

EPIC CASE STUDY

OPEN FIELD DEMONSTRATION

AL DAHRA AGRICULTURAL COMPANY, AL AIN, UNITED ARAB EMIRATES

The same technology taken out of the greenhouse and laid across open desert field: one excavation, one liner, chambers in rows.

Nov 2010
OPEN-FIELD INSTALLATION
Data collection from end of January 2011

3
SEPARATE CELLS
Water levels tracked apart

0
EPIC PLANT LOSSES AT THE DEMO SITE
Against about 10% on drip

EVIDENCE LEVEL
DOCUMENTED · Project brief and installation record

EPIC chambers set out on the EPDM liner across the open field at Al Dahra, Al Ain.

PROJECT RECORD

CLIENT	Al Dahra Agricultural Company
LOCATION	Al Ain, United Arab Emirates
INSTALLED	Greenhouse and open-field demonstration sites installed late November 2010
DATA COLLECTION	Open field data collection began at the end of January 2011
PLANTED	A variety of vegetables, alfalfa grass and forage grass
CONFIGURATION	One large area excavated and covered by EPDM liner, with EPIC chambers fitted in rows over the area: three separate cells, each allowing water levels to be tracked independently
STATUS	Date palm plot installations were expected by the end of March 2011

THE PROBLEM

Al Dahra wanted the technology proven not just under glass but on open ground, across the mixed cropping the farm actually runs: vegetables, alfalfa and forage.

The open field is the harder case: there is no shelter from wind or sun, and the evaporative demand is far higher than under glass.

The farm was also carrying a fertiliser problem. In a conventional system fertiliser seeps into the ground; with the EPDM liner it is contained once applied and released as the plant uses it, which keeps it out of the groundwater.

WHAT EPIC BUILT

Where the greenhouse needed hand-dug trenches, the open field was done the normal way: one large area excavated, covered with the EPDM liner, EPIC chambers fitted in rows across it, then gravel and sand.

Three separate cells were used so that water levels could be tracked separately during the demonstration. Under normal operation the same area, or a larger one, could have been run from a single cell. Extra tanks, water meters and pumps were installed purely to collect and analyse data.

The brief also sets out, explicitly *“not necessarily for this project, but in general”*, that the system can use seawater and grey water. With the liner in place nothing below it is contaminated; and because the system is sub-surface, people do not come into contact with the irrigation water.



The EPDM liner laid over the excavated open-field area.



Chambers set in rows on the liner, connectors in place, before gravel.

Nov 2010	3	0
OPEN-FIELD INSTALLATION	SEPARATE CELLS, WATER LEVELS TRACKED APART	EPIC PLANT LOSSES AT THE DEMO SITE, AGAINST ABOUT 10% ON DRIP

WHAT THE RECORD SHOWS

The open-field demonstration is documented by its project brief and installation photographs rather than by meter readings. The observations below are those given in the brief.

OBSERVATION	AS RECORDED
Plant condition, demonstration site	Plants under EPIC were greener and healthier
Plant losses, first 4 to 6 weeks	Drip lost approximately 10% of plants, possibly to nematodes. EPIC lost none.
Greenhouse saving reported by the farm	About 82%, on par with what was predicted

> The 82% figure is the farm's feedback on the greenhouse installation, not the open field; the metered greenhouse record is set out in CS-01. The plant condition and plant loss rows describe the demonstration site as a whole, not the open field alone.



Header and connector pipe delivered to the open field.



Forage grass established on the open-field system.

ALSO ON THE RECORD

- **Seasonality.** Vegetables grown outside in the UAE tend to grow from September through to May and are out of season from June to August. The brief expected that EPIC may allow some vegetables to grow through the year, which could increase production. This is an expectation, not a result.
- **Root behaviour.** A site report from the Al Ain project, 16 April 2011, describes EPIC-side plants without the secondary root system seen on the farm side, and records that *some* plants matched the farm side at 4 m in length. In the report's words: "our plant root with out second root system it's like this because it's looking for fertilizer not like other side big and contain second roots because there's too much fertilizer."

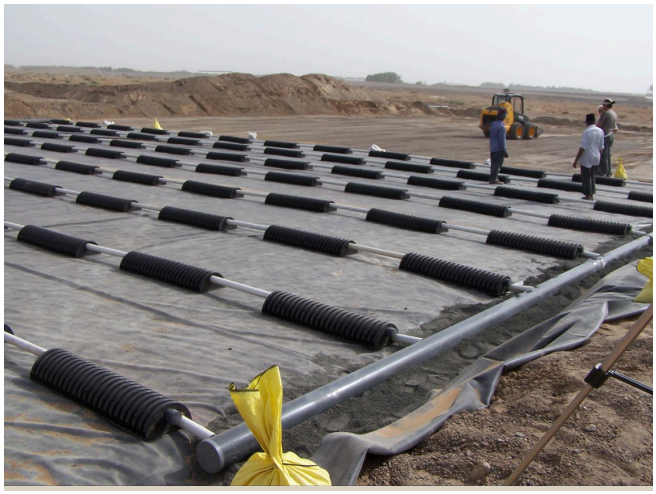
PROJECT AIM

"We want to make sure that any solution we provide to farmers is not only sustainable but is also simple, easy to use, and requires very little maintenance. Ultimately we are aiming for a turn-key system, with exact instructions based on what's going to be grown be it cucumbers, tomatoes, or any other agricultural produce."

Project brief, Al Dahra farm demonstration site



Sweet sand and gravel stockpiled on site.



The full open-field array: one excavation, chambers in rows across it.



Forage and alfalfa growing on the open-field installation.



The finished field in production.

RECORDS Project brief for the Al Dahra farm demonstration site; Al Ain project site report, 16 April 2011; installation photographs from the Al Dahra open field.