

Water Use Efficiencies - Help Note

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Introduction

This document explains how to setup Water Use Efficiencies in PAM software and record information to generate Water Use Efficiency reports. Water Use Efficiency reports give information on how much water has been used to grow a certain amount of produce.

PAM Water Use Efficiency reports and graphs can incorporate the applied water (irrigations) as well as the moisture available at planting and rainfall into those reports and graphs.

Software Includes:

- PAM QA Plus
- PAM UltraCrop
- PAM AusVit

Activation

Turn on Water Use Efficiencies feature

Configuration -> Customise Your PAM Program -> Cropping tab ->

The screenshot shows the 'Program Settings' dialog box with the 'Cropping' tab selected. The title bar reads 'Program Settings'. The tabs at the top are 'Settings (1)', 'Settings (2)', 'Cropping', 'Livestock', 'Individual Animals', and 'Pasture Watch Settings'. The main content area is titled 'Select Your Cropping System Features ...'. It contains two columns of checkboxes, all of which are checked. The checkbox for 'Crop Water Use Efficiency Analysis' is circled in red. Below the checkboxes are two buttons: 'Select All' and 'Select None'. Underneath, there is a section titled 'Setting your season:' with a paragraph of text: 'PAM will use the information below to calculate the season you are in as you enter the date of an activity in your Paddock Activities Diary. You may override the default season at data entry time if required.' This is followed by a dropdown menu for 'Nominate the month your season starts:' set to 'January'. At the bottom, there is another dropdown menu for 'PAM uses either the year the season starts or the year the season ends as the season "Code". Please select your preference for the season...' with the value 'I refer to the period from 2006 to 2007 as the season : "2006"'. On the right side of the dialog, there are 'OK' and 'Cancel' buttons.

Activated Features:

Configuration:

'Growing Season Information' button is now available in the Crop Setup screen (Configuration -> Crop Types and Associated Lists & Settings)

Reporting:

Annual Crop Summary Report now shows Water Use Efficiency calculations.

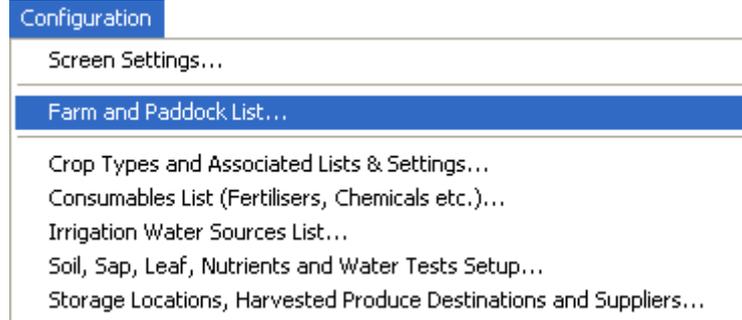
Crop Graphs:

- \$/mm Available Water Comparison
- % of Potential Yield
- Water Use Efficiency Comparison
- Water Use Efficiency vs Yield

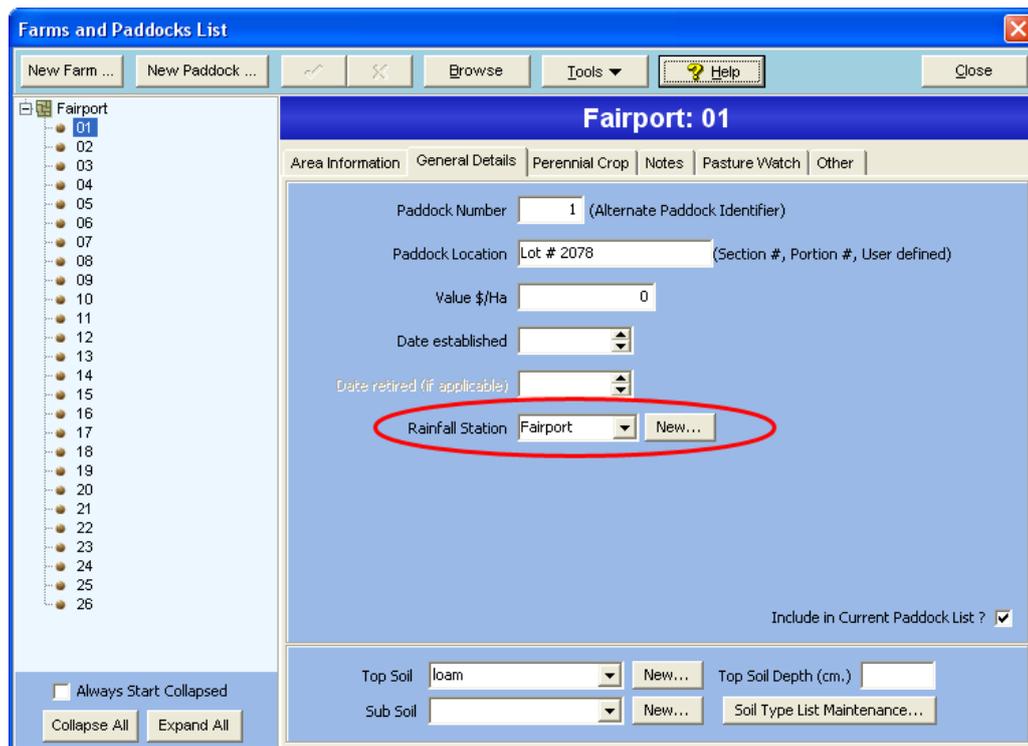
Configuration:

Assign Rainfall Stations to Paddocks:

Configuration -> Farm & Paddock List



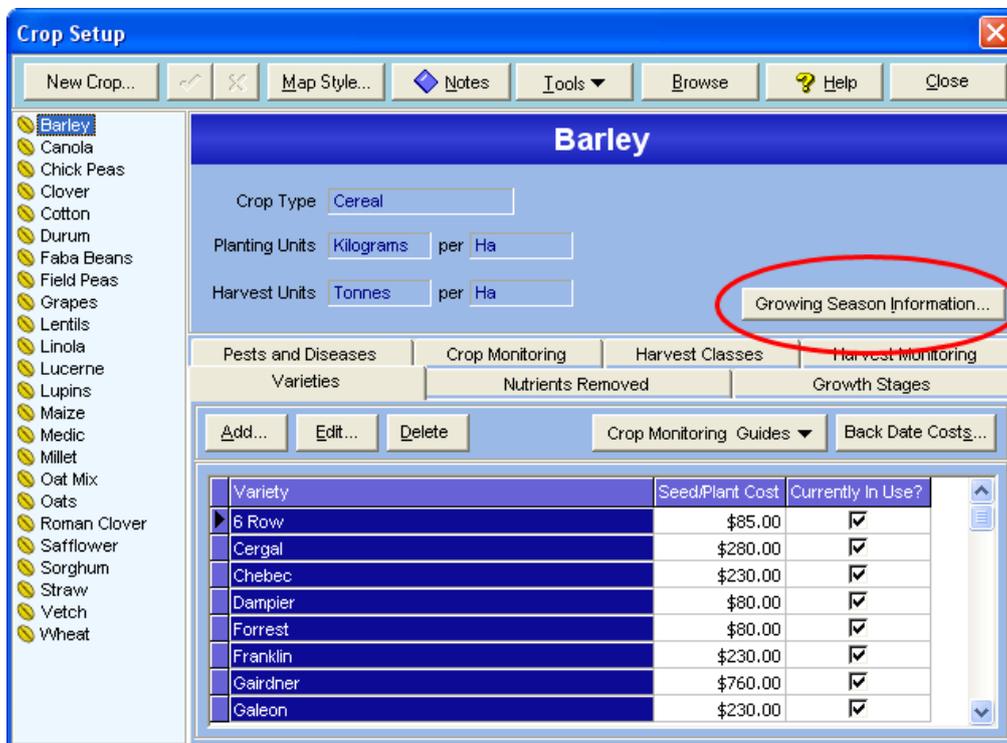
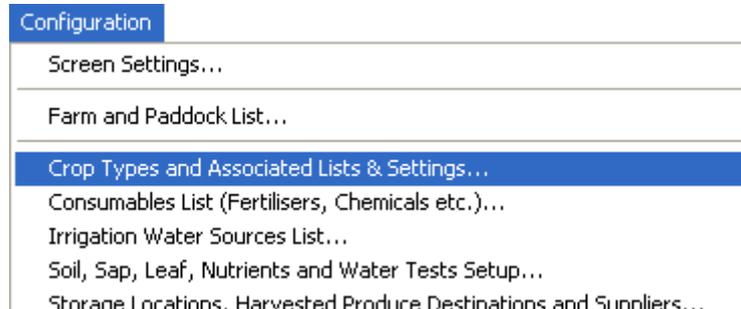
On the General Details tab select the rainfall station that has the rainfall recorded for that Paddock:



If the rainfall station is not in the list, then simply click the 'New' button next to the rainfall station selection list and type in the name of the new rainfall station. This is done so that any rainfall recorded against that rainfall station is applied to the selected paddock. There can be only one rainfall station selected for an individual paddock.

Set Up Growing Season Information:

Configuration -> Crop Types and Associated Lists & Settings...



Select the crop that we will be setting up the Growing Season Information for, then click the **Growing Season Information...** button.

Barley

Harvest month or month of last effective rainfall: Potential Yield: (Kg/Ha/mm Available Water)

Total mm. of Rainfall lost to evaporation or runoff:

Percentages of rainfall used by the crop for each month

Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
0	10	10	10	50	100	100	100	100	100	100	30

Buttons: Help, Cancel, OK

Some of the information required for this screen will need to come from your agronomist or your local Department of Primary Industries

- ① Select the month of last effective rainfall for the cropping season
- ② Enter the Potential Yield in Kg/Ha/mm of available water
- ③ Enter the amount of rainfall that will be lost due to runoff or evaporation during the season
- ④ For each of the months, click in the yellow field and type in the amount as a % of the water that the crop will use for that month. For instance, a newly sown crop will use less water than one 1/3 of the way through the growing cycle.

Data Entry Examples:

Seeding and Planting

Add Activity Wizard

Seed Details

Seed weight: 40 gms per 1000 seeds Seed Graded
Germination %: 86 Innoculation
mm of Soil Moisture at Planting: 20

Please note : To record Seed Dressing details please use the Chemical Applications activity.

Seeding and Planting Details

Variety	Seed/Plant Cost	Sow/Plant Rate	Total Units	Batch # and Location	Sow Depth (cm)	Row Spacing (cm)	Main Crop	Cost Per Ha
Canola : Dunkeld	\$2,700.00/T	12 Kg/Ha	353.76 Kg		cm	cm	<input checked="" type="checkbox"/>	\$32.40

Tools: + - ✓ ✕ Total Cost / Ha : \$0.00

Buttons: Help (F1) Job Notes Back (F5) Next (F8) Finish Cancel

During the Seeding and Planting operation, by entering the soil moisture at planting, this available water will be used in the Water Use Efficiency calculations.

Rainfall

Rainfall Recording System

Station: Fairport Year: 2005

June Information

Total: 33.0 Wet Days: 10
LT Ave: 53.5 LTA Wet Days: 1.1
LTA Yr to Date: 188.5 2005 Total: 401.0

Day	Rainfall	Wet Days
01	16	
02	17	
03	18	
04	19	
05	20	2
06	21	3.5
07	22	3.5
08	23	
09	5	24
10	5	25
11	6	26
12	3.5	27
13	1.5	28
14	29	2
15	30	1

Monthly Totals: J F M A M J J A S O N D

To ensure accurate Water Use Efficiency reports, keep your rainfall records up to date.

Irrigation

The screenshot shows a software window titled "Add Activity Wizard" with a "Tips" section and an "Irrigation" table. The "Tips" section contains instructions on how to enter irrigation data. The "Irrigation" table has columns for Source, Hours, Application Rate (mm.) Per Hour, Total Output Per Hour, Total Output, Total mm. Applied, Total Cost, and Cost Per Ha. A single row is visible for "V SMARTS" with 3 hours, 0 mm. application rate, 2300 KL / Hr total output per hour, 6900 KL total output, 23.41 mm. total mm. applied, a total cost of \$0.00 (H), and a cost per ha of \$0.00. Below the table are "Tools" buttons (+, -, checkmark, X) and a "Total Cost / Ha : \$0.00" label. At the bottom are navigation buttons: Help (F1), Job Notes, Back (F5), Next (F8), Finish, and Cancel.

Tips

Select one or more water sources and enter their application details in turn into the grid below. If you don't know the irrigation hours or the output per hour you can enter either the total water applied (Total Output) or the application rate (mm Rain Equivalent). If the total cost is known but the cost per hour isn't... simply enter the total cost.

Check the "Tools" button options to add a new water source to the water source pick-list or to allocate costs to future seasons;

Irrigation

Source	Hours	Application Rate (mm.) Per Hour	Total Output Per Hour	Total Output	Total mm. Applied	Total Cost	Cost Per Ha
V SMARTS	3	0 mm.	2300 KL / Hr	6900 KL	23.41 mm.	\$0.00 (H)	\$0.00

Tools: + - ✓ X Total Cost / Ha : \$0.00

Help (F1) Job Notes Back (F5) Next (F8) Finish Cancel

To ensure accurate Water Use Efficiency reports, keep your irrigation records up to date.

Reporting:

Preformatted Text Reports

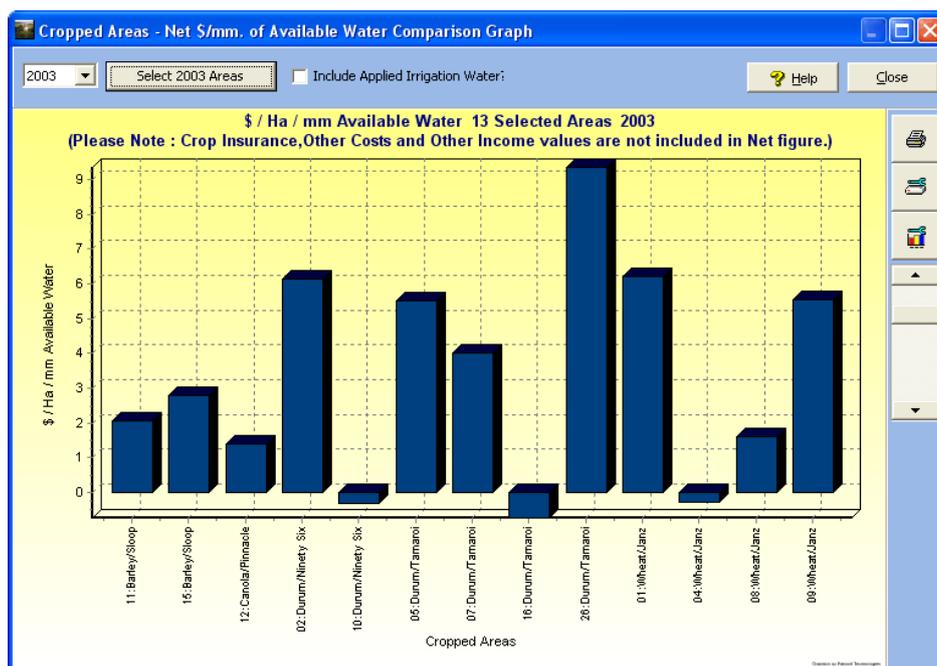
Annual Crop Summary Report

In the Annual Crop Summary Report the Water Use Efficiency information is available at the bottom of each of the crops available for the selected seasons:

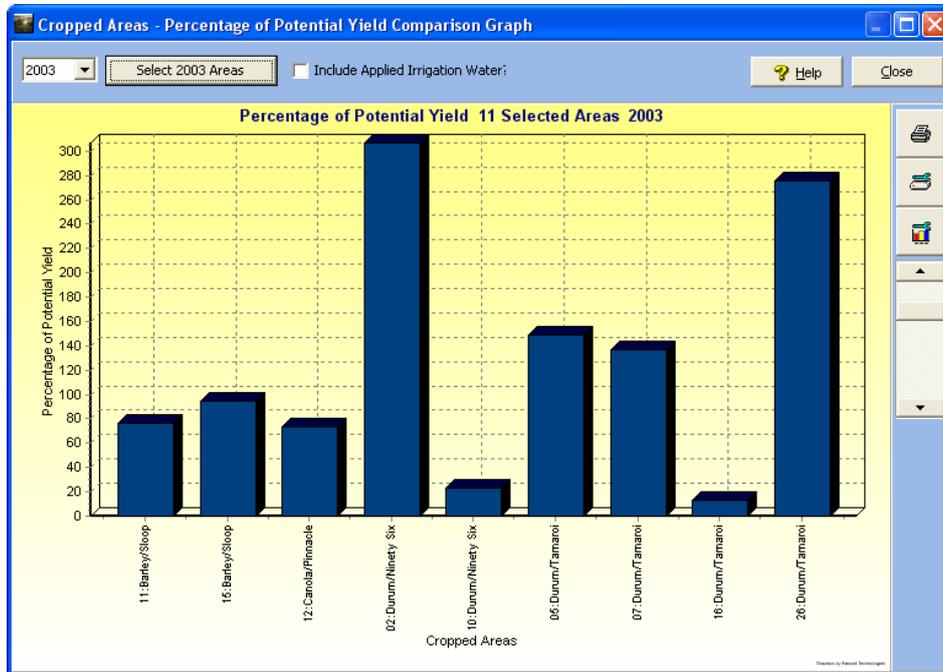
<u>Water Use Efficiency and Potential Yield details</u>	
Available Water:	319.85mm.
\$ / Ha / mm:	\$1.03 / Ha / mm
Total Yield:	70.00
Total Yield per Ha:	2.37
Break even Yield per Ha:	0.79
Potential Yield:	6.40 T / Ha
Percentage of Potential Yield:	37.1%
Water Use Efficiency:	7.42 Kg / Ha / mm

Graphs and Charts

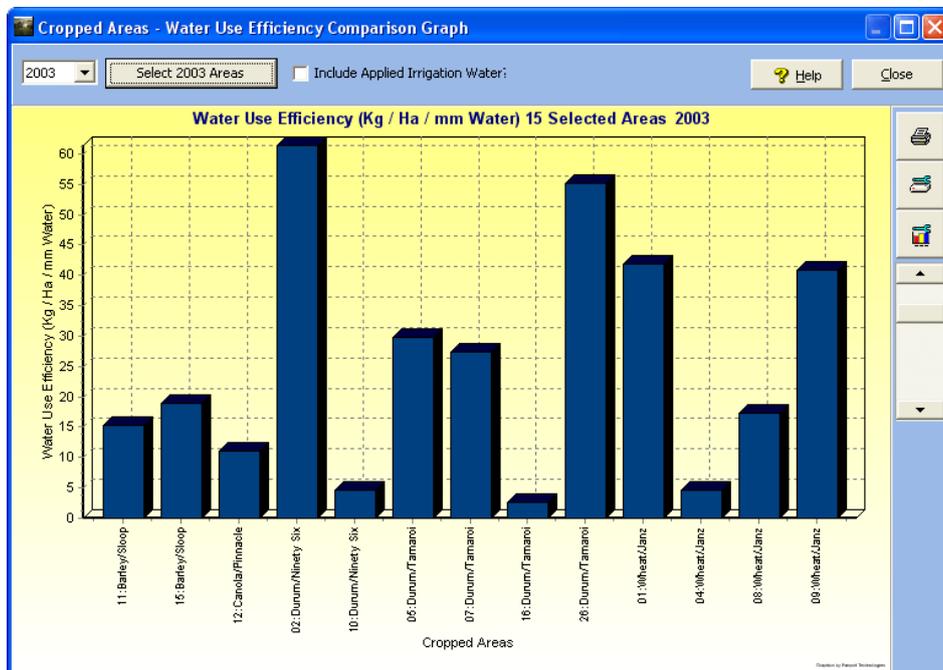
\$/mm Available Water Comparison



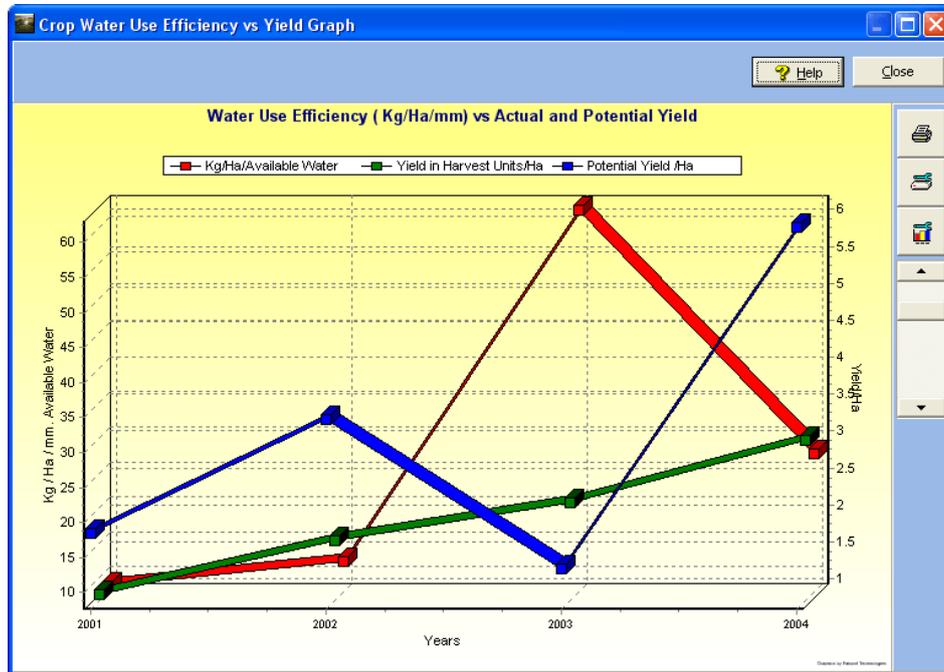
% of Potential Yield



Water Use Efficiency Comparison



Water Use Efficiency vs Yield



Under The Hood

Available Water = Monthly Rainfall x Percentage of that Month for each month in the period from User defined starting month until user defined ending month
LESS Loss to Run off and Evaporation
+ Any Irrigation water (if user chooses)
+ Any Stored Moisture (Entered while recording a planting)

Potential Yield = Available Water x T/Ha/mm (User defined amount)