

Final Report

Louisiana Hurricane Soil Remediation Trial

Trial Conducted In Cooperation With LSU Ag Center RiceTec Seed Company Francis & David LaCour G&H Seed Growth Plus, Inc.

November 2006

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Louisiana Hurricane Soil Remediation Trial

- **Objective:** To propagate rice on hurricane contaminated soil with less than 5000 ppm salt and more than 750 ppm salt.
- **Location:** Francis & David LaCour's farm located in Vermillion Parish Louisiana.
- Field Size: Field #1 (627 Feet X 437 Feet) 6.29 Acres Field #2 (615 Feet X 255 Feet) 3.60 Acres Total Trial Field Size 9.89 Acres
- Plot Sizes:Field #1 contained nine 40' X 627' plots: Plot size is .575 acres
Field #1 contained two edge buffer areas equaling 1.11 acres
Field #2 contained 3 40' X 615' plots: Plot size is .566 acres
Field #2 contained one 135' X 615 plot: Plot size 1.91 acres
- Trial Design: Double Plot Replicates

Rice Used: CL131, CL161, CLEARFIELD XL8, CLEARFIELD XL729, CLEARFIELD XL730

Treatments:7.06.06- Rice Tec Seed Company planted six CLEARFIELD lines of rice. Plot
is treated with 3 Tier Rice Starter Package (Establish 5-16-12 @ 32 ounces per
acre and Huma-Cal Plus XL@ 64 ounces per acre in 20 gallons of water/acre).

7.11.06 - Prowl H2O applied @ 2 pints per acre.

<u>7.12.06</u> – Stam M-4HF applied @ 3 quarts per acre, Newpath @ 5 ounces per acre, Karate Z @ 2 ounces per acre.

<u>7.21.06</u> - NESH is applied at 8.8 gallons per acre in 30 gallons of finished spray solution per acre.

<u>7.29.06</u> – Newpath applied @ 4 ounces per acre, Permit @ 0.53 ounces per acre, Londax @ 0.75 ounces per acre, Karate Z @ 2 ounces per acre, Urea @ 200 pounds per acre. Pre-Flood treatment.

8.22.06 - Application of Stratego @ 22 oz/acre with Tilt @ 6oz/acre.

8.25.06 - Mid season application of 30 lbs/ac Urea 46% on CL161 and CL131.

9.20.06 – Applied Stratego @ 22 oz/acre, Tilt @ 2oz/acre, KarateZ @ 2 oz/acre

<u>9.22.06</u> - Late season application of 30 lbs/ac Urea 46% on Hybrids, applied post heading per varietal specifications.

Assessments: The following assessments were completed over the course of the trial:

- Each plot was evaluated for average germination 10 days after planting.
- Each plot received four evaluations for salt levels.
- Field #1 received before and after soil analysis, Field #2 received post trial soil analysis only.
- Each plot was harvested individually and a complete yield analysis prepared.
- Each plot had a rice sample sent for milling analysis. Each sample was dried at RiceTec headquarters in Alvin, Texas prior to milling submission. The samples were processed by Area Rice Marketing in Eagle Lake, Texas.
- Each plot was evaluated for average height of plant the day of harvest.
- A complete cost analysis for the trial.

Trial Monitoring: In an effort to provide accurate and independent trial monitoring and data collection, 3 Tier Technologies provided only trial application guidelines, application supervision, and products needed for the trial. All trial monitoring, application validation and supervision, testing, and harvest validation and supervision were provided by trial partners LSU Ag Center, RiceTec Seed Company, G&H Seed Company, and Francis and David Lacour.

- Field preparation, all product applications or coordination, daily field/flood management, crop harvest and yield validation, were all provided by Francis & David Lacour.
- Individual plot seeding, monitored salt levels throughout the trial, harvest weight and yield validation, and milling analysis provided by RiceTec Seed Company.
- General trial supervision, plot scouting, supervision, and validation of all applications and procedures completed, and all soil testing provided by LSU Ag Center. Special thanks to Steve Linscombe, Howard Cormier, Johnny Saichuk, and Eddie Eskew.
- Application assistance/supervision, supply of all required products, field day assistance, and harvest/yield supervision and validation provided by G&H Seed Company.

Introduction:

Since Hurricane Rita, thousands of acres of prime agricultural land in Southwest Louisiana has been rendered idle due to the storm surge and the subsequent contamination of the soils with high salts, hydro-carbons, and other identified harmful organics and pathogens. 3 Tier's lead scientist Alexander Shulgin, an expert in advanced humic acid research, has isolated several key factors that have prohibited the ability to plant and propagate crops on these soils.

Through months of laboratory tests, Alexander has created a new product to complement current 3 Tier products to eliminate and/or isolate the harmful effects of the soil contaminates and to make these soils viable again. The objective of the product demonstration is to validate the ability of 3 Tier products to grow rice in contaminated soils lower than 5000 ppm salt and higher than 750 ppm salt and to compare various CLEARFIELD lines offered by RiceTec Seed Company.

The product demonstration began July 6, 2006 and was harvested on November 1, 2006. The following information is the data collected throughout the process.

Critical Dates:

7.06.06 - Rice Tec Seed Company planted six CLEARFIELD lines of rice. Plot is treated with 3 Tier Rice Starter Package (Establish 5-16-12 @ 32 ounces per acre and Huma-Cal Plus XL@ 64 ounces per acre in 20 gallons of water/acre).

7.08.06 - First plant germination is identified. (See Photo 1)

7.10.06 - Plants emerge from the soil. (See Photo 2A)

7.11.06 - Prowl H2O applied @ 2 pints per acre.

<u>7.12.06</u> – Stam M-4HF applied @ 3 quarts per acre, Newpath @ 5 ounces per acre, Karate Z @ 2 ounces per acre.

<u>7.21.06</u> - NESH is applied at 8.8 gallons per acre in 30 gallons of finished spray solution per acre. (See Photo 3)

<u>7.29.06</u> – Newpath applied @ 4 ounces per acre, Permit @ 0.53 ounces per acre, Londax @ 0.75 ounces per acre, Karate Z @ 2 ounces per acre, Urea @ 200 pounds per acre. Pre-Flood treatment. (See Photo 4)

<u>8.06.06</u> – Irrigation pump started.

<u>8.07.06</u> – Permanent flood established, pump stopped.

8.22.06 - Application of Stratego @ 22 oz/acre with Tilt @ 6oz/acre.

8.25.06 - Mid season application of 30 lbs/ac Urea 46% on CL 161 and CL 131.

9.20.06 - Applied Stratego @ 22 oz/acre, Tilt @ 2oz/acre, KarateZ @ 2 oz/acre.

<u>9.22.06</u> - Late season application of 30 lbs/ac Urea 46% on Hybrids, applied post plant heading per varietal specifications. (See Photo 7)

<u>10.17.06</u> – Field drained.

<u>**11.01.06**</u> – Field harvested. (See Photo 8)

119 Days from Planting to Harvest.

25.5 Inches of Rainfall During Trial.

Trial Plot Plan:

FIELD #2 - 615 FEET DEEP BY 255 WIDE

	P L O T 1A	P L O T 2A	Р L О Т 3А	P L O T 4A	P L O T 5A	P L O T 6A	Р С Т 1В	P L O T 2B	Р L О Т 3В		P L O T 4B	Р L О Т 5В	Р L О Т 6В	REMAINDER OF FIELD
FIELD BOUNDARY MOUND	E X P E R I M E N T A L O T V L O T DELETED FROM TRIAL	CLEARFIELD XL8	C L 1 6 1	C L 1 3 1	C L E A R F I E L D X L 7 3 0	CLEARFIELD XL729	E X P E R I M E N T A L O T L O T P LOT DATA DELETED FROM TRIAL	CLEARFIELD XL8	C L 1 6 1	FIELD BOUNDARY MOUND	C L 1 3 1	CLEARFIELD XL730	CLEARFIELD XL729	C L E A R F I E L D X L 7 2 9
				6.2	29 Acres								3.60 Ac	res

Plots 1A &1B are Experimental Rice not available. These plot results have been deleted from the trial data summary.

Plot Germination & Stand Counts:

First germination was identified just 48 hours after field planting (See Photo 1). Full seed emergence was observed 4 days after planting (See Photo 2A & 2B). RiceTec Seed Company took a random sampling of plant germination per square foot of each of the variety plots 10 days after planting. The following are the stand counts for each plot of this trial;

Individual plot and variety sample data

Rice Variety	Plot	Rate/Acre	Count Per Square Foot	Plot Average
Experimental	1A	N/A	N/A	Deleted
CLEARFIELD XL8	2A	30lbs*	8, 6, 7, 6, 10	7.40
CL161	ЗA	65lbs	14, 12, 19, 19, 9	14.60
CL131	4A	65lbs	11, 10, 15, 12, 17	13.00
CLEARFIELD XL730	5A	30lbs*	14, 11, 11, 20, 17	14.60
CLEARFIELD XL729	6A	30lbs*	8, 9, 11, 4, 7	7.80
Experimental	1B	N/A	N/A	Deleted
CLEARFIELD XL8	2B	30lbs*	4, 9, 5, 13, 6	7.40
CL161	3B	65lbs	10, 11, 12, 10, 9	10.40
CL131	4B	65lbs	16, 18, 12, 17, 15	15.60
CLEARFIELD XL730	5B	30lbs*	14, 15, 14, 21, 15	15.80
CLEARFIELD XL729	6B	30lbs*	10, 9, 11, 12, 10	10.40

*Hybrid seed rate is 600,000 seeds per acre, approximately 30lbs an acre. Pounds may vary due to seed size.

Average Per Square Foot Stand Counts By Variety

Rice Variety Field Averages	Average Stand Per Square Foot
CLEARFIELD XL8	7.40
CL161	12.50
CL131	14.30
CLEARFIELD XL730	15.20
CLEARFIELD XL729	9.10

The exceptional germination and early emergence of the plants can be attributed to several factors. The first factor was the timely rainfall the fields received. First rainfall came within hours of completing the planting and subsequent rain intervals maintained perfect field moisture for the first 12 days. The second factor that improved germination was the increased heat units. Planting in July provided longer days and higher temperatures which created a perfect environment for germination.

The final factor that positively influenced the exceptional germination and emergence was the 3 Tier Rice Starter Package. This scientifically designed, two product starter, provides a balanced N-P-K starter fertilizer, soluble calcium for improved soil conditioning and plant germination, humic acid for improved moisture retention and seed husk softening, and a complete microbial product for increased nutrient conversion and natural seedling protection against disease and insect pressure.

Field Salt Levels:

The primary focus of the trial was to demonstrate that rice can be planted and achieve proper growth and yield in soils that are contaminated with under 5000 ppm salt and more than 750 ppm salt. Throughout the trial, Robert Miller of RiceTec, made periodic visits to the trial to measure the salt levels. The tests were conducted using a soil conductivity meter. Pictures 3, 4, 5, and 6 were taken about the same time as the testing to validate plant performance in comparison to the identified salt levels.

Testing Dates								
Plot #'s	Variety	7/18/06	8/02/06	8/18/06	9/13/06	Average		
Plot 1A		1464.5	683.8	772.9	859.1	869.0 ppm		
Plot 2A	XL8*	1037.3	653.7	1388.3	934.3	933.6 ppm		
Plot 3A	CL161	3033.2	1050.9	1126.8	823.7	1182.4 ppm		
Plot 4A	CL131	1370.4	715.1	1474.7	854.5	1005.9 ppm		
Plot 5A	XL730*	1658.0	975.6	1353.1	956.7	1172.2 ppm		
Plot 6A	XL729*	2162.2	2253.5	989.2	725.6	1213.8 ppm		
Plot 1B		1636.8	1316.9	1250.0	998.4	1261.1 ppm		
Plot 2B	XL8*	1415.9	2051.3	1336.1	951.0	1336.1 ppm		
Plot 3B	CL161	1435.0	742.5	1124.8	941.2	1001.2 ppm		
Plot 4B	CL131	1185.2	547.9	911.7	948.1	829.8 ppm		
Plot 5B	XL730*	1161.5	493.1	1073.8	677.2	755.2 ppm		
Plot 6B	XL729*	1196.3	392.2	880.3	747.7	682.7 ppm		
Averages		1441.2	759.1	1097.8	855.5	1020.2 ppm		

Average Salt Readings for Entire Trial = 1020.2 ppm

* Denotes CLEARFIELD Hybrid rice.

According to LSU Ag Center, a field should not be planted if the soil salt levels exceed 750 ppm's or is close to this level. It is also possible for that number to increase or decrease throughout the growing season because of rainfall influences, salt in flood water, or salt solubilizing from the soil during flood periods. All these factors could have a negative impact in the field production capability. Soil types can also influence the affects of salt availability and impact on the crop.

During the salt evaluations of the trial field, Robert Miller of RiceTec noted "*The fact that the soil is sandy or at least not heavy clay makes the salt present more dangerous for the plants*". The fact that the trial plants remained healthy and produced a quality yield is more impressive due to the fact that the salt levels averaged over 1000 ppm's for the entire trial.

Two key factors can be attributed to the success of this trial and the ability to generate a quality yield in high salt conditions. The first factor is the ability of CLEARFIELD seed lines to have a higher tolerance to salt pressure. The different seed types have been produced specifically for these regions and conditions. The second factor that provided protection for the plants was the 3 Tier Rice Starter Package and the newly designed NESH (Nitrogen Enhanced Soft Humic) product applied just prior to the permanent flood. Knowing that the hurricane affected soils maintain a 1500 to 5000 ppm salt level with other soil contaminates, NESH was designed to provide plant protection up to 5000 ppm salt levels and other identified contaminates.

Field Soil Analysis:

The trial plots consisted of two fields, Field #1 is a 6.26 acre tract and Field #2 is an adjacent 3.60 acre tract. Field #1 received before and after trial soil testing and Field #2 received only post harvest soil testing. The following are the soil testing findings according to a standard Mehlich 3 test performed by Soil Testing and Plant Analysis Laboratory of LSU in Baton Rouge.

Field #1 SE Corner	5/22/06	11/07/06	Final Value	(0)	a (a)
Element (Mehlich3)	Value	Value	Interpretation	+/- Change	% Change
pH (1:1 vvater)	5.59	6.20	High	+0.61	+10.9%
Phosphorus, ppm	23.91	21.71	Hign	-2.20	-9.2%
Potassium, ppm	259.36	128.65	Medium	-130.71	-50.4%
Calcium, ppm	1298.72	1217.54	Medium	-81.18	-6.3%
Magnesium, ppm	333.08	257.08	V. High	-76.00	-22.8%
Sodium, ppm	816.67	145.61	Optimum	-671.06	-82.2%
Sulfur, ppm	84.74	17.86	High	-66.88	-78.9%
Copper, ppm	2.87	1.02	High	-1.85	-64.5%
Zinc, ppm	1.53	1.36	Medium	-0.17	-11.1%
Salts, ppm	3238.40	296.96	V. Low	-2941.44	-90.8%
Field #1 NE Corner	5/22/06	11/07/06	Final Value		
Element (Mehlich3)	Value	Value	Interpretation	+/- Change	% Change
pH (1:1 Water)	6.16	6.53	High	+0.37	+6.0%
Phosphorus, ppm	25.73	11.70	Medium	-14.03	-54.5%
Potassium, ppm	254.91	103.69	Medium	-151.22	-59.3%
Calcium, ppm	1693.33	1572.07	High	-121.26	-7.2%
Magnesium, ppm	420.48	292.07	V High	-128.41	-30.5%
Sodium, ppm	872.00	216.09	Optimum	-655.91	-75.2%
Sulfur, ppm	74.67	26.77	High	-47.90	-64.1%
Copper, ppm	2.92	2.44	High	-0.48	-16.4%
Zinc, ppm	1.83	1.33	Medium	-0.50	-27.3%
Salts, ppm	4160.0	588.80	Low	-3571.20	-85.8%
Field #1 SW Corner	5/22/06	11/07/06	Final Value		
Element (Mehlich3)	Value	Value	Interpretation	+/- Change	<u>% Change</u>
pH (1:1 Water)	5.99	6.15	High	+0.37	+6.0%
Phosphorus, ppm	17.29	12.08	Medium	-5.21	-30.1%
Potassium, ppm	250.06	117.66	Medium	-132.40	-52.9%
Calcium, ppm	1432.34	1115.79	Medium	-316.55	-22.1%
Magnesium, ppm	342.99	220.00	V High	-122.99	-35.9%
Sodium, ppm	814.44	195.44	Optimum	-619.00	-76.0%
Sulfur, ppm	66.47	25.66	High	-40.81	-61.4%
Copper, ppm	3.09	2.35	High	-0.74	-23.9%
Zinc, ppm	1.35	1.10	Medium	-0.25	-18.5%
Salts, ppm	3571.20	471.04	Low	-3100.16	-86.8%

Field #1: This field received both pre and post trial soil analysis. The following are those results.

Field #1 NW Corner	5/22/06	11/07/06	Final Value		
Element (Mehlich3)	Value	Value	Interpretation	+/- Change	% Change
pH (1:1 Water)	7.04	7.09	High	+0.05	+0.7%
Phosphorus, ppm	32.46	16.87	High	-15.59	-48.0%
Potassium, ppm	237.88	92.82	Low	-145.06	-61.0%
Calcium, ppm	2278.82	2064.09	Medium	-214.73	-9.4%
Magnesium, ppm	356.71	243.87	High	-112.84	-31.6%
Sodium, ppm	825.88	159.12	Optimum	-666.76	-80.7%
Sulfur, ppm	54.44	16.39	High	-40.05	-71.0%
Copper, ppm	2.84	1.95	High	-0.89	-31.3%
Zinc, ppm	2.04	1.33	Medium	-0.71	-34.8%
Salts, ppm	3507.20	432.64	Low	-3074.56	-87.7%

Field #2: This field received only post harvest soil analysis. The following are those results.

	SE Corner	NE Corner	SW Corner	NW Corner
Element (Mehlich3)	Value	Value	Value	Value
pH (1:1 Water)	5.71	6.27	5.66	5.48
Phosphorus, ppm	26.89	20.56	31.65	14.56
Potassium, ppm	115.95	69.55	81.17	65.93
Calcium, ppm	885.55	1225.00	1121.64	959.30
Magnesium, ppm	198.84	203.07	187.02	185.35
Sodium, ppm	162.54	191.59	196.49	145.81
Sulfur, ppm	23.02	22.31	30.19	31.37
Copper, ppm	0.95	1.41	1.08	1.51
Zinc, ppm	1.29	1.13	1.54	1.23
Salts, ppm	372.48	519.68	535.04	433.92

The primary objective of the trial was to create a treatment system that would allow the propagation of rice in a field with less than 5000 ppm salt and more than 750 ppm salt and regenerate the soils of the field for future use. The plots used for trial averaged 3700 ppm salt at the beginning of the trial and finished with an average salt level below 500 ppm or approximately a 90% improvement. In addition to the reduction of salts, the soil sodium levels were all balanced into the Optimum range with an average reduction of nearly 80%. These two critical factors are important for future field performance and validation of product performance.

Other objectives of the trial were to observe the overall nutrient usage of the field and the nutrient levels after the trial was completed. Though all measured nutrients were reduced throughout the trial, no major mining effect was noted and a follow-up soil test in the spring will be conducted to measure field nutrients after an off period. 3 Tier expects that the nutrient levels will substantially increase during this period and significantly reduce any required field supplements needed prior to spring planting.

Harvest Results:

The test plots were harvested on November 1, 2006 by David Lacour. Each plot was harvested individually and weighed in LSU Ag Center's weigh wagon. Weight was verified by Mark Spilman of RiceTec, Howard Cormier of LSU, Daniel Burdette of 3 Tier Technologies, and Dennis Blankenship of Growth Plus, Inc. The following information includes the results of the harvest:

		TOTAL	BAR	RELS	BUSI	%	
PLOT & SIZE	VARIETY	WEIGHT	Plot Total	Ave/Acre	Plot Total	Ave/Acre	Moisture
1A** .575 Acres	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1B** .575 Acres	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2A .575 Acres	XL8*	3899	24.07	41.85	86.64	150.67	18.3%
2B .575 Acres	XL8*	4177	25.78	44.84	92.82	161.42	18.5%
3A .575 Acres	CL161	3060	18.89	32.85	68.00	118.25	17.9%
3B .575 Acres	CL161	3307	20.41	35.50	73.49	127.80	17.0%
4A .575 Acres	CL131	3526	21.77	37.85	78.36	136.26	17.5%
4B .565 Acres	CL131	3963	24.46	43.30	88.07	155.88	16.7%
5A .575 Acres	XL730*	4643	28.66	49.84	103.13	179.43	19.8%
5B .565 Acres	XL730*	4398	27.15	48.05	97.73	172.99	17.2%
6A .575 Acres	XL729*	4694	28.98	50.39	104.31	181.40	20.3%
6B .565 Acres	XL729*	4893	30.20	53.46	108.73	192.46	19.0%
Rest 3.01 Acres	XL729*	23860	147.28	48.93	530.22	176.15	18.9%
CL131 & CL161	Average	13856	85.53	37.35	307.91	134.46	17.3%
CLEARFIELD H	ybrid Avera	ge50564	312.12	48.39	1123.64	174.21	18.9%
FIELD TOTALS	S D Hvbrid rice.	64420	397.65	40.21	1431.56	144.75	18.3%

According to LSU Ag Center, the state's early harvest results showed yields ranging from 30 to 50 barrel averages. According to Howard Cormier, LSU county agent for Vermilion Parish, the yields in this parish have held steady with most fields producing 30 - 40 barrels per acre. For the non hybrids in this trial, the average yield was 37.35 barrels per acre, with the hybrids averaging just over 48 barrels an acre.

Though these fields were not supposed to be able to generate a rice crop due to the high salt content, the fact is the average yield results were above average for the area. Another fact that makes these yield numbers interesting is that though the field had higher heat units for the early development of the plants, the amount of heat units the field received for filling the heads was far below the normal units for a crop planted in April and harvested in June or July.

See Photos 8, 9, 10, 11 for harvest day views and activities.

Rice Milling Analysis:

The following results are from a composite sample taken from each plot of the hybrid or seed variety in the trial. The samples were dried at RiceTec headquarters in Alvin, Texas and evaluated by Area Rice Marketing in Eagle Lake, Texas. RiceTec uses this 3rd party individual to process all strip trial samples throughout Texas and Louisiana.

Hybrid/Variety	Whole Milling	Total Milling
CL161	64%	71%
CL131	68%	73%
CLEARFIELD XL729	65%	72%
CLEARFIELD XL730	66%	73%
CLEARFIELD XL8	N/A	N/A

The milling analysis shows that all hybrids and varieties in the trial achieved exceptional milling quality. This is another key indicator that the overall performance of the trial exceeded expectations and the plants were able to produce a quality yield under abnormal soil conditions.

Plant Height Analysis:

The plots were evaluated for average height of plant the day of harvest. The following is the data collected:

		Height of Samples (Inches) Per Plot							
Plot	Variety	1	2	3	4	5	Average		
2A	CLEARFIELD XL8	37	33	33	36	35	34.8		
3A	CL161	31	35	37	32	33.5	33.7		
4A	CL131	32	37	29	30.5	32	32.1		
5A	CLEARFIELD XL730	41	42	39	37.5	32	38.3		
6A	CLEARFIELD XL729	35	35	38	39	41	37.6		
2B	CLEARFIELD XL8	37	37	36	35	35	36		
3B	CL161	33	35	35	32	34	33.8		
4B	CL131	36	31	33	33	27	32		
5B	CLEARFIELD XL730	42	42	41	37	39	40.2		
<u>6B</u>	CLEARFIELD XL729	41	40	40	39.5	38	39.7		
CL131 &	CL161 Averages						32.9		
CLEARF	<u>IELD XL8, XL729, XL730 Hyb</u>	orid Avera	iges				37.8		

Total Trial Averages – 9.89 Acres

According to RiceTec, all plants in each plot achieved normal height while exhibiting normal growth and development throughout the trial.

35.8

Cost Analysis:

The following is a complete cost analysis for the trial:

Item	Unit	Price	Quantity	Total .
Income				
#1 Rice	cwt	\$10.50	644.2 X .92 = 592.7	\$6223.35
Total Income				\$6223.35
Average Income	Per Acre			\$712.05/Acre
Direct Expenses				
Application Fees				
Custom Applications	acre	\$5.50	60	\$330.00
Aerial Applications	acre	\$10.00	10	\$100.00
Aerial Applications	acre	\$12.50	20	\$250.00
Seed Drilling	acre	\$6.50	10	\$65.00
Total Application	n Fees			\$745.00
<u>Fertilizers</u>				
3T Starter Package	acre	\$33.55	10	\$335.50
NESH	acre	\$55.00	10	\$550.00
Urea 46-0-0	acre	\$35.55	10	\$355.35
Total Fertilizer				\$1240.85
Pesticides				
Prowl H2O	acre	\$8.09	10	\$80.90
Stam M-4HF	acre	\$15.41	10	\$154.10
Newpath	acre	\$20.58	10	\$205.80
Newpath	acre	\$16.46	10	\$164.60
Karate Z	acre	\$6.56	20	\$131.20
Karate Z	acre	\$5.70	10	\$57.00
Permit	acre	\$9.73	10	\$97.30
Londax	acre	\$9.87	10	\$98.70
Stratego	acre	\$28.12	20	\$562.40
Tilt	acre	\$5.76	20	\$115.20
Total Pesticides		*		\$1667.20
Seed				
CL131	acre	\$36.08	1.15	\$41.49
CL161	acre	\$36.08	1.14	\$41.13
CLEARFIELD XL8	acre	\$76.00	1.15	\$87.40
CLEARFIELD XL729	acre	\$86.00	4.16	\$357.76
CLEARFIELD XI 730	acre	\$82.00	1.14	\$93.48
Total Seed		QQZIOO		\$621.26
Seed Drying Cost				
Seed Drying	cwt	\$1.08	644.2	\$695.74
Total Direct Expenses Average Expense	s ses Per Acre			\$4970.05 \$502.53/Acre
Profit After Expenses Average Profit P	er Acre			\$1253.30 \$143.40/Acre

Trial Summary:

On July 6th 2006, the Louisiana Hurricane Soil Remediation Trial began, and successfully ended with a quality harvest on November 1st 2006. The following are the trial highlights:

- Length of trial from planting to harvest was 119 days.
- Trial plot received 25.5 inches of rain over the course of the trial.
- First germination was detected on July 8th, just two days after planting with full field emergence on July 10th, four days after planting.
- Plot growth was vigorous and plant health was above average, even though the plot maintained salt readings above 1000ppm. All plots performed at or above expectation.
- Normal nutrients, as recommended by the manufacturer, were applied to the trial plot in combination with NESH for the remediation of the soil. NESH has a low nitrogen base.
- Seed germination per square foot was at or above expectation for all plots.
- Plant stand at the end of the trial was at or exceeded expectations.
- Yield expectations were exceeded for all seed types, with the CL131 and CL161averaging over 37 barrels per acre and the CLEARFIELD Hybrids yielding over 48 barrels an acre.
- CLEARFIELD XL729 was the top performing seed, delivering nearly 52 barrels an acre.
- Pre and post trial soil tests showed an average reduction in salt of over 650%. The plots contained an average of 3600ppm salt prior to the start of the trial and averaged less than 450ppm after the trial.
- Soil tests revealed little nutrient mining from the program and it is expected that little nutritional supplements will be required next year for field preparation.
- Milling analysis showed the rice produced had exceptional milling quality.
- Based on the market value of rice on November 15th 2006, the trial would have generated over \$712.00 an acre in revenue.
- Trial Expenses averaged \$503.00 an acre. This included the additional treatments of NESH for the remediation of the soils.
- The trial plot produced a profit after expenses of over \$143.00 an acre.

3 Tier Technologies understands that this is the first step in finding a solution for salt issues in Louisiana, however, a trial of this size and the results achieved moves the process ahead much further than just a small replicate trial or bench testing. Large scale, real world settings are the best platform to truly identify the performance of a product and is the reason 3 Tier conducted this product demonstration. The success in our labs provided the confidence we needed to fund such a trial and to evaluate the research to provide farmers in the affected areas options for their land in 2007.

3 Tier, RiceTec, and LSU continue to work on this issue as well as the mystery malady sites, higher salt contaminated areas, and improvements to regular production procedures. Our goal is to continue this process while increasing the production of rice in 2007 and hopefully getting the majority of the production back online for 2008.

2006 saw increased disease pressure throughout the state and 3 Tier is confident that we can help with this problem as well as with the ongoing issue of salt and excess iron.

For more information or copies of the original soil reports, contact Daniel J. Burdette at <u>dburdette@3tiertech.com</u> or by phone at 877-710-6953.

<u>3 Tier Post Trial Comments:</u>

This trial posed many opportunities to display the depth of 3 Tier's technology. The greatest opportunity was to see how the products would perform in high salt conditions. Historical data has shown that rice planted in soils containing salt levels higher than 750 ppm result in abnormally low yields. Advancements in new salt tolerant hybrids have shown promise in soils with higher than normal salt levels; however, they were ineffective in soils contaminated by Hurricane Rita.

Additional learning over the past season show that even though soils may start within the recommended salt range for planting, salt spikes may occur from either solubilization of salt from lower soil structures or from the water used to flood the fields. In either situation, plant performance and ultimately yields were affected.

The primary objective of the trial was to engineer a treatment system to regenerate hurricane affected soils to a level that would provide profitable yields and long term production capability. Additional goals included providing economically viable options for the farmer, and identifying other applications for the technology.

Through extensive in-house laboratory work, our science team was able to isolate three primary factors that contributed to the design of our treatment program. The first factor which created the greatest challenge was also the most obvious, excessive salt levels. The second factor was a toxic iron potential. The third factor was aggressive pathogenic activity. Our program had to address all of these factors to be successful. To further complicate the trial, the late planting of the crop increased the potential for higher disease and insect pressure. The recommended course of action resulted in a three part program, each scientifically designed to solve a particular plight.

The solution starts with our Rice Starter Package. This two product starter program provides a sound foundation for plant development, providing not only the critical N-P-K elements needed for rapid plant establishment, but also is complimented by our unique humic acid with a readily available calcium component and arguably the industries largest known beneficial microbial package. This unique combination provides the seed with the critical building blocks necessary for rapid germination while buffering the seed and early plant development from some of the contamination. The microbial package provided critical natural disease and insect suppression throughout the course of the entire process.

The second component to the solution required innovation. Our scientists created a new product called NESH[™], (Nitrogen Enhanced Soft Humic), designed specifically to correct the complex issues associated with hurricane contaminated soils. Applied three weeks after planting, this product provides a special buffering effect, protecting the plant from damage caused by high salt levels and other random contaminants.

While NESH provides and enhances critical nutrients beneficial to plant development, another critical benefit of NESH is its ability to keep potentially toxic iron levels in a non-toxic state and stimulate beneficial microbial activity initiated by the starter package.

These collective actions naturally correct the pathogenic activity that was identified in the soils. The combination of the two programs provides a cost effective solution to planting rice in hurricane affected areas.

The third component to the trials success was the use of higher salt tolerant rice varietals. Several CLEARFIELD varieties were used in this trial and each performed above expectation. When used in combination with 3 Tier products, the unique breeding of these varieties added to the plants' resistance to the higher salt conditions, and contributed to the overall success of the trial.

3 Tier Post Trial Comments Continued:

These trial results, coupled with our continued commitment to research, have resulted in other programs for regular rice production. These programs use a combination of all the strategies and products mentioned above in varied application rates. Our mission is to provide farmers with the tools needed to protect against disease and insect pressures, potential salt spikes, and the mystery malady that has challenged the area. These programs are available for spring planting and are designed for both wet and dry rice seeding.

3 Tier Technologies would like to extend sincere thanks and gratitude to Francis and David LaCour, the entire staff of the LSU Ag Center, RiceTec Seed Company, G&H Seed Company, and Growth Plus, Inc. for their hard work and tireless dedication. Without their help, this trial would not have been possible.

Trial Photos:



Photo 1 First Seed Germination 7.8.06 – 2 Days After Planting



Photo 2A Plant Emergence 7.10.06 – 4 Days After Planting



Photo 2B Plant Emergence 7.10.06 – 4 Days After Planting



Photo 3 Field View 7.20.06 - 14 Days After Planting



Photo 4 Field View 7.29.06 - 23 Days After Planting / 8 Days After NESH Application



Photo 5 Field View 8.13.06 - 38 Days After Planting / 7 Days After Flood



Photo 6 Field View 8.31.06 – 56 Days After Planting / 25 Days After Flood



Photo 7 Field View 9.26.06 – 82 Days After Planting / 49 Days After Flood



Photo 8 Field View 11.01.06 - Harvest Day / 119 Days After Planting



Photo 9 Harvest Day



Photo 10 Harvest Day



Photo 11 Harvest Day