ASSESSMENT OF INSECTICIDES AGAINST THE WEST INDIAN CANEFLY AND SUGARCANE APHID, 2017

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The West Indian canefly, *Saccharivora sacchraosydne* (Hemiptera: Delphacidae), is a sporadic pest of sugarcane in Louisiana which feeds on the sap of young cane. The pest can be found infesting sugarcane at low densities in most years, however, widespread outbreaks of potentially damaging infestations occurred in 1956, 1969, 1997, 2012, and 2016. Research in conducted in 2012 and 2016 demonstrated efficacy of several insecticides including labda-cyhalothrin, imidacloprid, and acetamiprid.

Five insecticide treatments were evaluated for control of the West Indian canefly (WIC) and sugarcane aphid (SCA), in a field of sugarcane cultivar L 01-299, first ratoon, located near Luling, LA (St. Charles Parish). The experiment was arranged following a randomized complete block design with 4 blocks and 4-row plots (24 ft each). Pest levels were assessed by counting the no. WIC and SCA on the 3rd or 4th leaf down from the whorl on 5 randomly selected plants on each of the 2 center rows of each plot. Pre-treatment data collection was conducted on 22 Jun 2017. On 26 Jun, insecticides were applied using a CO_2-pressurized backpack sprayer calibrated to deliver 10 gallons/acre at 30 psi. A 2-row boom, equipped with 8 TeeJet TP11001VS nozzles spaced 18 inches, was used to spray insecticides approximately 2 ft above the canopy. Insecticide efficacy was evaluated at 3, 7, and 14 days after treatment (DAT). Mean WIC and SCA numbers for each plot were calculated from the 10 sampled plants prior to analysis. Data from each sampling date were analyzed separately using linear mixed models (Proc GLIMMIX, SAS Institute) with treatment as a fixed effect and replication as the random effect. Tukey's honestly significant difference test ($\alpha = 0.05$) was used for mean separations and the Kenward-Rogers method was used for calculation of error degrees of freedom.

Differences were not detected among pre-treatment counts of either WIC or SCA (Table 1). WIC infestations were reduced in plots treated with Warrior (lambda-cyhalothrin) and Sivanto (flupyradifurone) relative to untreated controls at 3, 7, and 14 DAT (Table 1). WIC infestations in plots treated with either rate of Courier (buprofezin) were not different from untreated plots at any of the sampling dates. WIC populations had begun to decline in all plots by 14 DAT and further sampling was not conducted. Differences were not detected among treatments in SCA infestations at any of the sampling dates. Aphid infestations were numerically lowest in Sivanto treated plots at all sampling dates.

WIC outbreaks in Louisiana sugarcane are sporadic with widespread problems occurring in only 6 of the past 60 years. However, outbreaks in 2012 and 2016 indicate the pest may be emerging as a more consistent threat. Pyrethroids and pre-mixes with pyrethroids are the only currently labeled products for management of WIC and other hemipteran pests in sugarcane. The low rate of Warrior provided effective control in this study and may be less detrimental to beneficial insect populations. Insecticidal control of SCA in Louisiana sugarcane is inconsistent and no chemical controls are currently recommended for this pest.

Table 1. West Indian canefly (WIC) and sugarcane aphid (SCA) infestations in sugarcane as affected by insecticide treatments, St. Charles Parish, LA, 2017

Treatment/ Formulation	Rate (amt/ acre)	Pre-treatment (LS Means, no. per leaf)		3 DAT (no. per leaf)		7 DAT (no. per leaf)		14 DAT (no. per leaf)	
		WIC (±18.8 [SE])	SCA (± 0.4 [SE])	WIC (±18.8 [SE])	SCA (± 0.4 [SE])	WIC (±18.8 [SE])	SCA (± 0.4 [SE])	WIC (±18.8 [SE])	SCA (± 0.4 [SE])
Nontreated check	--	46.6	44.7	50.3a	20.4	27.3a	16.4	13.5a	4.6
Warrior	1.9 fl oz	55.5	41.7	10.5b	8.9	3.0b	13.9	2.3b	11.5
Warrior	1.0 fl oz	49.4	36.1	11.3b	18.0	7.6ab	19.8	1.7b	4.7
Sivanto	4.0 fl oz	58.4	58.0	7.9b	8.0	2.7b	9.9	0.6b	0.6
Courier	9.0 oz	55.8	23.3	39.1ab	20.6	20.8ab	9.6	5.0ab	4.4
Courier	13.5 oz	48.3	22.8	38.8ab	13.3	37.7a	0.0	7.9ab	4.0
	F =	0.17	1.18	6.07	0.96	3.38	1.15	6.79	0.71
	df =	5, 17	5, 18	5, 15	5, 15	5, 15	5, 15	5, 15	5, 15
	P =	0.969	0.358	0.002	0.472	0.030	0.376	0.002	0.627

Means within columns followed by the same letter are not different (P > 0.05, Tukey's HSD test)

INSECTICICAL CONTROL OF MIXED STEM BORER INFESTATIONS

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Sugarcane stem borers (Lepidoptera: Crambidae) are the most economically important insect pests of sugarcane in Louisiana. The sugarcane borer (SCB), *Diatraea* saccharalis¸ has been the primary pest of sugarcane in Louisiana for more than 100 years. The Mexican rice borer (MRB), *Eoreuma loftini*, is an emerging threat which has only recently begun infesting sugarcane in Louisiana. The SCB is effectively managed in Louisiana with an integrated pest management (IPM) program utilizing narrow range insecticide applications and resistant sugarcane varieties. It is not known if management strategies which are effective against SCB will provide adequate control of MRB. Research conducted in the Rio Grande Valley of Texas suggests control of MRB is more difficult to acheive than with SCB, but efficacy of MRB control in Louisiana has not yet been examined.

Mixed infestations of both species were observed in Vermilion Parish in 2017, allowing for the first opportunity to research MRB in Louisiana sugarcane. A small plot insecticide trial was conducted in a field of first ratoon HoCP 96-540 near Kaplan, LA. Pretreatment infestation counts taken on 6 July 2017 revealed 8% of stalks were infested with treatable larvae feeding in leaf sheaths. MRB accounted for approximately 40% of the larvae observed, while 60% were SCB. The experiment was arranged in a randomized block design with four replications with a plot size of four rows (24-ft long; 0.01 acres/plot). Insectides were applied on 8 July 2017 with a CO_2-pressurized backpack sprayer calculated to deliver 10 gallons/acre. Borer injury data was collected from 12 stalks/plot on 2 Oct 2017 by recording the number of total internodes and number of bored internodes. Although, larvae were not recovered at time of harvest, injury was attributed to either MRB or SCB based on characteristic tunneling. Pecertage bored data for SCB, MRB, and total combined were analyzed sepratately with generalized linear mixed models (SAS Proc Glimmix) and means were spearated with Tukey's HSD.

Approximately 30% of stem borer injury in non-treated controls was attributed to MRB with 70% attributed to SCB (Fig. 1). All treatments reduced total stem borer injury ($F = 30.55$, df = 5,15; $P < 0.001$) and MRB injury ($F = 17.75$, df = 5,15; $P < 0.001$) relative to non-treated controls. All treatments except Confirm (tebufenozide) reduced SCB injury relative to non-treated controls ($F = 6.96$, df = 5,15; $P = 0.002$). For all parameters, the high rate of Prevathon (chlorantraniliprole) provided the greatest level of control. Besiege (chlorantraniliprole + lambda-cyhalothrin) and Diamond (novaluron) provided intermediate levels of control.

Reinfestation of plots by SCB larvae in the weeks following the insecticide application likely explains the reduced level of control acheived relative to that of MRB. Results from this trial are consistent with previous studies which observed poor control by Confirm relative to other products attributed to shorter residual activity. The efficacy of insecticidal controls against MRB acheived in this study is greater than results from insecticide evaluations conducted in the Rio Grande Valley. Frequent scouting by crop consultants allowed for near optimum application timing in this experiment which provided a high level of control. Results are encouraging that IPM strategies for SCB can also be successful in managing MRB in Louisiana.

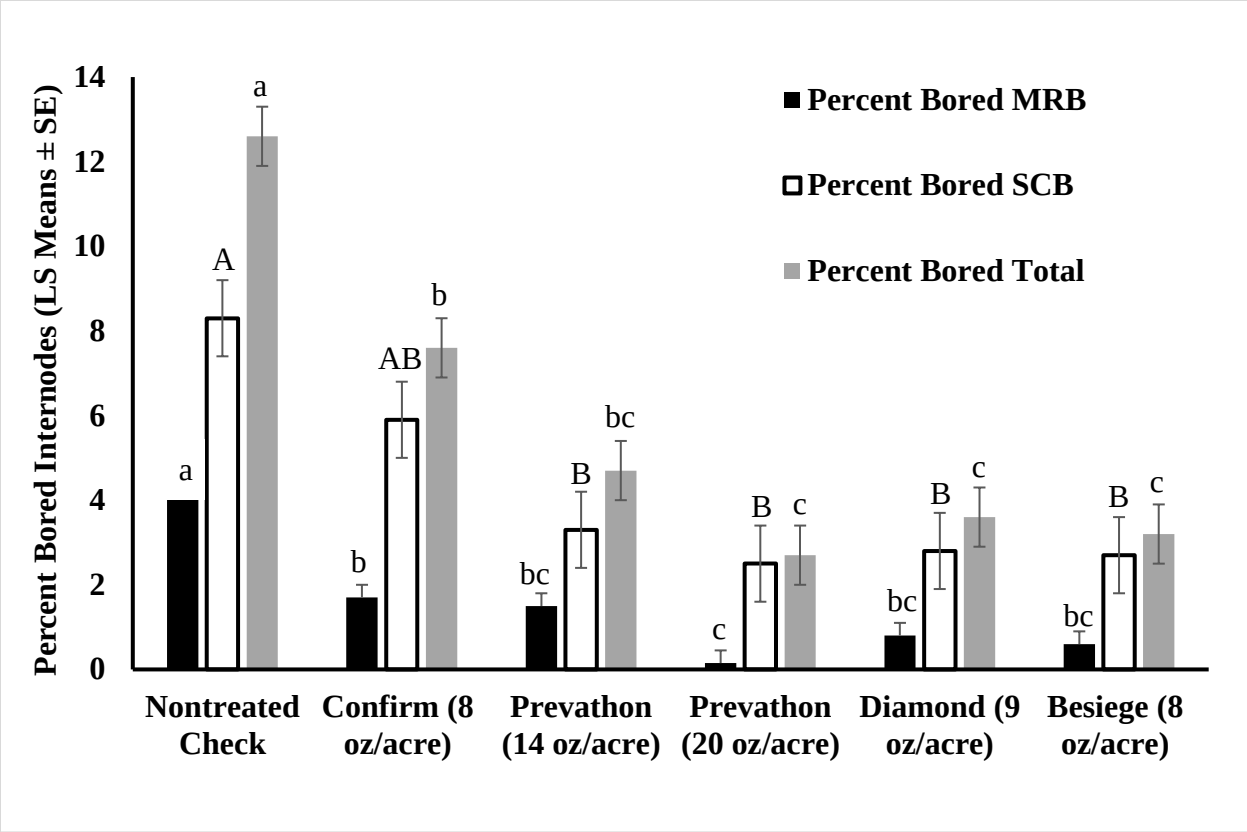

Figure 1: Sugarcane stem borer injury as affected by insecticide treatments; Kaplan, LA, 2017. Bars of the same color which share a letter are not significantly different (α = 0.05).

RANGE EXPANSION AND PEST STATUS OF THE MEXICAN RICE BORER IN LOUISIANA

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The Mexican rice borer (MRB), *Eoreuma loftini* (Lepidoptera: Crambidae), is a damaging pest of sugarcane and rice in Texas which has been expanding its range eastward along the Gulf Coast since 1980. The pest first reached Louisiana in 2008 and is now present in 12 Parishes. Range expansion is monitored primarily with pheromone traps. These traps attract male moths and are effective at detecting the pest even at very low population densities. High trap captures have been recorded in western rice producing Parishes since 2012, and widespread infestations have been observed in rice fields in Calcasieu, Cameron, Jefferson Davis, and Acadia Parishes.

Low level infestations were first observed in Vermilion Parish sugarcane in 2015 and in West Baton Rouge Parish in 2016. In 2017, mixed infestations of MRB and the sugarcane borer were observed in sugarcane fields in Vermilion, Pointe Coupee, and West Baton Rouge Parishes. Significant sugarcane acreage was treated with insecticides in Pointe Coupee and Vermilion for mixed infestations. Surveys indicated that MRB accounted for approximately 20–40% of stem borer larvae in these fields.

Sugarcane infested with MRB being transported to sugar mills during harvest may contribute to more rapid range expansion in coming years. Expansion into the Bayou Teche sugarcane production region within the next few years is anticipated. There is potential for MRB to have an enormous impact to Louisiana's sugarcane, however, its remains unknown if the pest will reach the severe levels commonly seen in sugarcane in the Rio Grande Valley. High annual rainfall and successful integrated pest management programs for the sugarcane borer, should help to mitigate the impact of this invasive pest in Louisiana.

Figure 1: Mexican rice borer range expansion in Louisiana 2008–2017