Category: Biotic Interactions: Plant-Microbe

1000-083 - Resistance to the Tomato-Potato Psyllid (Bactericera cockerelli) in Solanum habrochaites

Tuesday, Jul 17 1:30 PM – 3:00 PM

The tomato-potato psyllid (TPP), *Bactericera cockerelli*, vectors the phloem-limited bacteria *Candidatus Liberibacter solanacearum*(Lso), the causative agent of economically important plant diseases in Solanaceae species including the tomato vein-greening and potato zebra chip. The TPP has the ability to produce a three-pronged damage to its host plant. The TPP punctures the vascular bundles, secretes toxic saliva into the host, and vectors the disease-causing Lso bacterium. In the absence of commercial resistant cultivars to both the vector and the pathogen, growers have dramatically increased pesticide use to control the vector. Since no adequate resistance level is found in cultivated tomato, we screened wild tomato relative species for resistance. *S. habrochaites*was identified as a source of resistance sinceno living adults and nymphs were found on infested plants after 10 days. Available recombinant inbred lines (RILs) developed from the cross of *S. habrochaites*with cultivated tomato (*S. lycopersicum*) were screened to identify chromosome introgressions carrying resistance. RILs with introgressions in chromosome 3,5,6, and 8 showed partial resistance levels indicating that resistance is controlled by more than one gene. Partial resistance levels on individual RILs provide a good protection level against the insect and can be used for breeding purposes. Gene expression analysis shows that RIL with introgression in chromosome 8 upregulate salicylic acid defensive signaling in response to TPP feeding, while no up-regulation occurs in susceptible plants. In addition, RNAseq expression profile analysis comparing RIL resistant and wild-type susceptible plants infested with Lso positive and negative TPP was performed. Differential expressed resistance and susceptibility putative factors were identified in the presence and absence of Lso, suggesting that Lso may play an indirect role by either enhancing or eliciting additional plant resistance responses against the psyllid.

Primary Poster Presenter(s)

CA

Carlos Avila – Texas A&M AgriLife Research, Weslaco, Texas