SUBSURFACE DRIP IRRIGATION APPLICATIONS IN THE HUMID REGION: STATUS OF THE TASK COMMITTEE ACTIVITIES

Michael D. Dukes[1]
Daniel L. Thomas[2]
Members of the SDI task committee

ABSTRACT

The SDI applications in the humid region task committee was formed to coordinate expertise in SDI from the humid areas of the United States. These experts have met on several occasions and formed subgroups to draft working documents focusing on SDI applications in the humid region. Draft documents are currently being developed in the areas of site selection, design, installation, and management. As these documents are created, some areas will be identified as "lacking" good information to make reasonable recommendations. A separate "research needs" document will be created to help with future research directions.

INTRODUCTION

The Task Committee on "Subsurface Drip Irrigation (SDI) Applications in the Humid Region" is organized under the Environmental and Water Resource Institute (EWRI) of the American Society of Civil Engineers (ASCE) Water Quality and Drainage Technical Committee within the Irrigation and Drainage Technical Council. The purpose of the task committee is to bring together SDI system experts, determine unique characteristics of such systems when used in the humid region, and draft documents targeted toward potential SDI users in the humid region. The primary documents will address the site selection, design, installation, and management of SDI systems in the United States. Participants involved range from university personnel and government agencies to industry and farmers. Partnering organizations include the American Society of Agricultural Engineers (ASAE) and the Irrigation Association (IA).

ACTIVITIES TO DATE

1. November 30 – December 2, 1999, Augusta, GA. Preliminary planning meeting on initial concepts and partitioning of responsibilities for workshop development team.

---

[1] Assistant Professor, University of Florida, PO Box 110570, Gainesville, FL 32611, mddukes@ufl.edu
[2] Professor, University of Georgia, Tifton, GA

2. August 9 – 10, 2000, Florence, SC. Planning meeting for the local arrangements team for the workshop. A visit was made to the Pee Dee Research and Education Center to determine facilities available for the workshop. An initial workshop agenda and schedule was developed.

3. November 15, 2000, Phoenix, AZ. Meeting of all interested in the SDI project effort. This meeting was used to solicit input on topic ideas, facility requirements, and travel arrangements. Outlines in major topic areas were developed. The meeting coincided with the annual Irrigation Association meeting and the Irrigation Symposium. See Table 1 for participants.

4. February 13-15, 2001, Florence, SC. Meeting of the SDI task committee at the Pee Dee Research and Education Center. Groups were formed based on site selection, design and installation, and management topic areas. Outlines initially developed at the previous meeting were further developed and specific sections were assigned to individuals for completion. The goal was to have a draft document to present at the Environmental Water Resources Institute meeting in Orlando, FL in May 2001. Funding for this activity was provided by ASCE and outside sources to reimburse participants for travel expenses. See Table 1 for participants.

5. May 20-21, 2001, Orlando, FL. Meeting of the American Society of Civil Engineers (ASCE) Irrigation and Drainage committee. Panelists from each of the four SDI subgroups presented the status of their respective documents. Feedback from the audience was solicited.

6. July 10-13, 2002, San Luis Obispo, CA. Present a paper and poster outlining the current status of the SDI in the humid region task committee.

Table 1. Participants and affiliated organizations in the SDI task committee activities.

Last Name	First Name	Organization	Meeting Attended	
			Phoenix, AZ Nov., 2000	Florence, SC Feb., 2001
Alam	Mahbub	Kansas State University		
Ayars	James	USDA, ARS	Yes	
Benham	Brian	University of Nebraska		
Bliesner	Ron	Keller and Bliesner		
Boman	Brian	University of Florida		
Boswell	John	Farmer		
Buchanan	John	University of Tennessee		Yes
Burgess	Mark	Roberts Ro-Drip		
Camp	Carl	USDA, ARS	Yes	Yes
Clark	Gary	Kansas State University	Yes	
Curtis	Larry	Auburn University	Yes	
Darrell	Virginia	Washington State Dept. Health		
Dukes	Michael	University of Florida		Yes
Edling	Bob	Louisiana State University		
Evans	Robert G.	Washington State University	Yes	
Evans	Robert O.	North Carolina State University	Yes	Yes
Fipps	Guy	Texas A&M University	Yes	
Gervais	Ken	Coastal Irrigation		
Grabow	Garry	North Carolina State University		Yes
Haman	Dorota	University of Florida		
Hanson	Blaine	University of California, Davis	Yes	
Harrison	Kerry	University of Georgia		Yes
Henggeler	Joe	University of Missouri	Yes	
Hobbs	Bryan	B. B. Hobbs Irrigation		Yes
Hook	Jim	University of Georgia		
Huffman	Rod	North Carolina State University		
Jester	Ronald	University of Delaware	Yes	
Johnson	Henry	North Carolina		
Khalilian	Ahmad	Clemson University		Yes
Lamb	Marshall	USDA, ARS		Yes
Lamm	Freddie	Kansas State University	Yes	Yes
Law	W. P.	Farmer		

Parsons	Larry	University of Florida		
Patterson	Randall	North Carolina Farmer		
Powell	Norris	Virginia Tech		Yes
Roberts	Mike	Virginia Tech	Yes	
Rochester	Gene	The Rochester Group		
Rogers	Dan	Kansas State University	Yes	
Ross	David	University of Maryland	Yes	Yes
Ruskin	Rodney	Geoflow, Inc.		
Schwankl	Larry	University of California, Davis	Yes	
Smith	Bryan	Clemson University	Yes	Yes
Smith	Vernon	USDA, NRCS		
Sorensen	Ron	USDA, ARS		Yes
Spofford	Tom	USDA, NRCS	Yes	Yes
Tacker	Phil	University of Arkansas	Yes	Yes
Thomas	Dan	University of Georgia	Yes	Yes
Thomas	Jim	Mississippi State University		
Trooien	Todd	Kansas State University	Yes	
Tyson	Ted	Auburn University		
Tyson	Tony	University of Georgia		
Vories	Earl	University of Arkansas	Yes	Yes
Warner	Richard	University of Kentucky		
Wright	F. Scott	USDA, ARS		
Yoder	Ron	University of Tennessee		
Zazueta	Fedro	University of Florida		
Total			21	18

STATUS OF THE DOCUMENT

Currently, there are four main documents being prepared concurrently. The documents focus on the following areas with the coordinator for each group,

- site selection – Carl Camp,
- design – Garry Grabow,
- installation – Kerry Harrison,
- and management – Ron Sorenson.

All four groups have developed draft documents; however, several sections are incomplete in the site selection, design, and installation areas. Once developed,

these documents will lead to another document that details the research needs in SDI for the humid region.

The site selection group is working on topics in four general areas:

1. site conditions and assessment,
2. crop,
3. system operation, management, and maintenance,
4. and economic considerations.

These sections consider planning topics ranging from site topography, soils, water supply, and environmental factors. Some topics specific to the humid region are soils, water supply, and environmental factors such as off site impacts. Since SDI is relatively new to the humid region other factors that must be considered by users is availability of technical support and materials to install and maintain the system. Economics of SDI systems must be studied prior to implementation in the humid region. It is anticipated that SDI systems will exceed the cost of conventional systems (e.g. sprinkler); however, potential benefits such as lower water costs and increased yields will be explored.

The design group is working on design topics similar to other irrigation systems such as maximum daily evapotranspiration (ET) rate, pumping systems, and pipelines. Factors that must be considered in the humid region include crop water requirements, topography, crop, and location of lateral lines to avoid damage from tillage operations.

The installation group is addressing those characteristics that are most important in the actual installation of subsurface drip irrigation systems, especially as they relate to the humid region. Time of year, working with excess moisture conditions in the soil (plow pans, etc.), infield and long term documentation of buried lateral line locations (considering the impacts of adjacent tree lines on typical positioning technologies like global positioning, GPS), and equipment (available and build your own) used in the installation process.

The management group has developed a document that discusses typical management issues found in all irrigation systems such as when to irrigate and how much to irrigate. One topic identified that needs to be answered in the humid region is irrigation in one event versus irrigating several times to supply the same volume of irrigation water. The combination of sandy soils (typical of many humid area agricultural fields) with significant rainfall can lead to chemical leaching problems and trafficability impacts.

An interactive presentation was developed and copied to compact disc (CD) for distribution at the February 2001 meeting/workshop in Florence, SC. The presentation includes a database of SDI reference materials and also links to websites containing SDI information.

FUTURE WORK

Future deadlines will include further revision of existing documents and development of sections missing in current documents. In addition, people with expertise in the various areas are being solicited to participate and review the documents once they are completed. Finally, the document outlining research needs will be developed based on areas defined by development of the current documents. It is anticipated that the final documents will be published via ASCE publications and on the world wide web.

CONTACT INFORMATION

For more information or participation opportunities contact,

Dan Thomas, University of Georgia, Biological and Agricultural Engineering Dept., Tifton, GA 31793, phone: (912) 386-3377, fax: (912) 386-3958, email: thomasdl@tifton.cpes.peachnet.ufl.edu