

# Tyler Huffman, Plant Science

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## **Wolbachia: A screening of potential host organisms**

*T. Huffman, K. Barr, and G. Davis*

Wolbachia are gram-negative bacteria that infect 70% of invertebrates. Previous research in the Davis laboratory, by graduate student Kelli Barr, indicates that WCR-vectored Wolbachia can affect gene expression in *Zea mays* L. as a consequence of insect feeding. Specifically, Wolbachia turns off host defense genes. Given the ability of WCR-vectored Wolbachia to alter maize gene expression, we wanted to determine whether other pests of maize carry Wolbachia as a first step towards evaluating the extent to which insect-vectored Wolbachia might affect plant gene expression. In addition, several pests of *Arabidopsis* were also tested for Wolbachia since this plant offers the advantage of shorter generation time. DNA was extracted using a modification of the Qiagen DNEasy kit. The DNA was then amplified via PCR with Wolbachia-specific primers. The PCR products were then electrophoresed on a 0.8% agarose gel with positive and negative controls to determine whether Wolbachia was present. In a second experiment, insects that rapidly overcome chemical control were tested for the presence of Wolbachia and the specific strain of Wolbachia. Since Wolbachia is an obligate parasite in most insects and can induce genetic drive, as well as affect plant gene expression, we hypothesize that the difference in mutation rate and selection pressure on the bacterial compared to the insect genome may explain some insect's ability to easily overcome chemical control. DNA was prepared from these insects and tested for Wolbachia as described above. Wolbachia positive insects were assayed with a standard set of primers to delineate the strain of Wolbachia they carry. Future studies will examine whether Wolbachia vectored by other maize pests can cause similar changes in maize gene expression as those demonstrated with the western corn rootworm.