Competition index: a tool to define thinning in stands of Araucaria angustifolia

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The competition indexes express an estimative of the horizontal space occupied by a sample-tree relative to its neighbors. Another useful indicator to define the living space is the salience index, determining the space to be released around a selected tree, so it can grow without competition. The aim of this study was to evaluate the relationship between crown diameter (CD) and diameter at 1.30 m above the ground (DBH) and competition indexes in a 66 years old stand of *Araucaria angustifolia*, established in the National Forest of Açungui, Campo Largo, Paraná State, Brazil. The stand was established with 2.0 m x 2.0 m trees spacing. A forest inventory by random sampling on 12 plots of 20m x 30m was conducted, obtaining an average of 368 trees per hectare and 33 cm of average DBH. The stand presents signs of stagnation due to insufficient thinning. It was selected 49 trees, representing seven diameter classes equally distributed from 0 to 70 cm of DBH. Height was estimate for each tree and measured the diameter at breast height (DBH), the crown diameter (DC) and the distance between the selected tree and each of its neighbors, totalizing 419 studying trees. The salience index was calculated by the ratio between the DC and the DBH. Among the competition indexes tested, the Glover Hool index presented the highest values of correlation with the DBH (r = 0.8971). The relationship between DC and DBH, represented by a linear model, resulted in 0.773 of coefficient of determination adjustment. The transition point from free canopy and the beginning of competition occurred when the stands reached an average diameter near 9 cm, defining the moment when the first thinning should occur in the stand. In terms of planned thinning at current average diameter (33 cm) the stand should have about 246 trees per hectare. At the end of rotation aiming the maximum potential diameter occurred in the stand (60 cm), the number of trees per hectare should not be above 80. Competition indexes are useful and can be used to recover information in not managed stands to optimize resources, and can be used as basis to manage other stands in similar conditions. (SISBIO 35355-1)