

Winter hardiness zones





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Winter hardiness zones for trees and shrubs

The eleven winter hardiness zones based on observations recorded over many years are determined by the average annual minimum temperature for each zone. The information listed with each plant entry denotes the zone where plants can grow in optimum conditions. The plants will have more than 80% chance of surviving the prevailing winter temperatures without requiring additional protection. Although snow cover can offer plants protection during winter, this factor is not taken into account in determining winter hardiness.

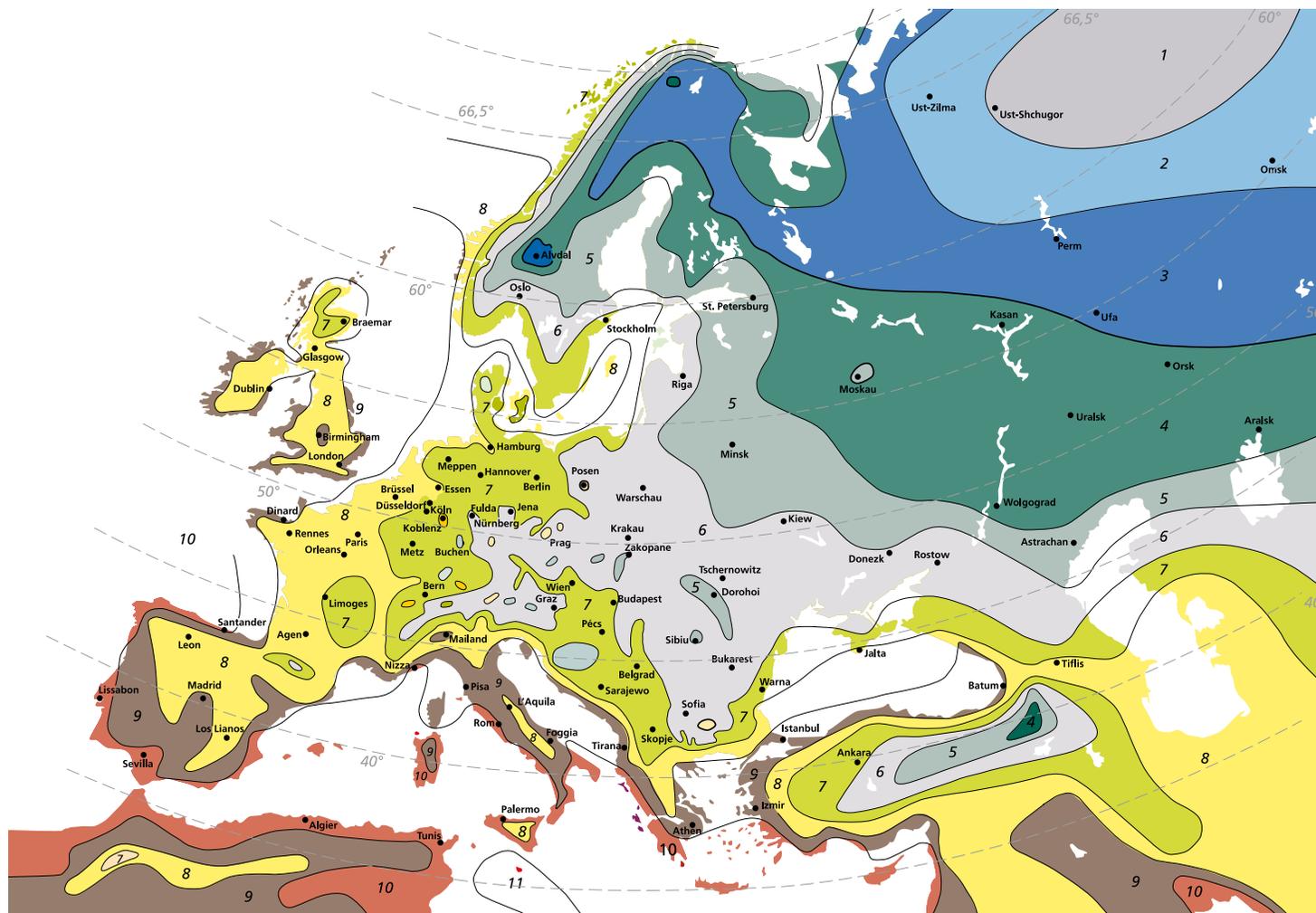
The zones are approximate however, and the information given is only a guideline as local variations can occur within each zone. So, for example, urban areas are generally half a zone warmer than adjacent rural areas; proximity to large bodies of water, and slopes and ridges can also have a favourable impact on winter temperatures, whilst valleys, frost pockets and areas exposed to cold winds may have an adverse effect on temperatures.

Susceptibility to frost, and the result damage to flowers, foliage and bark through the freezing and expanding of sap, varies according to numerous factors including topography and aspect, but it also depends on soil condition, availability of nutrients and water, weather conditions in the summer and autumn and the resultant shoot growth, and temperature patterns in winter, spring and early summer.

With good local knowledge, it is often possible to plant species in sheltered locations, for example in forests, on south facing slopes or in towns, within zones which are normally considered too cold for them. Plants can be grown in five or more different zones; a plant in zone 2 can also grow in zones 3, 4, 5, 6 and 7 without any problems and possibly also in zones 8 and 9.

In addition to these winter hardiness zones you should rely on your own experience. It may also be possible to improve local conditions for plants, for example by sheltering them from winds, or improving the soil.

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Map from: Mitteilungen der Deutschen Dendrologischen Gesellschaft. Nr. 75 (1984) by Prof. W. Heinze and Prof. D. Schreiber; from Bärtels, Gartengehölze 1991, Ulmer

Winter hardiness zones and their temperature range in respect of the average annual minimum temperature ($t_{min\bar{y}}$)

Zone	°F	°C
1	< -50	< -45,5
2	-50 to -40	-45,5 to -40,1
3	-40 to -30	-40,0 to -34,5
4	-30 to -20	-34,4 to -28,9

Zone	°F	°C
5	-20 to -10	-28,8 to -23,4
6a	-10 to -5	-23,3 to -20,6
6b	-5 to 0	-20,5 to -17,8
7a	0 to +5	-17,7 to -15,0

Zone	°F	°C
7b	+5 to +10	-14,9 to -12,3
8a	+10 to +15	-12,2 to -9,5
8b	+15 to +20	-9,4 to -6,7
9	+20 to +30	-6,6 to -1,2

Zone	°F	°C
10	+30 to +40	-1,1 to -4,4
11	> +40	> +4,4

