Texas Rice

Texas A&M University System
Agricultural Research and Extension Center
Beaumont, Texas

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33rd Annual Eagle Lake Rice Field Day

The 33rd Annual Rice Field Day at the Eagle Lake Research Station will be held Tuesday June 26th starting at 4:00 pm. Farmers, researchers and other industry representatives are encouraged to come and learn the latest information in rice research from Texas A&M and USDA scientists.

Field Day activities will begin with a tour of the research plots, with water and sodas provided. The tours are on covered trailers, and generally run about 45 minutes.

The tour will begin with Dr. Garry McCauley, who will discuss CLEARFIELD Hybrid rice evaluations. Since hybrids were first introduced the yield and grain quality has been greatly improved. The improved hybrid lines have resulted in an increase in acreage. This study is conducted each year at three locations to evaluate the performance of select CLEARFIELD varieties and conventional varieties. Numerous plant characteristics will be recorded for each entry, including main and ratoon crop yield and milling quality. This year's test includes 3 CLEARFIELD hybrids, 2 conventional hybrids, 2 CLEARFIELD varieties, 4 conventional long grain varieties, and 1 conventional long grain experimental line. The hybrid advantage was considerably less in 2006. In prior years, XL-723 out yielded Cocodrie by 1301 dry pounds per acre and CL XL-730 out yielded CL-161 by 2092 dry pounds per acre.

Eddie Pavliska, Farm Foreman, has worked at the Eagle Lake Station for over 20 years. Here he is shown laser leveling a research plot to improve water use efficiency.

Sam Willingham, a graduate student of Dr. Mike Chandler and Dr. Garry McCauley, will be next on the tour and will speak about new CLEARFIELD varieties. Previous research has indicated that first generation CLEARFIELD varieties displayed minimal tolerance to Newpath, but that second generation hybrids displayed increased tolerance. As new varieties are developed, research on herbicide tolerance continues to be important. This year, five varieties, CL-XL745, CL-XL730, CL-XL729, CL171-R, and CL161 are being studies for their tolerance to increasing rates of Newpath.

Beyond herbicide is an effective tool for removal of late-emerging or previously missed red rice in CLEARFIELD rice fields following two applications of Newpath. Research has shown that reduction in rice yield can occur when Beyond is applied after panicle initiation. Currently, Willingham and his professors are testing new and existing varieties for tolerance to Beyond when applied at various growth stages.

Next on the tour is Dr. Anna McClung speaking about varietial improvement progress and potential releases. The USDA-ARS and Texas A&M breeding programs conduct yield trials at Beaumont, Eagle Lake, and Ganado to assess how experimental lines perform across a diversity of environments. This year over 100 selections from the breeding programs are being evaluated in the Western Area.

Although the majority of these are being developed for the conventional long grain white milled rice market, there are number of selections that are being tested for specialty markets. These include aromatics, pigmented rice, waxy rice for the ingredients industry, and superior parboiling and processing rice cultivars.

In addition, several varieties that have very high yield potential (similar to that observed for hy-

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From the Editor...

Celebrating Science

Welcome to the June issue of Texas Rice. On May 25, the David R. Winterman Rice Research Station near Eagle Lake was in the news. The Texas A&M University System Board of Regents voted to purchase 77 acres of land that has been owned by the Texas Rice Improvement Association (TRIA) since the station was founded in 1972. The purchase was made possible through a generous donation by the Winterman Foundation and its Board of Directors, chaired by Jack Johnson. When combined with the 35 acre donation made by the Winterman Foundation in 2002, the Eagle Lake Station occupies 112 acres of land, serving as a vital component of Texas A&M's research in the Western area of the Texas ricebelt. The Eagle Lake Station allows our scientists to conduct replicated, highly controlled experiments. These experiments are an important reason why Texas rice yields have increased from an average of ca. 1700 lbs/ac in 1945 to ca. 7300 lbs/ac in 2007.

During June, we kickoff the first of two annual field days. The Eagle Lake Field Day is scheduled for June 26. This year's field tour speakers include Anna McClung who will discuss the USDA/ARS varietal development program in Arkansas and Texas, Garry McCauley who will provide an update on the performance of RiceTec varieties, Sam Willingham, who will discuss Beyond and Newpath herbicide research results, and Mo Way, who will provide an update on promising replacements for Icon. The keynote speaker for the evening program will be Representative Robby Cook, who will discuss water issues important to Texas farmers. In addition, LG Raun, will provide an update on Farm Bill legislation. Visitors will not be disappointed by the evening dinner provided by Austin's BBQ made possible by generous funding by BU Growers. We hope you can make it.

The major role of our Texas A&M and USDA scientists at Beaumont Eagle Lake is the development of knowledge that leads to improvements in varietal development and advances in crop production and pest management. Underpinning the research programs is ca. $3 million/yr in funding provided almost equally by the USDA Agricultural Research Service and the Texas Agricultural Experiment Station. This money pays for the lights, electricity, some infrastructure repairs, many of our staff and faculty salaries, and occasionally new equipment. While these monies are essential, they are not sufficient to support all of the research needed by our rice industry. Without additional funding, the development of higher yielding, superior quality varieties and improved production and management programs would be much slower in coming. Instead of an average yield of 7300 lbs/ac for 2007, who knows, we might be talking about average yields in the 5,000-6,000 lbs/ac range.

To maintain productive research programs, our scientists must successfully compete for grant funding from our rice industry, affiliated fertilizer and pesticide industries, and from state, national, and international funding agencies. How successful have our scientists been? Collectively, they generate ca. $2-3 million/yr in additional support. On a scientist basis, that places the Beaumont Center approximately 4th of the 13 Centers. Not bad from my perspective.

The following list provides a brief overview of the University and USDA programs at Beaumont and Eagle Lake, made possible by base funding and by grant funding.

Plant Breeding

Rodante Tabien (TAES) – Research focuses on developing higher yielding conventional long-grain varieties, high yielding water efficient single crop varieties, and herbicide resistant rice varieties

Anna McClung (ARS) – Research focuses on developing conventional and specialty rice varieties

Plant Genetics

Shannon Pinson (ARS) – Research focuses on unraveling the genetic bases for grain quality and plant tillering.

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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.

Apparent Development of Resistance by Blast Fungus to Rice Fungicides

Modern agriculture is dependant on pesticides to control many different insects, weeds, and pathogens that cannot be controlled by other practices, such as planting resistant cultivars, cultural management, and biological control. Most pests have the ability to overcome pesticides by becoming tolerant or resistant over time. This often leaves a dangerous gap in the farmer's ability to control important pests. Monitoring programs are in place to detect these events and allow time to develop new control practices.

Blast is one of the most important rice diseases in Louisiana and the Mid-South. Resistance is available in some varieties but not all. Control is enhanced by establishing and maintaining a flood as soon as possible, planting early to avoid late-season blast pressure, using recommended nitrogen fertilizer rates, and not planting in sandy soils or in tree-lined fields. Losses due to blast are escalating by current practices that require draining fields for insect control, correction of herbicide damage, or to prevent straighthead increase blast damage. Farmers often have to depend on fungicides to protect their rice crop from severe blast damage. Development of resistance by rice blast, also known as rotten neck blast fungus, *Pyricularia grisea,* to fungicides poses a major risk.


Photo by Don Groth, LSU Ag Center

Rice plant showing symptoms of neck bast fungus, just below the panicle.


Photo by Jay Cockrell, TAES Beaumont

Photo shows severe blast symptoms on a rice plant leaf.

Blast fungicide trials have been conducted at the LSU AgCenter's Rice Research Station, Crowley, Louisiana, since the 1970s. Small plots were usually 4 X 116 ft, consisting of seven drill strips with 7-inch row spacing. Seeding rates, fertility, and pest control followed current recommended practices. Experiments were arranged in a randomized, complete block design with at least four replicates. Varieties selected were susceptible to blast and managed to favor disease (i.e. fertilized with high N rates, planted late, drained at mid-tillering until the soil cracked and then reflooded, and/or located where disease pressure was high). Typically, fungicides were applied to small plots using CO_2-pressurized sprayers delivering 15 gal/A of water at 2-inch boot (B) and 50% heading (H). Benlate (50 WP or 50 DF) applied at B and H at 0.50 lb a. i. /A and Quadris (2.08 SC or 70 DF) at H at 0.2 lb a.i. /A were applied to plots. An unsprayed check was included. Blast incidence was determined by counting the number of heads infected with rotten neck blast. Plots were combine harvested and yields expressed in lb/A at 12% moisture. Milling samples were collected and total and head rice percentages determined. Percent control was determined and plotted over time.

Historical data from 30 years of testing showed that control of rotten neck blast by Benlate decreased from 70 - 60% to below 50% from 1976 to 2001, with light disease pressure and from 50 - 60% to 10 - 20%

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Blast continued...

Blast 'nursery' at the Texas A&M University Research and Extension Center at Beaumont showing the use of sprinklers to encourage the pathogen to spread throughout the inoculated field. The plants that survive exhibit blast resistance.

during the same time period with heavy disease pressure. Decreases observed in Quadris and Gem activity over time suggest that the blast fungus may be developing resistance to these fungicides also in the plot area. Preliminary tests using fungicide incorporated into agar have shown possible tolerance (reduced growth) but not resistance (ability to grow in presence of toxic substance) to benomyl. Fungal isolates from these studies have been sent to Arkansas for additional fungicide resistance screening in culture.

At this time, blast fungicides appear to be performing well in commercial rice fields in Louisiana, except in several failures reported in the last few years. Before Benlate was removed for sale, blast control failures had been reported. The current practice of using only one fungicide application per year and not using a fungicide every year has limited pressure on the fungal pathogen population in commercial fields to develop resistance. If blast becomes more of a problem and rice needs multiple fungicide applications every year, resistance in the blast pathogen population could easily become a problem. Loss of our present fungicides to resistance would be a major blow to rice production. It is essential that testing of fungicide efficacies in Louisiana rice fields be continued, and that management practices to reduce the speed of resistance development in major pathogens to pesticides be researched. ∗

Article by Don Groth, Professor, Rice Research Station, LSU AgCenter, Crowley, LA; Chuck Rush, Professor, and Don Lindberg, Retired Professor, Department of Plant Pathology and Plant Physiology, LSU AgCenter, Baton Rouge, LA

Field Day continued...

brids), but low milling quality, are being evaluated for use in the rice flour market. An overview of the yield and market potential of these breeding lines will be presented at the field day.

Dr. M.O. Way will be the final stop on the tour, discussing recent and future regulatory actions concerning Trebon3G, a granular formulation for treating rice water weevils. His project is conducting research this season to determine the best timing for pre-flood and post flood applications. Way will also share information on promising Icon seed treatment replacements for the rice water weevil. In addition, he will discuss insecticides and economic threshold issues relative to the rice stink bug.

The evening meal and program will follow the field tours and will begin around 6:30 pm. The dinner is catered by Austin's barbecue, and funded courtesy of BU Growers, a limited partnership business specializing in seed rice production, drying & storage, and rice brokering. Based in Bay City, BU Growers has sponsored the Eagle Lake and Beaumont field days since the company's inception in 1989.

The evening program will feature State Representative Robby Cook who will discuss water issues. Said Cook, "Water will continue to be one of the most important issues that agriculture will face in the future. As urban areas continue to grow, so will their needs and demands for water. We need to continue to protect our water resources in the rural areas of the state to protect our rural economies. El Campo rice farmer L.G. Raun, will also give a presentation addressing the Farm Bill, and discuss where we are in the process of creating and passing a new bill thru Congress. He will describe the process, the various titles of the Farm Bill, and the beginning challenges of funding due to the budgeting process. Raun will then describe our rice industry position and other commodity positions, the differences of the Chairmen and Ag committees in the House and Senate. He will finish by forecasting options and time lines for concluding the next Farm Bill.

CEU hours will be given to those on the field tour. Anyone interested in rice research and production is encouraged to attend. ∗

The Station is located at 2963 FM 102, Eagle Lake, Texas, 77434.
For more information on the Eagle Lake Field Day contact
Coleen Meitzen at (979)234-3578 or Brandy Morace
at (409)752-2741 ext 2227

Photosynthesis and the Rice Plant

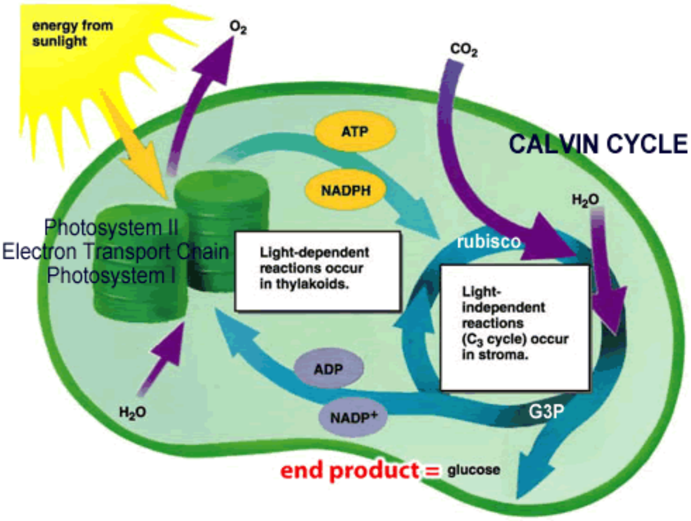

Diagram illustrating the process of photosynthesis that occurs in C3 green plants, such as rice. Source: www.biologycorner.com

Rice plants, like all green plants, start depending on photosynthesis for supply of reduced carbon (such as carbohydrates), reduced nitrogen compounds (such as amino acids), and most of their organic chemicals used as food or building-block compounds, soon after emergence.

Photosynthesis is the process by which plants convert some of the energy contained in visible radiation into energy contained in chemical bonds. This captured chemical energy, usually in the presence of appropriate biochemical catalysts, enables the interconversion of various chemical forms. This enablement occurs because chemical interconversion is often a form of work, albeit at the molecular scale, and thus requires some energy; this energy comes from using small portions of the energy contained in the chemical bonds.

The photosynthetic machinery primarily captures the radiation energy through production of reduced carbon compounds (carbohydrates and organic acids) by combining carbon dioxide and water, which are both commonly available in the environment. The oxygen that animals use is a byproduct of photosynthesis. The green pigments (chlorophylls), in concert with other compounds, in the leaves and other green tissues of the plant, capture the radiation energy and transfer it through a series of steps into the chemical bonds.

The sugars and amino acids, which are two major groups of chemicals resulting from photosynthesis and additional metabolic processes, are sometimes called the currency of the plant because they are the main forms in which the reduced carbon and reduced nitrogen are distributed throughout the plant where they enter into a plethora of uses. Much of what we need to know in rice plant physiology can be gained by examination of the fates of the sugars and amino acids.

The process of photosynthesis can be considered in two stages. The first stage is the capture of the radiation energy by the chlorophylls and its initial transfer into a chemical bond energy. The second involves the use of this energy when combining the carbon dioxide and water, and releasing oxygen, to form stable chemical compounds containing the energy in the chemical bonds.

The first stage directly requires the light radiation; the second stage only indirectly requires light through the activities of the first stage. It is no coincidence that plants use nearly the same range of radiation wavelengths for photosynthesis that we use for vision. The energy 'concentration' of visible radiation is high enough to readily be captured in chemical bonds, while not being so great as to cause damage, such as occurs with the ultraviolet.

If the visible radiation received by a rice plant is very low then the amount of photosynthesis will be limited. If the amount of visible radiation received is in excess of the plant's ability to channel energy into the chemical bonds, then damage to the leaf or other green tissue can occur. This damage can be very similar in form to that seen in application of some kinds of leaf desiccants (such as paraquat) or due to certain diseases. This occurs because of the formation of unstable chemical bonds that can transfer their excessive amount of energy to other chemical bonds in a chain reaction leading to disruption of the cells or of structures (including the photosynthetic machinery) within the cells.

The second stage of photosynthesis, the one that uses the captured energy to combine the carbon dioxide and water to make the reduced chemical products

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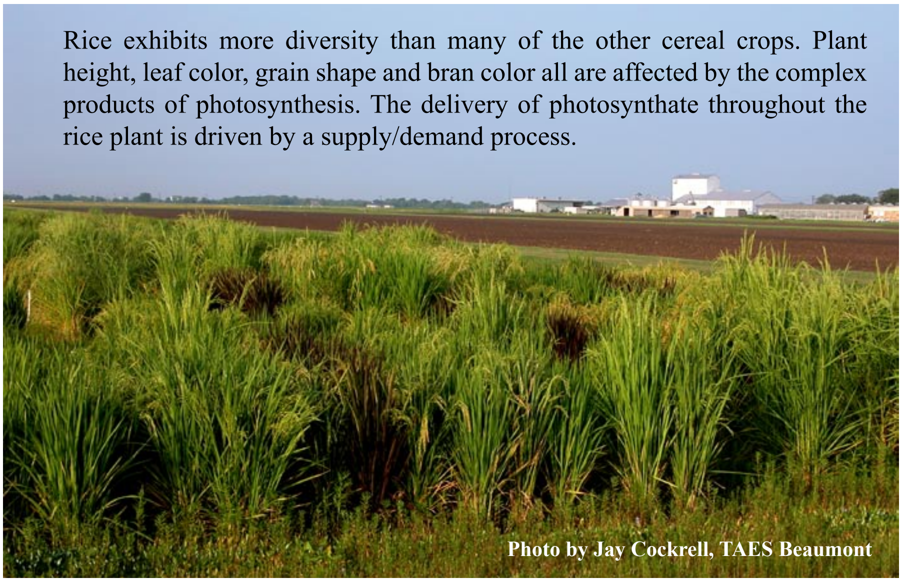
of photosynthesis, acts through the coordinated activity of a number of biochemical catalysts, called enzymes, that are protein molecules, which are complex molecules made of many amino acids in a particular sequence, and which in the cell fold into particular 3-dimensional shapes, dictated by the chemical properties of their contained amino acids.



Rice exhibits more diversity than many of the other cereal crops. Plant height, leaf color, grain shape and bran color all are affected by the complex products of photosynthesis. The delivery of photosynthate throughout the rice plant is driven by a supply/demand process.

Photo by Jay Cockrell, TAES Beaumont

The particular 3-dimensional shape of the enzymes allows them to catalyze (make easier) particular chemical reactions. The most common protein on earth is an enzyme, which is best known by its acronym – rubisco, which catalyses the incorporation of carbon dioxide in this second stage of photosynthesis. It makes sense that a photosynthetic enzyme would be the world's most common protein because nearly all life depends on photosynthesis directly or indirectly.

Scientists are not entirely sure why rubisco is the most prevalent among the photosynthetic enzymes, but it is probably because oxygen interferes with rubisco's ability to capture the carbon dioxide due to a mechanism that is difficult or impossible to improve upon. Perhaps the presence of a large number of rubisco molecules helps in the capture of a large number of carbon dioxide molecules, and thus in the production of a large amount of photosynthate, a general term for the 'currency' chemicals of the plant.

Possibly as an offshoot of its being present in high concentration, rubisco is also a major storage form for nitrogen in plants. It is readily broken down in the leaf to provide amino acids for use in various parts of the plant. This aspect of rubisco will be important later in the discussion of rice physiology, because rice leaves have among the highest rubisco concentrations in leaves that have been observed in crop plants.

The two stages of photosynthesis, although not necessarily operating at the same time and place, are maintained in careful balance. This is especially true for rice and many other plants (the so-called C3 plants, for reasons beyond the scope of this article) in which the two photosynthetic stages are indeed very close together in time and space, in contrast to the C4 group of plants (including maize and sorghum), in which the two stages occur in different cells. Then there are the CAM plants (including pineapple and prickly pear) in which the second stage occurs at night.

The different groups tend to perform better under certain environmental conditions: many desert plants are CAM, and the C4s can often handle somewhat hotter conditions than the C3s. Under more temperate conditions, many of the plants are C3s. The need for balance between the two stages of photosynthesis in the C3 plants, such as rice, is intuitive because if stage 1 was excessively large, then the potential for excess capture of radiation energy that could not be channeled into stage 2 machinery would exist, with the resulting possibility of cellular damage. The photosynthetic machinery of the second stage is one of the most expensive in the plant in terms of the amount of nitrogen used. Because nitrogen is one of the most common factors limiting plant growth, an excessively large stage 2 apparatus would be an inefficient use of a limiting resource.

Photosynthesis also requires the presence of an adequate amount of carbon dioxide and water. The water incorporated during the photosynthetic process is a very small portion of the water used by the plant, much of which passes through the plant via transpiration, so water does not typically limit photosynthesis. Carbon dioxide is ubiquitously present in the atmosphere, but can be limiting if it does not get into the leaves. Carbon dioxide enters the leaves through the stomata, which are small pores in the leaf, with opening and closure

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Photosynthesis continued...

regulated by a number of factors. One of these factors is turgor pressure, which is a positive pressure due to water inside the plant cells. Thus, low water supply to the plant can limit photosynthesis by triggering stomatal closure and thus low carbon dioxide supply. Even in the presence of adequate soil moisture, conditions which prevent adequate water uptake by the plant, such as a low amount of living root mass, can limit photosynthesis through the above process.


Photo by Jay Cockrell, TAES Beaumont

Rice seedlings initially depend on seed reserves to support early growth. Later in development, the plants capture radiation energy through the process of photosynthesis.

Plants have to open their stomata to get the carbon dioxide used for photosynthesis, but in doing so, lose a large amount of water. A consequence of the large amount of water loss from the plant through the stomata, a process that includes the transition from liquid water to the gaseous water vapor, and thus a release of heat, is a cooling of the plant tissue. Healthy lowland rice plants in a good quality paddy water flood rarely experience drought stress and are able to leave their stomata open for relatively long periods, thus can have good access to the carbon dioxide substrate for photosynthesis, and the potential for plant tissue cooling via transpiration.

Much of the photosynthate is used in the green tissue and much is transported out of the photosynthetic, or source, tissue. In either case, the photosynthate is allocated among a number of functions, primarily based on demand. Some of the photosynthate is used in structural material; some is used for other cellular building material. Some photosynthate is routed through various metabolic paths and end up in an assortment of compounds, including lipids (fats and oils), carbohydrates (starch and sugars), nucleic acids (for instance, DNA), proteins, and ‘secondary’ metabolites (which are often fairly complicated structures implicated to have diverse functions, such as plant defense, some structural materials, and signal compounds involved in the regulation of physiology).

Sometimes the photosynthate is stored for later use in plant growth (for example, starch in the grain). Much of the photosynthate is used in respiration through the same processes that animals use when breaking down food stuffs in cells for energy production. The respiration process occurs in plants during both the day and the night. There is some evidence that respiration in plants during the day is at reduced levels, but this remains controversial. In a typical day in a rice plant during early grain filling, we might see photosynthesis and respiration in the leaves, photosynthesis and respiration in the leaf sheaths, respiration in the grain, respiration in the inner tissue of the culm (stem), and respiration in the roots.

The delivery of photosynthate throughout the plant is driven by a supply/demand process, but it is a complicated network with multiple sources (net suppliers) and sinks (net demanders), so that delivery is influenced by a combination of proximity to other sources and sinks, as well as the strength of the individual parts as source or sink. Evidence also exists that a plant part, such as a culm at about boot stage, can act as a source and a sink at the same time.

Although conditions exist where we can talk about a plant as a whole being source limited, (i.e. not enough photosynthesis is being produced to satisfy the demands by the various parts of the plant), there are also times when the plant may be sink limited (the photosynthate delivery system is at capacity). However, so many levels of feedback control exist, that plants tend to maintain a fairly good balance of overall source and sink strength.

During the life of a rice plant, the major source parts and sink parts change. For example, a newly developing basal tiller is dependent on the rest of the plant for provision of photosynthate, but as it grows it starts to function relatively independently of the rest of the plant. As another example, the culm can store large amounts of photosynthate, much of which can be mobilized and used in filling the grain.

By better understanding these processes, farmers can care for their crop in such a way as to gain maximum returns. *

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Effects of an Expansion in Biofuel Demand

This report was conducted by the Economic Research Service, at the request of Senator Saxby Chambliss. Additional specific issues addressed were developed in discussions with Congressional staff. The main purpose of the report is to assess the effects on agriculture of alternative levels of biofuels production from corn and soybean oil. In addition, the potential for expansion of cellulosic ethanol production is reviewed.


Photo by Jay Cockrell, TAES Beaumont

A test plot of the 'Energycane' variety 03-48 that the Entomology Project is currently testing at the Texas A&M Research and Extension Center at Beaumont. Germplasm was obtained from Robert Cobill and Dr. Tom Tew at USDA/Houma, LA.

Scenarios. Two alternative scenarios of biofuel production are examined for crop years 2007-16 using an econometric model of the U.S. agricultural sector. Under Scenario 1, annual domestic ethanol production increases to 15 billion gallons by 2016, and annual domestic biodiesel production increases to 1 billion gallons. Under Scenario 2, annual domestic ethanol production increases to 20 billion gallons by 2016, and annual domestic biodiesel production increases to 1 billion gallons. The increase in ethanol production is assumed to use corn as the feedstock, and the increase in biodiesel production is assumed to use soybean oil. These scenarios compare with about 12 billion gallons of ethanol production and 700 million gallons of biodiesel production in 2016 in USDA's long-term agricultural projections released in February 2007 (baseline). During 2007-16, domestic ethanol production increases by an average of 2 billion gallons year under Scenario 1 compared with the baseline and by almost 5 billion gallons per year under Scenario 2. Domestic biodiesel production is projected to increase by an average of about 200 million gallons per year above the baseline during 2007-16 in both scenarios.

Corn and soybean market effects. Increased ethanol production would also increase the demand for corn. Corn used in ethanol is estimated at 2.15 billion bushels in 2006 crop year, accounting for 20 percent of corn production. Under Scenario 1, corn used in ethanol rises by an additional 1 billion bushels above the baseline by 2016, to 5.4 billion bushels, accounting for 37 percent of corn production. The increased corn demand would attract more acreage to corn and raise corn prices. The area planted to corn would rise to over 92 million acres by 2016 under Scenario 1, compared with 90 million acres for baseline. The season-average, farm-level corn price is projected to increase to $3.61 per bushel by 2016, $0.31 above the baseline. On average over 2007-16, corn prices are projected to rise by 6.3 percent ($0.22 per bushel) above baseline levels. Under the higher corn demand Scenario 2, corn used in ethanol production rises to 7.2 billion bushels, 47 percent of corn production, and area planted to corn increases to 98.5 million acres. Under Scenario 2, corn prices increase to $3.95 per bushel by 2016 and by 15.7 percent ($0.54 per bushel) above baseline levels on average over 2007-16.

Increased demand for soybean oil used to produce biodiesel increases the demand for soybeans. At the same time, the increase in the availability of ethanol co-products (distillers' dried grains) due to increased ethanol production would displace some soybean meal in feed rations, which lowers the demand for soybeans. The net change in the demand for soybeans of these offsetting effects depends on the relative size of each separate shift in demand for the products. On balance, soybean prices would increase less than corn prices, and soybean acreage would decline relative to the baseline. On average, soybean prices increase by 3.9 percent ($0.27 per bushel) and 7.5 percent ($0.51 per bushel) above baseline levels over 2007-16 under Scenarios 1 and 2, respectively. Soybean planted area declines to 68.1 and 64.1 million acres, respectively, under Scenarios 1 and 2, by 2016, compared with 68.8 million in the baseline. Smaller acreage declines would occur for wheat, cotton, and rice as well.

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Higher corn and soybean prices reduce exports of these commodities below baseline levels. The quantity of corn exported declines by 4.8 percent and 12.0 percent, respectively, under Scenarios 1 and 2. Exports of soybeans decline by 2.8 and 5.3 percent under the corresponding scenarios. However, due to higher commodity prices, the value of total U.S. agricultural exports increases slightly under both scenarios.

Livestock and livestock product market effects. Overall, livestock production is reduced under both scenarios. However, impacts vary by livestock category because of the unique feeding requirements for each type of animal. Nonetheless, production impacts would be small. Cattle can best use ethanol feed co-products compared with other livestock categories. Poultry would benefit from lower priced soybean meal. However, hogs and dairy face higher feed cost increases. Consequently, under the higher corn demand Scenario 2, average annual dairy and pork production declines a respective 0.7 and 0.9 percent below baseline production levels over 2007-16. Poultry production would decline 0.2 percent, and annual beef production would be 0.6 percent higher. The higher feed costs and production declines would be transmitted to higher farm and retail prices. Hogs, milk, and broilers exhibit the largest farm price increases, with average price increases above the baseline of 5.4, 4.8, and 4.4 percent, respectively, over 2007-16 under Scenario 2. Retail prices for pork, dairy products, and poultry increase over the baseline by an average of 2.0, 1.4, and 1.9 percent annually during 2007-16 under Scenario 2. While higher meat and dairy prices would increase the Consumer Price Index (CPI) for all food, the increase is small. The CPI for all food increases by an annual average of 0.5 percent above the baseline during 2007-16 under Scenario 2. The highest projected annual increases are 0.8-1.0 percent and occur during 2014-16.

Income effects. Cash receipts from farm marketing of crops increase due to higher crop prices and higher crop demand under both scenarios. Crop cash receipts increase by an annual average of $3.2 and $7.7 billion above baseline levels, respectively, under Scenarios 1 and 2. Higher livestock prices cause livestock receipts to increase, on average, by $1.1 and $4.3 billion above baseline levels under the two scenarios. The increases in cash receipts outweigh increases in production expenses in both scenarios. Net farm income increases above baseline levels by an annual average of $2.6 billion during 2007-16 under Scenario 1, and by an average of $7.1 billion under Scenario 2.

Low yield effects. Generally tight stocks during the analysis period suggest that any production shortfalls, such as those caused by adverse weather, would heighten impacts under both scenarios until markets adjusted. A 10-percent reduction in corn yields was simulated to occur in 2012 to assess the corn price effects of a short crop. As a result of such a yield decline, corn prices rise in 2012 to $4.71 per bushel, $1.02 above the Scenario 1 level, and to $5.51 per bushel under Scenario 2, $1.46 above the Scenario 2 level.

Environmental effects. Regional analysis indicates that along with bringing new land into production, induced changes in crop rotations and tillage practices from increased corn production lead to increases in soil erosion and nutrient loading, particularly in the Corn Belt and Northern Plains, where adjustments are the greatest.

Regional livestock effects. Regional livestock sector analysis suggests no major shifts in livestock production with the advent of higher prices for corn and possibly other feeds driven by increased ethanol demand. The extensive infrastructure in place to support existing production, especially in vertically integrated industries, is a significant factor constraining regional shifts.

Cellulosic ethanol prospects. Cellulosic ethanol production effects were not considered in the analysis of Scenarios 1 and 2. While cellulosic-based ethanol production holds promise in the longer term, more research and development is needed to make the conversion process commercially widely viable. A number of factors will be important in determining which feedstocks will be used in producing cellulosic-based ethanol, including the ability to compete with existing agricultural commodities as well as the costs associated with producing, harvesting, transporting, handling, storing, and processing these various biomass materials. In the near term, agricultural and forest residues appear to be the most commercially viable feedstocks for cellulosic ethanol production. *

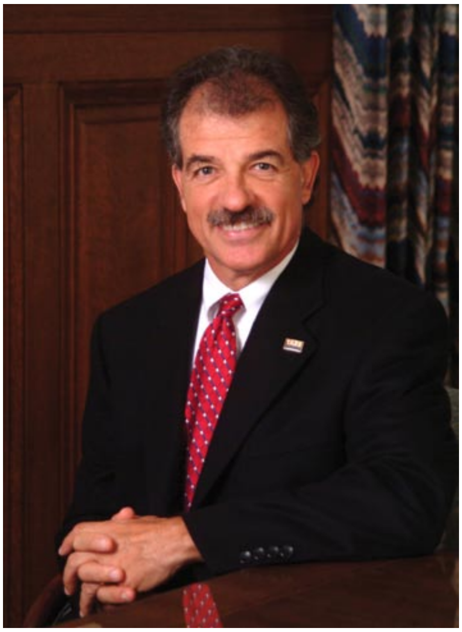
Excerpted from a report titled "An Analysis of the Effects of an Expansion in Biofuel Demand on U.S. Agriculture" conducted by the Economic Research Service and The Office of the Chief Economist, U.S. Department of Agriculture.

New Leadership in the Texas Agricultural Experiment Station


Dr. Mark Hussey

Dr. Mark Hussey was recently named as Director of the Texas Agricultural Experiment Station, after serving as Associate Director for TAES since April, 2005. In his current role Dr. Hussey is responsible for working with stakeholders, unit heads and faculty to monitor progress made by TAES to achieve the goals outlined in the Science Management Roadmap as well as unit and commodity specific strategic plans.

Dr. Hussey in a native of southern Illinois, where he received a Bachelor of Science degree in biology from the University of Illinois in 1977. He continued his education at Texas A&M University where he received the Master of Science and doctor of philosophy degrees in plant breeding in 1979 and 1983, respectively. Upon graduation, Dr. Hussey held an appointment as an Assistant Professor at the Texas A&M University System Agricultural Research and Extension Center at Weslaco where he conducted forage breeding and management research. He then joined the faculty at Texas A&M University as an Assistant Professor in 1985, where he was promoted in rank to serve as Professor in 1997. In 2001, Dr. Hussey was appointed Professor and Head of the Department of Soil and Crop Science, a position that he held until 2005.


Dr. Bill Dugas

As co-leader of a collaborative forage grass improvement team between the Texas Agricultural Experiment Station and the USDA-ARS, Dr. Hussey's research focused on the development of new breeding methods for subtropical forage grasses including the use of molecular tools to better understand the regulation and control of cold tolerance, hybrid vigor, seed production, and reproduction in those species.

In conjunction with this change in leadership, Dr. Bill Dugas was named as Deputy Director of TAES, and will report directly to Dr. Hussey supporting the TAES Director in the areas of strategic planning as it relates to communications, internal operations visibility, compliance with system, state, and federal regulations, assisting with fiscal assessments and projections, facilities and real estate, and TAES regulatory programs.

Dr. Dugas was formerly Associate Director for Operations for TAES, a position he has held since July, 2005. Before that, he was Professor and Resident Director at the TAES Blackland Research and Extension Center in Temple. He has a B.S. degree in climatology/meteorology from California State University – Chico, a M.S. degree from the University of Illinois, and a Ph.D. degree from Utah State University.

Dugas has authored over 140 scientific publications. He was a Visiting Scientist Fellow in Australia in 1985, a Guest Fellow of Royal Society, U.K. in 1991, a Visiting Scientist in New Zealand in 1997, and awarded the 1993 Texas A&M University Deputy Chancellor's Award in Excellence for Research.

Please join the Beaumont/Eagle Lake staff in welcoming Dr. Hussey and Dr. Dugas in their new roles of leadership for the Texas Agricultural Experiment Station. *

Email mhussey@tamu.edu and
w-dugas@tamu.edu

From the Editor continued...

Molecular Biology

Bob Fjellstrom (ARS) – Research focuses on the development of molecular markers that can be used to identify genes responsible for plant resistance and superior grain quality

Cereal Quality

Ming Chen (ARS) – Research focuses on determining the effect of varietal and environmental factors on grain quality

Plant Physiology and Nutrient Management

Lee Tarpley (TAES) – Research focuses on determining the role of plant hormones on ratoon crop performance and plant tolerance to high nighttime temperatures, and is currently serving as the project leader for the nutrient management program

Agronomy, Weed, and Water Management

Garry McCauley (TAES) – Research focuses on agronomic management on varietal performance, herbicide application timings, rates, and efficacy, and quantifying water savings from precision grading

Insect Management

Mo Way (TAES) – Research focuses on insect biology, ecology, and management

Agroecosystems Management

Yubin Yang (TAES) – Research focuses on estimating water savings and costs associated with the adoption of on-farm water conservation measures and post-harvest grain management

Ted Wilson (TAES/TAMU/TCE) – Research focuses on estimating water savings and costs associated with the adoption of on-farm water conservation measures, developing high yielding water efficient single crop varieties, and post-harvest grain management

Research Outreach

Jay Cockrell (TAES) – Outreach primarily focuses on working to produce Texas Rice.

Today's scientist not only conducts research, they must be good communicators to convince funding agencies that their research ideas should be funded, and they increasingly must be good business managers to insure their staff conduct quality research. This is not a job for the faint at heart. For many funding agencies, the success rate for people who submit research proposals is as low as 8-11%. Although state and industry groups fund a greater proportion of proposals, it still takes a tremendous amount of time and effort to obtain funding.

The following provides a summary of agencies that have funded our scientists so far this year, ranging from the development of molecular markers to identifying the presence of valuable genes, to agronomic and pest management, to the integration of management information into systems models, all of which are a vital and integral part of rice cropping systems management.

USDA CSREES Rice CAPS program - Anna McClung, Bob Fjellstrom, Shannon Pinson, Rodante Tabien – $122,632

US Rice Foundation - Shannon Pinson, Yulin Jai, James Gibbons - $32,000

Texas Rice Research Foundation - Rodante Tabien, Garry McCauley, Mike Chandler (College Station), Mo Way, Lee Tarpley, Anna McClung (USDA-ARS), Bill Park (College Station), Jay Cockrell, Dale Fritz (College Station), Jack Vawter - $393,223

National Science Foundation - Mapping the Gene Networks Controlling Nutrient Concentration in Rice Grain - David Salt (PI, Purdue), subcontract from Purdue to Shannon Pinson and Lee Tarpley - $902,000

USDA Risk Avoidance Mitigation Program - Ted Wilson, Yubin Yang, Frank Arthur and Jim Cambell (ARS, Manhattan, Kansas), Terry Siebenmorgen and Jean Meullenet (University of Arkansas), Tanja McKay (Arkansas State), Brian Adam (University of Oklahoma), Gene Reagan (Louisiana State University) - $612,199

Lower Colorado River Authority (LCRA)/San Antonio Water System (SAWS) - Ted Wilson, Dante Tabien, Jim Medley, Omar Samonte - $225,000

LCRA/SAWS - Ted Wilson, Yubin Yang - $144,385

Rice Tec, Inc. - Lee Tarpley - $26,000

Netafim - Ted Wilson, Jim Medley - $17,543

Texas Space Grant Consortium - Jenny Zhou, Yubin Yang - $10,000

Other Grants – Mo Way - $57,500

Other Grants – Garry McCauley - $52,300

Join me in congratulating our scientists for the outside funding they bring in to enhance our rice research efforts!

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

Farm Bill Web Site Developed

The 2007 Farm Bill will have enormous repercussions across the entire U.S. agricultural sector.

What impact will any policy changes have on crop and livestock agriculture, conservation, and energy?

How will the legislation influence trade policy conflicts and farm program payments?

What will the new bill mean for nutrition and food stamp programs?

A new Purdue University Web site covers topics that will be affected by the 2007 farm bill. “Our agricultural economics group felt it was useful to pull together as much information as possible to help inform the public, producers and agribusinesses as well as commodity groups, about the future farm bill,” says Mike Boehlje, Purdue extension ag economist.

The 2007 Farm Bill Issues and Analysis Web site was created to provide useful information for the debate and discussion of what the new farm bill should look like, says Boehlje. It’s located at http://www.agecon.purdue.edu/farmbill/.

The site contains an overview of USDA’s farm bill proposals for conservation, dairy, energy and commodities. There also are links to the Economic Research Service’s farm bill information and the Farm Service Agency.

The bill currently being debated will go into effect for the 2008 crop year. A finalized bill is expected to be submitted to the president by early fall. Purdue experts will continue adding to the Web site as new proposals are developed and the debate continues.

Rice Crop Update

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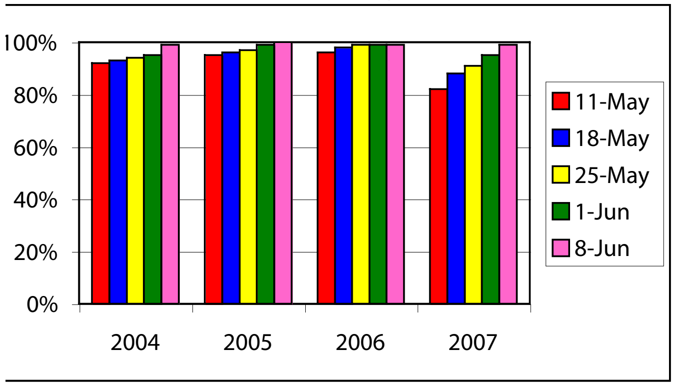

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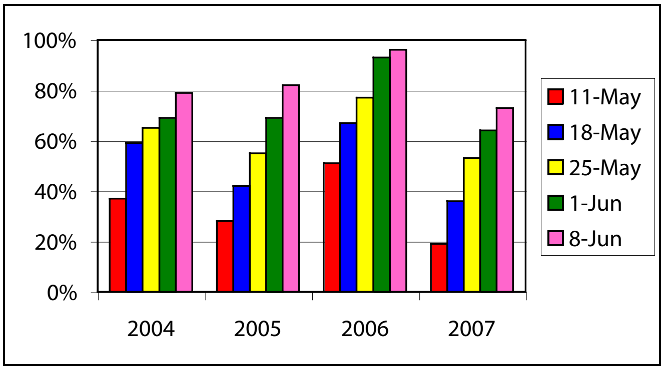

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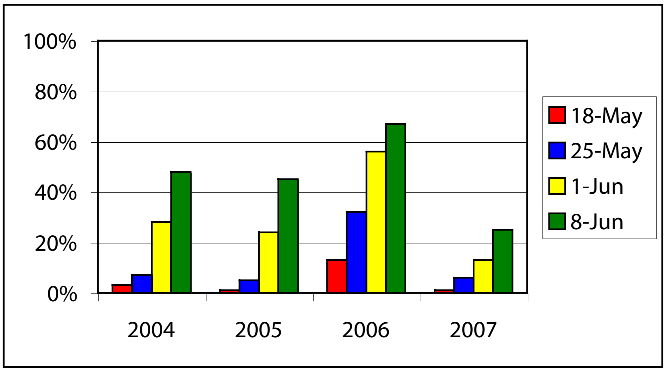

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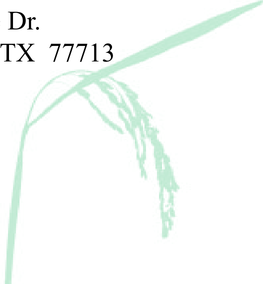

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