Estimating Root-Water-Uptake Using an Inverse Method. (S01-zhang031049-Poster)

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Abstract:

To estimate distributions of root-water-uptake in soils, an inverse method was developed. In the method, measured values of water content in soil profiles with root-water-uptake were used as input information. Then soil water flow equation incorporating an unknown sink term was solved inversely for the sink term, which characterizes the root-water-uptake distribution in the root zone. The estimated distribution of root-water-uptake rate was applied to calculate the normalized distribution of relative root density. Examples of numerical experiments were designed to examine the accuracy and stability of the proposed approach to estimate the average root-water-uptake rate. The method was also applied to estimate the normalized relative root density of winter wheat grown in soil columns. The results showed that the inverse method is reliable to estimate distributions of the root-water-uptake rate and the normalized distribution of relative root density, compared with the theoretical and measured values.

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