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The effect of coal bottom ash as revegetation substrate on revegetation woody plants and environment – pilot scale experiment

Takeshi Suzuki[1], Yoshio Ikumi[1], Fumihiko Saka[1], Kuo Watanabe[2], Nobuhide Fujitake[1] and **Noriharu Ae[1]**
[1]Kobe University, Japan
[2]Kansai Electric Power Inc., Japan

Coal ash is a major waste by-product of coal incineration in coal-fired power stations throughout the world. The annual generation of coal ash has been increased in the world. However, only half of the coal ash is applied efficiently. The objective of this study was to confirm that coal bottom ash can use substrate of revegetation woody plant as a pilot experiment. Ten species of tree seedling were grown in granite soil (GS) with bark compost (BC) (control), GS + coal bottom ash (CBA) with BC (CBA1), CBA with BC (CBA2), and 100% CBA (CBA3) for three years. Each experimental dimension is 6×6 m with 0.5 m height and lysimeters were placed under the substrate to measure various elements out of each experimental system. Each growth rate of woody plant was measured every six month and B, Ca, Mg, P, Al, Fe, Si, Mn, K, As, Na, Cu, F Cl, SO_4 and NO_3 concentration of leachate collected from lysimeters were measured. From the physical and chemical properties of the substrates, they were suitable for growth of woody plant. The leaching tests of the substrate made from coal bottom ash were below Japanese legal standard. The growth rate of a few species of woody plant grown in CBA3 was smaller than those in other substrate. Although, As, B, Ca, K, Mg and P concentrations of leachate from CBA2, CBA3 were larger than those of control, the concentrations of As and B were less than those of Japanese legal standard.

Biography

Takeshi Suzuki has completed his PhD from Kobe University, Japan. He is an Assistant Professor of Graduate School of Agricultural Science, Kobe University. He has published more than 25 papers in reputed journalswater.

tksuzuki@kobe-u.ac.jp

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