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ADHYDRA: a user friendly graphical interface model to simulate variably saturated flow on unstructured grids.

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It is presented a package with pre-processor, simulation engine, irrigation simulator and post-processor. It allows the simulation of variably saturated flow also in the presence of plant roots. Two data bases give the possibility to store both the soil and the plant data which the user uses. A CAD interface is compatible with most CAD package for providing geometrical inputs. Additionally an irrigation simulator has been added in order to easily perform different irrigation methods and strategies effects. Some case studies are presented regarding both irrigation and environmental practical problems. The simulation engine is based on a model developed by the author (Manzini and Ferraris, 2004). The unstructured vertical 2D grids allow to model the complex geometry, such as e.g. along canals sites. The software itself calculates the potential evapotranspiration starting from different levels of meteorological data (from daily minimum and maximum daily temperature and rainfall data, to solar radiation and wind, if any).

Reference

G.Manzini and S.Ferraris, 2004. Mass conservative finite volume methods on 2-D unstructured grids for the Richards' equation, Advances in Water Resources 27, 1199-1215.