

Abstract

The Beerkan infiltration field experiment was conducted to estimate soil hydraulic parameters in Sistan Dam research field. A simple metal ring with a 10-cm diameter was used in this infiltration experiment. The ring was pushed 1-cm into the ground. Water bottles with equal volume of 150 ml were used to pour water in ring slowly. After adding first water bottle the time of infiltration is recorded. The water of bottles were added to soil after each other immediately .meanwhile the time of each infiltration is recorded (cumulative time).This procedure is done at least 7 to 15 times as long as three readings latest time are almost equal. Overall two phases can be considered in infiltration process consists of transient and steady phase .these phases are considered in BESTslope, BESTintercept and BESTsteady algorithms.in addition these algorithms are based on van genuchten bardin model and brooks corey hydraulic conductivity equation. The amount of saturated hydraulic conductivity based on Brooks and Corey algorithm BESTslope was estimated less than other two algorithms meanwhile the amount of Ks in BESTsteady algorithm was closer to the original algorithm. In total, the result show in all texture there is no significant differences in hydraulic conductivity of three algorithm. S estimated value in all three algorithms are very close to each other; however, the estimated value of the original algorithm was slightly higher than the other two algorithms. Soil hydraulic conductivity curves estimated by original algorithm was slightly less than the other two algorithms, but three curves are almost the same. BESTintercept and BESTsteady characteristic curve were estimated same, and the algorithm BESTslope characteristic curve was slightly different from two other major algorithm. It was found that the higher the clay content of the soil increased root mean square error decreased and it led to more accurate and acceptable estimation of soil hydraulic properties by Beerkan infiltration test.

Keywords: Beerkan, infiltration, hydraulic conductivity, retention curve



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