

John K. Westbrook & Charles P.-C. Suh
USDA-ARS, APMRU, College Station, TX

OBJECTIVES

- To quantify the amount and composition of grandlure released from lure dispensers used by the Texas Boll Weevil Eradication Foundation
- To evaluate and compare the pheromone composition of trap-captured and field-collected weevils from Medina County

MATERIALS & METHODS

Analysis of Grandlure Dispensers

Study sites: USDA-ARS-SPARC, College Station, TX

Sampling frequency: 0, 1, 2, 3, 7, 10, and 14 d of field aging

Analysis method: Gas chromatography (GC) analysis of lure dispensers aged within traps

Sample size: 9 replicates for each age class, 7 evaluation periods between 21 April – 23 June 2009

Analysis of Pheromone Production

Study sites: 5 cotton fields in Medina County, TX

Sampling frequency: weekly from 14 April – 12 May 2009

Weevil source: pheromone traps, field-collections, and reared from infested squares

Feeding method: 1 square (6-9 mm diam with bracts) weevil⁻¹ day⁻¹ for 6 to 8 d at 29.4°C and 14:11 h photoperiod to promote pheromone production

Analysis method: GC analysis of pheromone produced by individual weevils over a 24-h period

Sample size: variable, based on availability of weevils

RESULTS

- Bimodal distribution of dispenser weights and initial content of grandlure (Fig.1)
- Release rates of grandlure decreased from 1.54 to 0.24 mg d⁻¹ from 1 to 14 d, respectively (Table 1).
- Individual weevils produced pheromone with an average blend of 44:43:2:11 (components I:II:III:IV)
- Weevils reared from infested squares generally produced more pheromone than adults collected from the fields or traps (Table 2).

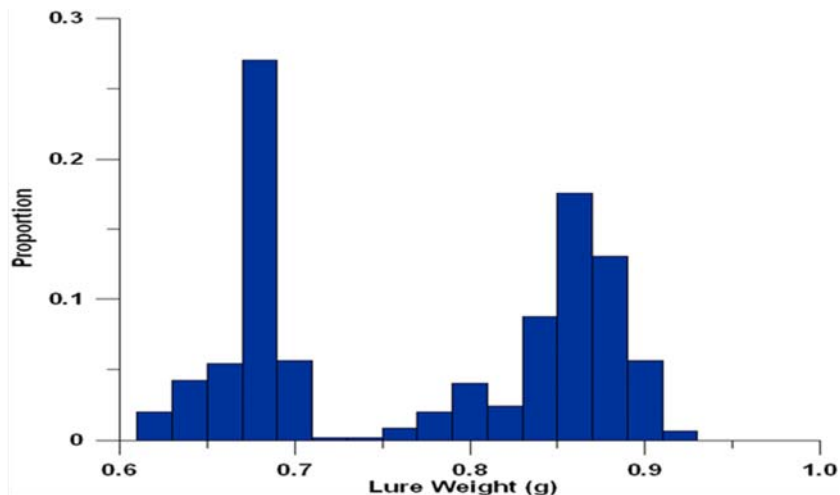


Figure 1. Distribution of weights of 10-mg grandlure dispensers used in a lure aging study at College Station, TX, April 21 – June 23, 2009

RESULTS (cont.)

Table 1. Daily mean release rate (mg d⁻¹) of total grandlure from 10-mg grandlure dispensers aged in the field at the USDA-ARS Southern Plains Agricultural Research Center in College Station, TX, in 2009.

Aging (d)	Evaluation Period							Overall
	I	II	III	IV	V	VI	VII	
1	1.00	0.90	1.00	2.70	1.30	1.90	2.00	1.54 ± 0.68
2	0.40	0.30	1.20	0.60	0.30	0.90 ^b	2.30	0.86 ± 0.72
3	0.50	0.30	0.50	0.50	0.60	0.10 ^b	0.70	0.46 ± 0.20
4-7	0.25	0.08	0.38	0.18	0.15 ^a	0.50	0.45	0.28 ± 0.16
8-10	0.10	0.17	0.23	0.20	-0.53 ^a	0.40	0.30	0.12 ± 0.31
11-14	0.10	0.23	0.10	0.23	0.35 ^a	0.38	0.33	0.24 ± 0.11

^a Dispensers obtained from a second bag within same lot.

^b Low grandlure content in one dispenser aged for 2 d.

Table 2. Overall mean ± SD proportions of pheromone represented by the individual components and the average amount of pheromone produced from boll weevils obtained from different sources, Medina Co., TX, 2009.

Source of adults	n	Pheromone component				Pheromone (µg)
		I	II	III	IV	
Pheromone traps	64	0.43 ± 0.02	0.43 ± 0.02	0.03 ± 0.01	0.11 ± 0.01	87.1
Field collection	6	0.44 ± 0.02	0.43 ± 0.02	0.03 ± 0.01	0.10 ± 0.01	98.0
Infested squares	128	0.44 ± 0.02	0.43 ± 0.02	0.02 ± 0.01	0.11 ± 0.01	107.4

SUMMARY

- Minor changes in the blend of grandlure components among aged lure dispensers may not have significantly impacted boll weevil response.
- Large differences between dispenser weights may have created situations where an adequate dose to attract weevils was not released from a baited trap, especially after lures had been aged for several days.
- The mean dose of total grandlure for un-aged dispensers among aging periods varied from 72% to 120% of the target value of 10 mg.
- No evidence of weevils in Medina Co., TX producing a unique pheromone blend.
- Future research should focus on other factors that can influence captures of weevils in pheromone traps (e.g., weather conditions, lure quality, trap placement, etc.).

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