

人工降雨条件下施加粉煤灰对耕作土壤结构和水土流失的影响研究

Effects of farming soil treated with fly-ash on soil structure and erosion through artificial rainfall simulation

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中文摘要:

利用人工模拟降雨试验,研究了 0° ~ 20° 坡度下的耕作土壤施加0~10%的粉煤灰后,对土壤结构和入渗、产流、产沙的影响。研究表明:随农田耕作层中粉煤灰含量的增加,土壤入渗速率明显加快,含10%粉煤灰土壤的入渗速率,较对照(土壤不加粉煤灰)提高了55.34%;施加粉煤灰降低了土壤容重,增加了土壤孔隙度,含10%粉煤灰的土壤,在 10° 坡时的容重较对照减小了17.42%,而孔隙度提高了9.84%;坡面产流量和土壤流失量降低,含10%粉煤灰的土壤,在 20° 坡时的产流量仅为对照的26.87%。因此,施加10%的粉煤灰,可有效改善土壤结构和蓄水减沙,具有较高的实用价值。

英文摘要:

Through artificial rainfall simulation, the farming soil structure and infiltration, water and sediment yields were studied under different slopes from 0° to 20° and different contents of fly-ash from 0 to 10%. Results show that with the increase of fly-ash content in the farming soil, the soil infiltration rate accelerates obviously. The infiltration rate of farming soil with fly-ash of 10% improves by 55.34% than that of the contrast (soil without fly-ash). The soil bulk density decreases and the soil porosity increases after adding fly-ash. Compared with the contrast, the bulk density of farming soil with fly-ash of 10% reduces by 17.42%, and the porosity improves by 9.84% at 10° slope. The runoff yield and soil losses decrease. The runoff yield of farming soil with fly-ash of 10%, accounts for 26.87% of that of the contrast at 20° slope. Therefore, after exerting 10% fly-ash in the cultivated soil layers, the soil structure can be improved effectively, and the runoff and sediment are intercepted, which have higher practical value.

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