



# Texas Rice

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## Can We Predict Rice Yields Using Remote Imaging?

Production costs continue to increase, while rough rice prices have remained fairly constant. One of the greatest sources of cost increase is nitrogen fertilizer. Nitrogen management is difficult and time consuming for rice producers and crop consultants.

In an ideal situation, drill-seeded rice is fertilized with urea immediately before flooding. In less than ideal situations, field size and irrigation well pump capacity may lead to delays in flood establishment.

Under these conditions urea can be lost by volatilization while a field is being flooded. Several methods have been developed to determine if additional nitrogen supplied post flood can increase rice yields.

Although Arkansas Plant Area Board measurements (plant height multiplied by row width) have been well correlated with rice yield response and mid-season N, many rice producers and crop consultants are reluctant to use it because of time constraints and complicated calculations. Hand held meters, which measure the greenness of rice leaves, have also been used successfully by university researchers but are too expensive for most rice producers and crop consultants. Tissue testing for N status of rice fields may be useful,



Collecting tissue samples to check nitrogen content, Bruce Beck, County Agent and Regional Rice Production Specialist, University of Missouri Extension.

but the expense and the additional time required to process the information may limit its utility.

Field maps produced with remote sensing technology offer an alternative solution. These maps, based on spectral reflectance, are now commercially available for some crops. Adaptation of this technology to estimate the nitrogen status of rice fields is currently being investigated. The objective of this research was to compare the ability of five traditional methods of assessing plant N status and one remote sensing method to predict rice yields at internode elongation.

In this 3-year experiment, reference strips with four nitrogen fertility regimes were produced. In 2003 and 2004, these strips were

located at the Missouri Rice Research Farm near Quin, MO on a Crowley silt loam soil. In 2005, the study was conducted at the University of Missouri-Delta Center near Portageville on a recently graded Sharkey clay soil.

The rice variety Cocodrie was planted in early-May of each year. At tillering, plots were treated with 0,

75, 150, or 225 lbs N/acre and immediately flooded. Each plot was 20 feet wide and 400 feet long. Each treatment was replicated 3 times. At internode elongation, a remote sensing image of the rice was collected with aircraft mounted sensors at a 0.5 mile altitude. The sensor scanned at 550nm in the green band, 670nm in the red band and 810nm in the near infrared band. In 2003, data were collected by Spectral Visions (Champaign, IL), and in both 2004 and 2005 the data were collected by InTime Corporation (Cleveland, MS). Plant height, plant color by color chart comparison (a visual color chart that correlates color to numbered rankings), and plant color by hand held meter readings were collected

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## From the Editor...



Welcome to the October issue of *Texas Rice*. The U.S. long grain rice market has at least partially recovered from the impact of the contamination with Bayer's LLRICE601. Rough rice January futures reached \$10.03/cwt, bringing the price back to the mid-August pre-contamination levels. This begs the question of how high the prices would have been had prices not dipped for 3 months. In mid-August, all indications were that rice prices were on an increase and would likely continue to increase for some time. A forecast made in early August by the Chief Executive Officer at Diapason Commodities Management, a \$5.5 billion trading company, went as far as to say that prices near \$20/cwt for long-grain rough rice was quite possible within the next two years. The recovery of the U.S. long grain market back to mid-August levels is a good sign. However, the closure of the European market and other markets around the world undoubtedly has created at least a temporary rice supply imbalance that is causing resistance to price increases.

On-going activities to address the LLRICE601 contamination will hopefully help to open European markets. The USA Rice Federation held a meeting in early November to develop proposed protocol and process to reduce the likelihood of contamination problems occurring during the 2007 and future seasons. A recommendation from the meeting was to test and certify, at the farm level, that planted seed is GMO free. If purchased from a seedsman, the seed would have a "GMO free" certification accompanied by a sales receipt indicating that the seed is GMO free.

If a grower "catches" or "brown bags" seed from commercial fields, the grower would have to have the seed tested and certified as being GMO free before it could be planted and subsequently sold. An FSA acreage certification would accompany the certifications to help insure that GMO free certified seed was used over the entire planted acreage. Proposed provisions also include language to address the certification of head-row, breeder, and foundation seed and the requirement for standardized testing by approved testing labs. All of this is positive and will hopefully help

to reduce future GMO contamination problems that have hindered sales in markets that have not accepted GMO foods. However, as a caveat, this type of certification will ultimately only be effective at opening the European market if producers and millers agree to follow a rigorous testing and certification protocol, and if the EU agrees to have the rice tested in the U.S. and not at European entry points as some in Europe are proposing.

The brown-bagging of seed for replanting has an interesting history that is very regional within the U.S. rice industry. At one extreme, brown-bagging in the Texas conventional long-grain market is almost non-existent. In contrast, an estimated 30-40% of Arkansas and Missouri farmers brown-bag rice seed. Why the difference? The Texas rice industry has long stressed the need for high quality rice. This position has its origins with the need to control red rice.

Red rice is a pervasive weed pest that is the same species as commercial rice, but a different biological type. Like commercial rice, red rice is well adapted to a flooded rice production environment. Because commercial rice fields do not go through the high level of rouging received by head-row and foundation seed fields, brown-bagged seed from commercial fields have a high probability of becoming contaminated with red rice. Texas rice breeders, seedsmen, and rice producers felt so strongly about the need to eliminate red rice from commercial fields that they worked long ago with the Texas Department of Agriculture to impose a zero tolerance for red rice in commercially-sold rice. Eliminating brown-bagging would go a long way to reduce the chances of future contamination of the U.S. long-grain market with unapproved GMO genes.

Please keep on sending us your suggestions.

Sincerely,

*L.T. Wilson*  
L.T. Wilson

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

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# Farming Rice

## a monthly guide for Texas growers

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

### Evaluation of N Fertilizers Applied Preflood to a Wet and Dry Soil

In the delayed, flood rice culture system that is currently used by farmers in Arkansas, it is recommended that urea be the N source for the large, early N application, and it be applied immediately before establishment of the permanent flood. However, research has indicated that multiple applications may not be necessary, and a single pre-flood application of N may achieve comparable yields, hence the one application approach in this study.

Urea has many fine qualities, but it also has an undesirable characteristic in that its initial reaction, when applied to soil, is alkaline and thus it is prone to ammonia volatilization losses if not soil incorporated within a couple of days after surface application. Most commercial rice fields require 5 to 10 days to get the floodwater across the field and thus, there is potential for substantial ammonia volatilization losses of urea. In addition, the soil is not always dry when the preflood N fertilizer has to be applied, and urea applied to muddy soil aggravates ammonia volatilization losses.

Ammonium sulfate is slightly acidic in its initial reaction when applied to soil, so it is much less prone

to ammonia volatilization loss. Urease inhibitors have been promoted as a means to significantly slow ammonia volatilization losses from urea fertilizer and Agrotain stabilized urea fertilizer contains the urease inhibitor NBPT. The objectives of this study were to evaluate urea, Agrotain and ammonium sulfate applied pre-flood, *in one application*, to dry and muddy soil surfaces, as to their ammonia volatility and influence on grain yield of drill-seeded, delayed flood rice.

The studies were conducted in 2004 and 2005 at the University of Arkansas Rice Research and Extension Center, on a Dewitt silt loam (Typic Albaqualfs), having a soil pH from 5.8 to 6.3. The cultivar 'Wells' was seeded at 89.3 lb/A, in nine-row plots, 15 ft in length. The rice was grown upland until the four to five leaf growth stage, and then a permanent flood was applied and maintained until maturity.

A split-plot experimental design, with four replications, was utilized with preflood soil moisture as the main plot, and the subplot arranged in a factorial with N source, N rate, and N application time as the factors. In 2004, the fertilizer N sources were urea, Agrotain, and ammonium sulfate, applied at rates of 0, 60 and 120 lb N/A to a dry soil 3 and 7 days prior to flooding and a muddy soil 3 days prior to flooding. In 2005, the same N rates as in 2004 were used and the two N fertilizers were urea and Agrotain applied to a dry and muddy soil 1 and 5 days prior to flooding. Also in 2005, ammonia volatilization of urea and Agrotain applied to the dry and muddy soil was measured using static chambers. At maturity, the plots were harvested with a small plot combine. Statistical analyses were conducted on grain yield and ammonia volatilization data with SAS and mean separations were based upon protected LSD where appropriate.

In 2004, the 60 lb N/A fertilizer rate resulted in maximum grain yield for the best

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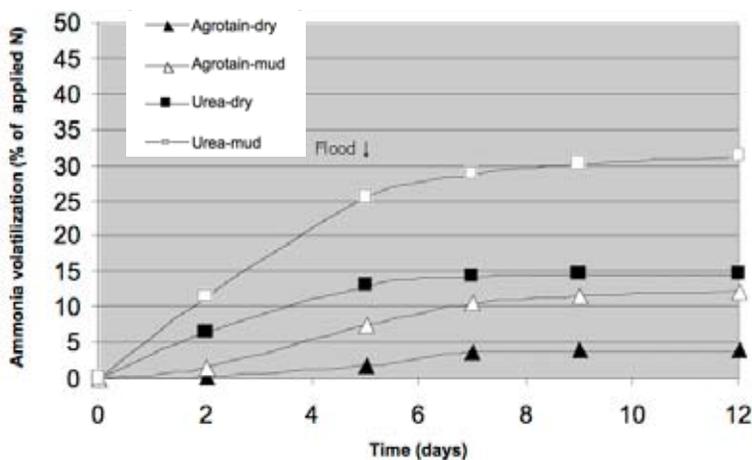


Figure 1. Ammonia volatilization of Agrotain and urea applied to dry and muddy soil 5 days prior to establishment of the permanent flood. Ammonia volatilization was measured over a 12 day period after N application. The period extended from 5 days prior to flooding to 7 days after establishment of the flood.

## Evaluation of N Fertilizers continued...

**Table 1: Yield, Income, Cost and Profit Per Acre Using Agrotain Stabilized Urea on Muddy and Dry Soil.**  
(Calculation based on 120 units N/acre, rice price of \$4.25 bu and urea \$350 per ton)

Soil Condition	Nitrogen Source	Yield (bu)	Income in Dollars	Total Cost of Production		Total Profit	Profit Increase Over Urea
				Minus N Cost	N Cost		
Dry	Urea	191.8	815.15	550.00	45.65	595.65	219.50
Dry	Agrotain Stabilized Urea	211.3	898.03	550.00	51.52	601.52	296.50
Mud	Urea	148.5	631.13	550.00	45.65	595.65	35.47
Mud	Agrotain Stabilized Urea	181.0	769.25	550.00	51.52	601.52	167.73

treatments, and was better than the 120 lb N/A rate in differentiating the three N sources. All three N sources applied to a dry soil 3 days prior to flooding resulted in a similar grain yield of around 9,000 lb/A. When the time between N application and flooding was increased to 7 days, grain yields significantly decreased, compared to those measured at 3 days prior to flooding for urea.

Agrotain and ammonium sulfate resulted in similar grain yields when applied 3 or 7 days prior to flooding. When the three N sources were applied to a muddy soil 3 days prior to flooding, grain yields for urea, ammonium sulfate, and Agrotain were 6705, 7515 and 7695 lb/A. Thus, grain yields were significantly less when the N sources were applied to a muddy soil compared to a dry soil, but Agrotain and ammonium sulfate resulted in significantly higher yields compared to urea when applied to a muddy soil.

In 2005, urea and Agrotain were applied to a dry and muddy soil 5 days prior to flooding. The amount of N fertilizer lost via ammonia volatilization over the 5 days between N fertilizer application and flooding when urea was applied to a dry and muddy soil was 13% and >25%, respectively, while Agrotain applied to a dry and muddy soil only lost <2% and 8%, respectively. (See Figure 1) Highest grain yields were measured with the 120 lb N/A fertilizer application for both sources.

When urea and Agrotain were applied on a dry soil 1 day prior to flooding, a grain yield of 9,650 lb/A was obtained. When the two N sources were applied to a dry soil 5 days prior to flooding, a yield of 9,495 lb/A was obtained with Agrotain while urea produced 8,640 lb/A. Yields decreased when the two N sources were applied to a muddy soil compared to a dry soil, however, yields decreased much less when Agrotain was the N source. When the N sources were applied to a muddy soil 1 day before flooding, urea and Agrotain produced grain yields

of 7,759 and 8,685 lb/A, respectively. When the N sources were applied to a muddy soil 5 days before flooding, urea and Agrotain produced grain yields of 6,682 and 8,145 lb/A, respectively. In conclusion, Agrotain or ammonium sulfate should be used if the pre-flood N has to be applied to a muddy soil. If the pre-flood N can be applied to a dry soil then Agrotain or ammonium sulfate should be used if greater than 3 days are required to establish a flood.\*

Article by R. J. Norman, C.E. Wilson, Jr., N. A. Slaton, D. L. Frizzell, B.R. Griggs, J. T. Bushong, W.J. Ross, and T. L. Richards.

## 2006 Farmer's Tax Guide

The Internal Revenue Service announced the release of the Farmer's Tax Guide for use in preparing 2006 tax returns. The Farmer's Tax Guide, IRS Publication 225, contains information on the farming business either as an owner or tenant.

"If you cultivate, operate, or manage a farm for profit, which includes stock, dairy, poultry, fish, fruit, vegetable and truck farms, this guide would serve you well," said IRS spokesperson Clay Sanford. "In tax year 2004, there were 240,000 farm tax returns (Schedule F) filed by Texans," Sanford noted. The guide explains how the federal tax laws apply to farming, how to figure your taxes and complete your farm tax return, and the new tax laws for 2006 and 2007.

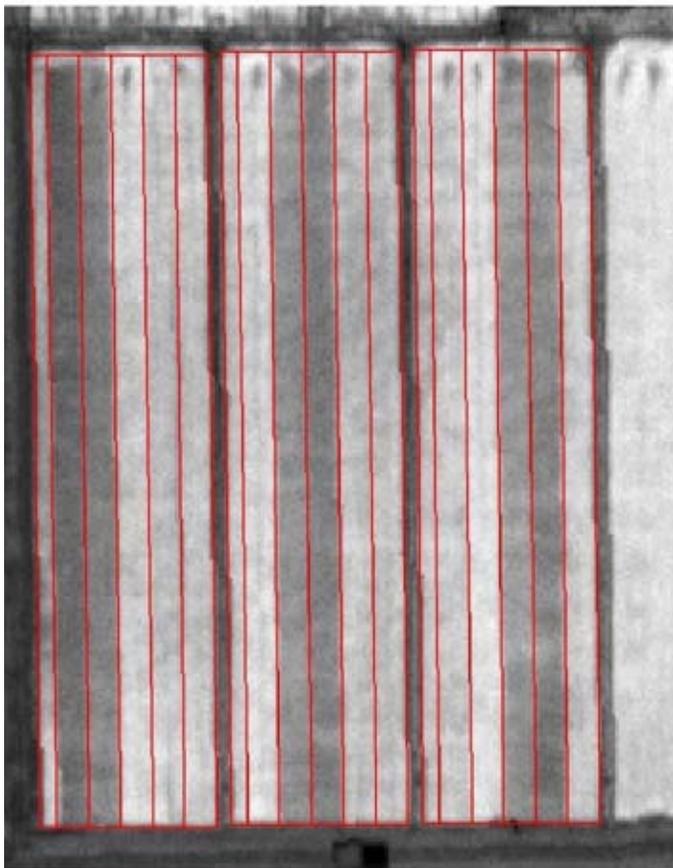
The guide explains the benefits of keeping records, what kinds of records you must keep, and how long you must keep them for federal tax purposes. Other topics include tracking farm income, expenses, employment taxes and sample tax returns.

The Farmers Tax Guide, IRS Publication 225, is available at the IRS Web site, [www.IRS.gov](http://www.IRS.gov). The Farmer's Tax Guide, as well as all other IRS forms and publications, can also be ordered by calling toll-free at 1-800-TAX-FORM.\*

## Remote Sensing continued...



Above: Test plots showing four different nitrogen regimes. Below: Remote sensing images of the test plots taken from an aircraft at 1/2 mile altitude.



from the center area of 8 locations in each strip, along with tissue samples for biomass accumulation, and nitrogen and potassium analysis. Rice yields for each of the 8 locations in the 12 strips were also collected. The data was then analyzed to see which method was the best predictor of yield.

In all three years, the pre-flood nitrogen treatments produced significantly different rice yields. In 2003, four methods were highly correlated with yield (Pear-

son coefficient  $> 0.50$ ). These methods were remote sensing ( $r = 0.8515$ ), plant biomass ( $r = 0.7275$ ), plant height ( $r = 0.6897$ ), and hand held meter ( $r = 0.5455$ ). Tissue analysis for N was able to explain only 36% of the variation in yield, while K analysis explained 30%.

In 2004, five methods were significantly correlated with yield. These methods were plant biomass ( $r = 0.9188$ ), plant height ( $r = 0.9114$ ), plant color ( $r = 0.7669$ ), hand held meter ( $r = 0.6151$ ), and remote sensing ( $r = 0.5314$ ). Tissue analysis for N was able to explain only 39% of the variation in yield while K analysis explained less than 1%. In 2005, only two methods were significantly correlated with yield. These methods were remote sensing ( $r = 0.6020$ ), and plant height ( $r = 0.5390$ ). Tissue analysis for N was able to explain only 45% of the variation in yield while K analysis explained 36%. See Table 1.

Table 1. Pearson correlation coefficients between rice yield and nitrogen status evaluation methods, 2003, 2004, & 2005.

Method	2003	2004	2005
Plant height	0.69	0.91	0.53
Plant color	0.14	0.77	0.47
Hand held meter	0.55	0.61	0.35
Dry matter	0.73	0.92	0.14
Tissue N %	0.36	0.39	0.02
Remote sensing	0.85	0.53	0.60

Of the five methods studied, only two, the remote sensing and plant height measurements, were successful at predicting rice grain yields each of the three years of this experiment. The results for the other methods were at times inconsistent during different years. These two methods represent the best choices among the available methods. The remote sensing method gave the best predictions of yield two of the three years studied. Given the amount of time required to measure plant height in the field and the commercial availability of remote sensing data maps, more research and development should be applied to this technique for rice. \*

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# Development of a Visual Sampling Method for the Rice Stink Bug in Texas Rice Fields

Determining the population density of an insect is one of the most important aspects of pest management. A reliable estimate of an insect's density allows growers to make decisions based on population levels, rather than on calendar schedules or guesses.

Avoiding unnecessary management actions (insecticide applications, release of natural enemies, cultural operations, etc.) will result in reduced costs and increased profitability, while making an intervention, only when needed, prevents economic losses due to pest injury. Population density estimates are also necessary when evaluating the effectiveness of a management action.

The rice stink bug (RSB) is one of the most important pests of rice in Texas. It attacks the crop from heading to harvest, feeding on the developing grains, causing a reduction in head rice yield and a discoloration commonly known as peck, which reduces the quality of the grain.

To determine if RSBs are present in damaging numbers, rice fields should be sampled using a 15-inch-diameter sweep net. However, because sweeping can be tedious, time consuming, and tiring, not all scouts have adopted the sweep net as a sampling method. Also, if the scout does not have a sweep net at hand, it is difficult to determine the population level of the insect.

For these reasons, a visual sampling method was developed for Texas rice fields. During the summer of 2003 and 2004, selected commercial rice fields



Determining the population density of the rice stink bug is more time efficient and less labor intensive using the sweep stick as opposed to the sweep net.

throughout the Texas Rice Belt were inspected. In each field, three visual sampling methods were compared to the sweep net method. Sampling was conducted in fields with different cultivars, during different stages of panicle development, and at various times of day to cover a wide array of growing conditions that could affect the sampling process. The visual sampling method that related best to the sweep net was the "sweep stick".

The sweep stick is a 3 ft PVC stick that is swept 180 degrees in front of the operator from one side to the other, lightly disturbing the top of the panicles. While doing this the operator counts the number of adult RSBs observed on the rice or in flight from the area determined by the last 15 inches of the stick. After one sweep, the operator takes one step forward and then repeats the sweeping process for a total of 2 sweeps. Two sweeps with the sweep stick are equivalent to 10 sweeps of the sweep net. However, the number of RSBs that are caught with the sweep net in a rice field is higher than the number of insects that would be observed in the same field using the sweep stick. The relationship between sweep stick and sweep net counts was found to be linear (fig. 1) and described by the formula:

$$SS = 0.407 + 0.396 * SN$$

where SS is the number of adult RSBs ob-

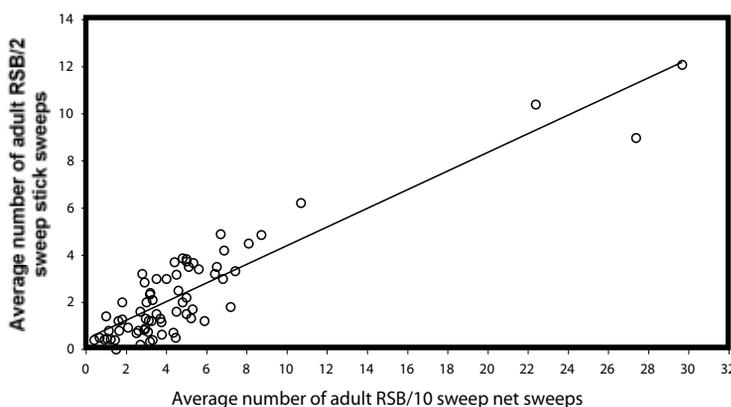


Fig. 1. Linear relationship between sweep stick and sweep net counts

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## Sampling for Rice Stink Bugs continued...

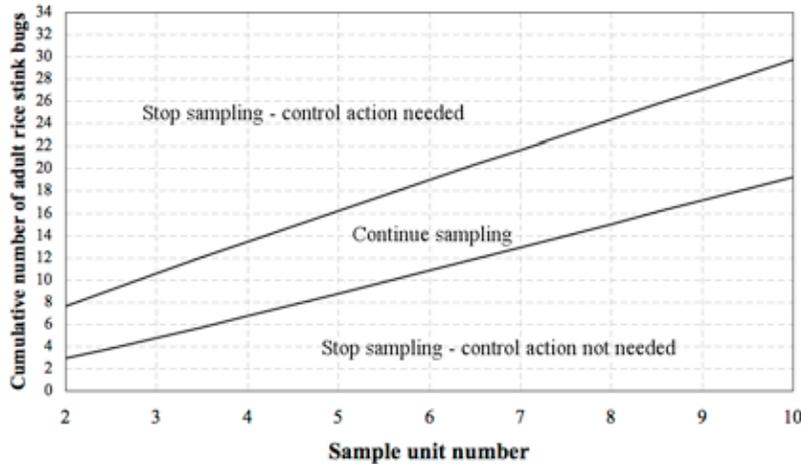


Fig. 2. Sequential sampling graph for the sweep stick for an economic threshold of 2.4 adult rice stink bugs per 2 sweep stick sweeps

served after 2 sweeps of the sweep stick, SN is the number of adult RSBs caught after 10 sweeps with a 15-inch-diameter sweep net.

Using this formula, it is possible to transform the sweep stick counts into number of insects caught with the sweep net. For example, if it is determined that the number of adult RSBs that justify a management action (the economic threshold) for a field is five per 10 sweeps of the sweep net, using the above equation we calculate that using the sweep stick, we need to observe an average of 2.4 adult RSBs per two sweeps to trigger a management action. In the same manner, if the economic threshold is determined to be 10 adult RSBs per 10 sweeps of the sweep net, this threshold becomes 4.4 adult RSBs per two sweeps using the sweep stick.

Depending on the scout's experience, some training may be needed before using the sweep stick to avoid confusing other insects with the RSB. Insects such as assassin bugs and other hemipterans are common in rice fields; however, these do not injure rice grains.

Another objective of this research is to develop a sequential sampling program for both the sweep net and the sweep stick.

Sequential sampling is a sampling procedure in which the number of sampling units necessary to reach a management decision in a field is not fixed, but depends on the number of insects encountered as the sampling process takes place. For conventional fixed sample size sampling, 10 sample units are required to determine a RSB population estimate. This means that

10, 10-sweeps of the sweep net or 10, 2-sweeps of the sweep stick are necessary to estimate the population density. Using sequential sampling, the number of sampling units required to reach the decision to treat or not to treat is optimized. In many cases, this means fewer samples are required, which reduces labor and time in the field.

Figure 2 shows a sequential sampling graph for the sweep stick for an economic threshold of 2.4 adult RSBs. After taking two sample units, the cumulative number of adult RSBs is determined and located on the corresponding axis of the graph. If the intersection between sample

unit number 2, and the cumulative number of RSBs is in the stop sampling areas, sampling is finished and a decision is reached. If the intersection is in the continue sampling area, then another sample unit is needed. This process is repeated until the interception of sample unit number, and the cumulative number of insects is in the "stop sampling" area, or until the maximum of 10 sample units is reached.

In sequential sampling, when the insect population density in a field is well above or below the economic threshold, the number of sample units required to reach a decision will be small. However, as the insect population density approaches the threshold, more sample units need to be taken. Comparing sequential sampling with conventional sampling, savings of up to 80% in sampling time have been achieved in fields where RSB populations were very high or very low.

Sequential sampling plans are being developed for the sweep net and the sweep stick, and for the most common economic thresholds used in rice. Using visual and sequential sampling as explained above, sampling for RSB will be faster and easier than the current sweep net method, improving management of this important pest. \*

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# LCRA/SAWS: A Water Plan for the Future

*The following commentary is the first of a two part series by Ronald Gertson, Region K Water Planner for the LCRA/SAWS project. The intention is to provide background information on the project, and clear up misconceptions that may have arisen since its inception.*

The LCRA/SAWS Water Project (LSWP), or “SAWS” as many refer to it, is a hot topic, as without a doubt there are many concerns by individuals and ag-related organizations. This is excusable due to a seemingly endless barrage of misinformation, and the complexity of the project further contributes to a lack of understanding. People are quickly motivated to be against the project through casual conversations that highlight potentially negative aspects without telling the whole story.

There is much that can be used to put a negative spin on the issue. Nobody wants their groundwater depleted, or their land taken from them, or to pay higher taxes as a result of land being condemned for reservoir construction.

What is the truth? Who is right? How did this project ever get this far? What do we know for sure and what will we know before the final decision on the project is made?

I have agonized over the misrepresentation this project has received and have resolved to share my knowledge of the project from the perspective of one who has invested over 4000 hours of time in the regional water planning process, since six years ago. I sponsored the Region K motion that eventually led to the creation of the LSWP.

## **History and Politics of the LSWP**

The LSWP is a complex project that seeks to develop and conserve surface water and groundwater from the three lower counties along the Colorado River. It deserves careful analysis within its proper scientific and political framework.

To appreciate the stewardship that led to the LSWP, one must start with the basic fact that water in the rivers and streams of Texas belongs to the state of Texas and not to the individuals temporarily enjoying its use along the way. The Texas Commission on Environmental Quality (TCEQ) is vested with the responsibility of permitting this water for public and private use, but the

final say on the use of Texas’ water actually lies with the Texas Legislature.

As a result of the population increase in urban centers, most of Texas’ legislators now hail from urban areas with ever-growing water needs. Water issues divide legislators along urban vs. rural lines.

In 1997, the Legislature enacted Senate Bill 1 (SB1), the omnibus water bill that comprehensively changed the way water planning was done in Texas. This law created a “bottom up” approach to water planning, and as a result, the state was divided into 16 planning regions. Each region is represented by a planning group composed of local individuals chosen to represent each of eleven water interest groups – river authorities, county government, municipalities, agriculture, groundwater conservation districts, industry, small business, environment, electric generating utilities, water utilities, and the public.

The initial appointments were established by the Texas Water Development Board (TWDB) with local input. Subsequently, additional and replacement members have been chosen by the regional water planning groups themselves.

Wharton County north of highway 71, Matagorda County and Colorado County as well as eleven other counties along the Colorado River are in Region K, a.k.a. the Lower Colorado Regional Water Planning Group (LCRWPG). The remaining portion of Wharton County south of Highway 71 is in Region P, a.k.a. the Lavaca Regional Water Planning Group (LRWPG) along with Lavaca and Jackson Counties.

SB1 calls for these regions to assemble a regional water plan once every five years. The first such plans were completed in January, 2001 and the second round of plans were completed in January of this year. SB1 also calls for the TWDB to assemble the 16 regional water plans into a comprehensive State Water Plan. In so doing the TWDB has the authority to over-ride or alter regional plans that conflict with one another. This serves as an incentive for regional planning groups to cooperate with one another in seeing that no such conflicts exist.

During the 1997-2001 regional planning round, Region K determined that a large percentage of irrigation needs in the three lower counties would go unmet during droughts if strategies for meeting those

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## LSWP continued...

needs were not developed and funded. This irrigation shortage results primarily from the growing upstream demands of the Austin area. These upstream municipal needs will take precedence over agriculture's use of the water stored in the highland lake system.

Agricultural interests in the lower counties are heavily dependent on "interruptible" stored water from the highland lakes operated by the LCRA. It is designated as interruptible because it is not contractually guaranteed to be available during periods of drought. Municipalities and industries purchase "firm" water from LCRA at a cost of about twenty times that of interruptible stored water. Firm water is reliable even through a period of extreme drought.

Generally, the more firm water LCRA delivers, the more unreliable the interruptible water becomes for irrigators. In fact, if there is not significant inflow to the highland lakes by the end of this year, the LCRA's Water Management Plan would trigger a curtailment of irrigation supplies in 2007 if rice acreage were not already well below its historic average.

Early in 2000 while Region K was developing unfunded strategies to meet the irrigation shortages, the neighboring Region L was identifying future shortages of their own, in excess of 350,000 ac-ft. Region L includes the fast-growing city of San Antonio and the L planners were evaluating as many as 14 different combinations of water supply strategies that relied heavily on large quantities of water from Region K to meet Region L's growing needs.

In order to meet K's own needs and prevent the L plan from conflicting with the K plan, Region K planners proposed to Region L a single water sharing strategy for meeting the K needs and a portion of the L needs, thereby defusing a volatile situation that could have led to an unjust, unilateral movement of water out of Region K either through TWDB's conflict resolution or through unfavorable legislative action.

The proposed plan was initially known as the Region K/Region L Water Sharing Plan. The basis for this plan was a resolution adopted by Region K referred to as the Nine-Point Plan, because it identified nine points of concern that had to be satisfied before such a water sharing plan should move forward. The intent behind the nine points was to see that there would be no losers in such an inter-regional water-sharing plan.

The 77<sup>th</sup> Legislature validated this wisdom when

it passed HB1629 in 2001 as a means of providing for the plan's implementation. HB 1629 includes much of the language from the nine points as conditions that must be met before the LCRA can transfer water to a neighboring basin. This legislation made it possible for the LCRA and the San Antonio Water System (SAWS) to enter into the agreement dated March 1, 2002 now referred to as the LSWP.

The LSWP calls for a seven-year study period followed by a 50 year implementation period and a possible 30 year extension. Four years of study are completed and some preliminary, albeit incomplete, data is presently available for some of the studies. None of the studies have uncovered a fatal flaw as of yet. A fatal flaw would occur if a necessary element of the plan is deemed incapable of meeting either the legal or financial constraints placed upon it. Such a fatal flaw would be reason enough for SAWS to legally pull out of the project at that time.

Detailed plan and study information may be accessed at <http://www.lcra.org/lswp/overview.html>.

### Key Elements of Water Project

So in review, the impetus behind the LSWP is: 1) to meet projected water shortages in our basin (primarily in irrigation) and 2) to help Region L meet a portion of its shortages thereby staving off water grabs that potentially would have very negative impacts on the Colorado River basin.

The LSWP calls for funding from the San Antonio Water System (SAWS) to accomplish several large scale tasks that together are projected to provide enough combined new water and water conservation to fully meet Region K's projected shortages for the 50 year planning horizon, and could have up to 150,000 acre-feet per year left over to help meet Region L shortages. The following outlines these tasks. These tasks include: delivery system conservation, on-farm conservation, conjunctive use of groundwater for irrigation and off-channel reservoir development.

#### CONSERVATION:

The LSWP proposes to conserve as much as 118,000 acre-feet of irrigation water annually from within LCRA's irrigation districts in Colorado, Wharton and Matagorda Counties. The conservation

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## LSWP continued...

strategies would include the on-farm practices of precision leveling and multiple inlet installation, as well as improvements in the canals themselves that could include small regulating reservoirs and automated structure controls for more precise and efficient water delivery.

Further conservation is anticipated from the development of varieties of rice that would require less water. Initial stages of this varietal development have already begun through a partnership between the LCRA and TAES.

Key Question: What will be the result if the projected amount of conservation is not achieved?

### GROUNDWATER:

The LSWP proposes to meet growing irrigation shortages in Region K by pumping groundwater wells (at SAWS' expense) directly into the irrigation canals to supplement surface water during times of low river flow. This is known as conjunctive use of surface water and groundwater.

The LCRA irrigation districts provide for the water needs of over half of the rice production in Colorado, Wharton and Matagorda Counties or roughly a quarter of Texas' rice production. Rice production brings a gross income of roughly 80 million dollars to these counties. Without the LSWP these traditional irrigation needs could go unmet by as much as 50% in major droughts due to the higher priority of growing upstream municipal uses.

It is noteworthy that HB1629 prohibits the LCRA from selling groundwater developed for this project to a municipality. In other words, the fear that groundwater is to be sent to San Antonio is unfounded and contrary to state law.

Key Question: What is the impact of the proposed pumping on local groundwater levels and what amount of impact, if any, is deemed acceptable?

### OFF-CHANNEL RESERVOIRS:

Off-channel reservoirs are a huge slice of the LSWP and are anticipated to provide a large chunk of reliable water. Much run-off from major storm systems enters the Colorado River below the upstream dams. The off-channel reservoirs would store a portion of this currently unused flow in addition to other unused flows to the extent those flows are not needed to meet

environmental needs.

Key Questions: What are the environmental impacts of removing this water from the river and can they be mitigated? Are there sufficient property owners willing to sell land to provide for the reservoir sites, without widespread use of eminent domain?

### ENVIRONMENTAL CONCERNS:

The LSWP is required by state law to "ensure that the beneficial inflows remaining after any water diversions will be adequate to maintain the ecological health and productivity of the Matagorda Bay system." (HB1629) Additionally the law requires that the project "will provide for instream flows no less protective than those included in the district's Water Management Plan for the Lower Colorado River Basin, as approved by the Texas Natural Resource Conservation Commission". (HB1629)

Key Question: What happens if during implementation of this project the TCEQ (formerly TNRCC) raises the environmental flow requirements thereby decreasing the over-all amount of water the project can make available for other uses?

### LAKE LEVELS AND UPSTREAM COMMUNITIES:

The LSWP must also result in an increase in the average levels of Lake Buchanan and Lake Travis in comparison to what the levels would be without the project, while providing 20,000 ac-ft of additional firm supplies for several upstream communities.

Key Question: Can this be accomplished without decreasing the water available for meeting downstream needs?

### PERMITTING:

Major components of the LSWP require permits of various kinds. Additionally, some of the LCRA's current water right permits would need to be amended in order to accomplish project goals.

The ability to gain the necessary permits and permit amendments could have a tremendous impact on the amount of water the LSWP is ultimately capable of producing. The permitting process will provide the public many excellent opportunities to be heard with regard to the merits of each permit or amendment sought.

*continued on page 12*

# State, National and International News...

## 10th Annual Conservation Systems Tillage Cotton and Rice Conference

In January 2007, the U.S. Rice Producers Association in cooperation with Cotton Incorporated will sponsor the 10th Annual National Conservation Systems Conference. American Farm Bureau Federation President Bob Stallman will be this year's opening speaker.

This unique national conference brings together agricultural leaders and successful farmers with objectives to share their experiences with each other and to those farmers in attendance. Every presentation will bring examples of profitable measures from research and actual farming practices that will suggest new ways to solve difficult problems and reveal novel ways to trim production costs.

The opportunity to network with a wide range of experts makes this conference attractive, as producers are encouraged to challenge presenters with questions and to share both successes and difficulties with them. We expect participants to learn not only from the presentations but from the interaction with other producers who are present at this national event.

USRPA is proud to join forces with such an impressive list of sponsors from academic, governmental and private sector agricultural organizations to bring farmers a program worthy of their time and involvement.

For more information visit [www.nctd.net](http://www.nctd.net) or email [info@usriceproducers.com](mailto:info@usriceproducers.com)

## Extension Offers Reduced-Cost Soil Test for 8 Greater Houston Counties

Texas Cooperative Extension kicked off the Southeast Texas Soil Sample Testing Campaign this month in Hardin, Harris, Jefferson, Liberty, Orange, Montgomery, Polk and San Jacinto counties. Through Dec. 1, residents in these counties can submit soil samples from properties used for agricultural purposes at a reduced cost of \$6. The normal cost is \$10. Samples for residential gardening or commercial landscaping are not eligible under the campaign.

"Some landowners live in the Greater Houston area where they work during the week, but have agricultural acreage in an adjoining county," said Wayne Thompson, Extension agent for agriculture in Harris County. "As long as the person submitting the samples is a resident of one of these counties, their soil samples can be from any land used for agricultural purposes." Extension offers soil testing as a regular service through Texas A&M University System's Soil, Water and Forage Testing Laboratory. Thompson said Extension conducts the testing campaign as a way to improve agricultural producers' accuracy in fertilization practices. To download instructions for testing from the Web, residents in the selected counties can visit [http://harris-tx.tamu.edu/anr/docs/tamu/20061201\\_soil.pdf](http://harris-tx.tamu.edu/anr/docs/tamu/20061201_soil.pdf), or call Thompson at 281-855-5600 for more information.

Article by Lorri Jones, email [LJones@ag.tamu.edu](mailto:LJones@ag.tamu.edu)

## Drop in U.S. Agricultural Exports to Cuba Hurt Rice Farming Industry

According to Alimport, the Cuban food import agency, U.S. agricultural exports to Cuba will be lower than in 2005. The reason for the drop in sales is tighter regulations that the administration has imposed on money transfers between the U.S. and Cuba. The tighter regulations on financial transactions imposed in 2005 have increased the cost doing business with the U.S. by 20 percent, according to Alimport officials.

Senator Byron Dorgan (D-ND) has introduced legislation that would bar the administration's requirement that Cuba pay cash in advance before shipment -- not just before delivery, which is the international norm for any U.S. agricultural exports. Dorgan said the administration's rule is another "back door attempt to block U.S. food sales to Cuba, by delaying delivery of those sales and imposing a requirement that U.S. competitors do not have to meet in order to ship farm products to Cuba."

U.S. agricultural sales to Cuba fell \$42 million in 2005 after the administration put the rule in place, compared to 2004 sales.

The main U.S. imports are chicken, corn, wheat, rice, soybeans, and powdered milk. Cuba has been increasing their imports from Argentina, Brazil, Canada, and China. Cuba imports approximately \$1.5 billion in agricultural products annually. The ban on U.S. food and medicine exports was lifted in 2000.

## LSWP continued...

Key Question: Would the LCRA's amended water right permits leave the irrigation districts with even less reliable water than they are currently projected to have, thereby increasing the need for groundwater?

### On-going Studies

While there are many unanswered questions about the LSWP, one can take comfort in knowing that as much as \$42 million is available to try to answer these questions, and hundreds more. The LSWP agreement calls for a seven year study period, and we are in the fifth year. Multiple studies are being conducted by third party consultants under each of the following broad categories:

- Environment
- Engineering
- Agricultural Conservation
- Groundwater for Agriculture
- Socio-Economic

Study findings and advisory committee meeting schedules can be found on-line at: <http://www.lcra.org/lswp/>. Whether or not the LSWP is ever implemented, there will be tremendous knowledge gained from these studies that will bolster the LCRA's ability to be a responsible steward of the precious Colorado River.

Part two of this series, in the Winter issue of *Texas Rice*, will concentrate in more detail on the LSWP's proposed surface water development (off-channel reservoirs), as well as ongoing studies to insure an adequate supply of water for everyone concerned.\*

Ronald Gertson is a fourth generation rice farmer from East Bernard, Texas in Wharton County. For more information call 979-758-4670, or email at [ronaldg@elc.net](mailto:ronaldg@elc.net).

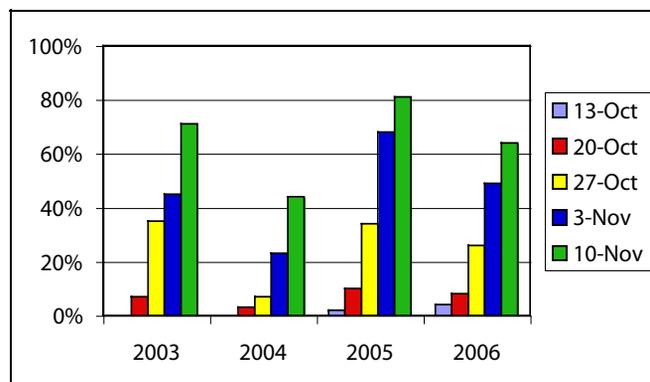
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## Rice Crop Update

As of November 10, 64% of the ratoon harvest was complete, compared to 81% in 2005, and 44% in 2004. Wet conditions kept many growers out of the field, compared to the drier fall conditions we had in 2005.

### Ratoon Harvest



## 2006 USA Rice Outlook Conference

December 3 - 5, 2006  
Caesars Palace  
Las Vegas, Nevada

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