

# Neonate larval survival of European corn borers, *Ostrinia nubilalis*, on high and low dimboa genotypes of maize: Effects of light intensity and degree of insect inbreeding

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## Abstract

Neonate (newly eclosed) larvae of the European corn borer, *Ostrinia nubilalis* Hubner, were studied in regard to their feeding responses on 9 different genotypes of field corn, *Zea mays* L., which were grown under two different light intensity regimes (high and low). Larval feeding rates were greatest on the DIMBOA A-less mutant (lacking the cyclic hydroxamate) and the low-DIMBOA inbred WF9 and lowest for the high-DIMBOA U.S. inbred B49 and the tropical genotype, San Juan × Antigua, under both light regimes. Significantly greater feeding rates were observed under the low-light-intensity compared to the high-light-intensity regime for all 4 Caribbean genotypes tested and WF9. The biochemical mechanism responsible for the reduced consumption rates of larvae on these varieties under the high-light regime is unlikely to be DIMBOA (2,4 dihydroxy-7-methoxy-1,4 benzoxazine-3-one) since its concentrations in leaves of the high-intensity regime were lower in all cases in which significant differences were observed. Leaf nitrogen concentrations were greater in the low-intensity regime and may be at least partially responsible for the greater feeding rates of larvae in this regime.

Another study was conducted to determine the relative magnitude of insect inbreeding on larval consumption rates using two corn genotypes from the “susceptible” (WF9 and DIMBO A-less) and two from the “resistant” (B49 and San Juan) ends of the spectrum. Laboratory-reared European corn borer larvae of two ages (1 year = 10 generations and 6 years = 52 generations) exhibited no significant differences in 72-h survival nor 72-h consumption rates on any particular corn genotype. This suggests that insect inbreeding through extended laboratory rearing does not necessarily render insects ineffective as bioassay organisms (at least during this critical neonate stage).