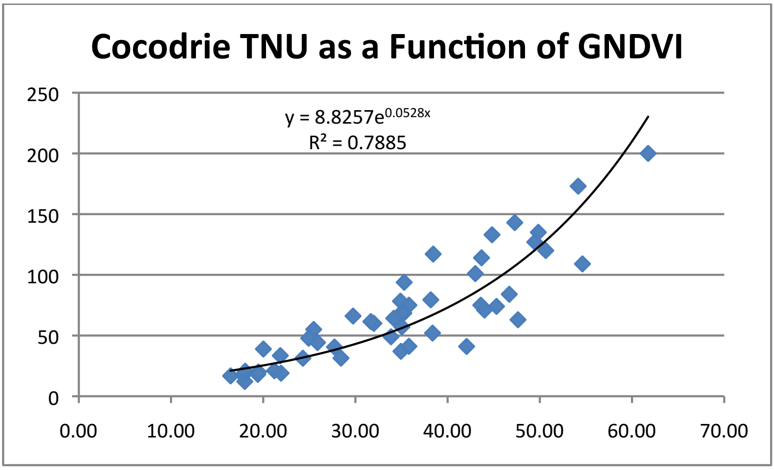
Figure 2. An example of the exponential relationship between total nitrogen uptake (TNU) and GNDVI for Cocodrie from studies conducted in 2007 and 2008.



Insecticidal Seed Treatments And Conservation Tillage

Presented by Dr. M.O. Way

Professor of Entomology, Texas AgriLife Research And Extension Center

Presented by M. S. Nunez

Presented by R. A. Pearson

Introduction

Conservation tillage is becoming more prevalent in Texas rice farming. This practice frequently results in earlier planting which is sometimes associated with poor emergence and stands. Furthermore, Texas rice farmers are planting at lower seeding rates than in the past which is due in part to increasing cost of seed (e.g. hybrid seed). Consequently, pesticidal seed treatments can be considered "good insurance" against the array of pests which threatens rice stands or vigor. Recently, we evaluated Dermacor X-100 seed treatment for control of rice water weevil (RWW), Lissorhoptrus oryzophilus, and stem borers including sugarcane borer (SCB), Diatraea saccharalis and Mexican rice borer (MRB), Eoreuma loftini. The active ingredient in Dermacor X-100 is rynaxypyr which has an excellent environmental profile---relatively low toxicity to birds, fish and mammals. Dermacor X-100 applied to seed greatly reduces the negative effects of drift associated with foliar insecticide applications.

Materials and Methods

Experiments were conducted in 2008. Dermacor X-100 treated seed was provided by DuPont. All rice was drill-seeded and flushed as needed until application of the flood-about 3 weeks after emergence. Plot size was 7-9 rows (7 inch spacing) by 16-18 ft long. Treatments were replicated 4 times. Weeds were controlled using recommended herbicides, rates and timings. Fertilizer was applied as recommended for Cocodrie and XL723---the 2 varieties used in the experiments. Plots were harvested and yields adjusted to 12% moisture. All data were analyzed by ANOVA and means separated by LSD.

Experiment 1. This experiment was conducted at the Beaumont Center. All plots were surrounded by metal barriers. The experiment was designed as a split plot with main plots seeding rate and sub plots various treatments as shown in Table 1. RWW were sampled 3 weeks after flood and about 10-14 days later. RWW were sampled according to standard sampling methods. SCB and MRB were the only stem borers in this experiment. Damage by stem borers was represented by whiteheads counted in the middle 4 rows of each plot.

Experiment 2. This experiment was conducted at the Ganado Research Site where stem borer damage is generally severe. The experiment was designed as a randomized complete block. Treatments are described in Table 3. RWW was controlled by a pyrethroid applied immediately before application of the flood. Whiteheads were counted in the middle 4 rows of each plot.

Results and Discussion

Experiment 1. Plant stands reflected seeding rates (Tables 1 and 2). Across treatments, the 90 lb/A seeding rate produced approximately 3 and 1.5x higher plant densities compared to the 30 and 60 lb/A seeding rates, respectively. As expected, across seeding rates, plant stands did not differ significantly relative to treatments. For both sample dates, RWW populations were well above threshold (about 15 larvae/pupae per 5 cores) in untreated plots. On both sample dates, across seeding rates, all Dermacor X-100 rates significantly reduced RWW populations. However, the lowest rate did not perform as well as the higher rates. Also, across seeding rates for both sample dates, the current labeled rates (0.025 and 0.05 mg ai/seed) gave excellent control of RWW. Data suggest excellent control of RWW can be achieved with as little as 0.031 lb ai/A equivalent to 0.025 mg ai/seed at a seeding rate of only 30 lb/A. The combination of seeding rate and Dermacor X-100 treatment rate to produce less than 0.031 lb ai/A may compromise RWW control.

Although whitehead (a measure of stem borer damage) densities in untreated plots were not exceptionally high, data indicate Dermacor X-100 provides considerable control of stem borers (combination of SCB and MRB). Across seeding rates, currently labeled rates of Dermacor X-100 reduced whitehead numbers 94%.

Across treatments, yields were not significantly different among seeding rates. However, across seeding rates, all Dermacor X-100 seed treatment rates produced yields significantly higher than the untreated. The average yield increase over the untreated for the 0.025 and 0.05 mg ai/seed rates was 800 lb/A due to RWW and stem borer control. Given a rice price of $18/cwt, this yield difference is worth $144/A in increased gross revenue.

Table 1. Mean data for Dermacor X-100 seeding rate for rice water weevil (RWW) control Beaumont, TX. 2008

Seeding rate (lb/A)	Treatment	Rate mg ai/seed (lb ai/A)[a]	Plants/3 ft of row	No. RWW[b]/5 cores		No. WH[b]	Yield (lb/A)
				Jul 4	Jul 16		
30	Untreated	---	15	82	37	22	7952
30	Dermacor X-100	0.0125 (0.016)	17	16	16	4	8853
30	Dermacor X-100	0.025 (0.031)	16	3	4	1	8812
30	Dermacor X-100	0.05 (0.062)	16	2	2	0	9018
30	Dermacor X-100	0.1 (0.124)	18	0	0	1	8843
60	Untreated	---	30	76	20	11	8297
60	Dermacor X-100	0.0125 (0.031)	33	5	1	1	8969
60	Dermacor X-100	0.025 (0.062)	31	2	1	1	8854
60	Dermacor X-100	0.05 (0.124)	31	1	0	1	8936
60	Dermacor X-100	0.1 (0.248)	31	0	0	0	8713
90	Untreated	---	45	81	17	15	8183
90	Dermacor X-100	0.0125 (0.047)	48	4	4	5	8909
90	Dermacor X-100	0.025 (0.093)	45	1	1	2	8937
90	Dermacor X-100	0.05 (0.186)	49	0	0	2	9105
90	Dermacor X-100	0.1 (0.373)	49	0	0	4	9256

[a] based on 18,800 Cocodrie seeds/lb.
[b] RWW = rice water weevil, WH = whiteheads in 4 middle rows.

Table 2. Statistical analysis of data in Table 1

	Plants/3 ft of row	No. RWW[b]/5 cores Jul 4	No. RWW[b]/5 cores Jul 16	No. WH[b]	Yield (lb/A)
Main plot effects:					
30 lb/A	16 c	21 a	12 a	6 a	8696
60 lb/A	31 b	17 b	5 b	3 b	8754
90 lb/A	47 a	17 b	4 b	6 a	8878
Sub plot effects:					NS
Untreated	30	79 a	25 a	16 a	8144 b
0.0125 mg ai/seed	32	8 b	7 b	3 b	8910 a
0.025 mg ai/seed	31	2 c	2 c	1 b	8868 a
0.05 mg ai/seed	32	1 cd	1 cd	1 b	9020 a
0.1 mg ai/seed	33	0 d	0 d	2 b	8937 a
Interactions:	NS				
Seeding rate x treatment rate	*P* = 0.7478	*P* = 0.0064	*P* = 0.0250	*P* = 0.3527	*P* = 0.8900

[a] RWW = rice water weevil.
[b] WH = whiteheads in 4 middle rows.
Means in a column followed by the same or no letter are not significantly (NS) different (*P* = 0.05, ANOVA and LSD).

Experiment 2. Dissection of stalks with whiteheads revealed a population distribution of about 75% MRB and 25% SCB in this experiment. Whitehead numbers in Cocodrie untreated plots were much higher than in XL723 untreated plots (Table 3). The mid-rate of Dermacor X-100 (0.05mg ai/seed) reduced whitehead numbers 86 and 80% in Cocodrie and XL723, respectively. Note that XL723 was planted at a much lower seeding rate than Cocodrie. The high rate of Dermacor X-100 provided 100% reduction in whitehead numbers for both Cocodrie and XL723. However, these results suggest current Section 18 labeled rates of Dermacor X-100 provide good stem borer control. The highest tested rate resulted in 100% reduction in whitehead numbers.

For Cocodrie, the lowest rate of Dermacor X-100 produced 1027 lb/A yield advantage over the untreated while for XL723, the mid-rate of Dermacor X-100 produced 1373 lb/A yield advantage over the untreated. These results show the severity of stem borer damage in this region of the Texas Rice Belt. Data also suggest XL723 is susceptible to stem borers despite the relatively low numbers of WHs. This indicates WH density does not capture total yield losses due to stem borers.

Notes:

Table 3. Data for seed treatments for stem borer control. Ganado, TX. 2008.

Variety	Treatment[a]	Rate (mg ai/seed)	Panicles/ft of row	No. WH[b]	Yield (lb/A)
Cocodrie	Dermacor X-100	0.025	23	5 c	6835 c
Cocodrie	Dermacor X-100	0.05	25	4 cd	6769 cd
Cocodrie	Dermacor X-100	0.10	24	0 ef	6759 cd
XL723	Dermacor X-100	0.025	26	7 bc	8261 b
XL723	Dermacor X-100	0.05	22	2 de	8409 b
XL723	Dermacor X-100	0.10	26	0 f	9070 a
Cocodrie	X	X	23	30 a	6209 de
Cocodrie	Karate Z	0.03 lb ai/A	23	1 ef	6652 cd
XL723	Karate Z	0.03 lb ai/A	22	0 f	8681 ab
Cocodrie	Untreated	---	24	28 a	5808 e
XL723	Untreated	---	24	10 b	7036 c
			NS		

[a] Karate Z applied at 1-2 inch panicle and again at late boot; Dermacor X-100 is a seed treatment

[b] WH = whiteheads in 4 middle rows

Means in a column followed by the same letter are not significantly (NS) different (P = 0.05, ANOVA and LSD).

PRECISION AG PRESENTATIONS

How Can Geospatial Technologies Help Improve Farming Efficiency

Presented by Dr. Roberto Barbosa
Assistant Professor, LSU AgCenter

Introduction

Much has been discussed about the potential benefits that geospatial technologies can bring to farmers. Better known as Precision Agriculture (PA), these technologies utilize global positioning systems (GPS) receivers, computer programs such as geographic information systems (GIS), controllers, sensors, and electronic monitors such as the yield monitor (YM) to bring information to the farmer about fertility, crop status, harvested yield, etc. The next question is what do we do with this all this information? Putting the potential agronomic and environmental benefits that PA can bring to the farm aside for a moment, we're going to focus on how can we use geospatial technologies to increase our farming efficiency.

Increased Cost

Figure 1 shows a 10-year index of prices paid for major inputs used in the farm: fertilizer, fuel, insecticide, herbicide, and machinery. The base period is 1990-1992, and the source of this information is the USDA Agricultural Statistics Service (Gould, 2008). We