Forced Cellular Dilation: A Novel Approach to Increasing Auxin Levels in Native Stem Cuttings for Habitat Rehabilitation and Greenhouse Production through the Use of a Vacuum Chamber

Anderson, Shannon (School: Anderson Christian Academy)
Anderson, William (School: Anderson Christian Academy)

Horticulturists regularly use asexual propagation techniques to more efficiently multiply specimens, but these methods have not changed dramatically in the last several decades. Native plants can been difficult to propagate with these methods and new methodologies are necessary to increase their populations rapidly. This research was conducted in hopes of finding a novel approach to increase auxin levels (IBA) in terminal stem cuttings to enhance productivity in greenhouse production and to potentially aid in habitat rehabilitation for native species. Cuttings from Texas native Salvia greggii and Lantana urticoides plants were used in a total of 18 trials. Terminal bud cuttings were taken and treated with three treatments: None, Powder IBA, and Vacuum IBA. The cuttings were grown in propagation trays using a sterile rooting media over a heat mat (24oC). It was hypothesized that Lantana and Salvia cuttings placed in a liquid rooting hormone within a vacuum chamber would produce more total root length than cuttings treated with only hormones. There was a significant increase in the average Salvia root length ($p=0.0324$) and a greater increase in root length for Lantana ($p=0.0017$) when compared to the control or only Powder IBA. Lantana urticoides cuttings treated with the vacuum had 79% more roots on average and Salvia greggii had 50% more roots on average compared to the Powder IBA treatment. These results suggest that Vacuum IBA propagation techniques could be utilized by the horticulture industry to rapidly increase the populations of Texas native plants like Salvia and Lantana.

Awards Won: