

## The Climate of the South West Peninsula of England®

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### INTRODUCTION

The peninsula of south west England may strictly be regarded as land south west of a line drawn from Bristol to Southampton, a distance of some 97 km (60 miles). In the context of horticulture it is more usually considered to largely comprise the county of Cornwall, west of a line from Bude on the north coast to Plymouth on the south coast, a distance of some 56 km (35 miles) (see Fig. 1). The land is rich in horticultural history, opportunity, and expertise.



**Figure 1.** Peninsula of South West England.

This Cornish peninsula covers an area of about 3626 km<sup>2</sup> (1400 mi<sup>2</sup>) and is approximately 121 km (75 mi) long from east to west. It is bounded to the north by the Atlantic Ocean and to the south by the English Channel. No location is more than 19 linear km (12 mi) from the sea. Lands End is the most westerly point of mainland England and Lizard Point the most southerly. Forty-five km (28 mi) to the west of Lands End lies the small archipelago of the Isles of Scilly.

The inland scenery is dominated by the four main granite bosses of Bodmin Moor, Hensbarrow Downs, Wendron Moor, and Lands End. The highest point on the peninsula is Brown Willy on Bodmin Moor which rises to 423 m (1375 ft). The granite masses overlie old Red Sandstone rock which is the main geological feature of the county. The peninsula inland otherwise lacks features and is significantly devoid of natural trees because of the strong prevailing winds. The north coast presents rugged scenery whilst the equally spectacular south coast supports more luxuriant vegetation, and there are inundated river valleys at intervals which impart a protected climate.

Archaeological remains are abundant and have presented evidence of farming activity in the Early Neolithic Age, 3500 years BC. Tin and copper ore mining were of early economic importance, with records of shipments to France in the 4th century BC. The extraction of copper and tin, predominantly in the east and west areas of the peninsula, grew in scale until by the late 19th century Cornwall was the primary source of tin worldwide. Mining is now virtually extinct with more than 2000 mines abandoned. China clay mining from open pits remains an important industry in the St. Austell district where kaolin is extracted by hydraulic means. The mostly reclaimed spoil heaps are a man-made landscape feature of the locality and the Eden Project's domes housing plants from tropical and mediterranean climates now shelter in a massive disused clay pit.

The demise of copper and tin mining towards the end of the 19th century, the arrival of steam railway transport, and the establishment of many more large domestic estates by families in mining, shipping, and other business resulted in growth of both commercial horticulture and private gardening. Each took advantage of the equable maritime climate of the peninsula, and in the latter instance benefited from the introduction of exotics by plant explorers. The cut flower industry of the Isles of Scilly dates from this time, promoted by Dorrien-Smith on Tresco and Trebilcock on St. Marys. Early flower production and strawberry cultivation flourished in the Tamar Valley.

The success of these enterprises were all borne along on climatic advantages.

## CLIMATE

The main features of the peninsular climate are an early spring, late summer, long autumn, and short winter. This results in a very long growing season — often 365 days compared to around 250 days in central England — where the definition is based upon mean temperature above 5.5°C (42°F).

The presentation of weather records as averages and means enables study of extremes and variation in seasonal climate in different regions. It should not preclude consideration of the important effects of localised microclimate. The south west peninsula manifests many peculiar local climates but the following comparative records provide illustration of the climatic advantage of the area in general.

**Temperature.** In Table 1 below, 30-year average maximum and minimum temperatures for three winter and three summer months are compared for sites in north Cornwall, south east England, and central England.

The records confirm a notable temperature advantage in the peninsular climate conducive to early growth. The advantage is known to be progressively more marked at westerly sites.

Distinct temperature advantage is demonstrated at the peninsular site for the winter months. This is emphasised by the significantly fewer number of days of recorded air frost. Summer months average maximum temperature records in the peninsula are notably lower, with higher minimum temperature.

There are around 19 days of recorded air frost in Cornwall, compared to around 51 and 66 in Surrey and Warwickshire, respectively. Current records for Cornwall match closely those made in the mid 18th century by William Borlase in the far west of the peninsula. Scientific predictions for the next 200 years suggest the climate will change.

**Table 1.** Average temperatures between 1961 and 1990 for three sites in England.

	Temperature						Air frost days		
	Max °C			Min °C			C	S	W
	C	S	W	C	S	W			
Dec	9.2	7.8	7.3	4.5	2.0	1.1	3.5	9.9	12.0
Jan	8.3	6.9	6.5	3.4	1.3	0.4	5.3	10.5	12.9
Feb	8.0	7.4	6.8	3.1	1.2	0.3	5.5	10.5	12.4
June	16.8	20.0	19.5	10.7	9.6	8.8	0.0	0.0	0.1
July	18.6	22.0	21.6	12.7	11.6	10.6	0.0	0.0	0.0
August	18.7	21.5	21.1	12.8	11.3	10.5	0.0	0.0	0.0
Year mean	13.0	14.1	13.6	7.5	5.8	4.9	18.7	50.5	65.6

C = Cornwall – St Mawgan (103 m above mean sea level).

S = Surrey – Wisley (38m above mean sea level).

W = Warwickshire – Stratford-upon-Avon (49 m above mean sea level) Source: U.K. Meteorological Office.

**Table 2.** Average sunshine and rainfall between 1961 and 1990 for three sites in England.

	Sunshine (h)			Rainfall (mm)		
	C	S	W	C	S	W
Dec	54.2	40.8	44.2	116	63	61
Jan	57.7	50.7	50.0	116	61	52
Feb	78.1	68.2	59.7	82	40	40
June	207.5	196.5	178.8	61	50	54
July	209.3	197.0	181.7	60	45	51
August	195.3	187.4	168.1	74	55	65
Year mean	1674.6	1510.2	1374.6	1005	650	616

Locations as Table 1, above.

Source: U.K. Meteorological Office.

**Table 3.** Average windspeed between 1961 and 1990 for three sites in England.

	Average hourly windspeed (km h <sup>-1</sup> @ 10 m)		
	C	L	W
Sept	10.9	8.7	7.8
Oct	11.8	8.8	7.8
Nov	13.0	10.1	9.4
Dec	13.5	10.1	9.5
Jan	13.4	10.1	9.4

C=Cornwall – St Mawgan (103 m AMSL).

L=Lincolnshire - Coningsby (7 m AMSL).

W=Warwickshire – Elmdon (96 m AMSL).

Source: U.K. Meteorological Office.

The records reveal that, contrary to popular belief, the area is by no means frost free and consideration should be given to the severe consequences of late frosts on plant growth in the locality. These can occasionally be very damaging to some commercial crops. The peninsula has also periodically experienced devastating losses to ornamental plant collections, in recent times particularly in 1987 and in 1961. Quite apart from the predictable loss of many exotics these experiences highlighted the vulnerability of plants normally regarded as hardy throughout the UK but acclimated to the mild peninsular climate.

**Sunshine.** The average monthly winter and summer hours of sunshine recorded in the south westerly part of England are considerably higher than in south eastern or central England. Table 2, above, illustrates the benefits, with 300 more hours of sunshine (+22%) at the Cornish site than at the Warwickshire site. Plant growth is advantaged by the associated long days.

**Rainfall.** The prevailing south westerly winds carrying moist air from the Atlantic Ocean cause high rainfall. An average yearly precipitation of 1005 mm (40 inches) compares notably with 650 mm (26 inches) and 616 mm (24 inches) at the other two sites. Land is mostly well drained and well charged with available water into spring. However, high rainfall contributes to high humidity and there are troublesome incidences of plant diseases which can devalue many commercial crops.

**Wind.** Probably the most conspicuous climatic feature of the peninsula is high winds. Plant injury and structural damage to buildings are the more obvious effects, but visually imperceptible adverse effects on growth are significant. Man-made shelter barriers of robust trees and shrubs and nonliving structures are essential for maximum production of quality commercial crops and for the establishment and maintenance of ornamental gardens.

Table 3, above, illustrates a higher recorded average hourly wind speed at a site in Cornwall compared to Lincolnshire and Warwickshire for the months of September to January. Most important is wind velocity and Table 4, below, presents an unsurprising sample record of percentage hours of gale force 6 or above wind, for the four seasons, at an Isles of Scilly site alongside similar records for a site in Hampshire.

Windborne deposits of sea salt are detectable many miles inland and cause damage to plant foliage and shoots. Measurements at a site 79 m (257 ft) above mean sea level in the west of the peninsula, 3 km (1.9 miles) from the Atlantic Ocean, have indicated an annual deposit of around 191 kg ha<sup>-1</sup> (170 lb per ac).

**Table 4.** Percentage number of hours of wind at Gale Force 6 or above.

	Isles of Scilly	Hampshire
Spring	17.5	1.2
Summer	7.1	0.8
Autumn	21.4	2.2
Winter	35.6	5.2

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## HORTICULTURAL BENEFITS OF THE CLIMATE OF THE SOUTH WEST PENINSULA

The principally important outdoor commercial crops of the area, (see Tompsett, this volume) are winter-heading cauliflowers (locally referred to as “broccoli”), early bulking potatoes, spring greens, strawberries, daffodils, anemones, and plants such as *Pittosporum* and *Eucalyptus* cut for the foliage market.

The peninsula is renowned for its ornamental gardens enriched especially with *Rhododendron*, *Camellia*, and *Magnolia*. Australasian species such as *Olearia*, *Acacia*, *Correa*, and *Grevillea* thrive, as do many palms and very tender species in favoured spots. The Penjerrick, Glendurgan, and Trebah gardens of the Fox family on the Helford estuary on Cornwall’s south coast are noteworthy. Also the coastal gardens of Caerhays Castle contain abundant camellias bred by the Williams family. Cotehele, Lanhydrock, Pencarrow, Trewithen, Trengwainton, Ince Castle, and Tresco Abbey on the Isles of Scilly continue a long list of gardens and plant collections which flourish as a result of the generally favoured peninsular climate. A host of plant patrons, breeders, and collectors associated with the favoured area have recognised the potential for horticulture and contributed much to our horticultural heritage.

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## Opportunities for and Constraints on Horticulture in the South West of England<sup>©</sup>

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### INTRODUCTION

Horticulture in the south west is inextricably linked to the climate which provides both opportunities and constraints regarding what is possible and what is economic. While the more easterly parts of the region tend to reflect national patterns, the peninsula of Devon and Cornwall, and the Isles of Scilly, are characterised by enterprises which seek to exploit the conditions. Horticulturally, the diversity of plants capable of being grown in the peninsula is remarkable and many horticultural businesses, including farms, nurseries, and gardens capitalise on this and see it as a pointer to future development and prosperity. The climate of Devon and Cornwall is characterised by mild winters, cool summers, moderate rainfall at all seasons, humidity, winds, good light, and a long growing season, all of which can tilt the balance in assessing the viability or potential for horticultural enterprise. When one considers the vast range of plants which can be grown in the far south west (some say it is greater than for any other area of its size in the world), the number of commercial crops grown on any scale in the area is rather limited. There are, of course, many significant horticultural businesses in the region, but it does remind us of the climatic and other factors underpinning any enterprise.

### TECHNICAL POSSIBILITIES AND COMMERCIAL REALITIES

In the past, the horticultural potential of the South West has often been exaggerated by an uncritical assessment of its potential. A thorough assessment of the climatic and other factors has always been recommended by the advisory services. In today’s global competitive market a fully realistic assessment is even more es-