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Moisture management made easier

Research equipment the basis for commercial soil moisture measurement equipment

by Lee Toop

Company Profile:
Environmental Sensors Inc.

Knowing how much water is in a patch of ground at one time, and how that water flows through the area around it, is valuable information when determining the proper irrigation methods for landscapes or grassy areas. It can also help save water, a growing concern for many land managers.

Much of the equipment to measure soil moisture is aimed at professionals, but for one British Columbia company, the goal has been to make precise measurement available to any user.

Environmental Sensors Inc., better known as ESI, has been involved in development of environmental sensors since 1973, and today offers several products to several sectors. While the academic and research sector is still part of the company's target audience, its Gro-Point products

are aimed at landscaping and irrigation specifically. “The company was founded in the early 1970s as a distributor of marine equipment, but in the early 1990s it started to diversify away from distribution into its own proprietary and patented line of moisture monitoring devices, primarily geared towards academic and research markets,” explained David Porter, ESI vice-president of sales and marketing. “That was simply a function of the mindset of the day – there were no real innovators on the commercial side of the irrigation industry.” Researchers using ESI products helped to shape development for other markets, Porter noted. “That has built a tremendous amount of credibility in our soil moisture monitoring products over time – we have hundreds of university clients around the world who are using our devices,” he said. “We have taken that expertise and refined and enhanced it to develop a commercially viable sensor, at a price point low enough that it encourages commercial deployment for agricultural, golf course, grass and turf use.” Soil moisture monitoring is a growing concern when it comes to irrigation management – there are many ways to theorize about the needs of a certain crop of grass or plants, but the only true way to be sure of what is happening underground is to know the actual conditions at any given time. Sensors installed in the area of interest can keep track of what is happening in the soil, and give the irrigation operator an idea of what to do to ensure proper growth.

Porter said that there have been attempts in the past to develop moisture sensors useful in an irrigation setting, but many of the early attempts used very basic technology far behind what is now available. “These are highly accurate and repeatable pieces of equipment that allow users to tell exactly how much moisture is in the root zone of the crop plant or turfgrass,” he explained. “That effectively tells you when you can start your irrigation and another to tell you when you can stop. It allows for premium irrigation, which is important for three reasons: one, it saves water, which in turn saves money; two, it allows for a higher quality crop or turfgrass or plant; and on the agricultural side it allows for a greater yield as well.” ESI’s key product line for irrigation is Gro-Point, which grew out of the Moisture-Point instruments produced for academic uses previously. The centre of the system is the sensor, which is made of stainless steel and built with all electronics protected by water-proof epoxy. Using electromagnetic waves, the unit operates on a similar basis to radar, sensing levels of soil moisture around the probe. Connected with dataloggers, handheld displays or other methods of recording information, the probes can help in development of an efficient irrigation plan.

The company has expanded its operation this year with the Gro-Point Light, a smaller unit designed for easier installation and lower soil disruption, as well as greater accuracy in saline soil conditions. “The unit is about the size of two butter knives taped together. It lends itself to much less disruption to turf or landscaping than larger sensors,” Porter said. “We’ve also engineered a lot of the cost out of it.” Also new is the Gro-Point Pro unit, which Porter said is the only sensor of its kind to provide four different readings from one sensor in a design similar to the Gro-Point Light. “It offers moisture readings, soil temperature, bulk conductivity, and also a wetting front reading which allows the user to know when the wetting front has reached a certain depth,” he said. “It also adjusts the soil moisture for temperature as a bulk conductivity reading, which is an important aspect to maintaining accuracy in extremely challenging situations like composting or landfills.” All of the units are designed to work with an integrated line of products that include handheld readers, dataloggers and other data collection options. A wireless option has been made available as well. “We offer a soil moisture and temperature alarm system through our Gro-Point wireless units which integrates with the sensors seamlessly,” Porter said. “They’ve been designed as a plug-and-play model that requires almost no technical expertise to install.” Displays are intended to be easy to read, and the system can be connected to a single-valve controller as part of a timer-based irrigation system, Porter said. In the case of a timer-based system, the controller is designed to interrupt the start of any irrigation event and instead checks the prevailing soil moisture levels. “If moisture is below a certain level, which is user-programmable, it will allow the irrigation event, and let it continue until moisture reaches the desired level,” explained Porter. “If the moisture sensor has a reading above that predefined level, it won’t allow the irrigation event.” ESI sensors can be incorporated into existing systems relatively easily, he noted.

Irrigation contractors, the largest portion of the market for the product, have reacted favourably to the ESI systems, especially recently as the

desire to consider conservation and incorporate soil moisture into irrigation has risen. “We’re finding tremendous acceptance of these systems, and less fear – people in the past have been a little more concerned about using this kind of product,” Porter said.

The company is continuing to develop its products and seeking ways to engineer cost and complexity out of future models, he added.

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FEATURES | back to list top of page