

Ch'osh doo Yit'iinii Dláádí dóó ábishjaa' Łeezh bii' Silá: The Bioremediation of Degraded Soil Through Biocrust Inoculation

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Over the past century, post-colonization activity has had a profound impact on Navajo Nation soil and environmental health. Today, the effects of overgrazing and heavy metal/coal mining are felt at every socioeconomic level among the Dine, and the health of fertile soil is crucial for the sovereignty of the Navajo Nation. These issues are further complicated by climate change and increasing anthropogenic presence characteristic of dryland environments. The bioremediation of soil through biocrust treatment could dramatically reduce the effects of soil degradation. Biocrusts are small, but incredibly complex, ecosystems of microbes among fungi, cyanobacteria, and mosses that are major players of their environments, particularly within desert ecosystems. Occupying the top few millimeters of soil, biocrusts are vital for soil aggregation, nitrogen fixation, nutrient storage/availability, water retention, and plant growth. They can take years, sometimes centuries, to recover after a disturbance without active restoration. At the Center for Adaptable Western Landscapes at Northern Arizona University, we are researching efficient, cost-effective, large-scale solutions to the degradation of soil from biocrust disturbance. Some of our methods include the dispersal of pellets with cultivated biocrust and anti-herbivory agents. With the inoculation of damaged soils with biocrust inoculate, we aim to speed up the establishment of healthy biocrust through active restoration.

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