New Irrigation Technologies for Nursery/Floral Producers and Commercial Landscapers:

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Project Need, Description and Expected Outcomes:
Water continues to be one of the most critical issues facing the green industry. Water availability, conservation, and quality all impact nursery/floral producers, landscapers and retailers. In addition, commercial and residential landscape irrigation is the single largest water use category for most major municipalities. Improved technologies and better management practices will be required if we are to protect and conserve this valuable natural resource.

Experts agree that irrigation management is the most important factor in conserving water. A well-designed irrigation system is only efficient if it is operated properly. Advances in technology are providing new opportunities to better address water management. However, much of this technology is not readily available through traditional horticultural suppliers. The objective of this project was to evaluate new irrigation technologies using currently available components.

There are a broad range of electronic components and computer software that has been developed for industrial water applications. However, many of these components have not been utilized in developing commercial, business or residential irrigation systems. This project focused more on using existing technology versus developing new components.

The project was conducted at the TAMU Horticultural Gardens in College Station, Texas. We previously utilized standard irrigation timers to monitor and control over 100 stations in the nursery, greenhouse and landscape. The newly designed/installed system incorporates modules equipped with X10 signal addressing to input data directly in to a PC. Commercially available X10 software (i.e. HomeSeer) runs in the background giving the user the ability set and modify run times as required. This mode allows users to assign an individual X10 code to each valve. An additional water conservation feature is a default or maximum run time which may be set for each value. In event of a lost X10 command, run

time is determined by the default setting. Each zone is programmed with its own default value.

All of the X10 signal information is automatically posted to a web site that provides both access and control of the irrigation system. Using a wireless PDA, PC or other internet device, users have the ability to remotely access data, turn valves on and off, as well as monitor ph, salinity and flow. The acquisition of historical data also provides meaningful analysis for improved management of the irrigation system.

This project has broad implications, including the ability to remotely monitor and control commercial, business and residential irrigation systems. The project has also created an easy to use water management tool that allows growers, commercial irrigators, retailers and homeowners do a better job of conserving and protecting our valuable water resources.

Additional Observations: After running the system over the course of an irrigation season, a number of additional observations were made. These include:

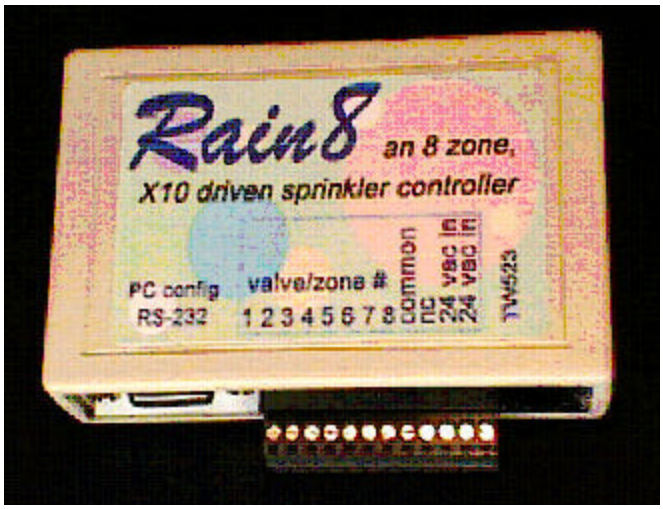
Because of the distance between the PC and many of the X10 controllers in the system, a wireless connection was used as a link. Loss of signal strength became an issue and it was necessary to increase antenna length to optimize system operation.

Changes in the wiring configuration and the addition of a new transformer at the test site also disrupted signal integrity. A system re-design was necessary to meet these challenges. The PC was moved to a more centralized location providing enhanced X10 signal accessibility.

Noise and signal disruption at the service panel also created a challenge. The addition of an X10 filter helped boost strength and limit problems with signal clarity.

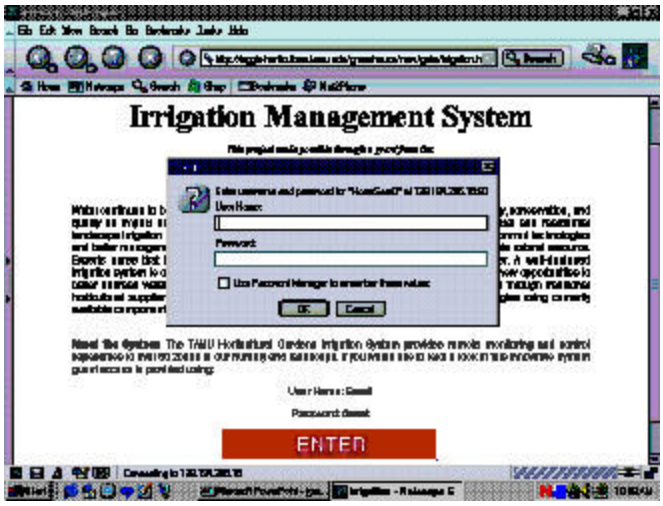
HomeSeer did an excellent job of managing the system. However, the script generator required updating to be compatible with our computing system. This was time consuming and caused problems with system operation.

All system components were available off the shelf and very little re-configuration was required to meet our needs. This was one of the most important aspects of the project and we were satisfied with the results. Based the findings of this project, one of the principal component manufacturers (WGL and Associates) has made modifications to better meet the needs of commercial, business and residential irrigation systems.

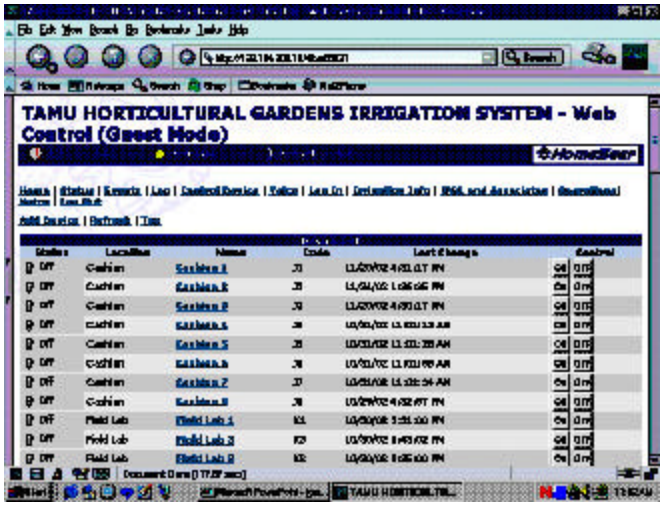


The individual Rain8 modules are manufactured by WGL & Associates, San Antonio, TX (210) 342 2858. The total cost of our system is less than $1,000 (not including the PC).

Our system may look a bit complex but it is really very straight forward. The PC/software processes the data and then posts the information to our web site where we can monitor and control irrigation.



If you would like to take a look at this innovative system guest access is provided at:http://aggie-horticulture.tamu.edu/greenhouse/new/gate/irrigation.htm



The TAMU Horticultural Gardens Irrigation System provides remote monitoring and control capabilities to over 80 zones in our nursery and landscape.