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More details on these events and more is available at www.msfp.org.au or phone 03 5021 9100



Sustainability Snapshots

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Water Use Efficiency in the Mallee

MSF is currently taking part in the GRDC National Water Use Efficiency Initiative. This Mallee project is a collaborative effort between MSF, CSIRO, DPI Victoria and Mallee Focus. Trials began at Karoonda in 2009 and will begin at Ouyen in 2010.

What is Water Use Efficiency?

$$WUE = \text{Grain Yield} \div (\text{Growing Season Rainfall} - \text{Evaporation} + \text{Stored Soil Water})$$

The Water Use Efficiency (WUE) of your crop is like the fuel economy in your car. Just as fuel economy measures how far you can

travel on a litre of petrol, WUE is a measure of how many kilograms of grain you grow per millimetre of rainfall your farm receives.

The upper WUE of a crop is 22 kilograms of grain per millimetre of water. You may have heard WUE described as the French and Shultz equation. This equation is:

WUE is closely related to productivity. However understanding the WUE of a crop allows you to analyse the crop performance between paddocks and seasons. For example, you have two paddocks each yielding 1.5 tonnes per hectare. Paddock one had a WUE of 15, coming off a chemical fallow in the previous season and was sown early. Paddock two had a

WUE of 18 and was a continuously cropped paddock which was sown last in the program. *Cont. page 2*

Early Bird Compendium

Production of the 2009 MSF Annual Results Compendium is in full swing with booklets available in the near future. However if you would like early access to some of the articles, you can visit the Members section of the MSF website—www.msfp.org.au. Articles will be posted as they are reviewed. A reminder that your web username is your initial and surname (eg jsmith) and your password is your membership number. If you have any difficulties, contact MSF on 03 5021 9100.

From The Boardroom

Hello Members,
I had the privilege of being invited to Canberra for the official launch of the CSIRO's Sustainable Agricultural Flagship. This program will see the Federal government and others like GRDC and MLA put \$70 million into agricultural research through the CSIRO. This should be good news for us as they stressed that farmer involvement through farming organisations was important. They even conceded that farmers may come up with things that scientists haven't even thought of!! Imagine that.
Actually the productivity of the agricultural sector compares very well within the context of the Australian GDP with agricultural achieving double the average increase rate over the

last twenty years. Australia currently produces enough food to feed 60 million people, however if we are to continue feeding the growing world population, this trend will have to continue, hence this Federal Government funding. The idea is to increase production by 50% while reducing carbon inputs by the same amount. It is possible that some of this increased production will come about through genetically modified crops. MSF is not against GM, but the effects must be thoroughly researched. We must be absolutely certain that the benefits are there for farmers before any decisions are made.

Jim Maynard
Chairman

Water Use Efficiency In The Mallee (Cont. from page 1)

Therefore more water was available to the crop in paddock one due to the fallow and longer growing season; however this was not expressed as grain yield. Comparing WUE of paddocks allows you to start identifying where improvements can be made, even in the highest yielding paddocks.

Improving Water Use Efficiency

Improving WUE can be thought as two separate components:

1. Improving the water supply to the crop; and,
2. Improving yield from the water the crop uses.

Figure 1 gives an overview of how both of these components can effect the WUE of a crop.

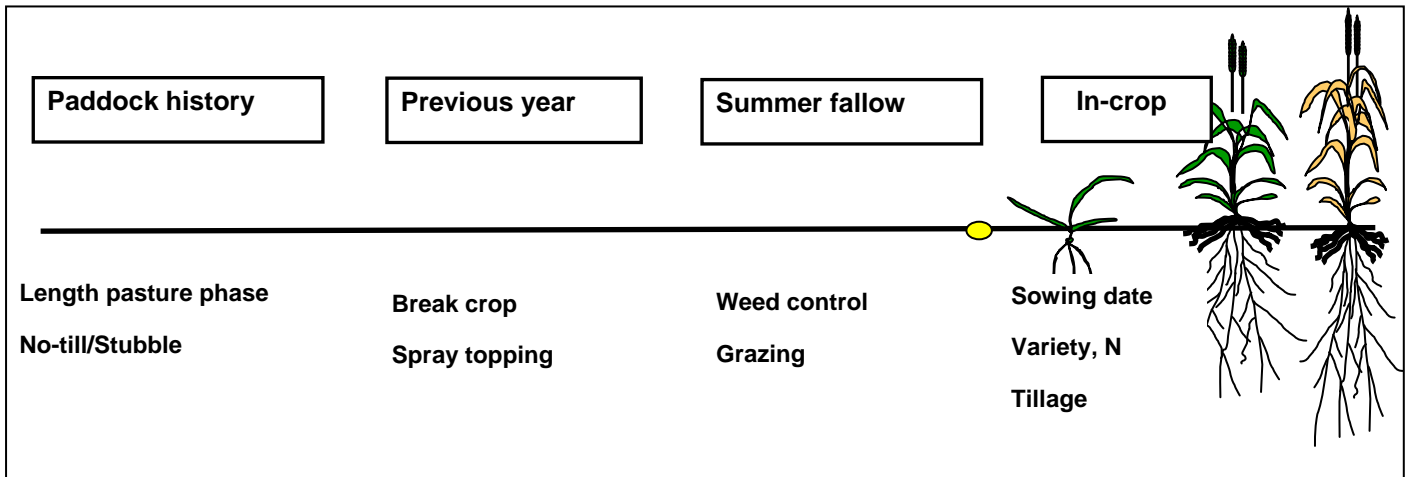


Figure 1. Management decisions that can impact on crop WUE.

Improving the amount of water available to the crop can begin in the previous season. Fallows and hay crops can leave behind water that may be available to the following crop. However grain crops and pastures will leave little available water for the next crop phase.

Summer fallows are also important for conserving moisture for the following crop phase. Summer weeds use high amounts of water and therefore early control is necessary. As a general rule 30 percent of rain that falls over summer could be available for use by the winter crop. This figure is highly variable and influenced by the quantity and

time that summer rainfall is received.

Crop management can also influence the quantity of water available to the crop. Early sowing increases the period of time where crops can receive growing season rainfall and allows more time for roots to explore the soil profile and access stored soil water. Early sowing can also establish early crop canopy closure which can help to reduce water losses through evaporation. Furthermore, early canopy development reduces weed competition, which is critical as weeds use water which crops can then not access.

Cont. page 3



Mallee Focus



Two new MSF core trial sites have been established at Karoonda and Duyen as part of the Water Use Efficiency Project. These photos from show examples of dune (left) and swale (right) at Duyen.

Water Use Efficiency In The Mallee (Cont. from page 2)



However sowing time must also be optimised to ensure that soil water is not used to promote excessive quantities of biomass that cannot be converted to grain yield in the spring.

Improving crop WUE generally involves good agronomic practices such as adequate levels of nutrition, timely sowing and minimising the impact of pest and diseases. Variable crop management for each soil type within a pad-

dock is required for the potential WUE of the whole paddock to be achieved. Timely sowing is also important to reduce the exposure of the crop to frost or hot days during flowering and grainfill.

You can also think of how you can improve WUE at the paddock scale and at the farm level. Table 1 below gives some examples of how WUE may be improved at both of these levels.

Table 1 *Examples of management strategies for improving WUE at the paddock and whole farm scale.*

Paddock Scale	Farm Scale
Match inputs to soil types	High crop intensity
Sow early	Use a mix of varieties
Early control of summer weeds	Sow paddocks with stored moisture first
Prevent/control disease	Use of break crops and rotations
Control of in-crop weeds	Integrated weed management

Ben Jones from Mallee Focus (front right) explains the Water Use Efficiency Project to a focus group of Ouyen district farmers. Consultation with farmers will be ongoing throughout the duration of this project. Although farmers considered many factors important to optimum WUE, the meeting agreed that the four focus areas would be :

- ◇ *Inputs for different soil types*
- ◇ *Nitrogen management*
- ◇ *Phosphorous inputs*
- ◇ *Time of sowing*



Summary

MSF and its partners will be investigating different options for improving WUE in Mallee cropping systems over the coming 3 years. A major focus will be on identifying different management options for different Mallee soil types. The opportunities to improve WUE on sand may be very different to the opportunities on heavy ground. In addition to core trial work at Karoonda and Ouyen, we will be implementing and monitoring paddock demonstration trials. Therefore there will be many opportunities for you to become involved in the project through field days, field walks and meetings. You will also get to see up-to-date results through this newsletter, the annual compendium and other publications. For more information please contact the MSF office on 03 5021 9100.

Sustainability Snapshots

Controlling Skeleton Weed Through Continuous Cropping

Research undertaken by the Department of Agriculture and Food, WA has shown that continuous cropping can control skeleton weed and in some cases, eradicate it altogether.

The findings from the trial work are about to be released in a scientific publication *Plant Protection Quarterly*.

Trial work was undertaken in SA as limited sites could be located in WA. The site, at a property at Lake King, was deemed to be the most suitable location for the trial work to occur as there were similarities (soil type and

rainfall) between infested areas in WA and SA.

Four cropping regimes were investigated to determine the most suitable rotation for the control of skeleton weed. The cropping regimes investigated were: one year in crop - one year out; two crops in and one year out; three crops in and one year out; and, continuous cropping.

For further information regarding the research go to www.agric.wa.gov.au.

Kathryn Kenny
MSF Project Officer



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Membership Reminder

2010 MSF Membership is now due and renewal forms were sent to all 2009 members last month. If you did not receive your renewal form please contact MSF on 03 5021 9100 or admin@msf.org.au. Membership forms can also be downloaded from www.msfp.org.au.

Contact Us

Phone: 03 5021 9100
Fax: 03 5022 0579
Email: admin@msfp.org.au
Postal Address:
PO Box 5093
Mildura 3502
Office Address:
2/152 Pine Ave
Mildura 3500

www.msfp.org.au

DRY LAND JUNCEA - 2010

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- **Loxton on 26 Feb at 10.30am at the Loxton Research Centre conference room**
 - BioMax DLJ200 is bred by SARDI
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 - To register for the BioMax DLJ200 Information session please RSVP to MSF Inc on (03) 5021 9100 by Monday 22 Feb 2010



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BioMax Biodiesel is produced by Smorgon Fuels Pty Ltd, 9-11 Maria Street, Laverton North VIC 3026
T (03) 8360 0600 www.biomaxfuels.com.au