

Catchment Landcare Group seeks to improve Soil Moisture Monitoring and Irrigation Management"

Col Peak.
Peak Environmental Monitoring

The Atkinson Buaraba Catchment (ABC) Landcare is a Landcare group based in the Lockyer Valley west of Brisbane, Queensland. The group obtained special funding from the Queensland Government following the floods of last summer to help re-build and improve irrigation practices in the Valley.

The funding has provided irrigation management technologies to three different farming enterprises separately involved in turf production, fodder production and horticulture within Landcare catchment.

The funding has allowed the purchase of a high quality agricultural weather station as well as telemetry based soil moisture probes . The telemetry provides near real time soil moisture and weather information to the irrigators. This project aim is to provide irrigators with information to enable them improve irrigation practices and maximise their water use efficiency.

Turf Queensland provided crucial support in relation to equipment and participant liaison, scientific planning and administrative support which greatly helped to obtain funding for the project.

Telemetry and radio systems

Field equipment installed comprises of solar powered radios and modems (Adcon A 755) which transmit field information to a central processing computer at approximately 15 minute intervals. This information is stored on a remote Adcon telemetry server located in Adelaide and is available (24/7) in report and table format to any person with login access.



Weather station

An automatic weather station located on one of the properties measures wind speed, wind direction, solar radiation, rainfall, temperature and humidity. From these parameters the weather station provides information on evaporation (evapotranspiration) rates, growing degree days and heat-sum units. Information from the weather station can be shared between users and available to anyone with access rights.



The weather station can issue different warnings such as advising conditions are unsuitable for spray activities based multiple inputs of wind speed, temperature and humidity. Warnings can be issued via SMS and email.

The weather station can provide estimates of crop water use by applying a crop coefficient factor (K_c) to the ETo . This data can then be used in conjunction with soil permeability characteristics, irrigation delivery rates and rainfall data to empirically estimate plant water use for areas where direct soil moisture measurement is not available.

Information from the weather station can be viewed in chart or text format with options to download and import directly into a spreadsheet.

Weather data can be printed directly from the server for EPA spraying logs if required.

Soil moisture probes

Soil moisture probes measure the volumetric soil moisture content of water in the soils at various locations across the three farms. The soil probes provide information on rainfall and irrigation infiltration rates. Irrigation management practices such as irrigation run times and application rates are being adjusted to match plant water requirements and soil characteristics.



The soil probes also provide data on soil temperature and soil salinity levels which will aid in fertiliser management with the idea to track nutrient translocation and prevent loss of nutrients into the catchment.

Data from all field units can be viewed using the Adcon Advantage Pro software using a PC , Netbook or mobile phone with Internet access such as the Apple iPhone.

The central server software can raise alarm messages such as warning when soil moisture conditions are reaching critical dry points or wind speeds may not be ideal for effective pivot based irrigating.



A series of weather and soil moisture charts have been set up for each enterprise.

Baseline data is currently being collected to help establish irrigation guidelines.

The initial phase of this project will be evaluated this summer and we hope to be able to quantify the effectiveness of the scheme in coming months. Currently the grower participants advise that the information is already proving very useful.

About the author

Col Peak is an IAL Certified irrigation agronomist and specialises in remote monitoring for use in agriculture and environmental monitoring.

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