Ultra-Low Energy Drip Irrigation for MENA Countries

MIT-MIRRA Quarterly Report

Year 1, Quarter 2: January – March 2017
PROJECT FACT SHEET

PROJECT TITLE: Ultra-Low Energy Drip Irrigation for MENA Countries

FUNDING AGENCY: United States Agency for International Development (USAID), Middle East Water Security Initiative (MWSI) - BAA- MWSI-ME-2015

START DATE: September 20th, 2016
END DATE: September 19th, 2019

IMPLEMENTING PARTNERS IN JORDAN:

Methods for Irrigation and Agriculture (MIRRA) - a Jordanian non-governmental organization that specializes in the development of water and agricultural sectors including optimizing pressurized irrigation networks at field and network levels, wastewater reuse in agriculture and capacity-building activities for individuals and institutions.

http://mirra-jo.org

MIT Global Engineering and Research (GEAR) Lab, the lead organization and creator of the drip irrigation emitters capable of maintaining a constant flow rate and matching the pressure of competing products at 50% of the energy required of conventional drippers.

http://gear.mit.edu

Jain Irrigation, Ltd., is the second largest micro irrigation company in the world, based out of India. Its role in the project is producing the prototype emitters so that they can be installed in the field by MIRRA.

http://www.jains.com/

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LIST OF SYMBOLS

ADRITEC Arab Drip Irrigation Technology
CV Coefficient of Variation
DAQ Data Acquisition
EU Emission Uniformity
FAZ Electricity Unit
GR Local Name for Inline Emitters
HP Horse Power
MENA Middle East and North Africa
MIRRA Methods for Irrigation and Agriculture
MIT Massachusetts Institute of Technology
NCARE National Center for Agricultural Research and Extension
PC Pressure Compensated
PRV Pressure Relief Valve
TRD Traditional
USAID United States Agency for International Development
USDA United States Department of Agriculture
WAJ Water Authority of Jordan

SITE KEY
Sharhabeel Station Site IDs 11, 12, 13, 14
Ramtha Station Site ID 15
Mafraq Farm Site ID 16
The Methods for Irrigation and Agriculture (MIRRA) team began the quarter by accumulating a list of manufacturers and farmers that produce or use drip irrigation equipment, respectfully.

After conducting interviews with farmers who use drip irrigation, MIRRA confirmed that irrigation systems are widely used in Jordan, but a majority of farmers who use irrigation systems prefer inline (GR) over online (PC). The reason GR is preferred among Jordanian farmers comes down to a matter of cost.

- Drip Irrigation Systems Manufacturers and Installers (List)
- Farms surveyed, drippers used, reasons for PC/GR, crops cultivated, region of Jordan (List)
Site Visits in Mafraq:

Private Farms

On January 1, MIRRA and MIT team headed to the Mafraq Governorate and to Talib Al-Faragat and Mohammad Farag-Allah’s farms. These farmers’ fields are adjacent to each other with similar irrigation systems and crops. Both farms utilize inline and online-PC systems with groundwater and use the Viro-Jet system with their peach and nectarines.

The following site was Abdullah Akash Al Zaben’s farm, an ideal farm because of its modern irrigation system; however, an inline system is used, not online. He cultivates grapes, peaches, nectarines, olives and other varieties using these systems.

The third farm was Dr. Fayez Khasawneh’s farm, which grows varieties of peaches, apricots, cacti and olives. Ground water is used in irrigation transferred with PC in the olive fields and GR for his peaches, apricots, grapes and a small portion of the olive fields.

The fourth farm was Ayman Abu-Keshek’s who gave the team an inside look at his farm, which utilizes an inline system in addition to K-clip emitters of 81/h-201/h. He operates his own desalination system on the farm and draws up groundwater.

State Farms Visited

Sharhabeel Station is one of Jordan’s National Center for Agricultural Research and Extension’s (NCARE) many member locations around the country. Its water source originates from the Yarmouk River and Wadi Arab Dam and is used to cultivate oranges, pomegranates, lemons, and other crops.

The next stop was a sister site under NCARE Karameh Station which grows date palm.

Also, the team visited Jamal Al-Zubaidi, an irrigation and agricultural tools retailer, who showcased the filters, emitters, tubes and various fittings available at his store.
Post Site Visits:

After visiting these sites and following the MIT team’s return to the U.S., MIRRA moved to select ADRITIC to install the irrigation systems on farms.

In mid-February, MIRRA submitted a request to the corresponding ministry to accept foreign financial support and move ahead with the next stages of the project.

The Decision is Made:

MIT and MIRRA decided that Sharhabeel Station will be the first site on which to carry out project work in addition to Ramtha Station based on MIRRA board member Dr. Samer Talozi’s recommendation. Later, ADRITIC and MIRRA visited Sharhabeel Station to draw up initial plans for the installation of the low-pressure drippers.

In February, March and April there was a follow up with the requests sent to Jordanian ministries, a draft report completed on the agricultural varieties on the sites as well as having prepared a questionnaire for the institutions and retailers that were visited in Ramtha, Irbid, and the and Sharhabeel.