

Plant traits linked to enhanced delivery of environmental benefits

Cooling	Pollutant trapping	Rainfall capture
◆ large leaf area	◆ large leaf area	◆ large leaf area
◆ presence of leaf hairs	◆ presence of leaf hairs	◆ presence of leaf hairs
◆ light leaf colour	◆ rough surfaces	◆ rough surfaces
◆ high ET rate		◆ high ET rate

These insights into the links between plant traits and the benefits they provide were the result of RHS-led and -supported research (see references below, 4–8).

Evapo-transpiration

Evapo-transpiration (ET) is water loss through leaf stomatal pores, a process unique to plants. This cools leaves as well as the surrounding air, which is particularly useful in hot dry weather. Through ET, plants also draw water from the soil, for instance after heavy rain, reducing flooding risks.

Choosing hedge species with traits linked to more environmental benefits

		UK native?	Hedge height†
<i>Cotoneaster</i> spp.*	Evergreen	N	1–1.5m
<i>Crataegus monogyna</i> (hawthorn)	Deciduous	Y	1.5–3m
<i>Cupressus × leylandii</i> (Leyland cypress)	Evergreen	N	1–15m
<i>Cupressus macrocarpa</i> (Monterey cypress)	Evergreen	N	1–3m
<i>Elaeagnus × ebbingei</i> (oleaster)	Evergreen	N	0.5–1.5m
<i>Fagus sylvatica</i> (common beech)	Deciduous	Y	1.2–6m
<i>Osmanthus × burkwoodii</i>	Evergreen	N	0.5–1.5m
<i>Rosa canina</i> (dog rose)	Deciduous	Y	1–3m
<i>Taxus baccata</i> (English yew)	Evergreen	Y	1.2–6m
<i>Thuja plicata</i> (western red cedar)	Evergreen	N	1.5–3m
<i>Viburnum tinus</i> (laurustinus)	Evergreen	N	1–2m

* *Cotoneaster* can be considered not as a typical hedge, but as an addition to mixed hedging as it has functional properties which enable it to efficiently reduce rainfall runoff and trap pollution

† Evidence suggests that to be efficient in particulate pollution screening hedges should be 1.5–2m high and at least 1m wide (9)

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For growing and selection information, go to rhs.org.uk/advice/garden-features/hedges

Hedges to meet urban challenges



Royal Horticultural Society

Sharing the best in Gardening

How to choose hedges which provide environmental benefits in urban settings: a summary of recent RHS research

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Hedges for urban gardens

Urban residents routinely face a range of environmental challenges: air pollution, noise, increased risk of flooding due to paving over. Urban hedgerows and hedges in domestic gardens have a role to play in minimising these risks and improving environmental quality.

Key environmental benefits (“ecosystem services”) provided by urban vegetation, including hedges:

- ◆ Reducing flood risks
- ◆ Sequestering particulate and gaseous airborne pollutants as well as soil-borne chemical pollutants
- ◆ Reducing noise
- ◆ Providing habitat, shelter and corridors for wildlife
- ◆ Providing shade and transpirational air cooling

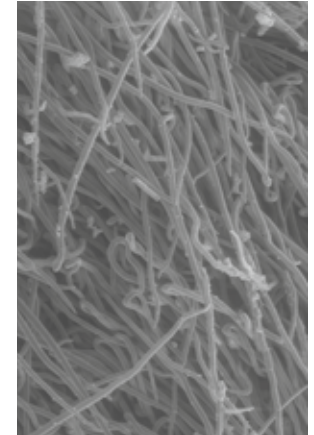
Recent RHS research and collaborative work has shown that several plant traits can be linked with better provision of environmental benefits. These include high evapo-transpiration rate, which can improve cooling and rainfall capture. Additionally, presence of large, relatively dense canopies with hairy leaves can enhance retention and capture of particulate pollutants, cooling at leaf level and retention of rainfall by the canopy.

Domestic gardens account for 15–25% of every UK town or city^{1, 2}



Increasing impermeable paving in domestic gardens is linked to increased risk of localised flooding³

Differences in physiological function, canopy size and structure, and leaf size, shape and morphology lead to differences in the extent to which plants provide environmental services⁴



Appropriate plantings which are sensitively and sustainably managed will provide a range of environmental benefits (“ecosystem services”)⁴