عنوان مقاله:

An underrelaxed-modified Picard iteration scheme for simulation of 3D wetting pattern under drip irrigation using Richards' equation on non-orthogonal grids

محل انتشار:

دومین کنگره سراسری در مسیر توسعه علوم کشاورزی و منابع طبیعی (سال: 1395)

تعداد صفحات اصل مقاله: 9

نویسندگان:

Mohammadreza Naghedifar - *Department of Water Engineering, College of Agriculture, Ferdowsi University ofMashhad (FUM), Mashhad, Iran*

Hossein Ansari - *Department of Water Engineering, College of Agriculture, Ferdowsi University of Mashhad (FUM), Mashhad, Iran*

Sayyed Majid Hasheminia - *Department of Water Engineering, College of Agriculture, Ferdowsi University of Mashhad (FUM), Mashhad, Iran*

Ali Naghi Ziaei - *Department of Water Engineering, College of Agriculture, Ferdowsi University of Mashhad (FUM), Mashhad, Iran*

خلاصه مقاله:

The knowledge of soil wetting pattern dimensions is one of the most important design parameters in drip irrigation systems. In this study, a three dimensional (3D) FORTRAN code based on finite volume approach is provided to investigate about wetting pattern characteristics under line source and point source drip irrigation systems. The coordinate transformation method is used to transform the governing equation from physical space to computational space. The model was validated with data obtained by HYDRUS 2D software. The results showed that the model is able to predict soil wetting pattern under both line source (2D model) and point source (3D model) irrigation systems in different soil textures. Eventually, the ability of this model for simulation of soil water redistribution process was investigated and acceptable results were obtained

کلمات کلیدی:

Numerical model, Subsurface flow, Finite volume, trickle irrigation, Coordinate transformation