Texas Rice

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The Indica Revolution: Improving Tropical Germplasm for the U.S.

Indica mutant 4484-1693 in 2006 Arkansas Disease Monitoring Program field.

Three fourths of the world grows indica, or tropical rice, while the U.S. grows japonica, or temperate rice, either temperate japonica as in California or tropical japonica as in the southern U.S. Although indicas are high yielding and have superior disease resistance packages, almost no indicas are grown in the U.S. because of cold susceptibility, delayed maturity, and grain quality that is not satisfactory for U.S. markets. However these reasons are starting to fall by the wayside, with the identification of earlier maturing germplasm which will mature in the U.S., and the development in several Asian programs of rice with grain quality very close to U.S. long grains. Therefore, a decade ago, J. Neil Rutger, retired Chief Scientist at the Bumpers Center, contributed to the change by initiating a base-broadening program to develop improved indica germplasm adapted to the U.S.

By the mid-1990s exciting yield increases had been observed in some early maturing indicas from China. For example in Arkansas three Chinese indica varieties yielded 23% more, in 11 days less, than three leading tropical japonica varieties. However, high amylose content of about 25%, and low head rice yields of 40 to 50%, rendered these sources unsuitable for U.S. markets. Therefore Rutger crossed the very early maturing germplasm from China with late maturing but high grain quality rice germplasm provided by Dr.. Gurdev S. Khush of the International Rice Research Institute (IRRI) in the Philippines. Although the IRRI indicas were about a month too late for the U.S., they had intermediate amylose of about 21% and reasonably high head rice yields. Intensive selection for recombinants possessing early maturity from a Chinese germplasm parent and suitable grain quality from six IRRI germplasms, resulted in the 2005 release of nine improved germplasms, named indica-1 to indica-9. Although comparable in maturity, grain dimensions, and amylose contents, these first nine lines had weaker straw and lower head rice yields than desired.

Since the IRRI lines had very good grain quality attributes, which were masked by their late maturity, induced mutation was used to produce earlier maturity germplasm in the IRRI background. Early flowering mutant germplasms, indica-10 to indica-13, were released in 2004. These mutants are 19 to 30 days earlier than their respective late maturing indica parents, are only 7 to 9 days later than the prominent japonica check cultivar Francis, yield 83 to 96% of the check, have grain shape and amylose contents similar to US long grain cultivars, and, very importantly, have competitive head rice yields. This marks the first time that high milling yield indicas have been available in the US.

Two additional early maturity mutants, indica-14 and indica-15, from two other IRRI lines, were released in 2006. Indica-14 and indica-15 are 23 and 11 days earlier than their respective indica parents, and are 9 and 21 days later than the japonica check Francis. Grain shape and amylose contents are similar to U.S. long grain varieties.

Still more early flowering mu-

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From the Editor...

Welcome again to *Texas Rice*. This issue marks the beginning of our sixth year of production. During this period we have strived to make *Texas Rice* the best rice newsletter in the U.S. We hope to continue to bring you new research findings and national and international news affecting rice. Our goal is to deliver information to producers, scientists, students, and policy makers to help them make informed decisions about the production and management of rice.

Texas Rice has grown since its inception, with approximately 3,500 hard copies mailed and 40,000 electronic copies downloaded from our website every year. The number of electronic copies circulating around the world-wide-web is even greater because other web sites also distribute *Texas Rice*. I hope the information we provide has a positive impact.

One of the most important topics affecting the U.S. rice industry this past year, and possibly for years to come, was the discovery of an unapproved transgene in commercial rice. The U.S. and international rice industry was informed by the USDA on August 16, 2006, that non-rice genes had been found in rice produced in 2005, and stored in facilities in Arkansas and Missouri. The contaminated rice contained genes that are the property of Bayer CropScience LP, and had been inserted into rice as part of Bayer's plan to develop rice that could be treated with the Liberty herbicide to control weeds without damaging the rice.

As is often stated in marketing and sales, timing is everything. The timing of this contamination could not have been worse for rice. While rice is certainly not the first commercial crop to have a transgene inserted into it, it is the first commercial human food crop that is widely produced to have an unapproved transgene. Being the first food crop out of the transgenic gate, so-to-speak, turned out to be a large problem for many of our international trading partners. The European Union, in particular, does not embrace this technology with open arms. Their mistrust for transgenics certainly has not been helped by Bayer's problems with controlling their transgenes. A case in point, about six years ago, another unapproved transgene owned by Bayer (at that time Aventis CropScience) was found in a commercial crop. The contaminant was a gene that produces Cry toxins, which are normally produced by *Bacillus* bacteria and provide control against a number of insect pests.

The problems that have occurred due to the Liberty Linked rice contamination very much mirror what occurred following the Starlink gene contamination in corn. The immediate impact for rice was a 14% drop in U.S. long-grain rice prices and a temporary suspension of U.S. rice trades on the Chicago Board of Trade.

Countries such as Japan, the Philippines, and South Korea were quick to ban the import of U.S. long-grain rice. In the case of Japan and South Korea, this amounted to little more than posturing, since import restrictions in both countries were already in place and prevented significant imports of rice from the U.S. The real problem occurred when the European Union got into the act and restricted imports. This problem soon escalated with numerous trading countries placing unrealistically low tolerance levels for contamination before allowing imports.

Eight months after the August 2006 announcement, we still do not know how the commercial rice was originally contaminated with Bayer's gene. However, speculations abound. Scenarios include harvest equipment mixing GMO contaminated seed with commercial rice seed, unauthorized catching of GMO seed and replanting the following year, wind aided dispersal of GMO pollen to non-GMO flowers, and insect aided dispersal of pollen from GMO rice flowers to non-GMO flowers. Each of these is a possible mechanism for dispersal, with the wind-aided dispersal probably the least likely given the relative heavy weight of rice pollen and the tendency for most

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Inside This Issue

Cover Story:
The Indica Revolution

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.

Progress Mananging Stem Borers in Rice

Texas rice is attacked by three species of stem borers—sugarcane borer (SCB), *Diatraea saccharalis*; Mexican rice borer (MRB), *Eoreuma loftini*; and rice stalk borer (RSB), *Chilo plejadellus*. The RSB is the least common of stem borers in the Texas Rice Belt (TRB), so our research has targeted the SCB and MRB. Some years, the SCB is more abundant in the TRB than MRB; however, other years, the MRB produces higher numbers. The SCB is native to the TRB whereas the MRB was introduced into Texas from Mexico in 1980. The MRB was first detected in the TRB in Calhoun Co. (the most southern county in the TRB) in 1988. The MRB has since moved north, east and west to infest all counties of the TRB except Orange Co., which borders Louisiana and the Gulf of Mexico. Pheromone trapping has revealed that the MRB is moving eastward towards Louisiana at the average rate of about 15 miles per year.

Both species lay eggs on rice foliage. Previous research suggests the majority of eggs are laid close to the time of panicle differentiation (PD), because visible symptoms of damage or signs of larvae are first observed after PD. Eggs hatch and most larvae crawl from the foliage to the junction of the leaf blade and sheath. At this point, the larvae enter the space between the sheath and culm. Here the early instars feed on the inside of the sheaths to cause orange-tan lesions on affected sheaths. These lesions are easily observed on the outside of sheaths; in fact, we are considering using these lesions as a base for future economic thresholds. A future article in *Texas Rice* will describe current progress towards developing economic thresholds for stem borers.

Table 1. Effect of planting date on stem borer activity in rice. Eagle Lake, TX. 2006

Planting date	Treatment[a]	Panicles/ ft of row	No. whiteheads in 4 middle rows		Yield (lb/acre)		
			Main crop	Ratoon crop	Main	Ratoon	Total
Mar 14	T	37	8	40	8,518	1,799	10,317
	U	37	53	39	7,475	1,902	9,377
Apr 12	T	33	2	31	8,430	1,573	10,003
	U	34	14	41	7,721	1,362	9,083
May 15	T	25	4	-	3,866	-	-
	U	25	30	-	3,024	-	-
Main plot (planting date):							
Mar 14		37 a	31 a	40	7,996 a	1,851 a	9,847 a
Apr 12		34 a	8 c	36	8,075 a	1,467 b	9,543 b
May 15		25 b	17 b	-	3,445 b	-	-
Sub plot (treatment):							
	T	32	5 b	36	6,938 a	1,686	10,160 a
	U	32	32 a	40	6,073 b	1,632	9,230 b

[a] Treatment: T = treated for stem borers with multiple applications of Karate Z @ 0.03 lb (AI)/acre, U = untreated

Means followed by the same or no letter are not significantly different at the 5% level.

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Eventually, the larvae bore into the culms causing disruption of the flow of nutrients and water. This can lead to deadhearts (dead foliage arising from the center of whorls), partially and completely unfilled grains and/or whiteheads (virtually all grains on panicles do not fill). Stem borers can cause significant yield losses. In fact, previous research at Ganado, TX showed that natural infestations of stem borers can reduce main crop yields by as much as 50%. Also, preliminary evidence suggests that stem borers can be very destructive to the ratoon crop.

Conservation tillage can be employed to ensure early planting, which increases the likelihood of a good ratoon crop. The ratoon crop is becoming increasingly economically important to Texas rice farmers, so improved management leading to better ratoon yields also is taking on added significance. Thus, improved management of the main crop to increase ratoon crop value includes expansion of conservation tillage and stem borer control.

In 2006, three stem borer experiments were conducted. The first experiment was conducted at Eagle Lake using Cocodrie planted on three dates – March 14, April 12 and May 15. Half of the plots were treated with Karate Z to control stem borers. Whiteheads were counted before harvest. After harvest, plots of the two earliest planting dates were ratoon cropped. The results of this experiment showed a combination of SCB and MRB infested the plots. Highest stem borer activity in the main crop occurred in the earliest planting date (Table 1). Across main plots, treated main crop plots

Table 2. Host plant resistance to stem borers. Ganado, TX. 2006

			No. whiteheads/4 rows		Yield (lb/acre)			
Variety	Trt.[a]	Panicles/ ft of row	Main	Ratoon	Main crop	Main crop (T – U)	Ratoon crop	Total yield[b]
Priscilla	T	35	1	31	7,544	1,114	3,796	11,340
	U	32	25	33	6,430		3,615	10,045
Trenasse	T	44	0	19	9,347	414	3,500	12,847
	U	44	9	29	8,933		3,186	12,119
XL723	T	38	0	9	10,593	635	4,240	14,833
	U	39	6	11	9,958		4,152	14,110
CL XL730	T	42	0	4	10,102	1,098	3,855	13,957
	U	41	1	6	9,004		3,992	12,996
CL XL729	T	38	0	9	10,696	1,262	3,940	14,636
	U	42	5	10	9,434		4,596	14,030

[a] Treatment: T = treated for stalk borers with 2 applications of Karate Z at 0.03 lb (AI)/acre, U = untreated
[b] Total yield = main + ratoon crops

Statistical analysis of stem borers for Table 2

		No. whiteheads/4 rows		Yield (lb/acre)		
	Panicles/ ft of row	Main crop	Ratoon crop	Main crop	Ratoon crop	Total yield
Main plot (variety):						
Priscilla	33	13 a	32 a	6,987 d	3,705 bc	10,692 d
Trenasse	44	5 b	24 b	9,140 c	3,343 c	12,483 c
XL723	38	3 bc	10 c	10,275 a	4,196 a	14,471 a
CL XL730	41	1 c	5 d	9,553 b	3,923 ab	13,476 b
CL XL729	40	3 bc	10 c	10,065 a	4,268 a	14,333 a
Sub plot (treated or untreated for stalk borers):						
Treated	39	0 b	14 b	9,568 a	3,866	13,434 a
Untreated	40	9 a	18 a	8,672 b	3,908	12,580 b

Means in a column followed by the same or no letter are not significantly different at the 5% level (ANOVA and LSD).

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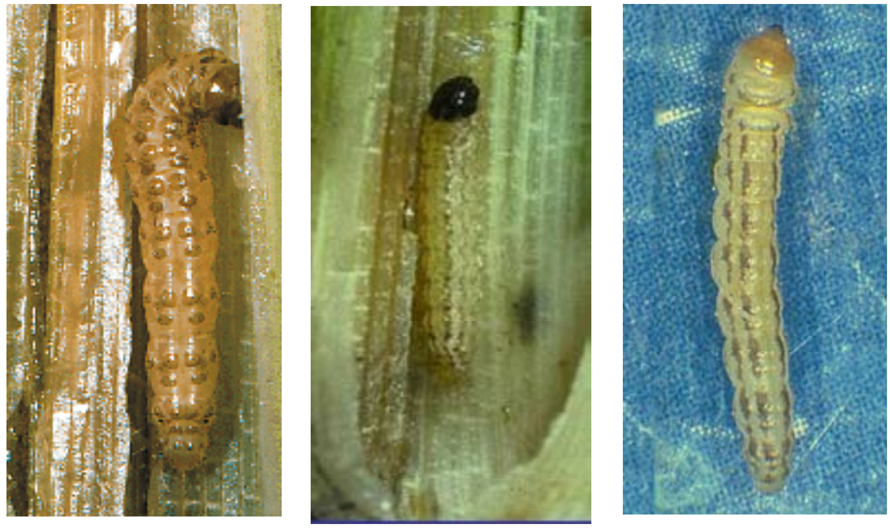

Left to right: sugarcane borer, rice stalk borer, Mexican rice borer

out yielded untreated plots by about 900 lb/acre, which shows the value of controlling stem borers.

The second experiment was conducted at Ganado where half the plots were treated with Karate Z to control stem borers. Whiteheads were counted before harvest. After harvest, plots were ratoon cropped. The study showed a combination of SCB and MRB infested plots. Priscilla produced the most whiteheads and the hybrids XL723, Clearfield XL730 and Clearfield XL729 produced the least (Table 2). Panicle density among varieties was not significantly different. Hybrid treated main crop plots out yielded untreated hybrid plots by almost 1000 lb/acre. The low level of white heads but significantly lower yield in the untreated hybrid plots strongly suggests that stem borer-induced yield loss is not solely confined to whiteheads. Significantly more whiteheads were found in ratoon plots derived from untreated main crop plots compared to treated main crop plots. So, a carryover of stem borer damage from main to ratoon crop is also possible. Research needs to be performed to evaluate response of ratoon rice to stem borer control in the main and/or ratoon crop.

The third experiment was conducted at Ganado using Cocodrie. Whiteheads were counted before harvest. The results showed a combination of SCB and MRB infested the plots. In general, best control in terms of density of whiteheads was achieved by two applications of Karate Z at 0.03 lb (AI)/acre, two applications of Mustang Max at 0.018 lb (AI)/acre and one application of Rynaxypyr 20SC at the high rate (Table 3). The results show stem borers are becoming serious constraints to yield in the TRB and that early planting does not necessarily avoid significant stem borer damage. Hybrid varieties, which produce fewer whiteheads than conventional varieties, still can benefit from stem borer control. Farmers in the southern TRB should consider applying KarateZ, Mustang Max or Prolex to control stem borers.*

Table 3. Evaluation of stem borer insecticides. Ganado, TX. 2006

Trt. #	Description	Rate [lb (AI)/acre]	Timing	WHs/4 rows [a]	Yield (lb/acre)
1	Untreated	—	—	26 a	6,927
2	Rynaxypyr 20SC	0.022	LB/H[b]	6 de	7,393
3	Rynaxypyr 20SC	0.044	LB/H	2 g	7,774
4	Orthene 90S	0.5	1–2" P[c]	21 ab	6,947
5	Orthene 90S	0.5	1-2" P + LB/H	15 bc	7,229
6	Exp. Seed Trtmt	—	—	29 a	6,803
7	Mustang Max	0.018	1–2" P	5 ef	7,354
8	Mustang Max	0.025	1–2" P	13 bc	7,172
9	Mustang Max	0.018 + 0.018	1–2" P+LB/H	2 fg	7,670
10	Mustang Max	0.025 + 0.025	1–2" P+LB/H	1 g	7,482
11	Karate Z	0.03	1–2" P	11 cd	7,215
12	Karate Z	0.03 + 0.03	1–2" P+LB/H	1 g	7,616

[a] WHs = whiteheads.
[b] LB/H = late boot/early heading.
[c] 1-2" P = 1 - 2 inch panicle.
[d] Significant yield differences were not detected for any treatment
Means in a column followed by the same or no letter are not significantly different at the 5% level (ANOVA and LSD).

Article and photos by
Dr. M.O. Way

We would like to thank the Texas Rice Research Foundation for their support of this project.

tants have been induced in another late maturing indica variety, in this case the highly disease resistant cultivar *Oryzica llanos* cinco (OL 5) from Colombia. Three of these mutants, indica-16 to indica-18, are being released in early 2007. These germplasms are 24 to 36 days earlier than the parent, making them 6 to 18 days later than the check variety Francis. They retain the extensive blast resistance of the OL 5 parent. The combination of early maturity and blast resistance make them useful sources of indica diversity for U.S. rice improvement programs.

All of the above improved indicas, indica-1 to indica-18, have been released to interested U.S. rice breeders. Next steps in indica germplasm improvement in the U.S. will be to secure additional indicas from China and intercross them with the present germplasms and others to further broaden the indica diversity available to rice growers in temperate regions.

Regarding Chinese indica with high yields and novel blast resistance in the USDA rice collection, 85% of the Chinese accessions were introduced before 1977 when yield in China was 3.64 t ha^{-1}. Rice yield in China is almost double nowadays (6.27 t ha^{-1} in 2002). Hence, it is desirable to update Chinese germplasm in our collection and introduce advanced rice varieties from China. In 1996, Robert H. Dilday and Wengui Yan, geneticists in USDA-ARS Dale Bumpers National Rice Research Center (DBNRRC), introduced about 200 Chinese lines, mostly indicas in exchange with 50 U.S. varieties Indicas GP-2, 4594, R 312, 4597, 4612, Taizhongxian 255, 4641 and Shufeng 121 were observed to have yield advantages from 20 to 40% over U.S. varieties in 2000. However, they were either too high or too low in amylose content for the grain types, and most of them were tall and lodging susceptible.

Long grain line 4484, which had 20% amylose similar to U.S. long grains and yielded 16% more than U.S. long grains, was entered into the Uniform Rice Nursery (URN) in 2002. This line yielded the same as Francis in both 2002 and 2003, and 16% more than Francis in the 2004 URN. For example, it had a total grain yield (main + ratoon) of 12.50 t ha^{-1} and ranked second after hybrid XL 8 in the 2004 Louisiana URN. Line 4484 was 112 cm tall and lodged 34 and 52%, respectively in 2002 and 2003, which explained lower yields in those years of URN. This line had head rice yield similar to Francis, but with Toro-type cooking quality of 18% amylose.

In 2004 entry 4484-1693, selected from the M4 generation of 4484 seed irradiated at 300 Gy, was 10 cm shorter in height and 4% higher in amylose than the parent 4484. This change decreased lodging risk and made it a typical long grain in cooking quality while its yield potential was maintained. In 2006 URN, this mutant yielded 10.05 t ha^{-1} and ranked 12th in all five states with the highest of 12.67 t ha^{-1} in Mississippi where it ranked 8th. Its head rice yield was 52%, 1% higher than adjacent Francis. In 2006 AR disease monitoring program (DMP), 4484-1693 averaged 8.52 t ha^{-1} over 14 counties, 0.15 t ha^{-1} more than Cocodrie.

4484-1693 had broad-spectrum disease resistance. It was resistant to blast disease in all 2006 field tests including URN, AR DMP, and ARPT (AR Preliminary Test), and also immune or resistant to 11 common races of blast in both 2006 URN and ARPT greenhouse evaluations (Fig. 2). These races included IB-33, IE-1K and BC3-1, the new races to which most varieties having the *Pi-ta* resistance gene are susceptible. In addition, evaluations of URN, AR DMP and ARPT concluded resistance of 4484-1693 to bacterial leaf blight, narrow brown leaf spot and leaf smut, and tolerance to sheath blight. Furthermore, none of the known genes for resistance to blast, i.e., *Pi-ta*, *Pi-b*, *Pi-k* and *Pi-z* were identified from molecular marker analysis conducted by DBNRRC and USDA-ARS Beaumont Rice Research Unit. These results indicated a new source(s) of resistance, and the novel gene(s) will add genetic diversity for resistance and make the resistance more durable.

New sources of disease resistance are extremely rare. Most prospecting for new genes is done on wild *Oryza* relatives or very poorly adapted accessions of germplasm, which often are less desired in yield, milling and general fitness. Poorly adapted varieties are very difficult to use in breeding. However, mutant 4484-1693 is a high quality variety possessing not only novel blast resistance, but high yield, acceptable milling and cooking traits. Therefore they can be rapidly bred into breeding programs to provide needed resistance, while enhancing agronomic traits.*

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The Marketing Problem for Rice Farmers

Store it or sell it, a question farmers in all commodities struggle with each year.

Rice farmers like most farmers are optimists. In short, they expect to get something for the rice they plant. Yet, to be honest, many rice producers really don't know much about the market and most of the people that do are not going to tell them a whole lot that is not in their own best interests, particularly buyers. I was a rice buyer for 18 years so I know how a buyer thinks.

Farmers when they market tend to second guess themselves and not do a very good job at it. My experience indicates that two thirds of the farmers sell in the bottom 25% of the annual price range.

If you let someone else market your rice, it is still your rice. If you let someone else market your rice, remember that it is your wallet you are giving them to manage. Your best bet of course is to market your own rice either direct to a buyer via a sales agent or, say, through a cooperative.

Here is the real marketing problem for a rice farmer. It is not who you sell it through but how you sell it that matters the most. Ninety per cent of the market is bearish (thinks the price will go down) ninety per cent of the time. Why so? It is simple: those in the know are rice buyers not rice sellers and rice buyers are buying rice to sell to buyers. The only time that a buyer is bullish is when he has bought all the rice he needs. Now doesn't that make sense?

So if you are going to make sense out of the market, you had better seek help from someone who understands about buying rice and about the bearish bias to the market place. You had best connect up with someone who doesn't just watch a rice chart but has access to all parts of the rice marketing chain.

Farmers get lots of information on what and how to produce a crop and nothing on how to market that crop. I have been at so many conferences where every crop under the sun has multiple market experts speaking, but often zero speak on rice. If there is a speaker there, ask yourself whether the person makes his living by putting money in the listener's pocket or is a buyer or is a seller. Most of the speakers on rice, when there is one, are either buyers or sellers of cash rice. That makes their conclusions somewhat suspect.

Do not just sell your rice, asks questions first and then sell your rice. No salesman worth his salt tries to sell someone something without asking lots of questions first. If the market is going up, say thanks to the market by selling a little rice. The only kind of thanks the market understands is when you sell some rice.

So what is my outlook for the rice market in 2007 and onwards? Let's see, the dollar is getting weaker and the oil price is firm, more or less $50-$70 per barrel. Every politician is in favor of ethanol and acreage is in short supply for all crops. The Asian rice market is super tight and should work higher into the summer. Our work indicates that food costs will rise versus everything else for a long time. I bought rice in Texas for 18 years and a Texas rice farmer asked me recently with some skepticism, "When is rough rice going to $20 per cwt, Milo?" I asked him, "in big or mini-dollars?"

My advice is to find a progressive banker that will help you replace cash sales with futures or options, learn to sell your rice in chunks and form a marketing team that will replace your market optimism with mar-

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Marketing continued...

ket realism. Watch the spread or implied basis between rice futures and Texas cash prices. When Texas cash gets $.50 per cwt or higher over futures, dump your cash and get on board the futures or options market if the trend is up. How do you know what the price trend really is, by the way?

Do not "hope" the price will go higher. The market eats hope for breakfast. And above all, take the advice of your friendly rice buyer with a grain of salt. They are all hoping your rice price will go lower, always. Look for no-spin rice advice by those who stand outside the deal flow for cash rice. And find a good futures broker that can teach you the fine art of successful rice hedging.

A very successful farmer in Arkansas I know invited me to stay at his beautiful home. I was admiring it when he told me, "Milo, rice production did not built this house, rice marketing did." What kind of financial home are you building for your farm right now? Are you building or dismantling your net worth each year? Before you ask questions about where the market is heading, ask yourself what price you need to break even on rice. Always, above all else, keep asking lots of questions. I do.*

Article by Milo Hamilton, President and Co-founder of Firstgrain.com, a fee-based market advisor on rice. You can obtain a free trial by going to www.firstgrain.com.

2007 Texas Rice Production Guidelines

New information on varieties and hybrids, fertility and cultural practices, pesticides and their application rates and timings, and economic forecasts valuable to rice producers.

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Texas Wildlife Service Feral Hog Control Program

Feral hogs (*Sus scrofa*) are members of the same family as the domestic breeds, and in Texas include the European wild hogs, feral hogs, and hybrids. Feral hogs prefer the cover of dense brush for protection, but may also be found in open range and grassy areas. During hot weather they spend much of their time wallowing in ponds, springs and streams close to protective cover, which makes rice field ideal habitats.

Feral hogs are omnivorous and will eat anything from grain to carrion. Vegetable matter constitutes an important part of their diet. They also consume roots and invertebrates such as centipedes, leeches, earthworms and crayfish, which means rice field levees are often damaged due to their foraging. In certain areas cultivated crops and row crops make up a significant portion of their diet.

Feral hogs are domestic hogs which have escaped into the wild or have been released for hunting purposes and have become free-ranging. Their size and color depend upon their breed and their nutrition during development.

European wild hogs (often referred to as "Russian" boars) differ in appearance from feral hogs. The wild hog usually has longer legs, a larger head, and a longer snout. In the 1930s, European wild hogs were released as game animals in areas of the Texas hill country that already had feral hog populations. Cross-breeding between the two species occurred. As a result of the hybridization, few individuals of the pure European strain are found in Texas. However, the hybrid offspring retained many characteristics of the European wild hogs.

Hogs were first introduced into the Americas in 1498 by Christopher Columbus during his exploration of the West Indies. Feral hogs have been present in Texas since 1689. Today, feral hogs and hybrid feral hogs are reported in almost every county of Texas.

The hogs can be controlled by live traps, snaring or hunting. In Texas, feral hogs may be taken at any time of the year by any legal means. Consult with the Texas Parks and Wildlife Department regarding any question about the legal status of feral hogs.

For more information and assistance, contact the Texas Cooperative Extension Wildlife Service or go to http://tcebookstore.org/pubinfo.cfm?pubid=287 *

From the Editor continued...

rice to be self-pollinated. Regardless of the cause, this genie is out of the bottle and will take some effort and cost to deal with. All of the industry has been affected by the implementation of testing and certification processes. Many in the industry are arguing about the financial impact.

The irony of the contamination announcement was the timing coincided almost exactly with extremely good news about the future of rice prices. Only two days earlier, on August 14, 2006, a Bloomberg article suggested that rice prices would likely see $20/cwt within the next two years (Wilson and Kishan, 2006). Not surprisingly, many exporters and undoubtedly all rice producers were ecstatic over this announcement. Unfortunately, the ecstasy only lasted a couple of days and was swept away by the problems caused by the unapproved Bayer gene being found in commercial rice.

Eventually, Liberty Linked rice or some other transgenic herbicide resistant rice will be commercialized. The incorporation of herbicide resistance into rice is desirable, in that it makes business sense for both the developer and our rice producers. The developer would benefit from the marketing of herbicide resistant rice due to the increased market share it would bring. Rice producers would benefit from herbicide resistant rice because it would make weed control easier, more effective, and cheaper.

One only has to look to producers of herbicide resistant crops such as corn, cotton, and soybeans who have long benefited from being able to control weeds with Roundup without having to worry about damaging their crops. While not perfect, as is evidenced by cases of herbicide drift onto neighboring non-herbicide resistant crops, herbicide resistance in rice would be extremely valuable in that it would be one more tool in the management arsenal that if used properly could increase the profitability of producing rice. Add to this the fact that, in the case of the Liberty Linked trait, it has absolutely no impact on human health. What could be better for our rice producers?

Our producers for too long have seen low to steady prices combined with escalating production costs. We will see $20/cwt prices as suggested by the Bloomberg report. It's just a question of time. I also expect we will see commercial GMO rice within the next several years. The only question is who will be the first out of the gate. If it is not the U.S., then some other country will release commercial GMO rice, joining the likes of commercial GMO corn, cotton, and soybeans. Only time will tell.

Please continue to send your comments and suggestions for how we may further improve *Texas Rice.*

Sincerely,

L. T. Wilson

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

Rice Belt Update

The planting intentions report had Texas up 7%, but nobody here can figure out how USDA arrived at that number. The feeling among farmers and other people in the field is that we will be down 10%. Of course, we won't know for sure until everything is in the ground. The overall price of rice isn't encouraging, and we've had one traumatic event after another that has really worked against any increase. About the time growers got past the loss of Cheniere, the Clearfield 131 thing blew up. Fuel and fertilizer prices are up. And water availability could be an issue. The highland lakes above Austin – which supply the Colorado River where we draw a lot of water – have been running 20 feet below normal. So, there may not be enough water to meet all of our needs.

Across our rice belt, we're approaching 70% planted. Progress is probably somewhat below that in areas east of Houston and something above that on the west side. No one is planting right now. It's wet from Beaumont to Victoria. There was some planting earlier in the month, but most areas did not dry out from the previous rains before it started raining again. The west side of our rice belt probably has the best chance to plant later this week if it doesn't rain again. But we've been on about a 7-day rain cycle, and that's killing us. However, recent rains in Central Texas are helping restock the Highland Lakes. That last cold front also shut the rice down. If temperatures drop into the 50s, rice goes into shock, and we were actually in the 40s. This may delay early growth in many areas. *

Article by Dr. Garry McCauley

Boosting Cellulosic Ethanol Production

Squeezing more ethanol from cellulose, the basic material from which all plants are made, is still a lofty goal for scientists. The most common process uses expensive enzymes that are limited in their ability to convert stubbornly rigid plant cells walls into fuels.

Now, an Agricultural Research Service (ARS) microbiologist has discovered a way to boost cellulosic ethanol production, with the help of some unusually hardy bacteria.

Paul Weimer, who works at the agency's U.S. Dairy Forage Research Center in Madison, Wis., is tapping the plant-degrading powers of *Clostridium thermocellum*. Thanks to this heat-loving microbe, which thrives in 145-degree-Fahrenheit environments and doesn't require oxygen, he's been able to create not only ethanol, but an all-natural wood glue as well.

According to Weimer, this bioadhesive could be a marketable byproduct of cellulosic ethanol production. It represents an added value and a means of potentially offsetting the high costs that currently inhibit the commercial production of cellulose-based fuel in the United States.

Even better is that, Weimer's method relies on a potentially cheaper, more streamlined ethanol-making process called consolidated bioprocessing. Instead of using two reactors, enzymes, plus yeast, as standard cellulosic ethanol production requires, this approach uses only one reactor and a single industrious microbe that makes its own enzymes.

The idea for a bioadhesive came to Weimer while observing *Clostridium* bacteria under a microscope breaking down bits of alfalfa. He saw that during the conversion of plant fiber ethanol, the bacteria latched onto the fiber with such fierceness that the only way to break the bond was to destroy the microbes and their sticky adhesive.

With scientists at the USDA Forest Service's Forest Products Laboratory in Madison, Weimer has found that this bioadhesive is tough enough to replace up to 70 percent of the petroleum-based phenol-formaldehyde that's used to manufacture plywood and other pressed-wood products. *

Article by Erin Peabody, (301) 504-1624

Statement From Mexico on GMO Rice

The genetically modified rice that entered the country has been evaluated and it has been confirmed that consumption of it does not represent a risk. The State Secretariats that integrate La Comisión Intersecretarial de Bioseguridad de los Organismos Genéticamente Modificados (CIBIOGEM), work to guarantee that all the imported rice counts with the authorization for its commercialization.

Random monitor programs are done to the rice that enters Mexico, to make sure that there is no risk for public health. As a result of the rice imports to Mexico from the United States, CIBIOGEM, through the Health Secretariat, and also, the Federal Commission for the Protection against Sanitary Risks (COFEPRIS) made an evaluation and risk analysis of this cereal, with the result that the rice introduced in the country does not carry any health risks.

For its part , the Food and Drug Agency of the United States (FDA) established that the LLRICE601 & LL62 varieties of the cereal are safe for human consumption. In Mexico, the Health Secretariat through COFEPRIS and the National Service of Health, Food Safety and Agricultural Quality respectively, are coordinated to have a stronger control of the GMOs and the products that contain them, that are destined for human and animal consumption or for processing, which enter the country in compliance with Mexico's Biosafety Law of Genetically Modified Organisms.

The Health, Economy and Agriculture Secretariats must guarantee that the GMOs that enter the country, have complied with the fundamental requirement of evaluation by the COFEPRIS, and to deny the admission of GMOs that have not been evaluated.

The Mexican agencies will maintain a permanent communication with the USDA and the FDA, in respect to the actions that these Secretariats take in relation to the biosafety measures that the United States will take regarding GMOs. The CIBIOGEM reiterates its commitment with the Mexican society, to continue to look at this important issue, through the employment of all technical and information capacity at its reach and, therefore, to guarantee an efficient application of Mexico's Biosafety Law of the Genetically Modified Organisms. *

Excerpted from a statement reported by Dwight Roberts, US Rice Producers Association.

State, National and International News...

Agronomy Lecture Series

Texas Cooperative Extension of Harris County will present a series of lectures on pasture management and hay meadow systems throughout 2007.

Each workshop in the five-part series will be repeated at four locations throughout the county: East Harris Community Center, Hockley Community Center, May Community Center and the Bear Creek Extension Auditorium.

The agronomy lecture series kicked off in February with the Pesticide Labels and Integrated Pest Management workshop. Other workshops this year will be:

- Compost and Other Bio-Based Plant Nutrient Sources in June.
- Managing Pasture and Hay Meadow Systems in August.
- Plant Identification, Forage Management and Weed Control in September.

All workshops will be held from 6:15 to 8:30 p.m., and continuing education units are offered on each topic for participants who complete the workshop.

"This lecture series gives all operations – big or small – basic information to help them be more productive."

To register or for more information, call Diana Todd at 281-855-5600 or visit http://harris-tx.tamu.edu/anr/docs/2007agronomy.pdf

Article by Lorri Jones, 281-855-5620, LJones@ag.tamu.edu

Borlaug Institute Helps Identify Ways to Increase Iraqi Agricultural Employment

Through its Norman E. Borlaug Institute for International Agriculture, Texas A&M University is again playing a significant role in helping revive agriculture in Iraq.

Dr. Edwin Price, Associate Vice Chancellor and Director at the Borlaug Institute, along with five other Texas A&M agricultural faculty and staff members, recently traveled to Iraq as part of a 10-person team assessing opportunities to increase Iraqi agricultural employment over the next nine months.

"This team, the Agriculture Team for the Brinkley Group for Business Transformation, was invited and supported by the Office of the Under Secretary for Business Transformation at the U.S. Department of Defense," Price said. "We met with staff representing U.S., Iraqi and coalition forces operating in the International Zone, as well as with U.S. military civil affairs offices and military personnel"

The agriculture team conducted its assessment from Feb. 24 to March 7. After making their assessment, they provided several recommendations for improving Iraqi agricultural employment.

The team's near-term team recommendations include a Tigris-Euphrates basin salination abatement, irrigation and drainage system program and a national campaign to boost crop value-chain efficiency and productivity.

Other recommendations for the near term include programs targeted at produce sorting, grading and packaging, and animal feed manufacture. "Efforts for these programs can be initiated within a few months to achieve a positive impact on increasing agricultural employment in Iraq," Price said.

The team also suggested steps for more medium- and long-term agricultural employment, he said. Those include livestock health and breeding improvement, oilseed production, crop variety implementation, sorghum and millet production, alternative crop selection and planting, and integrated pest management.

While the Iraqi agriculture absorbs a significant percentage of the workforce, it currently adds far less than it could to Iraq's gross national product, Price said. In addition, Iraq's current agricultural output is inadequate to provide the necessary food for its own population.

U.S. government agency estimates vary on the number of Iraqis currently employed in agriculture, with figures ranging from 25 percent to about 50 percent of their active workforce.

"For Iraqi agriculture to rebound in the short run and rebuild in the long run, it is vital that we have people there who can directly demonstrate the advantages of modern agricultural methods and policies over previous unsuccessful methods and policies," Price said. "Seeing is believing."

For more information contact: Dr. Ed Price, 979-458-0820, ec-price@tamu.edu

Excerpted from an article by Paul Schattenberg, 210-467-6575, paschattenberg@ag.tamu.edu

United States, Brazil Cooperate on Biofuels

During a visit to Brazil, on March 8, President Bush signed an agreement with his counterpart, President Luiz Inácio Lula da Silva, to strengthen their nations' partnership in ethanol and biofuels development.

The treaty creates a new path for cooperation in this field, from which Americans will have access to advanced technologies already in use in Brazil. Brazil has used ethanol as a main energy source since the 1970s.

"It would be unthinkable some years ago that an American president would come to Brazil to discuss energy," Bush said at a Petrobras' ethanol plant in São Paulo.

Since his State of the Union address, when Bush said his administration would seek alternative energy sources as a priority, the already heated up ethanol market in the United States went boiling.

In Brazil, the world's largest ethanol producer, spirits also rose. Presently, Brazilian ethanol is taxed in the United States to protect local U.S. farmers from the more-productive sugarcane ethanol produced in Brazil. The tax was one of the issues addressed by the two presidents during Bush's visit.

Although nothing was settled — it will surely demand much more time than the less than 30 hours Bush spent in Brazil — there is hope in Brazil that with the increase in American demand, the tax could fall. *

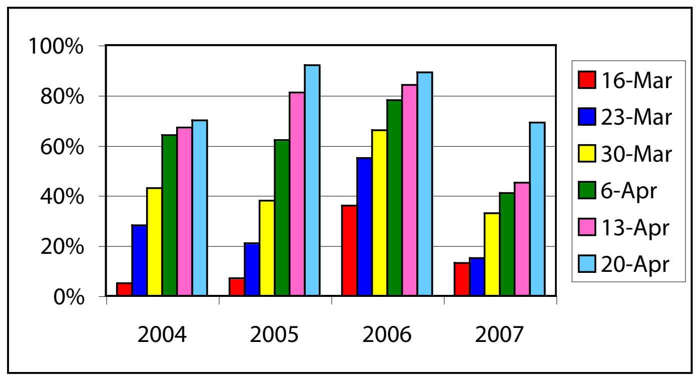
Excerpted from and article by Sergio Osse, freelance writer, Farm Press News

Rice Crop Update

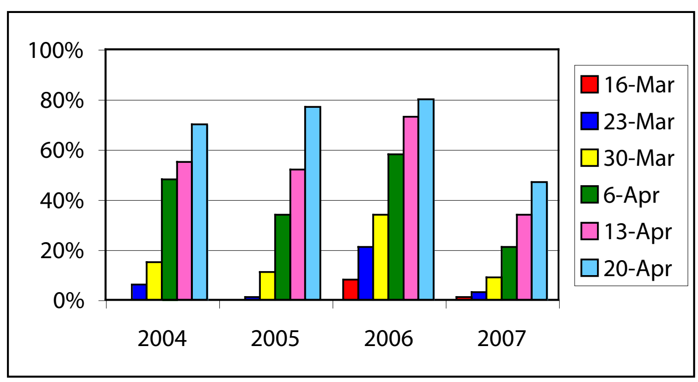
As of April 20, 69% of the Texas rice belt estimated acreage was planted, compared with 89% in 2006, 92% in 2005 and 70% in 2004. It is believed that an unseasonably cold and wet spring contributed to the number of growers delaying planting.

For seedling emergence, it is estimated that 47% of the crop had emerged, compared with 80% in 2006, 77% in 2005, and 70% in 2004.

Planted



Emerged



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