Texas Rice

Texas A&M University System
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The Anatomy of a Weed and Strategies for Alternative Control

Although at first glance it might seem obvious, defining a 'weed' is a complex issue among plant scientists. Some would define a weed as simply a plant growing in a location that it is not required. A more complex ecological definition would be a species that can successfully colonize an area with multiple disturbances, or successful competitors arising out of a mismatch between environment and cultivated crops. To complicate the issue further, many species that are considered weeds in one region of the world are highly prized for food or fiber in another region.

It is interesting to consider that weeds seem to have co-evolved with cultivated plants, as shown by pollen analysis that indicates common evolutionary lines. The role that humans have played in selecting crop plants, and therefore weeds, is evident by the fact that nearly 44% of the world's worst weeds belong to the family Poaceae, which happen to provide 8 major crops, namely wheat, maize, rice, sorghum, barley, millet, oat and sugarcane.

According to papers published by J.S. Holt, weeds are successful for the following reasons:

- Well-adapted seed dispersal, aided by wind, water, animals and humans
- Seed resistance to animal digestion
- Prolonged viability of seeds through dormancy, to survive through unfavorable conditions
- Seed polymorphism

Sesbania, a member of the legume family, is the bane of U.S. rice farmers.

These last two traits are related, and worth a bit more explanation. Seed polymorphism refers to plants having multiple alleles of a gene within a population, usually expressing different phenotypes. Polymorphism results from an evolutionary process, as does any species trait. Polymorphism is heritable, and is modified by selection (either artificial or in the wild). In polyphenism, an individual's genetic make-up allows for different morphs, and the switch mechanism that determines which morph shown is environmental. This gives many weed species the ability to readily adapt, and compete vigorously with cultivated crops.

Another use of the term refers to the ability of a plant to produce both immediately viable and dormant seeds. A dormant seed is one where there are blocks that must be overcome for the seed to germinate. These may be internal (metabolic or seed coat restrictions) or external (light, temperature, moisture) in nature. This ability of some weed species to produce dormant seeds means that the subsequent seedling establishment

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From the Editor...

Changes in Texas Rice Production

Welcome to the Winter issue of *Texas Rice*. End of season rice yield reports continue to trickle in. Yields for the 2007 crop are off from last year's record-breaking level. Our best estimate to date is that 2007 Texas rice yields will average ca. 6,600 lbs/ac, compared to ca. 7,400 lbs/ac last year.

The reduction was largely due to a number of factors.

- Cool wet springs caused a significant amount of seedling death for many early planted fields, which required a greater than average amount of replanting. In some fields, seedling death reached 85-90%.
- Planting was delayed for up to several weeks for fields that missed the early- to mid-March planting-window. Delayed planting results in a greater percent of flowering during periods of higher temperatures, which required a greater expenditure of metabolites, for crop growth and development. This in turn caused reduced flower set and reduced grain yield.
- Prolonged rainy weather decreased pollen viability and reduced fertilization of the flowers, which decreased grain set. Reduced grain set can negatively impact total yield.
- Organic rice acreage accounted for ca. 8% of the state's total rice production. Organic rice fields typically yield ca. 30-40% of conventional commercial yields, this brought down the statewide average rice yields. An organic rice crop that yields 40% of the yield of a conventionally crop is equal to a 60% yield decrease. Multiplying a 60% yield decrease by 8% of the acreage is equal to a 5% drop in the average yield per acre. On a positive note, organic rice received a premium of $24/cwt, which in many cases more than offsets the lower yield, providing some growers significant increases in revenue.

Early December saw many of our rice leadership attending the U.S. Rice Outlook Conference in Orlando, Florida. In general, most states expect to see a decrease in planted acreage for 2008. Texas expects to see acreage going either up or down depending on prices, with a range of 135,000 to 160,000 acres predicted. While July 2008 futures prices for long grain rough rice stood at $14.10/cwt at the time this editorial was written, much of the increase in prices will be offset by increased fuel and fertilizer costs. Let's hope last year's August Bloomberg article of $20/cwt for long-grain rice being reached within the next two years holds true.

The cover article for this issue of *Texas Rice* provides a general overview of alternative management approaches for weed control. Ms. Jay Cockrell, the author of that article, has long been a proponent of organic agriculture and discusses some of the non-chemical approaches to weed management in rice. Included is a discussion of cultural control through cultivation, which is also heavily used in conventional rice production, crop rotation, which is a challenge for our heavier soils along the Upper Gulf Coast, biological control using fungi and bacteria, and the development of allelopathic rice varieties that basically produce naturally occurring chemicals that inhibit weed germination and growth. While these approaches currently do not provide the degree of control required to produce conventional rice, they are undoubtedly important in producing organically certified rice. Cover crops in particular hold tremendous potential for organic production. They address an important limitation to organic rice yields, that be-

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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.

Potential New Product for Rice Water Weevil and Stem Borer Control

A new product is being evaluated by Beaumont Center Entomologist Dr. M.O. Way for the control of rice water weevils (RWW), and possibly South American rice miners (SARM) and stem borers. Working in cooperation with DuPont, Way has 3 years of data on DuPont™ Dermacor™ X-100 seed treatment, (the active ingredient is Rynaxypyr™). Researchers across the Southeast rice producing states requested a Section 18 exemption that would make Dermacor™ X-100 available to farmers in the 2008 growing season. The Section 18 packet is now under review by the TDA and EPA.

In trials at Beaumont and Ganado, no delay in rice emergence or phytotoxicity was found in any of the seed treatments, and rice plant stands were unaffected. Fewer SARM damaged leaves were found in the Dermacor™ X-100 seed treatments compared to the untreated. In looking at different rates, the middle and high rates of Dermacor™ X-100 provided significantly better control than the Karate Z treatment, which was applied after permanent flood (SARM damage inspections were conducted 59 days after planting, and core samples for RWW were taken 20 and 32 days after permanent flood).

All Dermacor™ X-100 seed treatment rates gave excellent control of RWW on both sample dates, in spite of high RWW populations in the untreated. On the second sample date, all Dermacor™ X-100 seed treatments significantly outperformed the Karate Z treatment.

Stem borer damage, reflected in whiteheads, was minimal at the Beaumont site so no conclusions can be drawn from that data. However, at Ganado, where stem borer damage was very severe in the untreated plots, the Dermacor™ X-100 treated plots yielded over 700 lbs/ac more than the untreated. (Table 1)

Overall, Dermacor™ X-100 seed treated plots significantly out yielded the untreated plots. After 3 years of research, the seed treatment appears to be very effective controlling RWW, and potentially other rice insect pests. ✻

Article by Dr. M.O. Way and Jay Cockrell

Table 1. Evaluation of seed and foliar treatments for stem borer control in rice, Ganado, TX. 2007.

Trt. #	Description	Rate lb AI/A / mg AI/seed[a]	Timing[b]	No. panicles /ft of row	No. WHs/plot[c]	Yield lb/A
1	Untreated	---	---	27	69 ab	6660 bc
2	Cruiser 5FS	0.064	ST	26	90 b	6140 c
3	V-10170	0.120	ST	28	60 b	6432 c
4	DuPont™Dermacor™ X-100 seed treatment	0.331 / 0.10	ST	28	2 d	7388 a
5	Rynaxypyr™	0.026	LB	25	12 c	7439 a
6	Rynaxypyr™	0.026	H	30	4 d	7053 ab
7	Rynaxypyr™	0.046	LB	26	4 d	7407 a
8	Rynaxypyr™	0.046	H	26	5 cd	7418 a
				NS		

[a]mg AI/seed given 18,800 Cocodrie seeds/lb and 80 lb/A seeding rate.
[b]ST = seed treatment; LB = late boot; H = heading.
[c]No. per 4 middle rows.
Means in a column followed by the same or no letter are not significantly different (NS, $P > 0.05$, ANOVA, LSD).

may be distributed both spatially and through time, giving the plants a competitive edge in a cultivated crop environment.

Holt gives other explanations for weed species success:

- As explained by seed polymorphism, seedlings can establish in a wide range of environments
- Once established, the plants are good at resource capturing through efficient photosynthetic pathways, and water and mineral uptake
- Abundant seed production and relatively short time to sexual maturity
- And for perennials, a higher rate of vegetative reproduction.

Finally, because of all these traits, weed species can rapidly become resistant to chemical herbicides which are predominant in commercial agriculture. The question is, what are other methods available to farmers to broaden their weed control toolbox? We'll start with the more common, tried and true methods, then move on to more modern, and innovative, approaches.

Physical. This type of control includes good seedbed preparation with tillage and harrowing. And, in some row crops, inter-row cultivation can be effective as well. This category also includes low and no-till practices, where previous crop residue is left on the soil surface to reduce weed seed germination due to low light. Most farmers still apply Round-up just before the crop is drill seeded to further reduce weed populations.

Cultural. Crop rotation and the use of cover crops are two of the cornerstones of cultural weed control. Not only do the cover crops shade out weeds and provide organic matter, research has shown that some species, such as the Brassicas, have compounds in their tissues that have an allelopathic effect on other weeds. And, rice farmers especially know the importance of water management in controlling weeds. When clover is used as a cover crop, the nitrogen fixed by the clover will be available for the next year's crop. For row crops, mulching and inter cropping can also be of great value.

Biological. This is an exciting area of research that has gained more attention in recent years. Host specific insects have been identified that effectively control the growth and development of certain weed species, such as weevils that attack water hyacinth and water fern. They have also identified beetles that are host specific to alligator weed and ragweed. Pathogens (both fungal and bacterial) have also been found to be host specific. For example, Dr. Douglas Boyette at the USDA Southern Weed Science Research Unit in Stoneville, MS used this approach to achieve good control of hemp sesbania in soybeans. Microsclerotia of the bioherbicidal fungus, *Colletotrichum truncatum*, was formulated in wheat gluten-kaolin granules called 'Pesta'. Weed control averaged 84% and 88%, respectively, in plots treated pre-plant incorporated, at Pesta rates of 150 and 300 lb/ac. The Pesta formulation is necessary to provide acceptable shelf-life of the microsclerotia. More recently, a paper was published with Dr. Boyette as the lead author called 'Biocontrol efficacy of *Colletotrichum truncatum* for hemp sesbania (*Sesbania exaltata*) enhanced with unrefined corn oil and surfactant'. Weed Biology and Management 7:70-76. This manuscript is available in PDF at http://www.ars.usda.gov/main/site_main.htm?modecode=64-02-20-00. Boyette's team has worked with this pathogen in paddy rice with some success in controlling hemp sesbania, when spores of the fungus were formulated in an oil emulsion, or

Pictured above is an excellent stand of clover. It will smother out weeds, keep the soil cool, and provide organic matter and nitrogen after it is incorporated, and decomposes in the soil.

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Photo showing a heavily infested field, mostly barnyardgrass, sedges and sprangletop.

in unrefined corn oil with surfactant. They have had some interest from various commercial entities, but as yet, none have been willing to develop this fungus as a commercial product.

Allelopathic Varieties. As far back as 300 BC, Theophrastus referred to 'phytotoxicity' among plants in his book, Enquiry into Plants, and the Greek philosopher Democritus reported the use of naturally occurring plant products as a practical method of controlling weeds.

It wasn't until 1937, though, that the German scientist Hans Molisch first coined the term 'allelopathy' in a monograph; which described the biological interaction among plants, algae and microorganisms. Although Molisch used the term to describe both positive and negative interactions, common usage of the term generally refers to the antagonistic effect some plants have on their neighbors.

Dr. Bob Dilday, (retired) from the USDA/ARS Dale Bumpers National Rice Research Center in Stuttgart (DBNRRC), Arkansas, paved the way for much of the work conducted in the U.S. on allelopathy in rice. Dilday received his PhD in Breeding and Genetics at Texas A&M University in 1971. In the early 1980's, he conducted research on the growth characteristics of single rice plants. He noticed that some plants had a 'weed free' zone around them specific to certain weed species. After Dilday's retirement, David Gealy and Karen Moldenhauer picked up the research, and went on to identify a number of cultivars that showed suppression of barnyardgrass, redstem, and duck salad. Although none had the yield/milling quality/disease resistance/cooking quality of typical US long-grain varieties, the potential is there to identify the marker(s) associated with the trait, and breed news lines that are commercially acceptable, and allelopathic.

Obviously, more research is necessary in these areas to give farmers much-needed help in the area of weed control, as it is a major production cost in many cultivated crops. ⁎

For more reading on the topic, see 'The Handbook of Sustainable Weed Management' by Harminder Pal Singh et. al., published by the Hawthorn Press, and Weeds, Control Without Poison by Charles Walters Jr., published by Acres USA.

Farm Policy News

Every day we see a steady stream of propaganda about U.S. farm subsidies being responsible for the myriad ills associated with world poverty. With the farm bill on the Senate floor, we've seen editorials in newspapers and magazines—even church newsletters—addressed to members of Congress, declaring that farmers be stripped of the safety net we know is indispensable for the production of a safe, wholesome and affordable food supply for all Americans and many other consumers around the world.

A recent issue of The Economist includes a chart depicting producer support as a percentage value of farm receipts. Guess what country is near the bottom of the list. If you haven't guessed the United States, then you've been taken for a ride by the propaganda of special interest groups.

As a percentage of farm receipts estimated for 2006, the subsidies of Switzerland and South Korea (both more than 60 percent), Japan (more than 50 percent) and the EU (32 percent) dwarfed those of the United States (11 percent). Iceland and Norway topped the list.

In real terms, South Korea's outlays were $25.4 billion; Japan, $40.7 billion; the EU, $138 billion, vs. $29.3 billion for the U.S. For a country-by-country breakdown of subsidies, view this previous Farm Policy Facts article at http://www.usarice.com/ ⁎

From USA Rice Federation

Researchers Seek Genes Behind Rice Nutrients to Combat Malnutrition

Project collaborator, Shannon Pinson, in the field tying up rice plants after the hurricane on September 12. Pinson is 5' 1" tall, so it is obvious the high-nutrient rice is much taller than normal U.S. semi-dwarf rice.

One research team is going with the flow and against the grain by searching out genes that regulate the transport and flow of nutrients within the rice plant and into storage in its edible grain.

Discoveries could help improve nutritional value of the grain, which be of great benefit to underdeveloped nations that rely on rice as their main source of food, and have fewer opportunities to supplement their diet with high protein, nutrient rich foods.

"Identifying genes involved in the nutrient-loading of the rice grain could allow engineers or breeders to develop new strains of rice with higher nutrient levels," said research team leader and Purdue University horticulture professor David Salt. "This could have a major impact on human health since many of the 3 billion people with nutrient deficiencies rely on rice as their main food source."

Salt and his team will use a combination of techniques and processes to hone in on genes that govern the rice grain ionome, a term coined by Salt referring to all of the plant grain's mineral nutrients and ions. The researchers will examine genes that regulate levels of elements both healthful and harmful. Micronutrients essential to human health, like iron and zinc, will be a particular focus since billions of people suffer from iron or zinc deficiency.

Initial steps in the study, which was recently funded by a $5.5 million, four-year grant from the National Science Foundation, are designed to find so-called "candidate genes" worthy of further investigation. To this end, researchers will analyze concentrations of 18 different elements in 1,800 varieties of rice from around the world and also will scour Salt's existing database of genetic and ionic data from thousands of plant and yeast samples.

Immediate insights could help improve scientists' understanding of the rice plant, *Oryza sativa*, and by extension, could shed light into the biochemistry of other crops in the grass family, including maize, barley and wheat.

Another important goal is to better understand *Oryza's* ability to take up harmful chemicals like cadmium and arsenic, Salt said. Contaminated soil and water make arsenic poisoning a major concern in Southeastern Asia, particularly in Bangladesh.

Researchers will use DNA microarrays to help find genes responsible for differences in observed phenotypes, or physical properties, like high iron concentrations. Salt said they will study both naturally occurring and mutant rice varieties.

Since plants are immobile, they must make the most of their environment, and their ability to survive and thrive is therefore tied to their ability to take up the right chemicals, usually in ionic form, from the soil. Plants also must be able to store chemicals for their own health and the health of their offspring.

Data from the study will be continually added to the Purdue Ionomics Information Management System database, accessible online at http://www.purdue.edu/dp/ionomics.

Salt will collaborate with researchers Mary Lou Guerinot of Dartmouth College, Lee Tarpley (TAES), Texas A&M University Research and Extension Center in Beaumont and Shannon Pinson (USDA-ARS), also at the Texas A&M University Research and Extension Center in Beaumont. Others involved in the research are Purdue's Ivan Baxter and Min Zhang. ⁎

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New Hybrid Rice Group Aims to Raise Rice Yields in the Tropics

High performance hybrid rice lines from Rice Tec, Inc. being evaluated at the farm of Jacko and Nancy Garrett in Dansbury, TX.

A new international research initiative, linking the private and public sectors for the first time and launched at the 2007 Asian Seed Congress, aims to boost the research and development of hybrid rice for the tropics.

The Hybrid Rice Research and Development Consortium (HRDC), established by the International Rice Research Institute (IRRI), will strengthen public-private sector partnership in hybrid rice, a technology that can raise the yield of rice and thus overall rice productivity and profitability in Asia.

Hybrid rice takes advantage of the phenomenon of hybrid vigor-known as heterosis to achieve yields that are significantly higher than nonhybrid (inbred) varieties. Over the past three decades, the technology has helped China achieve food security, but has not yet reached its potential in the tropics.

IRRI and its partners in the public and private sector have led research on development and use of hybrid rice technology in the tropics for almost 30 years. Successful deployment of hybrid rice in Asia, however, requires more effective cooperation between public research institutions and the private sector in research to overcome current constraints.

The HRDC will be hosted by IRRI and will have three major objectives:

- Support research on developing new hybrids with enhanced yield heterosis, improved seed production, multiple resistances to stresses, and high grain quality.
- Support research on best management practices for rice hybrids.
- Improve information sharing, public awareness, and capacity building.

Public and private sector organizations and companies with interest in hybrid rice development are invited to become members of the HRDC. For private-sector members, annual financial contributions under the consortium structure will take into account the status of seed companies at different stages of development. HRDC members will have access to improved parents, hybrids, and breeding lines, including seeds and associated information.

The HRDC will have a public-private sector advisory committee and will meet annually to provide information to its members on new plant genetic resources available or under development, review research on hybrid rice management, discuss new research priorities, and make decisions on other consortium activities such as capacity building for both the public and private sectors.

According to IRRI senior hybrid rice researcher Fangming Xie, the HRDC will significantly enhance the capacity for hybrid rice research and product delivery, while providing services and support to the private sector in its product development and delivery that will benefit the general public.

"National agricultural research and extension systems and other public sector organizations engaged in hybrid rice research and development will be among the primary beneficiaries of funds generated by the HRDC", said Dr. Xie. "Rice farmers in Asia will benefit from accelerated access to hybrid rice-based technologies such as more and better hybrids, good-quality seed, knowledge, and services provided by the private and public sectors." ⁎

Excerpted from an article by Dr. Fangming Xie, International Rice Research Institute, email: f.xie@cgiar.org. IRRI is one of 15 centers funded through the Consultative Group on International Agricultural Research (CGIAR), an association of public and private donor agencies (www.cgiar.org)

Rice That Made Colonial Americans Rich May Have Come from Ghana

Carolina Gold rice, a variety over 300 years old, growing at the Texas A&M Research and Extension Center in Beaumont.

A high-quality rice that made plantation owners in colonial America rich may have been brought into the country by west African slaves who were used as labour on the plantations. Rice became a cash crop for plantation owners in 1685 with the advent of a high-quality variety called Carolina Gold. Rice geneticist Anna McClung of the U.S. Department of Agriculture (USDA) in Stuttgart, Arkansas, and molecular geneticist Robert Fjellstrom of the USDA in Beaumont, Texas are in a bid to find out how the crop had come to the New World in the first place, noted that the first reported import of what is thought to be Carolina Gold occurred in 1685, when a slave ship from Madagascar unloaded a cargo of rice in Charleston, South Carolina. This suggested that the rice came from that island nation off the east coast of Africa, or that perhaps it came from Asia and was picked up at a port on the way to America.

To find out if Carolina Gold originated from an indigenous African rice called *Oryza glaberrima*, the researchers searched the USDA Rice Germplasm Collection for varieties with the molecular marker, RM190, for a gene that controls the starch content in Carolina Gold. This marker turned up in fewer than 1 % of the varieties. They then narrowed the research by analyzing 43 other molecular markers in Carolina Gold, and found one variety that shared 42 markers. Called Bankoram, it had been sent to the USDA collection in 1972 from a seed bank in Ghana.

The finding suggests that Carolina Gold came from West Africa, just like the slaves who cultivated it. “It’s nearly a perfect match,” McClung says. However, the researchers stress that the study is preliminary, and that the possibility that Carolina Gold may have been taken back to Africa and wound up in the seed bank in Ghana cannot be ruled out.

Geographer Judith Carney of the University of California, Los Angeles, says a Ghanaian origin of Carolina Gold fits with the idea that Carolina Gold arrived in the colony as food on slave ships and was then planted by the slaves.

The researchers presented the results at the annual meeting of the American Society of Agronomy in New Orleans, Louisiana. ⁎

From http://www.thaindian.com/newsportal/
For more information contact Dr. Anna McClung, email Anna.McClung@ars.usda.gov

Reminder:

32nd Rice Technical Working Group Meeting

February 18 to 21, 2008

San Diego, California

Early Registration due by January 15

The complete schedule for the 32nd RTWG is posted on the web at http://www.plantsciences.ucdavis.edu/rtwg

iFARM: Two High-Tech Tools for Farm Management

Raising a crop is hard enough without worrying about paperwork. Now, a new record-keeping tool developed by the USDA Agricultural Research Service (ARS) allows farmers to quickly enter information about their land, crops and management methods.

The "iFARM Record Keeper" can manipulate farm management information into multiple formats without requiring producers to enter data more than once, leading to improved efficiency, accuracy and organization.

As a farmer enters management information into the Record Keeper, the spreadsheet immediately converts it into a variety of diverse formats, such as those required for the farmer's home state restricted-use pesticide report and the USDA Natural Resources Conservation Service's Conservation Plan.

The Record Keeper was developed by ARS scientist Gale Dunn and technician Daniel B. Palic in collaboration with the Colorado Association of Wheat Growers, whose members wanted a simple, user-friendly record-keeping system. It is one of a suite of decision support tools being developed by scientists in the ARS Agricultural Systems Research Unit at Fort Collins, Colo.

Palic and Dunn also collaborated with ARS research leader Merle Vigil and University of Nebraska economist Paul Burgener to enhance a spreadsheet program originally developed by Vigil for evaluating simple farm economics. The expanded program, called iFEAT (iFARM Economic Analysis Tool), can help landlords and tenants assess, among other things, the economic outcomes of different farm leasing arrangements and management decisions.

For example, a farmer might be trying to decide which lease arrangement would be more beneficial to him: a cash lease, in which the tenant pays the landlord a set amount and assumes all the risks but keeps all the crop revenue, or a crop-share lease. In the Great Plains and other areas of the United States where leasing is common, choosing an appropriate leasing arrangement is key to economic success.

iFEAT is a user-friendly spreadsheet tool for helping no-till farmers, who often have higher fertilizer costs, quickly assess the economic benefits of various leasing and management options. The spreadsheet provides information on costs and net returns for different management alternatives, enabling them to assess the potential economic outcomes of management changes.

Both tools, iFEAT and the Record Keeper, can inform and guide growers' management decisions. *

From http://www.ars.usda.gov/is/pr/

Federal Disaster Assistance for Farmers Hit by Humberto

The United States Department of Agriculture (USDA) announced that farm operators that sustained losses caused by Hurricane Humberto are eligible for low-interest emergency loans from the Farm Service Agency (FSA).

The USDA has reviewed the Damage Assessment Report for Jefferson County, along with additional information submitted by the Farm Service Agency (FSA), and has determined that there were sufficient production losses to warrant a Secretarial Natural Disaster Designation. Jefferson county has been named a primary natural disaster area, and Liberty, Chambers, Hardin, and Orange counties were named contiguous disaster counties.

"Hurricane Humberto caught most of the folks in Southeast Texas unprepared," said Poe. "While a majority of our area was spared from any significant damage, our farmers did sustain losses from this unpredicted hurricane. This announcement comes as good news to the many farmers in both Jefferson and Liberty counties still recovering from Hurricane Rita."

This designation makes farm operators in both primary and contiguous counties eligible to be considered for low-interest emergency loans from FSA, provided eligibility requirements are met. FSA will consider each application on its own merit by taking into account the extent of losses, security available and repayment ability.

Local FSA offices can provide affected farmers with further information. Call Tim Respondek at 979-865-3138 *

From the office of Congressman Ted Poe, 2nd District of Texas. Media contact: DeeAnn Thigpen, 202-812-1645

Glomalin: A Key to Switchgrass Ethanol Success

If switchgrass succeeds as an ethanol crop, it will owe some of its success to glomalin, the key ingredient of soil organic matter. Glomalin was discovered in 1996 by Agricultural Research Service (ARS) soil scientist Sara F. Wright, now retired, and ARS microbiologist Kristine A. Nichols, then both at Beltsville, Md. Nichols is now at the ARS Northern Great Plains Research Laboratory in Mandan, N.D., where glomalin research continues.

A sugar protein, glomalin is excreted by soil fungi and helps them funnel water and nutrients into plant roots. It also helps store carbon in the soil and acts as a "glue" to hold soil particles together.

In assessing glomalin levels and their role in biofuel crops, Nichols measured higher levels of glomalin in the roots of switchgrass, big bluestem and other warm-season grasses than in the roots of cool-season grasses, such as wheatgrass and Russian wild rye. Switchgrass is a fast-growing, warm-season perennial with potential as a feedstock for cellulosic ethanol production.

Preliminary results show that warm-season grasses, such as switchgrass and big bluestem, also give soil more stability. Nichols found a strong association between warm-season grasses and the arbuscular mycorrhizal fungi, a type of mycorrhiza in which the fungus penetrates the cortical cells of the roots of a vascular plant, and produce glomalin.

Glomalin may be partly responsible for the ability of switchgrass to store more soil carbon than corn, and to store it deeper, so it's less likely to be lost to the atmosphere as carbon dioxide. Thus, glomalin might not only help biofuel crops grow and flourish under adverse conditions like drought, but also help to close the carbon cycle by storing carbon released as carbon dioxide during the burning of biofuels for energy.

Nichols' work could help growers know how to best establish switchgrass, and to make sure as much carbon as possible is stored below ground. *

Excerpted from an article by Linda Tokarz, Agricultural Research Service, USDA linda.tokarz@ars.usda.gov

Arkansas Extension Service Warns Producers About "Hay Rustler"

Hay rustlers are putting a cyber spin on a scheme to bilk a few bales out of Arkansas producers, according to Dr. Tom Troxel, Professor and Associate Head of the Animal Science Department of the University of Arkansas Cooperative Extension Service.

The scam surfaced as producers received e-mails from a supposed buyer, Troxel said. But the producers smelled a rat. "In one incident, two Van Buren County producers, who listed their hay for sale in extension's hay directory located on its Web site, received e-mails from a person … who said he wanted to purchase 15 bales of hay", Troxel said.

The man "asked the producers for their mailing address so he could send them a check via FedEx", Troxel said. "The amount of the check was to cover the hay purchase price and pay the shipping charges. The man told the hay producers he would arrange for a shipper to arrive at their farm to pick up the hay."

Troxel said one of the producers contacted Van Buren County Extension Agent Danny Griffin and inquired about the transaction. Griffin was suspicious because the buyer usually pays the shipper. That was the key that made the producers question the transaction. One of the Van Buren producers took the check to his bank and asked the bank to verify the check. "The check was fraudulent," Troxel said. Law enforcement officials have been notified.

Each bale is worth $30 to $35, Troxel said. "By keeping amounts small, he apparently hoped to fly under the radar and not draw suspicion," he said. "The alleged buyer could have gotten a load of hay free, and he could have turned around and sold it.

"Many agricultural producers in the state are trusting individuals. To them a man's word is his bond. They're used to doing business with friends and neighbors with their word and a handshake. Producers just need to be cautious. Computers and Internet opens them up to fraudulent schemes. Investigate a proposal if it doesn't sound right." *

Excerpted from MidAmerica Farmer Grower, www.mafg.net

State, National and International News...

Latest on Farm Bill

The U.S. Senate has finally crossed the finish line on the final passage of the 2007 Farm Bill. After being "on the Floor" for 5 weeks or more and the subject of a great deal of political maneuvering, votes this week proved that the disputes that were holding up the bill were based on politics, not policy.

The Senate considered and rejected at least 12 amendments, almost all by healthy margins. The only motion to pass, and to pass by the widest margin of any vote on the bill thus far, was the motion to limit debate (to "invoke cloture") that passed by a whopping 78 Yeas to 12 Nays. All of these votes are summarized in the link provided, and they tell us something important. Namely, they speak to the fact that the architects of the bill and the Senate Agriculture Committee did a very good job in crafting a balanced bill that has broad support in the Senate.

The defeat of major amendments touted as farm policy "reform" (Lugar-Lautenberg, Dorgan-Grassley, Klobuchar) act as evidence of the Committee bill's significant reforms to payment limitations and other issues. The defeat of several other amendments large and small make clear that the bill is sound and that the Senate never did have any real policy problems with the bill.

Dorgan-Grassley; Klobuchar Amendments Defeated. In a vote of confidence in the reforms included in the Senate Agriculture Committee Farm Bill, the Senate rejected several amendments proposing to "reform" farm programs further. Farmers have expressed their heartiest thanks and congratulations to Senators Blanche Lincoln (D-AR) and Saxby Chambliss (R-GA) who ably led the opposition to these short-sighted amendments. Rice Producers were urging a "no" vote on both of these amendments. To view the entire vote tallies on these farm bill amendments go to http://www.senate.gov/legislative/LIS/roll_call_lists/vote_menu_110_1.htm

Peterson: Farm Bill Conference Work to Begin ASAP – A Farm Bill to the President in January? In a meeting with USRPA Washington Counsel Fred Clark, House Agriculture Committee Chairman Collin Peterson made clear his intention to begin work on the Farm Bill conference soon. His goal is to complete work on the conference report and get it to the President in late January 2008. Peterson expressed his appreciation for the close working relationship between USRPA and the Chairman in the development of the payment limit provisions and the rice program in the House-passed farm bill. Peterson also made clear that payment limits will be a key issue that needs to be resolved in conference to the satisfaction of producers, the House and the Senate – including those Members hailing from congressional districts with little or no agricultural industry whose votes will be needed to pass a final conference report. In welcome news for rice producers, Peterson agrees with USRPA that it is impractical and inequitable to apply any changes in payment limits, adjusted gross income requirements, and related structural issues (e.g. direct attributions of payments and the repeal of the 3-entity rule) to 2008 crops of rice and other commodities. The Senate bill phases in these types of changes, with very few taking effect in 2008, while the House-passed bill would apply most if not all of them to 2008 crops. Peterson pledged to work in conference to ensure that such changes will not apply to the 2008 crop year.

From USRPA Rice Advocate.

Honors at Texas A&M

Nobel Peace Prize winner Norman Borlaug continues to reap honors for his scientific achievements and humanitarian service that have averted starvation for millions of people worldwide—the latest an honorary doctorate bestowed on him Friday by Texas A&M University, the institution with which he has been affiliated for more than two decades.

Borlaug, who holds the unique rank of Distinguished Professor of International Agriculture at Texas A&M, was presented his honorary doctorate during the first of the university's mid-year commencement exercises. The special honorary degree awarded to Borlaug, who won the Nobel Peace Prize in 1970, cites his "pioneering wheat research and personal crusade to end global hunger that has brought radical change to world agriculture by uplifting humanity and saving literally millions from starvation."

He is being joined in receiving degrees—all the others traditional undergraduate or graduate degrees—by 3,467 students during three commencement exercises in late December.

From agnews.tamu.edu

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From the Editor continued...

ing fertility management. However, a basic problem remains in that little data are available to determine how best to grow cover crops in our often saturated heavy clay soils. Claims about how much nitrogen can be obtained from a legume cover crop vary tremendously, all the way from 40 to 120 lbs of total nitrogen/ac. However, little if any data have been generated to support these claims.

Along this line of thinking, in 2007, the Beaumont Center initiated a 40 acres long-term organic rice production experiment to begin to develop production and management methods for organic rice. With funding for organic research being extremely limited, it may take us a considerable amount of time to develop improved answers. However, slow and steady progress is certainly better than no progress at all. With organic rice production in Texas at an all time high and likely to continue to increase, it behooves us to develop improved management solutions to increase the economic viability of organic rice production.

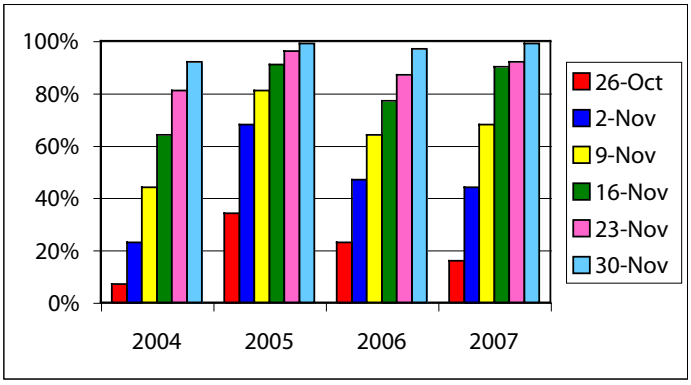
Keep on sending us your suggestions.

Sincerely,

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

Rice Crop Update

%Ratoon Crop Harvested



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