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ABE351

Wetted Bulb Dimensions From a Trickle Source[1]

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An estimation of the wetted bulb diameter dimensions is needed to determine the number of emitters per plant when using drip or trickle irrigation systems. It is generally recommended that a sufficiently large fraction of the root zone be wetted by irrigation to ensure adequate water and nutrient supply to the plant.

This software allows the calculation of the wetted bulb diameter from a point source in a sandy soil. Please note that the method has not been tested or calibrated for soils other than sands. In addition the method applies only to deep homogeneous, uniform soils.

Empirical Equation

There are several methods that allow estimations of wetted bulb diameters.This includes reports from field tests (Goldberg et. al, 1976), and the empirical equations presented by Schwartzmass and Zur (1985), and Zazueta (1992). Other approaches to present these results include tables, such as the ones published by Keller and Bliesner (1990).

This program implements the equation developed by Zazueta (1992):

$$D = 0.01\left(\frac{qr}{I}\right)^{1/3}$$

where:

D = approximate wetted bulb diameter (m),

q = emitter discharge (l/hr),

r = root depth (m), and

I = basic infiltration rate (m/s).

Downloading and Installing the Software

This software can be downloaded from http://fsz.ifas.ufl.edu. The file is in compressed Zip format. Unzip the file and execute the included setup program. Follow the standard set of instructions on the screen to install into your Pocket PC.

Sample Run

Figure 1 shows the Pocket PC display when the program is running. Enter the information corresponding to each data field (emitter discharge,

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root depth and basic infiltration rate) and press the calculate button to obtain a result.

Figure 1.

References

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