

Using Chameleon soil moisture sensors to develop irrigation schedules for improved water use efficiency without yield compromise

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Soil salinisation and freshwater scarcity during the Vietnamese Mekong River Delta (MRD) dry season is driving the identification of alternative crops to rice and soil management practices better suited to the changing climate. Farmers in the MRD are familiar with irrigating rice paddies, however the quantity and frequency of water required for upland crops differs from rice. The ability to monitor soil moisture status is important to assist farmers in making informed water management decisions and consequently save irrigation water. The Chameleon soil moisture sensor is a relatively affordable, easy to use device that indicates a soils moisture status in real time, via a colour coded system. Whilst providing accurate information to the farmer about their soil moisture, the Chameleons can also be used to build farmers knowledge about appropriate irrigation techniques for upland crops and labour-saving benefits.

Chameleon soil moisture sensors were installed in upland crop field trials in Soc Trang, MRD. Irrigation as determined by the Chameleon treatments were compared to farmer-controlled irrigation schedules with and without straw mulching. A range of upland crops were grown including watermelon and beetroot, and the yield, soil moisture status and water use was recorded.

The use of Chameleons and mulching saved 43% water compared to farmer determined irrigation treatments, with no compromise occurring for the yield of beetroots. Similarly, watermelons irrigated with Chameleons saved 58% water compared to farmer irrigation, with labour savings meaning irrigation occurred every 4-5 days instead of daily.

Monitoring soil moisture status via Chameleon soil moisture sensors significantly reduced irrigation quantity and frequency. Farmers developed efficient irrigation techniques based on soil moisture status without compromising the yield of upland crops. Monitoring soil moisture to develop irrigation schedules can improve the water use efficiency of upland crops without yield compromise.