

TRENDS IN VARIANCES AND HERITABILITIES WITH STAND DEVELOPMENT OF TROPICAL PINES

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Abstract: Phenotypic and additive variances as well as narrow-sense heritability for cumulative height were determined from assessments of tropical pine (*Pinus caribaea* Morelet, *P. chiapensis* (Mart.) Andresen and *P. tecunumanii* (Schw.) Eguiluz et Perry) trials established in South America and South Africa by the CAMCORE Cooperative. Stem height was analyzed from data collected on open-pollinated families to determine additive genetic and phenotypic variances. Variances based on arithmetic as well as log-transformed values are presented. Log-transformed phenotypic and genetic variances decreased over time reflecting the onset of intergenotypic competition and compensatory growth. Arithmetically derived variances increased over time as the trial became older but the rate of increase for phenotypic variance was greater than for additive variance. Individual narrow-sense heritability, changed over time but without showing any definite trend by species. It appeared that variance trends reflected the varying ontogenetic changes during the development of the stand which could be indicated by size rather than by age. Breeding strategies in tropical pines have to consider the increasing intensity of environmental effects as the stand matures that cause a decline of genetic variances in a higher rate than the phenotypic variances. Furthermore, it is hypothesized that a phenotypic trait in a given ontogenetic stage of the individual is, presumably, under temporal control of a set of genes that changes as the temporal environmental conditions change.