



Differences in planting methods on growth rates of *Calliandra calothyrsus* in ex-limestone mining areas

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Introduction

- Ex-mining areas must undergo reclamation activities to improve environmental quality.
- The faster the species of plants grow and develop in the ex-mining area, the faster the process of restoring and improving the ecosystem of the ex-mining area.
- Differences in planting methods such as Direct - Seedling and the use of Planting Stock can cause differences in growth rates.
- Therefore, it is necessary to investigate the effect of different planting methods on growth rates in ex-mining areas.

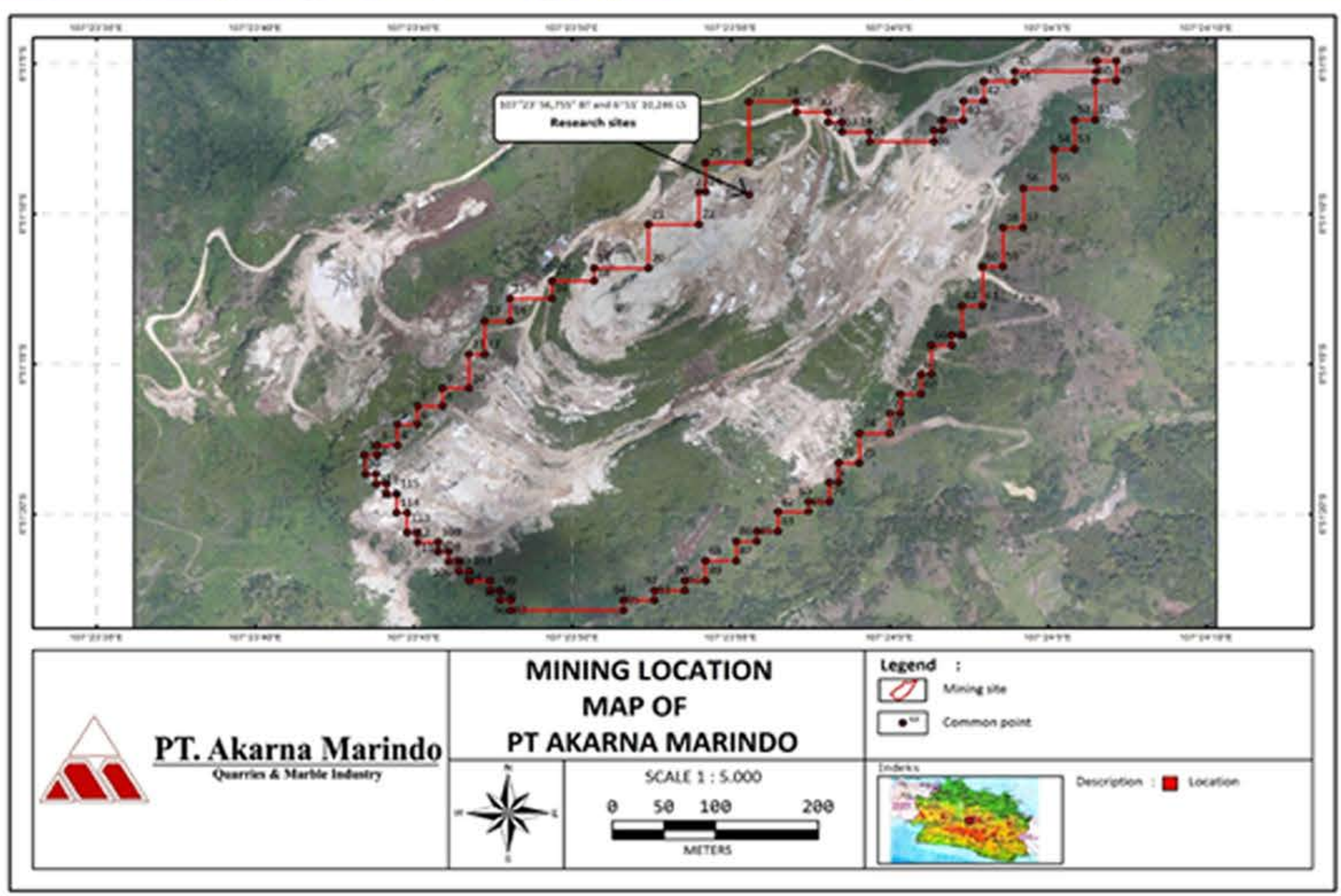


Figure 1. Location of study area of PT Akarna Marindo

Study Area

- The research was conducted at the limestone mining company PT Akarna Marindo located in West Bandung Regency, West Java Province Indonesia (Figure 1) which located in one of the forest areas owned by the state-owned forestry company, PT Perum Perhutani.
- Because it is located in a forest area, the form of reclamation carried out is revegetation of wood products and/or non - wood product species e.g. *Calliandra calothyrsus*.



Figure 2. Methods

Methods

- The planting method used is Direct- Seedling and Planting Stock with 20 seeds each.
- Seedlings with planting stock are planted after one month from the nursery process (germination).
- Direct seedlings: *Calliandra calothyrsus*. seeds are directly planted in the ex-mining area.
- The first measurement was carried out after 3 months of planting.

Result

- The mean height for Direct seedling was 15.9 cm with the minimum and maximum heights being 11.0 cm and 34.0 cm respectively.
- The mean height of Planting Stock is 20.5 cm with the minimum and maximum heights being 13.0 cm and 32.0 cm respectively.
- The mean diameter for Planting Stock also shows a higher mean value when compared to Direct-Seedling, namely 0.45 mm compared to 0.25 mm respectively
- The results of statistical analysis using the t-test showed significant differences in results between the two planting methods for both height ($p = 0.007$) and diameter ($p = 0.000$).

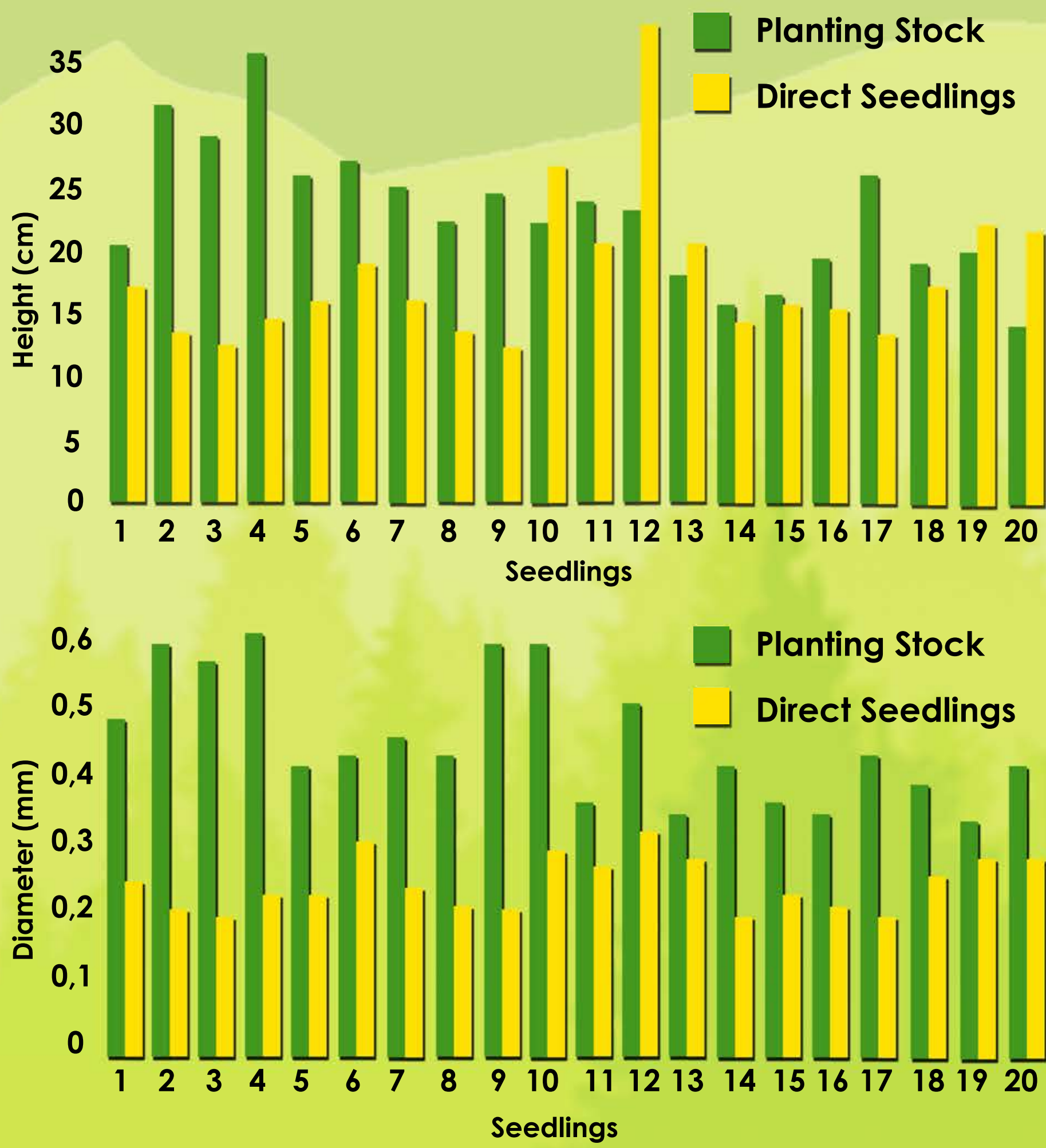


Figure 3. Results

Category	Mean of Planting-Stock	Mean of Direct-Seedling	t-value	df	p-value
Height (cm)	20.50	15.90	2.832	38	0.007
Diameter(mm)	0.45	0.25	9.206	38	0.000

Highlight

- The results of soil analysis show that the pH value tends to be high, namely an average pH = 8.14 as a result of limestone dust resulting from the crushing process.
- Planting *Calliandra calothyrsus* species using the planting stock method can be used for ex - mining reclamation activities compared to Direct Seedling.
- This also reduces the risk of seeds not germinating and being damaged/eaten by animals.



Figure 4. Highlight