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Peak Environmental Monitoring
Irrigation Management Services

Introduction

Peak Environmental Monitoring specialises in soil moisture monitoring technologies, soil moisture probes and sensors, data recording and telemetry control systems, irrigation software and data delivery including Internet based information delivery systems

Case study 1.

Internet based soil moisture monitoring in Blueberries.

Berry Exchange (formerly Blueberry Farms Australia (BFA), located near Coffs Harbour on the New South Wales North Coast, is world leader in blueberry production and one of the largest producers of blueberries in the southern hemisphere.

With a farm gate production value of $ 22 million dollars it is essential that irrigation agronomy is maximised. The plants are grown on raised beds with light sandy soils with limited water holding capacity. Knowing when to irrigate to of utmost importance.

In January 2007 we began the installation of a network of 16 Sentek soil moisture probes. These probes measure soil moisture at different levels in the root zone to a depth of about 0.5 meters. The soil probes are attached to GPRS modems which automatically transmit data to our web server twice per day.

Sentek IrriMAX software is used to display all probe data in a simple single page layout. From this layout the user is able examine soil moisture situation for the whole farm and plan irrigation scheduling events.

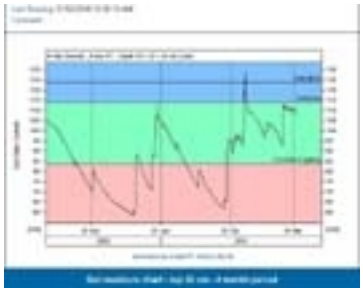
Prior to implementing the GPRS data uploads, the farm operated several in field data logger units. These often required a half day effort to travel to each site, retrieve the data logger from the field and download the data to the office computer. The operator would then manually run the software and update the soil charts. Failure to redeploy the loggers back in the field was not an unknown event resulting in considerable gaps in the databases and charts.

The task of getting up to date information on soil moisture conditions from all sites now takes less than a minute or two.
This has greatly enhanced the efficiency of data management and irrigation management of irrigation across the farm.

Case study 2.

Internet based information delivery system for irrigation scheduling.

In 2005 we set up a demonstration telemetry system on a macadamia orchard near Clunes in Northern NSW. The concept of the trial was to develop an understanding of the irrigation requirements, if any, for macadamia for northern NSW. Concurrently we were testing some new ideas on information delivery techniques looking at ways to simplify information delivery to the end user.



This site presented a difficulty in that GPRS and Next G mobile services were not available where we deployed the soil probes. We developed localised telemetry to transmit soil probe information to a point on the property with mobile phone coverage. From this point we used a repeater device to upload this information to the Peak Environmental Monitoring computer server over the GSM network.

We use Sentek IrriMAX software to create web based charts and automatically upload new charts to the client area of our web server. Concurrently an email is sent to the client advising that updates to the soil moisture charts have been made and a link to the updated charts provided. The end user simply opens the email and clicks on the link and accessing the soil charts.

The grower then either decides on a course of action for irrigation scheduling alone or in consultation with us.

Case study 3

The Evans Head Effluent Re-use project.

In 2006 Richmond Valley Council (RVC) implemented a strategy to utilise tertiary treated effluent for irrigation in the townships of Evans Head and Woodburn on the New South Wales far North Coast.

The scheme will attempt to greatly reduce the amount of tertiary treated effluent discharged to waterways. Areas to be irrigated include sporting ovals, road side vergers, public open spaces, a golf course and two district schools.

Peak Environmental Monitoring is responsible for design, installation and commissioning of soil moisture, groundwater, weather and data recording systems and the integration of this information into the Toro Central IrriNET irrigation control system.

Environmental Monitoring

Weather is monitored using Vaisala WXT 510 weather transmitters. Solar radiation is measured using solar radiation sensor which is required for the computation of evapotranspiration values.

Soil moisture is measured at all sites using Aquaflex soil moisture sensors. The sensors are buried underground within the plant root zone and are out-of sight, and thus ideal for public spaces.

Groundwater depth is measured at, or adjacent to, the irrigation areas using submersible pressure transducers .

Data is collected from the soil sensors , weather sensors and groundwater transducers and stored in PLC based data recorders. Each data recorder is fitted with a GSM modem. Information on weather conditions can be uploaded from the sites and data displayed in graphical format for viewing via the Internet using standard web browsers.

The irrigation system uses a network of Toro XL irrigation controllers. These controllers schedule irrigation on a time schedule. They connect to a central irrigation Control Centre (Central) comprising of a PC and radio telemetry. The Central monitors the activities of the field stations keeping checks on water flows, pump operations etc.

In advanced systems as deployed in this project, the IrriNET XL controllers continually request data on soil moisture, ground water, weather conditions and rates of potential evapotranspiration from the data recorder. If, for example, the soil at has become too wet, then the irrigation will cease until the soil dries out to a pre-determined level. Similarly, if wind or rain conditions are not suitable for irrigation then the controller will shut down irrigation and re schedule irrigation when conditions become more suitable.

About Peak Environmental Monitoring

Peak Environmental Monitoring was established by Col Peak in 1996 to provide specialist services to rural and agriculture industries. Col is a certified irrigation agronomist (CIAg) specializing in irrigation management and monitoring systems, certified by Irrigation Australia

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