1.1 Crop water use module

The main function of the *Crop water use module* is to calculate the water required for a specified period for all planted crops based on the plant date, area planted and the crop water use information. The generated water use for the specified periods can be used to estimate the water demands needed for the water release calculations and for water use forecasting.

Figure 1.1: Crop water use & planted areas

A crop water use graph is needed for each crop and it can be compiled with any available crop growth model. The crop yield (ton/ha) can be captured at the end of a growing season which is used to calculate the total yield (ton) and the yield in (g/m^3). A summary of water used for a specified period can easily be generated per crop type as shown in Figure 1.2.

Results from the Orange Riet River Water User Association (ORWUA) in South Africa showed that there is an excellent correlation between the bulk water delivered to the scheme and the total water usage calculated by the *Crop water use module*.

Crops & planted Areas

The *Crops & planted areas* form, as shown in Figure 1.1 is used to capture information on irrigated land areas per user. A Land-id must be specified and there is no limit to the number of lands that can be linked per user.

The following information is captured on the *Crops & planted areas* form:

- **User**: This is the unique number or reference number identifying a specific user.

- **Land-id**: A numerical number which is used to identify the specific land.

- **Area (ha)**: The size of the planted area in hectares.

- **Plant date**: The planting date of the specific crop.

- **Crop name**: The crop name which is selected from a list on a drop-down box on the capturing screen.

- **Volume (m³)**: The calculated volume for the specified period using the planted area and the crop water use information.

- **Yield (t/ha)**: The crop yield that is captured at the end of the growing season.

- **Total yield (ton)**: The total yield is automatically calculated by multiplying the planted area (ha) with the crop yield (t/ha).

- **Yield (g/m³)**: The yield in g/m³ is automatically calculated using the following equation:

$$Yield\ (g/m^3) = \frac{Total\ yield\ (ton) \times 100\ 000}{Crop\ water\ use\ (m^3) \times Planted\ area\ (ha)}$$

- **Water ward**: The water ward that is linked to the specific user. The *Ward* drop-down box can be used to filter the data according to the selected ward.

Crop	Area (ha)	Volume (m3)	Avg irrig (mm)	Yield (ton)	Avg yield (ton)	Avg yield (g/m3)
Barley	51.0	177220	590	170.0	34.0	542.4
Beetroot	7.0	5996	450	14.0	14.0	444.4
Cabbage	7.0	11060	558	31.5	31.5	806.5
Cotton	16.0	960	754	32.0	32.0	265.3
Garlic	10.0	7053	612	20.0	20.0	326.8
Grass	14.0	44800	683	21.0	21.0	219.6
Lucerne	27.0	23460	1280	59.5	29.8	175.8
Maize (early)	32.0	55900	826	105.0	26.3	393.7
Onion (Seed)	12.0	6581	636	48.0	48.0	628.9
Sweet potato	14.0	3240	530	52.0	26.0	707.5

Figure 1.2: Crops & planted areas summary

1.2 Crops & Crop water use

The *Crops & Crop water use* form, as shown in Figure 1.3, is accessed through the Crops-button on the *Crops & planted areas* form. This form is used to capture and maintain the list of available crops and their crop water use information. Each crop is linked to a specific crop group that can be used to filter the records according to the selected crop Group. The information needed is the days after planting (DAP) and the corresponding water use per day (mm/day). There is no limitation on the number of records that can be captured to describe the crop water use graph.
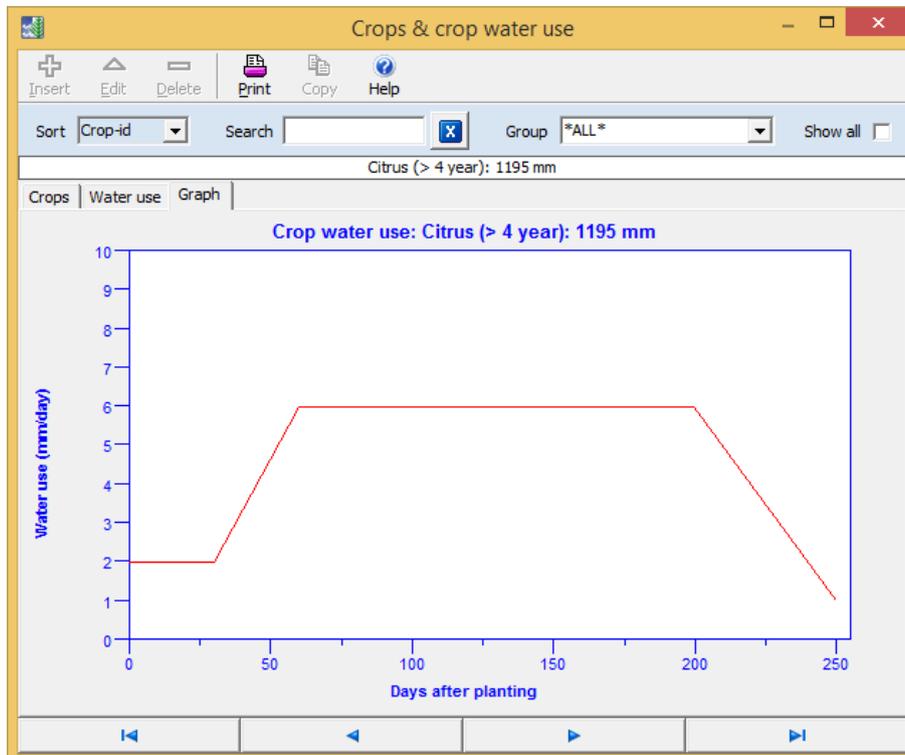
Figure 1.3: Crops & crop water use form

Figure 1.4: Crop water use graph