

## **POLLINATION BAG TYPE IMPACTS CONE SURVIVAL AND SEED YIELD FOR MASS PRODUCTION OF CONTROL CROSS SEED IN LOBLOLLY PINE**

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In 2016, over 1.4 million pollination bags were installed by seed orchard crews for mass production of control crossed seed of loblolly pine (*Pinus taeda* L.). At these production levels, even modest increases in seed yields for these control crosses will have a significant impact on seed orchard profitability and returns on investment in tree improvement. In the spring of 2014, we installed a study to compare four pollination bag prototypes. Bags from PBS International were compared to the industry-standard Lawson pollination bag with and without a support wire. Open-pollinated flowers were included as a control treatment. Based on preliminary results from the 2014 installation, another round of prototype testing began in the spring of 2015. The main objective of both trials is to compare seed yields and seed efficiencies of cones produced from different pollination bags.

Members of the NCSU Tree Improvement Cooperative installed this study in their operational seed orchards throughout the southeast US. In 2014, each bag type was installed at 9 orchards with 3 clones per orchard and 10 experimental blocks per clone, the target being 270 observations per bag type. The 2015 installation was very similar in design with the main exception being that the number of experimental blocks per clone was reduced from 10 to 5.

To quantify the utility of each bag, cone survival and seed yield per bag were calculated following cone harvest. Seed efficiency per cone was also calculated by counting the number of fertile and infertile cone scales. The 2014 version of the study is now complete; for seed yield per bag and cone survival, significant differences were found between the industry standard Lawson pollination bag and the two prototype bags and Lawson with a support wire. Results from the 2014 study suggest that stiffer/stronger material or the addition of a support wire to Lawson pollination bags increases female strobili survival at least 15%. The 2015 analysis is underway, and preliminary results indicate that cone survival per bag is significantly different between the Lawson bags and some PBS prototypes.

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