

Loblolly Pine Survival and Growth on a Reclaimed Mineral Sands Mine in Southeastern Virginia¹

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Abstract: Mineral sands mining for zircon and ilmenite in southeastern Virginia results in compacted soils with low fertility and low pH. Loblolly pine (*Pinus taeda*) is a common timber species planted in the southeastern USA that is well-adapted to sandy, infertile, somewhat poorly drained soils. Loblolly pine plantations generally require minimal inputs by landowners and may be a preferred post-mining land use for many. In 2013, we initiated a study on a recently reclaimed mineral sands mine to assess the effects of fertilizer amendment (F), weed control (WC), and fertilizer plus weed control (WCF) treatments on loblolly pine growth and survival. Bare root seedlings were planted in January 2013 and treatments were actively managed during the first two growing seasons. Fertilizer treatments were applied in March 2013 and June 2014 with 56 kg/ha N as urea, 12 kg/ha N as DAP, 28 kg/ha P₂O₅ as DAP, and 56 kg/ha K₂O as potash. Fertilized trees also received 114 kg/ha granulated trace minerals in June 2014. In March and June 2013, and June 2014, 1.5 m circle was sprayed with 1% glyphosate around trees in weed control treatments. After five growing seasons, overall mean survival was 74.4%. Survival was highest in the C treatment (92.9%) and lowest in the F treatment (53.0%) (p=0.013). Trees in the WCF treatment had the greatest mean height (332.6 ± 7.0 cm) and ground line diameter (GLD, 9.23 ± 0.21) after five growing seasons. WCF trees also had the greatest total height and GLD growth. Overall growth rates were lower than regional undisturbed soils over the first two growing seasons but by year three, growth rates were similar to expected natural stand growth rates. Our findings show that the combination of weed control and fertilizer was the most effective treatment for loblolly pine growth in this reclamation environment.

Additional Key Words: Silviculture

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