

SmartGardenWatering Demonstration

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This demonstration will present a Flash-based online tool designed to help gardeners determine a watering schedule for their gardens and assist in the planning for the use of a water tank. The project was funded by the 2006 Smart Water Fund (Vic) and is described more fully in a paper by the authors at this conference (Pearce et al, 2008).

How it works

There are two principles underlying the program. The first is that a garden can be divided into 'zones' representing areas watered from a common source and containing (ideally) plants of similar water demand. For example, a vegetable plot, a bed of roses, a mixed bed of Australian natives.

The second principle relates to the optimal way to apply water to these zones. We assume that a 10 mm 'drink' is the optimum amount of water to apply at any one time. This encourages deep root growth while minimising wastage to groundwater and runoff.

The program has six main areas that the user works within. Four of these are accessed by clicking on horizontal concertina panes. They are:

1. **Plants.** This is where users select groupings of plants for each zone of their garden. There is also an advanced database of plants (based on the Burnley Plant Database, The University of Melbourne) that lets a more knowledgeable gardener choose plants based on their name, flower colour, water demand or origin.
2. **Conditions.** This is where various garden conditions are set: area of the garden, soil type, plant density, mulch type, microclimate and slope.
3. **Watering.** Here the user can choose the type of watering system to be used (sprinklers, drippers, soaker hose, etc.).
4. **Schedule.** This pane shows, for each month of the year, the optimal number of days between each watering, and for how many minutes to water. The user can adjust these values.

The last two areas are presented as tabs at the top of the screen. They are:

5. **Water tank.** This tab allows the user to determine the size of a water tank and the roof catchment area. A graph shows the likely amount of water remaining in the tank week by week throughout the year (assuming an average amount of rainfall). The tank can be attached to one or more zones and will then show an estimation of the performance of the tank in supplying water to these zones throughout the year.
6. **Garden summary.** This tab summarises water requirements for all zones as well as allowing the user to print out a copy of the schedule for all zones.

At all times the screen displays a live 'water demand graph' showing the monthly water required to keep each zone healthy through the year. Figure 1 shows the water demand graph at the bottom of the screen; above it is the 'Plants' concertina open to let the user select from simple groupings of plants. The demand graph dynamically changes as different plants are selected, or the conditions are varied. Overlaid on this graph is a set of columns showing the water schedule as determined by the software.

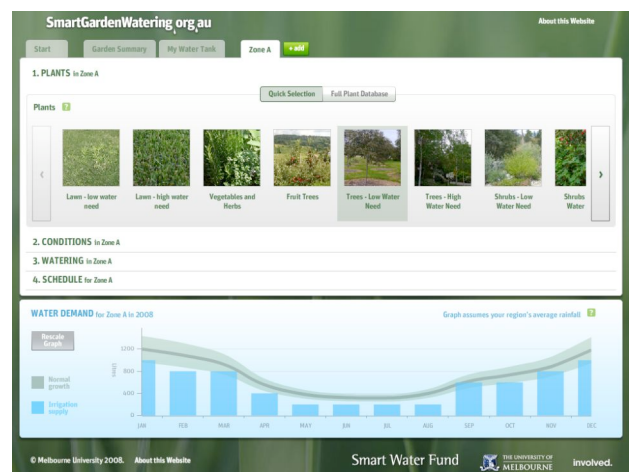


Figure 1. Screen of plant selection & water demand graph

The program has a set of short video clips on the first screen that overview the use of the software. Rollover help text links to a web site with further information about the program as well as other horticultural issues.

Acknowledgements

This software is the final stage of a three-year project initiated by Geoff Connellan and Peter May at the Burnley Campus, School of Resource Management, University of Melbourne. Their work involved researching the effects of soil types, mulches, watering systems, etc. as well as identifying the water demand for about 1500 plants located in various climate zones in and around Melbourne. They created a mathematical model to calculate water demand; the resulting software program is the result of converting this complex model into a usable form. The graphics design and programming was done by Paul Prickett and Nicholas Bruning (involved.com.au).

References

1. Pearce, J. M., Murphy, J., & Smith, W. (2008). *Supporting gardeners to plan domestic watering: a case study of designing an 'everyday simulation'*. Paper presented at the OzCHI Conference, Cairns.
2. *SmartGardenWatering* software can be freely accessed at <http://smartgardenwatering.org.au>