ABSTRACT

ZAMUDIO, FRANCISCO. Age-related Variation in Growth Characteristics for Families of Pinus tecunumanii in South America. (Under the direction of Dr. Gene Namkoong)

This paper reports the results of a planning sire and age related analysis of total height (HT) and diameter (DBH) growth in fifteen half-sibs families of Pinus tecunumanii (Pro^{y}. Mt. Pine Ridge, Belize). Families were established in four field-tests by CINICORE's organizations in South America, in 1982. Each family was planted at 3 m x 3 m spacing in a randomized complete block design, replicated nine times using six-tree row plots, and assessed for growth traits at ages three, five, and eight since planning.

Families combined large family variation with a large range of hentabiliries across locations and ages, which indicate that a moderate to strong generic control of DBH and HT exists in cenain environments. Heritabilities changed with age without a clear trend related to environmental conditions.

The study of growth increments for both traits suggests that they were under a lower genetic control than the cumulative growth, and that families were less interactive with the environment after age five. Age-to-age correlations showed a highly correlated response in cumulative growth for HT and DBH, due mainly to the effects of the family variability during the first growth period. The high proportion of non-significant age-to-age phenotypic correlations for growth increments could be the effect of family variation in response to environmental fluctuations. Since total growth for diameter and height is a function of successive growth increments, and because later growth increments were poorly correlated with earlier growth, the age-to-age phenotypic correlation is misleading in most locations.

The decreasing family stability over time suggests the presence of a family x age interaction, which has to be verified in future research. Not only did families change their performance across sires at each age, but they also changed their relative performance over time.