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Rice Research Station News

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Seeding Rates for Rice Varieties

Choosing a rice variety or hybrid is the first important decision you will make for the upcoming 2014 rice crop. Once a variety or hybrid has been chosen, the next decisions include determining a proper seeding rate to maximize yield and determining how much seed you need to purchase. When determining your seeding rate for rice varieties, keep in mind that rice yields can be maximized with a target plant population of 10 to 15 plants per square foot. Higher plant populations above this will not enhance yields, and it is likely they can have a negative effect. For example, high plant populations can lead to an increased potential for disease pressure and increased lodging, which will reduce grain yield and grain quality.

Now that you have a target plant population in mind, you need to determine the amount of seed per square foot required to obtain that target plant population. Unfortunately, this determination is not an exact science. Research has shown that for typical variety seeding rates under normal conditions in a drill-seeded system, it takes approximately two rice seeds for one rice seedling to survive to the 5th-leaf to 1st-tiller stage of development. That means you will need to plant approximately 20 to 30 seeds per square foot to reach that desired plant population of 10 to 15 plants per square foot.

What is normal anyway? In production agriculture, nothing is ever normal. Many things can reduce the survival of every planted seed or emerged seedling. This can include the quality of the seed, soil and air temperature, seed to soil contact, soil moisture (too much or too little), use of gibberellic acid, competition from weeds or other rice seedlings once emerged, seedling disease pressure, nutrient deficiencies, insect pressure, and the list goes on. Nonetheless, the estimate of needing two seeds to obtain one surviving rice plant at the 5th-leaf to 1st-tiller stage of development is a good starting estimate.

Last time I checked, rice seed was sold in pounds. So, now that you have a target seeding rate of 20 to 30 plants per square foot in mind, the next step is determining how many pounds of seed you need per acre. Remember, rice varieties have different seed sizes and weights so this determination is variety dependent. Refer to the seed weight table in the 2014 Rice Variety and Management Tips publication (page 8) to help you with this step. An abbreviation of this table is shown below. First, find your variety on the left-hand column. Then, find your targeted seed per square foot in the middle of the table (20 to 30 seed per square foot). Once found, trace your finger to the top of the table to determine the seeding rate in pounds per acre. For example, you would need to plant 50 to 70 pounds of seed per acre to reach the desired plant population for CL111. You can use the lower seeding rate if conditions are favorable and the higher rate when you expect conditions to be unfavorable.

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Table 1. Seed per Pound and Average Number of Seed per Square Foot for Important Rice Varieties.

Variety	Seed/lb†	Seeding Rate (lb/A)								
		40	50	60	70	80	90	100	110	120
		seed/ft²								
Antonio	19,324	18	22	27	31	35	40	44	49	53
Caffey	15,701	14	18	22	25	29	32	36	40	43
Catahoula	18,274	17	21	25	29	34	38	42	46	50
Cheniere	19,752	18	23	27	32	36	41	45	50	54
CL111	18,398	17	21	25	30	34	38	42	46	51

Picture from a 2012 seeding rate trial where optimum plant populations were determined.

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Special Dates of Interest:

Rice Technical Working Group
February 18-21, 2014
New Orleans, LA

Rice Research Station Annual Field Day
Wednesday, June 25, 2014
Crowley, LA

Pest of the Quarter Creeping Rivergrass

Creeping rivergrass [*Echinochloa polystachya* (Kunth) Hitch.] is native to South America and particularly problematic in the Amazon region, where it forms solid stands by outcompeting the native vegetation. It is estimated that 12,000 to 15,000 acres of rice and crawfish production in south Louisiana are infested with creeping rivergrass. Although movement and spread of the species are slow, once established in an acceptable environment, it is difficult to manage.

Aggressive growth habits and the competitive nature of creeping rivergrass, coupled with the sub-tropical climate of south Louisiana, increase the weed's invasive potential. The coastal region of Louisiana receives up to 60 inches of annual rainfall, twice the required rainfall needed for creeping rivergrass to establish and survive. Creeping rivergrass can produce dry matter equivalent to the most efficient plants on earth, and biomass production occurs at a rate of 7,000 tons per acre per month.

Both carbon dioxide and water use efficiency of creeping rivergrass are comparable with those of fertilized corn in warm, temperate conditions. Creeping rivergrass sequesters high amounts of nutrients, including nitrogen and phosphorus. In Louisiana, rice requires high amounts of nitrogen, phosphorus and potassium and is grown in flooded conditions for much of the crop cycle. Although rice is an efficient consumer of nutrients, dense stands of creeping rivergrass can be highly competitive with rice.

Environmental and cultural practices associated with rice production create favorable conditions for growing and reproducing many terrestrial, aquatic and semiaquatic weeds. Rice yield and growth are affected by interference of more than 70 weed species, causing an average yield loss of 17 percent. The most common rice weed species are barnyardgrass, junglerice, broadleaf signalgrass, ducksalad, hemp sesbania, red rice, sprangletop species and sedges. Of these species, grass weeds are the most common in rice production systems.

Creeping rivergrass with exposed ligule.

Barnyardgrass and junglerice are considered the most important weeds in rice production in the world and are the most common weeds found in Louisiana rice production. Barnyardgrass and junglerice are considered annuals and are genetically similar to creeping rivergrass; however, creeping rivergrass is a perennial and reproduces primarily by stolons rather than seed.

Depending on planting density, research conducted in Louisiana indicates creeping rivergrass can produce a total aboveground stolon length of 3 to 60 miles per acre and aboveground fresh weight of 116 to 1,130 pounds per acre at 100 days after study initiation. Creeping rivergrass plants also produced 114,000 to 1.1 million nodes per acre, demonstrating the high growth and reproductive potential of this weed.

A herbicide program for the management of creeping rivergrass should include glyphosate applied at 1 quart per acre as a burndown treatment. Glyphosate should be used throughout the fallow period when tillage is not an option, as well as immediately prior to rice planting. A Clearfield rice variety or hybrid should be selected to allow the use of two applications of Newpath applied at 6 ounces per acre. Clincher should be used as needed throughout the season at 15 ounces per acre. Although residual preemergence herbicides have no activity on creeping rivergrass, the addition of a herbicide, such as Command, would help control other weed species, allowing the rice to emerge free of competition from other weeds.

Employing an adequate herbicide program – coupled with other integrated management strategies such as tillage, early planting and increased rice seeding rates – decreases the competition of creeping rivergrass with rice, reduces total population size, and reduces the spread of this weed. The integrated weed management program should be implemented indefinitely in fields that have established stands of creeping rivergrass until the population of the field, neighboring fields and irrigation water-ways are completely controlled.

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Are Insecticide Seed Treatments Worth It?

The majority of rice producers in Louisiana now use one of three available insecticidal seed treatments (Dermacor X-100, CruiserMaxx and NipsitINSIDE) to help manage their insect pests. Seed treatment insecticides offer many advantages, including ease of use and superior effectiveness against the rice water weevil, the primary target pest. Using seed treatments is, however, generally more expensive than using foliar insecticides, and the decision to use seed treatments must be made before a producer knows if his fields will be infested with pests. Moreover, no insecticide should be used indiscriminately because all insecticides can have deleterious environmental effects. Thus, the question of whether seed treatments are worth their cost is an important one.

A recent economic analysis of trials done in Mississippi sought to directly answer this question. By examining yield differences between untreated fields and fields treated with Dermacor X-100 or Cruiser Maxx, and using current rice prices, the economic benefits associated with the use of seed treatments were calculated and compared with the economic costs of using seed treatments. This analysis found that Dermacor X-100 gave a net return on investment in 72 percent of the fields where it was used (57 trials), while CruiserMaxx gave a net return in 79 percent of the fields where it was used (48 trials). In Mississippi, seed treatments pay for themselves (and more) roughly 75 percent of the time.

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Are Insecticide Seed Treatments Worth It?

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Although a comparable analysis has not yet been conducted with Louisiana data, data from insecticide demonstration trials conducted in commercial rice fields in Louisiana from 2008 to 2011 indicate the rice water weevil is at least as important a pest in Louisiana as it is in Mississippi. In these demonstration trials, between 65 percent and 100 percent, depending on the year, of fields not treated with insecticides were found to harbor populations of rice water weevils that exceeded three larvae per core sample, a density that translates to a $10 to $15 loss per acre. The average rice water weevil density in untreated fields across the four years of the study was about 11 larvae per core sample, a density which causes yield losses between 5 percent and 10 percent. Furthermore, recent research across the South has shown that seed treatments can help manage many of the insect pests that occur sporadically in rice fields. Dermacor X-100 helps control sporadic lepidopteran pests such as stem borers and fall armyworms, while the neonicotionid seed treatments (Nipsit and Cruiser) have activity against occasional pests such as colaspis and chinch bugs. Given the widespread occurrence and damaging nature of the rice water weevil in Louisiana, and the effectiveness of seed treatments against other pests, the use of a seed treatment insecticide is probably warranted in most fields in Louisiana.

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Rice water weevil larvae on rice roots

35th RICE TECHNICAL WORKING GROUP

MEETINGS HELD AT THE SHERATON NEW ORLEANS

HOSTED BY LSU AgCenter Research & Extension

FEBRUARY 18-21, 2014
NEW ORLEANS, LA

FOR MORE INFORMATION VISIT THE WEBSITE AT:

WWW.RTWG.NET

CLICK HERE TO REGISTER FOR THE RTWG MEETING

Accommodations

https://www.starwoodmeeting.com/Book/rice

500 Canal Street, New Orleans, Louisiana
504-525-2500

Rice Technical Working Group

February 18-21, 2014

Sponsorship Opportunities

Sponsorships for the 2014 Rice Technical Working Group Meeting in New Orleans, LA, are now available. This is your opportunity to showcase your company while also showing your support of both the rice industry and this long-standing professional research organization. Sponsorship gifts to the Rice Technical Working Group Meeting offer increased exposure and visibility to your company, position your company as an industry leader, and allow you to reach a large audience in a cost-effective manner.

CYPRESS $5000 +

•Two complimentary meeting registrations.

• One half-page full-color advertisement in the RTWG 2014 program.

• Your company can promote or highlight new products or services with the insertion of one promotional piece in registration bags.

• Access to meeting attendee list upon request.

• Recognition as an official Cypress level sponsor in the meeting program and on the RTWG 2014 website.

CATAHOULA $2500-4999

• One complimentary meeting registration.

• One quarter-page full-color advertisement in the RTWG 2014 program.

• Your company can promote or highlight new products or services with the insertion of one promotional piece in registration bags.

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COCODRIE $1000-2499

• One business card size, color advertisement in the RTWG 2014 program.

• Your company can promote or highlight new products or services with the insertion of one promotional piece in registration bags.

• Access to meeting attendee list upon request.

• Recognition as an official Cocodrie level sponsor in the meeting program and on the RTWG 2014 website.

MAGNOLIA $100-999

• Access to meeting attendee list upon request.

• Recognition as an official Magnolia level sponsor in the meeting program and on the RTWG 2014 website.

Sponsorships of breaks or receptions are also available - please contact us for information.

Sponsorship Form

To commit sponsorship or for more information contact:

The Rice Technical Working Group is made up of research and extension personnel in the rice-growing states of Arkansas, California, Florida, Louisiana, Mississippi, Missouri and Texas. At the RTWG 2014 meeting, these professionals will come together to share the newest discoveries and innovations in rice breeding, genetics, entomology, plant pathology, weed science, rice storage and processing. An up-to-the-minute exchange of information, enabled by a meeting such as this, is especially important in current market conditions. Because many of the rice varieties growing in fields today were produced by public breeding programs, farmers trust these researchers to continue making advancements in DNA marker technology, to test the new chemistries needed to enhance fertility and combat yield-robbing pests, and to study grain handling efficiency.

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Thank you for your consideration as we look forward to a productive 2014 meeting.

New Rice Varieties for 2014

The Rice Research Station will release two new varieties for production beginning in the 2014 growing season. CL271 is an early-maturing, short-stature Clearfield medium-grain variety, which was tested as LA1202065. It has consistently outyielded CL261, which is the only Clearfield medium-grain variety now available in the southern United States. In 18 head-to-head yield tests in 2012 and 2013, CL271 had an average per acre yield of 8,995 pounds compared to 7,687 pounds for CL261. CL271 has also shown similar or slightly better yields than Jupiter and Caffey, the predominant conventional (not Clearfield) medium grains. The new variety is also similar to CL261 in plant height and three to four days later in maturity. CL261 is known for having excellent whole-grain milling yields and excellent grain appearance characteristics, and CL271 looks to be similar in these traits. One of the significant advantages of CL271 is the very high level of resistance to blast disease. CL261 is very susceptible to this disease, which was especially evident during the blast epidemic of 2012 in southwest Louisiana. The new variety also has shown high levels of resistance to Cercospora. It is moderately susceptible to sheath blight and susceptible to bacterial panicle blight and straighthead.

Another new variety will be marketed as CL-Jazzman. This is an aromatic, soft-cooking Clearfield long-grain line. The line has cooking, appearance and aroma characteristics similar to Jazzman-2. It has very nice aroma and excellent grain appearance, as well as very long and uniform milled grains. Jazzman and Jazzman-2 were grown on approximately 33,000 acres in Louisiana in 2013. The new variety will allow for the production of a Jazzman-type variety to be grown using the Clearfield production system. CL-Jazzman has excellent grain yield and has consistently outyielded both Jazzman and Jazzman-2. The new variety is similar in height to Jazzman, making it 4-5 inches taller than Jazzman-2. Therefore, CL-Jazzman will be somewhat more susceptible to lodging than Jazzman-2 and will require slightly lower levels of applied nitrogen. The new variety is similar in maturity to Jazzman-2 and about three days earlier than Jazzman. CL-Jazzman is highly resistant to blast disease and Cercospora, moderately susceptible to sheath blight, and susceptible to both bacterial panicle blight and straighthead disorder.

Both CL271 and CL-Jazzman are Clearfield lines that will allow for the use of the Clearfield system to control for red rice and other problem weeds in rice production.

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Rice Fungicide Seed Treatments

Rice seed and seedlings suffer severe damage from seed rots and seedling damping off caused by microorganisms, primarily fungi, which results in dead or weak seedlings and poor stands. These organisms can be seed-borne or present in the soil. Seedling rot is often referred to in rice as water mold (Figure 1) and is more common in water-seeded systems than dry-seeded systems. These diseases are caused by a complex of fungi infecting the seed and are more severe when soil and water temperatures are low or unusually high. Seed treatment is based on the concept of surrounding the seed and early seedling (Figure 2) with a fungicide that prevents infection and damage by these microorganisms. Some of these fungicides operate by providing a protective area around the seed, while some are systemic and enter plant tissues. Treatment effectiveness depends on how contaminated the seed or the soil is and how favorable conditions are for infection. Under severe conditions, no seed treatment is effective. In addition to the loss of the seed and cost of replanting, seed and seedling diseases reduce the competitiveness of rice with weeds. Although fields with poor stands can be replanted or over-seeded, this leads to late-maturing rice, a condition less favorable for high yields. Seed treatments can reduce these losses.

Figure 1. Typical water mold

Field trials are carried out to determine the most effective fungicide seed treatment and the optimum rate of application. Too little fungicide provides poor control, and excessive rates are likely to be phytotoxic. Trials are conducted in favorable environments for infection, usually early in the year when conditions are cool and moist. Trials are run in different locations for several years to test seed treatments over a wide range of climatic conditions. In trials at the Rice Research Station, fungicide seed treatments averaged a 10%-25% increase in stand densities over the untreated controls in unfavorable conditions. Often this was enough to change a poor stand into an adequate stand. However, when disease was severe,

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Rice Fungicide Seed Treatments

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seed treatments were ineffective. When warm, moist environmental conditions favored germination and seedling establishment, stands were not significantly increased. Seed treatments were most beneficial early and late in the planting season. Most of the time yield increases over the untreated checks were not statistically significant. This is due to rice's ability to compensate for thin stands with additional tillering. If compatible, insecticides, growth regulators (such as gibberellic acid) and nutrients can be included with fungicide seed treatments and help improve stands.

Adequate rice stands provide yield potential and competition against weeds. With the increasing cost of hybrid and private varieties and the trend to lower planting rates, to reduce costs and lower foliar disease pressure, seed treatments are an important investment toward ensuring adequate and vigorous stands. It is suggested that rice seed be treated with a recommended fungicide at the proper rate to reduce seed and seedling diseases. A list of recommended fungicides is available from your Cooperative Extension Service. Most seed is treated by seed dealers and is readily available.

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Figure 2. Rice seedling establishment

EARLY SEASON WEED CONTROL

Rice weed management for 2014 began in the past. For the 2014 growing season, the last time rice may have been grown was in 2013, 2012 or earlier. It is very important to have an understanding and knowledge of what weeds infested any particular field the last time rice was grown on any farm. If a producer has this basic knowledge of historic weed pressure, a weed management program can be developed. This will allow the grower to make informed decisions that will be more practical and profitable.

The use of a standard herbicide program on every field can put the producer at a disadvantage. After 16 years in Louisiana, I have learned standard, across-the-board weed control programs do not exist in the state. This statement cannot be said for other rice-producing areas. The lack of a standard program in the state has helped manage the development of weed resistance problems seen in other parts of the country. Louisiana's success in the area of weed resistance management is as an example of how things should be done.

The best early season weed control is to start with a clean seedbed. If a no-till or stale-seedbed program is standard practice on your farm, the initial burndown program should be applied six to eight weeks prior to planting. It is important to start with a clean seedbed to reduce competition for space and light between rice with weeds.

Graduate student Ben McKnight applies herbicides

The rice weed management program at the LSU AgCenter has shown that being aggressive during the early growing season is an economical advantage. Yield loss due to weed competition occurs in the first three to four weeks after rice emergence, and if a producer can allow the crop to be weed-free for this period of time, over half the battle is won. If a preemergence herbicide is used, make sure it is activated by adequate rainfall or surface irrigation. Postemergence herbicides work much better when applied to small, actively growing weeds. It is never a good idea to allow weeds to become large before applying postemergence herbicides. When a producer gets into a salvage situation, herbicide programs are more expensive plus yield loss has already occurred.

It is very important to select a weed management program that fits your production practices and systems. Always refer to labels for rates and application instructions. Learn to correctly identify weeds because the wrong herbicide selection can be expensive. For example, several herbicides have activity on hemp sesbania, but if the weed present is actually jointvetch, which can be confused with hemp sesbania, control may be drastically reduced if the wrong herbicide is used.

There are a lot of resources available through the LSU AgCenter to help with your weed management decisions. These sources are county agents, extension specialists, printed materials and the Internet. Good luck with your decisions and the 2014 growing season.

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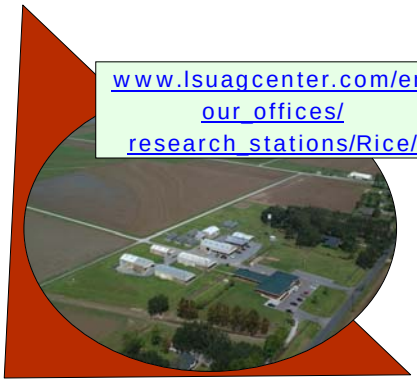

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RICE RESEARCH STATION 1909-2009

Gretchen Zaunbrecher

Focus

Dr. Gretchen Zaunbrecher, of Roberts Cove, has worked at the LSU AgCenter Rice Research Station since July 2008 as a research associate with Dr. Herry Utomo.

She graduated in 1988 from Notre Dame High in Crowley. She received a master's degree at Texas Tech University in reproductive physiology and her bachelor's degree from the University of Louisiana at Lafayette in animal science.

Gretchen received her doctorate in transgenics at Texas A&M in 2004. One of her projects in her doctoral work involved cloning pigs to develop organs that could be used for patients needing transplants.

Her DNA work shifted to plants when she started working at the station. She identifies genetic markers for desired traits in rice plants and coastal marsh plants. In addition, she has started working on the hybrid project with Dr. Jim Oard.

Gretchen said her work requires taking samples of leaf tissue and isolating DNA to find the intended markers, particularly for blast resistance.

Utomo said Zaunbrecher is a valuable asset to his project. "She has a strong work ethic and pays attention to details and directions. She is excellent in carrying out DNA lab analyses."

Before working at the Rice Station, she taught at LSU-Eunice and the University of Louisiana at Lafayette.

Much of her work appears tedious and labor intensive, but Gretchen said she enjoys her work.

"It's repetition, but each time it's a little different. If there is a problem, I like figuring out the solution."

She grew up surrounded by agriculture and showed sheep in the 4-H program. Her father, Steve Zaunbrecher, works for BASF. Her brother, Quentin Zaunbrecher, previously worked at the station.

In her spare time, she reads, knits and enjoys time with her family.

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