# IMPACT OF HURRICANE RITA STORM SURGE ON SUGARCANE INSECTS

T. E. Reagan[1], J. M. Beuzelin[1], W. Akbar[1], H. J. Cormier[2], and J. W. Flanagan[2]

Department of Entomology [1]
Vermilion Parish LCES Agent[2], and Iberia / St. Mary Parish LCES Agent[2]

Following Hurricane Rita storm surge, a 12-replication study comparing flooded and non-flooded plant and stubble sugarcane fields was conducted in Iberia, St Mary, and Vermilion parishes during the summer of 2006. The abundance of soil-associated arthropod fauna (15 arthropod groups) was monitored from mid-July to mid-September using two pitfall traps in each of the 48 fields surveyed. Sugarcane borer, *Diatraea saccharalis* (F.) injury was recorded in mid-October from 25 stalks per field. The number of insecticide applications for *D. saccharalis* control was also obtained from the growers. Data were analyzed using generalized linear models (SAS Proc Glimmix), and means were separated using Tukey's HSD ($\alpha = 0.05$).

The storm surge overall caused a significant (*P= 0.001*) 2.76-fold decrease in red imported fire ant populations, the primary *D. saccharalis* predators. However, imported fire ant populations were affected to a greater extent in plant cane fields than in stubble cane fields, with a 4.90-fold decrease in abundance (Fig. 1). For stubble cane fields, it was only a numerical trend for a 1.72-fold decrease. Spiders, collectively second in importance in the *D. saccharalis* predatory complex, were also very likely (*P=0.075*) affected with a 1.23-fold decrease in storm surge areas (Fig. 2). No negative effect of the storm surge was detected on predatory beetles (*P= 0.4824)* and earwigs (*P= 0.1614*), which also prey on *D. saccharalis*. For the non-predatory groups (crickets, non-predatory beetles, leafhoppers, etc…), no adverse effects of the storm surge were detected (data not shown).

The storm surge impacted to greater extent fire ants and spiders than other soil-associated arthropods. Thus, the Shannon index, which integrates the number of groups present as well as their relative proportion, was calculated to estimate soil-associated arthropod diversity over the 15 groups collected. The storm surge significantly (*P= 0.0007)* increased diversity, with an increase from 1.36 to 1.77 in Shannon indexes (Fig. 3). There was a strong trend for higher *D. saccharalis* injury (*P= 0.08*), even with an overall 2.4-fold increase (*P< 0.05*) in the number of insecticide applications in fields that had been flooded.

Impacting to a greater extent imported fire ants, Hurricane Rita storm surge enhanced a greater balance among soil-associated arthropods in the Louisiana sugarcane agroecosystem. However, this "ecological balance" disturbed the "pest management balance" between beneficial and pest arthropods. A decrease in the primary *D. saccharalis* predator increased insecticide use. *D. saccharalis* predators, especially red imported fire ants, are critical components of the sugarcane IPM and need to be preserved through the use of environmentally friendly chemistry and borer resistant sugarcane cultivars.

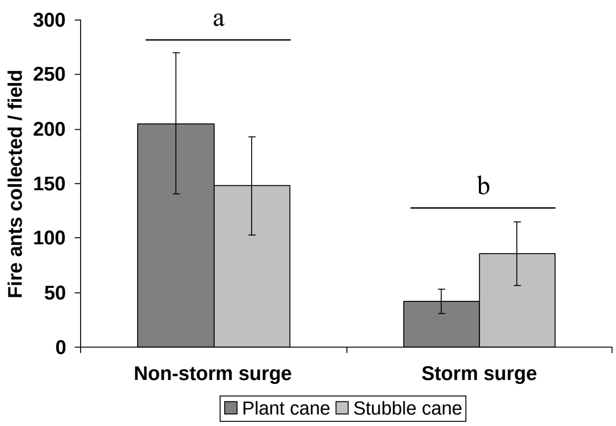


**Fig 1.** Imported fire ant abundance in sugarcane, July-September, 2006.

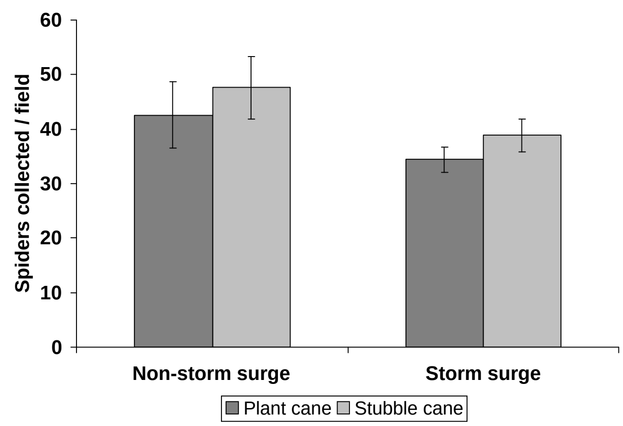


**Fig 2.** Spider abundance in sugarcane, July-September, 2006.

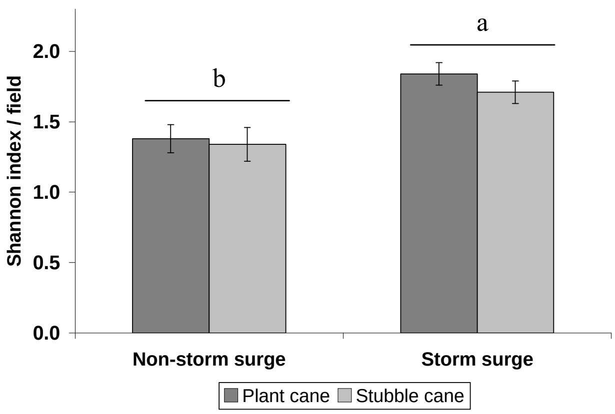


**Fig 3.** Shannon arthropod diversity index.

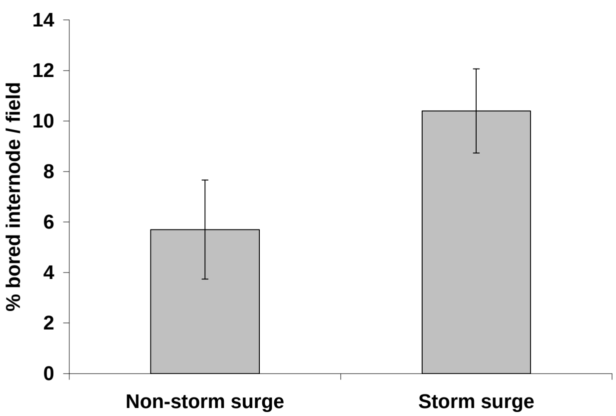


**Fig 4.** *D. saccharalis* injury.

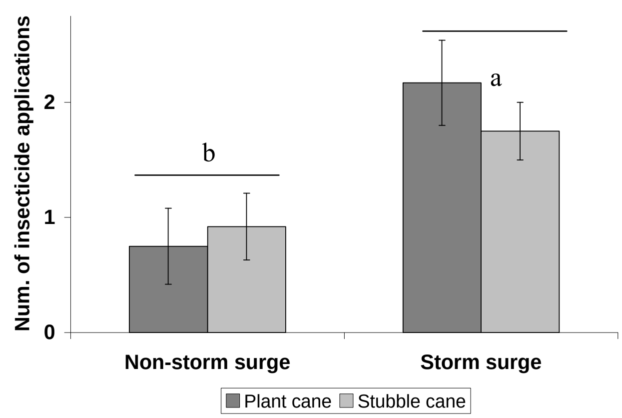


**Fig 5.** Insecticide application frequency.

# SMALL PLOT ASSESSMENT OF INSECTICIDES AGAINST THE SUGARCANE BORER COMPLEX

T. E. Reagan, W. Akbar, and J. Beuzelin
Department of Entomology

A study was conducted at the Texas A&M University research site at Ganado, TX (Jackson County) to evaluate insecticides for control of the sugarcane borer (SCB) and the Mexican rice borer (MRB). Five different insecticide treatments, in addition to an untreated check, were assessed for season-long control of SCB and MRB in a CRD with three replicates in a field of variety HoCP91-555 planted in October 2005. Insecticide treatments were applied to 1-row plots (8 ft) on 23 August and September 11, 2006. The treatments were mixed in 2 gallons of water and applied using a Solo back pack sprayer delivering 10 gpa at 14 psi. Borer injury to sugarcane for each borer species was identified and assessed by counting the number of bored internodes and the total number of internodes from each of 4 treatments and the untreated control (15 stalks per plot) from each plot at the time of harvest (October 20). The proportion of bored internodes was analyzed using a generalized linear model (Proc Glimmix, SAS Institute) with a binomial distribution, and means were separated with Tukey's HSD ($\alpha$ = 0.05).

Minimum injury in insecticide treated plots was 1.95% (for SCB) and 5.64% (for MRB) bored internodes with all treatments significantly less than the untreated check of 24.0% and 44.4% bored internodes for SCB and MRB, respectively. The pyrethroid gamma cyhalothrin (Prolex®) at 2.05 oz/acre rate showed a trend providing the maximum borer control for both species (Table 1).

Table 1. Insecticidal control of sugarcane borer and Mexican rice borer in a small plot test at Ganado, TX, 2006.

| Insecticide | Rate (oz/acre) | % Bored Internodes | |
|---|---|---|---|
| | | SCB[d] | MRB[d] |
| Control | | 24.02a | 44.39a |
| Alverde EC[a] | 29 | 14.22ab | 5.80b |
| Delta Gold EC[b] | 2.5 | 11.23b | 9.15b |
| Diamond 0.83EC[c] | 12 | 8.52bc | 10.75b |
| Confirm 2F[c] | 16 | 3.25c | 7.70b |
| Prolex 1.25EC[c] | 2.05 | 1.95c | 5.64b |
| *F* value | | 16.3 | 44.4 |
| *p* value | | <.0001 | <.0001 |

[a]Treatment was applied with Penetrator Plus surfactant at 0.5% v/v.
[b]Treatment was applied with Interlock surfactant at 4 oz/acre.
[c]Treatment was applied with Latron CS-7 at 0.25% v/v.
[d]Means within column followed by the same letter are not significantly different ($P \geq .05$, Tukey's HSD).

## SMALL PLOT ASSESSMENT OF INSECTICIDES AGAINST THE SUGARCANE APHID, 2006

T. E. Reagan, W. Akbar, and J. Beuzelin, G. Coburn*
Department of Entomology

Six different insecticides were evaluated for control of the sugarcane aphid (SA) in a RCB design with five replications in a field of plant cane LCP 85-384 sugarcane located on a farm near Chenyville, LA. Pre-treatment counts were assessed (August 4) prior to test initiation. Insecticide treatments were applied on August 4 to 3-row plots (6 ft x 20 ft) using a Solo back pack sprayer delivering 10 gpa at 14 psi. For each sampling date, aphids were counted on the 3rd leaf down from the whorl on ten randomly selected plants on the center row of each plot. Data were analyzed using Proc Glimmix with means separated with Tukey's HSD ($P < 0.05$).

Differences were not detected among pre-treatment counts on August 4. On 8 Aug (4 DAT) and on Aug 15 (11 DAT), all treatments had significantly fewer SA than the check (untreated control). The trend for the best treatments both 4DAT and 11DAT were Intruder® and Trimax Pro®, respectively.

Table 1. Insecticidal control of sugarcane aphid in a small plot test at Chenyville, LA, 2006.

| Insecticide | Rate (lbs ai/acre) | Pretreatment Counts | 4-day Post treatment counts | 11-day Post treatment counts |
|---|---|---|---|---|
| Control | | 464a | 379.1a | 93.2a |
| Karate-Z | 0.030 | 400a | 36.6b | 6.7b |
| Prolex 1.25EC | 0.020 | 576a | 27.9b | 6.4b |
| Carbine 50WG | 0.063 | 539a | 18.3b | 7.6b |
| Centric 40WG | 0.050 | 740a | 18.1b | 5.9b |
| Trimax Pro | 0.050 | 590a | 9.2b | 5.8b |
| Intruder WSP | 0.035 | 674a | 7.7b | 6.1b |

Counts represent mean # of aphids per leaf.
Means within columns followed by the same letter are not significantly different ($P < 0.05$, Tukey's HSD).

*Pest Management Enterprises Inc., Chenyville, LA

**ASSESSMENT OF VARIETAL RESISTANCE TO THE SUGARCANE BORER**

T. E. Reagan, W. Akbar, and J. Beuzelin
Department of Entomology

Sugarcane resistance to the sugarcane borer (SCB), *Diatraea saccharalis*, is categorized as a combination of physical characteristics that hinder boring (i.e. rind hardness, leaf-sheath appression), variety specific tolerance to boring, and antibiosis mechanisms that contribute to differences in survival in larvae that have bored into the stalks. The extent of this resistance also is influenced by the severity of infestations. Heavy borer pressure results in more bored internodes even in varieties considered highly resistant. Several factors contributing to seasonal area-wide SCB infestation levels include weather conditions, predator and parasite numbers, indigenous borer populations, and effectiveness of insecticidal controls. Expansive acreage of varieties with elevated moth production increases endemic SCB populations and imposes additional pressure on the remaining acreage of more resistant varieties. A minimal component in the practice of host plant resistance in entomology involves the encouragement of breeding programs not to release varieties more susceptible to key insect pests than those varieties already commonly grown. This is particularly important when there is evidence that the susceptible variety has the potential to enhance pest populations. For this reason, we also report moth production for each variety in these tests.

Fourteen sugarcane varieties of the L04, several HoCP00 and the HoCP03 series, kept in the variety development program and six standard varieties (HoCP96-540, HoCP 91-555, HoCP 85-845, LCP 85-384, Ho95-988, and L99-226) were evaluated for resistance/susceptibility to SCB during 2006. All varieties were planted in 15-ft plots (6 stalks/variety/plot) on September 14, 2005 near Burns Point at the Bozo Luke farm in St. Mary parish in a randomized complete block design with 4 replications each. The varieties had to be replanted on December 21, 2005 because of flooding in the field after Hurricane Rita. A 15-stalk sample was cut from each plot on December 5, 2006 (four replications = 60 stalks per variety). Sample stalks were examined to determine the number of bored internodes, moth emergence holes, and the total number of internodes at the end of the season.

Significant differences among the varieties were detected with Ho95-988 (41.6% bored internodes) being the most susceptible. Among the standard varieties tested, HoCP 85-845 was the most resistant (11% bored internodes). Theses results are presented in Table 1.

Table 1. Sugarcane borer injury in plant cane L04, several HoCP00, HoCP03 series varieties and six commercial varieties during 2006, Bozo Luke Farm near Burns Point, LA. Test was planted September 14, 2005, and replanted on December 21, 2005, after Hurricane Rita. Samples harvested December 5, 2006.

| Variety | SCB % Bored Internodes |
|---|---|
| **Ho95- 988** | **41.6a** |
| CP89-2143 | 41.4ab |
| HoCP00-950 | 29.0bc |
| L04-403 | 28.7bc |
| **HoCP91-555** | **25.4bcd** |
| **L99-226** | **27.2bcd** |
| L04-408 | 29.6bcdef |
| L04-434 | 26.0bcde |
| **HoCP96-540** | **22.6cdef** |
| **LCP85-384** | **19.1def** |
| L04-410 | 19.8ef |
| L04-425 | 20.7efg |
| HoCP03-743 | 17.6fg |
| **HoCP85-845** | **11.0g** |

Means within columns followed by the same letter are not significantly different ($P \leq 0.05$, Tukey's HSD).

Acknowledgment: The sugarcane entomology program would like to express appreciation for help from other members of the sugarcane variety development and breeding program for their assistance in cutting the seed-cane, and helping to select the varieties for evaluation. Additionally, Dr. W. H. White (USDA-ARS) provided the USDA varieties used in these studies.

# ASSESSMENT OF VARIETAL RESISTANCE TO THE SUGARCANE BORER AND MEXICAN RICE BORER

T. E. Reagan[1], M.O. Way[2], J. Beuzelin[1], and W. Akbar[1]

Department of Entomology[1]
Texas A&M Research and Extension Center at Beaumont[2]

Sugarcane resistance to the sugarcane borer (SCB), *Diatraea saccharalis*, and Mexican rice borer (MRB), *Eoreuma loftini*, is categorized as a combination of physical characteristics that hinder boring (i.e. rind hardness, leaf-sheath appression), variety specific tolerance to boring, and antibiosis mechanisms that contribute to differences in survival in larvae that have bored into the stalks. However, the single greatest component of resistance to the Mexican rice borer shows to be characteristics of plant vigor minimizing leaf senescence and attractiveness for egg laying. The extent of this resistance also is influenced by the severity of infestations. Heavy borer pressure results in more bored internodes even in varieties considered highly resistant. Several factors contributing to seasonal area-wide SCB and MRB infestation levels include weather conditions, predator and parasite numbers, indigenous borer populations, and effectiveness of insecticidal controls. Expansive acreage of varieties with elevated moth production increases endemic SCB and MRB populations and imposes additional pressure on the remaining acreage of more resistant varieties. A minimal component in the practice of host plant resistance in entomology involves the encouragement of breeding programs not to release varieties more susceptible to key insect pests than those varieties already commonly grown. This is particularly important when there is evidence that the susceptible variety has the potential to enhance pest populations. For this reason, we also report moth production for each variety in these tests.

Seven sugarcane varieties of the L99, L01, and HoCP00 series, kept in the variety development program including three standard varieties (HoCP 85-845, LCP 85-384, and L99-226) were evaluated for resistance/susceptibility to SCB and MRB during 2006. All varieties were planted in 12-ft plots (5 stalks/variety/plot) on October 6, 2005 at Ganado, TX in a randomized complete block design with 5 replications each. Mocap 20G and atrazine herbicide were applied in furrow and immediately covered as rows were planted.

For an early season assessment of borer injury, number of deadhearts caused by SCB and MRB were recorded on June 3, and June 30, 2006. The deadhearts were dissected and evaluated for MRB or SCB damage. Only one larva out of the 180 recovered was a SCB indicating that early season infestations are exclusively caused by MRB. Significant differences were detected among cultivars with Ho01-564 having the greatest deadhearts frequency (17,545 per acre), and HoCP01-523 the lowest (2,541 per acre) (Table 1). Among the standards, maximum deadhearts were recorded in HoCP85-845 which is a borer resistant variety.

Mid-late season assessment of borer injury was recorded on August 23-24, 2006 by dissecting four randomly selected stalks from each variety. A strong trend suggests that HoCP85-845 is the least susceptible to MRB infestations (Fig. 1). MRB injury was higher than SCB for all varieties. The proportions of bored internodes relative to the position in the sugarcane stalk showed that MRB injury is approximately four times more frequent than SCB injury early in the season (Fig. 2). As the season progresses, the proportion of SCB injury increases, the proportion of MRB injury decreases, and both proportions become almost equal late in the season.

For final variety assessment, 15-stalk samples were cut from each plot at the end of the season (winter 2006) (five replications = 75 stalks per variety). Sample stalks were examined to determine the number of bored internodes, moth emergence holes, and the total number of internodes. Significant differences among the varieties were detected with LCP85-384 (55.9% bored internodes) being the most susceptible. Among the standard varieties tested, the newly released L99-226 was the most susceptible (39.7% bored internodes) and HoCP 85-845 was the most resistant (26.6% bored internodes). Theses results are presented in Table 2.

Table 1: Mexican rice borer-caused deadherats in sugarcane cultivars at Ganado, TX, June 2006.

| **Variety** | Stand density/acre | Deadhearts frequency/acre |
|---|---|---|
| Ho 01-564 | 43,560 a | 17,545 a |
| **HoCP 85-845** | 37,026 ab | 13,189 ab |
| L 01-283 | 36,478 ab | 11,616 ab |
| **L 99-233** | 35,574 ab | 11,011 b |
| **L 99-226** | 42,229 ab | 8,228 bc |
| HoCP 00-950 | 34,364 ab | 5,808 cd |
| L 01-299 | 32,549 b | 5,082 cd |
| **LCP 85-384** | 37,268 ab | 5,082 cd |
| HoCP 01-523 | 32,428 b | 2,541 d |
| $P > F$ | 0.0062 | <.0001 |

Means within the same column followed by the same letter are not significantly different ($P \leq 0.05$; Tukey's HSD). Total number of deadhearts collected on 06/03/06 and 06/30/06.

Table 2. Sugarcane borer and Mexican rice borer injury in plant cane L99, L01, and HoCP00 series varieties along with three commercial varieties during 2006, Ganado, TX. Test was planted October 6, 2005, and samples harvested end of 2006 season.

| Variety | % Bored Internodes | Relative Survival[a] |
|---|---|---|
| **LCP85-384** | **55.9a** | **0.25b** |
| HoCP00-950 | 51.3ab | 0.46a |
| L99-233 | 41.8bc | 0.19b |
| **L99-226** | **39.7c** | **0.16b** |
| L01 299 | 38.8c | 0.19b |
| L01-283 | 38.3c | 0.25b |
| **HoCP85-845** | **26.6d** | **0.19b** |

[a]Relative survival based on moth emergence holes/number of bored internodes following Bessin et al. (1990) J. Econ. Entomol. 83:221-225, and Reay-Jones et al. (2003) J. Econ. Entomol. 96:1929-1934.
Means within columns followed by the same letter are not significantly different ($P \leq 0.05$, Tukey's HSD).

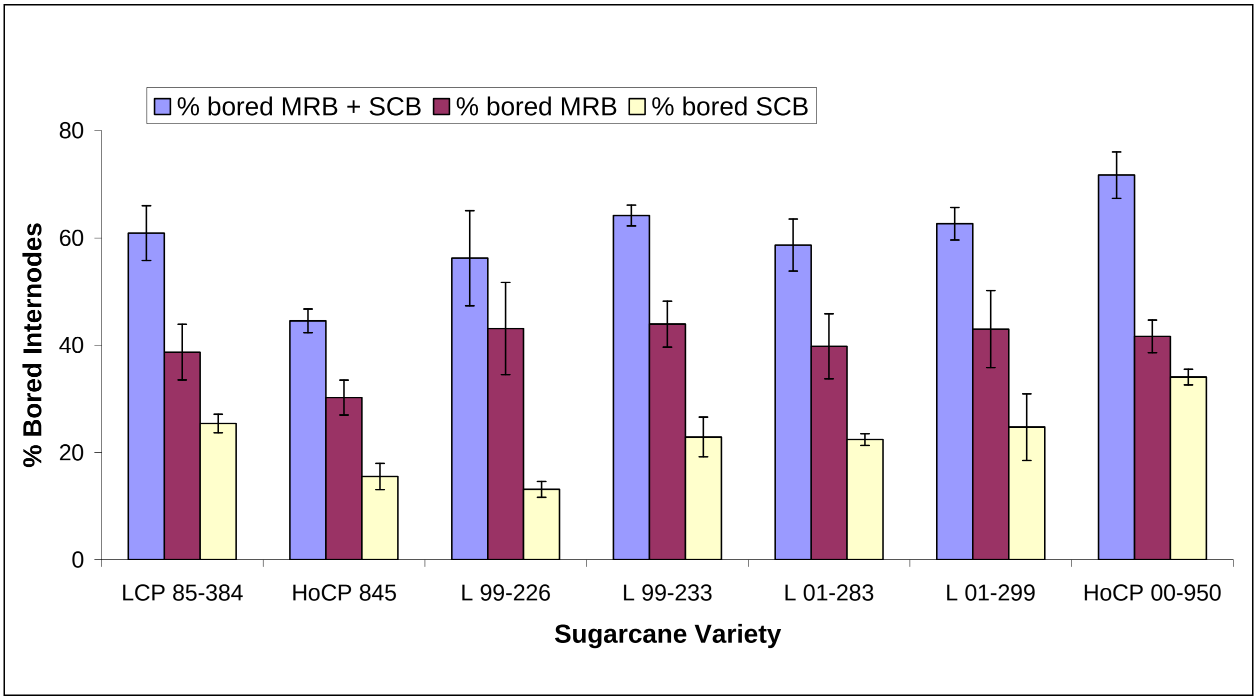


Fig. 1. Destructive sampling of sugarcane stalks on August 23-24, 2006 at Ganado, TX.

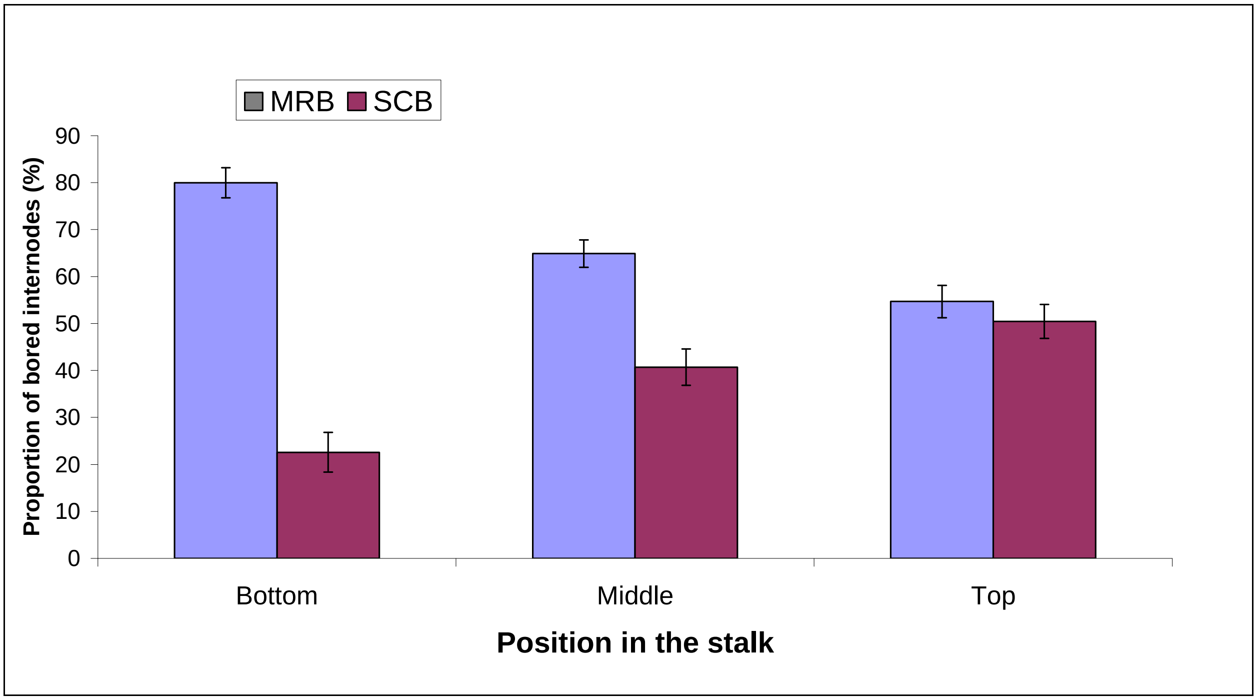


Fig. 2. Proportions of bored internodes caused by MRB and SCB relative to the position in the sugarcane stalk, Ganado, TX, 2006.

Acknowledgment: The sugarcane entomology program would like to express appreciation for help from other members of the sugarcane variety development and breeding program for their assistance in cutting the seed-cane, and helping to select the varieties for evaluation. Additionally, Dr. W. H. White (USDA-ARS) provided the USDA varieties used in these studies.

# CHANGES IN SUSCEPTIBILITY AND POPULATION ATTRIBUTES OF THE SUGARCANE BORER AFTER CONTINUOUS SELECTION WITH CONFIRM®

T.E. Reagan, W. Akbar, J.A. Ottea, and J. Beuzelin
Department of Entomology

Continuous use of similar insecticide chemistries exerts selection pressure on insect physiology which may cause insecticide resistance. The sugarcane borer (SCB), *Diatraea saccharalis* (F.) has a long history of resistance development against a wide range of insecticide classes. Our previous studies have shown that borers collected from Duson area fields, with a history of heavy Confirm® application frequencies, were 3.78- and 7-fold more resistant at $LC_{50}$ and $LC_{90}$ levels, respectively, when compared to the susceptible standard. In 2006, we continued laboratory selection of the Duson strain with Confirm® for several generations. Only ten selections over 12 generations of SCB resulted in a 27.1- and 83.3-fold increase in $LC_{50}$ and $LC_{90}$ values, respectively (Table 1, Fig. 1). Several life parameters including pupal weight, days to pupation and emergence, fecundity, and hatchability were significantly compromised in the highly resistant cohort (Duson Selection after 10 selections) when compared to the susceptible and moderate level resistant cohorts. The male and female pupae of the highly resistant cohort (Duson Selection) weighed 32.7 and 32.6%, respectively, less than the untreated susceptible standard. Days to pupation were increased by 8 and 6 for males and females, respectively, and days to emergence were lengthened by 9 and 8 days for male and female, respectively, when compared to the susceptible standard. The fecundity of resistant females was significantly less with 84.5 eggs per female as compared to 260 laid by the Alexandria cohort. Egg hatchability in the Alexandria cohort was 65.8% whereas only 26 % eggs of Duson Selection cohort were able to hatch (Table 2). These studies indicate that Confirm® resistance does have a biological fitness cost. However, the ability of the highly resistant strain to survive, pupate, and lay fertilized eggs poses a serious situation. Confirm® can be preserved for longer period of time and phenomenon of resistance buildup delayed only if rotation of chemistries is practiced. When another chemical group (i.e. pyrethroid) is used, that mortality will kill an even percentage of the Confirm® resistant larvae because of mode of action. New replacement insecticide chemistry labels for the sugarcane borer are expected not to be available for several years in the future.

Table 1: Changes in survival, pupation, and susceptibility of Duson cohort after continuous selection with tebufenozide for 12 generations.

| Selection & (No.) | Concen. (ppm) | % survival after 7 days | % pupation | $LC_{50}$ | $LC_{90}$ | [a]$RR_{50}$ | [a]$RR_{90}$ |
|---|---|---|---|---|---|---|---|
| 0 | | | | 0.53 | 2.17 | **3.78** | **7.00** |
| 1 (960) | 0.82 | 40.2 | 27.2 | 0.45 | 2.19 | 3.2 | 7.1 |
| 2 (1260) | 0.53 | 37.3 | 26.3 | 0.48 | 1.37 | 3.4 | 4.4 |
| 3 (720) | 0.53 | 45.8 | 12.5 | ** | ** | | |
| 4 (900) | 0.53 | 31.1 | 14.2 | 0.69 | 2.13 | 4.9 | 6.9 |
| 5 (600) | 0.25 | 39.8 | 19.6 | 0.44 | 2.15 | 3.1 | 6.9 |
| 6 (600) | 0.35 | 49.8 | 57.1 | 0.67 | 2.21 | 4.8 | 7.1 |
| 7 (1261) | 0.53 | 49.3 | 24.5 | 0.49 | 1.60 | 3.5 | 5.1 |
| 8 (963) | 0.53 | 32.1 | 21.9 | 0.62 | 4.22 | 4.4 | 13.6 |
| 9 (810) | 0.53 | 42.7 | 37.5 | 1.42 | 3.34 | 10.1 | 10.8 |
| 10 (812) | 0.62 | 68.4 | 32.3 | **3.80** | **25.85** | **27.1** | **83.3** |

[a]Resistance Ratios using the susceptible Alexandria cohort as the ratio divisor.
**No experiment was conducted because did not have enough larvae.

Table 2: Mean female pupal weight, fecundity, and egg hatchability of three different SCB cohorts with no, moderate, and high levels of tebufenozide resistance.

| Cohort | Resistance Level | Mean fem. pupal weight (mg)* | Mean no. of eggs/female (±SEM) | % Hatch (±SEM) |
|---|---|---|---|---|
| Alexandria | No | 145.1a | 260.5 (43)a | 65.8(5)a |
| Duson | Moderate | 144.3a | 163.3 (16)ab | 49.6 (3)b |
| Duson Sel. | High | 113.7b | 84.5 (38)b | 25.6 (17)c |

*Mean weight of female pupae that emerged as adults.
Means within columns not followed by same letter are significantly different from each other according to Tukey's HSD test at $\alpha = 0.05$.

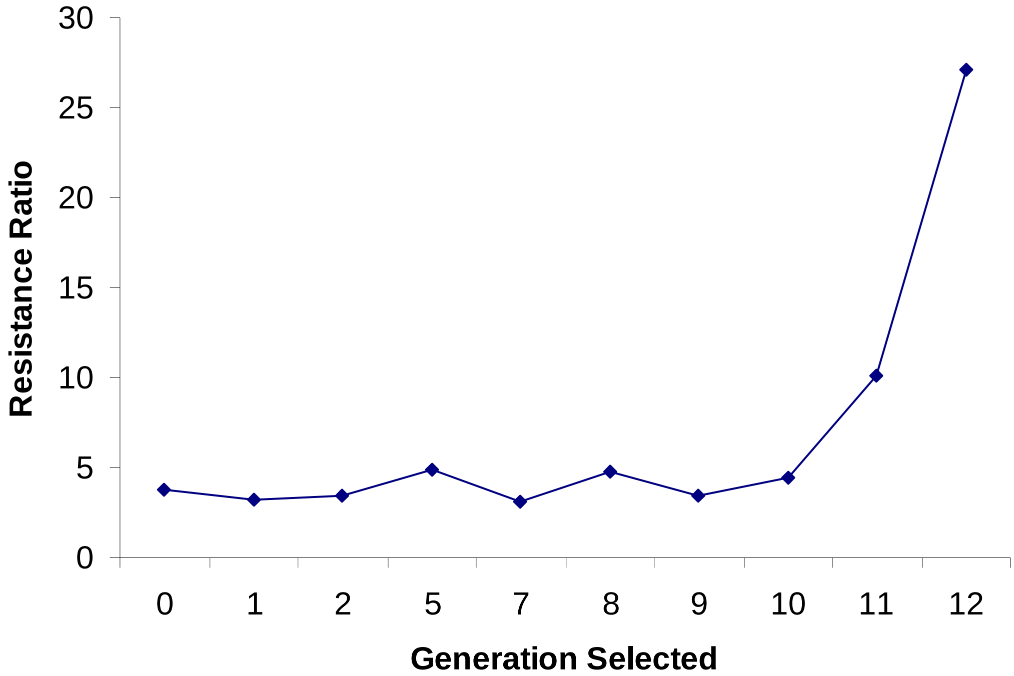


Fig. 1**.** Changes in the resistance ratios of the Duson Selection cohort at $LC_{50}$ level when selected over 12 generations.

## MONITORING MEXICAN RICE BORER MOVEMENT

T.E. Reagan[1], M.O. Way[2], W. Akbar[1], J. Beuzelin[1], L.T. Wilson[2],
and F.P.F. Reay-Jones, former Graduate Student[3]

Department of Entomology[1]
Texas A&M Research and Extension Center at Beaumont[2]
Clemson University South Carolina[3]

Cooperative studies on the Mexican rice borer (MRB), *Eoreuma loftini* (Dyar), between the LSU AgCenter, the Texas A&M University research station at Beaumont, the Texas Department of Agriculture and the Louisiana Department of Agriculture and Forestry were conducted to monitor the movement of this insect towards Louisiana and to study the population dynamics of this devastating pest of sugarcane that can not be controlled with simple insecticide applications. The MRB has been the major economic pest in Texas sugarcane since it established in 1980, quickly surpassing the pest severity of the sugarcane borer, *Diatraea saccharalis* (F.).

A major monitoring effort has been on-going since 2000 with the various cooperating agencies as well as with the assistance from farmers, county agents, and consultants. After the discovery in Brazoria, Colorado, Fort Bend, Waller and Wharton Counties in 2000, Harris and Austin Counties in 2001, Galveston in 2002, Chambers and Liberty in 2004, a new county was documented with MRB invasion (Jefferson) in 2005 (Fig. 1 and Table 1). The MRB is now found within seven miles of Beaumont, less than 25 miles from the Louisiana border and has been moving at a rate of 14.4 miles/year since it was discovered in Texas in 1980. Each year, infestations in newly invaded counties were initially low, but consistently increased the following year (Table 2). Regulatory activities involving both Departments of Agriculture will continue to be important to Louisiana sugarcane farmers in order to delay the invasion of this very serious pest.

Extensive attempts involving several millions of dollars in research to introduce MRB parasites have not resulted in effective control in the Lower Rio Grande Valley of Texas. In our program, alternative control methods involving varietal resistance and cultural practices were investigated. In a field experiment in 2006, the newly released varieties L99-226 and L99-233 suffered 39.7 and 41.8% bored internodes, respectively. Based on results for the last several years, moderate levels of resistance are recorded in HoCP 85-845 (26.6% bored internodes in 2006 test at Ganado, TX). Our work for the last several years on this devastating pest has emphasized the importance of using multiple tactics in combination to manage this pest, which will be necessary when MRB becomes established in the Louisiana sugarcane industry. Appreciation is expressed to the American Sugar Cane League for grants to the LSU Sugarcane Entomology program in partial support of this work, also supported by national USDA competitive grants and collaboration with county agents and agricultural consultants.

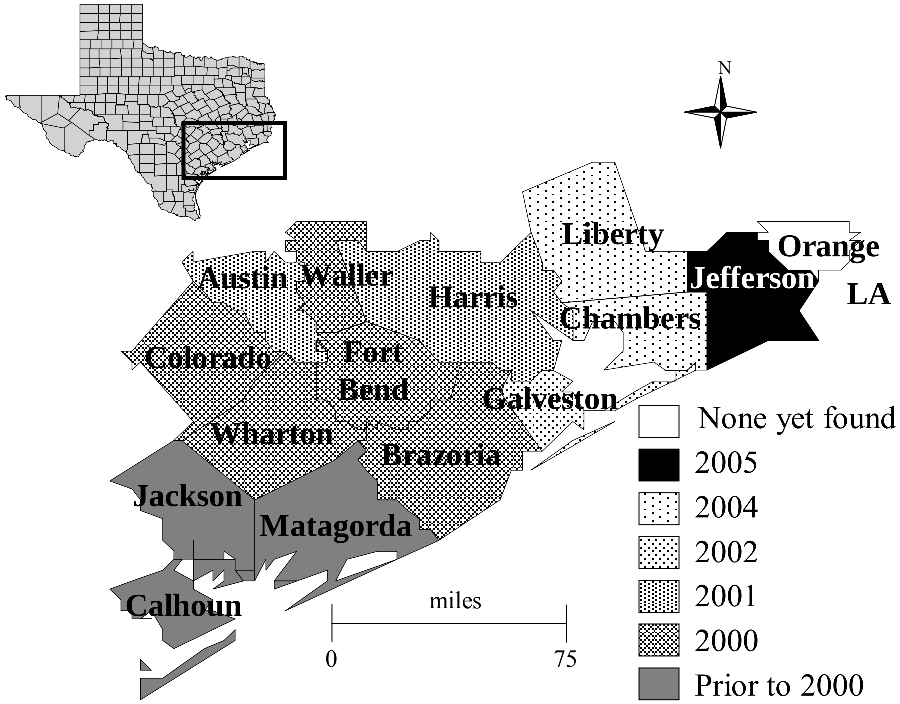


**Fig. 1.** Movement of the Mexican rice borer through the East Texas rice and sugarcane area, 2000-2006.

Table 1. Pheromone trap collections of Mexican rice borer (*Eoreuma loftini*) moths in Southeast Texas during 2006[1].

| Texas Counties | May | June | July | August | September | October | November | December | Total |
|---|---|---|---|---|---|---|---|---|---|
| **Previously Known Counties** | | | | | | | | | |
| Brazoria | - | 1141 | 954 | 447 | - | - | - | - | **2542** |
| Chambers | 712 | 647 | 850 | 1102 | 1986 | 1190 | 834 | - | **7321** |
| Colorado | 382 | 198 | 136 | 148 | 154 | 421 | 215 | - | **1654** |
| Galveston | - | 221 | 369 | 817 | 521 | 940 | 259 | - | **3127** |
| Jackson | 1077 | 250 | 248 | 210 | 674 | 990 | 389 | 60 | **3898** |
| Jefferson | 3 | 10 | 5 | 22 | 85 | 89 | 20 | 5 | **239** |
| Liberty | 2291 | 891 | 441 | 242 | 867 | 2875 | 1065 | - | **8672** |
| Waller | - | 570 | 710 | 808 | 1732 | 2104 | 395 | 14 | **6333** |
| **No MRB Collected** | | | | | | | | | |
| Orange | - | - | 0 | 0 | 0 | 0 | 0 | 0 | **0** |

[1]Number of moths per two traps per month.

Table 2. Pheromone trap collections of Mexican rice borer (*Eoreuma loftini*) moths in Southeast Texas from 2003 to 2006, i.e. MRB range expansion.

| Texas counties | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|
| Liberty | 0 | 413 | 1586 | **8672** |
| Chambers | 0 | 6 | 3843 | **7321** |
| Jefferson | 0 | 0 | 5 | **239** |