

THE GARDENS OF IRELAND

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Abstract. Ireland lies between 51.5° and 55.5° N latitude. The climate is essentially maritime being influenced by the Gulf Stream and the relatively warm waters of the North Atlantic Drift which reach the coastline of Ireland and northwest Europe.

Ireland's mild, oceanic climate is characterised by equable temperatures, plentiful rainfall in most seasons, overcast skies, and high humidity. Conditions are suitable for the growth of a wide range of temperate trees and shrubs. In addition, many sub-tropical species, such as banana (*Musa basjoo*), tree ferns, *Echium pininana*, *Callistemon* spp. and *Dacrydium* spp., thrive in the open in mild areas. With some notable exceptions most of Ireland's best known gardens occur near to the coast.

Although the climate in Ireland is generally favourable for gardening, wind and year-round weed growth are two potentially major handicaps. Gales and strong winds are common; salt damage occurs frequently in coastal gardens and occasionally some distance inland. A wide range of plants is used to form windbreaks including *Pinus muricata*, *Cupressus macrocarpa*, *Escallonia rubra* var. *macrantha*, and *Olearia macrodonta*.

Herbicides can be used particularly effectively in Ireland to suppress weed growth. The rainfall, fairly evenly distributed throughout the year, enables soil-acting herbicides such as simazine to be used more effectively than in many other countries. In addition, the generally high organic matter content of the soil reduces the risk of plant damage. Herbicides have a major advantage in landscape maintenance in shifting major weed control activity from the busy late spring/early summer period to the late autumn/winter period when labour is more readily available.

INTRODUCTION

The Gulf Stream and the North Atlantic Drift, originating in the Gulf of Mexico, have a major influence on the climate in Ireland and consequently on Irish gardens. This current and the predominantly southwesterly winds that blow over it and are warmed in the process, gives Ireland an essentially maritime climate of mild winters, cool summers, and year-round rainfall.

Ireland lies nearer to the North Pole than to the Equator and is further north than Newfoundland. If it were not for the warm westerly winds, the Atlantic Ocean, and the Gulf Stream, Ireland would be icebound for part of the winter, somewhat similar to the Labrador coast of North America. In contrast the temperature of the coldest month (January) ranges from 7°C in the south to 4°C in the north. Figure 1 shows that the temperatures in southern Ireland during January are similar to those in the Mediterranean areas of Europe. Apart from the Midlands, most of Ireland seldom experiences freezing days when the temperature fails to rise above 0°C (Figure 2). Long spells of low temperatures sufficient to kill less hardy plants are exceptional.



Figure 1. Isotherms (-3, 0, 3, 5, and 7°C) for Europe in January. (Source—World Survey of Climatology, Vol 5; Elsevier Publishing Co.)



Figure 2. Frequency of freezing days in the British Isles when the temperature failed to rise above 0°C (Source H. H. Lamb, The English Climate)

Summer temperatures are comparatively low. The mean daily temperature for the warmest month (July) is 14.5° to 16°C for most lowland areas (Figure 3). Prolonged summer heat, like extreme winter cold, is uncommon. In the southwest part of Ireland there is only 8°C difference in temperature between the means of the coldest and warmest months and only 10 to 11°C difference in most of the rest of the country.

Rainfall varies from 800 to 1000mm in the drier East and Midlands and from 1000mm to over 2000mm in the South and West. Rain falls every month of the year, although there is a tendency for March to June to be the driest months and December the wettest. Each of the twelve months has been the wettest or the driest in some year.

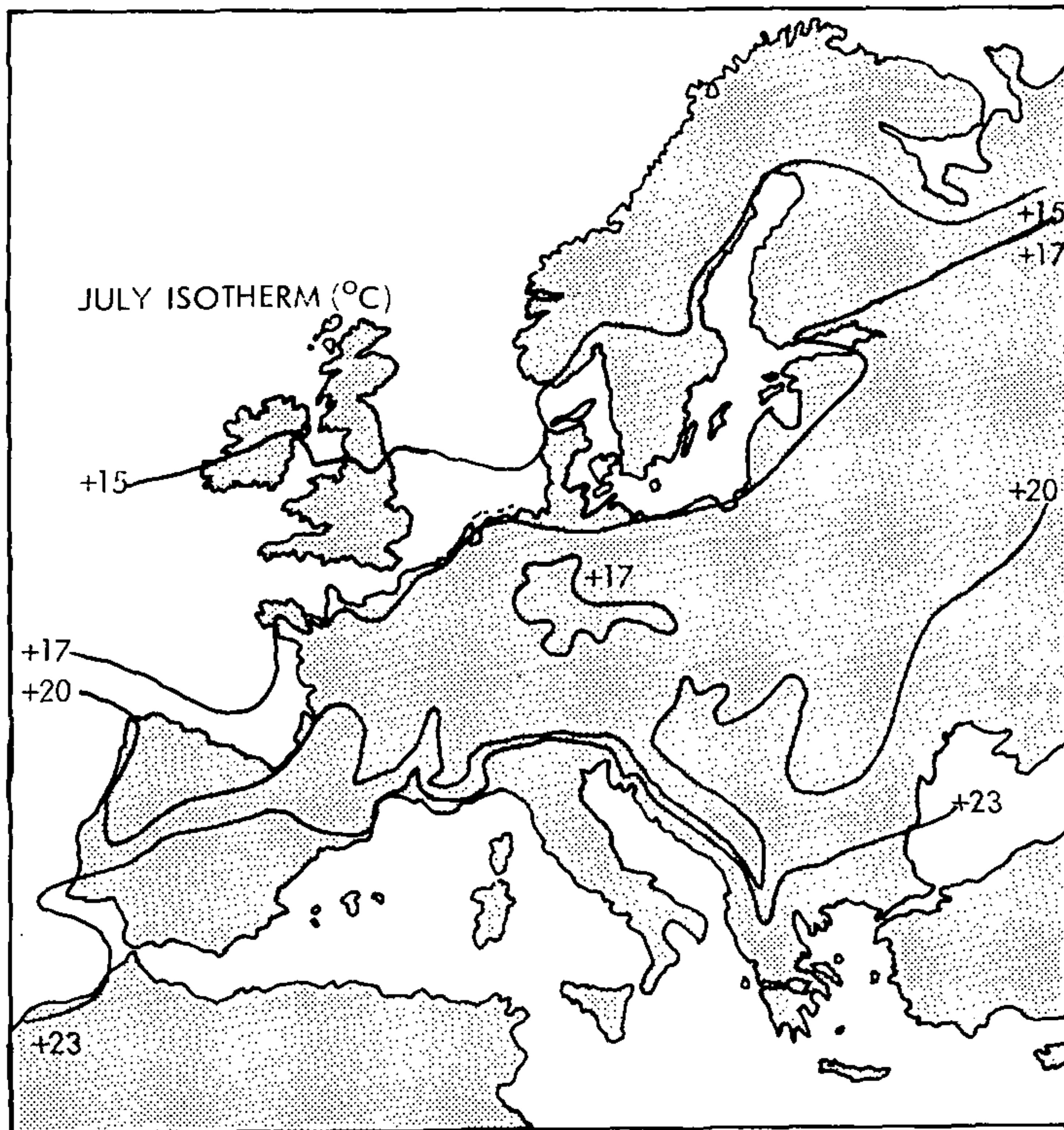


Figure 3. Isotherms (15–23°C) for July in Europe. (Source—World Survey of Climatology. Volume 5; Elsevier Publishing Co.)

Native and exotic species. While the mild climate and ample rainfall encourages the growth of a wide range of plant species, Ireland has a very restricted natural flora as a result of the early breakdown of the land connection with Europe. Consequently, Ireland has only about two-thirds of the native flowering plants

found in Britain. Only three evergreen tree genera (*Arbutus*, *Ilex* and *Taxus*) and thirteen deciduous genera (*Alnus*, *Betula*, *Corylus*, *Crataegus*, *Fraxinus*, *Malus*, *Populus*, *Prunus*, *Quercus*, *Rhamnus*, *Salix*, *Sorbus* and *Ulmus*) are native. However, the climate encourages the growth of a richer and more diverse range of exotic plants than any other country of similar latitude and species from all continents are used to create Irish gardens. Of the most commonly used 1400 tree and shrub species in the country, about 30% were introduced from Asia, especially from Japan and the Himalayas, about 21% from North America, about 20% from Europe, and the remaining 23% are mainly introductions from the southern hemisphere (3).

The naturalising of exotic plants which plays so large a part in the development of Irish gardens probably began with Sir Arthur Rawdon (1662–1695) of Moira, County Down (6). Sir Arthur received a shipload of exotics from Jamaica at Carrickfergus in 1692 and built a hot house at Moira to protect them. Plants propagated there were widely distributed to other gardens in Europe.

Due to historic and economic reasons, gardening in Ireland has evolved more slowly than in England. Interest in gardening and in visiting gardens is increasing, however, and at present many gardens are open to the public. The Irish Tourist Board (Bord Fáilte) recognises that Irish gardens constitute a special tourist attraction with potential for development and expansion and there are now about 40 gardens regularly open to the public, with many more on an occasional basis (1).

Large gardens open to the public occur in all parts of Ireland with the majority lying close to the south and east coasts (5). Hyams (4) describes some of the more notable of these gardens (see Appendix) and traces the evolution of gardening styles and their influence on Irish gardens.

The introduction of large numbers of new plant material from Asia, the Americas, and Australasia in the 19th and 20th centuries had a significant impact on Irish gardens. As so many of the new introductions flourished under the Irish climate, Hyams (4) considers that the wild Robinsonian type garden reached a level of excellence in Ireland rarely achieved elsewhere. A comprehensive inventory of the woody plants in private and public gardens with significant plant collections has been published recently (2).

The suitability of the Irish climate for the growth of trees and shrubs is illustrated in the National Botanic Gardens, Dublin, and in many large private gardens. Rosdohan, County Kerry, is reputed to have the finest examples of tree ferns in Europe; both *Dicksonia antarctica* and the very much rarer and more beautiful *Alsophila tricolor* [syn. *Cyathea dealbata*] are naturalised there. Mount Usher in County Wicklow contains greatly admired specimens of *Pinus montezumae* from south and central Mexico, a very striking

Cunninghamia lanceolata from China and a remarkable collection of eucalyptus species, along with many other Australian plants such as callistemons, grevilleas, and melaleucas. Banana (*Musa basjoo*), *Echium pininana*, and tree ferns flourish in coastal gardens of county Dublin.

Mount Congreve in County Waterford is a garden of 40 ha containing vast plantings of some of the world's most spectacular and beautiful trees, such as *Magnolia campbellii* from the Himalayas and *Embothrium coccinium* from Chile, which gives probably the most colourful display of all the trees that can be cultivated outdoors in these Islands. The National Botanic Gardens, Dublin, have many fine specimens of trees notably the unusual *Cedrus atlantica* 'Pendula' and a fine specimen of the red-trunked, *Arbutus × andrachnoides* from Greece. Ilnaculin in County Cork contains many plants of exceptional interest such as *Taiwania cryptomerioides* from Taiwan, *Dacrydium cupressinum* from New Zealand, described by Bean in his reference book on "Trees and Shrubs Hardy in the British Isles," as the best specimen recorded in these Islands.

Bean makes frequent mention of other species, especially conifers, that do particularly well in Ireland. Examples are the very large *Abies* spp. such as *A. amabilis* at Castlewellan and *A. nordmanniana* at Powerscourt, the very large *Fitzroya cupressoides* in County Wicklow, an avenue of *Araucaria araucana* at Inistioge in County Kilkenny in which the largest tree is 24 × 3.5 m, a size seldom exceeded by specimens in its native Chile or Argentina, an 11 m high *Cornus capitata* regarded as the finest in these Islands, an 8.5 m high *Cupressus cashmeriana* in County Meath, and 8.5 m high specimens of *Dacrydium franklinii* in County Down and County Cork, these being the tallest of both genera recorded in Britain and Ireland.

While these species come from all five continents, many of them thrive in most parts of Ireland and are not confined to especially favoured areas. Some of our most impressive gardens are situated in the north, e.g. Glenveagh Castle in Counties Donegal and Rowallane, Castwellan Castle and Mt. Stewart in County Down.

The problem of wind exposure. Many of Ireland's best known gardens could not exist without wind protection. Strong winds are frequent and much of the west coast has between 20 to 30 gales per year, when the wind reaches gale force of Beaufort 8 or more (Figure 4). Valentia in County Kerry has an average of 12 days with gales per year while the mean annual wind speed is 6 m/sec compared with 5 along the coast of Brittany and 3 at De Bilt in the Netherlands. Even though these winds tend to be moisture laden, rather than desiccating, exposure is an important element in the Irish climate and horticulturists have to pay much attention to wind shelter and wind hardness.

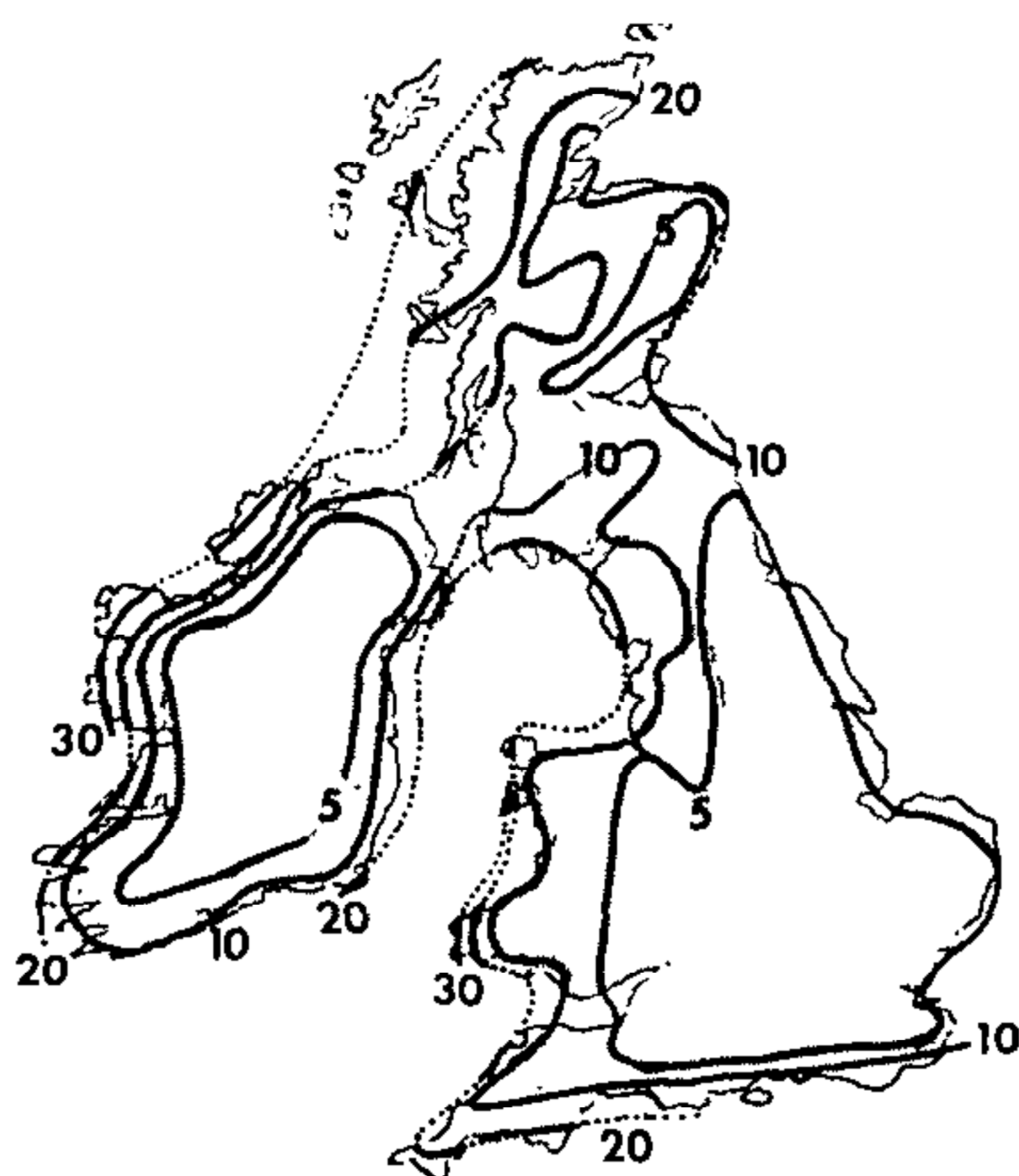


Figure 4. Frequency of gales in the British Isles; days of winds of gale force (Beaufort Force 8 or more). (Source—H. H. Lamb, *The English Climate*)

Wind adversely affects plant growth in a wide variety of ways including direct leaf and branch damage, increasing transpiration, and lowering air temperatures. In Irish gardens near the coast, saltladen winds in spring and summer can be particularly harmful by causing severe leaf scorch. Salt spray may also be carried many miles inland.

A wide variety of plant species is used for wind shelter. At Rossdohan, County Kerry, *Pinus radiata*, *Cupressus macrocarpa*, *Escallonia rubra* var. *Macrantha* and *Rhododendron ponticum* were used initially, but *Pinus muricata*, which is less easily blown over is now preferred to *P. radiata*. Other plants used for wind shelter include: *Pinus nigra* [syn. *P. nigra* subsp. *austriaca*], *Olearia macrodonta*, *Olearia solandri*, *Elaeagnus macrophylla*, *Elaeagnus ebbingei*, *Griselinia littoralis*, *Tamarix* spp., *Ulex europaeus*, *Phormium tenax*, *Salix caprea* and *Alnus* spp.

The problem of weed control. The climatic and soil conditions in Ireland that provide such favourable conditions for the growth of exotic trees and shrubs are naturally even more favourable for the growth of indigenous weeds. Many weed species such as *Poa annua*, *Stellaria media*, and *Senecio vulgaris* can grow and seed throughout the year. Initially weeds in Irish gardens were controlled by manual and mechanical means. These methods are highly inefficient because many species, particularly *Poa annua*, after being hoed or hand pulled, promptly reroot in the highly humid environment. At present there is a wide range of herbicides available which can suppress the development of seedling weeds for long periods and give better control of perennial weeds than soil tillage. Herbicides are relatively cheap compared with the cost of hand labour.

Just as conditions in Ireland proved to be unexpectedly suitable for the new Robinsonian style of gardening introduced in the 19th century, so the Irish climate and soil have been found to possess significant advantages for chemical weed control compared with many other countries. Simazine, the cheapest soil-acting herbicide available at present, controls a wide range of common annual weeds. It is only effective as a selective herbicide when applied under moist soil conditions. Normally simazine will persist close to the soil surface but on light sandy soil or in soil deficient in organic matter, simazine may leach downwards and may be phytotoxic. Most soils in Ireland have more than 4% organic matter and simazine has proved highly satisfactory for weed control and is safe under a range of conditions in many parts of the country. Moreover, the moist summers and mild winters provide suitable conditions for the activity of soil microbes. Consequently, there have been fewer problems arising from the build-up of residues of soil-acting herbicides in Ireland compared with countries with drier seasons and colder winters.

Simazine and many other soil-acting herbicides may be used at any time of the year, assuming moist soil conditions, and will control germinating weeds for many months. This allows major weed control activity to be shifted from the busy late spring/summer period to other times of the year when labour is more readily available.

A 1.5 ha amenity area in North County Dublin has been used as a "herbicide-garden" since 1969 to evaluate the long-term effects of herbicides on ornamental trees and shrubs and on soil conditions. The garden contains representatives of over 200 plant genera, mainly shrubs. The soil is a medium loam derived from Cambrian shale and quartzite, containing approximately 25% clay and 4.5% organic matter in the top 75mm.

Usually two applications of a triazine herbicide (simazine or atrazine) were applied as an overall treatment each year from 1969 to 1986. Two applications of simazine at 1.7 kg a.i./ha per annum were applied between 1969 and 1976 and between 1981 and 1986, and two applications of atrazine at 1.7 kg a.i./ha between 1977 and 1980, except in 1970 (3 applications) and 1979 (1 application). Other herbicides were used as spot treatments against specific weeds (7). To reduce the risk of a build-up of resistant biotypes, a determined effort was made to control any weeds that survived the routine application of triazine herbicide before they shed their seeds. This necessitated the use of a range of different herbicides supplemented by some hand weeding.

Following the extensive and repeated use of herbicides on the same area for 17 years, the main conclusions are:

(1) Herbicides provide a practical, highly successful and impressive means of maintaining an amenity area. In contrast to experience elsewhere no woody plant, established for at least one

year, has been found to be susceptible to simazine or atrazine injury. While the prevailing soil conditions assisted the safe use of herbicides, soils equally suitable for chemical weed control occur in many parts of Ireland.

(2) Although triazine herbicides (simazine or atrazine) have been applied at 1.7 kg a.i./ha usually twice a year for 17 years, there is no evidence of any build-up of triazine-resistant weed biotypes. This was almost certainly due to the high level of weed control which prevented most weeds from seeding.

(3) Weed populations have been reduced and the time required for control has decreased.

(4) There has been no deterioration of soil structure apart from the formation of a thin crust (ca 10mm thick) at the surface. On this soil type, the crust caused no problems with water run-off or erosion and has not had any adverse effect on soil aeration.

(5) There is no evidence of any build-up of phytotoxic residues of triazine herbicides after repeated application for 17 years.

Although some herbicides, notable glyphosate, are adversely affected if rain falls within 6 hours of application, chemical weed control in general is favoured by good growing conditions.

Herbicides are used extensively in a few large Irish gardens, such as Mount Congreve and the National Botanic Gardens, and for controlling weeds in paths and uncropped areas in many others. Results obtained in North County Dublin suggest that chemical methods could be used much more extensively for the maintenance of amenity areas and to ensure the survival of large Irish gardens in a period of steadily rising labour costs. Herbicide technology can overcome a major maintenance problem and free time for more constructive horticultural activities. Probably most important of all, the use of effective chemical methods can eliminate the struggle against year-round weed growth which has done so much to sap enthusiasm for amenity land management.

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APPENDIX

Irish gardens described by E. Hyams (4).

Annes Grove, Co. Cork
Ardsallagh, Co. Tipperary
Birr Castle, Co. Offaly
Castlewellan, Co. Down
Fota, Co. Cork
Glasnevin, Co. Dublin
Glenveagh Castle, Co. Donegal

Ilnacullin, Co. Cork
Mount Congreve, Co. Waterford
Mount Stewart, Co. Down
Mount Usher, Co. Wicklow
Powerscourt, Co. Wicklow
Rossdohan, Co. Kerry
Rowallane, Co. Down

ALPINES WORTH GROWING

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When asked to speak on alpines worth growing, one is immediately in a dilemma, so numerous are the plants worth growing in the rock garden. One can only make a selection—and a selection must be largely subjective. There are some huge genera: gentians, saxifrages and primulas, to mention only three, which have contributed so many lovely species to our gardens that each genus alone could fill the 45 minutes allotted to this talk.

So here is my selection. I have avoided, on the one hand, those rather rampant but worthy plants represented by, for example, aubrietia, arabis and cerastium (though there are a few aristocrats amongst these) and on the other, those choice but exacting plants that demand culture in an alpine house, like the high alpine androsaces and dionysias. I love them all, but I have to come down to earth, and I have endeavoured to choose from those that I consider choice enough for the keen plantsman, but not too difficult to grow and propagate. Above all, they are plants that I have been able to grow and enjoy in the open garden.

Some of the earliest spring bulbs are happily placed in the rock garden. One of the first to flower, in February, is *Narcissus cyclamineus*, and a long lasting flower it is too. I find it does poorly in alkaline soil, but flourishes and seeds itself in peaty soil, as does the delightful hoop petticoat daffodil (*N. bulbocodium*). The hardy cyclamen, too, brings colour to the rock garden early, and again later. The earliest is *Cyclamen coum* in a variety of shades. I must digress here to show you how it has naturalised in a County Wicklow garden, to give a pink haze through the lawns. *C. repandum* does so well with me that I have taken it out of the rock garden and naturalised it under beech trees. The secret, I think, is to plant the corms deeply.