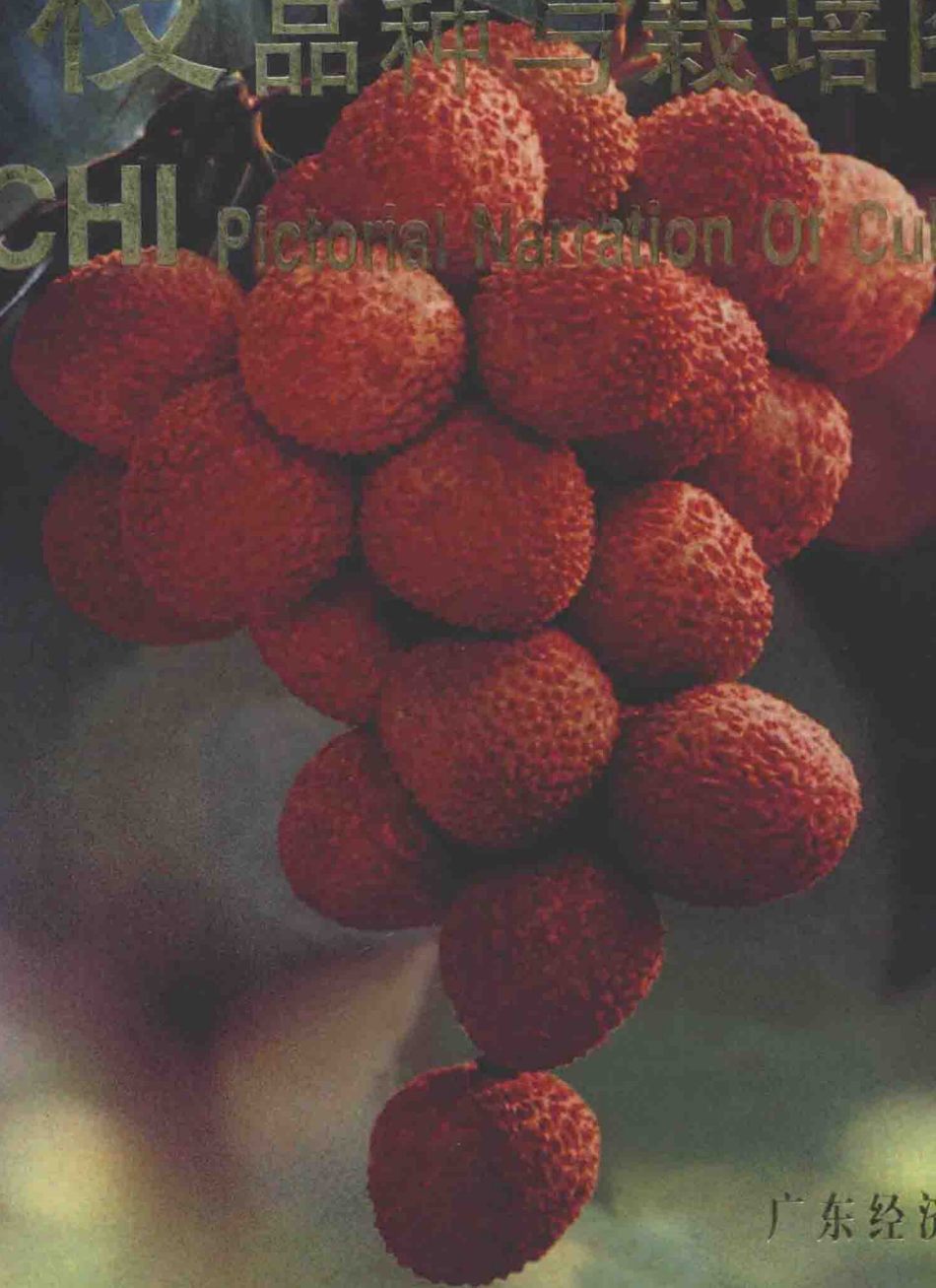


广东省农业科学院果树研究所 编

荔枝品种与栽培图说

LITCHI Pictorial Narration Of Cultivation



广东经济出版社



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广东省农业科学院果树研究所 编



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荔枝 品种与栽培图说

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王碧青 广东省连平县人,1960年3月出生,1982年毕业于华南农业大学植保系。现为广东省农业科学院果树研究所副研究员。主要从事荔枝栽培、病虫害防治的研究及技术推广工作。

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邱燕萍 广东省信宜市人,1962年11月出生,1985年毕业于华南农业大学土壤农化专业。毕业后一直在广东省农业科学院果树研究所从事荔枝果实发育、坐果生理及高产栽培技术研究。现为广东省农业科学院果树研究所副研究员。

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李剑书 广东省揭阳市人,1936年10月出生,1956年毕业于华南农学院植保系。毕业后从事植保科研、教学和技术推广工作。主要进行荔枝、龙眼病虫害的研究。现为广东省农业科学院果树研究所副研究员。

Jianshu Li a native of Jieyang County, Guangdong Province, born in October, 1936, graduated from the Department of Plant Protection, South China Agricultural University in 1956. He has been working on research, education and technical extension concerning plant protection, mainly dealing with pest control of litchi and longan (*Euphoria longan*), and is now an associate research professor in the Pomology Research Institute, Guangdong Academy of Agricultural Sciences.





序(一)

荔枝原产我国，已有两千多年的栽培历史记载。唐代诗人白居易著的《荔支图序》。北宋蔡襄 1059 年著的《荔支谱》，全书两万余言，论述荔枝的历史、分布，提出优良品种“陈紫”，“香气清远、色泽鲜紫、壳薄而平、囊厚而莹、膜如桃花红、核如丁香母”。当时福建的荔枝，已远销出口日本、阿拉伯等地。诗人杜牧《过清华宫》诗云：“长安回望绣成堆，山顶千门次第开，一骑红尘妃子笑，无人知是荔枝来”。我国的荔枝在十八世纪引进日本，1873 年引到美国夏威夷。本世纪初，我国的荔枝品种，引进到美国佛罗里达亚热带果树研究所，均因气候不适，未能大量发展。

我国的荔枝品种资源非常丰富。公元前 116 年，汉武帝进兵南粤，带回 100 多株荔枝，修建扶荔宫，均不能过冬成活。福建莆田卫星街，尚有 1200 年生的古荔枝树“宋香荔”。海南省五指山，以及粤西、桂东一带山区，尚有野生的原始荔枝林。唐代郑熊曾著的“闽中荔支谱”记载有 22 个荔枝品种，明代徐燊著的《荔支谱》和吴应逵著的《岭南荔支谱》等专著记载广东、广西、四川、云南的荔枝品种近百种，其中有岭南名种挂绿，早熟品种三月红、晚熟品种中秋绿，矮化的尚书怀等名种。《蜀志》记载：四川犍为、涪州出荔枝。张世南在《游宦纪闻》中叙述：公元四世纪时，创造了高压无性繁殖技术，选品质好的母本树 2~3 年生枝，在春季 4~5 月压条生根后剪下移栽。

广东省农科院果树研究所张展薇研究员等，多年来研究荔枝品种的生物学特性，地理分布，育苗繁殖，矮化密植，栽培技术，环割整枝，授粉受精，坐果生理，早结丰产，采摘贮藏，运销加工等新技术。收集丰富多采的实物照片 360 余幅，编著古代以来世界上第一本图文并茂，内容丰富的《荔枝》专著。为我国原产的珍果荔枝享誉世界，为我国的荔枝生产发展，提供科学技术的依据。特此作序，以表祝贺。

橘翁： 

1996 年国庆节于武汉华中农业大学

Preface (I)

The litchi originated from China which has a cultivation history of more than 2000 years. It was introduced into Japan and the United States in the 18th century. At the beginning of this century, some litchi cultivars were introduced into Florida Fruit Research Institute, but did not develop into mass production due to the unsuitable climate.

China has very rich litchi resources. Wild litchi groves can still be found in Wuzhi Mountains, Hainan Province, and mountainous areas in the Western Guangdong and Eastern Guangxi. In Tang Dynasty, Zheng Xiongzheng edited Central Fujian Litchi Manual and described 22 litchi varieties. In Ming Dynasty, Xu You compiled Litchi Manual, which recorded nearly 100 varieties in Guangdong, Guangxi, Sichuan and Yunnan.

For years, Prof. Zhanwei Zhang, research scientist in the Pomology Research Institute, Guangdong Academy of Agricultural Sciences, and her colleagues have been focusing on research on the biological characteristics, geographic distribution, propagation of nursery trees, dwarfing and close planting, pollination and fertilization and fruit setting physiology, early bearing and bumper yielding, shaping and pruning, and fruit harvest, storage and transport, etc. They collected more than 360 material object pictures and compiled this litchi treatise, which is the first one in this subject in the world and lays scientific foundation for the precious China-originated fruit to achieve worldwide fame and for the development of litchi industry in China as well.

As preface, the above words are put forward to express my wholehearted congratulation on the occasion of its publication.

Wencai Zhang
Professor in Horticultural Science
Central China Agricultural University
Wuhan, P. R. China
On National Day of 1996



序(二)

荔枝被誉为“岭南果王”。广东是荔枝的原产地之一,栽培荔枝已有两千多年的历史,是我国荔枝的第一大产区。其品种资源、栽培技术、种植面积和产量均居全国之冠。位处“荔枝王国”的广东省农业科学院果树研究所 对于荔枝的研究,极为重视。多年来在密切结合生产、研究推广一系列实用型科技成果的同时,在对荔枝的应用基础理论研究和编写科技著作方面也做了不少工作。除了建成“国家果树种质广州荔枝圃”外,陆续编辑出版了《广东荔枝志》(1978年)、《广东荔枝图谱》(1985年)、《广东优稀水果图谱》(1990年)和《荔枝高产栽培》(1993年)。现又由新一代研究人员张展薇、袁沛元等荔枝专家,以他们最新的科研成果为基础,结合前人的工作积累,编辑出版图文并茂的《荔枝》专著,实属可喜可贺。

专著共 14 章,内容十分丰富而新颖。它详实介绍了包括挂味、糯米糍等十大名种在内的荔枝主要品种,同时也介绍了一些新发掘品种的生产潜力。书中所介绍的荔枝“三高”栽培技术全过程,均经实践证明行之有效,操作性强,很值得荔枝经营者取经和参考。它还介绍了综合防治荔枝病虫害的具体方法,特别是彻底防治为害较严重的荔枝蝽蟥及蒂蛀虫等,在这方面,我认为是很有实用价值的。

还要提及,本书诸位作者,是我国著名果树学者章文才教授和李沛文教授培养出来的园艺专家。名师高徒,承前启后。他们多年来深入粤西荔枝产区,从事早熟品种白糖罂等的选育种、栽培技术研究和成果推广,促使茂名市建成为我国最大的荔枝生产基地,应该说,他们是作出了一定贡献的。

最后,我期望在党中央“科教兴国”的战略思想指导下,这部科学性、实用性都很强的荔枝新书,能为广大荔枝生产者和科研工作者所采用,这样,将有助于我国荔枝生产水平的提高。作为一名毕生致力于果树教学和科研工作的老兵,我酷爱荔枝,更酷爱指导荔枝栽培的好书。因而乐为之推介,并乐为之作序。

华南农业大学教授 周其明
1996 年 10 月 30 日于广州

Preface (II)

Guangdong is one of the gene centers of litchi and ranks the first in terms of its germplasm resources, cultivation practices, planting acre and total production.

Litchi project is considered to be very important by the Pomology Research Institute of Guangdong Academy of Agricultural Sciences. In this book, the authors present us with up-to-date knowledge based on their latest research results and combined with experiences from the predecessors in litchi industry. All the major cultivars, including the famous Guiwei and Nuomici, as well as some newly discovered ones with potential, are described. The complete set of practices for the cultivation of high yield and superior quality in litchi, which is recommended in this book, has been fully proved effective. The detailed procedure of IDPM (Integrated Disease and Pest Management), especially against the most damaging pests, such as litchi stink bug and stem-end borer, is also included and is very practical and valuable.

Authors of the book are all horticultural experts educated by Prof. Wencai Zhang (Ph.D) and Prof. Peiwen Li (Ph.D), the well-known scientists in pomology in China and abroad. I am really glad to see that they are qualified successors.

I fully believe that this book will make great contribution to scientific researchers and farmers in litchi. I, myself, as a veteran both in pomology education and research, ardently love litchi. I am even more fond of any book good for instructing litchi cultivation. Therefore, I enjoy recommending this book and take great delight in writing the preface.

Qiming Zhou
Professor in Pomology
South China Agricultural University
Guangzhou, P. R. China
Oct. 30, 1996



编 者 的 话

荔枝原产我国,有 2000 多年的栽培历史,其栽培面积之大,品种之丰富,产量之多均居世界之首。为了让果树科技工作者和荔枝生产者、经营者以及广大消费者更加了解荔枝的品种、栽培和保鲜贮运技术,我们将我国荔枝第一主产区广东的荔枝品种、栽培情况和生产技术介绍给读者,并试图将本书编成既是一本技术书籍,又是一本美丽的画册。如果您是生产者,愿您能从本书中了解和选择适合本地栽培的品种和早结果、丰产、稳产的栽培技术,这将是您事业成功的基础。如果您是荔枝的爱好者,本书可以带您进入荔枝世界,使您认识和选择您所喜爱的荔枝品种,如早熟的三月红、白糖罂、白蜡;早中熟的妃子笑;中迟熟的著名优质品种桂味、糯米糍、挂绿;晚熟的雪怀子、马贵荔等。在蝉鸣荔熟时,您不妨和您的家人,您的朋友一览荔树成荫,树面挂满红果的古老荔枝园,或走进那新植的矮化、密植、早结、丰产业园,那里会让您耳目一新。一人高的矮化荔枝树,从树冠的下部到上部,荔果累累,您可以亲手摘下串串新鲜的荔枝品尝,一种无可比拟的美的享受,会使您真正体验唐朝诗人苏东坡的诗句“日啖荔枝三百颗,不辞长作岭南人”对荔枝的赞美。

但愿这本书对广大读者有所贡献。

我们非常荣幸得到国内外著名的果树专家章文才教授和周其明教授为本书作序,著名摄影家廖衍猷先生为我们拍摄部分珍贵的照片,彭永宏博士为本书的翻译与编排提出宝贵的意见。同时本书编写过程中得到茂名市水果开发总公司,从化市科学技术委员会,广州军区后勤部深圳企业局瑶湖农场及许多同行专家的支持和帮助,谨此一并致谢。

本书不足之处,敬请读者批评指正。

Words from the Editors

Litchi originated from China which has a cultivation history of more than 2000 years and ranks the first in the world in terms of planting area, cultivars and total production. To help pomological researchers and technicians, farmers, businessmen and consumers better understand litchi cultivars, cultivation, preservation, and transportation, we compiled this book to bring readers information on litchi in Guangdong Province which is the most important litchi production area in China, and tried to make it a technical reference and an attractive picture album as well. If you are a producer, you may learn how to choose cultivars suitable for your local situation and cultivation practices for early fruiting, high and stable yields. If you are a litchi-lover, you might follow this book and enter a litchi wonderland, pick litchi fruits whichever you like, such as early-season cultivars Sanyuehong (March red), Baitangying (sugar poppy), and Baila (white wax); early mid-season cultivar Feizixiao (princess smile); and mid-late season cultivars Guiwei (osmanthus flavor), Nuomici (glutinous rice doughnut), and Gualu; and late-season cultivars Xuehuaizi, Maguili (horse noble), etc. In lovely summer time, you might go with your family and friends to an old-age litchi orchard, where you will certainly enjoy the shade under the flourishing trees and the beautiful crown full of cardinal fruits. You can also visit a newly-built, dwarfing, close planting, and early bearing and high yielding orchard, where you will have a feeling of complete freshness. Seeing the one-person-tall dwarf litchi trees, you will be fascinated by numerous ruby-like fruits adorning all over the trees from top to bottom. If you pick a cluster of fresh fruits and taste them, an incomparable pleasure will come to your heart, and you are really experiencing the poem that Dongpo Su, the great poet of Tang Dynasty, wrote: "Everyday you savor three hundred of litchi fruits. You would never regret to live in the South eternally."

We wish this book bring something valuable to the readers.

The authors take it as a big pleasure that professors Wencai Zhang and Qiming Zhou, who are well-known pomology scientists both at home and abroad, write prefaces, and the famous photographer, Mr. Yanyou Liao take some precious pictures for this book. The authors would also like to thank Dr. Yonghong Peng for his valuable suggestions in translation and edition of this book; Maoming Fruit Development Company, Conghua Science and Technology Committee, and Yaohu Estate of Shenzhen Enterprise Bureau of PLA of Guangzhou Military Region, and many experts who have contributed to this book's publication.

The authors would greatly appreciate any suggestion and comment which will help the improvement of the book.

The editors

March 1, 1997



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1 概 说

Introduction

荔枝(*Litchi chinensis* Sonn)属无患子科,是一种经济价值高,寿命长,产量高的常绿性亚热带果树。其果皮颜色鲜艳,肉质细嫩多汁,味美绝佳,营养价值高,被誉为“果中之王”,为古今中外人士推崇备至,在国内外市场引人瞩目,发展前途非常广阔。

我国是世界荔枝原产地,拥有世界上最富有的种质资源及先进的栽培技术。我国荔枝分布于北纬 $18^{\circ}\sim 24^{\circ}30'$,主要栽培产区是广东、广西、福建、海南、云南、四川、台湾等省(区)。广东省是我国荔枝的第一产区,其品种资源、栽培技术、栽培面积及产量均居全国之首,堪称“荔枝王国”。

广东是荔枝的原产地之一,已有两千多年的栽培历史。广东省荔枝分布区域广阔,除粤北少数地区外均有荔枝栽培。东莞、增城、高州、从化、电白、广州市郊、深圳、中山、惠来、饶平、新兴等县(市)是最著名的产区。广东荔枝的品种、品系及优良单株琳琅满目,已发现的就有 200 多个。进行商品性栽培的有 40 多个,其中糯米糍、桂味、妃子笑、增城挂绿、三月红、白糖罂、白蜡、黑叶、怀枝等为主要栽培品种。在广东,荔枝早、中、迟熟品种的整个鲜果供应覆盖期长达 3 个多月。目前,广东省的荔枝栽培面积已达 23 万多公顷,且基本形成了良种区域化栽培的格局,建立了许多大规模的商品生产基地。1996 年全省荔枝总产约 28 万吨,鲜果以内地销售为主,部分出口到香港、东南亚及日本等地。在广东珠江三角洲及茂名等主要荔枝产区,每当蝉鸣荔熟,红果压枝时,均举办荔枝节盛会,吸引许多国内外宾客。

广东荔枝传统进行疏植,树体虽然高大,但结果期晚,管理不便,产量极不稳定。近 10 年来,随着荔枝商品性生产的发展,广大科技工作者在对优良品种的选育,对密植矮化、早结、丰产栽培技术,对荔枝生物学特性,花芽分化,开花及坐果机理,培养健壮结果母枝,控冬梢促花,人工授粉和提高坐果率等基础理论和应用技术方面开展了深入研究并取得了很大进展,发掘出不少优良品系和单株。荔枝不再是开花坐果难而是栽植后 3~4 年可以挂果,产量也有了较大幅度提高。古云“不须更论何时吃,前种后收人我同”的感叹已成为过去。相信通过广大科技工作者和生产者的努力,荔枝产量、质量和效益将会进一步提高,荔枝产业将会得到进一步的发展。



Litchi (*Litchi chinensis* Sonn.), a species in the *Sapindaceae* family, is an evergreen, subtropical tree that has a long life and bears high yield. The litchi fruit has beautifully-colored skin and delicate and juicy pulp. It is famed as 'the King of Fruits' for its nourishing value and excellent taste. It has long been highly praised by people nowadays and in ancient times, at home and abroad, and be of brilliant future.

As the indigenous home of litchi plants, China has the most abundant germplasm resources and advanced cultivation practices in the world. Litchi in China distributes between 18° to 24°30' north latitude, where Guangdong, Guangxi, Fujian, Hainan, Yunnan, Sichuan and Taiwan are the main production provinces. Among them, Guangdong ranks the first and can be called 'the Kingdom of Litchi' for its richest resources, best cultivation technology, largest planting area and highest yield in the country.

Guangdong is one of the native habitats of litchi with a plantation record of more than two thousand years. Litchi is grown everywhere in Guangdong except few places in the northern part of the province. The most important production areas are counties /municipalities such as Dongguan, Zengcheng, Gaozhou, Conghua, Dianbai, Guangzhou suburbs, Shenzhen, Zhongshan, Huilai, Yaoping and Xinxing, etc. There are over 200 litchi cultivars in Guangdong, about 40 are grown commercially, with cultivars Nuomici, Guiwei, Feizixiao, Zengchenggualu, Sanyuehong, Baitangying, Baila and Huaizhi being dominantly planted. With the early, mid-and late season cultivars combined together, the marketing season of fresh litchis can last over three months. At the present, Guangdong has a litchi plantation area up to 230, 000 hectares. Many large scale commercial production bases (orchards) have been established and a cultivation setup based on regional conditions and superior cultivars has been basically formed. The total litchi production was about 280, 000 tons in Guangdong in 1996 season, with most of the fresh fruits being consumed in and outside the province at internal market and a part exported to Hong Kong, Southeast Asia and Japan, etc. Litchi Festivals are annually held in the Pearl River Delta Area and Maoming when summer comes and brilliant red litchis are heavily pressing the branches down, which attracts crowds of visitors from home or abroad.

Litchi trees were traditionally sparsely planted. It is neither a good way for orchard management nor a ideal pattern for constant production since the tree is very tall and bears fruit very late. With the great development of litchi commercial production during the past decade, systematic and meticulous research in both basic and applied fields, including cultivar improvement; cultivation practices for high-density planting, dwarfing, early bearing and high yielding, mechanism of flower bud differentiation, flowering, fruit setting, culture of strong and healthy mother branches, winter shooting control and flowering promotion, artificial pollination and fruit-set improvement, has been conducted and great progress has been made. Many good cultivars and selections have been found. Flowering and fruit setting are no more obstacles to litchi production. Litchi tree can start to bear fruit in the 3rd or 4th year after transplanting. Yield is greatly increased. Farmers would not again complain about the long waiting for harvesting fruit. We have the reason to believe that litchi yield, quality and productivity will be further developed and the litchi industry will be of a brilliant future.