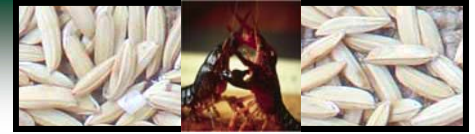




Southwest
Region



Rice Research Station News

Volume 6 Issue 4
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Fall, Winter and Spring Pre-Plant Weed Control

I am beginning to get questions on the need for burndown herbicides in rice production. With the move to more true no-till and stale seedbed production, the need for burndown herbicides is more important.

Fall applications are important if they are truly needed. A producer may have a field that was fallowed in 2009, and it may be overgrown with vegetation. Or, the producer may be in an area where a flush of troublesome weeds occurred after harvest because of warm, wet conditions in September and early October. In most cases when a fall application is made, a producer will need another burndown application closer to planting. Fall applications tend to expose bare ground, which can promote erosion. The presence of vegetation through the winter months is not necessarily a bad thing. The vegetation can provide protection from runoff or wind erosion. As a rule, fall burndown applications or fall vegetation removal should be avoided on highly erodible lands. Fall applications should be considered on a case-by-case basis and should not be done as a blanket treatment on every acre, if not needed.

From a vegetation management standpoint, it is more important to apply a burndown herbicide in a timely manner and within the guidelines of the label. The LSU AgCenter recommends burndown herbicides should be applied approximately 4 to 6 weeks before planting. This removes any vegetation that can compete with emerging rice seedlings, and it can reduce the insects that may feed on rice seedlings. In many cases, an at-planting burndown may be required even when an earlier treatment was applied. It is important to plant into a clean seedbed. Our research indicates competition from weeds is more severe within 2 to 3 weeks after rice emergence than weeds that emerge after the 3-week weed-free period.

Several herbicides are labeled as burndown or fallow treatments. Two herbicides other than glyphosate, gramoxone and 2,4-D are Valor and FirstShot. Valor is an excellent addition in a burndown program and provides residual activity on many broadleaf weeds; however, it provides little to no activity on grasses so it should be mixed with a glyphosate product. FirstShot provides excellent activity on many broadleaf weeds, and it has excellent activity on many aquatic weeds. FirstShot contains the same herbicide combination found in Harmony Extra but in a different ratio or rate. This new ratio allows the plant-back interval to decrease from 45 days to zero days. This provides an excellent tool for a burndown program. However, the herbicide has no plant-back restriction so producers feel it is okay to wait to planting. But, this is not an LSU AgCenter recommendation. Even though herbicides can be applied closer to planting, this practice should be avoided to allow the rice to emerge in a weed-free situation. Listed below are several common herbicides used in burndown vegetation management programs along with plant-back restrictions.

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Special Dates of Interest:

USA Rice Outlook Conference
New Orleans, LA
December 9-11, 2009

**National Conservation Systems
Cotton & Rice Conference**
Tunica, MS - Jan. 12-13, 2010

RTWG - Biloxi, MS
February 22-25, 2010
<http://www.rtwg2010.com/>

**Rice Research Station
Rice Field Day - July 1, 2010**

- 2,4-D (numerous trade names) – 28-day plant-back interval.
- Clarity – 22-day plant-back interval per 8 oz when applied at 24 oz/acre or less; 45-day plant-back interval per 16 oz when applied at greater than 24 oz/acre.
- FirstShot – No plant-back restrictions.
- Grandstand – 21-day prior to planting for drill-seeded and 14 days for water-seeded.
- Gramoxone Inteon – No plant-back restrictions.
- Glyphosate (numerous trade names) – No plant-back restrictions.
- Ignite 280 – No plant-back restrictions.
- Valor – 30 days prior to planting.

For more information on winter weed vegetation management visit:
<http://www.agctr.lsu.edu/NR/ronlyres/F78E2BBA-700D-4451-AFCF-251449F3A531/56764/03WinterVegetationBurndown09.pdf>

You will need Adobe Reader to view the file.

Dr. Eric Webster
ewebster@agcenter.lsu.edu



Proper timing and herbicide selection are essential when using a conservation tillage seeding program.

Research Efforts to Enhance Grain Protein Content in Louisiana Rice

New emerging rice-based products, such as rice milk, high-protein rice flour and rice whole grain cereals, are examples of potential markets that emphasize the nutritional quality of rice. A rich source of natural dietary energy, rice is also a good source of thiamine, riboflavin and niacin. Non-milled (brown) rice contains a significant amount of dietary fiber. Rice bran is a natural source of dietary fiber, vitamins, minerals, specific oils and some disease-fighting phytochemicals.

The Biotechnology Laboratory at the Rice Research Station has analyzed more than 2,000 new lines developed from Louisiana varieties and germplasm lines. Crude protein content as high as 14.51% was found among new entries derived from Cocodrie. The highest protein content found among new entries derived from Cypress was 14.2%. Typical protein content in the varieties Cocodrie and Cypress are between 7% and 8.5%. We have recovered 183 lines developed from Cypress with protein content ranging from 10.5% to 14.2%. Seventeen lines have protein content of 12.5% to 14.2%, 72 lines have protein content of 11.5% to 12.4%, and 94 lines have protein content of 10.5% and 11.4%. Seventy-nine lines developed from Cocodrie have protein content between 10.5% and 14.5%. Among these, 16 lines have protein content of 12.5% to 14.5%, 23 lines have 11.5% to 12.4% and 40 lines show protein content of 10.5% to 11.4%. Lines with an average protein content of more than 10.5% will be advanced.

High protein research has also focused on determining the stability of the trait across growing seasons. Important production traits, including yield, plant height, milling quality, grain quality, length of time from seeding to maturity, resistance to lodging and seedling vigor, are a part of selection criteria to advance high protein lines. In addition to the stability of high protein traits across different growing seasons, extensive studies are being conducted to evaluate variation for this trait within rows and among panicles.

Based on its amino acid profiles, the highest amino acid increase in a Cocodrie-derived line, HP-1570, was in arginine (48.22%). The lowest increase (17.41%) was in methionine content. An average increase of 33.21% was observed in lysine content. Some high protein lines exhibit chalkiness, and this is being evaluated.

Improved protein content provides a foundation for producing high nutritive value varieties that could potentially be used to support functional food. As personalized nutrition (nutrigenomics) becomes more common as a result of scientific and technological advances in the field of health and nutrition, improved nutritional values will be needed.

Dr. Ida Wenefrida
iwenefrida@agcenter.lsu.edu



The N-combustion analyzer used to measure total crude protein content of rice grain for screening purposes.

Below are several useful Web Pages for information on rice. Each quarter we will provide additional web pages.

Suggestions are welcomed- dgroth@agcenter.lsu.edu

LSU AgCenter Academic Departments conducting agricultural research.

http://www.lsuagcenter.com/en/our_offices/departments/

LSU AgCenter Cooperative Extension Parish Offices.

http://www.lsuagcenter.com/en/our_offices/parishes/

The International Rice Research Institute Library has an impressive collection of rice information available.

<http://ricelib.irri.cgiar.org/>

USDA ARS Dale Bumpers Rice Research Center.

<http://www.ars.usda.gov/Research/Research.htm?modecode=62-25-05-00>

And don't forget to check the 2010 RTWG in Mississippi web site for updates on the upcoming meeting

<http://www.rtwg2010.com/>

LA2162 (URN 065)

Potential New Medium-Grain Variety

In 2009, medium-grain rice acreage increased dramatically compared to recent years. Strong demand and lower medium-grain stocks resulted in higher prices compared to the historical average. As a result, many growers produced more medium-grain than usual, and some producers may have grown medium-grain rice for the first time.

Researchers at the LSU AgCenter Rice Research Station have developed new experimental medium-grain lines that exhibit many good agronomic, yield, and cooking characteristics. One line in particular, LA2162 (URN 065), has been closely evaluated for three years in the Commercial-Advanced Yield Trial conducted across the Louisiana rice-growing regions.

LA2162 was developed from a cross made in 1999, and it contains Bengal, Mercury and Rico in its pedigree. It is a very-early, conventional, semi-dwarf variety with excellent resistance to lodging similar to Neptune. LA2162 typically reaches 50% heading approximately 1 to 3 days before Neptune and Jupiter. The grain yield potential of LA2162 is slightly higher than Jupiter and substantially higher than Neptune and Bengal. In 19 trials conducted in Louisiana, the average yield of LA2162 was 8076 lb/acre, compared to 7438, 7675 and 7904 lb/acre for Bengal, Neptune and Jupiter, respectively. Limited data has indicated that LA2162 has improved ratoon potential, similar to Neptune and higher than traditional medium-grain varieties.

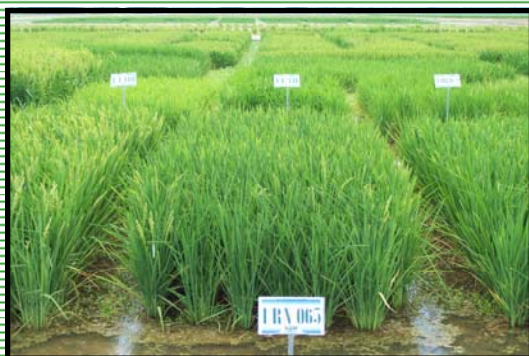
In addition to excellent yield potential, it has also exhibited good milling quality in all of our trials. Head and total rice milling yields for LA2162 have averaged 62.9:68.9% compared to 63.3:68.6%, 65.9:70.0% and 61.9:68.0% for Bengal, Neptune and Jupiter, respectively. The grain characteristics of LA2162 are within U.S. medium-grain classifications, and it appears to have a larger grain than any other medium-grain currently being produced. Large, bold grains are generally preferred by medium-grain processors. Milled rice grain sizes, measured as the weight in grams of 1,000 grains, were 10.64, 10.26, 10.10 and 8.84 for LA2162, Bengal, Neptune and Jupiter, respectively. Furthermore, it appears to have good uniformity for grain size and shape. LA2162 has good medium-grain quality and cooking characteristics with an apparent amylose content of 12.3% and a low gelatinization temperature, and the grain has a good translucent appearance.

We have planted a seed increase of LA2162 at the Puerto Rico nursery to evaluate purity and potentially provide seed for a larger seed increase in 2010. LA2162 can provide rice producers with a medium-grain variety that has excellent yield potential, good milling quality and excellent grain characteristics. We will continue to evaluate this experimental line to determine if it has a fit among the current medium-grain varieties.

Dr. Brooks Blanche
sblanche@agcenter.lsu.edu



Milled grains display the very bold and uniform grain size of LA2162 compared to Jupiter. These characteristics are typically favored by medium-grain users.



Field shots of LA2162 (URN 065) from the Rice Research Station.

Pest of the Quarter — Sheath Rot

Sheath rot is caused by the fungus *Sarocladium oryzae*. Symptoms are most severe on the uppermost leaf sheaths that enclose the young panicle during the boot stage. Lesions are oblong or irregularly oval spots with gray or light brown centers and a dark reddish-brown diffuse margin. Early or severe infections may affect the panicle so that it only partially emerges. The unemerged portion of the panicle rots, with florets turning red-brown to dark brown. A powdery white growth consisting of spores and hyphae of the pathogen is usually observed on the inside of affected leaves. Insect or mite damage to the boot or leaf sheaths increases the damage from this disease. Emerged panicles may be damaged, with florets discolored reddish-brown to dark brown and grain not filled. The disease is easily confused with *Cercospora* sheath net blotch and sheath discoloration due to bacterial panicle blight infection.



Some varietal resistance is available. The disease is usually minor, affecting scattered tillers in a field and plants along the levee. Occasionally, large areas of a field may have significant damage. No control measures are currently recommended. Fungicidal sprays used in a general disease control program may reduce damage.

Dr. Don Groth
dgroth@agcenter.lsu.edu



Rice Variety Development 101 Part III

In the two previous newsletters, we discussed rice variety development beginning with the crossing program through preliminary yield testing. This normally takes a minimum of 4-5 years. The lines that display superior characteristics in preliminary testing are considered for advancement to our Commercial-Advanced (CA) trials, as well as the Uniform Regional Rice Nursery (URN). Only about 5% of lines entered into the preliminary trials will be advanced.

The CA trials are conducted throughout the rice growing regions of Louisiana. In 2009, these tests were conducted at the Rice Research Station and at off-station locations in Evangeline, Jeff Davis, Richland and Vermilion parishes. The off-station locations are conducted in cooperation with rice producers willing to provide land, land preparation, irrigation and assistance with these trials in countless other ways. Our cooperators in 2009 were Kody and Larry Bieber (Evangeline), Jimmy Hoppe (Jeff Davis), Elliot Colvin (Richland) and Kent Lounsbury (Vermilion). The farmer will provide an area that has independent flooding and draining capabilities. We will then plant the trial using the same small plot equipment used on the Rice Research Station.

After emergence, the trial is handled just as it would be on the research station to optimize production and minimize any environmental variation that would affect our ability to evaluate true genetic differences among the lines in the trials. These trials are evaluated at least weekly, and data are collected for all characteristics just as is done on the research station. These trials are harvested using our small plot combine. Those trials harvested before August 15 will normally be ratoon-cropped to provide data on this important characteristic.

The URN is a cooperative endeavor conducted by the public rice breeding programs in Arkansas, Louisiana, Mississippi, Missouri and Texas. The nursery is a yield testing program conducted at the primary research location in each of those states. The "Uniform" comes from the fact that the same rice lines are tested at each of the five locations. The test currently contains 200 rice lines (or genotypes). The 200 entries in the test are made up of the elite lines from each breeding program that the breeders think might have the attributes for consideration as a new release, as well as the currently grown commercial varieties. Each of the breeding programs contributes a number of lines to the testing program. The yield test is then conducted at the research station in each state using the best cultural practices for that region. (The lines are also evaluated as single rows at the Rice Experiment Station in California).

All data from the testing program are then provided to each cooperator. Most of the experimental lines in our CA trials are also entered into the URN. Also, in both the URN and CA trials, the current commercial varieties are included to provide a benchmark for comparison purposes.



Rice Variety Development 101 Part III

Cont.

Between the CA and URN trials, our most advanced experimental lines are evaluated in 10-12 yield trials each year. The CA and URN trials are extremely important in making decisions on potential variety releases. It is critical that a line be evaluated under numerous environments. We are looking for superior and stable performance. We often see a line that will have excellent performance in two or three of these trials but average or inferior performance in several others. This line will be eliminated because of a lack of stability. Also, as with the preliminary trials, all of the entries in each of these trials are evaluated by Dr. Don Groth for relative susceptibility or resistance to major rice diseases.

Lines that show good and stable yield, milling and agronomic characteristics across all these diverse environments will be re-entered into these trials the following year. A line that shows good potential as a future release will also be provided to Dr. Dustin Harrell for inclusion in his statewide Variety by Nitrogen Rate testing program. In addition, Dr. Eric Webster will evaluate these lines for differential response to selected rice herbicides. This research is conducted so that if a line is released as a variety, we can also provide a package of agronomic recommendations for its production.

If a line displays significantly better performance than the current commercial varieties, it may also be grown as a larger headrow population as a step toward potential increase. Remember, each line in these testing programs is also concurrently being grown as panicle rows for purification and increase. A typical headrow population is approximately 1,000 rows, which is often grown at our winter nursery facility in Puerto Rico. Seed from this size headrow increase will easily provide enough seed for up to a 20-acre foundation seed field on the Rice Research Station. The foundation seed production is under the direction of Mr. Larry White, who works closely with the breeders through each step of increase and purification.

We generally want at least three years of CA and URN data before we would consider a new variety release. We will be increasing seed on superior lines during this same time period so we often have foundation seed production during the third year of testing. If we feel that the line has consistently shown superior and stable performance after the third year of advanced testing and we have adequate foundation seed available, we will prepare a comprehensive data package on the line and provide this to the director of the Louisiana Agricultural Experiment Station. If, after reviewing the data, the director agrees this is a candidate line for release, a committee will be appointed to evaluate the data and make a recommendation on the release. The final decision rests with the director. If the decision is positive, the director will ask for suggestions and approve the name for the new variety.

Foundation seed will then be made available to Louisiana seed growers based on the allocation formula developed a number of years ago by the Louisiana Seed Rice Growers Association. The Rice Research Station will continue to produce foundation seed for any released variety for as long as demand remains in the industry.

Thus, rice variety development is a long-term process that demands a great deal of time, hard work and dedication by a large number of people within the LSU AgCenter.

Dr. Steve Linscombe
slinscombe@agcenter.lsu.edu

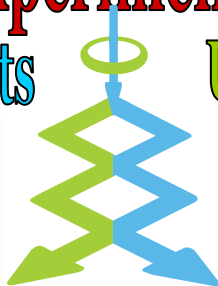
2009 Experimental Lines

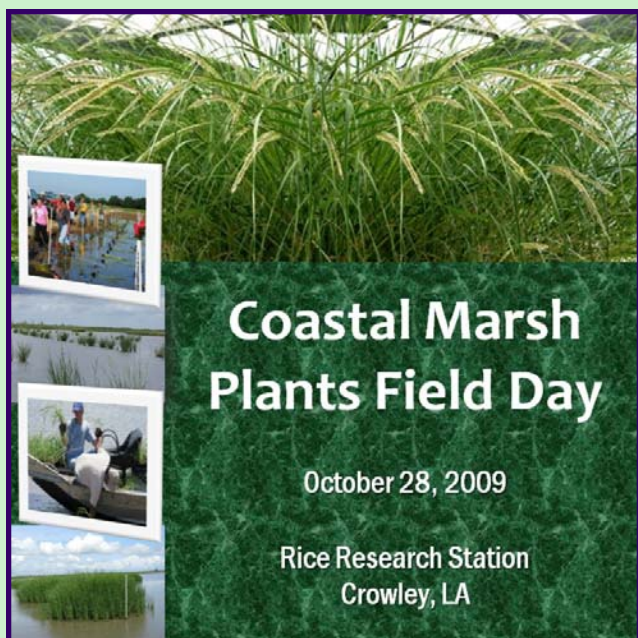
Commercial Advanced Tests

Uniform Regional Nursery

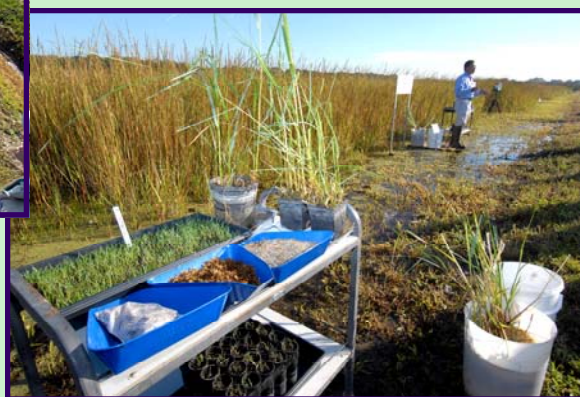
- ⇒ **Rice Research Station**
- ⇒ **Evangeline Parish**
- ⇒ **Jeff Davis Parish**
- ⇒ **Richland Parish**
- ⇒ **Vermilion Parish**

- ⇒ **Louisiana**
- ⇒ **Arkansas**
- ⇒ **California**
- ⇒ **Mississippi**
- ⇒ **Missouri**
- ⇒ **Texas**





Dr. Herry Utomo



A Coastal Marsh Plants Field Day was held at the Rice Research Station on October 28. The field day provided an opportunity to highlight the important research being conducted in genetic improvement of coastal restoration plant species within the LSU AgCenter. It also provided an excellent forum for discussion of coastal restoration efforts which are critical to coastal Louisiana.



www.lsuagcenter.com/en/our_offices/research_stations/Rice/



Rice Research Station
1373 Caffey Road
Rayne, LA 70578
 Phone: 337-788-7531
 Fax: 337-788-7553
 E-mail:
slinscombe@agcenter.lsu.edu



This newsletter is produced by:
Karen Bearb
Bruce Schultz
Don Groth
Darlene Regan
Steve Linscombe
Linda Benedict
Frankie Gould

Focus

Carol LeDoux started working at the LSU AgCenter Rice Research Station in 1978. She keeps the books for the station, the same job she did when she started 32 years ago.

After attending the University of Southwestern Louisiana, she went to work in Crowley for the state welfare office for a year before taking the job at the station.

"It's been a second home for years," she said. "I couldn't have found a better place."

She's near retirement but plans to keep working.

Most of the changes that she has experienced involved technology - from typewriters to "word processors" that have now been replaced with computers.

"There were changes everyday, and there still are," LeDoux said.

She still maintains a hand-written record of the financial records to have on hand if the computer system crashes.

LeDoux grew up in Indian Bayou where her father and grandfather were rice farmers, and her great-grandfather had a post office. She lives in the family home, built more than 100 years ago as a one-room house with 12-foot ceilings. Remodeling the home place has become a pastime.

When she's not at work or working on the house, she enjoys working in her flower garden and baking. Her two sons, Cary and Dylan, live with her and work in Baton Rouge.



Research partially funded by the Louisiana Rice Research Board

The LSU Agricultural Center is a statewide campus of the LSU System and provides equal opportunities in programs and employment.