PREFACE

During the last 10 years or so, gardening in much of Australia has become more difficult. Water restrictions have progressively become more severe as drought has intensified its grip on all of our largest cities and their hinterlands. These restrictions have progressed from mild (watering allowed every second day or three times a week), through once-a-week watering via drippers – to, in increasingly large areas, bucket only, and in others, a total ban on the application of municipal water direct to the garden.

Gardeners might argue that these restrictions are unfair, as they do not always address water use by industry and within the home. But before you get too agitated, spare a thought for irrigation farmers, some of whom have had to watch their life’s work die because their water allocation has been slashed.

Water shortages are likely to get worse in all parts of Australia except the far northern tropics as the global warming to which we all contribute bites harder. If we want to have the many benefits that gardens provide, we need to make the most of the water that is available to us. That means using ALL the water that is provided free to us via rain, and recycling to the garden as much as possible of the water that we use in our homes.

I want to show you how it is possible to have a lovely garden even when water restrictions are severe. The knowledge contained in this book, supplemented where appropriate with information freely available on the websites listed, will, I am sure, enable you to do this. I will show you that with a little thought and some effort, it is possible to have a beautiful garden almost anywhere in Australia even with the most severe restrictions on the use of water from municipal supplies.

There are several sets of characters in this book. The central character is water. It is essential to all life. Waters from different sources are not all created equal though; they come with different amounts of dissolved salts and sometimes other contaminants. One part of this book will show you how to assess water from different sources and how to use this information when you use these kinds of waters in your garden.

The characters of the second set are almost beyond counting. They are the many thousands of plants that you can choose from to produce the visible part of your garden. They will not thank you if you have put them in an environment they do not like. Life will be
easiest for you as their carer, and for them, if you have chosen only plants that like your soil and climate, and that manage with the amount and quality of water that you can provide to them.

Plants get most of their water from the medium in which they are growing. This growing medium will generally be a soil, sometimes natural, sometimes a blend produced by a soil supplier. It could also be a potting mix. To allow your plants to get the most out of the water you or rain provide to them, it is desirable that you understand something of the interaction between water and growing media. The third set of characters of this book is therefore soils and other growing media. Their ability to hold and supply water is fundamental to having a good garden, even with less water.

A couple of invisible characters support the others. These are air and light. The first is the source of carbon dioxide, without which there are no plants. The second provides the energy that is essential for plants to use carbon dioxide, take up water and grow.

There is of course another character – you, the gardener. It is you who will enjoy the garden that you have created out of water, plants and soil. It is you who may well have a longer and more satisfying life because of your efforts. It is you who will know that your garden is soaking up some of the extra carbon dioxide that is the major cause of the water shortages we are experiencing in Australia. You know that you are providing oxygen for yourself and others through the plants of your garden.

Enjoy your garden.

KEVIN HANDRECK
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If only we had this much water in southern Australia! Victoria Falls, Zimbabwe–Zambia border.
CAUSES OF WATER SHORTAGES

There are three major causes for the current restrictions on water use in our gardens.

The main cause is reduced rainfall, which in turn is due to the increasing concentrations of the greenhouse gases carbon dioxide, nitrous oxide and methane in the atmosphere. The carbon dioxide and nitrous oxide come from our burning of fossil fuels – coal, oil and gas – that produces the energy we use for heating and cooling, for running our appliances, and for powering our factories, vehicles and aeroplanes. The methane comes from rice paddies, cattle, rubbish dumps and, increasingly, from peat bogs as they thaw, and deep ocean deposits as ocean temperature rises. The higher the concentration of these gases in the atmosphere, the greater is the reduction in the loss to space of heat generated when the sun’s rays hit the earth’s surface. The resulting rise in the average temperature of the lower atmosphere increases evaporation of water. Water in the atmosphere is a powerful greenhouse gas, so the warming is further increased.

One result of increasing atmospheric temperature is that circulation patterns in the atmosphere shift. This means lower average rainfall across southern Australia, but increased rainfall in the tropics and in parts of central Australia (see the references listed in Appendix 1 for detailed information). Scientists have shown that when rainfall decreases by 10%, there is 30–50% decrease in runoff into streams and reservoirs. The trend towards decreased rainfall started about 25 years ago in south-western Western Australia and, more recently, in south-eastern Queensland, but it is now universal in southern Australia.

There is therefore a direct link between our use of energy and lower water levels in our reservoirs. And because Australians use more energy per person than do the citizens of any other industrialised country, we are major contributors to our lack of water. More widely, the combination of rising living standards throughout much of Asia and the Middle East, and rapidly increasing populations, is bringing billions of people in these regions up towards our energy use and greenhouse gas production levels.

A second cause of water restrictions is increasing population. At a local level, the combination of increasing population with
drastically lower water levels in reservoirs has an inevitable result.

A third cause is lack of vision by some politicians. The first warnings about global warming and its possible consequences were made by scientists nearly 40 years ago. Solid evidence has existed for at least 15 years, yet the leaders of countries whose citizens are the biggest polluters have taken little action until very recently. Even now, when the evidence is as solid as anything can be, much of the political response is nowhere near what is necessary to avert catastrophe for our grandchildren.

**Some hopeful signs**

Despite the size of the problem, there are many hopeful signs:

- decreased amount of water used in gardens, generally with minimal effect on plant quality
- voluntary reductions in energy use by increasing numbers of people
- general acceptance and practice of shorter showers and many other water-saving measures
- reduction of carbon footprint by parts of Australian industry
- small increase in the proportion of total energy production from wind, the sun, geothermal sources and waves
- phasing out of incandescent light bulbs
- improved energy efficiency in electrical appliances
- purchase of carbon offsets to plant trees and generate green energy
- some moves to require energy efficient design for new homes and other buildings
• slight decrease in average distance travelled by private car
• some increased use of public transport, motor scooters, bicycles and feet.

**Gardens are a part of the cure**

Gardeners make a significant contribution to reducing the effects of global warming. About 70% of the green cover in our cities is in home gardens. The main environmental effect of this greenery is that, by providing shade and natural evaporative cooling, it cools the area around our homes in summer, so reducing – even eliminating – the need for energy hungry air conditioning.

Our plants soak up carbon dioxide and release oxygen back into the atmosphere. Gardening broadcaster Colin Campbell has suggested that there should be an ‘oxygen tax’ imposed on non-gardeners!

Food produced in a home garden, even if it is only a few herbs and salad greens, saves the energy required to transport it from distant farms to local shops. Recycling of food scraps through compost bins eliminates the energy cost of taking them to a landfill. Time spent planting, trimming, weeding and sweeping by hand in the garden is time that might otherwise have been used in energy intensive activities such as driving or watching television.

Gardens are places for relaxing from the stress of modern life. Anyone who has visited the slums or ‘concrete jungles’ of many cities soon learns to appreciate the softening effect that living plants have on a cityscape.

Our cities do not have to become almost treeless, as in dusty Iquique, Chile. (Photo: Eleanor Handreck)
Also, by creating a pleasant setting for their home, gardeners increase its value by up to tens of thousands of dollars. They create employment for at least 50,000 Australians through their purchases of plants, fertilisers, tools and landscaping services. They provide habitat for birds and other wildlife. And on average they live longer and healthier lives than non-gardeners.

So before you feel guilty about using some of your allocation of municipal water in your garden, think of all the benefits you are providing to yourself, your family, your community, our Earth.