Texas holds public meetings annually. For those interested, county meetings will soon be posted on the Texas NRCS website www.tx.nrcs.usda.gov.

Trade talks continued...

for Texas products and more pressure to cut U.S. farm support,” he said. U.S. Secretary of Agriculture Mike Johanns said the 80 percent tariff for high quality beef in the U.S. blocks the market.

“There is no more effective trade distortion than that,” Johanns said during a teleconference media briefing. “Under the proposal, the new tariff would be 61 percent. That is still a remarkable blocking of the market. It makes it impossible to sell beef into that marketplace.” European Union officials for the past month said they were willing to meet the 54 percent reduction proposed by the G-20 countries (a group consisting of 19 of the world’s largest economies with the European Union). But at the trade table, several countries were still limiting market access and keeping their own farm market system closed to outside trading.

“The other big stumbling block was that the G-20 wanted to designate 20 percent of their products as ‘special’, meaning that about 90 percent of all agricultural products would still have high tariffs even after agreed upon reductions,” he said.

Rosson said the U.S. had been clear that the offer of a 60 percent reduction in trade-distorting domestic support “could only be justified if the EU, Japan and developing countries, mainly G-20, made substantial reductions in agriculture tariffs. “This did not happen, therefore the parties were so far apart that (WTO Director General Pascal) Lamy thought a suspension in negotiations was in order.”

For more information contact Dr. Rosson at 979-845-3070, or email prosson@tamu.edu

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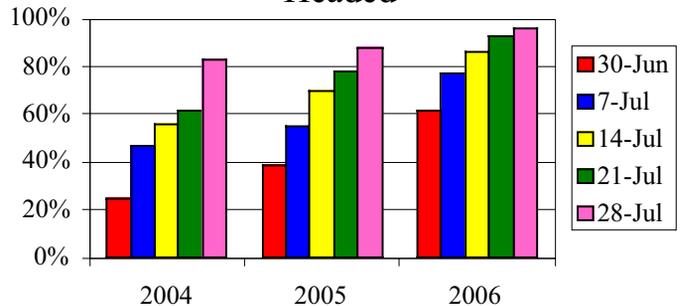
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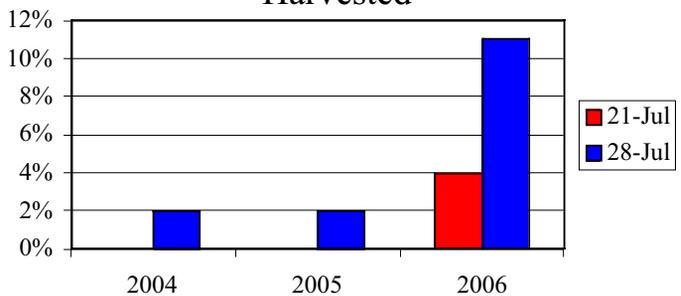
Rice Crop Update

As of July 28, 96% of the rice was headed, compared with 88% in 2005. 11% of the rice was harvested, well ahead of the 2% in the previous 2 years.

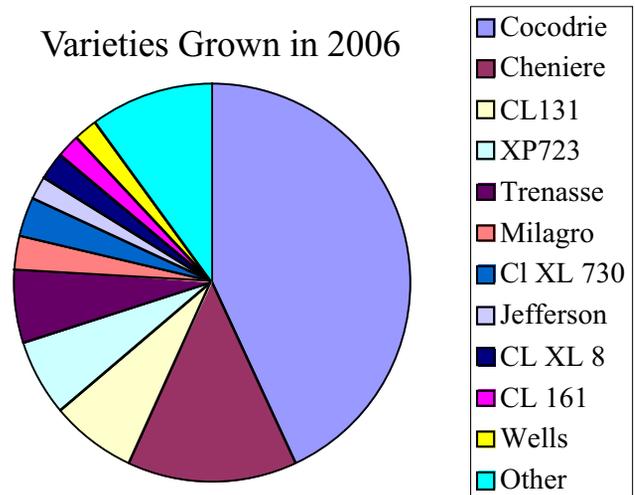
Headed



Harvested



Varieties Grown in 2006



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