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## Site Index Curves for Five Pine Species in El Salto, Durango, Mexico

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### Abstract

Forest productivity is a key component in classifying forest stands for the sustainable management of forests. For most species, height growth is independent of stocking over a fairly wide range of stand density, thus is often used as a measure of site productivity. In this study, we tested six site index functions for five commercial pine species of the forest region of El Salto, Durango in Mexico. The species investigated in this work were *Pinus cooperi* var *ornelasi* MARTÍNEZ, *Pinus durangensis* MARTÍNEZ, *Pinus engelmannii* CARR, *Pinus leiophylla* SCHL ET CHAM and *Pinus herrerae* MARTÍNEZ. Height growth functions were fitted for individual species and all species based on stem analysis data. The correlation coefficient and the root mean square error were used as criteria for evaluating the functions and finally selecting the best equation for the construction of the site index curves. A residual analysis was done for detecting dependencies and discrepancies of the patterns of curves. Among the six height growth models used, the special polymorphic formulation of the HOSSFELD function proposed by CIEZEWSKI and BELLA (1989) gave the best accuracy and precision for four out of the five pine species. SLOBODA'S function showed a slightly better performance for the one remaining species. Based on the analysis, the CIEZEWSKI and BELLA'S polymorphic function can be recommended for all the five species. The proposed function has fewer coefficients than the previously developed CHAPMAN-RICHARDS' model used for the major tree species in this forest region, and is able to provide compatible site index curves as well as height growth.

**Keywords:** Durango, El Salto, Mexico, *Pinus*, site index function