Improving the Water Use Efficiency of Farming Systems in Victoria.

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The recently approved GRDC project, titled "Optimizing the Profitability of HRZ Cropping in SW Victoria through improved Water Use Efficient Farming Systems", is aimed at validating and integrating more profitable and sustainable crop production practices and technologies into full cropping/mixed farming systems, in an effort to increasing the whole farm water use efficiency.

Background: The Victorian High Rainfall (550mm+) Agro ecological Zones are fast gaining a reputation for reliable crop production- (especially in recent times of changing climate (Beeston et.al. 2005), but yet are considered sub-optimal in the efficiency for conversion of rainfall to grain produced (10 to 18 kg/mm/ha: Riffkin & McNeil, 2006). The Water-use efficiency (WUE) in these regions can be extremely variable, resulting from climatic, environmental and agronomic constraints that limit productivity. The WUE figures for the HRZ in of Victoria have been calculated at ~55% of the potential 20kg/mm/ha (French and Schultz, 1984). This and other published WUE data for SW Victoria are now considered vague, varied and irrelevant, mainly due to the recent nature of large scale modern cropping techniques employed throughout the Glenelg Hopkins & Corangamite (GH&C) catchment regions. However, in the HRZ of WA, published values of WUE for commercial wheat crops are around 10 kg/mm/ha (Zhang et al., 2005). Unpublished WUE data for the Victorian HRZ (R. Wardle, unpublished) , range from 3 kg/mm/ha in trials affected by constraints to yield such as frost at flowering, to more than 22 kg/mm/ha in field trials where grain yields were 5 t/ha in a decile 1 year. While being the exception rather than the norm, this latter figure indicates the potential WUE under SW Victorian conditions, where high grain yield has been achieved when sound agronomy and desirable climatic influences prevail.

Methodology: This project will therefore aim to identify key constraints of the agricultural production system that limit the realisation of potential yield and explore agronomic and practical options for ameliorating such constraints. It will, in a participatory action research model (including growers, agronomists, researchers and agribusiness), recognize and develop farming practices that will to a reasonable degree, overcome such major constraints to localised and regional productivity. Through increased adoption of relevant, profitable and sustainable practices so developed, it is anticipated that the annual average WUE within the Glenelg Hopkins and Corangamite catchment regions of south west Victoria can be increased by a minimum of 10%.

Knowledge and Experiences: While some of the more entrepreneurial farmers in the HRZ do achieve high yields under water limiting conditions (through careful management of soil constraints, timely agronomy/adequate nutrition, reduced tillage, controlled traffic and stubble retention practices), there

are many producers that still have numerous unresolved constraints, with yield in many situations well below both the desired farm and district average. Therefore, all farmers across these production regions can benefit from an in-depth understanding of current research, innovative technologies and worthy interventions that help achieve an increase in WUE. The project will provide a platform for active networking with relevant stake holders in this project including agronomists, agribusiness and researchers to help collectively achieve improvements in site-specific WUE. Each year of research and evaluation will build the skills for strategic and tactical decision making based on individual land capability (the ecosystem challenges), financial resources and attitude to risk that each locality presents.

What's Happening Now: Initial investigations have begun and includes a literature review of current WUE knowledge and outcomes across the two SW Victorian HRZ regions of the Glenelg Hopkins and Corangamite CMAs (until end of 2009), that will quantify yields and major constraints to productivity and possible methods of amelioration. The establishment of a steering committee is also underway to guide field trials aimed at identifying farmer changed practices. Research outcomes will be delivered through annual specialist action learning technical workshops and a range of other extension methods, including the production of peer reviewed papers, with clear guidelines for practical options for farmer adoption.

Project Theme: Empowerment of the producer will allow for a greater partnership between all stake holders, for implementation of these short-term tactical management activities that focus at a somewhat individual paddock level, through to a farm and catchment system that achieves personal, business and community financial, social and environment goals and aspirations.

Your Involvement: All farmers are welcome to participate in any manner that they see relevant to improving water use efficient farming systems on their farm and throughout SW Victoria.

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Let's all aim for better ways to do business. Our focus is growing better crops that maximize the use of resources and minimize the negative impacts on sustainable farming systems.