

The 3D Modeling of Heat Transfer in Soil

We present 3-D numerical models developed for heat transfer under soil with different shape pots in order to determine the influence on the temperature and the evolutions of temperatures at different depths with time over a day. The governing differential equations of heat transfer are solved by Explicit Method and Crank-Nicolson Method in Cartesian coordinate. The models were validated in comparison to the experimental results from the conditions of southern Thailand. We then applied the model to the cylindrical concrete tank which is commonly used in plant growing. The results are in good agreements with the experiments suggesting that the model can be efficiently used for determining the conditions under soil in different shape pots.

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