



## Water Erosion in a Two Year Old Stand of *Eucalyptus benthamii* under three Plantation Methods

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The preparation of the soil is the main issue of soil management. Thus, it is also one of the main operations with regard to management of planted forest during the whole productive process. Soil preparation is thought to directly affect various processes of the hydrologic cycle, water erosion, crop productivity and, subsequently, play an important role both for the environment and for the invested capital. Therefore knowledge of the effect of each specific soil management system on forest production is viewed as an essential issue. Based on these considerations, the aim of this work was to quantify soil and water losses by water erosion during the seasons of the year with the highest rainfall intensity in the south hemisphere, i.e. spring and summer in a two year old stand planted with *Eucalyptus benthamii*. This tree species was planted following three different conditions: 1) soil mechanical preparation in furrows following the land slope, 2) soil mechanical preparation in furrows dug perpendicular to the slope and 3) semi-mechanical preparation by digging an individual hole for each plant. The field experiment was located in Otacílio Costa municipality, SC, Brazil, at the Gropp forest farm owned by the Kablin SA company, 841 m asl altitude. The soil was classified as a “Cambissolo Húmico Alumínico Léptico” according with the Brazilian Soil Classification System with a slope of about  $0.12 \text{ m m}^{-1}$ . The experimental design consisted of randomly located erosion plots with 3 repetitions, thus a total of 9 plots. The surface area of the plots was  $12 \times 24 \text{ m}$  and they were oriented so that the main side followed the land slope. Suspended sediments and water losses were channelled to collecting tank at the end of the plot. Runoff water and eroded sediments were weakly measured, so that they correspond to cumulative weakly rainfall. The highest soil and water losses were recorded in plots with furrows dug perpendicular to the slope and the lowest ones corresponded to the semi-mechanical treatment with individual holes. Soil losses were 2.6 times greater in the treatment with furrows following the land slope when compared with the treatment with furrows perpendicular to the slope and this figure was 21.5 when the first treatment was compared with preparation by digging individual holes. Water losses in the treatment with furrows following the land slope were 3.6 and 4.1 times greater than in treatments with furrows contouring the land slope or with individual holes, respectively. So, like in annual crops, contour cultivation, with respect to the land slope, of planted forest stands is also an efficient plantation system for reducing water erosion when compared with other plantation systems.