Treatability of oil palm frond and rubber wood chips with urea for the development of slow release fertiliser

ABSTRACT

Treatability of a material is fundamental in determining how much chemicals or fillers are retained in the material before it can be used for slow release fertiliser. The aim of this study was to investigate the effect of urea retention in oil palm frond and rubber wood chips treated at different urea concentrations using pressure and non-pressure treatments. Treatability of the materials was calculated based on weight percent gain. Comparative nutrient contents of the impregnated chips were also determined. Oil palm frond and rubber wood chips were treated separately with three different concentrations of urea solution (5%, 10% and 15% w/v) using vacuum-pressure or soaking process. The results showed that type of material, treatment process and urea concentration significantly affect weight percent gain. Regardless of treatment combinations, oil palm frond chips had higher urea retention compared to rubber wood chips. For nutrient contents, treated rubber wood chips attained higher carbon content while treated oil palm frond chips had higher N content. Within the range of urea concentration studied, treatment with 15% urea using vacuum pressure process was found to be the most efficient treatment combination in the development of wood waste slow release fertiliser. The release pattern of nitrogen from both oil palm frond chips and rubber wood chips proved that these materials are suitable for the development of slow release fertiliser.

Keyword: Oil palm frond; Rubber wood; Weight percent gain; Urea; Nutrient contents