Presentation of Teak Seedling Nutrient Deficiency Symptoms Masters Research at the 3rd World Teak Conference 2015, Guayaquil, Ecuador, May 11-15

Report to the Bruce and Barbara Zobel Endowment for International Forestry Studies

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In late 2014 I submitted an abstract to the committee with the 3rd World Teak Conference in hopes of presenting preliminary results from my master’s research looking at the effects of different nutrient disorders on hydroponically grown teak seedlings. In early 2015 I was informed that my abstract was chosen and I had been invited to speak in Guayaquil, Ecuador during May of 2015. On receiving this good news I applied to the Bruce and Barbara Zobel Endowment for International Studies for funds to help cover my airfare and conference registration.

My research is oriented towards helping growers working with teak seedlings in nursery settings that encounter issues related to incorrect plant nutrition. In order to better diagnose nutrition issues I investigated the symptoms of twelve macro and micro nutrient deficiencies and toxicities on hydroponically grown teak seedlings. Initial studies were conducted to determine ideal hydroponic solution strength, pH level, and buffer solution for hydroponically growing tropical teak seedlings in temperate North Carolina.

Following initial studies investigating my proposed methodology the larger nutrient disorder study was conducted. This portion of my research focused on applying nutrient solutions that were either deficient or toxic in one of the twelve essential plant nutrients to hydroponically grown seedlings and recording the different symptoms exhibited. Photographs and foliar nutrient analysis were taken at the onset of each symptom in order to visually describe plant response and provide reference levels of nutrient levels.
In addition to the nutrient disorder symptomology experiment a second study was conducted in order to develop predictive models of foliar nutrient levels of Nitrogen, Phosphorous, and Potassium using near infrared spectroscopy. Models are slated to be developed using both a handheld Microphazir NIR scanner on fresh leaves and with dried ground leaves in a laboratory Foss NIR 6500 machine. Both systems were investigated in order to compare the accuracy of the less expensive and more efficient handheld machine with that of the more intensive wet-laboratory module. Results from all sections of my research will be incorporated into a guide that provides growers with a suite of tools to accurately diagnose issues with their seedlings.

Ecuador was chosen as the location for this conference due to the fact it is one of the largest growers and exporters of teak in the Americas. The opportunity to organize early findings from my master’s research and present this work internationally to a large group of world renowned scientists and foresters working with teak is one of the highlights of my time in graduate school. Listening to the numerous presentations and talking with different individuals about how my research pertains to real life examples was eye opening. Without the help from the Bruce and Barbara Zobel Endowment for International Forestry Studies I would have likely not been able to attend this conference and for this reason I am extremely grateful for this financial support. Presenting at the 3rd World Teak Conference in Ecuador was an invaluable experience to both my education and professional development.