

## The Effect of Filter Cake Powder on Soil Stability Enhancement in Active Sand Dunes, In the Long and Short Term

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**Abstract :** Active sand dunes (ASD) may cause significant damage to field crops and livelihood, and therefore, it is necessary to find a treatment that would enhance ADS soil stability. Biological soil crusts (biocrusts) contain microorganisms on the soil surface. Metabolic polysaccharides secreted by biocrust cyanobacteria glue the soil particles into aggregates, thereby stabilizing the soil surface. Filter cake powder (FCP) is a waste by-product in the final stages of the production of sugar from sugarcane, and its disposal causes significant environmental pollution. FCP contains high concentrations of polysaccharides and has recently been shown to be soil stability enhancing agent in ASD. It has been reported that adding FCP to the ASD soil surface by dispersal significantly increases the level of penetration resistance of soil biocrust (PRSB) nine weeks after a single treatment. However, it was not known whether a similar effect could be obtained by administering the FCP in liquid form by means of spraying. It has now been found that spraying a water solution of FCP onto the ASD soil surface significantly increased the level of penetration resistance of soil biocrust (PRSB) three weeks after a single treatment. These results suggest that FCP spraying can be used as a short-term soil stability-enhancing agent for ASD, while administration by dispersal might be more efficient over the long term. Finally, an additional benefit of using FCP as a soil stabilizer, either by dispersal or by spraying, is the reduction in environmental pollution that would otherwise result from the disposal of FCP solid waste.

**Keywords :** active sand dunes, filter cake powder, biological soil crusts, penetration resistance of soil biocrust

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