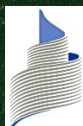


A HANDBOOK OF  
TROPICAL GARDENING  
AND PLANTING

H. F. MACMILLAN



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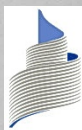


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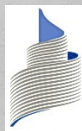


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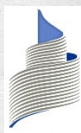


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A HANDBOOK  
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AND PLANTING

WITH SPECIAL REFERENCE TO CEYLON

BY  
H. F. MACMILLAN, F.L.S.

*(Superintendent, Royal Botanic Gardens, Ceylon).*

AUTHOR OF "ILLUSTRATED GUIDE TO THE  
ROYAL BOTANIC GARDENS, PERADENIYA," ETC.

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SECOND EDITION

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## PREFACE TO FIRST EDITION

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The need for a practical work of this nature, especially adapted for the Tropics, has apparently been long felt, judging by the demand for information on the subjects treated in this handbook. Of books on horticulture in temperate countries, there is no end, but they are generally of little guidance in tropical regions, where the conditions of climate, labour and methods of working are so different. A writer in the *Ceylon Observer* recently remarked: "How much more attractive and interesting our bungalow gardens and compounds might be made if the right sort of information regarding their care were available. Too often they are tended only by the garden-cooly, who has no pretensions to any knowledge of gardening, and things which grow, do so more by luck than good management." The aim of the author has been, therefore, to supply as concisely as possible and in a manner to suit the practical man in the field or garden, the kind of information which is most generally sought for, not only on horticultural matters, but also on general planting or agricultural subjects.

In practice there is no sharp line of distinction between Planting or tropical farming and Horticulture, and the main principles underlying both are the same. "Agriculture in the tropics," said SIR WILLIAM THISELTON DYER, "is essentially extended gardening; it has little relation to the agriculture of temperate countries, and its methods are those of horticulture." According to LIEBIG, "perfect agriculture is the foundation of all trade and industry, the foundation of the riches of state." "Scientific horticulture," said DR. BAILEY, "joins hands with the plant biologists on the one hand, and with commerce on the other."

Gardening or horticulture is obviously advancing in Ceylon, as in other tropical countries, and it is being recognised, slowly but surely, that it plays an important part in home adornment and comfort, as well as in rural improvement and sanitation. Nowadays

many planters, mercantile and professional men, manifest a keen interest in their garden, and in some cases become experts in the cultivation of certain classes of plants which claim their special attention. Superintendents of estates or plantations in lonely districts admit that the presence of choice flowering plants or trees about their bungalow have an exhilarating influence, and when these are absent it is usually due not so much to indifference on the part of the superintendent as to circumstances over which he has no control. In Rubber districts especially, the depressing effects of long interminable stretches of sombre-looking rubber trees is well-known, and recently several companies have shown a desire to have attractive flowering trees (as urged by the writer in a recent pamphlet) planted around the bungalows of their superintendents.

For ladies, gardening has special attractions; the cultivation and arrangement of flowers is not only especially appropriate to them, but they are also frequently successful competitors with men in the art.

I leave it in the hands of readers to judge of the merits of this work, if it has any. The general arrangement of the plants or crops, useful or ornamental, into sections according to the elevation and purpose for which they are especially suited, will, I trust, be appreciated. To facilitate reference and save the time of readers, considerable use has been made of tabular forms which contain only the most essential particulars. The planting products in Chapters XXII and XXIII are considered in accordance with their importance in Ceylon. Though a botanical arrangement has been avoided in preference to an economic or practical one, the botanical name and Natural Order or family of each plant or product mentioned throughout the book are invariably given. Most people nowadays know the meaning of plant affinity, and to these a knowledge of a plant's scientific name and family often conveys some idea as to its general character or utility. The common or vernacular names, when sufficiently popular or well-known, are given in English, Sinhalese, and Tamil, also in some cases in Hindustani and Malay.

My thanks are due to several gentlemen as well as ladies who have kindly supplied me with valuable suggestions and information. LADY BLAKE has favoured me with useful notes on various ornamental plants, and MRS. WESTLAND and other ladies have contributed recipes for jams, jellies, preserves, etc. I am especially

indebted to MR. E. E. GREEN, F.E.S., F.Z.S., Government Entomologist, and MR. T. PETCH, B.A., B.SC., Government Mycologist, who obligingly furnished me with much of the information in the chapters on *Insect Pests* and *Fungus Diseases* respectively; to DR. R. H. LOCK, M.A., SC.D., Assistant Director, Royal Botanic Gardens, for useful guidance; to MR. M. KELWAY BAMBER, M.R.A.C., F.I.C., etc., Government Chemist, who has read, and contributed to, the chapters on *Soils* and *Manures*; to MR. J. K. NOCK\* Curator of Hakgala Gardens, for much information on Up-country fruits, vegetables, etc.; to MR. C. DRIEBERG, B.A., F.H.A.S., Secretary of the "Ceylon Agricultural Society" and Superintendent of School Gardens, who has written the Calendar for the Low-country and afforded assistance in other ways; and to the Hon. the Principal Collector of Customs, Colombo, who has courteously obliged me with statistics of exports. Finally I desire to acknowledge the constant courtesy of MESSRS. H. W. CAVE & Co., the printers, whose work I think speaks for itself.

For the loan of several excellent half-tone and electro blocks, I have to thank *The Agricultural Economist & Horticultural Review*, *The Gardener's Chronicle*, *The Ceylon Agricultural Society*; also MESSRS. PLATE & Co., MESSRS. WALKER SONS & Co., and MESSRS. BROWN & Co. My thanks are likewise due to MR. H. W. CAVE, M.A., MESSRS. F. SKEEN & Co., THE COLOMBO APOTHECARIES Coy. and MR. T. PETCH for permission to use certain photographs. With the exception of these, the photographs for all the illustrations have been taken by myself.

Among useful works of reference which I have consulted, I would especially mention the following:—WATT's *Dictionary of Economic Products of India*, CAMERON's revised edition of *Firminger's Manual of Gardening for India*, WOODROW's *Gardening in India*, NICHOLL's *Tropical Agriculture*, MUKERJI's *Indian Agriculture*, HALDANE's *Sub-tropical Cultivations and Climates*, NICHOLSON's *Encyclopædia of Gardening*, WATSON's revised edition of *Thompson's Gardeners' Assistant*, FERGUSON's *Ceylon Handbook and Directory*, FREEMAN AND CHANDLER's *The World's Commercial Products*, BAILEY's *Pruning Book*, MAXWELL-LEFROY's *Indian Insect Pests*, PEARSON's *Book of Garden Pests*, SORAUR's *Physiology of Plants*, WILLIS' *Agriculture in the Tropics*, TRIMEN's *Flora of Ceylon* and WRIGHT's *Hevea brasiliensis*.

H. F. M.

\*Whose lamented death has since occurred.

## PREFACE TO SECOND EDITION

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The rapid exhaustion of the first edition has given the author an opportunity of enlarging and fully revising the work, the book being now considerably increased in size. Some of the chapters have been entirely re-written and extended, and several new features have been added, among these being the following subjects: Use of explosives in agriculture, inter-crops and catch-crops, dry-farming, intensive or French gardening, sericulture, lac-culture, selections of trees, plants, etc., for cemeteries or memorial purposes, selection of Ceylon indigenous plants, poisonous plants, sacred trees, remarkable or curious seeds and fruits, insectivorous, fly-catching, and myrmecophilous plants. The illustrations also have been almost doubled in number.

I have to express my indebtedness especially to MESSRS. JOHN PARKIN, M.A., N. C. ROLT, and C. DRIEBERG, B.A., for valuable assistance and suggestions; also to MESSRS. R. N. LYNE, Director of Agriculture, for kind encouragement; C. H. KNOWLES, B.Sc., Superintendent of Agriculture, Fiji; GEO. BRYCE, B.Sc.; and J. W. IRWIN, of Coorg, for a photograph of coffee cultivation. For the loan of some excellent blocks, I have to thank MESSRS. SUTTON & SONS, Reading; RYDER & SONS, St. Albans; BROWN & Co. and WALKER & SONS, LTD., Colombo.

H. F. M.

*Royal Botanic Gardens,  
Peradeniya,  
May, 12th, 1914.*





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## ERRATA

PAGE

- 118 for *Casuarina equisetifolia* read *C. equisetifolia*.
- 120 for *Malpighia coccinea* read *Malpighia coccifera*.
- 124 line 5, for Soil of potting plants read "Soils for pot plants."
- 215 line 12 from bottom, for Tamba-karawila read Tumba-karawila.
- 248 18 " " for *Oca-quina* read *Oca-quira*.
- 317 after *Allamanda Schottii* read *A. violacea*; flowers rosy-purple; height 5 to 7 ft.
- 325 line 2, for *ilicifolio* read *ilicifolia*.
- 359 for *flabilefer* read *flabellifer*.
- 378 for *Alocasia Argyrea* read *A. argyrea*.
- 389 *Scutellaria* should be *Scutellaria*.
- 398 for *Ailanthus* read *Ailantus*.
- 399 for *Chamaecyparis Lawsoniana* read *Cupressus funebris*, and under the former read: A handsome pyramid-shaped small tree, with crowded fern-like leaves; 4-6,000 ft.
- " line 11 from bottom, for *C. knightiana* read *Cupressus knightiana*, and for *C.* in following leading lines read *Cupressus*.
- 404 for *Philadelphus* read *Philadelphus*.
- 405 line 11, for *Wiganda* read *Wigandia*.
- 421 for *Lebelia* read *Lobelia*.
- 431 for *Tigrida* read *Tigridia*.
- 435 for *Clyclamen* read *Cyclamen*.
- 537 after *Asclepias curassavica* read perennial, not perennia
- " " *Brayera* read *N. O. Rosaceae*.
- 547 line 6, for *Agave rigida* var. *Sisalana* read *Agave Sisalana*.
- 564 line 5, for *Nectandra* read *Nectandra*.
- 572 under Lemon-grass read *Cymbopogon*, not *Andropogon*.

# A HANDBOOK OF TROPICAL GARDENING & PLANTING.

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## CHAPTER I.

### CLIMATE AND SOILS

**Climate.**—Climate is the principal factor which controls the growth of plants, and constitutes the conditions which render a country suitable for the abode of man and animals. One of the first questions the planter or gardener in the tropics has to consider is whether the climate is suitable for the cultivation he intends to take up. Climate mainly depends upon latitude and altitude; it is usually hottest at the equator at sea-level, and coldest the furthest away from it and the highest above sea-level. It is also, however, materially affected by the distance from the sea, form and slope of the land surface, the nature of the soil and its vegetation, and other circumstances. The influence of altitude is specially noticeable in the tropics, the temperature becoming appreciably cooler as one ascends in the hills. Thus, while at Colombo it is hot and tropical, at Nuwara Eliya, 6,000 feet above the level of the sea, it is cool and temperate. For about every 300 feet of elevation there is a reduction of about one degree in the temperature, and it is estimated that for about every 270 feet elevation the effect on the temperature is equivalent to receding a degree from the equator. Thus, Kandy being about 1,500 feet above sea-level, its average shade temperature is about 5 degrees cooler than that of Colombo. At Nuwara Eliya the difference is even more marked, so that it

Pidurutalagala, our highest mountain (8,296 ft.), were about 8,000 ft. higher still, it would probably be covered with perpetual snow. The cooler climate of the hills not only renders possible the cultivation of certain plants or crops which are indigenous to temperate regions, but also affords residents and visitors a very grateful substitute for the more bracing climate of a temperate country. The flat northern and eastern portion of Ceylon are characterized by a dry arid climate, to which typical forms of thorny vegetation or scrub are indigenous. Here, however, certain crops may thrive under special methods of cultivation better than in the wet zone, being specially adapted (xerophytic) to the arid climate, as for example the useful Palmyra palm, which in the dry zone luxuriates and forms a valuable product.

In Ceylon there thus occur four distinct types of climatic zones, viz:—(1) the *hot and moist zone*, from sea-level to about 1,000 feet elevation with a well distributed rainfall of 70 to 120 or more inches, and a mean shade temperature of about 80° Fah.; this is confined to the south-western part of the island; (2) the *hot and dry zone*, formed by the flat country of the northern and eastern part of the island, with a rainfall confined to only a few months of the year; (3) the *intermediate zone*, from 1,000 to 4,000 feet, with a rainfall of 80 to 130 or more inches; (4) the *montane or cool zone*, from about 4,000 feet to the highest altitude (8,296 feet), with an evenly distributed rainfall of 85 to 150 or more inches. In the months of January and February, cool night temperatures are usually experienced in the low-country; thus at Colombo a night temperature of 65° F. and at Kandy of 50° F. have been recorded; whilst at Nuwara Eliya a slight frost frequently occurs in the period named. Such a diversified climate allows of the successful cultivation of a large variety of plants or crops from different latitudes, and within a comparatively small area. Consequently there may be seen in Ceylon a considerable number of acclimatized plants from Brazil, Mexico, Pacific Islands, Malay, Tropical Africa, India, etc., luxuriating in the low-country; whilst at the higher elevations many species from cooler regions, as Europe, South Africa, Australia, Peru, etc., are perfectly at home, many having become naturalised.

**Seasons.**—SIR EMERSON TENNANT said: "The line is faint that divides the seasons in Ceylon. No period of the year is divested of its seed time and its harvest in some part of the Island, and the ripe fruit hangs on the same branches that are garlanded with

open buds." Thus there are no seasons in Ceylon, in the sense the word is used in temperate countries. The uniform moist climate of the south-western districts is only varied by a period of comparatively short rainfall between January and March, known as the "dry season." No "cold season" occurs here as in India, though during the dry season named, as well as the hotter months (March to May), most people prefer to enjoy the more bracing air of the hills, which is then dry and crisp. So that the only variety in the climate is afforded by the two annually recurring monsoons, viz., the *south-west monsoon*, commencing at the end of May and lasting till October, and the *north-east monsoon*, lasting from October to May. The rainfall of the former is more or less confined to the south-west of the Island, while the eastern side of the country receives its most copious rain from the north-east monsoon, chiefly in November and December, its driest seasons being from June to September. In the northern part of Ceylon, the rainy season is mostly confined to the three months of October to December, very little rain falling from April to September. The hottest period of the year, all over Ceylon, is from March to May.

### LOCAL INFLUENCES ON CLIMATE

**Forests.**—These constitute one of the most important conditions affecting climate. The presence of forests prevents erosion of the soil, retards the evaporation of moisture, enables the soil to retain a large proportion of rain water, and tempers the atmosphere both by cool vapours from the soil and by preventing the sun's rays from reaching the earth. It is also claimed that forests cause precipitation of the clouds, resulting in more frequent showers and heavier rainfall than would otherwise be the case; but this is a disputed point. When the forest is cleared away, radiation from the land is increased, the soil is less retentive of moisture, and the air, as well as the soil, becomes drier and warmer. A similar effect takes place when swampy and marshy land is drained and brought into cultivation. The climate of islands and maritime districts is usually much more equable than that in the interior of continents, the atmosphere in the former being frequently loaded with clouds and vapours. Lakes, marshes and rivers have usually an unfavourable effect on climate, as they give rise to fogs, especially at night, which chill the ground and render the vicinity unhealthy.

