

Bioindicators of mine soil rehabilitation

The majority of soil monitoring programs include only measurements of soil nutrients, chemical properties, texture, and heavy metal content. There has been much less emphasis placed on soil biological properties, even though soil microorganisms are central to ecosystem function. They are the major living component of topsoil, which in turn is the most important rehabilitation asset on a mine site.

Soil biology tests are needed that are the equivalent of some of the established chemical and physical tests.



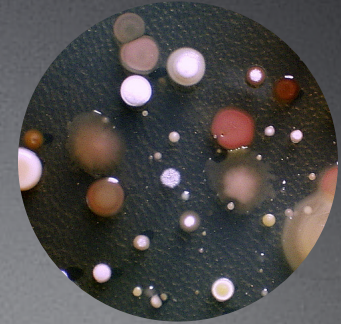
CEC EC
FC
ESP pH
BC

Methods to determine soil microbial properties should be simple and robust for routine measurement, yet provide enough information for meaningful insights into the state of a soil.

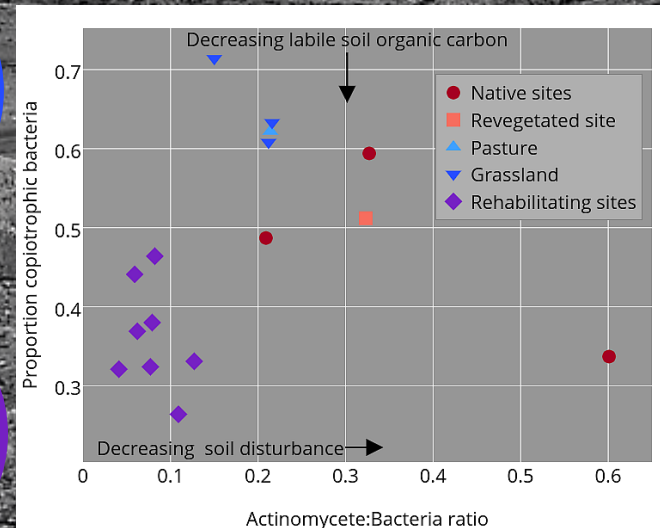


A metric of mine soil biological health has been developed using two measurements of the soil microbial community.

- The ratio of actinomycetes to non-filamentous bacterial colonies on soil dilution plates is a primary bio-indicator of the degree of soil disturbance.
- The proportion of copiotrophic (fast-growing) bacteria is a bio-indicator of the level of labile soil organic carbon.



The metric readily distinguishes soils at different stages of and in different types of mine rehabilitation as seen in this graph. It is a reliable and cost effective measure of the biological health and quality of rehabilitating mine soils.



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Building microbial communities

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