

Lake Wales Charter Schools Students Conduct Research on Citrus Greening



The citrus industry is a key component of the economic framework of Central Florida. Over the past decade growers have seen a major decrease in orange juice production due to the Huanglongbing (HLB) disease, commonly referred to as citrus greening disease. It is caused by toxic bacteria (*Candidatus Liberibacter asiaticus*) that is injected into citrus leaves by the Asian Citrus Psyllid.

Though the issue of citrus greening has been around for several years, very few students know much about it. Instead of spending their summer watching television and playing video games, on June 20, 2016, a cohort of 25 students from Lake Wales Charter Schools (LWCS), with the help of LWCS teachers and staff from Ecotek Lab, launched the first phase of a multi-year hands-on research program into finding solutions to combat and improve the management of HLB.

Above: Student scientist dissecting HLB infected citrus

The partnership between Ecotek Lab and the Lake Wales Charter Schools is designed to enhance student performance and learning capacity in science, technology, engineering and math (STEM). Project based learning using real-world problems is at the center of the Ecotek Lab student development model and fits perfectly with the strategic direction of STEM learning within LWCS. Phase one of the citrus green project was conducted over a two week period (June 20 thru July 1) and primarily involved student scientists gathering foundational information. Student scientists spent countless hours learning about the characteristics of HLB bacterium and its impact on the physiology of the citrus fruit. They also conducted a number of hands-on experiments ranging from identifying HLB infected fruit and leaves to examining the physiology and behavior of the Asian Citrus Psyllid.

The student scientists have taken their research beyond the classroom. On June 22, 2016, they visited a local citrus grove to see, first hand, the impact of HLB on citrus trees. While at the grove, they collected insects along with samples of soil, root stock, and oranges from HLB infected trees. On June 28, 2016 the cohort met with agricultural and entomology experts at the IFAS Research Center in Lake Alfred, Florida. To round out their foundational research activities, on June 30, 2016 the students met with genomic experts at the National Center for Agricultural Resource Research Lab in Fort Collins, Colorado. While there, they learned about citrus genomics and how the USDA is working to help develop disease resistant citrus trees.

Launching a multi-year hands-on research program in citrus greening is not easy. The student scientists at LWCS are the first to achieve this goal in the State of Florida. This is a great opportunity for them to not only build their scientific research skills, but to also participate in solving a problem that is directly impacting their community.



Student scientists conducting soil chemistry tests



Student scientists examining leaves on citrus tree



Student scientists and teacher examining mass of HLB citrus



Student scientist examining vascular structure of citrus plant

About the Ecotek Science Program

Ecotek is a science research lab program for young inventors and researchers in grades 5 thru 12. Student scientist work on projects aligned with the issues being addressed by world leaders at the United Nations. To learn more about Ecotek Lab go to <http://www.ecotek-us.com>