



Tropentag, September 20-22, 2023, hybrid conference  
“Competing pathways for equitable food systems transformation:  
Trade-offs and synergies”

## Opportunities of mine reclamation areas for food crops plantation: Case study of coffee plants in former limestone mining

TEDI YUNANTO

*Ministry of Energy and Mineral Resources, Bandung Polytechnic of Energy and Mining, Indonesia*

### Abstract

Reclamation activities must be carried out after mining operations are completed. Mine reclamation areas, such as limestone mines, can be used as food crops plantation e.g. coffee. However, limestone dust affect the soil physical, chemical and biological properties, which will affect the coffee growth. Therefore, to increase the coffee growth, arbuscular mycorrhiza fungi (AMF) was introduced. The purpose of this study was to determine the effect of limestone dust covering former mines and different doses of AMF on coffee growth. The study was conducted using a RCBD method. The study area was divided into several blocks consisting of soil without lime dust, 0–2.5 cm and 0–5 cm dust cover. The blocks were treated with 10 g, 15 g and 20 g AMF with 5 replications each. Inorganic NPK fertiliser was given every month (till 5 month) to all treatments with successive 10 g/seedling, 20 g/seedling, 30 g/seedling, 40 g/seedling and 50 g/seedling for each month. Parameters observed were plant height, plant diameter, and number of leaves. The research results show that limestone dust affects soil conditions such as silt, clay, pH, organic C, bulk density, and C/N ratio. In addition, limestone dust affected plant height and number of leaves of coffee seedlings compared to those grown in areas without dust. The influence of the amount of AMF was significant ( $p < 0.05$ ) and tended to increase the height and diameter parameters of the coffee seedlings. The mean height of coffee seedlings in the 10 g treatment was 23.09 cm, while 15 g = 26.73 cm and 20 g = 25.59 cm. While the mean diameter for the 10 g = 3.78 mm, 15 g = 3.94 mm, and 20 g = 4.53 mm, however, the difference in the doses of AMF was proven to significantly ( $p < 0.05$ ) decrease the number of leaves, namely 10 g = 10 leaves, 15 g = 9.5 leaves, and 20 g = 8 leaves. This study shows that coffee plants can be planted in mine reclamation areas, but further research is needed regarding the quantity and quality of coffee beans produced.

**Keywords:** Coffee, limestone dust, mine reclamation, mycorrhizal biofertiliser, soil