N O T E

Incidence of Corn Ear Rots as Affected by Hybrids and Lepidopteran Damage in Mexico[1]

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Field corn, *Zea mays* L., is planted on nearly 80,000 ha in northern Tamaulipas, México, each year. There is a growing interest in the region to plant yellow instead of white varieties of corn because of increasing demand by swine, poultry, and snack-food industries in Mexico. However, preliminary observations have shown yellow varieties of corn were more susceptible to ear insect pests and diseases than was white corn (Rodríguez-del-Bosque et al. 2010, Southwest. Entomol. 35: 157 - 163). The objective of this study was to determine the interaction between lepidopteran ear insects and ear rots in yellow and white corn in northeastern Mexico.

This study was conducted at the Campo Experimental INIFAP (Mexican Agricultural Research Service), near Río Bravo, Tamaulipas (25°57´N, 98°01´W) during 2008. Eight hybrids were planted during the first week of February and harvested during late June. The hybrids evaluated were 5 white corn (H-437, H-439, H-440, P-3025, and Tigre) and 3 yellow corn (P-31G98, G-8222, and DK-697). The experiment was set up in a randomized complete block design with 4 replications. Plots were 3.2 m (4 rows) wide × 5 m long. No insecticide was applied, and other agronomic practices were according to local recommendations. Ten plants per plot in the 2 central rows were randomly sampled each at milk stage and harvest. At milk stage, ears were inspected for identification of lepidopteran species. At harvest, damage by ear insects was determined by the revised centimeter scale (Widstrom 1967, J. Econ. Entomol. 60: 791 - 794), and fungi (*Fusarium* spp., *Aspergillus flavus* Link:Fr., and *Ustilago maydis* [DC.] Corda) infection was determined by visual inspection. Percent incidence (infected plants/total plants × 100) was calculated for fungi. Damage by ear insects and fungi incidence was subjected to ANOVA, and means were compared using the LSD test ($P < 0.05$) (SAS Institute 2004, STAT/SAS user´s guide, Cary, NC).

Regardless of hybrid, the most abundant lepidopteran species was *Helicoverpa zea* (Boddie) with an overall 86% of all larvae observed; the remaining 14% were

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Table 1. Mean damage (cm scale) by corn ear lepidopteran larvae* and fungi incidence (%) in yellow and white hybrids. Río Bravo, Tam., México. 2008.

Hybrid	Kernel color	Insect damage (cm)	Ear fungi incidence (%)		
			Fusarium spp.	*A. flavus*	*U. maydis*
DK-697	Yellow	4.3 a	28.6 a	1.1 a	2.8 a
P-31G98	Yellow	4.0 b	30.0 a	1.4 a	1.4 a
G-8222	Yellow	3.3 c	29.2 a	1.9 a	1.4 a
Tigre	White	2.5 d	12.5 bc	0.6 a	0.6 a
H-439	White	2.4 de	11.1 bc	0.6 a	1.7 a
P-3025	White	2.3 e	19.2 b	1.1 a	2.2 a
H-440	White	2.0 f	6.4 c	0.6 a	1.7 a
H-437	White	1.7 g	11.7 bc	0.6 a	1.5 a

* *Helicoverpa zea* (86%) and *Spodoptera frugiperda* (14%).
Values in columns, followed by the same letter, do not differ significantly ($P < 0.05$) as determined by the LSD test.

Spodoptera frugiperda (J.E. Smith). Damage by these pests in yellow hybrids was significantly greater than in white hybrids (Table 1), probably as a result of softer endosperm and comparatively loose husk of the yellow hybrids. The yellow hybrids were developed in the U.S. Corn Belt, and have fewer husk leaves and less husk tightness compared with the white hybrids developed for northeastern Mexico. Husk characteristics are important for resistance to ear insects (Rector et al. 2002, J. Econ. Entomol. 95: 1303 - 1307).

Incidence of *Fusarium* spp. in yellow hybrids was significantly greater than in white hybrids (Table 1), probably influenced by the greater damage by ear insects as shown

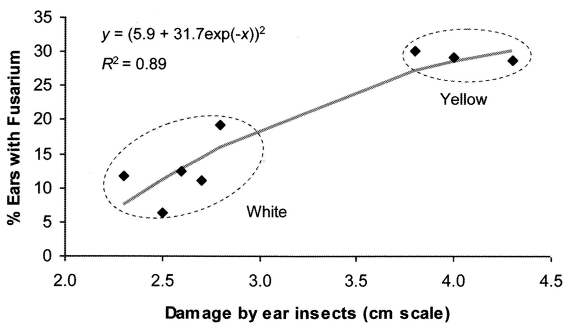

Fig. 1. Relationship between ear insect damage (cm scale) and percentage of ears infected with *Fusarium* in white and yellow corn hybrids. Río Bravo, México. 2008.

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elsewhere (Dowd 2003, J. Toxicol. Toxin Rev. 22: 327 - 350). The relationship between ear insect damage and percentage of ears infected with *Fusarium* spp. in white and yellow corn hybrids was closely explained by a curvilinear model ($r^2 = 0.89$) (Fig. 1). Incidences of *A. flavus* and *U. maydis* were low (<3%), and differences among hybrids were not observed (Table 1).

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