Table 4. Stem borer research on main and ratoon crop rice. Cocodrie. Ganado, TX. 2007.

Main Crop[a]	Ratoon Crop[a]	No. WHs[b]/4 middle rows		Yield (lb/A)		
		Main	Ratoon	Main	Ratoon	Total
T	T	7 b	1 b	7502 a	2648	9970 a
T	U	7 b	10 a	7377 a	2106	9484 a
U	T	55 a	2 b	6477 b	2318	8795 b
U	U	61 a	16 a	6404 b	1975	8379 b
					NS	

[a]T = treated for stem borers; U = untreated.
[b]WHs = whiteheads.
Means in a column followed by the same or no letter are not significantly different (NS, $P > 0.05$, ANOVA, LSD).

Table 5. Stem borer research on main and ratoon crop rice. XL723. Ganado, TX. 2007.

Main Crop[a]	Ratoon Crop[a]	No. WHs[b]/4 middle rows		Yield (lb/A)		
		Main	Ratoon	Main	Ratoon	Total
T	T	1 b	0 c	8377 a	2423	10800 a
T	U	0 b	2 b	8675 a	1902	10577 a
U	T	67 a	1 bc	6715 b	2602	9317 b
U	U	66 a	4 a	6794 b	1907	8700 b
					NS	

[a]T = treated for stem borers; U = untreated.
[b]WHs = whiteheads.
Means in a column followed by the same or no letter are not significantly different (NS, $P > 0.05$, ANOVA, LSD).

11th Annual National Conservation Systems Cotton & Rice Conference

CORN PRESENTATIONS

Corn Rotations In The Mid-South

Presented by Dr. Chad E. Brewer
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Corn production has a long history in the Southern United States. In the mid-1860's corn was grown in rotation with cotton as an energy source for farm livestock and humans. This rotation was prevalent up until the mid-1900's when mechanization and the introduction of soybean and rice decreased corn acreage. Although there were practical reasons for this crop rotation sequence there were many unintended benefits.

A corn-cotton rotation reduces incidence of pests specific to cotton, can increase soil quality, and diversify farm production. Reniform nematodes (Rotylenchulus reniformis)infest 50% of cotton production fields in LA and MS, and approximately 10% of fields in AR (NCSU 2007). Currently there are no commercial cotton cultivars with genetic resistance to this pest (Weaver et al. 2007). Rotations to a non-host crop, such as corn, or the use of nematicides are the only control options. Research in AR and AL indicates that rotation to a non-host crop can be as effective as nematicide treatment (ACES 2007; UAEX 2007). Rotating to corn also provides many benefits for weed management. Corn is a highly competitive crop that limits weed growth through resource competition. Corn production typically includes the use of herbicide modes of action that are not associated with cotton production. These alternative modes of action can be used to controlherbicide-resistant weed populations that are associated with cotton. Glyphosate-resistant Palmer amaranth (Amaranthus palmeri) can be effectively controlled with preemergenceor in-crop applications of Cinch (s-metolachlor), Cinch ATZ (s-metolachlor + atrazine), and Steadfast ATZ (nicosulfuron+rimsulfuron+atrazine). There is also a short plant-back interval for 2,4-D and dicamba burndown herbicides for control of glyphosate-resistant horseweed (Conyza canadensis).

Soils in the Mid-Southern U.S. are typically extremely low in organic matter because a history of intense tillage, warm climate, and relatively low biomass crop production. Rotations that include corn benefit from the 3.5 to 7 tons/acre of crop residue (Martin et al. 2007) that can build soil organic matter over time. Increases in soil organic matter can increase water holding capacity, cation exchange capacity (influences nutrient availability), and improves soil aggregate structure (soil tilth) (Hillel 2004).

Corn commodity prices have created an opportunity for cotton producers to diversify crop production. Production diversification spreads the planting and harvest windows allowing labor and equipment costs to be reduced. Diversification also spreads the risk of crop failure caused by unforeseen weather events and increases cash flow at harvest. The benefits of the corn-cotton rotation are numerous and many would apply to other crop rotations that include corn, such as a corn-rice rotation.

The corn-rice rotation has traditionally been view unfavorably due to low corn yields.Low corn yields following rice are caused by the complex soil chemical and physical changes that occur with rice production. Soil chemical changes revolve around the anaerobic conditions associated with flooded soil. When oxygen is limited by the flood water, non-plant available P-containing complexes are reduced and increase the amount of plant available P. However, when the flood is removed, the soils dry and oxygen is reintroduced to the soil environment. The oxygen addition creates an aerobic environment in which the non-plant available P-containing complexes are reformed. These complexes are stable for long periods and reduce the amount of P available for the following corn crop. The soil pH following rice should also be considered.Flooded soil chemistry causes soil pH to approach 7 so long as the soil is saturated. However, when the flood is removed and the soil dries, soil pH will return to its native state. If the native soil pH falls below 5.7 lime should be applied for corn production. Soil physical properties that are altered by rice production are air infiltration and water percolation. Poor aeration and water infiltration has a devastating effect on corn production following rice. However, both the chemical and physical soil properties can be altered to favor corn production.

A long-term rotational study at the University of Arkansas since 1999 is being conducted to explore the effects of several crop rotations including; rice-rice, rice-soybean, rice-corn, rice-soybean-corn, and rice-corn-soybean and the rotational interactions with tillage level. Beginning in 2000 the corn yields were suppressed following rice across both no-till and conventionally tilled plots. However, the no-till plots were especially low with yields averaging only 45 bu/A. During the last 6 years of the experiment the no-till corn yields have steadily increased and the 2006 yields were comparable to the conventionally tilled plots. This increasing yield trend indicated that the soil profile in the no-till plots was stabilizing and the plow pan was being fractured. In 2007 a second study was initiated that utilized a rice-corn rotation. Following rice harvest the area was disked twice in the fall. The following spring P and K fertilizer were added prior fracturing the plow pan with a no-till ripper. Beds were immediately pulled with a roller-bedder and Pioneer 38P09 (95 CRM), Pioneer 36B11 (105 CRM), and Pioneer 33M57

(115 CRM) corn hybrids were planted. Plots were fertilized with a single 150 lb/A N application formulated as either urea, Agrotain coated urea, or a slow release N formulation. Corn yield was measured at harvest and indicated that there was no effect from N formulation. However, the hybrid yields averaged across N source were different. The longest maturity hybrid, Pioneer 33M57, yielded greater than 220 bu/A following rice. Pioneer 36B11 yielded 175 bu/A and Pioneer 38P09 yielded 150 bu/A. The hybrid performance relative to maturity is expected since longer season hybrids typically outperform similar shorter season hybrids. Corn yield following rice appears to be enhanced by fracturing the plow pan. This procedure allows the corn plant to develop greater rooting volume, which enhances nutrient scavenging. The fractured plow pan increases water and air infiltration and one year of data suggests that it can alleviate much of the rice effect (Anders 2007).

Corn rotations are not new to Mid-South agriculture. However, new rotations including corn following rice are possible. These rotations are possible by understanding of the soil physical and chemical properties associated with this system. Adding corn to any rotation sequence increases cash flow, diffuses economic risks, manages specific pest problems, and can increase soil quality.

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Corn Production Tips For The Mississippi Delta

Presented by Dr. Arnold Bruns

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Mid South corn growers have improved their production practices over the past 10 years to a point that they are consistently achieving yields that rival and in many cases surpass those of the Corn Belt states. There are several points worth reviewing that will assist you in continuing to produce large yields of high quality corn in the lower Mississippi River Valley. Once you have decided to grow corn the next step is hybrid selection. There are a number of sources of information to help you but, two things to keep in mind: 1). All seed companies that sell in your area have adapted hybrids. If they don't they won't be in business long. 2). Every state conducts corn hybrid yield trials through the state Agriculture Experiment Station and that information is available, usually at no cost, through your local University Extension Service Office. A sizeable number of genetically enhanced hybrids are now available, i.e. Bt's, Roundup Ready, Liberty Link and such,