Efficient use of water in dryland agriculture (...in the world)

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**GOAL:** DECREASE EVAPORATION IN ORDER TO INCREASE W.U.E. (WITH AN EMPHASIS ON SIMPLE APPROACHES).

a. Intercropping (Runoff Agroforestry)
b. Changing geometry for flooding systems
c. Polyethylene mulching
RUNOFF AGROFORESTRY SYSTEM

P: precipitation
R: runoff
E: evaporation
T: transpiration
W: retaining wall
S: spillway
D: drainage
B: basin
**Hypothesis**: The rate of evaporative losses will be reduced if the runoff water is stored in narrow trenches.
Schematic plot outlay. Microcatchment and Trench runoff collection systems
WATER LOSS ($\times 10^{-3}$ m$^3$ d$^{-1}$)

- ET Trenches
- ET MC
- T Trenches
- T MC
- Class A Pan
EVAP. FLUX (X10^{-3}) m^3 d^{-1} vs DOY

- E MC
- E Trench
TRANSPERSION NORMALIZED BY CANOPY CROSS-SECTION

Transpiration (mm day⁻¹) vs. DOY (Days of Year)

Class A Pan evaporation (mm day⁻¹)

MC

T
MAIZE FIELD TRIAL

Distance between plants in the row: 0.14 m
Furrow Drip Evaporation (%)
• The water losses due to direct evaporation from the soil to the atmosphere were significant in the three agrosystems tested.
• The reduction in evaporation increased the water available to crops and hence the total biomass yields per unit planted area.
• The implementation of the techniques that lead to a reduction of the aforementioned losses require different types and levels of investments and may be adapted to the possibilities of various population groups.
• The reduction in evaporative losses may compensate the expected reduction in precipitation due to climate changes in the Eastern Mediterranean.
THE END
8. DROPPELMANN, K. and BERLINER, P.R. 2003. Runoff agroforestry - a technique to secure the livelihood of pastoralists in the Middle East. *Journal of Arid Environments.* 54: 571-577