Name	Counterpart	Title
Bambang Irawan, Gindo Tampubolon, Hasbi Hasibuan	**Z01**	Ecosystem reclamation after coal mining and silviculture of forest plantation in PT. Nan Riang

Background and Objectives

The main problem that occurs after coal mining is the deterioration of soil quality (soil degradation), e.g. due to deterioration of chemical properties, environmental changes, and changes in soil morphology and topography. Referring to these changes, reclamation measures must be implemented. However, the problems that occurred are a limiting factor in the growth rate of plants to be planted during reclamation activities. For this reason, plants that have considerable potential and are adapted to the environment are needed for reclamation activities, especially in the former coal mining area. The plants used in this study were sengon solomon (*Paraserianthes mollucana*), calliandra (*Calliandra calotyrsus*) and jati (*Tectona grandis*). These plants has advantages over other plants such as fast growth, adaptability to extreme environments, and a fairly high economic and ecological value (Setiowati *et al*., 2017 and Hendrati *et al*., 2014). However, to support the growth of these plants, special treatment is required to improve the condition of the soil. One of these measures is the provision of organic material as soil enhancers, namely humic acid, boiler ash and poultry manure and dolomitic lime. In addition, NPK fertilizer is administered to provide primary macronutrients to the soil to promote plant growth.

The purpose of this research was to investigate the soil chemical properties and the growth of sengon solomon and calliandra due to the application of NPK fertilizer, NPK fertilizer with humic acid, boiler ash application, and dolomitic lime application with poultry manure, evaluate the growth of jati plants and investigate the effect of soil chemical properties on the growth of jati.

Methods

The research was conducted using an experimental method with a Randomized Block Design (RAK). In the NPK fertilizer experiment, there were 5 levels with 5 replicates, the NPK fertilizer experiment with humic acid contained 9 treatment combinations with 3 replicates, in the boiler ash experiment there were 5 levels with 5 replicates and for the poultry manure experiment with dolomitic lime there were 9 treatment combinations with 3 replicates, for the jati study there are 4 experiments with 5 replicates. The observed plant variables were height, diameter, increase in height, increase in diameter, increase in the number of leaves, increase in the number of branches, root length, crown dry weight, root dry weight and number of root nodules. The observed variables of soil chemical properties were soil texture pH, Al-dd, K-dd and P_2O_5. The resulted data were analyzed statistically using Analysis of Variance (ANOVA) 5 % and Duncan's Multiple Range Test (DMRT) to determine the differences between treatments.

Major Results and Conclusion

The results showed that the interaction of NPK fertilizer and humic acid had no significant response on the growth of sengon solomon and calliandra and on some soil chemical properties. A single application of 100 g/plant NPK fertilizer had the best effect on Sengon plant growth and K-dd content. A single application of 20 g/plant of humic acid had the best effect on sengon solomon growth. A single application of 150 g/plant of NPK fertilizer had the best effect on calliandra plant growth and P_2O_5 content. A single administration of humic acid 30 g/plant had the best effect on the K-dd content, but no significant effect on calliandra growth. The interaction of dolomitic lime and poultry manure had no significant effect on the growth of sengon solomon. The single application of dolomitic lime 1 x Al-dd/plant hole had the best effect on the growth of sengon solomon and soil pH. Single application of poultry manure 2 kg/planting hole had the best effect on the growth of sengon solomon. The best effect on the growth of sengon solomon plants and soil pH was the administration of boiler ash (4 kg/planting hole). The percentage of living jati that were categorized successful was 86 %. The respective height and average diameter of jati plantations in the concession area of PT. Nan Riang is 6.26 m and 10.81 cm. The growth of jati plants was affected by clay content, but pH and C-organic content had no significant effect on the growth of jati plants because the range of soil acidity was relatively the same (very acidic) and C-organic content was relatively the same and classified as very low.

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Major Outcomes

The main result of this research is a paper for the benefit of bachelor at Jambi University.

References

Hendrati RL., Suwandi and Ftargiyanti. 2014. Cultivation of Kaliandra (Calliandra calothyrsus) for Energy Source Raw Materials. Bogor. IPB Press, Bogor, Indonesia.

Setiowati DN, Amala AN, and Aini UNN. 2017. Study on the selection of revegetation plants for the success of ex-mining land reclamation. Journal of Environmental Engineering. Vol 3 (1):14-20.