The use of RNAi technology to manage emerald ash borer (*Agrilus planipennis*)

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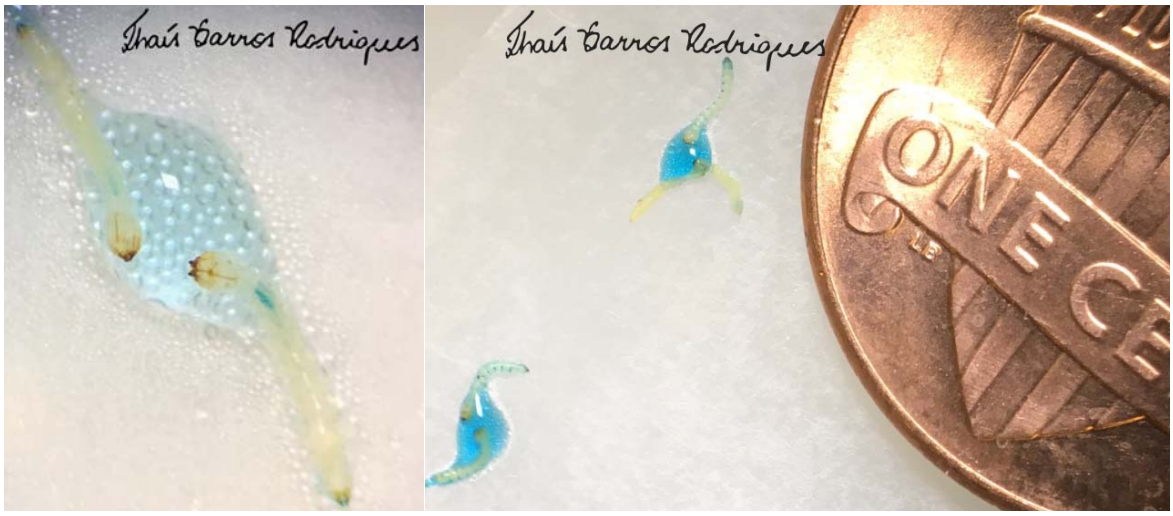
For the past several decades, biotechnology has been used successfully to manage insect pests in agricultural and forest systems. More recently a new generation of biotechnology, RNA interference (RNAi), has emerged as a useful tool in insect pest management. RNAi is a natural biological process that uses double stranded RNA (dsRNA) to silence specific genes. We are using RNAi to fight the invasive tree pest, the emerald ash borer (*Agrilus planipennis*). The emerald ash borer (EAB) feeds and develops just beneath the bark of ash trees, killing trees rapidly.



EAB larvae feeding on droplets that contain dsRNA for RNAi trails

In our preliminary research, we have found that feeding EAB larvae particular dsRNA fragments of essential EAB genes (using RNAi) causes larval mortality. We are currently screening additional genes to find those that cause the highest EAB mortality when used in RNAi. In the future we will look for ways to use this technology in a field setting. For example, we are exploring the potential of developing a non-toxic pesticide specific for EAB as well as genetically modified ash trees resistant to EAB. These RNAi approaches would result in pest-specific control not only saving ash trees but also minimizing potential hazards to the environment, non-target organisms, and humans.

About: Dr. Thais B Rodrigues

Dr. Thais B Rodrigues is a postdoctoral scholar in the Department of Entomology at the University of Kentucky and an active member of Forest Health Research and Education Center. Her primary research interest is RNA interference, gene expression analyses, and pest management.

Dr. Rodrigues has a broad background in molecular biology. During her bachelor's and master's degrees her research dealt with transgenic plants, *Bacillus thuringiensis* toxins, and toxicity bioassays against corn pests. In her Ph.D. she studied RNAi and gene expression of corn rootworm. She has worked at several institutions in both Brazil and the USA, including the Federal University of Lavras, the University of Nebraska, the Agronomic Institute of Campinas (IAC), the Brazilian Agricultural Research Corporation (EMBRAPA), and the Center of Nuclear Energy in Agriculture (CENA/USP).