Texas Rice

Texas A&M University System
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Latest News on the Farm Bill

Agriculture Secretary, Mike Johanns, appears to be poised to break with tradition by becoming the first secretary in recent history to submit a farm bill to Congress. Whether the draft bill gets more than a cursory review remains to be seen.

Previous administrations have sent farm bill proposals, former Secretary Anne Veneman, Johanns' predecessor, sent a book to the House and Senate Agriculture Committees. But Johanns could be the first in some time to offer actual legislative language when those bodies start writing the new law in May.

USDA Agricultural Secretary Mike Johanns at one of many farm bill conferences.

Speaking at a farm bill conference held by Informa Economics in Washington, Johanns said he was responding to requests he received during some of the congressional briefings he's given on USDA's farm bill proposals.

"Not to throw names out, but at many of those we've been asked if we had an interest in offering legislative language," Johanns said. "It has prompted us to work on legislative language, and that's what I wanted to share with you today. I think it's a very positive and important step, and we literally are working title by title to finalize our proposals."

He said the administration's proposed language on three or four of the farm bill titles could be available within two weeks.

The chairmen of the House and Senate ag committees did not seem to be overjoyed at the prospects of legislation from USDA, although Sen. Tom Harkin, D-Iowa, said he would welcome the administration's input.

"I see nothing wrong with it," he said in a speech to the North American Agricultural Journalists Association. "I welcome it. I don't know that I'll agree with all of it, but if somebody wants to do the work for me, I'm all for it. My staff is busy enough."

Rep. Collin Peterson, the House ag committee chairman, said he wasn't aware of anyone requesting farm bill language from USDA. "No one on the (ag) committee has shown much interest in Secretary Johanns' farm bill that I'm aware of," he said. "And no one has expressed interest in introducing it."

Until the 1980s, it was not uncommon for USDA to take out a farm bill position, according to veteran farm bill observers.

"This seemed to stop during the Reagan administration, and this marks the first time that the USDA has actively re-entered directly into the policy setting position," said Abner Womack, director of the Food and Agricultural Policy Research Institute at the University of Missouri-Columbia.

"Normally they played the same role as FAPRI by providing analytics on likely outcomes of different options under consideration by the ag committees. But, like us, they never took a position on a particular option under consideration."

Observers said they believe John Block, agriculture secretary in the Reagan administration, may have been the last head of USDA to submit a farm bill. (The bill was introduced by Rep. Ed Madigan, R-Ill., who later became agriculture

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From the Editor...

Welcome to the latest edition of *Texas Rice*. The 2007 crop season is starting off very slow. Unseasonably cool weather, combined with continuing damp conditions, has greatly delayed plantings. Many of the fields that were planted early experienced poor germination and high seedling death. Many of these fields have had to be replanted due to low stand densities. The ability to replant in some areas has been a major problem with some varieties due to tight seed stocks caused by Cheniere and CL131 being pulled from the market as a result of contamination with Bayer's Liberty Linked genes.

Normally, when rainfall is limited, rice seeds remain dormant in the soil. However, once soil temperatures begin to rise, and if soil moisture is adequate, the seedlings quickly germinate and begin to grow rapidly. Under these conditions, the seedlings continually outgrow any minor injury caused by normally occurring soil pathogens.

However, when temperatures drop and soil moisture content is high, due to sporadically continuing rainfall, the rice seedlings' growth is slow. When temperatures are near or below 60˚F, growth is especially slow, plant respiration begins to deplete stored reserves, and the seedlings slowly weaken.

This problem can be exaggerated in soils with high clay contents, which restricts oxygen flow to the roots, further reducing seedling growth. Unfortunately, these same conditions favor seedling pathogen development, resulting in seedling death or severely stunting in a matter of days. Early season growth often sets the stage for future crop productivity. Weak seedlings often means low stand densities, which normally means reduced main and ratoon crop yields.

Last summer, experiments were initiated at the Beaumont Center to better determine how soil moisture affects seedling germination and early growth. Using sterilized soil, to reduce soil pathogen abundance, rice seeds were planted on pots containing 10 moisture treatments, ranging from 10% to 100% saturated moisture content in 10% increments. The experiment was replicated 4 times for each variety and repeated for a dozen odd varieties, from conventional inbreds to hybrids. The results were similar across the varieties, with the highest germination and seedling emergence occurring for the 40% to 60% soil moisture treatments. Seedling in the treatments with lesser or greater concentrations of soil moisture had lower seedling emergence rates and the seedlings grew more slowly.

In a later experiment, we plan to evaluate emergence and growth for different temperature conditions and possibly different seedling pathogen inoculum densities. We will provide more details of our results, when they become available, in a later issue of *Texas Rice*.

From the international pages, recent events in China bode poorly for confidence in U.S. food security. Adulterated pet food from China caused the death and/or serious illness of numerous pets across the U.S., showing how easy it is for someone who either wants to make a fast buck or wants to harm someone to contaminate the U.S. food chain. Recently, this problem has spilled over into the U.S. poultry and hog rearing industries.

In the case of the Chinese feed scandal, lethal concentrations of melamine and melamine related compounds, both of which are usually associated with the plastics industries, were added to animal feed, apparently in an attempt to make the feed appear to have a higher protein concentration. Because melamine contains nitrogen, and because tests for protein are based

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Inside This Issue

Cover Story:
Latest News on the Farm Bill

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.

Costs of Precision Leveling Rice Fields

Precision leveled fields require significantly less applied water than traditional contour levee fields. Precision leveling removes depressions in the field that hinder water movement and results in a reduction in the minimum depth of water required to cover the entire field. Water savings associated with precision leveling can range from 12 percent for straight levee fields without multiple inlet irrigation tubing to 60 percent for fields graded to a zero slope.

However, precision leveling is a land improvement and requires a capital cost to be paid upfront. The land owner must determine whether the work should be hired on a custom basis or preformed using owned soil-moving equipment. This article compares the costs of precision leveling using custom hire to costs of precision leveling using owned equipment at varying volumes of soil moved per acre. Data was obtained by phone interviews in 2006 from professional soil moving businesses, equipment dealers, and rice farmers in eastern Arkansas. (Editors note: Laser leveling costs vary with soil type, the amount of soil moved, and regional cost differences, so actual costs may differ from the values presented in this paper.)

Custom Hire Versus Owned Equipment

The unit of payment for custom hire in eastern Arkansas can vary by hour or by cubic yard depending on the amount of soil moved per acre. If the per acre amount of soil moved is small (100 cubic yards or less), the custom work is usually charged on an hourly basis and ranges from $125 to $150 per hour. If large amounts of soil are moved per acre (greater than 100 cubic yards), the custom work is usually charged by cubic yard and ranges from $1.15 - $1.25 per cubic yard. Other circumstances such as total volume of soil moved and distance soil is moved will influence the payment method selected by the business.

The charge per cubic yard of precision leveling may be reduced if owned equipment and on-farm labor are used in place of custom hire. Table 1 presents a description of the equipment needed for on-farm precision leveling and the cost per hour and per cubic yard associated with each piece of equipment assuming 300 cubic yards of soil per acre are moved on 200 acres of land per year. Fuel costs were calculated using a farm diesel price of $2.20 per gallon, and labor costs were calculated assuming a labor wage of $10 per hour. For

Table 1. Description of On-Farm Precision Leveling Setup

Item	Purchase Price ($)	Useful Life (years)	Annual Use (Hours)	Cost per Hour ($)	Cost per Cubic Yard($)[z]
			Single Pan		
4wd 400 Hp Tractor	183,000	10	1,000	97.25	0.68
Scraper – 18yd	60,000	15	417[y]	22.36	0.16
Laser Equipment	25,600	10	417	9.85	0.07
Total, Single Scraper	268,600			129.47	0.90
			Dual Pans		
4wd 400 Hp Tractor	183,000	10	1,000	97.25	0.45
Scraper – 18yd	60,000	15	278[y]	33.54	0.16
Scraper – 18yd	60,000	15	278	33.54	0.16
Laser Equipment	27,600	10	278	15.93	0.07
Total, Dual Scrapers	330,600			180.28	0.83

[z] Estimated volume of soil moved per hour for single pan setup is based on 8 cycles per hour with an 18-yard pan (144 cubic-yards per hour with 1 pan). Estimated volume of soil moved per hour for dual pan setup is based on 6 cycles per hour with two 18-yard pans (216 cubic-yards per hour with 2 pans).

[y] Number of annual hours required to move 300 cubic yards of soil per acre on 200 acres using either single pan equipment or dual pan equipment.

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this particular example, the total cost per unit of soil moved using owned equipment and on-farm labor ranges from $0.83 per cubic yard, if two dirt pans are used, to $0.90 per cubic yard if one dirt pan is used. Both cost estimates are lower than the custom charges of $1.15 to $1.25 per cubic yard, reported above for eastern Arkansas.

Table 2. Estimated Costs of Precision Leveling using On-Farm Equipment for Given Volumes of Soil Moved.

	Single Pan, Owned		Dual Pans, Owned	
Volume of Soil Moved (cubic yards per acre)	Cost Per Hour ($)[z]	Cost Per Cubic Yard ($)[y]	Cost Per Hour ($)[y]	Cost Per Cubic Yard ($)[y]
75	226.12	1.57	429.34	1.99
100	193.90	1.35	346.32	1.60
200	145.58	1.01	221.79	1.03
300	129.47	0.90	180.28	0.83
400	121.41	0.84	159.52	0.74
500	126.58	0.81	147.07	0.68
600	123.36	0.79	148.76	0.64
700	121.06	0.77	142.83	0.61
800	109.33	0.76	128.39	0.59
900	107.99	0.75	124.93	0.58
1000	106.92	0.74	122.16	0.57

[z] Costs per hour calculated based on 200 leveled acres per year.
[y] Estimated volume of soil moved per hour for single pan setup is based on 8 cycles per hour with an 18-yard pan (144 cubic-yards per hour with 1 pan). Estimated volume of soil moved per hour for dual pan setup is based on 6 cycles per hour with two 18-yard pans (216 cubic-yards per hour with 2 pans).

Estimated costs of precision leveling using on-farm equipment are presented for selected volumes of soil moved in Table 2. These data demonstrate how the amount of soil moved might impact the choice of leveling option used. Custom hire is more attractive when the volume of soil moved is 100 cubic yards per acre or less. At these volumes, the cost per cubic yard of soil moved for custom hire is lower than that for either the single pan setup or the dual pan setup. Owned equipment becomes more attractive at volumes greater than 100 cubic yards per acre. The choice of single or dual pan setup also is impacted by the amount of soil moved. The single pan setup produces the lowest cost per volume of soil moved at volumes less than or equal to 200 cubic yards per acre. Beyond 200 cubic yards per acre, the dual pan setup results in the lowest cost per cubic yard moved.

Table 3 presents the estimated per acre costs of precision leveling for selected volumes of soil moved using either owned equipment or custom hire. The charges reported in Table 3 include a $10 per acre charge for obtaining a cut sheet of the field prior to land leveling. A cut sheet provides a topographic layout of the “cut” and “fill” areas of the field and provides an estimate of the total cubic yards of soil to be moved to achieve the desired grade. A charge of $46.45 per acre is also included to ac-

Table 3. Estimated Costs of Precision Leveling Per Acre at Selected Volumes of Soil Moved with On-Farm Equipment and Custom Hiring.

	Leveling Options [z]		
Volume of Soil Moved (cubic yards per acre)	Single Pan, Owned Cost ($)/ac	Dual Pans, Owned Cost ($)/ac	Custom Hired Cost ($)/ac
75	174	206	143
100	191	217	171
200	259	262	286
300	326	307	401
400	394	352	516
500	461	397	631
600	529	442	746
700	596	487	861
800	664	532	976
900	731	577	1,091
1000	799	622	1,206

[z] Custom hired precision leveling charge = $1.15 per cubic yard. Additional charges of $10 per acre for obtaining a cut sheet of the field and $46.45 per acre for applying one ton of loose raw broiler litter as a soil amendment are included in the total costs. Excluded from total costs are charges for ripping (subsoiling) prior to land leveling, which may be necessary if soil compaction or hardness prevents efficient scraper operation. Ripping would increase cost figures by an additional $12 per acre.

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Precision Leveling continued...

Tripod that carries the beam to the tractor used for laser leveling fields.

count for the cost of applying one ton of loose raw broiler litter as a soil amendment (Young et al., 2006). Excluded from the total cost figures reported in Table 3, are charges for ripping (subsoiling). Ripping might be necessary for some fields if soil compaction or hardness prevents efficient scraper operations. Such conditions might prevail if land leveling is conducted during a dry period prior to a rain. An additional charge of $12 per acre would be added to the total cost figures in Table 3 to account for ripping.

The per acre cost of precision leveling increases as the number of cubic yards of soil moved per acre increases. Custom hire is less costly than owned equipment at volumes less than or equal to 100 cubic yards per acre. Beyond 100 cubic yards, land leveling costs are lower when the work is performed using owned equipment. Greater efficiencies may also be achieved for large volumes of soil moved per acre using two dirt pans opposed to one, as exhibited by lower per acre costs for dual pan compared with single pan equipment when 300 or more cubic yards of soil are moved per acre. *

Article by K. Bradley Watkins, Jason L. Hill, and Merle M. Anders, University of Arkansas Rice Research & Extension Center. For more information call (870) 673-2661 or email kbwatki@uark.edu

Impact of Agriculture in Texas

- Texas is the second-largest agricultural state in the United States, accounting for about 7 percent of the total U.S. agricultural income.
- The food, horticulture and fiber industry is the second-largest industry in the state and generates $73 billion a year for the economy, or approximately 9.5 percent of the state's total gross state product.
- Eighty percent of the land in Texas is in some form of agricultural production.
- Ninety-two percent of Texas' agricultural operations are still run by individuals or families
- Agriculture employs one out of every seven working Texans.
- Texas ranks first in the nation in the number of cattle and calves, accounting for 14 percent of the U.S. total. Texas also ranks first in the number of cattle operations and the value of all cattle and calves.
- Texas is the top producer of cotton, hay, sheep, wool, goats, mohair and horses. The state's top crops also include vegetables, citrus, corn, wheat, peanuts, pecans, sorghum and rice.
- Texas is one of the leading exporters of agricultural commodities. Texas' top agricultural exports are live animals and meat, cotton and cottonseed, feed grains and products, hides and skins, wheat and products, and feeds and fodder.
- Each Texas farmer grows enough food and fiber for 129 people in the United States and abroad.
- The Texas Department of Agriculture's Family Land Heritage Program has recognized more than 4,200 farms and ranches in 232 counties for being maintained in continuous agricultural operation by the same family for 100 years or more.

From the Texas Department of Agriculture. For more information go to www.agr.state.tx.us secretary during the George H.W. Bush administration.)

In his speech to the Informa Economics group, Johanns said he has been "enormously encouraged" by the response he and other USDA officials have received to its farm bill proposals, which were developed following a series of farm bill forums in 2005.

"In the last two months since our rollout, I testified three times before congressional committees," he said. "Chuck Conner, our deputy at the USDA, along with senior officials at the department had testified six more times. That's a far cry from anyone saying dead on arrival."

Johanns, Conner and other staff members have also delivered 22 informal briefings on the administration proposals to members of Congress and their staffs, according to the secretary.

"This is the kind of thing you're not going to read about in your favorite ag publication," he noted. "But there's enough interest where we keep getting invited back over and over again to talk to staff or members on the Hill."

Noting the conference title (2007 Farm Bill: Policy Evolution or Revolution?), Johanns said he felt the former might be the more appropriate description because he and his staff have been working on the new farm bill for more than two years.

During a question-and-answer session following his speech, he went through what has become a litany on the number of farm bill forums (52) conducted by USDA and him personally (21). He said he was pleasantly surprised at the audiences the forums attracted, ranging to as high as 1,600 persons in some locations.

Following the forums, USDA published a series of summaries dealing with different topics covered in those venues. The papers became the basis for USDA's farm bill proposals, which Johanns announced on Jan. 31.

"I think in the end, our proposals just result in a better farm bill, a farm bill that's going to operate better for farmers while putting money into focused areas," he said. "We heard out there that farmers and stakeholders wanted us to invest.

"Because of new commitments like these, our farm bill proposals would actually deliver about $5 billion more in supporting producers than they would have received if the 2002 farm bill were simply reauthorized."

That same package of proposals will also save $10 billion in terms of spending in the 2002 law versus spending in USDA's version of the post-2007 farm programs. The savings would fit with the president's plan to balance the budget and eliminate the deficit by 2012," he said.

While some members have criticized Johanns' accounting, the secretary took a swipe at the reserve funds created to increase the farm spending baselines in both the House and Senate budget resolutions. The House reserve fund is set at $20 billion and the Senate's at $15 billion.

"Now, reserve funds have been used to a limited extent in the past, but in most cases, they were funds that were actually set aside," he said. "This year nearly 50 reserve funds have been created by House and Senate budget resolutions, including funds for veterans health care, middle income tax relief and a host of other important needs."

Johanns said the administration farm bill will also provide increased funding for renewable energy, conservation specialty crops, market access and research programs. "We do so in a manner that fits within the plan to balance the budget within five years."

But Johanns' plans for those areas may hit tough sledding when his legislative language hits the Senate Agriculture Committee. Harkin has been critical of both the administration's farm bill and budget provisions.

"I was disappointed that the proposal fails to remedy the budget damage to the Conservation Security Program since the 2002 farm bill," he said, following Johanns' announcement of the proposals. "It does not restore CSP to a nationwide program so every producer at least has an opportunity to apply.

"On energy, the proposal is not enough to meet the ambitious goals the president laid out in his State of the Union speech for increasing production of alternative and renewable fuels. While I support the rhetoric, I do not see adequate resources dedicated to backing it up." *

Article by Forrest Laws, Delta Farm Press,
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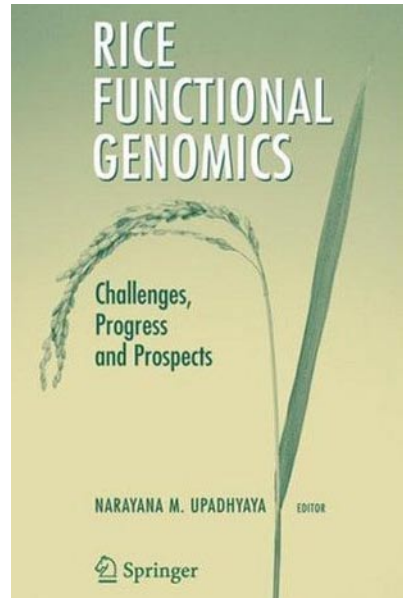
Rice Functional Genomics



Rice is an important crop to Texas, and also the world. Texas rice researchers work to benefit rice production in Texas, and also work with rice researchers around the world to mutually benefit rice production around the world. Rice research has advantages over that of other crops, first, because rice is the staple crop for much of the world's population, and second, due to its use as a "model crop" for plant biology research. The "cutting edge" aspects of rice research are the best of any crop, and we are starting to see success stories translating these findings into application in improvement of rice production. The intensity of much of this modern rice research is such that it is only through international cooperation between scientists that we can expect applications to come to fruition.

We are experiencing exciting times in rice research as we strengthen the chain of connections between genomics and agronomy. The branch of rice research that seeks to build from the sequence of rice genes into understanding the regulation of metabolism and cellular responses to the environment is known as rice functional genomics. Rice biology research that seeks to build from rice plant physiology to regulation of metabolism and cellular response to environment is known as rice cellular systems biology.

Rice functional genomics research provides applied benefits that do not require an understanding of cellular systems biology. Sometimes a project will start with an application in rice research and will then study it in such depth that it reaches into functional genomics. Such studies are identifying new approaches to rice improvement and management. Other studies are conducted in rice functional genomics and have uncovered new patterns of regulation of gene expression. These provide indirect benefits by accelerating our ability as an international community of rice scientists to develop success stories in improving rice production.

The forthcoming book, "Rice Functional Genomics. Challenges, Progress and Prospects", edited by Narayana Upadhyaya, Commonwealth Scientific and Industrial Research Organisation, Australia, and published by Springer, is for researchers in plant genomics and rice plant biology, but it also provides a glimpse into international research in rice functional genomics. The 98 contributors to the book are from 13 countries, and four continents. Many chapters have authors from multiple countries. Exciting is the number of applications for improving rice production that have resulted from the research. A few of these are discussed below as a way of demonstrating the march of rice functional genomics toward increasing application.

Shoshi Kikuchi (Japan), Guo-Liang Wang (Ohio State University), and Lei Li (Yale University), in their chapter "Genome-Wide RNA Expression Profiling" describe a procedure called Robust Long-Serial Analysis of Gene Expression, which is being used to quantify the expression of thousands of genes in rice plant tissues (transcriptomics) exposed to the rice blast disease. Rice blast is one of the major rice diseases of the world. By using this sophisticated and systematic genomics approach, the research will identify means to develop rice varieties with resistance to this disease. The authors also discuss the use of an approach called MPSS (Massively Parallel Signature Sequencing) to systematically identify the genetic response of rice to various environmental stresses.

Kikuchi et al. also describe the use of Genome Tiling Microarrays, which consist of a huge collection of genetic "probes" to determine if the genes lying next to each other on a chromosome are regulated together. The answer is a dramatic "Yes." There are huge portions of a chromosome that are less active in terms of gene expression under normal growing conditions, but become relatively activated when the rice is grown under mineral nutrient stress. The possibility of a common regulator of many hundreds or thousands of genes provides new understanding of rice response to mineral induced nutrient stress.

Setsuko Komatsu (Japan) in the chapter "Rice Proteomics: A Step toward Functional Analysis of the Rice Genome", describes procedures to examine the biochemical response of rice plants to various environmental conditions. By identifying the proteins in rice tissues, Dr. Komatsu can identify coordinated biochemical responses. The enhanced understanding of the biology can lead to an increased ability to

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identify crop management tools and genetic improvement schemes. Dr. Komatsu has greatly assisted this process through the selection of key agronomic and physiological conditions for study, for example the rice "proteomic" response to seedling chilling (< 52°F to just above freezing) and response to salinity, both of which are of importance at times in Texas rice production. In addition, Dr. Komatsu examines the response to gibberellic acid (GA) application. GA is one of the most common plant growth regulators used in U.S. rice production, with application to the seed to enhance germination and pre-emergence vigor, sometimes the 2-leaf stage to enhance seedling vigor and accelerate canopy closure, and during main crop grain filling to enhance ratoon tiller vigor and ratoon yield.

Lee Tarpley (Texas A&M University System) and Ute Roessner (University of Melbourne, Australia) in their chapter "Metabolomics: Enabling Systems-Level Phenotyping in Rice Functional Genomics" discuss the role of metabolomics, which is the comprehensive measurement of the metabolites in rice tissue. Metabolomics connects the gene expression results to the biochemical phenotype, so it works with transcriptomics and proteomics to describe what is happening biologically inside the rice tissues as it relates to the genetic sequence information. By going into this much detail, researchers can study the effects of environment, plant development, and the genetics to predict rice response to genetic changes in a way that was not possible before. These integrated functional genomic approaches are quickly proving to be a powerful way of characterizing difficult situations, such as silent phenotypes, where two genotypes that appear identical to one another under most conditions, but one exhibits enhanced tolerance when exposed to specific environmental stresses. Information such as this can efficiently lead to new marker-assisted breeding strategies for enhanced stress tolerance.

Drs. Tarpley and Roessner provide an example of a study to biochemically profile early stages of seedling tillering in rice. Seedling tillering is a critical stage in rice development, which can greatly affect yield. The study developed tools to identify specific responses of tillering to environmental stresses, which enables the design of new crop management and genetic strategies to counter environmental stresses. An example is also provided where a mapping population is used to develop QTLs (molecular markers) for metabolite and whole-plant traits simultaneously.

The chapter "Informatics Resources for Rice Functional Genomics" by Baltazar Antonio (Japan), C. Robin Buell (The Institute for Genetic Research, Maryland), Yukiko Yamazaki (Japan), Immanuel Yap (Cornell University), Christophe Perin (France) and Richard Bruskiewich (Philippines), describes a number of databases developed to organize and provide access to the huge amount of rice functional genomic information, and also describes efforts to connect all these databases so that they can be used throughout the world as if they were a single site. Among many examples, the chapter discusses programs in a number of countries that have developed methods to take advantage of natural ways of mutating rice plants and have built large databases describing the phenotypes that result alongside the gene sequence information that is associated with the particular changes. These programs are opening the door to new levels of sophistication in marker-assisted breeding. An example is provided where seed quality information including starch, amylose, fat, protein contents and gel consistency is systematically related to sequence information.

Takashi Matsumoto (Japan), Rod Wing (University of Arizona), Bin Han (China), and Takuji Sasaki (Japan) discuss the "Rice Genome Sequence: The Foundation for Understanding the Genetic Systems." One example of the utility of such research is the use of sequence information to identify sequence sites that are prone to vary among varieties, thereby greatly increasing the availability of molecular markers. Furthermore, the rice map is useful for other related cereal crops. A large amount of sequence information is common across plant species and can be used as a foundation to develop information relating sequence data to phenotype expression in these species.

The examples described above represent only a small portion of the "Rice Functional Genomics. Challenges, Progress and Prospects" book and the research it presents, but illustrate that the international, multidisciplinary efforts in rice functional genomics, while replete with esoteric technologies, is also growing exponentially with respect to applicability for improving world-wide and Texas rice production. *

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Description of the USDA Rice Germplasm Collection with Core Strategy

A valuable core collection that is a subset of the USDA rice germplasm collection should capture most of the variation present in the whole collection (Fig. 1), while allowing for more efficient evaluation and management due to it's smaller size.

The USDA rice core subset, assembled by stratified random sampling, consists of 1,790 entries from 114 countries and represents approximately 10% of the 18,412 accessions in the USDA rice collection.

Since 2002, a joint effort contributed from federal and state scientists has been applied to phenotype this core collection (Fig. 2). Data obtained from the USDA germplasm system at http://www.ars-grin.gov for the whole collection and from the 2002 evaluation of the core collection subset were studied for their relationship. Comparative analysis of frequency distributions for 14 descriptors demonstrated that the core was highly correlated with the whole ($r = 0.94$, $P < 0.0001$).

Fig. 2. Evaluation of the USDA rice core subset for agronomic characteristics in Stuttgart, Arkansas in 2002.

Thus, information from the core could be effectively used to assess the whole collection with 88% certainty. Correlation coefficients between the core and the whole for eight descriptors were ≥ 0.90, indicating that the core was highly representative of the whole. Correlation coefficients for the other six descriptors were lower (0.65 - 0.88), but still significant.

These results demonstrate that the core subset is representative of the diversity of the USDA rice collection based on the 14 descriptors. Phenotypic descriptors that are difficult or costly to measure can be evaluated using the core subset to reveal the diversity in the whole collection as well as identify accessions and regions of the world that offer unique phenotypes that can be explored in greater detail.

In addition, molecular tools that could be cost prohibitive, if used on the whole collection, can be used on a core subset to provide one assessment of the allelic diversity and genetic substructure of the collection. It is expected that this analysis will lead to a greater utilization of diverse germplasm in the collection for genetic studies, gene discovery, and breeding purposes. *

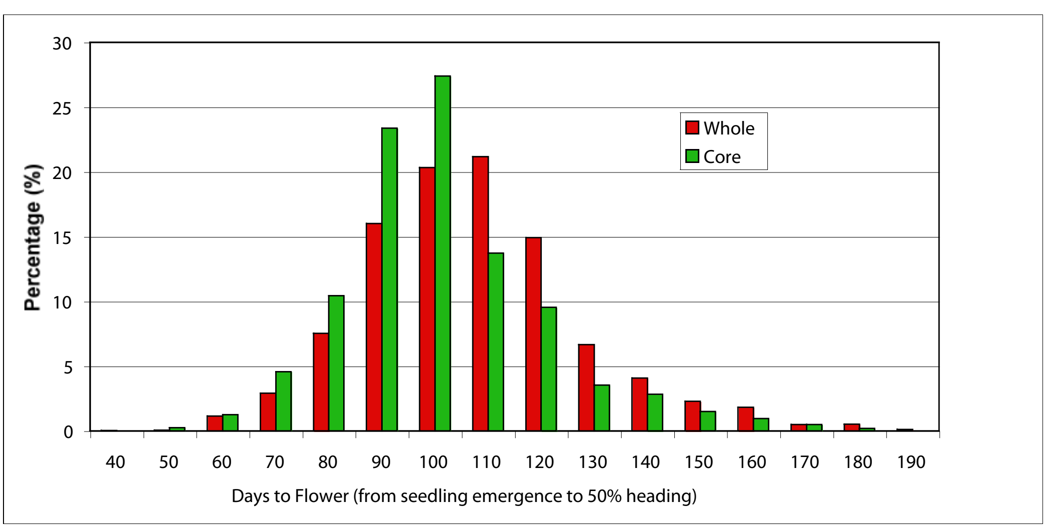
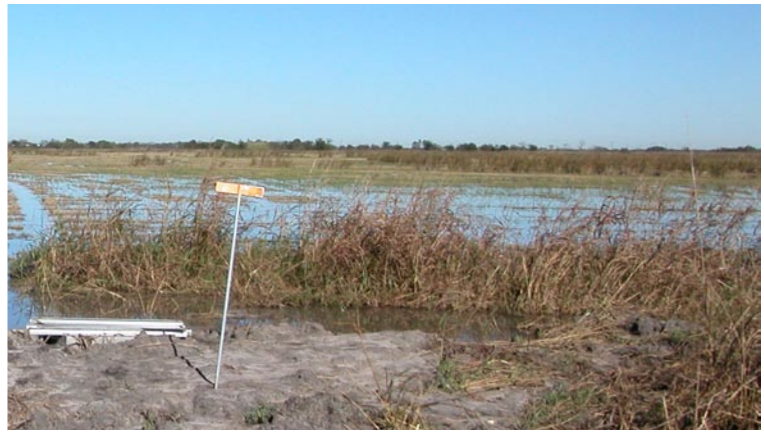


Fig. 1. Comparative distributions of frequency (%) for days to 50% flowering among 15,097 accessions in the USDA rice whole collection (Whole) and 1,668 entries in the rice core subset (Core).

Article by Wengui Yan, email WYAN@spa.ars.usda.gov
To read about the study in more detail go to http://crop.scijournals.org/cgi/reprint/47/2/869

Conservation Component of the Farm Bill

The major pressures on USDA's conservation program have been twofold. First, conservation groups, urban citizens, and others believe that a higher proportion of the budget might better be spent on conservation (working lands or CRP type reserves) than on commodity programs. Second, farmers have complained not only about a lack of resources for particular conservation programs (both matching funds and technical assistance) but also about the complexity of the current programs. The Administration's proposal attempts to address both of these concerns.



Above: Land under the supervision of Bill Stransky, Director of Texas Rice Industry Coalition for the Environment. This parcel was removed from production under the conservation program. Below: An adjacent piece of land that was not entered into the program.

1. Consolidate existing related programs—simplify, reduce redundancies, and produce more cost effective environmental benefits. Create a Regional Water Enhancement Program. Increase the budget of the expanded EQIP program ($4.25 billion over 10 years).

2. Modify the Conservation Security program to emphasize higher levels of conservation practices. (Baseline budget $8 billion increased to $8.5 billion for 10 years.) Expand enrollment to 96.5 million acres from 15.5 million. CSP has also been simplified in the USDA proposal by moving from four types of payments to just enhancement payments while reducing the number of tiers from three to two.

3. Combine the three existing easement programs for working lands into one (add $900 million over the 10 year period to existing commitments).

4. Reauthorize the Conservation Reserve Program (CRP), and continue to target sensitive lands. Give priority within whole field enrollment for lands for biomass for energy.

5. Reauthorize Wetlands Reserve Program (WRP), and consolidate with the floodplain easements program of the Emergency Watershed Program. Increase total acreage to 3.5 million acres. (Baseline funding was $445 million constrained by the acreage cap. An additional $2.125 billion over 10 years is proposed though baseline funding after 2008 was zero.)

6. Broaden the conservation compliance provision with "sod saver." Rangeland and native grassland not previously in crop production converted to crop production would be permanently ineligible for all USDA program benefits (except crop insurance).

7. Enhance access to conservation programs for beginning and socially disadvantaged producers with a 10% set aside for all conservation programs.

8. Encourage new private sector environmental markets to supplement existing conservation programs ($50 million over 10 years).

9. Repeal the regional equity provision (Section 1241(d) of the 1985 and 2002 Farm Bills). This will increase conservation program allocations to meritorious program areas and increase cost effectiveness of programs.

10. Consolidate existing emergency response programs EWP and Emergency Conservation Program (ECP) into one Emergency Landscape Restoration Program.

Within the Commodity Title of the Farm Bill are several proposals that relate to conservation objectives.

1. Reduce or eliminate crop bases when a farm or portion of a farm is sold for non-agricultural uses. This might stem some farmland conversion.

2. Offer farmers a "Conservation Enhanced Pay-

ment Option", allowing them to receive an enhanced guaranteed direct payment if they agree to meet certain conservation requirements and forego marketing assistance loan program benefits and certain counter-cyclical program payments ($50 million over 10 years). This is seen as a WTO legal green box payment.

The Administration's suggestions for the Conservation Title increase the dollar resources for conservation programs, attempt to simplify and consolidate programs, and also extend the reach of the Conservation Security Program. The key political and budgetary question is whether the increased funding for the conservation programs will represent funds diverted from the commodity programs. Within the Conservation Title, there may be competition among proponents of CSP (stewardship programs), EQIP (working lands programs), and CRP/WRP (land retirement programs). Also important is the desire by livestock producers and producers of non-program commodities or specialty crops to be able to tap into higher levels of assistance for conservation on working lands.

The standard and status of conservation compliance (the basic responsibility of the farmer for stewardship to allow participation in any USDA farm program) is an important issue. The original level of conservation compliance set out in the 1985 Farm Bill has been gradually diminished. The administration is attempting to at least halt this decline in required standards with the "sod saver" requirement (item 6 above). Environmental groups would like to see the withdrawal of crop insurance as well from such land.

An important part of the proposal to give financial support to encourage market based approaches to conservation (item 8 above) is the request for USDA to have the authority to rank applications for conservation programs based on competitive bidding and consideration of an applicant's willingness to increase their share of contributed funding (cost sharing). USDA previously was able to target payments in this way until Congress disallowed such practices in the 2002 Farm Bill to spread conservation payments more broadly. Ranking and competitive bidding are essential for targeting to increase the cost effectiveness conservation programs.

How incentives are structured for farm participation in conservation programs is critically important. Another concern is the trade-off between spending money on incentives versus increased technical assistance. These two issues, especially technical assistance, have been considered by Congress in the past, but the considerations have been largely administrative. *

Article by Otto Doering, Department of Agricultural Economics, Purdue University

Reaching Out to Future Scientist

Recently, the Beaumont USDA-ARS Rice Research Unit and Texas Ag. Experiment Station jointly hosted 70 students, teachers, and adult chaperones participating in the Future Scientists-Student Outreach Initiative (FSSOI) directed by Dr. Craig Wilson. These students came from 10 different schools. One group traveled 100 miles to attend. The teachers' first visit was in July 1006, hosted in conjunction with the Beaumont Annual Rice Field Day. The teachers were provided with curriculum and digital microscopes for use in their classrooms to conduct investigative research.

Students and Teachers reconvened with Dr. Craig Wilson in Beaumont on May 1 to present their research results using posters and PowerPoint presentations. They also took tours of the research facility. The FSSOI provided unique opportunity to divert from the more traditional textbook learning process of classroom science, to allowing students to experience the thrill of developing and answering through research their own, novel scientific questions.

The photo below captures the Beaumont Center Director, Dr. Ted Wilson, speaking about the history of rice in Texas, and the value of our research in helping the farmers, and the state economy. *

Editor continued...

on nitrogen content, the Chinese pet food appears to be of high quality, at least until animals began to show up dead and ill.

Thank goodness we were not dealing with an intentional terrorist-caused human food contamination. Alexei Barrionuevo, in a recent New York Times article, stated imports into the U.S. have increased by 400% over the past decade. This, combined with inspection of import shipments that are sampled prior to their release at U.S. ports now being less than 2% of shipments, means food shipments are a weakness in U.S. biosecurity.

A partial solution to this problem is right in front of our faces. By maintaining a strong food production infrastructure, the U.S. can avoid becoming dependent on other countries for our food and animal feed. Only time will tell whether we can avoid following down the same road taken with foreign energy dependency.

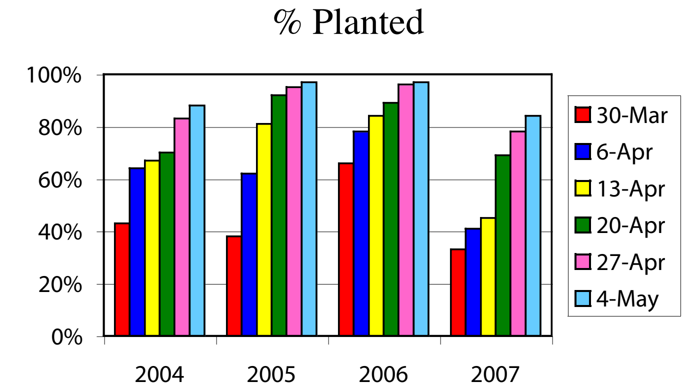
Please keep on sending us your comments and suggestions.

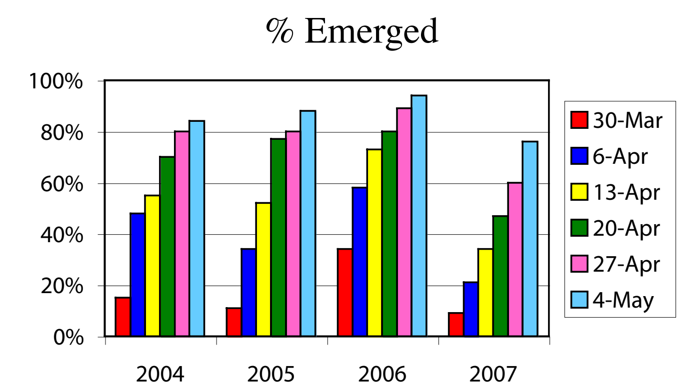
Sincerely,

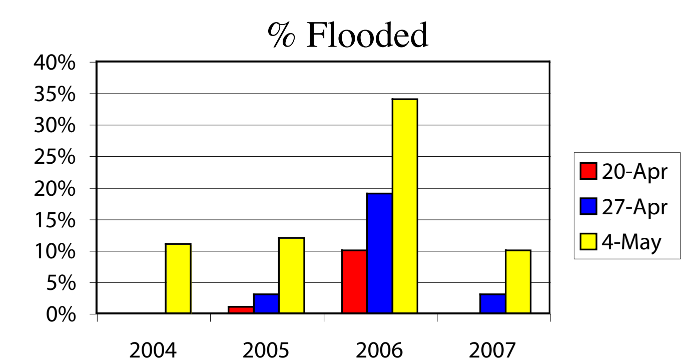
L. T. Wilson

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

Rice Crop Update







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