

Field grown *Acacia mangium* : how intensive is root growth?

ABSTRACT

Under rainfed conditions, root development of trees can be very unpredictable and variable, depending on the amount and distribution of rainfall received. This becomes more critical when the rainfall is seasonal and the soil has a high clay content. Our investigation dealt with the root development of *Acacia mangium* established as plantation forest on a soil with heavy clay texture in Kemasul Forest Reserve, Malaysia. The distribution of active roots was measured at 9- and 21-month-old plantations using the radioactive ^{32}P injection method. Growth at different distances from the tree base and at different soil depths was studied. After nine months of field planting, we found that roots were mostly concentrated at the surface within 1000 mm distance from the tree base. At one year after the first measurement, roots were traced as far as 6400 mm away. A large part of these roots, however, were detected within 3700 mm distance in the upper 300mm soil. At this stage, roots still did not go deeper than 450 mm depth, probably due to the high clay content at lower depth and low pH. This rapid root growth indicates that below-ground competition can be very intense if this species is established as a mixed-species plantation.

Keyword: Acid soil; Foliar analysis; Forest plantation; Heavy clay soil; Radioactive ^{32}P ; Root activity