

## **Irrigation water management**

### **Quantifying WRC research in irrigation scheduling**

# **A completed study has investigated the impact of the Water Research Commission's (WRC's) investment in irrigation scheduling.**

#### **Study objectives**

The importance of research to water resource management is of utmost importance, and the WRC, has over many years ensured that the strategic direction of water research is attuned to the country's needs. Appropriate water resource management technology can only be effective within the very small window of opportunity irrigation farmers and researchers have.

Over the past four decades the WRC has invested substantially into the developing and adoption of various irrigation scheduling methods like PUTU, BEWAB, SWB, SAPWAT, MyCaneSim, Wetting Front Detector (WFD) and the ACRU agrohydrological model which estimates the behaviour of southern Africa hydrological systems in a physical conceptual manner. Still, the adoption by irrigators is very limited in South Africa.

A survey amongst 332 irrigation schemes in South Africa in 2005 illustrated that objective scheduling was being applied by only 18% of the irrigators, with the rest relying on intuitive approaches based on experience, instinct, confidence and knowledge gained over many years of farming.

This implies that irrigators in practice irrigate often with fixed amounts or at constant interval with little flexibility to take weather conditions and actual crop water requirements into account.

A study was consequently commissioned by the WRC to quantify and assess the impact research funding has had by considering the adoption and implementation of irrigation scheduling tools and methods developed.

The study was conducted in three phases, which also

resulted in four separate products namely:

- A literature study and description of the conceptual framework
- A brief background and mapping of relative research reports to each of the seven irrigation scheduling methods and models included in the study
- Qualitative and quantitative assessment of the research impact applying the McMaster Model
- Recommendations regarding the transfer and facilitation of the uptake of research.

#### **Main research findings**

The output of the research indicated that it is important to recognise that different target audiences (irrigators, water administrators, irrigation engineers, academics and educators) have different needs. It is therefore crucial to warrant different measures of impact.

Some scheduling tools/methods, such as SAPWAT, WFD, BEWAB and MyCaneSim are more appropriate for decisions to be taken at the irrigation field level, while tools such as SAPWAT, ACRU and SWB are more popular to be used by water administrators for the planning of irrigation water management strategies at scheme level and by engineers in the designing of irrigation systems.

Secondly, due the number of paradigm shifts and transformation that has taken place in the research and development arena over the last couple of years, the way that irrigation water management research is conceived, designed, implemented and how results are disseminated and used to generate innovations, changed.

What changes constantly is the environment in which discovery and innovation occurs, and this has impacted on the

organisation and the social process of discovery and innovation. It is no longer enough to know *whether* research was used, but rather *how* research was used in the agricultural value chain.

Often research organisations, such as the WRC, produce new knowledge or 'solutions to a problem' referred to as an innovation. However, it usually requires a major effort to ensure that a brilliant idea becomes something widely used, and involves many more steps and use of resources and problem solving on the way.

Important in the uptake of an innovation, such as irrigation scheduling, is that this innovation is strongly embedded in a specific prevailing socio-economic structure, which largely determines what is going to be learned and where the innovation is going to take place.

The type of decisions that are influenced by the uptake of irrigation scheduling innovations differed across the various users. Scheduling tools can either be used for instrumental purposes in the identification and solving of problems at catchment, scheme and field level. It can also be used conceptually where concepts are enlightened and where knowledge capacity is built through training or teaching. The frequency of use of scheduling research knowledge also depends largely for what purpose the research output is used.

The perceived ease-of-use of research knowledge is crucial in the uptake of irrigation scheduling knowledge. Clearly,

some scheduling tools and methods are more user friendly and do not require too much additional skills and knowledge of the potential user like MyCaneSim and WFD.

The role of understandable research reports, appropriate user manuals where applicable and flexibility of a specific irrigation scheduling tool are important factors that determine the acceptance uptake of research.

## Conclusion

This research highlights that the research knowledge will only lead to useful outcomes if emphasis is placed on development, and therefore the innovation process has to be purposefully managed with expertise, time, efforts and funds for both research and knowledge brokering.

Research uptake is important, and knowledge brokering is an essential function, but should be accompanied by and integrated within the function of innovation brokering, which more broadly focuses on rearranging all technical, social and institutional relationships needed for innovation and change.

### Further reading:

To order the report, *Quantifying the impact of WRC-funded research in irrigation scheduling* (**Report No. KV 318/13**) contact Publications at Tel: (012) 330-0340, Email: [orders@wrc.org.za](mailto:orders@wrc.org.za) or Visit: [www.wrc.org.za](http://www.wrc.org.za) to download a free copy.