BIODETERIORATION OF WOOD CHIPS IN STORAGE PILES AND ITS EFFECTS ON PULP YIELD AT PAN AFRICAN PAPER MILLS, WEBUYE, KENYA

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ABSTRACT

Forest resources in Kenya are decreasing every year while the demand for pulpwood increases. Kenya is also losing a lot of money by importing high quality pulp from South Africa to blender the one produced at PanPaper Mills, Webuye. The current pulp wood requirement is about 380000m^3 and is projected to double by the year 2020 if the present industrial development is sustained in Kenya.

A research project was carried out over six months to study the losses caused by wood decay fungi in the pinus species storage chip pile at Pan African Paper Mills, Webuye, Kenya. These losses were quantified in terms of pulp yield and pulp quality. It was found and confirmed through light microscopy and scanning electron microscope observation that fungal decay in chip pile was mainly caused by soft rot, white rot and brown rot fungi. Decay was more severe at lower levels of the pile and towards the centre probably due to the prevailing favourable environmental conditions such as high temperature (70^0C) and high moisture content (between 30.0 and 60.0%). Further tests carried out on chip samples collected from the pile showed that paper strength properties decreased drastically with storage time. For example, tensile, tear and burst strengths decreased by almost 17.0%, 19.0% and 14.0%. These were highly significantly different from the control when subjected to Duncan's Multiple Range Test. Pulp yield loss of up to 12.0% was recorded equivalent to about 40 ha of pulp wood going to waste due to biodeterioration (Pages 22 and 36). It was subsequently suggested to PanPaper to adopt storing pulpwood in multiple piles to reduce pile height and storage time to less than one month, process chips on a "first in first out basis", install porous material under each pile and construct drainage system to avoid retention of rain water within the pile. The results could be used in future as a basis in formulating the control measures in terms of preservative costs and application at different levels of the chip pile.