

## National Water Use in Agriculture Initiative

### Summary

- Water is the major limiting factor to Australia's agricultural productivity.
- The Commonwealth should establish a National Water use in Agriculture Research and Development Initiative as a joint venture between the Australian Government and key stakeholder groups.
- This will deliver Government commitments to boost agriculture profitability, improve water management, synergise the water reform agenda and foster prosperous regional communities.
- In essence, it would require a specific \$5-10 million per year to stimulate matched contributions from partners, industry and the States. This additional funding is essential to promote collaboration across the industry sectors as well as the diverse range of research providers from Government agencies, universities and the private sector. It will provide a significant incentive to collaborate and gain efficiencies in Research and development pathways and hence the foundation to address one of Australia's most important issues, producing more from our scarce water.
- It will provide a 25% improvement in water productivity and efficiency over 5 years, develop new innovations and practices to enable Australia to become the global water technology leader in agriculture and grow regional skills and business. All this will boost the profitability of farms and regional economies.

### Challenges

- Water is the major limiting factor to Australia's agricultural productivity yet we do not have a long term strategic Research and Development investment for it.
  - The water reform agenda of Government's such as the Murray Darling Basin Plan, competing water uses from mining and urban growth, and Australia's highly variable climate patterns are placing record pressure on water use in agriculture.
  - Energy prices have increased by 250% since 2000 changing the context of agricultural production systems. Energy costs are a major driver of water use practice.
  - There is growing interest in the development of precision and smart irrigation and farming systems which are energy efficient, offer labour savings and maximise input efficiency and profitability.
  - Irrigation with poor quality water is becoming a key issue (e.g. CSG water or treated waste water) as is rehabilitation of disturbed agricultural land. This needs investigation.
  - Food security and production is now a key part of the policy agenda and there is renewed interest in expansion (e.g. Northern Australia & Tasmania) and transformation of existing irrigation areas.
  - Irrigation is a major area of Commonwealth investment including water reform, farm profitability and regional productivity. Irrigation is the largest user of water in Australia, yet other water using
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sectors (urban, groundwater) have a corresponding national cross sector R&D initiative. Policy reviews have highlighted the policy failure of cross sector R&D within irrigation.

- Infrastructure, technology & engineering solutions alone will not provide the outcomes required - new knowledge; learning sites, adaptation and adoption of current knowledge; and improvement in the skills and capabilities of water suppliers, environmental managers and farmers are crucial to achieving long-term, continuing improvement.
- It is not all about water. For example there are complex interactions between water, energy, labour, nutrient use, crop agronomy, soils, salinity and the water balance that need to be better understood.
- Previous national research agencies/funds responsible for irrigation research including Land and Water Australia, CRC for Irrigation Futures, National Program for Sustainable Irrigation and the National Water Commission Raising National Water Standards have ceased in recent years. This leaves no national body with funding to drive cross sector irrigation and related environmental R, D & E at a time when pressure for rapid improvement and industry transformation is escalating. As a consequence water research investment in agriculture is at a 20 year low.

We need to:

- ***Increase Adoption*** – putting research into practice more quickly through new approaches such as farmer led network of learning sites to increase farm profitability.
- ***Boost Water use efficiency, profitability and productivity*** – growing more with less, balancing energy, and other inputs across all scales, markets and uses.
- ***Grow technical human capacity and skills*** – increased skills base in industry, policy and research sector, effective frameworks for a coordinated, focused, critical mass in research, education, communication and adoption.
- ***Develop new innovations and practices*** to enable Australia to become the global irrigation leader.

## Some example activities

### Precision and automation technologies

Precision technologies have the potential to help Australian agriculture optimise the efficiency of water use and nutrients to increase yields, crop quality and profitability, while reducing the risk of environmental impacts. This program would involve work to apply new and emerging real-time, precision technologies and automation to optimise the use of water and nutrients across a number of agriculture sectors. Enhanced human capacity and greater technology adoption (sensors and devices) to optimise scheduling, automation, measurement and delivery of water and data integration to improve water use decision making would be the major outputs and through automation, reduction in labor costs.

### Pathways to Profit – understanding scale and externalities

A specific challenge on the path to productive and profitable irrigation systems and water management is understanding the trade-offs between energy consumption (a major cost of some systems), labour needs, and productivity gains (gross income) – and how they differ between pressurized and non-pressurized systems. This project would involve work to assist irrigation companies and growers to identify and adopt appropriate management techniques to profitable irrigation systems across a range of scales from the farm to region. The key focus would be on system modernisation and optimising energy, water, and labour

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efficiencies and crop agronomy such as nutrient efficiency, soils, recognising energy costs are a growing component of farm business inputs.

### **Key Learning Sites – leveraging and increasing RD&E impacts**

A 'Virtual Hub' concept will help maintain momentum in turning 'knowledge into practice' and sharing and extending RD&E experiences and outcomes across the various irrigation industries. Its foundation will involve the linking of existing facilities and programs, brought together into a national network. It would be an additional link in the 'chain to adoption' – a significant part of multiple delivery mechanisms. Other features to be included are: National network of on-ground regional research sites and 'learning sites', including on-farm trial sites, demonstration sites and case studies that are linked into national activities and co-ordinated for maximum benefit. This network will provide national, regional and local focus and relevance, and cut across across regions and systems covering irrigated production within Australia. Additionally, the network will help identify water champions and case studies of success, provide on-line and physical Knowledge Exchange between the research, extension and farming communities..

### **Outcomes**

- 25% improvement in water productivity over 5 years;
  - 25% improvement in irrigation water use efficiency over 5 years;
  - Reduce off site nutrient movement to streams and ground water; and
  - Improve the management of salinity in the landscape and water systems
  - Grow regional skills and knowledge and business that contribute to stability and resilience of regional communities.
  - Develop new innovations and practices to enable Australia to become the global irrigation leader
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