

Plant species indigenous to central Europe are usually not spread across the whole region, but rather often found in certain sections. Some are exclusive to particular areas owing to their special abilities. In order to use the plants completely in accordance with their proper landscape, such special origins must be carefully observed to prevent the contamination of flora in critical plantings where plant types foreign to the vegetation are introduced. To this end, special studies of the location are recommended. It should, however, be kept in mind that the centuries of use of the wild species makes it difficult to pinpoint the original boundaries for many species.

Genus/species/variety	Found everywhere	Found in regions	Found in special areas
1. Deciduous trees			
Acer campestre	+		
Acer platanoides	+		
Acer pseudoplatanus	+		
Alnus glutinosa	+		
Alnus incana		+	
Betula pendula	+		
Betula pubescens		+	+
Carpinus betulus	+		
Castanea sativa		+	
Fagus sylvatica	+		
Fraxinus excelsior	+		
Juglans regia			+
Malus sylvestris		+	
Populus canescens		+	
Populus nigra		+	
Populus tremula	+		
Prunus avium	+		
Prunus padus		+	
Pyrus communis		+	
Quercus petraea	+		
Quercus robur	+		
Salix alba	+		
Salix caprea	+		
Salix daphnoides		+	
Salix fragilis	+		
Sorbus aria		+	
Sorbus aucuparia	+		
Sorbus domestica		+	
Sorbus intermedia			+
Sorbus torminalis		+	
Tilia cordata		+	
Tilia europaea		+	
Tilia platyphyllos		+	
Ulmus carpinifolia		+	
Ulmus glabra		+	
Ulmus laevis			+

continued on next page

39 - Indigenous plants

continued

Genus/species/variety	Found everywhere	Found in regions	Found in special areas
2. Shrubs			
Amelanchier ovalis		+	
Arctostaphylos uva-ursi			+
Berberis vulgaris		+	
Buxus sempervirens			+
Calluna vulgaris	+		
Colutea arborescens			+
Cornus mas			+
Cornus sanguinea	+		
Corylus avellana	+		
Crataegus laevigata	+		
Crataegus monogyna	+		
Cytisus nigricans		+	
Cytisus scoparius		+	
Daphne cneorum			+
Daphne mezereum		+	
Empetrum nigrum		+	
Erica carnea			+
Erica cinerea			+
Erica tetralix		+	
Euonymus europaeus	+		
Genista sagittalis		+	
Genista tinctoria		+	
Hippophae rhamnoides		+	
Ilex aquifolium		+	
Ledum palustre			+
Ligustrum vulgare		+	
Lonicera caerulea			+
Lonicera xylosteum		+	
Mespilus germanica			+
Myrica gale			+
Prunus mahaleb		+	
Prunus padus		+	
Prunus spinosa	+		
Rhamnus catharticus		+	
Rhamnus frangula	+		
Ribes alpinum		+	
Rosa arvensis		+	
Rosa canina	+	+	
Rosa gallica		+	

Genus/species/variety	Found everywhere	Found in regions	Found in special areas
Rosa glauca		+	
Rosa pimpinellifolia		+	+
Rosa rubiginosa		+	
Rubus fruticosus	+	+	+
Rubus idaeus	+		
Salix aurita	+		+
Salix cinerea	+		
Salix daphnoides and varieties			
Salix elaeagnos			
Salix purpurea	+		
Salix repens and varieties			+
Salix rosmarinifolia			
Salix smithiana		+	
Salix triandra			
Salix viminalis	+		
Sambucus nigra	+		
Sambucus racemosa		+	
Ulex europaeus			+
Vaccinium vitis-idaea		+	
Viburnum lantana		+	
Viburnum opulus	+		
3. Climbers			
Clematis alpina			+
Clematis vitalba		+	
Hedera helix	+		
Lonicera caprifolium		+	
Lonicera periclymenum		+	
Rosa arvensis		+	
Rubus fruticosus	+	+	+
4. Conifers			
Juniperus communis		+	
Juniperus sabina			+
Larix decidua			+
Picea abies		+	
Pinus cembra			+
Pinus mugo			+
Pinus sylvestris		+	
Taxus baccata		+	

40 - Freely growing indigenous hedges

For natural hedges, both in open landscapes and in settled areas, plants are needed that like light and warmth, tolerate drought and wind, and shoot proliferously. Most of the species named form such a dense canopy of leaves that no weeds can grow under the hedges. Perennials are useful only at the edges where more light enters.

Genus/species/variety	Height in m	Likes light	Tolerates shade	Thorns, prickles	Good for birds
1. Deciduous trees					
<i>Acer campestre</i>	8-12	+	+		+
<i>Carpinus betulus</i>	5-20	+	+		+
<i>Fraxinus excelsior</i>	20-35	+			
<i>Malus sylvestris</i>	5-10	+	+	+	+
<i>Populus tremula</i>	10-15	+	-		
<i>Prunus avium</i>	15-20	+			+
<i>Prunus padus</i>	3-10	+	+		+
<i>Quercus petraea</i>	20-35	+	+		+
<i>Quercus robur</i>	30-35	+	+		+
<i>Rhamnus catharticus</i>	2-3	+	+	+	+
<i>Salix caprea</i>	3-8	+	-		
<i>Sorbus aucuparia</i>	5-10	+	+		
<i>Ulmus carpinifolia</i>	25-35	+			
2. Shrubs					
<i>Amelanchier ovalis</i>	1-3	+	-		+
<i>Berberis vulgaris</i>	1-3	+	+	+	+
<i>Cornus mas</i>	3-6	+	+		+
<i>Cornus sanguinea</i>	1-5	+	+		+
<i>Corylus avellana</i>	4-6	+	+		+
<i>Crataegus laevigata</i>	2-5		+	+	+
<i>Crataegus monogyna</i>	2-6	+	+		+
<i>Euonymus europaeus</i>	2-6	+	+		+
<i>Ilex aquifolium</i>	2-5	-	+	+	+
<i>Ligustrum vulgare</i>	2-5	+	+		+
<i>Lonicera caerulea</i>	0,5-1,5	-	+		+
<i>Lonicera xylosteum</i>	1-2		+		+
<i>Prunus mahaleb</i>	3-6	+			+
<i>Prunus spinosa</i>	1-3	+	-	+	+
<i>Rhamnus catharticus</i>	2-3	+	+	+	+
<i>Rhamnus frangula</i>	2-5	+	+		+
<i>Rosa canina</i>	1-3	+	+	+	+
<i>Rosa gallica</i>	0,5-1	+		+	+
<i>Rosa glauca</i>	1-3	+	-	+	+
<i>Rosa pimpinellifolia</i>	0,5-2	+	-	+	+
<i>Rosa rubiginosa</i>	2-3	+	-	+	+
<i>Rubus fruticosus</i>	1-2	+	+	+	+
<i>Sambucus nigra</i>	2-7	+	+		+
<i>Viburnum lantana</i>	2-4	+	+		+
<i>Viburnum opulus</i>	2-4		+		+
3. Climbers					
<i>Clematis vitalba</i>	5-15	+	+		+
<i>Lonicera caprifolium</i>	2-5		+		+
<i>Lonicera periclymenum</i>	1-3		+		+
<i>Rubus fruticosus</i>	1-2	+	+	+	+

Apicultural plants are good for honey production and feeding the honeybees and wild bees. This list concerns the flower nectar and pollen, but also the honeydew.

Genus/species/variety	Nectar	Pollen	Honeydew
1. Deciduous trees			
Acer campestre	++		*
Acer platanoides	++	+	*
Acer pseudoplatanus	+++	+	*
Aesculus hippocastanum	++	+	*
Aesculus carnea	++	+	*
Alnus species		++	*
Betula species		+	*
Carpinus betulus			*
Castanea sativa	++	+	*
Euodia hupehensis	+++		
Fagus sylvatica		++	*
Fraxinus excelsior		+	*
Juglans regia		+	*
Malus species and varieties	+++	+++	
Populus species and varieties		++	*
Prunus species and varieties	+++	+++	*
Prunus padus	+	+	
Pyrus species and varieties	+	++	
Quercus petraea		+	*
Quercus robur		++	*
Rhamnus catharticus	+		
Robinia species and varieties	+++	+	*
Sophora japonica	++	+	
Sorbus aria	+		
Sorbus aucuparia	++	++	
Sorbus domestica	++	++	
Sorbus torminalis	++	++	
Salix species and varieties	+++	+++	
Tilia cordata	+++		*
Tilia platyphyllos	++		*
Tilia europaea	++		*
Ulmus carpiniifolia		++	
Ulmus glabra		++	*
Ulmus hybrids		++	*
Ulmus laevis		++	*
2. Shrubs			
Amelanchier species and varieties	+		
Berberis species and varieties	+		
Buddleja species and varieties	+		

Explanation of symbols: +++ = very suitable / ++ = quite suitable / + = recommended / * = proliferous

continued on next page

41 - Plants for bees

continued

Genus/species/variety	Nectar	Pollen	Honeydew
Buxus sempervirens varieties	+		
Calluna vulgaris varieties	+++		
Caryopteris species and varieties	+		
Cornus sanguinea	+		
Cornus mas	++	+	
Corylus species and varieties		++	*
Cotoneaster species and varieties	++		
Crataegus species and varieties	+	+	
Cytisus species and varieties	+	+	
Elaeagnus species and varieties	+		
Erica species and varieties	++	++	
Euonymus europaeus	+		
Ligustrum vulgare	+		
Lonicera xylosteum	+		
Lycium barbarum	+	+	
Malus-hybrids varieties	+++	+++	
Mespilus germanica	+		
Prunus species and varieties	+	+	
Rhamnus catharticus	+		
Rhamnus frangula	++	+	
Ribes species	+		
Rosa species and varieties		++	
Rubus fruticosus	++	++	
Rubus idaeus	+++	++	
Salix species and varieties	+++	+++	
Sambucus nigra	+	++	*
Spiraea species and varieties	+		
Viburnum species and varieties	+		
3. Conifers			
Larix decidua		+	*
Picea abies			*
Pinus sylvestris			*
Taxus baccata		+	

Explanation of symbols: +++ = very suitable / ++ = quite suitable / + = recommended / * = proliferous

42 - Plants for birds

Almost all plant fruits are accepted by some type of bird, some by very many (such as Sambucus nigra or Sorbus aucuparia), others only by one type of bird (such as Lonicera xylosteum). The number of visiting birds is not, however, the only criterion for selection. Often, the birds are common and not picky about their feed. Plants that are only frequented by a few types of birds are also indispensable for the overall biological cycle. The plants listed here are very popular among many birds. The thorns and dense branching contribute to the protection of nests. This information is based on many years of observation in the test garden at Weißenstephan near Munich.

Genus/species/variety	Visited often	Thorns prickles	Preferred for nests
1. Deciduous trees			
Acer species and varieties	+		+
Alnus species and varieties	+		
Amelanchier species and varieties	++		
Betula species and varieties	+		
Carpinus betulus			+
Crataegus species and varieties	+	+	+
Fagus sylvatica	+		
Fagus sylvatica - cut			++
Malus species and varieties	+		
Morus species and varieties	+		
Prunus species and varieties	+		
Quercus species	+		
Robinia pseudoacacia		+	
Sorbus species and varieties	++		
Tilia species	+		
2. Shrubs			
Acer campestre - cut			++
Amelanchier species and varieties	++		+
Aronia species and varieties	+		
Berberis species and varieties	+	+	+
Carpinus betulus - cut			++
Chaenomeles species and varieties	+	+	
Cornus species and varieties	+		+
Corylus species and varieties	+		
Cotoneaster species and varieties	+		
Crataegus species and varieties	+	+	+
Crataegus monogyna - cut		+	++
Elaeagnus species and varieties	+	+	
Euonymus species and varieties	+		
Hippophae rhamnoides	+	+	+
Ilex species and varieties		+	+
Ligustrum species and varieties	+		+
Lonicera species and varieties	+		+
Lycium barbarum	+	+	
Mahonia species and varieties	+	+	
Malus species and varieties	+		
Photinia villosa	+		
Prunus species and varieties	++		
Prunus spinosa	+	+	++
Pyracantha hybrids varieties	++	+	+
Rhamnus species	+	+	
Ribes species and varieties	+	+	+

Explanation of symbols: ++ = visited very frequently / + = visited frequently

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42 - Plants for birds

continued

Genus/species/variety	Visited often	Thorns, prickles	Preferred for nests
Rosa species and varieties	+	+	+
Rubus species and varieties	+	+	++
Sambucus species	++		
Symphoricarpos Arten and varieties			+
Syringa vulgaris			+
Vaccinium species	+		
Viburnum species and varieties	+		
3. Climbers			
Clematis species and varieties			+
Euonymus fortunei varieties	+		+
Hedera species and varieties	+		+
Lonicera species and varieties	+		+
Parthenocissus species and varieties	+		+
Rosa - Kletterrosen	+	+	+
Rubus fruticosus	+	+	++
4. Conifers			
Abies species	+		+
Cedrus species and varieties	+		+
Chamaecyparis species and varieties			+
Juniperus species and varieties	+		+
Larix species	+		+
Picea species and varieties	+		+
Pinus species and varieties	+		+
Pseudotsuga menziesii caesia			+
Taxus species and varieties	+		+
Taxus baccata - cut			++
Thuja species and varieties			+
Tsuga species	+		+

Explanation of symbols: ++ = visited very frequently / + = visited frequently

43 - Plants to hold soil on embankments and slopes

Plants that hold top soil on embankments and slopes have to have a robust, intense root system, which should also be resistant to mechanical loads. Plants that form many runners are very useful. Incorrectly formed embankments or loose material cannot, however, be held together with plants alone. To do this, additional technical measures have to be taken.

Plants to hold soil on embankments and slopes - 43

A. In open landscapes

Genus/species/variety	Roots	Runners	Resistance to covering
1. Deciduous plants			
Acer campestre	intense		moderate
Acer platanoides	intense		moderate
Acer pseudoplatanus	deep		very good
Alnus glutinosa	very intense		very good
Alnus incana	very intense	++	very good
Berberis vulgaris	intense	+	very good
Betula pendula	very intense		sensitive
Carpinus betulus	intense		moderate
Clematis vitalba	intense		good
Cornus mas	intense		
Cornus sanguinea	very intense	+++	moderate
Corylus avellana	intense	+	good
Crataegus laevigata	intense		good
Crataegus monogyna	deep		good
Cytisus scoparius	deep		moderate
Fagus sylvatica	extremely intense		sensitive
Fraxinus excelsior	deep		good
Hedera helix	intense		good
Hippophae rhamnoides	deep	+++	good
Ligustrum vulgare	intense	+	very good
Lonicera xylosteum	intense		moderate
Malus sylvestris	intense	+	moderate
Populus alba varieties	very intense	+++	good
Populus canescens	very intense	+++	good
Populus tremula	very intense	+++	very good
Prunus padus	intense	+++	good
Prunus spinosa	intense	+++	good
Pyrus communis	deep	++	good
Quercus petraea	deep		good
Quercus robur	deep		good
Rhamnus catharticus	deep	+	good
Rhamnus frangula	intense	+	moderate
Rosa arvensis	deep		good
Rosa canina	deep	++	moderate
Rosa glauca	deep		good
Rosa pimpinellifolia	intense	+++	good
Rosa rubiginosa	deep		good
Rubus fruticosus	intense	+	good
Salix alba	intense		very good
Salix caprea	intense		very good
Salix cinerea	intense		very good
Salix elaeagnos	intense		very good
Salix fragilis	very intense		very good
Salix purpurea	deep		very good

Explanation of symbols: +++ = very strong / ++ = strong / + = slight

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43 - Plants to hold soil on embankments and slopes

continued

Genus/species/variety	Doots	Runners	Resistance to covering
Salix triandra	intense		very good
Salix viminalis	intense		very good
Sambucus nigra	intense	+	very good
Sambucus racemosa	intense		very good
Sorbus aucuparia	intense	+	good
Rubus idaeus	intense	++	very good
Tilia cordata	very intense		sensitive
Ulmus carpinifolia	intense	+	moderate
Ulmus glabra	very intense		moderate
Viburnum lantana	intense		good
Viburnum opulus	intense	+	good
Vinca major	intense		good
2. Conifers			
Abies alba	deep		good
Larix decidua	deep		good
Pinus sylvestris	deep		good

Explanation of symbols: +++ = very strong / ++ = strong / + = slight

The following list is for alternative and complementary beds in urban areas. Basically, indigenous species are preferred for such tasks within settlements. Extreme local conditions that indigenous forest trees and shrubs cannot handle justify resorting to foreign plants.

B. In settled areas

Genus/species/variety	Durchwurzlung	Ausläuferbildung	Verschüttungsresistenz
1. Deciduous plants			
Acer negundo	intense		moderate
Acer saccharinum	very intense		good
Ailanthus altissima	intense	+++	good
Alnus cordata	intense		good
Alnus spaethii	intense		good
Amelanchier lamarckii	intense		moderate
Berberis ottawensis varieties	intense		very good
Buddleja davidii varieties	deep		good
Cercis siliquastrum	intense	++	moderate
Chaenomeles hybrids	intense	+	moderate
Caragana arborescens	deep		good
Cornus alba	intense		good
Cornus stolonifera 'Flaviramea'	very intense	++	good
Cotinus coggygria	intense		moderate

Explanation of symbols: +++ = very strong / ++ = strong / + = slight

Plants to hold soil on embankments and slopes - 43

Genus/species/variety	Roots	Runners	Resistance to covering
Cotoneaster species	intense		good
Crataegus coccinea	deep		good
Crataegus lavallei 'Carrierei'	deep		good
Elaeagnus angustifolia	very intense		good
Elaeagnus commutata	very intense	+++	good
Forsythia varieties	intense		very good
Gaultheria shallon	very intense	+++	sensitive
Hypericum calycinum	intense	+++	moderate
Ligustrum ovalifolium	intense		good
Lonicera japonica repens	intense		moderate
Lonicera ledebourii	intense		good
Lycium barbarum	intense		good
Philadelphus coronarius	intense		good
Physocarpus opulifolius	intense		moderate
Platanus acerifolia	very intense		very good
Populus balsamifera	very intense		very good
Populus berolinensis	very intense	++	very good
Populus canadensis	very intense		very good
Potentilla fruticosa	intense		moderate
Prunus serotina	intense		moderate
Pterocarya fraxinifolia	extremely intense	+++	good
Quercus rubra	very intense		sensitive
Ribes divaricatum	intense		good
Robinia pseudoacacia	extremely intense	+++	moderate
Rosa carolina	intense	+++	moderate
Rosa multiflora	intense		good
Rosa nitida	intense	+++	good
Rosa rugosa	intense	+++	good
Rosa rugotida	very intense	+++	good
Symphoricarpos species	very intense	++	good
Syringa vulgaris		++	good
2. Conifers			
Larix kaempferi	deep		moderate
Metasequoia glyptostroboides	very intense		moderate
Pinus nigra	deep		good

Explanation of symbols: +++ = very strong / ++ = strong / + = slight

44 - Plants for biological engineering methods

Layers of bushes are used to secure embankments, dams, and slopes. The branches of strong-shooting plants are introduced.

Layers of hedges are used in similar ways. For this, plants are needed that are known to form adventive roots and known for their obvious resistance to covering with soil. This, however, is often only seen with young plants.

(Literature: M. SCHIECHTL, 1973; U. SCHLÜTER, 1986)

Genus/species/variety	Bush layers	Hedge layers	Cuttings, etc
1. Trees			
Acer campestre (i)		+	
Acer negundo		+	
Acer pseudoplatanus (i)		+	
Acer saccharinum		+	
Aesculus hippocastanum		+	
Ailanthus altissima			+
Alnus glutinosa (i)		+	
Alnus incana (i)	+	+	+
Betula pendula (i)		+	
Carpinus betulus (i)		+	
Castanea sativa (i)		+	
Fraxinus excelsior (i)		+	
Fraxinus ornus		+	
Populus alba (i)		+	
Populus canescens (i)		+	
Populus nigra (i)	+	+	+
Populus tremula (i)		+	
Prunus mahaleb (i)		+	
Prunus padus (i)		+	
Prunus serotina		+	
Quercus robur (i)		+	
Quercus rubra		+	
Rhus typhina		+	
Salix alba (i) varieties	+		+
Salix caprea (i)		+	
Salix daphnoides (i) varieties	+		+
Salix fragilis (i)	+	+	+
Salix matsudana 'Tortuosa'	+		+
Sorbus aria (i)		+	
Sorbus aucuparia (i)		+	
Ulmus glabra (i)		+	

Explanation of symbol: (i) = indigenous

Genus/species/variety	Bush layers	Hedge layers	Cuttings, etc.
2. Shrubs			
Berberis vulgaris (i)			+
Caragana arborescens		+	
Cornus alba		+	
Cornus mas (i)		+	
Cornus sanguinea (i)		+	
Corylus avellana (i)		+	
Cotoneaster acutifolius		+	
Cotoneaster multiflorus		+	
Crataegus monogyna (i)		+	
Euonymus europaeus (i)		+	
Forsythia intermedia			+
Hippophae rhamnoides (i)		+	
Ligustrum vulgare (i)	+	+	
Lonicera xylosteum (i)			+
Lycium barbarum			+
Prunus mahaleb (i)		+	
Prunus spinosa (i)		+	
Rhamnus catharticus (i)		+	
Rhus typhina		+	
Rosa arvensis (i)		+	
Rosa canina (i)		+	
Rosa rubiginosa (i)		+	
Rosa rugosa		+	
Salix aurita (i)	+	+	+
Salix balsamifera mas	+	+	+
Salix caprea (i)		+	
Salix cinerea (i)	+	+	+
Salix daphnoides (i) varieties	+	+	+
Salix elaeagnos (i)	+	+	+
Salix hastata (i)			+
Salix purpurea (i) varieties	+	+	+
Salix repens (i) varieties	+		+
Salix rosmarinifolia (i)	+		+
Salix smithiana (i)		+	+
Salix triandra (i)	+	+	+
Salix viminalis (i)	+	+	+
Sambucus nigra (i)		+	
Sambucus racemosa (i)		+	
Syringa vulgaris		+	
Viburnum lantana (i)		+	
Viburnum opulus (i)		+	
3. Climbers			
Clematis vitalba (i)		+	
Rosa arvensis (i)		+	
Rubus caesius in types (i)			+
Rubus fruticosus in types (i)			+

Explanation of symbol: (i) = indigenous

45 - Nitrogen-collecting plants

Many plants live symbiotically with bacteria that collect nitrogen (such as Lupine) or actinobacillosis (such as sea buckthorn). The activity of these micro-organisms binds the nitrogen in the air and enriches the soil with the metabolism of the roots of these higher plants. This behaviour is, above all, advantageous in sterile or poor soil for initial planting to facilitate the settlement of other plants later on.

Note:

Initial fertilisation will lead to the exact opposite effect for the plants listed as the micro-organisms that collect nitrogen become lazy and no longer actively produce nitrogen. Fertilisation may even lead to depressed habits.

The nitrogen compounds produced are not always good for the following plants. The nitrogen produced by Robinias, for instance, hampers beeches and birches while it helps elders, nettles, and others.

Genus/species/variety	Wide local range	Narrow local range
1. Trees		
Alnus species and varieties	+	
Cercis siliquastrum		+
Hippophae rhamnoides	+	
Laburnum species and varieties	+	
Robinia pseudoacacia	+	
Sophora japonica	+	
2. Shrubs		
Arctostaphylos uva-ursi		+
Caragana arborescens	+	
Ceanothus species and varieties	+	
Cercis siliquastrum		+
Colutea arborescens		
Cytisus species and varieties		+
Elaeagnus species and varieties	+	
Genista species and varieties		+
Hippophae rhamnoides	+	
Laburnum species and varieties	+	
Lespedeza thunbergii		+
Myrica gale		+

46 - Pumping plants

Pumping plants are used to drain damp areas biologically when the source of the water is local and limited. To do so, trees and shrubs are needed that have high rates of evaporation with usually large leaf laminae and a high water consumption during the vegetation period.

1. Trees

Acer negundo
 Acer platanoides
 Acer pseudoplatanus
 Acer saccharinum
 Aesculus hippocastanum
 Alnus glutinosa
 Alnus incana
 Alnus spaethii
 Fraxinus excelsior
 Juglans nigra
 Populus alba varieties
 Populus canadensis varieties
 Populus canescens
 Populus nigra varieties
 Prunus padus
 Salix alba varieties
 Salix caprea
 Salix fragilis
 Ulmus species and varieties

2. Shrubs

Euonymus europaeus
 Physocarpus opulifolius
 Prunus padus
 Rhamnus frangula
 Salix acutifolia 'Pendulifolia'
 Salix aurita
 Salix caprea
 Salix cinerea
 Salix smithiana
 Salix viminalis
 Sambucus canadensis
 Sambucus nigra
 Sorbaria sorbifolia
 Viburnum opulus

Village and courtyard trees - 47

A number of central European and naturalised species have long been used in landscapes or settlements with regional and traditional variations and preferences. In the course of the development of the settlement, traditional tree types have been replaced by new tree types. Within the framework of urban renewal projects, the traditional tree types are being used more and more.

Genus/species/variety	Conspicuous flowers	Genus/species/variety	Conspicuous flowers
1. Deciduous trees		Quercus robur	
Acer platanoides	+	Robinia pseudoacacia	+
Acer pseudoplatanus		Salix alba	
Aesculus hippocastanum	+	Salix daphnoides 'Praecox'	+
Alnus glutinosa		Salix fragilis	
Alnus incana		Sorbus aucuparia	+
Betula pendula		Sorbus domestica	+
Carpinus betulus		Sorbus intermedia	+
Castanea sativa	+	Tilia cordata	+
Crataegus laevigata 'Paul's Scarlet'		Tilia platyphyllos	+
Fagus sylvatica		Tilia europaea	+
Fraxinus excelsior		Ulmus carpiniifolia	
Juglans regia		Ulmus glabra	
Malus varieties	+	Ulmus laevis	
Populus alba varieties			
Populus canescens		2. Conifers	
Populus nigra		Larix decidua	
Prunus avium	+	Picea abies	
Pyrus communis varieties	+	Pinus sylvestris	
Quercus petraea			

48 - Ground-covering plants

Flat-growing plants that spread quickly are used as quick, long-lasting, and low-maintenance greenery for large areas. Ground-covering varieties should not be mixed among themselves, though, as they may suppress each other reciprocally if both are strong competitors. Good varieties are those that spread with layers (shoots above ground that take root upon contact with the ground) or runners (subterranean root sprouts). The larger or denser the leaves, the better the cover. Small or fine-leaf ground-covering plants should not be used for large areas as they require too much care.

If the plan calls for the planting of new shrubs and trees in areas with existing ground-covering plants, the quick development and competitiveness of the plants must be kept in mind. Experience has shown that only large shrubs or trees survive. Small ones are often no match for the ground-covering plants, which smother or cripple them. This is especially true for the "invasive ones", i.e. ground-covering plants such as dwarf bamboo that grow rampantly through the root systems of other plants.

Note:

The indications of growth rate are taken from comparison with *Cotoneaster dammeri* 'Skogholm', the strongest growing ground-covering plant of all.

Genus/species/variety	Leaves	Runners	Layers	Growth rate	Number/ m ²
1. Deciduous plants					
<i>Arctostaphylos uva-ursi</i>	e		+	moderate	3-5
<i>Berberis buxifolia</i> 'Nana'	e			slight	6-9
<i>Berberis candidula</i>	e			slight	3-5
<i>Berberis frikartii</i> 'Verrucandi'	e			moderate	3-5
<i>Berberis thunbergii</i> 'Atropurpurea Nana'	sg			slight	6-9
<i>Berberis verruculosa</i>	e			moderate	3-5
<i>Buxus sempervirens arborescens</i>	e			slight	16-40
<i>Calluna vulgaris</i> varieties	e	+	+	slight	9-16
<i>Chaenomeles hybrids</i>	sg	+	+	moderate	1-3
(= <i>C. superba</i>) varieties	sg	+	+		
<i>Cornus canadensis</i>	sg	+		slight	9-16
<i>Cornus stolonifera</i> 'Kelsey'	sg		+	moderate	3-5
<i>Cotoneaster adpressus</i>	sg		+	slight	6-9
<i>Cotoneaster dammeri</i> varieties	se - e		+	slight/strong	3-12
<i>Cotoneaster horizontalis</i>	sg		+	strong	1-3
<i>Cotoneaster microphyllus</i> 'Cochleatus'	e		+	slight	3-5
<i>Cotoneaster praecox</i>	sg		+	slight	3-6
<i>Cotoneaster salicifolius</i> 'Parkteppich'	se - e		+	moderate	
<i>Cytisus beanii</i>	sg		+	slight	3-6
<i>Cytisus decumbens</i>	sg		+	slight	5-6
<i>Cytisus kewensis</i>	sg			slight	
<i>Cytisus purpureus</i>	sg		+	slight	3-6
<i>Daboecia</i> species and varieties	e		+	slight	9-12
<i>Daphne cneorum</i>	e		+	slight	4-6
<i>Deutzia gracilis</i>	sg			slight	3-5
<i>Empetrum nigrum</i>	e		+	moderate	5-9
<i>Erica carnea</i> varieties	e		+	slight	12-16
<i>Erica vagans</i> varieties	e		+	slight	9-12
<i>Euonymus fortunei</i> varieties	e		+	slight	3-12

Explanation of symbols: sg = summer green / se = semi-evergreen / e = evergreen

Ground-covering plants - 48

Genus/species/variety	Belaubung	Runners	Layers	Growth rate	Number/ m ²
Gaultheria procumbens	e	+	+	moderate	9-16
Gaultheria shallon	e	+		strong	4-6
Genista lydia	sg			slight	4-6
Genista radiata	sg			slight	3-5
Genista sagittalis	sg	+		slight	9-16
Hedera helix varieties	e		+	slight	3-9
Hypericum calycinum	se - e	+		strong	6-9
Hypericum 'Hidcote'	se - e			moderate	3-5
Hypericum moserianum	wi				5-6
Ilex crenata varieties	ie		+	slight/moderate	3-6
Kerria japonica	so	+		moderate	3-5
Lavandula angustifolia varieties	e			slight	5-9
Ledum palustre	e			slight	3-5
Leucothoe walteri	e	+	+	moderate	3-6
Ligustrum vulgare 'Lodense'	se			slight	5-8
Lonicera japonica repens	se - e		+	strong	2-4
Lonicera nitida 'Elegant'	se - e			moderate	3-5
Lonicera nitida 'Maigrün'	se - e			slight	4-6
Lonicera pileata	se		+	moderate	3-5
Pachysandra terminalis	e	+		moderate	9-16
Pleioblastus pumilis	e	+		strong	1-3
Potentilla fruticosa varieties	sg		+	slight/strong	3-6
Prunus laurocerasus varieties	e			strong	1
Pyracantha 'Red Cushion'	se - e			strong	1-2
Rhododendron carolinianum varieties	e			slight	2-4
Rhododendron Diamant Azaleas	se			slight	3-5
Rhododendron-Impeditum-hybrids	e			slight	3-6
Rhododendron keleticum	e			slight	4-6
Rhododendron 'Radistrotum'	e			slight	6-8
Rhododendron radicans	e			slight	6-8
Rhododendron Repens hybrids	e			slight	6-8
Rhododendron Yakushmanum hybrids	e			slight	3-6
Ribes alpinum 'Schmidt'	sg		+	moderate	3-5
Rosa nitida	sg	+		moderate	3-6
Rosa rugotida	sg	+		strong	2-5
Rosa - ground cover rose varieties	sg		+	moderate/strong	1-4
Rubus calycinoides	sg		+	moderate	5-7
Rubus fruticosus	sg-we	+	+	strong	1-3
Salix purpurea 'Pendula'	sg		+	strong	1-2
Salix repens argentea	sg		+	moderate	3-5
Salix rosmarinifolia	sg		+	moderate	2-3
Sasa veitchii	e	+		strong	3-5
Spiraea betulifolia 'Tor'	sg			slight	3-5
Spiraea bumalda varieties	sg			moderate	2-4

Explanation of symbols: sg = summer green / se = semi-evergreen / e = evergreen

continued on next page

48 - Ground-covering plants

continued

Genus/species/variety	Leaves	Runners	Layers	Growth rate	Number/ m ²
Spiraea decumbens	sg		+	slight	9-12
Spiraea japonica varieties	sg			slight/moderate	3-8
Stephanandra incisa 'Crispa'	sg			moderate	4-6
Symphoricarpos chenaultii 'Hancock'	sg		+	strong	1-3
Vaccinium macrocarpon	e		+	slight	6-9
Vaccinium vitis-idaea varieties	e	+		slight	8-12
Viburnum davidii	e		+	slight	3-5
Vinca major	e		+	strong	5-7
Vinca minor varieties	e		+	slight	10-15
2. Conifers					
Juniperus communis 'Hornibrookii'	e			strong	1
Juniperus communis 'Repanda'	e			moderate	1-2
Juniperus horizontalis varieties	e		+	moderate	2-5
Juniperus sabina 'Tamariscifolia'	e			moderate	3-5
Pinus mugo pumilio	e			moderate	2-3
Taxus baccata 'Repandens'	e			moderate	1-2

Explanation of symbols: sg = summer green / se = semi-evergreen / e = evergreen

49 - Hedges, espaliers, and borders

Trimmed hedges and tall hedges take up little space as living fences and borders. Hedges and trained espaliers are used to provide greenery against the facades of buildings instead of, or in addition to, vines and other climbers. Borders bring a geometrical order to farm and front gardens, and cemetery plantings, and can be used to enclose small areas.

Number per linear meter (single row):

Number per linear meter (single row)		Height (cm)					Number per m
		100-125	125-150	150-175	175-200	200-250	
1. Tall hedge	2xtr	100-125	125-150	150-175	175-200	200-250	2-3
2. Espalier hedge	2xtr	40-60	60-100				3-4
3. Normal hedge	2xtr	80-100	100-125	125-150	150-175		4-5
4. Border - high	2xtr	30-40	40-60	60-80	60-100	80-100	3-7
5. Border - low	2xtr	15-20	20-25	25-30	30-40	40-50	5-8

Hedges, espaliers, and borders - 49

Genus/species/variety	Tall hedge	Espalier hedge	Normal hedge	Border
1. Deciduous trees				
Acer campestre	+		+	
Carpinus betulus	+	+	+	
Crataegus species and varieties	+		+	
Fagus sylvatica varieties	+		+	
Malus species and varieties		+		
Platanus acerifolia	+			
Quercus cerris			+	
Quercus petraea	+		+	
Quercus robur	+	+	+	
Robinia hispida 'Macrophylla'		+		
Sorbus aria		+		
Tilia cordata	+	+	+	
Tilia flavescens 'Glenleven'	+			
Tilia platyphyllos	+	+	+	
Tilia europaea	+	+	+	
2. Deciduous shrubs				
Berberis species and varieties			+	+
Buddleja Davidii-hybrids		+		
Ceanothus species and varieties		+		
Chaenomeles species and varieties		+	+	
Cornus mas			+	
Cotoneaster species and varieties		+	+	+
Crataegus species and varieties			+	
Deutzia gracilis				+
Escallonia species and varieties		+	+	
Forsythia species and varieties		+	+	
Hydrangea quercifolia		+		
Ligustrum species and varieties		+	+	+
Lonicera tatarica			+	
Lonicera xylosteum			+	
Magnolia liliiflora varieties		+		
Magnolia soulangiana varieties		+		
Malus hybrids varieties		+		
Potentilla fruticosa varieties			+	+
Prunus cerasifera 'Nigra'		+	+	
Prunus spinosa			+	
Ribes sanguineum varieties		+		
Ribes species and varieties			+	+
Rosa species and varieties		+		
Spiraea bumalda varieties				+
Spiraea japonica varieties				+

continued on next page

49 - Hedges, espaliers, and borders

continued

Genus/species/variety	Tall hedge	Espalier hedge	Normal hedge	Border
Symphoricarpos albus laevigatus			+	
Syringa chinensis			+	
Syringa hyacinthiflora varieties		+		
Syringa vulgaris			+	
3. (Semi-) Evergreen shrubs				
Berberis species and varieties			+	+
Buxus sempervirens varieties	+		+	+
Ceanothus species and varieties		+		
Cotoneaster species and varieties		+	+	+
Elaeagnus species and varieties		+		
Euonymus fortunei 'Vegetus'		+	+	+
Ilex species and varieties	+		+	+
Lavandula angustifolia				+
Ligustrum species and varieties		+	+	+
Lonicera nitida varieties		+	+	+
Lonicera pileata				+
Mahonia aquifolium			+	+
Osmanthus heterophyllus		+	+	
Prunus laurocerasus varieties		+	+	
Pyracantha hybrids varieties		+	+	+
Viburnum burkwoodii		+		
Viburnum 'Pragense'		+		
Viburnum rhytidophyllum		+		
Viburnum tinus			+	+
4. Conifers				
Chamaecyparis species and varieties	+		+	
Cupressocyparis leylandii varieties	+		+	
Ginkgo biloba		+		
Juniperus chinensis varieties	+		+	
Juniperus communis varieties			+	
Juniperus virginiana			+	
Larix species	+		+	
Metasequoia glyptostroboides	+		+	
Picea abies	+		+	
Picea omorika			+	
Pinus mugo			+	+
Taxus baccata	+		+	
Thuja occidentalis varieties	+		+	+
Thujopsis dolabrata			+	
Tsuga canadensis			+	

Climbers need support or walls to develop optimally. Dimensions and appearance depend on the shape of the climbing aids. According to the type of climbing, two main groups can be distinguished:

A. Trellis climbers

B. Self climbers.

Both groups are further subdivided according to the climbing method.

Genus/species/variety	Leaves	Flowers	Fruit	Height in m
A. Trellis climbers				
1. Twining climbers				
Actinidia arguta	sg	white	green, sweet	3-6
Actinidia chinensis (= A. deliciosa)	sg	white	brown, sweet	
Actinidia kolomikta	sg	white	green	
Akebia quinata	sg-se	pink	green, sweet	4-6
Aristolochia macrophylla	sg	brown	green, poisonous	8-10
Celastrus orbiculatus	sg	green	yellow-orange	8-12
Humulus lupulus	sg	green	green	3-8
Lonicera japonica repens	se-e	white	red	2-3
Lonicera brownii 'Dropmore Scarlet'	sg	orange	orange	2-3
Lonicera caprifolium	sg	white	red	2-5
Lonicera heckrottii	sg	pink	red	2-4
Lonicera henryi	e	yellow	blue	5-7
Lonicera periclymenum	sg	white	red	1-5
Lonicera tellmanniana	sg	yellow	orange	4-6
Polygonum aubertii	sg	white	white	8-15
Wisteria floribunda	sg	blue	green	6-8
Wisteria sinensis	sg	blue	green	6-15
2. Sarmentous plants without suction pads				
Clematis alpina varieties	sg	blue	silvery	1-2
Clematis hybrids varieties	sg	many	silvery	2-4
Clematis macropetala varieties	sg	many	silvery	2-3
Clematis maximowicziana	sg	white	silvery	5-8
Clematis montana varieties	sg	white	silvery	5-8
Clematis montana 'Rubens'	sg	pink	silvery	3-10
Clematis orientalis 'Orange Peel'	sg	yellow	silvery	3-5
Clematis tangutica	sg	yellow	silvery	4-6
Clematis texensis varieties	sg	pink	silvery	1-1,5
Clematis vitalba	sg	white	silvery	10-20
Clematis viticella varieties	sg	blue	silvery	2-5
Vitis coignetiae	sg	green	black	6-8
				2-5
3. Splayed climbers				
Jasminum nudiflorum	sg	yellow	-	2-3
Rosa arvensis	sg	white	orange-red	1-2
Rosa - Kletterrosen	sg	red		2-3
Rubus fruticosus	sg-se	white	black	1-3
Rubus henryi	e	pink	black	2-3

Explanation of symbols: sg = summer green (no leaves in winter) / se = semi-evergreen / e = evergreen

continued on next page

50 - Climber

continued

Genus/species/variety	Leaves	Flowers	Fruits	Height in m
B. Self climbers				
1. Plants with suction pads				
Parthenocissus quinquefolia	sg	green	black	10-15
Parthenocissus quinquefolia 'Engelmannii'	sg	green	black	15-18
Parthenocissus tricuspidata 'Veitchii'	sg	green	black	15-18
2. Climbers with suction roots				
Campsis radicans	sg	red	green	6-15
Campsis radicans 'Flava'	sg	yellow	green	4-5
Campsis tagliabuana 'Mme Galen'	sg	red		3-5
Euonymus fortunei radicans	e		-	2-5
Euonymus fortunei 'Vegetus'	e	green	orange	3-6
Euonymus fortunei varieties	e		orange	1-3
Hedera colchica	e	yellow	black	6-8
Hedera helix	e	yellow	black	10-20
Hedera helix 'Woerner'	e	yellow	black	10-15
Hedera helix hibernica	e	yellow	black	5-20
Hydrangea petiolaris	sg	white	brown	8-12

Explanation of symbols: sg = summer green (no leaves in winter) / se = semi-evergreen / e = evergreen

51 - Plants for roof garden with good maintenance

This selection is only for roof gardens in unprotected areas exposed to wind. For a selection of plants for protected roof gardens or courtyards, no special sensitivities need be considered thanks to the protection provided by the building on all sides.

For a special selection:

1. select plants with several stems as they withstand wind pressure and turbulence better than single-stem plants,
2. loose crowns that allow air to pass instead of compact trees or shrubs which have great wind resistance,
3. small-leaf varieties are damaged less than large-leaf ones,
4. do not use plants that break easily,
5. do not use plants that have aggressive roots (such as Hippophae) lest they take advantage of errors in the use of insulation sheets,
6. do not set up a luxurious supply of nutrients for the higher the soil moisture and amount of nutrients, the flatter the roots and the more luxurious the parts above ground will be.

Note:

The habit sizes and limitations listed here concern the response of the plants to roof gardens and are not identical to behaviour on level ground!

Almost all climbers are useless on roof gardens as they are too sensitive to wind. Usually they do not accept the supports, but rather wind their way into other plants. Climbing aids should be very stable. Climbing plants that have fallen down have to be cut back hard to further new shoots as old shoots no longer climb. The base of the plant has to be in the shade.

(For further information, see publications by KIERMEIER, P., KOLB/SCHWARZ, KRUPKA, B., LIESECKE/LÖSKEN etc., various editions)

Plants for roof garden with good maintenance - 51

Genus/species/variety	Height (m)	Limitations
1. Deciduous trees and Large shrubs		
Acer campestre	3 - 10	-
Acer ginnala	3 - 6	-
Acer neglectum 'Annae'	6 - 10	may be too big
Amelanchier laevis	3 - 5	Flower not wind resistant
Amelanchier lamarckii varieties	3 - 5	-
Cornus mas	3 - 6	-
Corylus avellana	3 - 5	sensitive when exposed to wind
Crataegus lavalleyi 'Carrierei'	5 - 8	-
Crataegus coccinea	5 - 7	-
Crataegus crus galli	5 - 7	-
Fraxinus ornus varieties	4 - 8	very sensitive to frost, flower not wind resistant
Philadelphus inodorus grandiflorus	3 - 4	Flower not wind resistant, needs thinning out
Physocarpus opulifolius	3 - 4	-
Prunus mahaleb	3 - 6	many seedlings
Prunus serotina	5 - 10	troublesome seedlings
Pyrus salicifolia	4 - 6	sensitive to frost, Flower not wind resistant
Salix acutifolia 'Pendulifolia'	4 - 6	break easily, cut back to keep young
Salix caprea	3 - 6	flowers brown from July on during droughts
Sorbus aria varieties	5 - 8	-
Sorbus aucuparia	5 - 8	loses its leaves early during drought
Sorbus hybrida 'Gibbsii'	4 - 6	early leaf loss due to stagnant dampness
Sorbus intermedia	8 - 10	may be too big
2. Medium to large shrubs		
Berberis ottawensis 'Superba'	2 - 4	-
Berberis thunbergii varieties	0,5 - 2	lose their leaves early during droughts
Buddleja alternifolia	2 - 3	very overhanging, sensitive to frost
Buddleja Davidii-hybrids	1 - 2	sensitive to frost, cut back yearly
Buxus sempervirens 'Bullata'	1 - 2	occasionally sensitive to frost
Chaenomeles Arten and varieties	1 - 2	flowers not wind resistant
Cornus alba	2 - 3	-
Cornus alba 'Sibirica'	1 - 2	-
Cornus stolonifera 'Kelsey'	0,5 - 1	not in hot, dry areas
Cotinus coggygria	2 - 3	sensitive to frost
Cotoneaster bullatus	2 - 3	occasionally sensitive to frost
Cotoneaster dielsianus	1 - 2	-
Cotoneaster divaricatus	1 - 2	-
Cotoneaster acutifolius	1 - 2	-
Cotoneaster multiflorus	1 - 2	occasionally sensitive to frost
Cotoneaster praecox	1 - 1,5	occasionally sensitive to frost
Deutzia species and varieties	0,5 - 2	not in hot, dry areas
Euonymus alatus	0,2 - 2	not in hot, dry areas
Hypericum 'Hidcote'	0,5 - 1	sensitive to frost, cut back yearly

continued on next page

51 - Plants for roof garden with good maintenance

continued

Genus/species/variety	Height (m)	Limitations
Hypericum patulum henryi	0,5 - 1	sensitive to frost, cut back yearly
Ilex meserveae varieties	1 - 2	sensitive to frost, may lose all their leaves
Kerria japonica varieties	1 - 2	sensitive to frost
Kolkwitzia amabilis	2 - 3	age quickly, thin out often
Ligustrum obtusifolium regelianum	1 - 2	-
Ligustrum ovalifolium	2 - 3	sensitive to frost
Ligustrum vulgare varieties	2 - 3	-
Lonicera ledebourii	2 - 3	not in dry areas
Lonicera tatarica	2 - 3	cut back occasionally
Lonicera xylosteoides 'Clavey's Dwarf'	2 - 3	-
Lonicera xylosteum	1 - 2	not in hot, dry areas
Lycium barbarum	2 - 3	very overhanging
Perovskia abrotanoides	1 - 1,5	cut yearly
Philadelphus coronarius	2 - 3	cut back occasionally
Philadelphus- hybrids	1 - 2	flowers not wind resistant, thin out often
Potentilla fruticosa varieties		all varieties are sometimes sensitive to frost, thin out
Potentilla 'Goldfinger'	0,5 - 1,5	-
Potentilla 'Goldteppich'	0,5 - 1	avoid planting too closely
Potentilla 'Sommerflor'	0,5 - 1	
Prunus laurocerasus 'Otto Luyken'	1 - 2	many fir-tree weevils on humic substrates, then hard to stop! occasionally sensitive to frost
Prunus laurocerasus 'Zabeliana'	1 - 2	
Prunus tenella	0,5 - 1,5	flowers not wind resistant, cut yearly
Pyracantha 'Red Cushion'	0,5 - 1	sensitive to frost, turn black when cold
Pyracantha 'Red Column'	2 - 3	sensitive to frost, turn black when cold
Pyracantha 'Soleil d'Or'	1 - 2	sensitive to frost
Ribes alpinum 'Schmidt'	0,5 - 1	not in hot, dry areas
Ribes aureum	1 - 2	loses its habit, not in hot, dry areas
Ribes divaricatum	2 - 3	not in hot, dry areas
Rosa glauca	1 - 2	co competition, loses its leaves starting in August
Rosa multiflora	1 - 2	-
Rosa rubiginosa	1 - 2	somewhat sensitive to wind
Rosa varieties	0,5 - 1	yearly care, sensitive to frost
Salix species and varieties		as a rule unsuitable as they lose their leaves early
Salix purpurea 'Pendula'	0,5 - 1	slow-growing, prostrate
Salix rosmarinifolia	1 - 1,5	not in hot, dry areas
Spiraea bumalda varieties	0,5 - 1	cut back often
Spiraea japonica varieties	0,3 - 0,5	cut back often
Spiraea vanhouttei	1 - 2	flowers sensitive to wind, sensitive to drought
Symphoricarpos albus laevigatus	1 - 2	troublesome runners
Symphoricarpos chenaultii	1 - 1,5	occasionally sensitive to frost
Symphoricarpos orbiculatus	1 - 1,5	occasionally sensitive to frost
Syringa chinensis	2 - 3	base for grafting, sometimes with new shoots
Syringa microphylla 'Superba'	1 - 1,5	-
Tamarix species	2 - 3	sensitive to frost, cut back frequently

Plants for roof garden with good maintenance - 51

Genus/species/variety	Height (m)	Limitations
Viburnum farreri	2 - 3	flowers sensitive to frost, need thinning out
Viburnum lantana	2 - 3	occasionally eaten bare by birds
Weigela hybrids varieties	1 - 2	thin out regularly, not in hot dry areas
3. Small and Dwarf shrubs, ground-cover plant		
Cornus stolonifera 'Kelsey'	0,5 - 1	not in hot dry areas
Cotoneaster adpressus	0,2 - 0,5	very slow-growing
Cotoneaster dammeri varieties	0,2 - 1,2	sensitive to frost, bronze when cold
Cotoneaster salicifolius 'Parkteppich'	0,3 - 1	sensitive to frost
Euonymus fortunei varieties	0,3 - 1	sensitive to frost, not for hot, dry extreme areas (colourful varieties susceptible), many fir tree weevils in humic substrates, then hard to stop
Hypericum calycinum	0,2 - 0,3	sensitive to frost
Hypericum moserianum	0,3 - 0,5	sensitive to frost
Ilex crenata varieties	0,3 - 1,5	sensitive to frost, not in hot dry areas
Ligustrum vulgare 'Lodense'	0,5 - 0,7	very slow-growing, bronze when cold
Lonicera nitida 'Maigrün'	0,5 - 0,8	sensitive to frost
Lonicera pileata	0,5 - 1	sensitive to frost
Mahonia aquifolium 'Apollo'	0,5 - 1	sensitive to frost, avoids sun
Philadelphus 'Erectus'	0,5 - 1	Flower not wind resitant
Potentilla 'Goldteppich'	0,5 - 1	avoid planting too closely
Potentilla 'Sommerflor'	0,5 - 1	-
Pyracantha 'Red Cushion'	0,5 - 1	sensitive to frost
Rosa - ground covering species	0,3 - 0,5 0,5 - 1 1 - 1,5	occasionally sensitive to frost, sensitive to wind, sometimes roots shoot, care for yearly
Symphoricarpos chenaultii 'Hancock'	0,8 - 1,2	occasionally sensitive to frost
4. Climbers		
Clematis montana 'Rubens'	2 - 5	frost sensitive, flowers sensitive to wind
Clematis tangutica	2 - 3	-
Euonymus fortunei radicans	1 - 3	sensitive to frost, not in hot dry areas
Hedera helix	3 - 8	does not always climb
5. Conifers		
Juniperus communis 'Hornibrookii'	0,5 - 1	-
Juniperus communis 'Repanda'	0,3 - 0,5	-
Juniperus horizontalis 'Wiltonii'	0,2 - 0,3	-
Juniperus sabina 'Tamariscifolia'	0,5 - 0,8	-
Picea abies 'Nidiformis'	1 - 1,5	only in shady areas
Picea abies 'Pumila Glauca'	0,3 - 0,5	only in shady areas
Pinus leucodermis	4 - 6	sensitive to stagnant water
Pinus mugo varieties	1 - 2	-
Pinus parviflora 'Glauca'	4 - 6	may be too big

continued on next page

51 - Plants for roof garden with good maintenance

continued

Genus/species/variety	Height (m)	Limitations
Pinus parviflora 'Negishi'	1 - 1,5	-
Pinus sylvestris 'Watereri'	3 - 5	-
Taxus baccata varieties		many fir-tree weevils on humic substrates, then hard to stop
Taxus baccata 'Dovastoniana'	2 - 4	may be too big
Taxus baccata 'Nissens Corona'	1 - 3	see above
Taxus baccata 'Nissens Präsident'	2 - 3	see above
Taxus baccata 'Repandens'	0,5 - 0,7	see above
Taxus cuspidata 'Nana'	1 - 2	see above

52 - Low-maintenance roof gardens

Lignifying plants are not recommended for low-maintenance roof gardens as the strong layers of the substrate (approx. 3-8 cm) are too shallow. With low-maintenance roof gardens, the plants are neither watered nor regularly fertilised; both of these processes are, however, necessary for large lignifying plants to live long lives.

Lignifying plants for simple, high-maintenance roof gardens

To minimise the requirements of maintenance, plants that need great care, such as regular pruning, should not be selected. The thickness of the layers should be increased – “piled up” – as needed, with approx. 1 m² is planned for each plant. As a rule, the plants should not be larger than 0.8-1.0 m for simple intensive greenery in order to avoid frequent watering or fertilisation. For the growth rates, keep in mind that the average ultimate sizes cannot be reached on roofs. Only about 2/3 of the usual height can be expected, accompanied by loose leaves and fewer flowers.

The selection of plants corresponds to the high-maintenance roof gardens in section 3 (small and dwarf plants) and section 5 (conifers), though all plants taller than 1 m should be avoided.

53 - Trees for shady courtyards

The opening of inner-city courtyards for residents requires new considerations in the selection of plants. In most narrow, shady quads, large trees can rarely be planted as they could cast the courts into greater darkness than they already have. In such court situations where direct light seldom shines or only does so for brief periods, the trees rarely reach their optimal height. Often, they grow towards the light (crooked), or characteristic crown shapes are lost due to the lack of light. In addition, leaves, fruits and flowers are less plentiful.

Problems also occur when the ground is paved too close to the stems of the trees as most varieties lift the pavement.

(species in parentheses) = preferred in lighter courts

1. Deciduous trees

Acer campestre varieties
Acer palmatum
Acer pensylvanicum
(Acer platanoides in green-leaf varieties)

Acer rufrinerve
Acer neglectum 'Annae'
(Amelanchier lamarckii varieties)
Carpinus betulus varieties
(Cercidiphyllum japonicum)
Cornus alternifolia

Cornus controversa
 Cornus florida and varieties
 Cornus kousa and varieties
 (Cornus mas)
 Crataegus laevigata
 Crataegus lavalley 'Carrierei'
 Crataegus monogyna
 Crataegus coccinea
 Fagus sylvatica in green-leaf varieties
 (Fraxinus excelsior in slender-crown varieties)
 Ilex aquifolium varieties
 (Malus hybrids in green-leaf varieties)
 Ostrya carpinifolia
 (Parrotia persica)
 Prunus padus
 (Quercus petraea)
 (Quercus robur)

Sorbus aria varieties
 Sorbus arnoldiana varieties
 Sorbus aucuparia varieties
 (Sorbus intermedia varieties)
 (Sorbus torminalis)
 (Tilia americana varieties)
 (Tilia cordata varieties)
 (Tilia europaea varieties)
 Ulmus carpinifolia
 Ulmus hollandica 'Lobel'

2. Conifers

Chamaecyparis species and varieties
 Taxus species and varieties
 Thuja species and varieties
 Tsuga species and varieties

54.

Heath gardens - 54

"Heaths" are not only understood to be endless heath meadows with Junipers and white, shimmering birches, but also include dwarf shrub formations in areas with high humidity on substrates with little nutrition, which do not necessarily have to be on acidic sandy soil. The most conspicuous heaths are primarily small-leaf Ericaceae, dwarf and rod shrubs such as broom and related varieties, and numerous conifers. Shrubs and trees such as common hawthorn and birches also grow on heaths. As these plants suppress the herbaceous heaths, they must be used carefully. Heaths do not withstand autumn leaf loss or large amounts of shade. Thus, the herbaceous heaths generally occur around conifers as the needles do not damage them. They should not, however, be used for ground cover under trees and shrubs; rather, use other shade-tolerant Ericaceae such as the Vaccinium species.

Genus/species/variety	Needs light	Tolerates shade
A. Heaths near coasts		
1. Deciduous plants		
Betula pendula varieties	+	
Betula pubescens	+	
Cytisus scoparius varieties	+	
Crataegus monogyna		+
Empetrum nigrum	+	
Genista sagittalis	+	
Genista tinctoria varieties	+	
Myrica gale	+	
Rhamnus frangula		+
Salix repens argentea	+	
Sorbus aucuparia varieties		+
Ulex europaeus	+	

continued on next page

54 - Heath gardens

continued

Genus/species/variety	Need light	Tolerates shade
2. Erikaceae varieties		
Calluna vulgaris varieties	+	
Erica cinerea	+	
Erica tetralix	+	
Erica vagans varieties	+	
Vaccinium vitis-idaea varieties		+
3. Conifers		
Juniperus communis varieties	+	
Pinus sylvestris varieties	+	

Note:

Broad-leaf plants should not be used in true heaths. Rather, slender-leaf species – especially grasses – are ideal complements. The recommended varieties are *Deschampsia flexuosa*, *Festuca ovina*, *Festuca tenuifolia* and *Molinia caerulea*. In shady areas, ferns can also be used. For more, see planting tips for perennials, list of heath plants.

Genus/species/variety	Need light	Tolerates shade
B. Alpine rose heaths		
Heaths in mountainous regions are similar to those in plains, though the species usually differ.		
1. Deciduous plants		
Clematis alpina		+
Crataegus monogyna		+
Cytisus purpureus	+	
Daphne cneorum	+	
Lonicera caerulea		+
Ribes alpinum		+
2. Ericaceae varieties		
Arctostaphylos uva-ursi	+	
Empetrum nigrum	+	
Erica carnea varieties	+	
Rhododendron ferrugineum		+
Rhododendron hirsutum		+
Vaccinium vitis-idaea varieties		+
3. Conifers		
Juniperus communis varieties	+	
Larix decidua	+	
Picea abies varieties		+
Pinus cembra	+	
Pinus mugo varieties	+	
Pinus nigra varieties	+	
Pinus sylvestris varieties		

Genus/species/variety	Needs leight	Tolerates shade
C. Heath-like formations form foreign countries		
1. Deciduous plants		
Aronia species and varieties		+
Betula species and varieties	+	
Clethra alnifolia		+
Cornus canadensis		+
Cornus stolonifera 'Kelsey's'		+
Cytisus species and varieties	+	
Daboecia species and varieties		+
Elaeagnus pungens varieties		+
Fothergilla gardenii		+
Genista species and varieties	+	
Hebe species and varieties	+	
Ilex crenata varieties		+
Ilex meserveae varieties		+
Ilex verticillata	+	
Rubus calycinoides	+	
Skimmia japonica varieties		+
Sorbus species and varieties	+	
Spiraea betulifolia		+
Spiraea prunifolia	+	
2. Ericaceae varieties		
Gaultheria procumbens		+
Gaultheria shallon		+
Kalmia angustifolia 'Rubra'		+
Kalmia latifolia varieties		+
Leucothoe walteri		+
Pernettya mucronata varieties		+
Pieris floribunda		+
Pieris japonica varieties		+
Rhododendron Wildarten		+
Rhododendron canadense	+	
Rhododendron impeditum varieties	+	
Rhododendron keleticum	+	
Rhododendron minus		+
Rhododendron radicans		+
Rhododendron 'Radistrotum'		+
Rhododendron - Japanese Azaleas		+
Vaccinium macrocarpon u.a.	+	

continued on next page

54 - Heath gardens

continued

Genus/species/variety	Needs light	Tolerates shade
3. Conifers		
Juniperus species and varieties	+	
Larix kaempferi	+	
Pinus contorta	+	
Pinus densiflora 'Pumila'	+	
Pinus leucodermis	+	
Pinus parviflora 'Glauca'	+	
Pinus pumila 'Glauca'	+	
Thuja standishii	+	
Tsuga diversifolia		+
Tsuga mertensiana		+

55 - Plants for tubs and pots

Explanation:

As attractive as potted plants are, they need a lot of care in the final analysis. It does not suffice to set up decorative pots in pedestrian zones, atriums, squares or terraces. A main problem is the surplus of organic material in most substrates that results in a decrease in the mass of the soil between 30-50%. The plants lose their stability and even starve. Plants that need humus thus are rarely good in pots. It is extremely necessary to add material that stabilises the structure and to calculate for 10-20% loss from the outset. Many potted plants are clearly stymied after the first year if they only live in root ball material and no nutrients are added. Slow-release fertilisers are recommended. Regular watering is a primary requirement for the survival of the plants. Plants sensitive to frost are more so in a pot than in a bed. Thus, the location has to be selected with care. The size of the pot depends on the size of the plants and their number. Too many plants or plants that are too big will cramp each other and gradually become gaunt.

As a rule, the diameter of the pot should be at least one third of the mean diameter of the largest plant selected with a minimum substrate depth of 40-60 cm. The more the better, as less soil means more maintenance.

1. Deciduous plants

Acer ginnala
 Acer japonicum 'Aconitifolium'
 Acer rufinerve
 Amelanchier lamarckii
 Berberis ottawensis varieties
 Berberis thunbergii 'Atropurpurea Nana'
 Catalpa bignonioides 'Nana'
 Clerodendron trichotomum fargesii
 Cotinus coggygria varieties
 Cotoneaster species and varieties
 Crataegus lavalley 'Carrierei'
 Crataegus coccinea
 Cytisus species and varieties
 Elaeagnus species and varieties
 Genista species and varieties
 Hydrangea arborescens varieties
 Lonicera tatarica varieties
 Mahonia aquifolium varieties

Malus-hybrid 'Red Jade'
 Nothofagus antarctica
 Perovskia abrotanoides
 Philadelphus 'Erectus'
 Potentilla fruticosa varieties
 Prunus fruticosa 'Globosa'
 Ptelea trifoliata
 Pyrus salicifolia
 Quercus pontica
 Rhodotypos scandens
 Robinia 'Casque Rouge'
 Robinia hispida varieties
 Rosa glauca
 Salix purpurea 'Pendula'
 Sorbus serotina
 Sorbus thuringiaca 'Fastigiata'
 Spiraea betulifolia varieties
 Spiraea bumalda
 Spiraea decumbens

Spiraea japonica varieties
 Spiraea nipponica varieties
 Staphylea colchica
 Stephanandra incisa 'Crispa'
 Symphoricarpos chenaultii 'Hancock'
 Syringa meyeri 'Palibin'
 Syringa microphylla 'Superba'
 Syringa patula 'Miss Kim'
 Tamarix parviflora

2. Evergreen broad-leaf shrubs

Berberis buxifolia 'Nana'
 Berberis candidula
 Berberis frikartii varieties
 Berberis gagnepainii varieties
 Berberis media varieties
 Berberis verruculosa
 Buxus sempervirens varieties
 Cotoneaster species and varieties
 Daphne cneorum
 Elaeagnus species and varieties
 Erica carnea varieties
 Hedera colchica varieties
 Hedera helix varieties
 Hypericum species and varieties
 Ilex species and varieties
 Lavandula angustifolia varieties
 Ligustrum delavayanum
 Ligustrum ovalifoium 'Aureum'

Lonicera nitida varieties
 Lonicera pileata
 Osmanthus heterophyllus
 Prunus laurocerasus varieties
 Pyracantha hybrid varieties
 Rhododendron Diamant Azaleas
 Rhododendron Impeditum hybrids
 Rhododendron keleticum
 Rhododendron 'Radistrotum'
 Rubus henryi
 Skimmia japonica varieties
 Viburnum davidii
 Viburnum tinus
 Vinca major

3. Conifers

Chamaecyparis obtusa 'Nana Gracilis'
 Juniperus communis 'Repanda'
 Juniperus horizontalis varieties
 Juniperus sabina varieties
 Microbiota decussata
 Picea abies 'Nidiformis'
 Picea abies 'Pumila Glauca'
 Pinus densiflora 'Pumila'
 Pinus mugo varieties
 Pinus nigra varieties
 Pinus parviflora varieties
 Pinus sylvestris 'Watereri'
 Taxus species and varieties

Plant weights and root ball sizes can only be approximated as many factors influence weight and root ball size. The shape of the root ball, the specific weight of the soil or substrate, the water saturation, and other factors leave a lot of leeway. The information below is based on experience and can be used to extrapolate transport weights.

Categories	Size	Approx. weight in kg/plant	Roots ball diameter in cm
Ground-covering shrubs	1,5 l container	1,3	
	2 l container	1,7	
Evergreens	20 - 30 cm tall	3	
	30 - 40 cm tall	4	
	40 - 50 cm tall	6	
	50 - 60 cm tall	9	
	60 - 80 cm tall	13	
	80 - 100 cm tall	18	
	100 - 125 cm tall	25	
	125 - 150 cm tall	40	
	150 - 200 cm tall	60	

continued on next page

Category	Size	Approx. weight in kg/plant	Root ball diameter in cm
Roses	A quality	0,2	
Rhododendron	30 - 40 cm tall	3	
	40 - 50 cm tall	4,5	
	50 - 60 cm tall	6	
	60 - 70 cm tall	8	
	70 - 80 cm tall	11	
	80 - 90 cm tall	16	
	90 - 100 cm tall	25	
	100 - 120 cm tall	40	
	120 - 140 cm tall	60	
Decorative shrubs and hedges	2 xtr., bare root, - 100	0,5	
	2 xtr., bare root, 100 - 150	1	
	2 xtr., bare root, 150 - 200	2	
	3 xtr., rootballed, - 100	8	
	3 xtr., rootballed, 100 - 125	12	
	3 xtr., rootballed, 125 - 150	18	
	3 xtr., rootballed, 150 - 175	25	
Branched-trunk trees	2 xtr., bare root, 80 - 100	0,6	
	2 xtr., bare root, 100 - 125	0,8	
	2 xtr., bare root, 125 - 150	1	
	2 xtr., bare root, 150 - 200	1,5	
	2 xtr., bare root, 200 - 250	2	
	3 xtr., rootballed, 80 - 100	8	
	3 xtr., bare root, 100 - 125	9,5	
	3 xtr., bare root, 125 - 150	11	
	3 xtr., bare root, 150 - 175	14	
	3 xtr., bare root, 175 - 200	18	
	Streettrees and standards	2 xtr., bare root, 8 - 10	4
2 xtr., bare root, 10 - 12		4,5	
3 xtr., rootballed, 12 - 14		50	40
3 xtr., rootballed, 14 - 16		100	45
3 xtr., rootballed, 16 - 18		150	50
3 xtr., rootballed, 18 - 20		200	60
4 xtr., rootballed, 20 - 25		270	70
4 xtr., rootballed, 25 - 30		350	80
5 xtr., rootballed, 30 - 35		500	95
5 xtr., rootballed, 35 - 40		650	100
5 xtr., rootballed, 40 - 45		850	125
5 xtr., rootballed, 45 - 50		1100	130
6 xtr., rootballed, 50 - 60		1600	140
6 xtr., rootballed, 60 - 70		2500	160
6 xtr., rootballed, 70 - 80		4000	180
6 xtr., rootballed, 80 - 90	5500	190	
6 xtr., rootballed, 90 - 100	7500	210	
6 xtr., rootballed, 100 - 120	9500	220	