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RNAi-Based Strategy for Asian Citrus Psyllid (*Diaphorina citri*) Control: A Method to Reduce the Spread of Citrus Greening Disease

Hawkings, C., Morgan, K., Shaffer, L., Powell, C., Borovsky, D., Cave, R., Dawson, B., Gowda, S., and Shatters, R.G., Jr.

Citrus greening disease is a serious bacterial disease of citrus worldwide and is vectored by the Asian citrus psyllid (*Diaphorina Citri*). The only effective control strategy includes vigorous control of the psyllid, primarily through heavy reliance on pesticides. As a more sustainable and environmentally friendly method of psyllid control, we evaluated a RNA interference (RNAi) approach based on psyllid oral uptake of dsRNA molecules that target specific psyllid genes. This approach is based on the finding that cellular uptake of dsRNAs, that match the sequence of essential genes, results in down regulation of those genes and can lead to cell/organism death. These dsRNA molecules were introduced into the psyllids through feeding on citrus engineered to express the dsRNA using a Citrus tristeza virus as a paratransgenesis vector. Increased toxicity was observed when adult psyllids were fed on citrus producing dsRNA targeting either gut protease genes. No increased psyllid toxicity was observed in psyllids fed on citrus producing green fluorescent protein (GFP) dsRNA. Toxicity related to specific psyllid gene knockout will be discussed. These results suggest that RNAi-based control may be a viable alternative to current pesticide use for control of psyllids and all phloem feeding pests.