

Subsurface irrigation with ultra-low-pressure (ULP) dripper

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In desert farming, water use efficiency is crucial for all plants including agroforestry crops such as date palm which are highly adapted to the desert ecosystems. To respond to the water use efficiency requirement in desert farming, innovation packages (Genetic, biophysical, and managerial) have been developed and deployed. *Subsurface drip irrigation is one of such innovations. The system aims at minimizing water loss through evaporation, percolation and run off by directly delivering the water to the root zone.* Subsurface irrigation is an improvement over the micro catchments established around the date palm trees. ICARDA and NARS partners in the Arabian Peninsula demonstrated that subsurface drip irrigation can save water in date palm production compared to conventional flood, drip, and bubbler irrigation systems

Further improvement on sub surface irrigation is

- Use of Ultra Low-Pressure Drippers (ULPD) to minimize energy consumption and facilitate us of solar energy
- Placement of the ULPD within perforated tubes facilitating moisture distribution while preventing clogging

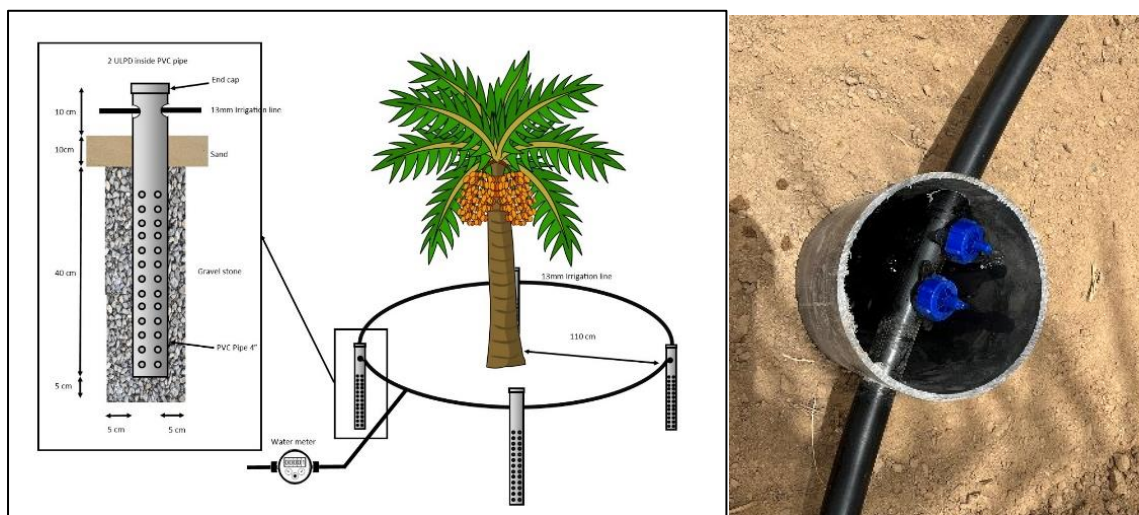


Figure 1- diagram of subsurface irrigation system with ULP drippers

Advantages

- A high precision of water application and uniformity in distribution
- Low and renewable solar energy use
- Minimum cost of establishment and maintenance
- Better control of weeds around the tree (figure 2)
- Reduced water loss caused by runoff, evaporation, and percolation
- The system can be fine-tuned using soil moisture sensors.
- Great performance under windy and arid conditions
- The risk of direct contact of wastewater with crops and laborers is reduced



Figure 2- The new sub-surface irrigation with ULPD powered by solar energy (left) and bubbler in UAE. With subsurface irrigation, the grass growing under the trees is very limited.