



Restoring the natural state of the soil surface by biocrusts

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In arid and semi-arid areas, with mean annual precipitation of 70–200 mm, the dominant component of the ground cover is biocrusts composed of cyanobacteria, moss and lichens. Biocrusts play a role in stabilizing the soil surface, which reduces erosion by water and wind. Human disturbances, such as heavy vehicular traffic, earthworks, overgrazing and land mining destroy the soil surface and promote erosion. The aim of the study was to evaluate restoration of the soil surface by the return of a biocrust layer. We examined the impact of disturbances on the creation of a stable crust and on the rate of recovery. Biocrust disturbance was studied in two sites in the northern Negev. The nine treatments included different rates of biocrust inoculum application and NPK fertilization. Recovery rates of the biocrusts were monitored for five years using chemical, physical and bio-physiological tests which determined infiltration rate, soil surface resistance to pressure, shear force of the soil surface, levels of chlorophyll, organic matter and polysaccharide, NDVI and aggregate stability. The results show that untreated disturbed biocrusts present long-term damage and a very slow rate of recovery, which may take decades, while most of the treatments showed a faster recovery. In particular, NDVI, polysaccharide levels and aggregate stability showed steady improvements over the research period.