AgriLife NEWS

November 11, 2009

Irrigation engineers test subsurface drip systems at College Station

AgriLife engineer: If they'll work here, they'll work anywhere

By: Robert Burns, 903-834-6191

Contact(s): Dr. Guy Fipps, 979-845-7454, g-fipps@tamu.edu

COLLEGE STATION - - "If we can make it work here, we can make it work everywhere," said Dr. Guy Fipps, Texas AgriLife Extension Service engineer in College Station.

Fipps was not singing about show biz in New York, New York. Instead, he was talking about subsurface drip irrigation for turf.

Fipps and Charles Swanson, AgriLife Extension associate-urban irrigation, have been testing several subsurface drip systems near the Medical School on the Texas A&M University campus since July 2008.

The test was originally designed to test subsurface

systems in the area's heavy clay soils. But it turned out to be a test of the systems under drought conditions as well, Fipps said.

View All Media/Resolutions

"At the beginning of the summer of 2008, we had 54 consecutive days without rain. From May 23 to Aug. 25 – 94 days – the site only experienced four days of significant rain," he said.

The drought made one thing very clear, Fipps said.

"During droughts, there's no doubt that you can't go greater than 1-foot spacing," he said.

Subsurface drip irrigation is being promoted by irrigation companies as a potentially water-saving alternative to conventional sprinkler systems.

"But the thing that is not well understood is how durable the drip irrigation is," he said. "That is, how long it will last under a typical landscape installation."

Several factors can affect the longevity of subsurface systems, including shrinkage and swelling of soils, and trash, particulates and minerals in the water, he said. Shrinkage and swelling of soils can damage drip tape and fittings. Trash and other foreign matter in the lines can clog the small holes or emitters. As the lines are typically buried 2 - 4 inches deep, repair can be expensive.

College Station was the ideal location for the test because the heavy clay soils shrink and expand a great deal as they dry out and become wet again, he said. Also, the local water supply contains a lot of particulates and minerals.

"In sandy soils, you won't have shrinkage and expanding as you do with clay soils," Fipps said. "Also, many areas in Texas have better water quality. And we had a drought this summer, as everyone knows."

Fipps and Swanson tested eight drip irrigation products at different spacings of the drip lines. They also compared all four systems with and without an installed back-flush feature. The back-flush feature allows one end of the line to be open and any trash and particulates purged.

"Typically, landscape installations do not include a back-flush system," Fipps said.

The tests included products made by four manufacturers: Bowsmith, Inc., Netafim, Toro and Roberts (Roberts is now John Deere Landscaping). Swish, Inc. and Jain Irrigation Systems Ltd. contributed drip fittings to the study, Swanson said.

"The products were installed in a 'square spacing,' which means that if the emitter spacing was 12 inches then the drip lines were installed 12 inches apart," Swanson said. "Flows for these products ranged from 0.17 gallons per hour to 0.53 gallons per hour."

The project consisted of two plots, each about one acre, with each plot divided into eight test sections. The layout on the two plots was the same, except the systems were equipped so they could be back-flushed and the others were not.

The visual differences were dramatic this summer, Swanson said. In the 18-inch and wider spacings, banding of green and browned-up grass could be seen.

"The reason that is significant is that you'll need a lot more drip tubing and that will be considerably more expensive, both in terms of material and installation," Fipps said.

As of late October, there have been no problems with emitters clogging or with tears in the tubing.

"However, it appears that during dry periods, if there is inadequate irrigation, the soil will shrink and compact around the drip tubing, thereby reducing and or preventing the free flow of water along the full length of the tubing," Fipps said. "After installation, we had problems with the drip tubing being pulled out of the fittings connecting it to the supply pipelines, which could have been caused by any combination of soil shrinkage and swelling, fluctuations in pressure and improper installation."

Fipps and his associates hope to continue the study for at least five years.