

Interactive comment on “Potential for agricultural production on disturbed soils mined for apatite using legumes and beneficial microbe” by R. Swift et al.

Anonymous Referee #1

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The paper by Swift et al. presents an interesting study that aim to provide a scientific basis to rehabilitate an area previously mined for rock phosphate using six legume species in Christmas Islands. Given the isolation of the area, and the need for developing a sustainable agriculture, this research can provide useful information at the local or regional scale. However the authors should further discuss how this study can be useful at more global scales. Could this particular research be an example or case study of adequate land management for similar areas with analogous status?

The authors claim that rehabilitation of the area with legumes can provide an opportunity to develop alternative industries that would replace mining. However, narrowing the selection of species to restore could have a large impact on biodiversity in the area,

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particularly if this occurs at a large scale. Please, elaborate on this issue.

The objective of the study ('establish the scientific basis upon which agriculture can effectively be developed on land that has been previously mined for phosphorus establish' is a little unclear and unspecific. Also, some of these aims are not addressed in the study, e.g. underpin potential future animal feedlot operations, aquaculture or aquaponic operations. Please rewrite considering these comments.

Methods for soil collection and analysis should be explained in detail. Did you collect a bulked composite replicates? Was it replicated? Why did you choose those particular rates of fertiliser? Please explain the rationale for this. Also, why did you add the fertiliser by hand and how did you ensure consistency in the application? Using a non-replicated unfertilised plot can result in an unbalanced design. Please, clarify. The rate of seedling emergence seems quite high (90%). Did you use any treatment to overcome potential dormancy? You affirm that although no nitrogenous fertilizer was applied and the soil had low nitrogen levels, your plant tissue had adequate nitrogen levels. Why do you think you obtained these results?

Other comments/technical corrections: I suggest using colors for the figures. Please, check consistency across the document e.g the use of 'nitrogen' or 'N'; '2 ha' or 'two ha'. Table 1. Explain abbreviations.

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