

ASSOCIATIONS BETWEEN *WOLBACHIA*, MAIZE AND

*DIABROTICA VIRGIFERA VIRGIFERA*

Kelli L. Barr

Dr. Georgia Davis, Dissertation Supervisor

ABSTRACT

*Diabrotica virgifera virgifera* which is infected with *Wolbachia*, is the most significant and widespread pest to maize in North America and Europe. *Wolbachia* are obligate intracellular bacteria which seem to be limited to ecdyzoan hosts. Many *Wolbachia* hosts induce or vector serious human diseases resulting in the loss of millions of lives annually. The majority of differentially expressed genes identified in a microarray experiment performed to locate endogenous sources of *D. virgifera virgifera* resistance in maize, *Zea mays* L., are normally involved in microbial defense rather than wounding or insect attack. A second microarray experiment to determine whether *Wolbachia* were influencing the response of maize to *D. virgifera virgifera* attack indicated the presence of *Wolbachia* in the insect can down regulate genes in all plant defense classes. This may contribute to the success of *D. virgifera virgifera* as a maize pest. To further test this idea, assays on *D. virgifera virgifera* larval competitiveness and fertility were performed. Results of the assay suggest *D. virgifera virgifera* and *Wolbachia* share a commensal association.