Dual-Drip Subsurface Irrigation System: Can it Act as a Hydraulic Barrier?

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Typical plant root system
Majumdar (2004)

25% of water consumption
30% of water...
20% of...
10%
Water application problem in SDI system

El-Berry (1989)

LIGHT SOIL

25% of water consumption

30% of water...

20% of...

10%

Solution I


Solution II

Ismail et al. (2006)

The Hydraulic barrier


Marketable Yield Kg/fd.

392

48% More Yield

265

Exist

Hydraulic Barrier

Absent

Hydraulic Barrier

48%
OBJECTIVES

MATERIAL AND METHODS
Although there are some differences in water profiles in sandy and loamy soils, but these differences do not seem to be sufficient to explain large recorded differences in crop yield. Therefore, we studied the effect of the dual drip system on the solute distributions in the root zone.
The application of a dual-drip system or the installation of a physical barrier can significantly alter both the wetting pattern and spatial distribution of applied solutes.
Physical barriers prevent downward movement of water, nutrients, and chemicals, thus their usefulness depends on the need of keeping or flushing these substances.

A dual-drip system can manipulate the distribution of solutes in the root zone, especially for sequential operation. Such a system allows growers to control solutes retaining or leaching by simply altering the operation sequence.

Thanks for your attention.