Rice Borer Spread, Rice Borer Management Plan

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Gene Reagan
Department of Entomology
LSU AgCenter, Baton Rouge, LA

Support from the American Sugar Cane League, chemical industry, grower cooperators

Adult Comparison

Mexican Rice Borer
Eoreuma loftini

Sugarcane Borer
Diatraea saccharalis

Larval Comparison

MRB

SCB

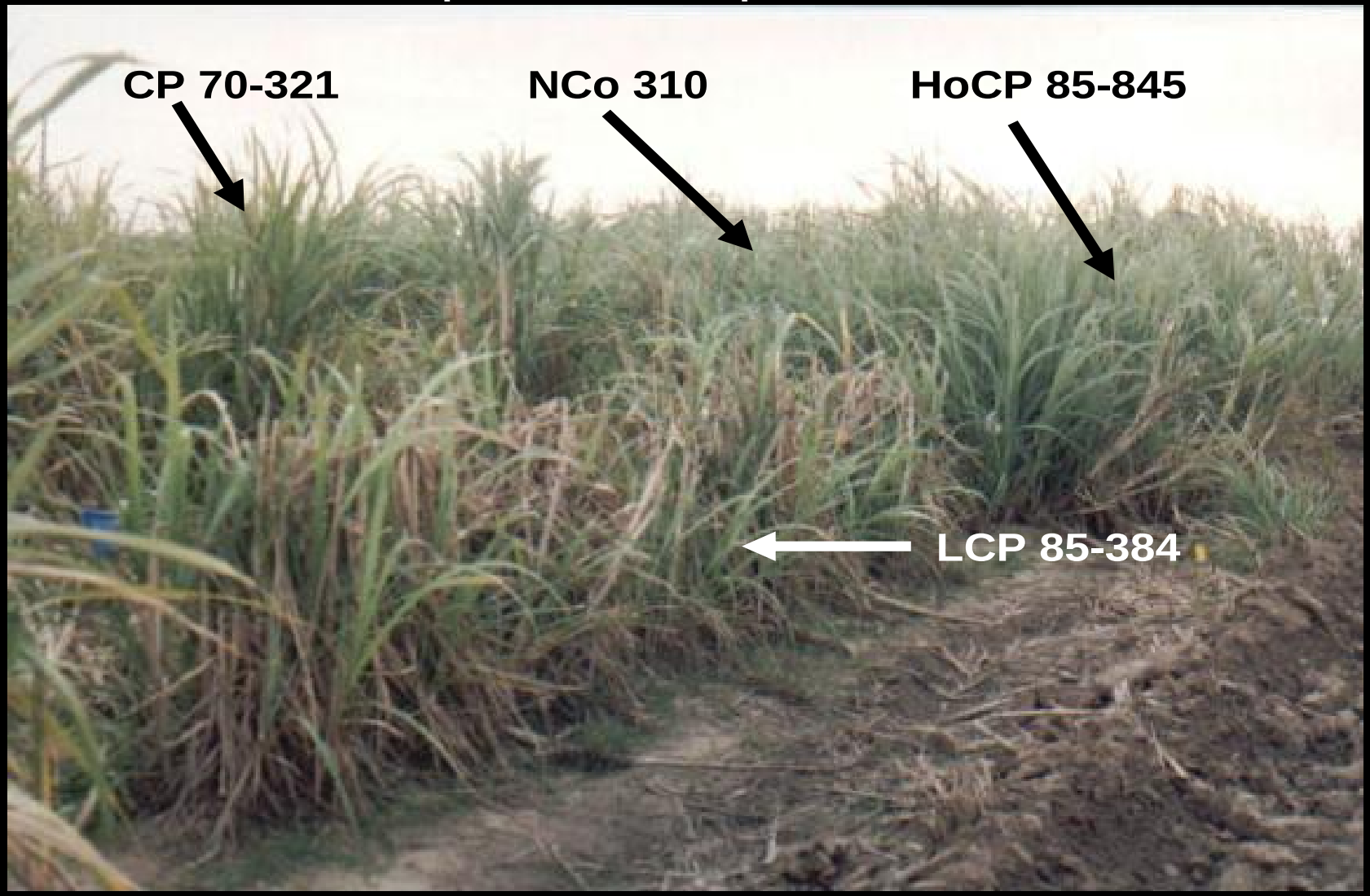
Eggs laid in masses, usually within folds on dry leaves.

Larvae then bore into the stalk where they remain sheltered until adult emergence.

Neonates feed with on leaves and sheaths before stalk entry.

MRB Larval Injury

Natural MRB Infestations under drought and salt stress conditions, 5 reps of cultivar experiment, Ganado, TX 2002



Reay-Jones et al. 2003. J. Econ. Entomol. 96: 1929-1934

Insecticides Labeled for Sugarcane Stalkborers

Trade Name	Company	Common Name	Class (IRAC MOA)	Rate (fl oz/A)	
				SCB	MRB
Confirm 2F	Gowan	Tebufenozide	Diacylhydrazine [IGR](18)	6-8	16
Diamond 0.83 EC	MANA	Novaluron	Benzoylurea [IGR] (15)	9-12	12
Belt	Bayer	Flubendiamide	Diamide (28)	3-4	3-4
Coragen	Dupont	Chlorantraniliprole	Diamide (28)	3.5-5	NA
Prevathon	Dupont	Chlorantraniliprole	Diamide (28)	14-20	NA
Besiege (Voliam Xpress ZC)	Syngenta	Chlorantraniliprole + λ-Cyalothrin	Diamide (28) + Pyrethroid (3A)	8-10	8-10
Karate	Syngenta	λ-Cyalothrin	Pyrethroid (3A)	2.6	2.6
Baythroid	Bayer	β-cyfluthrin	Pyrethroid (3A)	2.1	2.8

Evaluation of Insecticides for SCB Control

St. Mary Parish, 2011

Treatment	Rate (fl oz/acre)	% Bored Internodes	Emergence/ Stalk
Control	NA	20.3 B	0.72 B
Prevathon (low)	12	1.30 A	0.03 A
Prevathon (high)	20	1.20 A	0.04 A
Belt	3.0	0.92 A	0.01 A
Coragen	3.0	0.80 A	0.01 A
Confirm	8.0	0.62 A	0.03 A
Diamond	12.0	0.34 A	0.00 A
Besiege	9.0	0.09 A	0.00 A

Means within column followed by the same letter are not significantly different ($P < 0.05$, Tukey's HSD)

Aerial Insecticide Study, Rio Grande Valley, TX, 2010

Treatment	Brix	Sugar (lbs)/ ton of cane	Cane (tons)/ha	Sugar (tons)/ha
Novaluron	17.0 A	208.2 A	77.20 A	8.03 A
Baythroid	16.7 B	203.0 B	64.67 B	6.58 B
Control	16.5 B	197.8 C	70.94 AB	7.04 AB
F	7.47^{a}	16.03^{a}	5.60^{b}	6.78^{b}
P >F	0.0009	<0.0001	0.03	0.019

Evaluation of insecticides for control of the MRB in commercial sugarcane fields of variety CP 72-1210. Pheromone trap assisted scouting was used to time a single aerial application.

MRB Varietal Resistance

Beaumont, TX, 2011

Variety	% Bored	Emergence/stalk
HoCP 08-726	17.2	0.45
L 08-090	13.7	0.35
HoCP 04-838	13.4	0.28
HoL 08-723	13.1	0.10
Ho 08-711	13.1	0.46
Ho 08-717	12.4	0.20
Ho 08-706	9.5	0.18
Ho 07-613	9.0	0.27
**L 79-1002	8.5	0.21
L 07-57	8.5	0.21
Ho 08-709	8.0	0.07
L 08-088	8.0	0.23
HoCP 00-950	7.9	0.08
**Ho 02-113	7.7	0.08
L 08-092	7.7	0.08
Ho 05-961	7.6	0.24
HoCP 91-552	7.6	0.23
HoCP 85-845	3.9	0.10
L 08-075	1.9	0.02

*Means which share a line are not significantly different (LSD α=0.05).

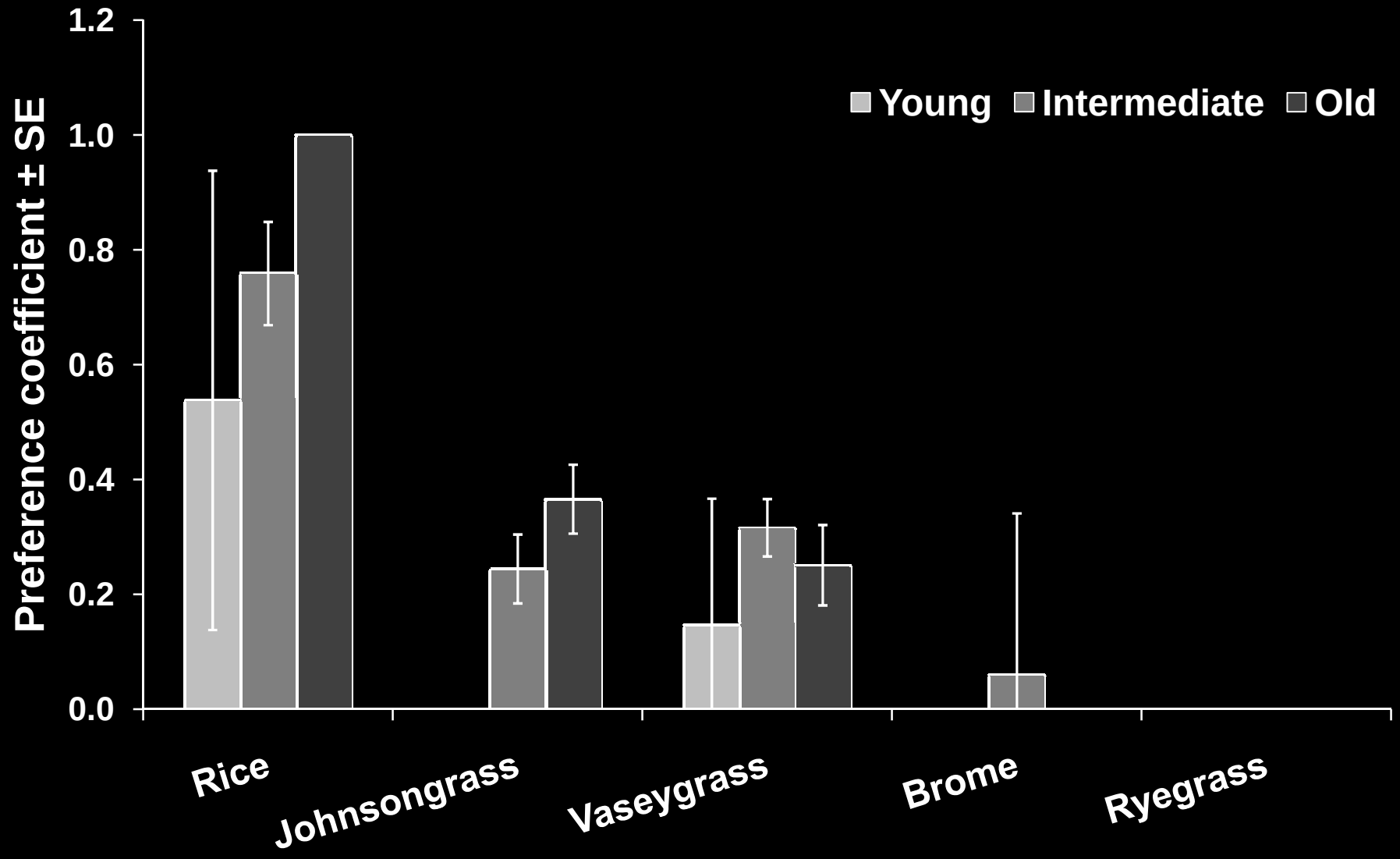
** Designates energycanes

Effect of Fire Ant Predation on MRB Infestations

Beaumont, TX, 2011

Variety	Ants Suppressed		Ants Not Suppressed	
	% Bored internodes	Emergence/ stalk	% Bored internodes	Emergence/ stalk
HoCP 85-845	6.28	0.1	3.36	0.07
HoCP 04-838	11.67	0.4	9.61	0.15
Ho 02-113	6.51	0.14	7.79	0.06
L 79-1002	6.62	0.23	9.76	0.22
Ho 08-9001	17.48	0.4	9.19	0.15
Ho 08-9003	33.88	0.99	13.04	0.3

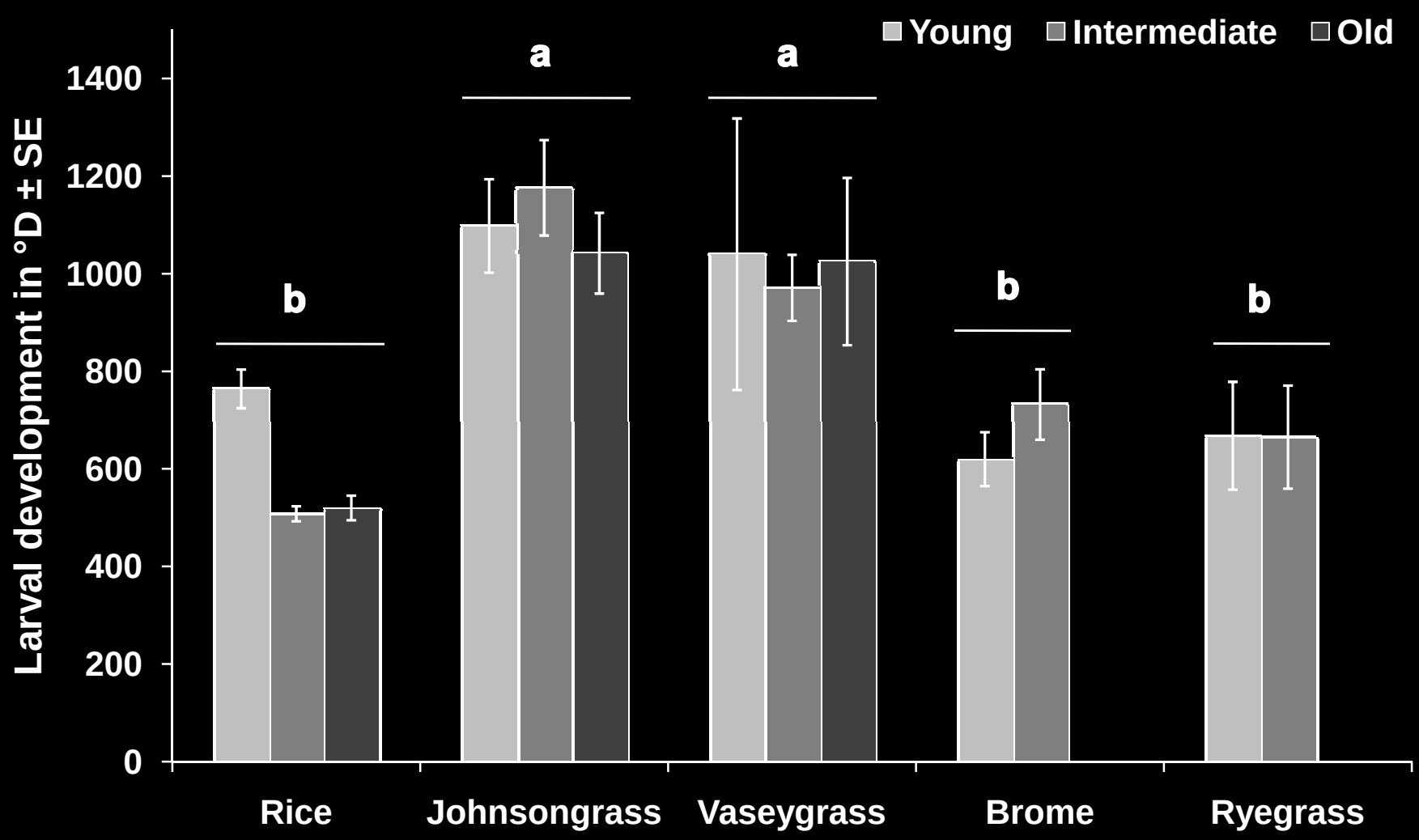
Oviposition preference (based on fresh weight)



Regression model: $P < 0.001$, $R^2 = 0.59$

JMP, Non-linear modeling

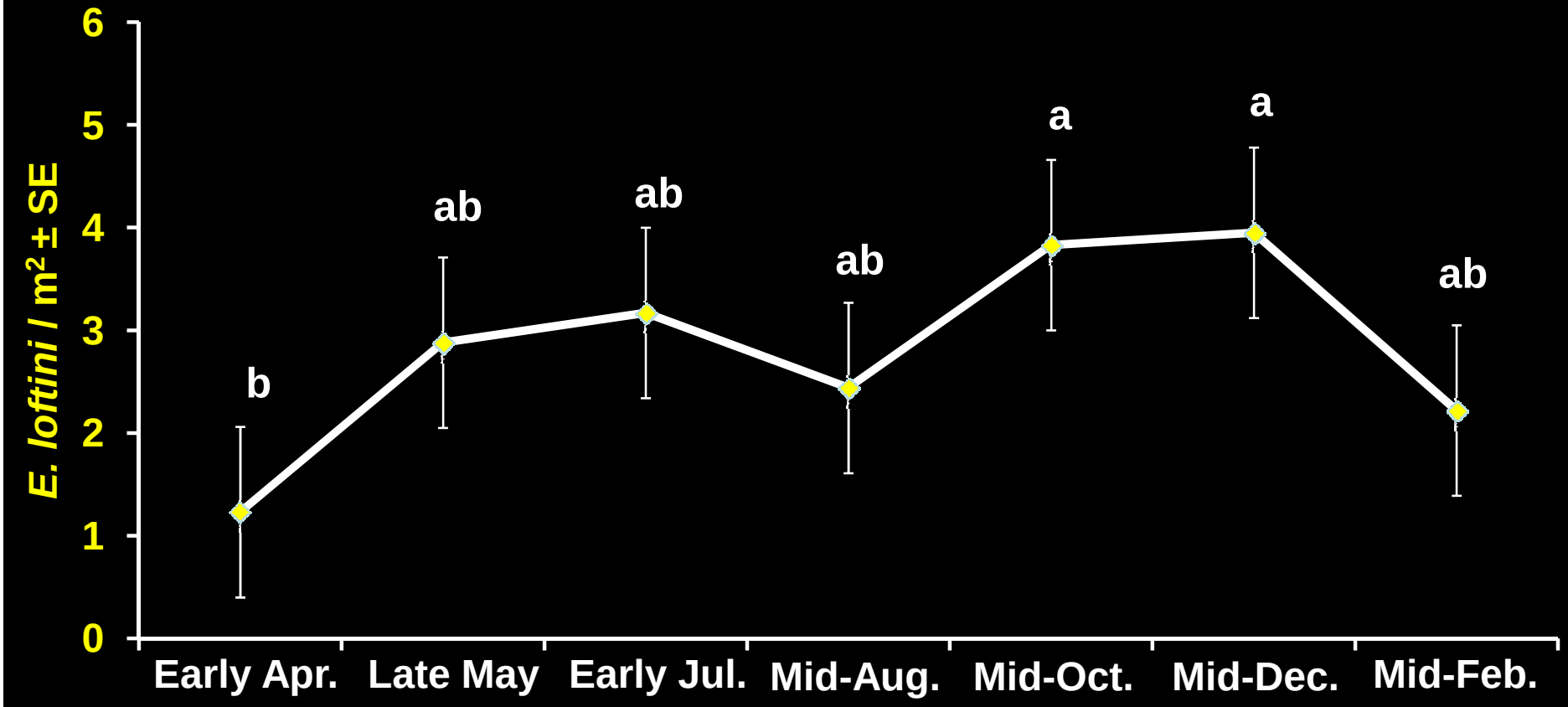
E. loftini larval development duration



Host: *F* = 10.45; df = 12, 90; *P* < 0.001

SAS, Proc Mixed – Contrasts, bars with the same letters are not different (*P* > 0.05)

Seasonal *E. loftini* density in non-crop habitats (2 years)



Repeated measures ANOVA (SAS Proc Mixed); Tukey's HSD, α = 0.05 – **bars with the same letters are not different**

Year: $F = 8.8$; df 1, 2.0 ; $P = 0.097$

Date: $F = 2.5$; df 6, 60.2 ; $P = 0.030$

Year × Date: $F = 1.4$; df 6, 60.2 ; $P = 0.222$

MRB Sugarcane Management Plan

- Multiple modes of action
- Resistant varieties
- Minimize plant stress
- Pheromone trap-assisted scouting
- Role of non-crop hosts

Evaluation of Insecticides for Wireworm Control

Segura Farms, Iberia Parish, 2011

Treatment	Company	Stand / 24ft	Deadhearts / 24ft
Arena	Valent	51.2	0.47 AB
Thimet	Amvac	44.0	0.27 B
Prevathon	Dupont	46.3	0.07 B
Check	NA	44.3	1.20 A

Means within column followed by the same letter are not significantly different (P< 0.05, Tukey's HSD)

Evaluation of Insecticides for Wireworm Control

Segura Farms, Iberia Parish, 2011

Treatment	Company	Common Name	Rate (lbs a.i./A)
Arena 0.25G	Valent	Clothianidin	0.2
Thimet 20G	Amvac	Phorate	3.9
Prevathon	Dupont	Chloranitraniprol	0.43
Check	NA	NA	NA

Five replications. Plot size: Three 24-ft rows. Planted September 16, 2011.

Sampling for Wireworms

- Fermented Corn Bait: 2-4 in deep
- 15-20 locations per 10 acre field
- 1-4 weeks prior to planting
- Average of one wireworm per bait station would justify insecticidal control
- Infestations are generally not uniformly distributed, so patches of damaged areas often result

Relative Need for Wireworm Control

I. Highest Priority-
   A. New cane following pasture or turf
   B. Light soils heavily grass infested
   C. Sugarcane surrounded by large pasture areas

II. Moderate Need (dependent on soil type)-
   A. Long-term cane production maintained grass free
   B. Continuous production with good stands

III. Never-
   A. Heavily textured soils
   B. Cane following flooded rice