

Conservation Technology

New developments in water management and energy are adding to the benefits of integrated environmental control systems.

by **JASMINE PETERSON**

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WITH rising heat and energy costs today, integrated environmental controls are a must. They will not only save money, but your precious time and resources, as well.

According to the National Greenhouse Manufacturers Association (NGMA), early greenhouse environmental controls were as simple as pulling a chain to open or close a vent, turning a valve to control heat or irrigation, or throwing a switch to activate a pump or fan. Because of the advancement of technology over the years, greenhouse systems have become much more intricate. Early automated control consisted of independent thermostats, humidistats, and timers. Today, many of these control devices and methods cannot deliver the level of automation and efficiency needed in today's dynamic, aggressive market.

As operating costs increased, and greenhouse systems became increasingly complex, the demand grew for increased control capability. According to NGMA, computers allowed improvements in control equipment and technology. Computerized control systems are standard in modern greenhouses, with continued improvements as the technology advances.

Clear Control

Plant Elements. Marketing development director Patricia Dean, Wadsworth Control Systems, Arvada CO, says there is a vast array of advantages environmental control systems can offer growers. Two of these advantages – crop climate and data recording methods – are the focus of

various new programs from Q-COM Corp., Irvine, CA; Argus Controls, White Rock, BC; Wadsworth Controls, Arvada, CO; and Priva Computer Inc, Vineland, ON. Crop climate deals with the control of all the elements of the plant environment including temperature, humidity, light, CO₂, irrigation, and fertilization.

According to NGMA, because they integrated these functions into a single control system, environmental computers can manage complex interactions between these elements providing the grower with a tool to optimize production. "We call it anticipatory control, which reads the input from sensors, including the weather station, to make adjustments to the control parameters to prevent sudden changes in the devices controlled, such as how much irrigation is needed," says Q-COM CEO Jim Crockett.

Q-COM tries to keep its customers' needs in mind, says Crockett. "Our fertilizer control systems are flexible to meet the demands of any complex production system," he explains. "We have systems in water purification using low pressure UV, which can be sized for any water demand."

According to Alec Mackenzie, general manager, Argus Controls, growers want a more personalized system for their particular operation. "Growers' needs are unique to each operation," he says. "Increased control system flexibility and further simplification of installation and maintenance are high on customers' lists."

Mackenzie says Argus' new hardware and software developments preserve and enhance the performance and reliability found in its older systems. "Our current developments focus on simplifying installation and troubleshooting, while increasing reliability and performance."

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Priva Computers Inc. has also been pumping out new products to integrate within environmentally controlled systems. The integration of boiler control in the Priva Maximizer environmental

control provides an anticipatory control of the greenhouse heating. "Priva's environmental control system offers all kinds of energy-saving features, such as for heat storage, variable speed pumps and motors, energy management systems, humidity control based on plant temperature, and multi-day temperature integration," says marketing manager Colleen Moffat.

ager Colleen Moffat.

Dean says Wadsworth offers computerized water management solutions for irrigation and misting. "The controller can schedule irrigation according to elapsed time, integrated solar energy, or temperature and humidity, in any combination."

Recording data. Environmental control computers keep records of their sensor readings and equipment usage. This allows the grower to monitor past conditions and events that occur on nights and weekends.

Mackenzie says Argus' programs have intelligence alarms that can routinely advise the grower of small errors or deviations from expected performance, and escalate to "red alert" when conditions become unacceptable. "This frees the grower from the constant checking required to see if everything is okay," he says. "And allows for more time to be spent on the more valuable aspects of crop production and business management."

Crockett agrees that growers should be allotted more time to spend on

The Value Of Good Control

According to the National Greenhouse Manufacturers Association (NGMA), greenhouse environments present unique challenges to good control. Temperature changes occur rapidly and vary widely depending on a number of factors. Because of this, growers that own integrated control systems have a clear advantage. These systems can offer:

- Higher energy efficiency
- Better labor efficiency
- Improved management effectiveness
- Reduced water use
- Reduced fertilizer use
- Reduced chemical use
- Reduced pesticide use
- Improved plant quality and uniformity
- Reduced equipment wear and tear
- Less plant loss from failures



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ENVIRONMENTAL CONTROLS CONSERVATION

other aspects of their business. He says this why Q-COM's programs offer wire communication. "This, in turn, frees the grower from his or her desk so they can walk the crop area and make direct adjustments to the irrigation program, the heating program, or any other environmental control parameter in the field," he says.

Q-COM's latest software is Internet based and more flexible, Crockett says. This new system will also allow growers with multiple sites to control all locations from one computer or with the proper hardware from remote locations – where there is Internet availability. "Control is available using palm pilots or cell phones," he explains. "This connectivity gives the growers more flexibility to have a real family life – being able to relax and, at the same time, remain informed at all times."

A Clear Picture

With so many environmental control systems available today, it is easy to encounter problems, as far as confusion is concerned. Growers must take advantage of the literature and information out there regarding the use of these systems, Dean says. "Growing is a technology that's radically different from computerized controls. Instruction manuals, telephone support, video, and live training are all key elements in helping the grower take maximum advantage or new control equipment and we are active in each of these areas," she says.

Regardless of the systems a grower may consider and ultimately purchase, NGMA says, one of the most important aspects of any system is the training and support available from the manufacturer. Q-COM, for example, says its main objective is to make its customers profitable. "As they grow, we grow, so we have to go the extra mile," Crockett says. "We become the growers' technical consultants that help keep them ahead of the rest."

NGMA says when selecting an environmental control system, growers should make sure that the people

A Support System

Training and support are two of the most important aspects when selecting an environmental control system. Growers need to make sure they can train their operators and have technical support when they need it. The National Greenhouse Manufacturing Association (NGMA) offers a list of "critical items" growers should keep in mind when making their final decision:

- Are replacement components readily available overnight?
- Can the components be serviced or replaced by your own staff?
- Is hardware and software support available by telephone and modem or is an on-site technician required?
- Does the manufacturer provide remote training by telephone and/or modem or is an onsite visit required?
- Is there adequate system and program documentation provided in either written form or online?
- Does the system provide standard programs to accommodate "typical" horticulture control routines and equipment or does it require custom programming and equipment?
- Can the system be accessed remotely by the vendor and the user? Is there an additional cost for remote access?

For more information or for NGMA's "Helpful Hints" brochures, please contact NGMA at 800-792-6462 or visit www.ngma.com.

providing their support are knowledgeable of greenhouse specific applications and have a good concept of how greenhouses work (see, "A Support System").

A greenhouse environment presents specialized challenges to good control. According to the NGMA, environmental control technology affects the pressure of labor availability and costs, energy costs, and market demands. Understanding these controls and implementing their use is becoming more important than ever. GG

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