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Whole-Stand Models: Loblolly and Slash Pine Plantations

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WHOLE-STAND MODELS

Loblolly and Slash Pine Plantations

A new compatible whole-stand growth and yield model to predict total tree cubic-foot volume per acre yield (outside and inside-bark) was developed for unmanaged loblolly pine (Pinus taeda) and slash pine (Pinus elliottii) plantations in east Texas. This model was compared to the non-compatible whole-stand model of Lenhart (1996) and the Lenhart (1996) model refit to current data. For the two species, all three models were evaluated with independent observed data. The model developed in this study out-performed both Lenhart models in prediction of future yield and basal area per acre for all age classes combined and by five-year age classes. The Lenhart models consistently over-estimated yield and basal area per acre. All three models predicted surviving trees per acre similarly. An example is also provided to show users how to use the new whole-stand model. An ETTPRP report was published in 2010 which provides updates to the coefficient values in the 2009 SJAF paper, a new survival equation (which includes site index) as well as new arithmetic mean diameter equation.

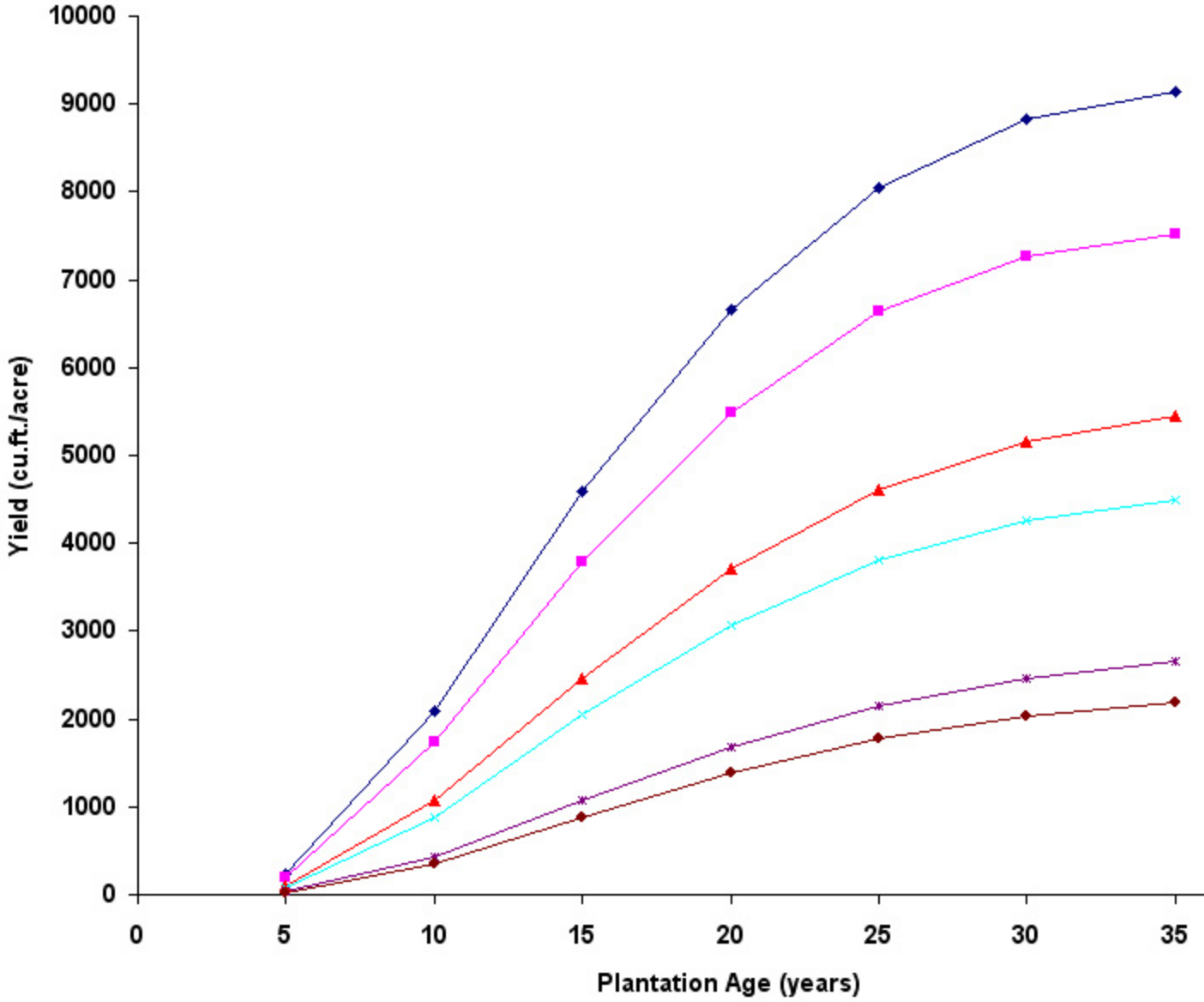

Figure 1. Predictions of per-acre cubic-foot volume wood and bark (ob) and wood only (ib) over time from the new east Texas loblolly pine whole-stand growth and yield model with 600 initial trees per acre for different levels of site index (SI in feet, base age = 25 years).

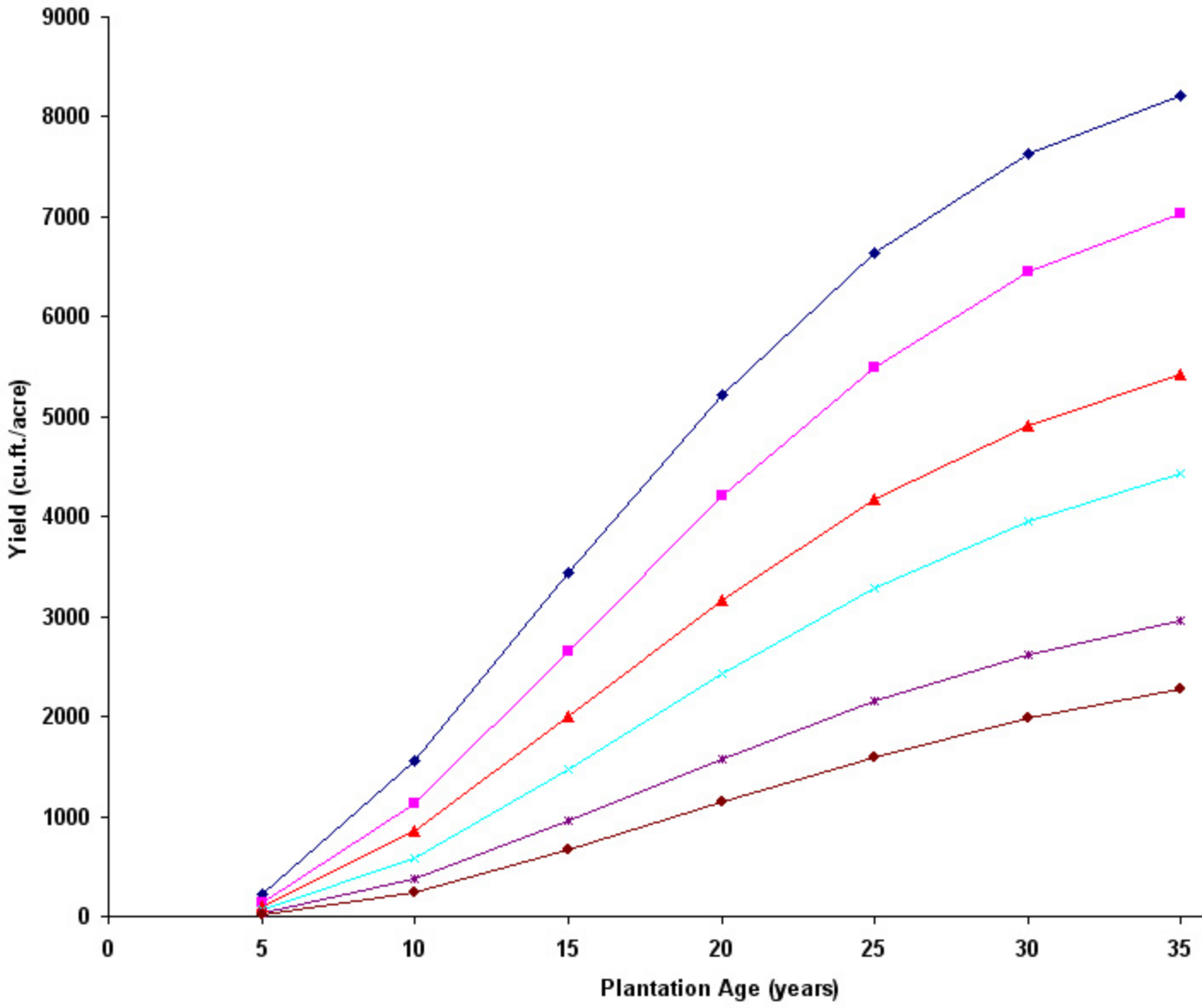

Figure 2. Predictions of per-acre cubic-foot volume wood and bark (ob) and wood only (ib) over time from the new east Texas slash pine whole-stand growth and yield model with 600 initial trees per acre for different levels of site index (SI in feet, base age = 25 years).

References

Coble, D.W. 2009. A new whole-stand model for unmanaged loblolly and slash pine plantations in east Texas. South. J. Appl. For. 33(2):69-76.

Allen, M.G., II, D.W. Coble, I. Hung, and J. Yeiser. 2010. A whole-stand growth and yield model for unmanaged east Texas loblolly and slash pine plantations. East Texas Pine Plantation Research Project Report No. 67. Arthur Temple College of Forestry and Agriculture, Stephen F. Austin State University, Nacogdoches, Texas. 12 pages.

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