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Long-term growth data of plantation-grown *Eucalyptus* established in south-eastern Uruguay

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Behind beef production, *Eucalyptus* logs oriented to kraft pulp production represent Uruguay's second-largest export product. In this context, the analysis of long-term growth data of plantation-grown *Eucalyptus* forests acquires a material relevance. A total of 2208 permanent plots representing longitudinal growth data of *Eucalyptus globulus*, *Eucalyptus maidenii*, *Eucalyptus dunnii*, and *Eucalyptus smithii* trees were analyzed and modeled. The plots are part of a more extensive set established since 2012 on a forest state of over 22,000 ha planted. The selected plots were of variable shape, varying in size between 200 and 1000 m^2. Both planted and coppiced areas were included. Tree-level data (diameter at the beast height and height) was measured on each plot over a different number of years. Plantation ages, at the time of measurement, ranged from 1 to 18 years. The forests were all planted for the first time under the context of degraded grasslands, where there was no other better alternative use for the land. Soils are not very deep, of medium-to-coarse texture, and have low natural fertility. The dominant land cover was grasslands. The results highlight the variability in site quality. Stand density varied between 100 and 2500 trees per ha (TPH), with a site index (SI) at base age 11 ranging between 12 and 38 m. A strong relationship between dominant height (DH) and standing volume (TV) is evident, reinforcing that SI is still a valuable quantity to represent site quality. A set of anamorphic SI curves fitted to the DH data showed that *E. dunnii* and *E. smithii* height far exceeds that of *E. globulus* and *E. maidenii* at the same age, with an average SI of 28 and 31 m, respectively. Similarly, a family of TV curves fitted to each species as a function of DH, TPH, basal area, and age showed that the implicit current annual growth (CAI), given the model form used, peaked between 7 and 9 years. Depending on the stocking and site index considered, the CAI varied; but, in all cases, the CAI of *E. dunnii* was the highest, followed by E. smithii, and then *E. maidenii* and *E. globulus* in descending order. As an example, for a fixed density of 1100 TPH, the peak CAI was almost 48.6 m^3|ha|yr for *E. dunnii* (SI28), approximately 42.1 m^3|ha|y for *E. smithii* (SI31), and 17.8-21.3 m^3|ha|yr for *E. maidenii* and *E. globulus* (SI23).

Keywords: Eucalyptus sp., long-term growth monitoring, current annual increment, site index, south-eastern Uruguay

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