



Monitoring and First Discovery of the Mexican Rice Borer *Eoreuma loftini* (Lepidoptera: Crambidae) in Louisiana

Authors: Hummel, N. A., Hardy, T., Reagan, T. E., Pollet, D., Carlton, C., et al.

Source: Florida Entomologist, 93(1) : 123-124

Published By: Florida Entomological Society

URL: <https://doi.org/10.1653/024.093.0118>

The BioOne Digital Library (<https://bioone.org/>) provides worldwide distribution for more than 580 journals and eBooks from BioOne's community of over 150 nonprofit societies, research institutions, and university presses in the biological, ecological, and environmental sciences. The BioOne Digital Library encompasses the flagship aggregation BioOne Complete (<https://bioone.org/subscribe>), the BioOne Complete Archive (<https://bioone.org/archive>), and the BioOne eBooks program offerings ESA eBook Collection (<https://bioone.org/esa-ebooks>) and CSIRO Publishing BioSelect Collection (<https://bioone.org/csiro-ebooks>).

Your use of this PDF, the BioOne Digital Library, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Digital Library content is strictly limited to personal, educational, and non-commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne is an innovative nonprofit that sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

MONITORING AND FIRST DISCOVERY OF THE MEXICAN RICE BORER *EOREUMA LOFTINI* (LEPIDOPTERA: CRAMBIDAE) IN LOUISIANA

N. A. HUMMEL¹, T. HARDY², T. E. REAGAN¹, D. POLLET¹, C. CARLTON¹, M. J. STOUT¹, J. M. BEUZELIN¹, W. AKBAR¹
AND W. WHITE³

¹Department of Entomology, Louisiana State University Agricultural Center, 404 Life Sciences Bldg.,
Baton Rouge, LA

²Louisiana Department of Agriculture and Forestry, Baton Rouge, LA

³USDA-ARS Sugarcane Research Unit, Houma, LA

The Mexican rice borer, *Eoreuma loftini* (Dyar), is native to Mexico, and has been reported in the Mexican states of Baja California, Colima, Hustecas, Jalisco, Michoacán, Nayarit, Nuevo Leon, Oaxaca, San Luis Potosi, Sinaloa, Sonora, Tamaulipas, Veracruz, and Yucatan (Morill 1925; Van Zwaluwenburg 1926; Riess 1981; Johnson 1984; Rodriguez-del-Bosque et al. 1989; Reay-Jones et al. 2007). *Eoreuma loftini* was originally described by Dyar (1917) as a member of the genus *Chilo* Zincken from a specimen collected in Arizona, U.S.A. The species was transferred to *Eoreuma* Ely by Klots (1970). It has been collected from sugarcane (*Saccharum officinarum* L.), corn (*Zea mays* L.), rice (*Oryza sativa* L.), sorghum (*Sorghum bicolor* (L.) Moench), and lemongrass (*Cymbopogon citratus/flexuosus* L.) (Johnson 1984). Weedy grasses including johnsongrass (*Sorghum halepense* (L.) Pers.), vaseygrass (*Paspalum urvillei* Steud.), Amazon sprangletop (*Leptochloa panicoides* (J. Presl) Hitchc.), and barnyardgrass (*Echinochloa crus-galli* (L.) P. Beauv.) also have been reported as hosts (Reagan et al. 2007). It was first reported in the Lower Rio Grande Valley (LRGV) of Texas, U.S.A. during 1959 when a single larva was detected in sugarcane shipped from Mexico (Johnson 1984). By 1980, *E. loftini* had established itself as a serious pest in the LRGV and populations subsequently spread into the rice production region of Texas along the Gulf Coast (Johnson & van Leerdam 1981, Browning et al. 1989). From 2000 to 2002, female sex pheromone traps captured *E. loftini* moths in seven new southeast Texas counties (Reagan et al. 2005; Reay-Jones et al. 2007). During 2002, moths were captured within 100 km of sugarcane in east Texas and within 200 km of sugarcane in Louisiana. By 2004, *E. loftini* was present in over 75% of the Texas rice growing area and had spread into sugarcane plantings in Chambers County, Texas (Reagan et al. 2005, Reay-Jones et al. 2007).

In an attempt to slow the spread of *E. loftini* into Louisiana, in 1999, the Louisiana Department of Agriculture and Forestry (LDAF) entered into a compliance agreement with the Texas Department of Agriculture which placed restrictions on the entry of *E. loftini* infested Texas sugarcane

into Louisiana for processing. This agreement required that east Texas sugarcane fields be monitored for *E. loftini* using pheromone traps. The agreement's conditions also stipulated that a positive *E. loftini* finding in east Texas sugarcane would automatically trigger the establishment of a one-mile-radius quarantine around that field and sugarcane within that quarantined area could not be shipped into Louisiana. All truckloads of sugarcane destined for Louisiana were required to be tagged and certified as *E. loftini* free (Reagan et al. 2005).

In a proactive effort to monitor the natural spread of *E. loftini*, LDAF initiated deployment of 12 pheromone traps during fall 1999 at selected sugarcane fields and adjacent to sugarcane processing facilities in Louisiana. The number of traps deployed annually increased from 12 to 40 through 2005. During this timeframe, traps also were placed near rice fields. Beginning in 2005, 35 to 40 traps have been deployed annually. Traps remained in the field from planting of rice (Mar) through harvest of sugarcane (Dec-Jan), and until processing facilities finished milling sugarcane.

The detection of *E. loftini* in 2 east Texas pheromone traps adjacent to sugarcane in 2004 (2-IX-2004, 20-IX-2004, 2-X-2004) triggered a one-mile-radius quarantine (Reagan et al. 2005). By 2005, *E. loftini* was widespread in east Texas and all sugarcane from that area was prohibited from entry into Louisiana due to the risk of accidental introduction of *E. loftini* (Reagan et al. 2007). This prohibition helped to slow the spread of *E. loftini* movement into Louisiana (Reay-Jones et al. 2008).

The pheromone trap monitoring program determined that *E. loftini* was expanding its range 16.5 km/yr through the Texas rice belt toward Louisiana (Reay-Jones et al. 2007). Based on natural movement, Reay-Jones et al. (2007) predicted that *E. loftini* would establish in Louisiana during 2008. On 12-XII-2008 one *E. loftini* adult was detected in each of 2 pheromone traps in Calcasieu Parish (Louisiana, U.S.A.) located approximately 8 km from the Texas border. These traps were adjacent to harvested rice fields approximately 8 km apart. C. Carlton confirmed identifications by examination of male genitalia and com-

parison to published illustrations with vouchers from LRGV populations (Agnew et al. 1988; Riess 1981). Louisiana vouchers are deposited in the Louisiana State Arthropod Museum. Reay-Jones et al. (2008) predicted economic consequences when *E. loftini* spreads across the entire state of Louisiana, forecasted to occur by 2035. Potential annual yield losses of \$220 million are predicted for the sugarcane industry, while rice production may suffer \$45 million in damages, assuming no improvement in management technology (Reay-Jones et al. 2008).

SUMMARY

Eoreuma loftini has expanded its range from the LRGV to east Texas, and now into southwest Louisiana. LDAF and LSU AgCenter scientists forecast that natural and unintended artificial movement will result in the continued spread of *E. loftini* toward the heart of Louisiana's rice and sugarcane-growing regions. The 12-XII-2008 collection was the first confirmation of this pest in the state. By catching *E. loftini* early in its natural advancement into Louisiana, additional rapid and proactive responses will allow producers to become educated on the best management practices for the pest in sugarcane and rice. These best management practices include planting resistant varieties, use of pheromone trap-assisted scouting, applications of narrow-range minimum-risk insecticides, minimizing plant stress through manipulation of irrigation and fertilization practices, and processing of cane at the closest mill to minimize spread. Also, the continued prohibition of the east Texas sugarcane shipments into Louisiana for processing is likely the most important step to avoid any artificial spread of *E. loftini*.

ACKNOWLEDGMENTS

This work was supported in part by grants from the USDA (CSREES) Crops-at-Risk IPM Program (2008-51100-04415). The authors thank J. Davis, J. Allison, and 2 anonymous reviewers of this manuscript. This paper has been approved for publication as manuscript # 2009-234-3818 by the Director of the Louisiana Agricultural Experiment Station.

REFERENCES CITED

- AGNEW, C. W., RODRIGUEZ DEL BOSQUE, L. A., AND SMITH, J. W., JR. 1988. Misidentifications of Mexican stalkborers in the subfamily Crambinae (Lepidoptera: Pyralidae). *Folia Entomol. Mex.* 75: 63-75.
- BROWNING, H. W., WAY, M. O., AND DREES, B. M. 1989. Managing the Mexican rice borer in Texas. *Tex. Agric. Exp. Stn. B-1620*.
- DYAR, H. G. 1917. Seven new crambids from the United States. *Insecutor Inscitiae Menthruus* 5: 84-87.
- JOHNSON, K. G. R. 1984. Identification of *Eoreuma loftini* (Dyar) (Lepidoptera: Pyralidae) in Texas, 1980: fore-runner for other sugarcane boring pest immigrants from Mexico? *Bull. Entomol. Soc. America* 30: 47-52.
- JOHNSON, K. G. R., AND VAN LEERDAM, M. B. 1981. Range expansion of *Acigona loftini* into the Lower Rio Grande Valley of Texas. *Sugar Azucar* 76: 34.
- KLOTS, A. B. 1970. North American Crambinae: notes on the tribe Chiloni and a revision on the general *Eoreuma* Ely and *Xubida* Schaus (Lepidoptera: Pyralidae). *J. New York Entomol. Soc.* 78: 100-120.
- MORRIL, A. W. 1925. Commercial entomology on the west coast of Mexico. *J. Econ. Entomol.* 18: 707-716.
- REAGAN, T. E., REAY-JONES, F. P. F., LEGENDRE, B. L., WAY, M. O., AND AMADOR, J. 2005. Slowing down the Mexican rice borer. *La. Agric.* 44(1): 6-8.
- REAGAN, T. E., REAY-JONES, F. P. F., WAY, M. O., WILSON, L. T., BEUZELIN, J. M., AND AKBAR, W. 2007. Management of an invasive alien species, the Mexican rice borer (Lepidoptera: Crambidae) on sugarcane and rice. *Intl. Congress of Plant Protection – October 2007. Scotland, U.K.* 2: 610-611.
- REAY-JONES, F. P. F., WILSON, L. T., WAY, M. O., REAGAN, T. E., AND CARLTON, C. E. 2007. Movement of Mexican rice borer (Lepidoptera: Crambidae) through the Texas rice belt. *J. Econ. Entomol.* 100(1): 54-60.
- REAY-JONES, F. P. F., WILSON, L. T., REAGAN, T. E., LEGENDRE, B. L., AND WAY, M. O. 2008. Predicting economic losses from the continued spread of the Mexican rice borer (Lepidoptera: Crambidae). *J. Econ. Entomol.* 101(2): 237-250.
- RIESS, C. M. 1981. Taxonomy and distribution of sugarcane borers (Fam. Pyralidae), pp. 131-144 *In* Proceedings, Second Inter-American Sugarcane Seminar Insect and Rodent Pests, 6-9 June 1981, Miami, FL.
- RODRIGUEZ-DEL-BOSQUE, L. A., SMITH JR., J. W., AND BROWNING, H. W. 1989. Exploration for parasites of sugarcane and corn stalkborers in the Huastecas area of Mexico. May 1985. *Tex. Agric. Exp. Stn. PR-4595*.
- VAN ZWALUWENBURG, R. H. 1926. Insect enemies of sugarcane in western Mexico. *J. Econ. Entomol.* 19: 664-669.