

## **STI Smarter Irrigation Project: Regional and Economic Benefits through Smarter Irrigation**

Irrigated agriculture is the single largest water user in Australia (65%) and also in Victoria (over 75%) (ABS, 2005) Further, one-third of Australian irrigators grow pastures for grazing and irrigated pastures accounted for 66% of total water use of Victoria.

Irrigation scheduling and control in irrigated farms through out the country is predominantly manual, which is labour intensive and given the nature of operation, it is widely recognised as less efficient in terms of water use. Precise control water added to crops is not only important in water savings and improving farm productivity but also critical for minimising environmental impacts associated with excessive on-farm water use.

Sensor based irrigation scheduling and automated control of irrigation systems provide farm-operators opportunities to efficient use of irrigation water, minimise water losses, save labour & time while improving the productivity per unit volume of irrigation water.

This project is a multidisciplinary collaboration of the University of Melbourne, National Information and Communication Technology Australia (NICTA) and Goulburn-Murray Water (GMW) jointly funded by Victorian government (Science, Technology and Innovation (STI) Infrastructure Grant), GMW and the university.

Objectives are to develop, test and introduce, a wireless sensor-based automated irrigation control systems to deliver water to plants in precise quantities and at required time for optimum production with the aim of improving the economic water use, whole farm efficiency and productivity and better environmental outcomes from irrigated agricultural sector of regional Victoria.

Project activities cover flood irrigation (dairy pastures) and pressurised micro-irrigation (Viticulture & horticulture). Five demonstrator/pilot sites have already been established at Dookie (a dairy pasture site and an apple orchard), Tatura (open hydroponics in collaboration with DPI), Kyabram (diary pasture) and Corop (Shiraz vineyard).

NICTA Team at Melbourne has successfully developed a low cost wireless communication and actuator platform (NICTOR®) for remote monitoring and automated control of critical irrigation infrastructure and a user-interface software (Terraview®) for data capture, data-warehousing and analysis. Sensors presently used in the systems include flow and, soil moisture and weather and the project intend to include plant-based sensors for irrigation automation particularly in hort/viticultural crops very soon.

Test system is being presently evaluated for flood irrigation (dairy pastures) and pressurised micro-irrigation (Viticulture & horticulture). Five demonstrator/pilot sites have already been established at Dookie (a dairy pasture site and an apple orchard), Tatura (open hydroponics in collaboration with DPI), Kyabram (diary pasture) and Corop (Shiraz vineyard).

Wireless automated irrigation system will be compared against existing irrigation scheduling and operation systems for system efficiencies, whole farm productivity socioeconomic impacts, on/off farm environmental impacts using various tools including whole farm simulation models.