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## Study of Secondary Vegetation Treated as Bokashi on the Intercropped Maize and Soybean of Smallholding Farmers Land in Southeast Sulawesi, Indonesia

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### Abstract

Slash-and-burn agricultural system is being practised by more than 80% of the population in Southeast Sulawesi province. This system could no longer be maintained due to low yield of crops observed. Moreover, the number of soil limiting factors, such as low soil macronutrient contents, low cation exchange capacities, shallow top soil layers, and high soil acidities, were profoundly discovered. Therefore, the farmers are still under poverty condition. High input technology using inorganic fertiliser to increase agriculture production has terribly experienced since negative impacts on the environment widely occurred. One of the abundant natural resources is the presence of secondary vegetation in land use agricultural system after fallowing. The main objective of this paper was to overview the potential biomass derived from secondary vegetation as an organic fertiliser on the growth and yield of various crops. The species composition, biomass and nutrient stocks of secondary vegetation as well as the potential use as source of the organic fertiliser had been reported. The species diversity of vegetation in the early stages of development was principally controlled by *Chromolaena odorata* L., *Imperata cylindrica* L. Beauv and *Colopogonium mucunoides* L, and the nutrient stocks preserved, i.e. N, P, and K contents, were determined. The application of EM4 might help organic biomass to be rapidly decomposed in order to release nutrient into the soil. The response of intercropped maize and soybean treated as bokashi originated from combined secondary vegetation such as *C. odorata*, *I. cylindrica* and *C. mucunoides*, consisting of three levels: 0 t ha<sup>-1</sup>, 5 t ha<sup>-1</sup> and 10 t ha<sup>-1</sup>, was also described. The results revealed that the treatment of 10 t ha<sup>-1</sup> was better than other treatments, with the total maize yield of 4.5 t ha<sup>-1</sup>. Similar results on the application of *C. odorata* itself showed high yield of intercropped maize and soybean amounted to 5.2 t ha<sup>-1</sup>. The application of organic fertiliser, derived from *C. odorata*, *C. mucunoides*, and *Albizia lebbek*, might increase doubled or even tripled the yield of maize, peanut, soybean, and mungbean compared to control, indicating the promising results of the potential organic fertiliser use, replacing slash-and-burn to slash-and-mulch system for the smallholding farmers to improve their income and welfare.

**Keywords:** *Chromolaena odorata*, intercropping4, organic fertiliser, slash and burn