EFFECT OF GOSSYPOLONE ON THE GROWTH AND DEVELOPMENT OF HELICOVERPA ZEA

Robert D Stipanovic Lorraine Puckhaber USDA-ARS-CPRU College Station, TX Jesus Esquivel John Westbrook Michael O'Neil USDA **College Station, TX** Alois A. Bell USDA-ARS-SPARC **College Station, TX** Sara E Duke **USDA-ARS College Station, TX Michael Dowd** USDA New Orleans, LA Kater D Hake **Cotton Incorporated** Cary, NC

<u>Abstract</u>

The pigment glands of the cotton plant (*Gossypium*) produce terpenoid aldehydes that protect the plant from herbivorous insects. Of these terpenoids, the most extensively studied is gossypol. Gossypolone, a compound closely related to gossypol, has been reported in these pigment glands but its activity against *Helicoverpa zea* (Boddie) has not been reported. We now report the effect of gossypol and gossypolone fed to 1st instar of *H. zea* at concentrations of 0.06%, 0.08% and 0.12% in an artificial diet. In previous studies, gossypol showed a hormetic effect when fed to *Heliothis virescens* (Fabricius) or *Helicoverpa armigera* (Hübner); in the present study gossypol also showed a hormetic effect when fed to *H. zea*. Gossypolone were significantly smaller than those fed the control diet or any of the diets with gossypol. Gossypol at the concentrations tested did not extend days-to-pupation, but in an earlier study gossypol at 0.16% extended days-to-pupation from 13.9 days (\pm 0.5) to 22.6 days (\pm 1.0). In this study, gossypolone also extended days-to-pupation but at a lower concentration [i.e., gossypolone at 0.12% extended days-to-pupation from 13.3 days (\pm 0.1) for the control to 20.8 days (\pm 0.7)]. A delay in days-to-pupation will reduce the number of generations that develop during a growing season, and may reduce larval survival. Manipulation of the genes responsible for the biosynthesis of gossypolone in cotton plants could provide an overall increase in resistance to Heliothines pests of cotton.