

IMPACT OF DEFOLIATION ON HEIGHT AND DIAMETER OF A FIRST YEAR RISING COTTONWOOD PLANTATION

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Poster Summary

In 2003, an 8-year study was initiated to determine the impact of herbivores on three selected eastern cottonwood clones. The plantation, managed by MeadWestvaco, is located just north of Hayti, Pemiscot County, MO. Each clone was planted in 100 (10 x 10) tree plots. There was a total of 8 blocks, each of which contained all 3 clones (300 trees). Four of the eight blocks were not protected from defoliation (untreated) and the remaining four (treated) were treated with an insecticide to control the cottonwood leaf beetle (CLB) (*Chrysomela scripta* F.) and other incidental herbivores. The 8-year objective is to determine the overall losses and/or gains associated with controlling or not controlling defoliation caused primarily by the CLB.

Monthly height, ground-line diameter (gld), and degree of defoliation were recorded and statistically analyzed. Degree of defoliation (damage rating) utilized the Leaf Plastochron Index (LPI) 1 to 8 leaves to assess the severity of defoliation (Fang and Hart 2000, Larson and Isebrands 1971). A damage rating of 0 indicated no feeding on LPI 1 to 8 leaves whereas a damage rating of 4 indicated heavy feeding with > 50 percent of LPI 1 to 8 missing plus the main leader and terminal bud are severely damaged or destroyed.

The treated blocks received an insecticide treatment as needed throughout the growing season. Insecticide treatments reduced CLB feeding and held the damage rating below 1.0 throughout the growing season. Untreated blocks had damage ratings between 3.5 and 4.0 for September and October, 2003. Results clearly demonstrated that insecticide treatments can reduce CLB feeding and early volume loss. Significant differences in gld and height among treated and untreated blocks were observed during the first year. The greatest increase in both gld and height occurred in the treated blocks. In the untreated blocks, CLB caused significant growth reduction. Average volume loss across the stand was 72 percent. This was

similar to an earlier study by Coyle and others (2002) in that the above-ground volume was reduced by as much as 73 percent. Results from the first and second year of this study are reported in Nebeker and others (2006).

As cottonwoods continue to gain popularity, the need will arise for the control of pests that affect them. With CLB being a significant herbivore in this plantation culture, it is important that this pest be controlled to reduce growth loss and stress reduction.

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