

Economic and Environmental Analysis of Tree Crops on Marginal Lands in Florida

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Tree crops can be used to remove contaminants from reclaimed wastewater, restore ecological functions of phosphate and titanium mined lands and to provide renewable energy in Florida. The economic feasibility of these potential tree crop systems, the value of environmental services they provide and opportunities to make up the current difference between minimum feasible and current market prices are investigated. Profitability measured as land expectation value (LEV) of 128 scenarios of *Eucalyptus grandis* cropping irrigated with reclaimed wastewater ranged from -\$2,343 to +\$2,762 per ha and was greatly reduced by high interest rates, high irrigation costs, and low yields. Each \$1 per kg N increment in a dendroremediation incentive increases profit by \$223-\$376 per ha, depending on interest rate and site productivity.

Optimum management requires harvests every 2.6 to 4.0 years and replanting after two or three harvests, though the optimum number of stages per cycle would increase with improved coppice growth. LEVs of *Eucalyptus amplifolia* cropping on phosphate-mined lands in central Florida ranged from \$762 to \$6,507 per ha assuming interest rates of 10% and 4%, respectively, establishment costs of \$1,800 per ha, planting costs of \$1,200 per ha, high yields, and a stumpage price of \$20 per dry Mg, excluding CO₂ mitigation incentives. Incorporating CO₂ mitigation incentives increased LEV, particularly when incentives recognize the CO₂ emissions reduced by biofuels use. Optimum management necessitates harvests every 2.5 to 3.5 years and replanting after two or five harvests. Average LEVs of slash pine (*Pinus elliottii*) stands established on titanium mined lands varied widely with productivity, but on average were profitable and similar to those of unmined lands.

KEYWORDS: Clay settling areas; Faustmann; Non-timber benefit; Phosphate-mined land; Reclamation; Restoration; Short-rotation coppicing

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