

Grain Size Effect of Durability of Bio-Clogging Treatment

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Abstract : In this work, the bio-clogging of two soils with different granulometries is presented. The durability of the clogging is also studied under cycles of hydraulic head and under cycles of desaturation- restauration. The studied materials present continuous grain size distributions. The first one corresponding to the "material 1", presents grain sizes between 0.4 and 4 mm. The second material called "material 2" is composed of grains with size varying between 1 and 10 mm. The results show that clogging occurs very quickly after the injection of nutrition and an outlet flow near to 0 is observed. The critical hydraulic head is equal to 0.76 for "material 1", and 0.076 for "material 2". The durability tests show a good resistance to unclogging under cycles of hydraulic head and desaturation-restauration for the "material 1". Indeed, the flow after the cycles is very low. In contrast, "material 2", shows a very bad resistance, especially under the hydraulic head cycles. The resistance under the cycles of desaturation-resaturation is better but an important increase of the flow is observed. The difference of behavior is due to the granulometry of the materials. Indeed, the large grain size contributes to the reduction of the efficiency of the bio-clogging treatment in this material.

Keywords : bio-clogging, granulometry, permeability, nutrition

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