

Water the way nature intended: switch from Mains2Rains



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What needs to be done?

Despite the UK being considered a wet country, the Environment Agency suggest that, without action, an additional 25% of the current daily public water supply will be needed in England by 2050. We all have a part to play in reducing the demand for mains water, which will also help to protect the environment and reduce greenhouse gas emissions.

How can I help?

We all know we need to make changes to our lives to meet the challenges facing us, from climate change to the need to protect our rivers and streams, but is popping a saucer under a flower pot really going to make a difference?

Well, if all 30m gardeners in the UK did just that for the growing season, we could save enough water to supply 2m people for a whole day – that’s the population of Bristol, Leeds and Sheffield. When we collectively make small changes, we have a big impact. The Mains2Rains pledges show gardeners how they can make the switch from mains to rainwater, and how those changes add up, building resilience into our own gardens as well as the UK’s mains water supply and leaving more water in rivers and streams so that wildlife can thrive.



“If all 30m gardeners in the UK put saucers under containers, we could save enough water to supply 2m people for a whole day.”



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What are the benefits of using rainwater?

- It's free, unlike mains water. We just have to get better at keeping it in our gardens.
- It doesn't produce any carbon emissions, whereas mains water has to be treated and pumped to our homes, which uses energy.
- Many of the ways you can make better use of water (such as adding mulch, and replacing paving with plants) also mean that more carbon is stored in your soil and plants. This is another step towards sustainable gardening.

Why do plants prefer rainwater?

- Rainwater often has a pH below 6.0, whereas mains water is always kept above pH 6.5 in the UK so that it doesn't corrode plumbing.
- Mains water often contains minerals such as calcium and magnesium that can raise the pH of soil. Rainwater on the other hand lacks these minerals, which would otherwise alter the pH.
- Many nutrients needed by plants such as phosphorus, iron and manganese are more available to the plant in the slightly acidic conditions provided by rainwater.



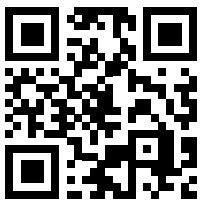
Chalk streams are usually high in calcium and magnesium, which means the water is hard with a high pH. It is better left in these streams than extracted for uses such as watering our gardens, where rainwater will do the job just as well. Photo © Mike Blackmore, Wessex Rivers Trust.

What is pH?

This is a scale used to measure acidity, which can affect the way roots absorb water and nutrients. A pH of 7.0 is considered neutral. An acid soil has a pH value below 7.0. Above pH 7.0 the soil is alkaline. When designing and planting your garden, you need to know if the soil is acid or alkaline, since different plants thrive in different soils.



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From Mains2Rains: discover how to make the switch

Explore how turning off the tap, using less water and collecting more rain can benefit you, your garden, society and the environment. Not less gardening, just less watering.



1 Plants for wet soils

Growing the right plants in the right place for the right purpose will make your garden more resilient and easier to maintain.

2 Roots matter

Understand how roots affect your garden's resilience to droughts and flooding.

3 Healthy soils

Healthy soil holds more water and nutrients, has more biodiversity and captures carbon. Home-produced leafmould, compost and mulch keeps soil healthy.

4 Layered plantings

Mixed layers of plants draw moisture from different soil depths and create microclimates around their foliage. Taller plants provide shade from hot sun.

5 Collect the rain

Water butts are the obvious choice but there are many other ways of storing water in your garden, including in the soil and self-watering containers.

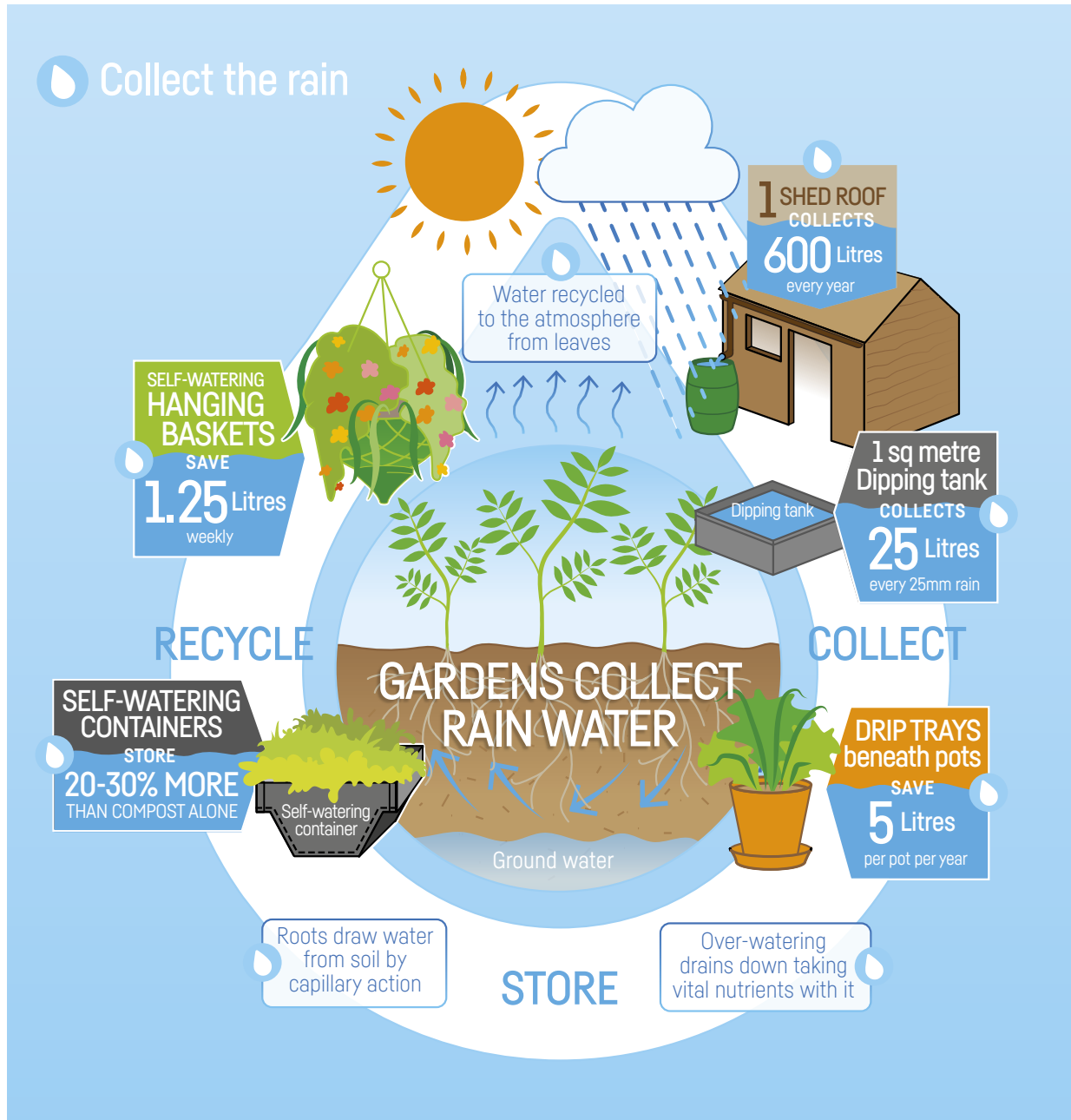
6 Plants for dry soils

Understanding your garden's soil conditions will help you choose the combination of plants that will thrive best.

7 Slow the flow

Plants and healthy soils promote infiltration of rainfall, reducing the runoff that can contribute to flooding. Plants in place of paving deliver many other benefits.

Water the way nature intended: how to collect rainwater



What you can do

- 1 Use a water butt
- 2 Place drip trays beneath pots to collect drainage
- 3 Add mulch around new plants
- 4 Add homemade compost to your soil
- 5 Choose the right plant for the right place
- 6 Swap paving for plants
- 7 Avoid watering the lawn
- 8 Use self-watering containers
- 9 Choose permeable paving

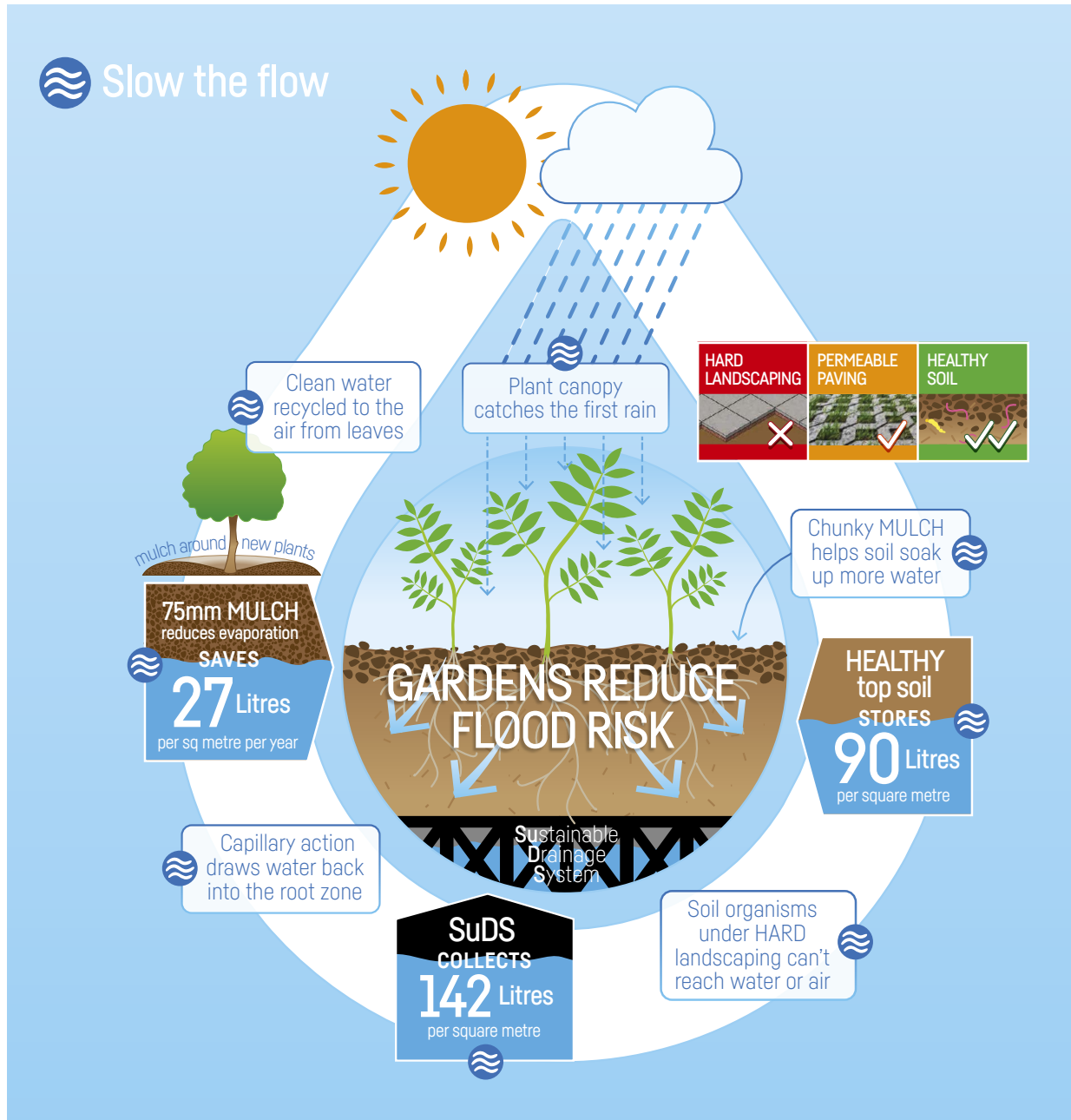


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Water the way nature intended: how to reduce flood risk



Slow the flow



What you can do

- 1 Use a water butt
- 2 Place drip trays beneath pots to collect drainage
- 3 Add mulch around new plants
- 4 Choose the right plant for the right place
- 5 Swap paving for plants
- 6 Use a watering can, not a hose
- 7 Avoid watering the lawn
- 8 Add homemade compost to your soil
- 9 Use self-watering containers
- 10 Choose permeable paving

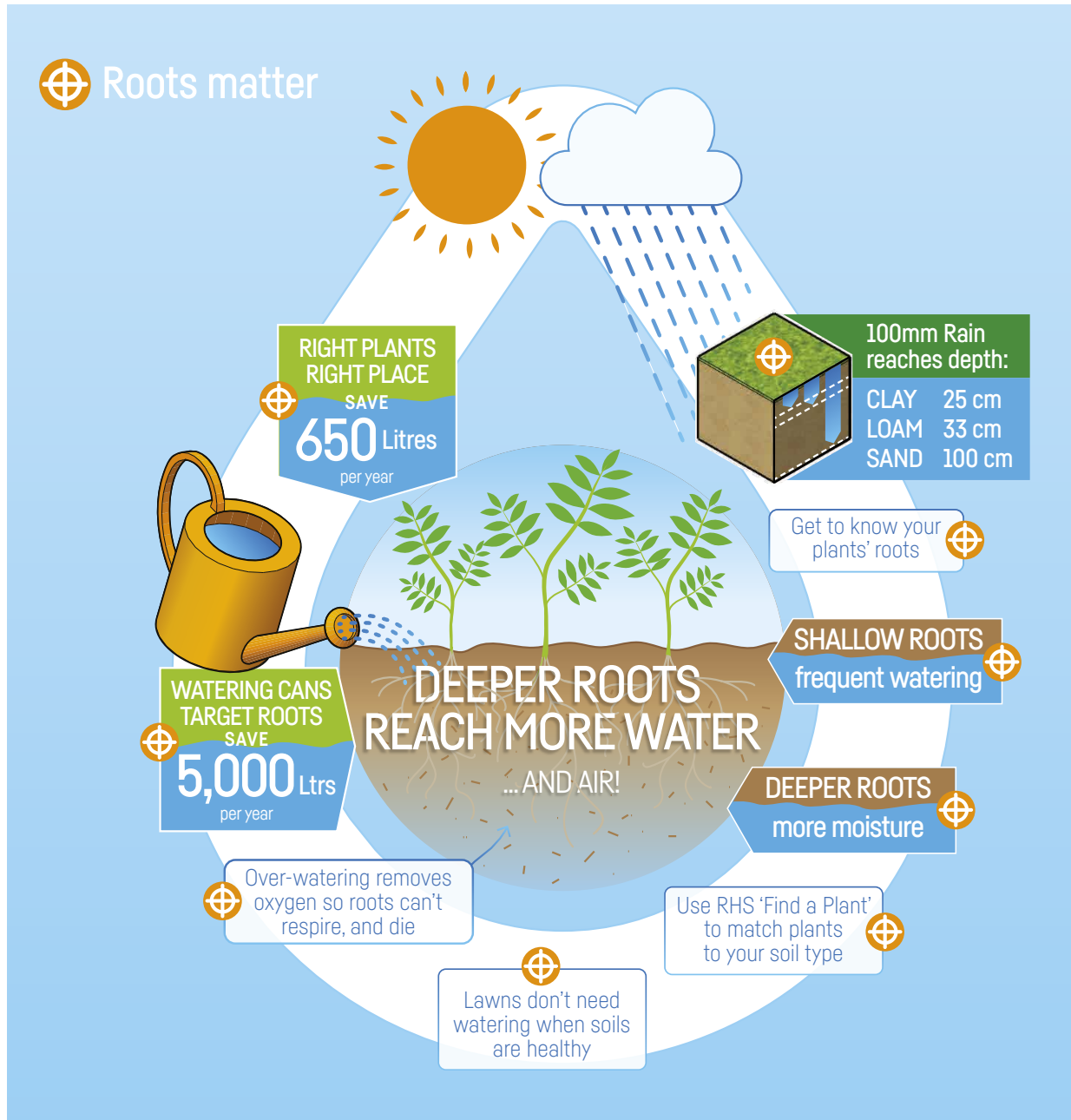


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Water the way nature intended: how to grow deeper roots



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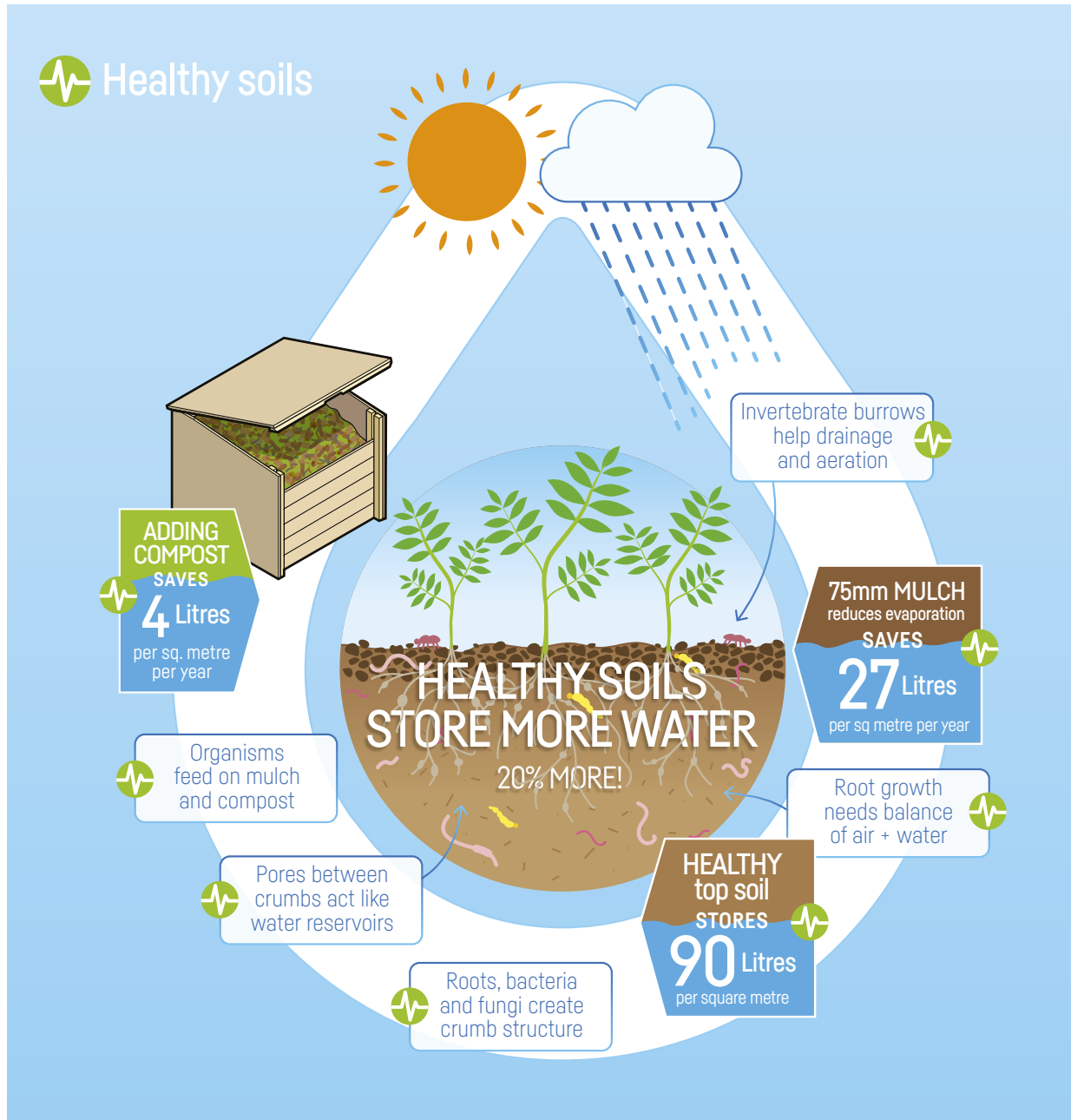
What you can do

- 1 Place drip trays beneath pots to collect drainage
- 2 Add mulch around new plants
- 3 Choose the right plant for the right place
- 4 Swap paving for plants
- 5 Avoid watering the lawn
- 6 Add homemade compost to your soil
- 7 Use self-watering containers

Water the way nature intended: how to make soils healthy



 Healthy soils



What you can do

- 1 Add mulch around new plants
- 2 Choose the right plant for the right place
- 3 Avoid watering the lawn
- 4 Add homemade compost to your soil



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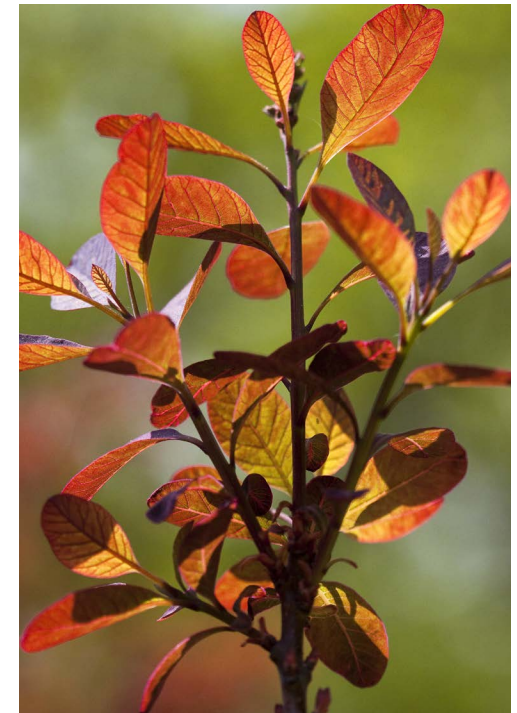
Right plant, right place

Choosing plants that are better matched to the conditions they are growing in means less watering and more resilience to changes in the weather. For the Chelsea exhibit, we chose plants to showcase three different ways to make the best use of the soil texture and prevailing weather.

Dry planting often requires fast drainage to deliver the rain into the deeper layers of soil where it is less prone to evaporation from the surface, but that means using plants with deep roots to reach it, such as *Salvia* AMETHYST LIPS. It's this combination of well-drained sandy or chalky soil and plant adaptations such as small silvery leaves that makes this a success.

Damp areas may be created by shade, low lying areas or deep organic or clay soils that hold more moisture. Plants such as *Hosta* 'Patriot' adapt by having large leaves to capture more light, but they also lose more water, not so much of a problem in a damp place. They often have shorter roots as there can be less oxygen available in deep wet soil. This makes them more vulnerable to drying, but these damp shady areas provide evaporative cooling in a heatwave.

Layered planting takes advantage of differing heights of plants and depth of rooting. Tall plants such as *Cotinus* 'Grace' can reduce the water use of the shorter plants such as *Fragaria vesca* by providing dappled shade and humidity.



Clockwise from top left: *Salvia* AMETHYST LIPS ('Dyspurp'), *Cotinus coggygria*, *Hosta* 'Patriot'.



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Plant list

Plants for wet soil

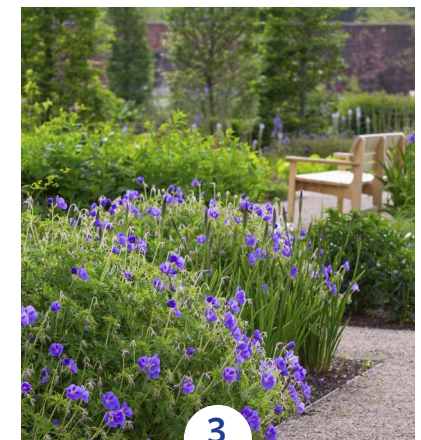
Alchemilla mollis (lady's mantle)
Alnus glutinosa (alder)
Anemanthele lessoniana (syn. *Stipa arundinacea*; pheasant's tail grass)
Anemone 'Elfin'
Blechnum spicant (hard fern)
Brunnera macrophylla 'Alexanders Great' (Siberian bugloss)
Carex testacea 'Prairie Fire' (orange New Zealand sedge)
Dryopteris erythrosora 'Brilliance' (copper shield fern)
Dryopteris filix-mas (male fern)
Dryopteris wallichiana (alpine wood fern)
Euphorbia amygdaloides var. *robbiae* (Mrs Robb's bonnet)
Geranium ROZANNE ('Gerwat') **3**
Heuchera 'Obsidian' (alum root)
Heuchera 'Violet Shimmer' (Fox Series) (alum root)
Hosta 'Patriot' (plantain lily)
Hydrangea paniculata 'Levana'
Hydrangea paniculata 'Limelight'
Liriope muscari (big blue lilyturf)
Nandina domestica (heavenly bamboo)
Pachysandra terminalis 'Green Carpet' (Japanese spurge)
Physocarpus opulifolius 'Diabolo' (ninebark)
Polystichum polyblepharum (Japanese lace fern)
Sambucus nigra f. *porphyrophylla* 'Eva' (syn. BLACK LACE; elder)
Sarcococca confusa (sweet box)
Tiarella 'Pink Skyrocket' (foam flower)

Plants for dry soil

Allium tuberosum (Chinese chives)
Brachyglottis (Dunedin Group) 'Sunshine'
Convolvulus cneorum (silverbush)
Echinacea GOLDEN SKIPPER ('Echgol243') (Butterfly Series)
Erigeron karvinskianus (syn. 'Profusion') (Mexican fleabane)
Euphorbia characias 'Blue Wonder' (spurge)
Lavandula x intermedia 'Edelweiss' (lavender)
Miscanthus sinensis 'Gracillimus' (eulalia)
Miscanthus sinensis 'Morning Light' (eulalia) **2**
Myrtus communis (myrtle)
Myrtus communis subsp. *tarentina* (Tarentum myrtle)
Nepeta grandiflora 'Dawn to Dusk' (Caucasus catmint)
Pennisetum alopecuroides 'Hameln' (Chinese fountain grass)
Pittosporum tenuifolium 'Elizabeth' (tawhiwhi)
Pittosporum tenuifolium 'Golf Ball' (tawhiwhi)
Salvia AMETHYST LIPS ('Dyspurp')
Salvia rosmarinus 'Miss Jessopp's Upright' (rosemary)
Santolina chamaecyparissus (lavender cotton)
Stipa tenuissima (feather grass)
Teucrium fruticans (tree germander)
Thymus polytrichus (wild thyme)
Verbena bonariensis (purple top)

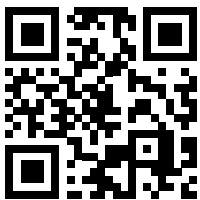
Layered planting

Abelia x grandiflora (glossy abelia)
Aloysia citrodora (lemon verbena)
Anemanthele lessoniana (syn. *Stipa arundinacea*; pheasant's tail grass)
Anemone 'Elfin'
Apium graveolens (celery)
Aster x frikartii 'Mönch'
Brunnera macrophylla 'Alexanders Great' (Siberian bugloss)
Cornus alba 'Sibirica' (Siberian dogwood)
Cotinus 'Grace' (smoke tree)
Fragaria x ananassa PINK PANDA ('Frel') (strawberry)
Fragaria vesca (alpine strawberry)
Geranium ROZANNE ('Gerwat') **3**
x Heucherella 'Tapestry'
Hydrangea quercifolia (oak-leaved hydrangea)
Ligusticum scoticum (Scots lovage)
Malus 'Evereste' (crab apple) **1**
Mentha suaveolens (apple mint)
Nandina domestica FLIRT ('Murasaki') (heavenly bamboo)
Osmanthus x burkwoodii Burkwood osmanthus)
Pachysandra terminalis 'Green Carpet' (Japanese spurge)
Physocarpus opulifolius LADY IN RED ('Tuilad') (ninebark)
Tiarella 'Sugar and Spice' (foam flower)
Viburnum tinus 'Ladybird' (laurustinus)





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KTP project team

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Dr Mark Gush (RHS)

Prof Ian Holman (Cranfield University)

Prof Jerry Knox (Cranfield University)

Dr Matthew Hogan (KTN)



Our designer

‘Water the way nature intended’ was designed by Dave Green of Dave Green Gardens, a gold medal-winning landscape and garden design practice based in Birmingham and London. A former trainee at RHS Garden Wisley, Dave has over ten years’ experience of working with the RHS. Above: *Dryopteris wallichiana*.

Photography. **1** RHS / Georgi Mabee **2** RHS / Tim Sandall **3** Mike Blackmore, Wessex Rivers Trust **9** RHS / Neil Hepworth (*Salvia*); RHS / Carol Sheppard (*Cotinus*); RHS / Tim Sandall (*Hosta*) **10** RHS / Tim Sandall (*Allium, Miscanthus*); RHS / Neil Hepworth (*Malus, Geranium*) **11** RHS / Neil Hepworth.

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