Performance of Casuarina Hybrid (C. junghuniana x C. equisetifolia) as the Fast Growing Tree for Bio-energy in Saline Soil

Maliwan Haruthaithanasan¹*, Yutthana Banchong¹, Eakpong Thanavat¹, Tepa Phudphong², Bunvong Thaiutsa² and Kasem Haruthaithanasan¹

¹ Kasetsart Agriculture and Agro-industrial Product Improvement Institute
Kasetsart University, 50 phaholyothin, Ladyao, Chatujak, Bangkok 10900, Thailand
² Faculty of Forestry, Kasetsart University
50 phaholyothin, Ladyao, Chatujak, Bangkok 10900, Thailand
* Email: aapmwt@gmail.com

Abstract

The growth performance in term of biomass of Casuarina hybrid (C. junghuniana x C. equisetifolia) and other fast growing species (14 species in total) planted in saline soil with influence of tidal current of sea water was evaluated at Samutsakorn province, Thailand. Soil salinity of this site was measured in terms of the Electrical Conductivity (EC) which was observed to be moderate in salinity level (EC = 4.2-4.4 mS/cm). The trial was planted in Randomized Complete Block Design (RCBD). As the site was low-wet land, ridging as a soil preparation was done before planting. Harvesting was done during December 2013, when the trees reached 2 years old. After 2 years of planting, Melaleuca leucadendron presented the highest survival rate 100 %, followed Acacia ampliceps at 97.78%, while Acacia dificilis and Acacia torulos could not survive in this type of soil. In term of growth as dbh, Acacia ampliceps and Casuarina hybrid showed significantly higher value than the others with 8.41 and 8.33 cm respectively. With reference to total height, Casuarina hybrid showed obviously the highest value with 7.9 m height, followed by Eucalyptus camaldulensis with 6.3 m height. Regarding the biomass yield performance, Casuarina hybrid provided the highest stem, leaves and total biomass which were 34.39, 21.05 and 66.72 ton/ha, respectively followed by Acacia ampliceps with 21.68, 10.57, and 52.63 ton/ha for stem, leaves and total biomass respectively. Results of this study indicated that Casuarina hybrid and Acacia ampliceps are two potential fast growing species in saline soil for energy plantations.