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Presentation

Fertilization increases the risk of loblolly pine to ice storm damage *(pdf)*

Fertilization increases the risk of loblolly pine to ice storm damage

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Winter storms resulting in substantial ice accumulation occur with periodic frequency in the southeastern United States and they have potential to severely damage softwood plantations. Loblolly pine is one of the most important crop tree species in this region and a combined understanding of initial damage and subsequent growth and recovery may allow for more productive utilization of these stands following severe ice storms. In January 2004 a severe ice storm deposited approximately 2 cm of ice on an intensively managed four-year old loblolly pine plantation in South Carolina . The existing treatments within this plantation presented an opportunity to examine the effects of irrigation and fertilization on ice damage and recovery. Damage was assessed 2 weeks after the storm by measuring the degree of terminal stem bend and recording the height of terminal stem breakage. Recovery of bent stems was assessed 11 and 28 weeks after the storm. Averaged over all treatments (control, irrigation, fertilization, and irrigation + fertilization), 14% of the individuals experienced no damage (stem breakage or bending), 71% experienced stem bending, and 15% experienced stem breakage. Fertilized plots and irrigated + fertilized plots experienced significantly greater proportions of broken individuals compared to irrigation and control plots. There was no treatment effect on the degree of terminal stem bending 2 weeks after the storm. Relative height increases one growing season after ice damage were significantly greater for individuals experiencing stem breakage as compared to unbroken trees. However, relative diameter increases one season following damage were significantly lower for individuals experiencing stem breakage. Thus, it appears that individuals with broken stems allocate resources toward height recovery in favor of diameter growth immediately after stem breakage occurs. Furthermore, relative diameter increases for broken trees were significantly lower for fertilized and irrigated + fertilized plots relative to control plots. One growing season after the storm, terminal stem angle measurements indicate that 86% of initially bent trees had straightened terminal leader to undamaged positions by bending the upper stem back toward an upright position while shifting the lower stem underneath the bend.

Key words: glaze, intensive management, *Pinus taeda*, disturbance

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