

Book Reviews

WESTERN FERTILIZER HANDBOOK—SECOND HORTICULTURE EDITION. Soil Improvement Committee, California Fertilizer Association. 1998. Interstate Publishers, Inc., 510 North Vermilion Street, P.O. Box 50, Danville, IL 61834-0050. 362 p. \$26.95 + S&H, softcover. 50 color photos. ISBN 0-8134-3146-8.

The *Western Fertilizer Handbook—Second Horticulture Edition* is a handy reference for horticulturists and gardeners with strong interests in plant nutrition. It also serves as a good textbook for an introductory plant nutrition course. This handbook includes a forward, acknowledgments, an introduction, thirteen chapters, four appendices, and a glossary of terms. The second edition is a great improvement over the first edition. Two new chapters have been added while two chapters have been eliminated. Each remaining chapter has been greatly expanded.

The *Western Fertilizer Handbook—Second Horticulture Edition* is simple enough for amateur gardeners, fairly comprehensive for undergraduate students, and very practical for horticulture industry professionals and educators. The first three chapters of the handbook deal with the basics of soils as a medium for plant growth, water in relation to nutrients and plant growth, and principles of plant growth. Physiological roles of mineral nutrients, nutrient deficiencies, and essential plant nutrients are then discussed. The physiological roles of nonmineral elements such as carbon, hydrogen, and oxygen are discussed in two paragraphs. The available forms and physiological roles of all fourteen elemental essential elements are discussed in short paragraphs. They include nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, zinc, iron, manganese, copper,

boron, molybdenum, chloride, and nickel. Nutrient deficiency symptoms are listed as bulleted items. In addition, there are 24 high-quality color plates of nutrient deficiencies and toxicities included in this chapter as well.

The next three chapters deal with fertilizers—a source of plant nutrients, speciality fertilizers, and fertilizer formulation, storage, and handling. Many forms of fertilizers are listed for each essential element. Data on elemental content, basic reactions, origin, and chemical properties are provided for each fertilizer. The acidity or basicity equivalent of common nitrogen, phosphorus, and potassium fertilizers are also included. This information is a great aid to proper fertilizer selection when dealing with plants that respond to acid or alkaline soils. The chapter on fertilizer formulation, storage, and handling, supplies information that benefits fertilizer manufacturers, dealers, and distributors, more than horticultural industry professionals or educators.

The chapter on the methods of applying fertilizers provides important information regarding the advantages and disadvantages of fertilizer application methods: surface application, sub-surface application, fertigation, and foliar applications. In the chapter dealing with soil, media, and tissue testing, the authors have done a very good job of explaining the theories, practices, advantages, and limitations of each method. Two chapters are devoted to soils, soilless media, and using amendments to correct soil and growing-media problems. There are two sections dealing with corrective measures for acid soils and saline soils. However, I am disappointed that there is no discussion on the management of alkaline soils. One chapter is devoted to growing plants in solution culture or hydro-

ponics in both small and large scales. There are several helpful tables on stock solution preparation for commonly used macronutrients and micronutrients.

The last chapter deals with best management practices in both production horticulture and ornamental horticulture. This handbook would have been very beneficial to me when I was a teaching assistant for the undergraduate plant nutrition course at Ohio State University. I now refer to the handbook regularly when I make fertilizer recommendations.

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COMMERCIAL GREENHOUSE VEGETABLE HANDBOOK. Gary W. Hickman. 1998. University of California, Division of Agriculture and Natural Resources, Communication Services-Publications, 6701 San Pablo Ave., 2nd Floor, Oakland CA 94608-1239. 24 p., 7 line drawings, 2 black & white photographs. \$5.00, softcover. Publication 21575.

This is a very inexpensive handbook packed with basic information about greenhouse vegetable production and marketing. The information is targeted at commercial growers and will be especially useful to a prospective or new grower. An excellent summary of preconstruction considerations is given for greenhouse structures, covering, location, and basic environmental controls.

Common greenhouse vegetable crops are discussed with emphasis on tomato and cucumber. Crop production systems such as bag culture and nutrient film technique are described and supported with photographs. Very clear and practical descriptions and illustrations are provided for several frequently asked questions on crop production. These topics are best supported with illustrations such as those provided. The topics covered in this method include a typical greenhouse floor plan for bag culture and training and trellis systems for tomato and cucumber.

Many new growers spend a lot of time figuring and managing nutrient programs. A good overview is provided on the basics of hydroponic nutrient concentrations. Only one example of

an actual formula with ingredients is provided. Detailed information about how growers can develop nutrient solutions using various nutrient sources is not provided in the handbook itself, but other references with that information are provided. Tables with adequate nutrient ranges from leaf tissue analysis are also provided.

An accurate list of common problems for all growers gives the new grower a real sense of the many challenges to be met, including physiological problems, insects and diseases. A very simplified cost analysis for a 20,000-ft² greenhouse structure and estimated production costs will be very helpful to prospective growers. The estimated cost to produce tomato is listed at \$0.77/lb and cucumber \$0.72/lb. These costs are realistic, but ranges above and below are to be expected.

This introductory handbook is similar to those developed by other educational institutions such as the University of Florida and Mississippi State University. It will serve as an excellent resource for new and prospective greenhouse vegetable growers. Any county extension agent with requests for information about beginning a new greenhouse vegetable operation should know about and refer to this handbook. The handbook's strength is in providing easy to understand information about the most frequently asked questions by new growers.

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20TH CENTURY BIOSCIENCE: PROFESSOR O.J. EIGSTI AND THE SEEDLESS WATERMELON. John H. Woodburn. 1999. Pentland Press Inc., 5123 Bur Oak Circle, Raleigh, NC 27612. 169 p. \$21.95 plus \$4.00 s & h, hardcover. ISBN 1-57197-132-7.

This is an interesting biography of O.J. Eigsti, whose vision and perseverance led to the commercialization of the seedless watermelon. Eigsti -the breeder and developer of Tri-X-313, the first dominant seedless watermelon in today's market was the founder of the American Seedless Watermelon Seed Corporation that later became American Sunmelon. But, as Woodburn points out, Eigsti was much more. He introduces us to O.J. Eigsti the educator,

who taught genetics during the period when knowledge of the subject developed from early cytogenetic work up to the advent of modern molecular genetics. Eigsti as a scientist and author, coauthored *Colchicine—In Agriculture, Medicine, Biology, and Chemistry*. Woodburn introduces us to Eigsti, a man with passion whose roots are deep in rural agricultural America.

Through the twelve chapters of this book, Woodburn takes us into the life of Eigsti, from his early experiences on the family farm and one-room rural school in the early 1900s up to the present day. Woodburn undertakes this challenge by placing Eigsti's life in context with the dramatic changes in agriculture, science, and higher education that have occurred since the 1920s. The structure is not chronological. Instead, the book is arranged into loosely organized themes. This format makes it difficult to follow the progression of Eigsti's life and career. Yet, it does help the reader to see the unifying threads of this man's life. The author provides plenty of background information about plant breeding, agriculture, and science so that readers with little knowledge of these areas might more fully appreciate Eigsti's achievements. Woodburn also includes a glossary defining many of the terms that may be unfamiliar to the nonbiologist. However, some may not agree entirely with all of Woodburn's definitions.

The more interesting and clearly written portions of the book deal directly with the problems associated with development of the seedless watermelon. In the chapter From Seeds to Seedless, Woodburn focuses on the creation and development of the seedless watermelon, often using Eigsti's own words to tell the story. This fascinating chapter deals with Eigsti's initial meetings with Kihara from Japan, who pioneered the production of tetraploid/triploid watermelons. The reader is taken through the ups and downs of varietal development including losses due to disease, problems of seed production and seed quality, and most importantly, the hard work necessary to create market and grower acceptance of something new.

This is a book that should appeal to anyone curious about a plant breeder's art and, more generally, an interest in the passion and commitment of a farmer turned scientist, whose life and work spanned much of this cen-

tury. Woodburn, who points out his life circumstances were very similar to Eigsti's, often interjects his own views by directly commenting on the changes in society, science, and science teaching that have occurred since the Great Depression. His writing style is at times rambling and several chapters have many misspellings. The book would benefit greatly by more through editing and proofreading.

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THE GARDENER'S ATLAS. THE ORIGINS, DISCOVERY, AND CULTIVATION OF THE WORLD'S MOST POPULAR GARDEN PLANTS. John Grimshaw and Bobby Ward. 1998. Firefly Books Ltd., 4 Daybreak Lane, Westport, CT 06880. hardcover. \$29.95. ISBN 1-55209-226-7.

I wish I had read this book when I was still teaching floriculture. It would have given me an insight into the origin of the important garden plants that are so prominent in home gardens and other landscape sites, and that have become profitable crops for people who produce plants for a living. I did try to include such information in my lectures but I usually had to go to several sources to get as much information as there is in this atlas.

The photographs in the book are really outstanding. The high quality of the paper helped in the reproduction of the pictures but the photographer had an artist's perspective as well as a botanist's knowledge. Usually a reviewer tells how many illustrations there are in a book, because the publisher makes it easy by listing the number in press releases or in the book itself, but this book was lacking that information. A press release does state that "*The Gardener's Atlas* is brimming with maps, exquisite botanical color prints, and gorgeous full-color photographs and illustrations." I didn't count them so I don't know how much brimming is, but I do know that every page has at least one photograph and sometimes more.

The role of wars, the Crusades and other such events had a tremendous impact on the introduction of new plants to countries such as England and the Netherlands. Botanical gardens also

played prominent roles, when they either sent out their own plant hunters or obtained specimens from sailors, nurserymen or even royalty. At first a plant had to have some medicinal value but later its attractiveness was justification enough for it to be accepted.

There are some inconsistencies in the layout of the pages. For example, on page 58 I was reading about the plants in the family Compositae (Asteraceae), but on page 60, I am reading about medieval gardens. On page 62, I was back to the Compositae. That strange interlude happened several times, and I wondered why a family wasn't completed, and then the gardens described. The author and the publisher must have had some valid reasons for this, but I surely don't know what they are. I found them to be disconnecting.

One coauthor (Grimshaw) is British and he does emphasize the importance of the British in the worldwide distribution of plants. This approach is logical because it is true but at times one can tell that he knows much more about English horticulture than he does about horticulture in the United States. For example, he states that the hydrangea became a very popular potted plant in the 19th Century but now is grown primarily as a hardy shrub. Apparently he hasn't been in a greenhouse or a retail outlet in this country in the spring. He also writes that the hydrangea sepals will turn pink if plants are not treated with aluminum sulfate. In the United States we would be more likely to state that the sepals will be blue or mauve in color if the aluminum is not tied up. Pink here is the traditionally favored color.

The author also is much more aware of the efforts of European plant breeders than he is of Americans. If I had written the book I undoubtedly would have done the same thing, except the other way around. I wouldn't have mentioned impatiens without mentioning the work of Claude Hope, who was inducted into the ASHS Hall of Fame in 1999 because of his wonderful achievements as a plant breeder.

When I took a plant physiology course under Dr. Daniel G. Clark at Cornell University, he incessantly preached against using teleological expressions, such as the "plant enjoys" or it "dislikes". Grimshaw frequently uses such terms, such as "*Galanthus* bulbs dislike being dried out" or "Hostas enjoy light shade". Perhaps most read-

ers wouldn't mind reading such things but I prefer writing that plants do better in light shade or that they shouldn't be allowed to dry out.

Though the latter part of this review seems to be only critical I would like to conclude that I do think that the book is very well done, easy to read, I never found it to be boring, and I am very glad I had the opportunity to read it. I also think the price is very reasonable, not out of reach for students, amateur or professional gardeners, and it is much more than just a coffee-table piece of literature.

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BIOLOGICAL CONTROL OF WEEDS, A WORLD CATALOGUE OF AGENTS AND THEIR TARGET WEEDS. 4th ed. M.H. Julien and M.W. Griffiths (eds.). 1998. Oxford University Press, 198 Madison Ave., New York, NY 10016. 223 p. \$50.00, softcover. ISBN 0-85199-234-X.

Biological control of weeds is growing rapidly because it offers an environmentally and economically sound method to control invasive weeds. *Biological Control of Weeds* is the standard reference on biological control agents of weeds, including insects and other invertebrates, fungi, and vertebrates. Reading the lists of weeds and their biological control agents is like reading a battle report of efforts to stem the spread of exotic weeds. For example, you can learn about the Australian struggle against common prickly pear cactus [*Opuntia stricta* (Haworth) Haworth var. *stricta* (Haworth) Haworth] during the 1920s, which resulted in the introduction of many biological control agents and eventually in control. Most introductions have the statements of "not established" or "provides no control," but then with *Cactoblastis cactorum* and a few other invertebrates, you can see success, "rapid establishment and destruction of primary [cactus] growth." The catalog is a welcome update of the previous edition and adds information on the 220 releases of biological control agents that occurred between 1990 and the end of 1996. I just hope that

we do not have to wait another 6 years before the next update.

The heart of the *Biological Control of Weeds* is four lists or tables. The first and largest list deals with exotic invertebrates and fungi that have been released outside of their native range for biological control of weeds. The target weeds are grouped by family and then listed alphabetically within family. Common names and origin of the weed are also provided. This list illustrates how many invasive weeds have been introduced into regions. The biological control agents, mostly insects, are listed alphabetically by their scientific names under each weed. The utility of *Biological Control of Weeds* would have been improved if the common names were listed for the biological agents. This would be especially useful for horticulturists, botanists, or weed scientists not familiar with many of the insects. One disadvantage of using an alphabetical approach for listing weeds and their biological control agents is that it can be hard to determine which agents have been most successful in controlling specific weeds. This list presents a tremendous amount of information in tabular form. The problem with the tabular format is that it can be difficult to follow and one can get lost. Especially distracting is the way the columns on "Country, status, and degree of control" and "Research organisation" run into each other making them hard to read. In multipage entries, I would have liked to see the weed species name given on each page. But these are just minor complaints on an otherwise excellent presentation of information.

The other three lists have a more limited audience. List B deals with exotic vertebrates used to control weeds. The list is exclusively fish that have been introduced to control aquatic weeds. The lack of terrestrial vertebrates, such as goats and geese, for controlling common agronomic weeds is a limitation of the list which the authors acknowledge. Other books on biological control agents also have this same weakness of not adequately reflecting control of multiple weed species by terrestrial vertebrates. It would be helpful if some method was found to include these species which in specific regions have successfully controlled problem weeds. List C includes organisms used within their

native range to control weeds. This is an area that has attracted a lot of interest and research with the aim of developing commercial mycoherbicides. I believe that List C is biased toward insects and misses fungi that have been evaluated at least in a limited scale. The final list (List D) is interesting because it deals with biological control agents that have been found in exotic ranges where they were not deliberately released. This list raises the question of how did these organisms spread? Should unintentional spread of biological control agents be a concern?

Other features of *Biological Control of Weeds* also are very helpful. I feel the reference list of close to 1000 articles on biological control is worth the cost of the book. It will jump start any literature review on biological control. The extensive index makes it easy to find your favorite weed or insect. Although *Biological Control of Weeds* is unlikely to be a classroom textbook, it is a must reference in any library used by horticulturists, entomologists, weed scientists, plant pathologists, and botanists interested in biological control of invasive plants.

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INTEGRATED PEST MANAGEMENT FOR TOMATOES. 4TH ED. Larry L. Strand (ed.). 1998. Publication 3274. University of California Division of Agriculture and Natural Resources Communication Services, 6701 San Pablo Avenue, Oakland, CA 94608-1239. 118 p. \$30.00 softcover. ISBN 1-879906-32-5

If tomatoes are an ancient fruit, then, the pests that attack them are even more ancient. There are, however, modern methods for dealing with pest problems.

The fourth edition of *Integrated Pest Management for Tomatoes* offers the most comprehensive, up-to-date information from the University of California on managing pests in fresh market and processing tomatoes.

The stated purpose of this book is "to help growers and pest control advi-

sors apply the principles of integrated pest management (IPM) to California tomato crops." The authors might have looked beyond the borders of the Golden State because anyone dealing with tomatoes can surely use the wealth of information contained within the covers. This volume can help increase the understanding and application of IPM among all producers of tomatoes regardless of which aspects of production they are involved in.

The book is well designed with a wide choice of topics and an excellent and diverse array of authors for particular subjects. More than 50 University of California researchers, cooperative extension specialists, farm advisors, experiment station scientists, and industry representatives have contributed to this manual. Since the first edition in 1982, the format has remained much the same, with an ever increasing amount of technical knowledge being incorporated as it becomes available from research.

This manual covers the biology, economic status, and the management of weeds, diseases, nematodes, insects and vertebrates that affect tomatoes. The layout of the book enables the reader to quickly gain access to their particular area of interest. Each of the major areas is concisely written with accompanying photos in a logical and readable manner. More than 180 color photographs and numerous drawings illustrate nearly 100 different pest problems in tomatoes as well as common natural enemies of insect and mite pests. One set of extremely detailed line drawings of the major caterpillar pests includes a key for identification. The section on insects covers 31 pages and includes excellent illustrations on life cycles of insects and charts showing what damage they cause and what time period it occurs. The pest sampling section with its leaf and fruit sampling, threshold discussion and pest sampling illustrations are valuable tools for any producer.

This new edition is written in the same easy-to-read format as the first three editions and has been revised extensively to include the latest information on management techniques, pest monitoring, and available control options.

Some new additions are as follows:

- Revised fertilizer recommendations for processing and fresh market tomatoes

- Discussion of weather monitoring and disease models
- New diagram illustrating seasonal occurrence of major insect and mite pests
- New sections on lygus bugs and tomato bug
- New monitoring information for worms in processing tomatoes, aphids, and stink bugs
- New sections on Fusarium foot rot, black dot root rot, anthracnose fruit rot, tobacco streak, and several other virus diseases
- Revised information on meadow voles Latest information on effectiveness of available herbicides
- New weed monitoring chart with 16 new color photos

The incorporation of relevant references and an understandable glossary are a welcome addition to this fourth edition. Recordkeeping and sanitation is also stressed throughout the publication. If producers would follow their advice many recurring tomato problems could be avoided or held to a minimum.

I would conclude that the authors have provided a valuable resource for those using IPM to diagnose the numerous pest problems of tomatoes and a useful guide for the determination of the problems.

This book would be a useful addition to anyone working with tomatoes and is a must for extension agents, consultants, and farmers.

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GROWING BULBS INDOORS. P.J.M. Knippels. 1999. A.A. Balkema Publishers, Old Post Rd., Brookfield, VT 05036. 101 p. 66 color photographs. \$25.00, hardcover. ISBN 90-5410-467-8.

When the author searched in existing reference books for cultivation instructions on growing bulbs indoors in his environmental conditions (Netherlands), he found an information niche present for a practical guide available in the trade. The result is this book where a chart was developed for cultivating a particular genus and species of bulb based on the rhythm of growth, flowering and rest found in the country of

origin. He subsequently suggests whether a beginning, experienced or very experienced grower should attempt cultivation according to his chart divided into calendar months with a precise watering schedule. This book fills the niche for growing wherever one is located, not just in North America or the country of bulb origin. And the author readily admits this is his single point of view based on experience.

To be successful, first one must gain insight into the theoretical aspects of bulb development, i.e., the periodic development of growth and flowering which alternates with dormancy. A bulb is a geophyte, "a perennial plant which survives unfavorable conditions by means of subterranean parts." This includes true bulbs, rhizomes, tubers, corms and other storage organs. These various plants are adapted to seasonal climatic changes based on their point of origin and alternating rest and growth patterns. Bulbs are classified into three categories based on when rainfall is most abundant in their country of origin, either summer, winter or throughout the entire year. The winter-growers include most true bulbs which come from South Africa, especially the Cape, where all natural habitats are found. Dormancy is the most important period for true bulbs, when leaves and inflorescences are initiated. Most summer-growers are from central Chile near Santiago where leaves and flowers grow simultaneously. In contrast, corms, rhizomes and tubers develop leaves or stems first and no buds are initiated during dormancy. Most bulbs are monocotyledons and belong in the five main families Amaryllidaceae, Iridaceae, Alliaceae, Asphodelaceae, and Hyacinthaceae.

After understanding this background, the topics then turn to cultural information on soil requirements, planting depth, propagation, pests and diseases, bulb storage, temperatures and troubleshooting suggestions. The main section of the book covers 40 genera and 200 species of common and specialty bulbs, revealing the author's practical expertise of growing succulents and bulbs indoors for many years, as well as his contributions to various journals. Photographs of inflorescences scattered throughout add color and a sense of delicacy to the text. Valuable references and classification of bulbs by ornamental value can be found at the end of the book.

Along with each genus are listed pertinent facts such as country and climate of origin, plant name origin, flower and leaf descriptions, blooming period, summer or winter grower, and so on. A straightforward chart corresponds the growth and watering cycle with each month of the year. It includes symbols for when the bulb is dormant, if leaves are formed or forming and whether the plant flowers with leaves present or before or after leaves occur. The watering regime recommends the following drying schedule: totally dry, dry for 3 weeks, dry for 7 to 10 days or 1 or 2 days. To emphasize this point, the author stresses, "If you hesitate to water, then don't!" And finally, special growing aspects suggest ease of culture and planting depth alternatives.

This bulb guide lends itself for comparison to the similar text, *Growing Bulbs, The Complete Practical Guide*. Here, Brian Mathew aimed his gritty, practical approach of growing over 100 genera at enthusiasts. However, Knippels has carefully chosen bulbs available in the trade that can be grown indoors by specialty growers, either beginners or experienced, and provides detailed cultural information. The textbook style does not convey enthusiasm for becoming a specialty grower, an interest the reader must already possess. But the descriptive paragraphs reveal the author's insight and personal knowledge of these plants as individuals. This particular bulb selection will not appeal to all readers but will be treasured by those who have searched but not found such information in other specialty bulb texts.

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100 HEIRLOOM TOMATOES FOR THE AMERICAN GARDEN. Carolyn J. Male. 1999. Workman Publishing Company, Inc., 708 Broadway, New York, New York 10003-9555. 246 p. Color photographs. \$17.95, softcover. ISBN 0-7611-1400-9.

The tomato is the most popular vegetable in the American garden, grown by some 21 million backyard tomato growers. What many people may not realize is that all tomatoes are not red and round. There is a whole

new world of heirloom tomatoes to discover, rich with wonderful flavor and a profusion of colors and shapes. Tomatoes may be yellow, purple, green, and even mahogany brown and shaped like a heart, pear, or oval. They may be striped or marbled or even pubescent like a peach. The diversity and array of heirloom tomatoes is seemingly endless, and that is what makes this book so interesting.

The book is a field guide, but is so visually stunning that it will inspire as well as educate the reader. One of a series of Smith & Hawken guides, its format lays out a page of description opposite a full-page photograph of each variety. Each tomato is portrayed with ripe fruit and foliage included in vivid, richly colored photographs. The information for each variety gives type of heirloom, origin (if known), maturity, color/shape, size/arrangement, yield, plant/foliage, taste, and seed availability. The author also provides her synopsis of that variety, telling what makes it distinctive, including a review of its flavor and any known stories about its heritage.

The author recently retired from teaching college microbiology. When she discovered the world of heirloom tomatoes about 10 years ago, she became immersed in the subject, and has raised more than 1,000 varieties in her own garden. She has been active with the Seed Savers Exchange, published numerous articles in well known gardening publications, and is a major voice on AOL's tomato forum.

The book's photographs, done by Frank Iannotti, are stunning in their clarity and richness of color. Printed on heavy, glossy paper, these pictures seem to leap right off the page so that you can almost taste the tomatoes as you read.

The book's organization works in a logical manner. There are introductory chapters with practical, how-to information, such as selecting varieties for your own garden, growing tips, saving seed, and how to cross them to create your own heirlooms. The 100 heirloom varieties that are reviewed are arranged alphabetically, making it easy to look up a specific type. Two appendices at the end of the book list commercial sources for seeds and books and seed sources for individual varieties.

While there are several books on heirloom vegetables already published,

this is the first just on heirloom tomatoes, and the only one to go into such depth on the subject. It could be used as a textbook for classes or seminars, but will be mainly used as a reference book by home gardeners, both beginner and expert alike. Most people have limited garden space, and this book will allow them to make more informed choices about what to grow. On the other hand, the book's strong suit is not about limiting choices, it is rather to make these heirlooms look so inviting that we will grow more.

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CITRUS GROWING IN FLORIDA. 4TH ED. L.K. Jackson and F.S. Davies. 1999. University Press of Florida, 15 N.W. 15th Street, Gainesville, FL 32611-2079. 313 p. hardcover, \$29.95. ISBN 0-8130-1668-1.

When one thinks of citrus, the Florida citrus industry comes naturally to mind, as it is the largest in the United States and second largest in the world. This fourth edition of *Citrus Growing in Florida* describes well the practical and horticultural aspects of citrus production in Florida.

Originally written by L.W. Ziegler and H.S. Wolfe and used as a textbook in undergraduate courses in citriculture at the University of Florida, *Citrus Growing in Florida* was twice revised by L.K. Jackson, the last time in 1990. Notable changes in the Florida citrus industry during the last decade suggested the need for the current revision, capably written by L.K. Jackson and F.S. Davies. This fourth edition is as current and pertinent to Florida citriculture today as the constraints of time between revision and publication permit.

L.K. Jackson is a distinguished Extension citrus specialist and teacher at the University of Florida, whose career spanned 32 years until his retirement in 1994. F.S. Davies is a teacher and researcher in citriculture at the University of Florida, where he has been some 20 years.

The book is generally well-organized, although one could argue that Chapter 3, Taxonomy and Botany, should precede Chapter 2, Climate

and Soils. The chapter Pest, Disease and Weed Management for the Bearing Grove is initially a little confusing in that it presents control, then spray periods and then the pests.

The final chapter on home citrus production is inappropriate for a textbook or reference for producers, although it was included in prior editions. Frequent references to home plantings throughout the text are of little value to students or commercial growers, and are too dispersed to benefit the average homeowner who simply wants to better care for one or more citrus trees in the home landscape.

This edition reads better than prior revisions, but both typographical and grammatical errors can be found in the text. The clarity of the illustrations could be improved with better paperstock, but not for \$29.95.

Relatively newer citrus growers and managers would find this book most useful; veteran growers will find something of interest in it. For students of citriculture, the book is indispensable. Serious gardeners interested in citrus history and botany and those wishing insight into commercial citriculture will find *Citrus Growing in Florida* to be a good resource.

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COMMERCIAL COOLING OF FRUITS, VEGETABLES, AND FLOWERS. James F. Thompson, F. Gordon Mitchell, Tom Rumsey, Robert F. Kasmire, and Carlos H. Crisosto. 1998. University of California, 6701 San Pablo Avenue, Oakland, CA 94608-1239. 62 p., illus. \$10, softcover. UC publication 21567.

This publication is the second major revision of *Coolers for Fruits and Vegetables* by Rene Guillou (UC Agr. Ext. Bul. 773, 1960); the other revision was in 1972. Its concise presentation coupled with numerous figures (30), color plates (11), and tables (15) should help readers maximize their understanding of the subjects presented.

The main subjects covered are the design and proper use of forced-air and hydrocoolers, cooling calculations, and crop cooling/storage specifications. Also presented is a good overview of

factors affecting crop postharvest quality and specific ways to troubleshoot various crop-cooling problems. The comprehensive forced-air and hydrocooler design procedures and recommendations are not available in any other known publication.

The authors state that the publication is for those interested in investigating crop-cooling, professionals who desire cooler design details, and operators of postharvest storage and/or cooling facilities. They should have also stated that it could be used as a good supplemental text for college level classes in agricultural refrigeration and/or postharvest physiology. The very practical information presented would add value to these classes that sometimes can be too theoretical and/or crop specific.

Many important crop cooling related equations are presented that, at first glance, may seem complicated for some readers. However, they are explained very well and the examples presented should make them understandable and relevant for most readers. These equations will be useful for those in the commercial world involved with the cooling, storage and/or refrigerated transport of horticultural crops.

While the title includes flowers, most of the information presented is for fruits and vegetables. The publication would have been even better if more flower data and examples were presented. In addition, some data in the appendix adapted from USDA Handbook 66 (Hardenburg, Watada and Yang, 1986), containing cooling and long-term storage requirements for floral and nursery crops, should have been updated.

One style of a commonly used forced-air cooler for flowers was not described. It is a positive pressure type with the cold wall containing numerous specifically designed holes/orifices that work equally well regardless of the number of flower boxes being cooled. Readers interested in this design should contact the senior author for details.

In summary, this low cost, readable and concise publication makes it a very good value for a broad spectrum of readers.

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FANDEX WILDFLOWERS. Ruth Rodgers Clausen. 1999. Workman Publishing, 708 Broadway, New York, NY 10003. 50 die-cut cards, 140 color photographs. \$9.95. ISBN: 0-7611-1464-5.

The obvious feature of this book is its unique format. It is a collection of 50 long, slim, two-sided, full-color, die-cut cards that are bolted together in one corner with a rivet, allowing the reader to fan the cards and compare flowers. Each card describes one wildflower that is highlighted with a large color picture at the end of the card. In all, 47 wildflowers in 33 families are described.

Several common names and their origin are included in the text. *Podophyllum peltatum*, for example is listed as mayapple, American mandrake, and wild lemon. Medicinal folklore is given, as well as Native American usage. The family, native range, and native habitat are also listed for each plant. Garden culture is covered as well as cultivars. For the space, there is an amazing amount of information on each card.

Publishing a wildflower guide for the entire United States limits the scope, but a wild range of plants is covered, from the popular trillium and coneflower to more obscure rattlesnake master and wild senna. California poppy is included, which is really native only to the west, especially California. *Monarda fistulosa* is described and somewhat confused with *M. didyma*.

The biggest drawback is the scale of the large color picture of the flower on the cards. Some, such as *Anemone thalictroides* and *Aster novae-angliae* are depicted with 3- and 4-inch individual flowers respectively. For the novice, this is very misleading and the additional photos must be used for identification. Most of the others, such as *Baptisia* and *Mertensia* are presented more realistically with the entire inflorescence. Because the photos are cutouts, and the pages fan, the cutouts can become bent and worn with repeated use.

This field guide is for inexperienced and beginning gardeners. In addition to easy identification, it includes folklore and historical information about each wildflower. Its distinctive format may appeal to readers of all ages or the whole family, as stated on the promotional text.

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IMPRESSIONIST ROSES. BRINGING THE ROMANCE OF THE IMPRESSIONIST STYLE TO YOUR GARDEN. Derek Fell. 1999. Friedman/Fairfax Publishers. 15 West 26th St., New York, NY 10010. 144 p. 153 illustrations. \$27.50, hardcover. ISBN 1-56799-801-1.

Impressionist Roses reinforces the bond between art and horticulture. It is a refreshing look at designing rose gardens by emulating specific garden design ideas of impressionist painters. Many horticulturists already enjoy impressionist painting. After reading Derek Fell's book, a greater appreciation is developed for the beauty of the rose and impressionists' paintings.

This book is a reference for gardeners who want to grow roses that give a romantic look to their garden. It is also for artists and rose enthusiasts who are interested in roses that the impressionist's loved to paint and grow. For the horticultural scientist it is a unique reference book for learning more about roses and viewing roses from an artist's eye. For everyone, it provides inspiration for incorporating imagination into designing rose gardens. The use of old and new cultivars of wild and old-fashioned roses that give a garden that look of paradise seen in an impressionist's painting is promoted throughout the book.

The book opens with a very interesting history of rose introductions and breeding. From Empress Josephine, the wife of Napoleon, to the Meiland family's new class of shrub roses called The Romanticas. Next, the author investigates the impressionists' love for roses. And it turns out the way in which the surface of a rose petal reflects light was the perfect subject for impressionist painters to practice their unique painting technique.

The chapter The Rose Gardens of the Impressionists examines ways in which the impressionists used roses in their gardens and in their floral arrangements and highlights their favorite varieties. It describes briefly the lives of the painters and the roses that they had in their gardens and in their paintings. For example, it explains how Monet used climbing roses to get color up into the heights of his garden. It also tells how Monet used other vines to intertwine with roses to blend their colors into new combinations. The book also includes infor-

mation on visiting the impressionists' gardens that are still in existence.

Designing with Roses is a chapter that includes the categories of roses such as hybrid tea and floribunda and how each category's plant form makes it more suitable for different uses. It gives the reader many ideas for incorporating impressionist roses into their own gardens. These ideas include rose tunnels, rose arbors and rose walls in addition to theme gardens, containers, etc. Fell makes helpful suggestions of more disease-free modern alternatives to the older roses the Impressionists used.

The author lists his top fifty roses in chronological order of introduction and includes a description and photograph of each. Following is cultural information including propagation, planting, growing, and winterizing. The book is illustrated with fabulous photographs throughout that are sure to inspire new and avid rose gardeners alike. The book concludes with a list of rose gardens to visit and sources of roses to purchase and leaves the reader yearning to do both.

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MAPLES FOR GARDENS, A COLOR ENCYCLOPEDIA. C.J. van Gelderen and D.M. van Gelderen. 1999. Timber Press, Inc., 133 S.W. Second Avenue, Suite 450, Portland, OR 97204-3527. 294 p. 683 color photos. 2 color maps. \$49.95, hardcover. ISBN 0-88192-472-5.

In case you haven't noticed, reference books are expensive. And if your office is anything like mine, book shelf space is precious real estate. Therefore, before I purchase a new book, or recommend one to you, I must be convinced that it will pull its own weight. You know. The kind of book that you station just north of your mouse pad, ready at a moment's notice to answer a question or provide inspiration. But what of *Maples for Gardens, A Color Encyclopedia*? Will it enter your rotation of indispensable books or will it join the ranks of other dust collectors on your shelf. Allow me to help you decide.

Since 1994, the definitive treatise on the genus *Acer* has been *Maples of the World* by D.M. van Gelderen, P.C. de Jong, and H.J. Oterdoom. Written more for an academic audience, *Maples of the World* systematically and comprehensively covers the waterfront with regard to maples. Now along comes *Maples for Gardens*, intended as a photographic companion for *Maples of the World*. But unlike its utilitarian predecessor, *Maples for Gardens* spends little time discussing taxonomy, use, maintenance, propagation, or distribution of maples around the globe. Instead, C.J. and D.M. van Gelderen have created a more user-friendly volume in which individual maple species (arranged in alphabetical order by scientific name) are the focus. From *Acer acuminatum* to *Acer ×zoeschense* 'Annae', each entry is accompanied by at least one color photograph (identified with the month it was taken) and information in the following sequence: scientific name, cultivar name (when given), section and series of the genus *Acer* to which the maple belongs, synonyms for a plant's name, habit, leaves, flowers, fruits, distribution, authority or introducer, special recognition, degree of cultivation, garden attributes, and hardiness zone ratings for both Europe and North America.

One of the motivations for owning *Maples for Gardens* is to associate a name with a face. In other words, if you've never seen the striped bark of *Acer davidii*, the breathtaking autumn leaf color of *Acer japonicum* 'Aconitifolium', or the conspicuous red samaras of *Acer pseudoplatanus* 'Erythrocarpum', this is your chance. *Maples for Gardens* is replete with colorful and artful images of both familiar and rare maple taxa. No, not every photograph is suitable for framing, but most are good enough to satisfy the botanist and photographer in all of us.

But before you reach for your checkbook, potential buyers should be forewarned that *Maples for Gardens* could have just as easily been titled *Japanese Maples for Gardens*. You see, the authors are more than just a little bit enamored with *Acer palmatum* and the bevy of associated cultivars. In fact, they boldly proclaim that "*Acer palmatum* is probably the most important maple in horticulture." Now if you're of like mind,

share the same level of devotion to Japanese maples as the authors, and enjoy reveling in the differences between *Acer palmatum* 'Koto hime', 'Koto maru', and 'Koto no ito', then pages 95 to 201 (45% of all pages dedicated to plant descriptions) will be pure bliss for you. I, on the other hand, found the disproportionate attention given to Japanese maples excessive and would rather have learned more about several lesser species (*Acer griseum*, *Acer maximowiczianum*, *Acer triflorum*, and *Acer truncatum*, among others) that were given short shrift.

Although the authors do a credible job, experienced maple aficionados will find nothing particularly new or revealing in the pages dealing with North American taxa. Color photographs are adequate, descriptions are for the most part accurate, but the authors only provide a cursory overview of available cultivars. Cultivar listings and descriptions are particularly thin in segments devoted to *Acer rubrum* and *Acer saccharum*. Being more familiar with North American taxa also allowed me to find several errors in these segments. Giving *Acer rubrum* October Glory a Zone 3 hardiness zone rating, stating *Acer rubrum* 'Autumn Flame' is synonymous with *Acer ×freemanii* 'Autumn Flame', referring to *Acer rubrum* 'Franksred' (Red Sunset) as 'Red Sunset', and similarly referring to *Acer ×freemanii* 'Jeffersred' (Autumn Blaze) as 'Autumn Blaze' may not be debilitating errors, but do detract from the book's overall credibility.

Now back to the original question. Is the book worthy of its price tag and your consideration? I would answer that question with a qualified yes. Excellent photographs, descriptions of rare and lesser-known taxa, and the thorough treatment given to *Acer palmatum* and cultivars (provided this is what you have need for) are reasons enough to recommend this book. Buyers should remember, however, that as a companion piece, *Maples for Gardens, A Color Encyclopedia* is not the photographic equivalent of *Maples of the World*. Now that would be a book!

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INTEGRATED PEST MANAGEMENT FOR APPLES AND PEARS, 2ND ED. Barbara L.P. Ohlendorf. 1999. University of California, DANR Publication 3340, DANR Communication Services, 6701 San Pablo Ave., Oakland, CA 94608-1239. 232 p. 250 color photographs, line drawings, and tables \$30.00, softcover. ISBN 1-879906-42-2.

California has maintained an extensive research and extension effort in integrated pest management including pest management publications. This revised reference book for growers of apples and pears consists of seven main sections. The first chapter discusses fruit growth and development and the second details the general management practices on which most of the pest management guidelines are based. The remaining chapters discuss the five major categories of orchard pests, vertebrates, insects and mites, diseases, nematodes and weeds.

The publication discusses where and when major pests occur in California and provides general monitoring guidelines. It provides detailed descriptions and photographs of individual pests and the damage they cause plus specific guidelines for enhancing natural control factors and information on how to design a monitoring program.

The new edition contains a completely revised section on codling moth management with detailed information on mating disruption, a revision of leafroller management, new pear psylla control strategies and updates on oak root fungus and biological control of fire blight. It provides a description and seasonal development of many pest, the damage associated with each and management or control methods. It does not include specific information on pesticides, selection or application rates.

The manual is well written in an easy-to-read style. It contains excellent color photographs, line drawings and tables to assist in the identification and monitoring of nearly 150 pest problems. It also has a brief list of extension references related to these crops and pests plus a list of sources of supplies for pest management programs.

The comprehensive reference book has been written for California

orchardists and climatic conditions. Therefore, some of the pest threshold values are not appropriate for other geographical areas. Some cultural practices discussed are also different from other areas of the country. However, this is an excellent reference publication for commercial orchardists, extension agents and pest control advisors. It is especially helpful for integrated fruit insect control.

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DESIGNING WITH PLANTS. Piet Oudolf with Noel Kingsbury. 1999. Timber Press, 133 S.W. Second Ave., Suite 450, Portland, OR 97204-3527. 160 p. \$34.95 +S&H, hardcover. 300 color photographs. ISBN 0-88192-437-7.

Piet Oudolf, a Dutch garden designer, shares his insight in using perennials in this new book. Only perennials are included because they have a "unique, distinct structure that is in a state of almost constant change throughout the growing season." Oudolf urges gardeners to examine perennials, especially the inflorescence, for overall structure and form. A chapter is included on flower shapes, with sections on spires; buttons and globes; umbels; daisies; and screens and curtains. Understanding structure and form are critical, he contends, because "a good planting should have enough variety of shape to look good in a black and white photo...by adding color another dimension comes in, but a secondary one."

Color is the third consideration of plant selection, after form and structure. Oudolf's ideas for using color are subtle, such as combining many flower shapes of the same color, to bold, where he suggests combining opposite colors for dramatic effects. He classifies perennials into structure or filler plants, acknowledging most are "in between" and recommends using one structure plant for every three filler plants. He includes steps for assembling a border planting from the back forward.

Oudolf's goal is to "not copy nature but to recreate the emotion." Thirty pages are devoted to the chap-

ter entitled Moods, where he describes the use of light, movement, harmony, control, sublime and mysticism. He encourages gardeners to discover the assets of their own gardens wherever or whatever they may be, looking for special beauty in all seasons.

Oudolf creates a garden in two layers, the first being a formal underlying framework of static hedges, walks, and paths that create the backbone. Then he overlays perennials on this formal backbone, adding the look of informality and constant change. It is a blending of nature and wildness with the art and control of formal gardens. Oudolf's "plants look wild but his gardens do not."

The book provides a rich look at garden design and plant combinations. Also included are over 50 perennials and 12 grasses in a detailed plant directory. Favorite plants are asters, umbellifera, grasses, echinaceae, helinium, and "plants ignored before" such as astantia and eryngium. A section covers the year-round variation of perennials.

Designing with Plants is a book with many new ideas for landscape designers, landscape architects and anyone who wants to look at new ways of using perennials in the garden.

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BEYOND THE PONDEROSA. SUCCESSFUL LANDSCAPE TREES FOR HIGHER ELEVATIONS IN THE SOUTHWEST. Tom DeGomez and John Duff Bailey. 1999. Flagstaff Community Tree Board, 211 West Aspen St., Flagstaff, AZ 86001. Spiral bound \$10.00.

Beyond the Ponderosa. Successful Landscape Trees for Higher Elevations in the Southwest is a new plant materials reference book on shade and specimen trees aimed at a part of the country where shade means either a half-dead cottonwood or an occasional cloud overhead. Since the uplands of the southwest, and mountain west in general, are both dry, cold, and alkaline, the number of native tree species that are suitable for amenity landscapes is vanishingly small. This paucity led to use of tree species from such

exotic locales as the northeast hardwood forest by early settlers. Successes were few and far between due to improper, or even lack of, irrigation, high pH, and winter injury due to severe temperature extremes and intense winter sunlight. Consequently, landscape architects, homeowners, and the rest of the populace of higher elevations in the mountain west, including parts of Utah, Nevada, Arizona, New Mexico, Colorado, and Idaho, have long found their shade and specimen trees among the fast growing species that can outpace the harsh local conditions. Species such as cottonwood (*Populus nigra*), willow (*Salix* sp.), and Siberian elm (*Ulmus pumila*) comprise the total species diversity of a great many rural areas in the mountain west, and these species generally die as fast as they grow.

This book targets landscape architects, extension personnel, and the general interest homeowner who desire to reduce the monoculture made up of these fast growing species, and create a longer-lived and lower-maintenance urban forest. It describes the botanical characteristics, environmental requirements, and cultural considerations of 14 conifer and 26 broadleaf tree species. Half of the conifers and a few of the broadleaves are native to the intermountain west. The quite adequate species descriptions are livened up with further short descriptions of cultivars, where they exist, a useful commentary on the overall suitability of the species, and very functional symbols indicating tree shade, water requirements, shade tolerance, maintenance needs, and particular siting considerations. Up to four pictures of overall form, leaves, bark, and flowers on a flanking page nicely complement the description.

The book's weak points stand out in the pictures, as a number of them are rather blurry, and several species have just three pictures, and a blank spot where the fourth could be. The book is rounded out with a supplementary information on hardiness zones, a tree care guide with tips on species and site selection, fertilization, watering, and pruning, and a glossary. I was disappointed with omissions of some very durable and desirable, but uncommon for the mountain west, tree species such as Kentucky coffee tree (*Gymnocladus dioica*) and hackberry (*Celtis occidentalis*) that are equal

to or superior to many of the listed broadleaf species in terms of appearance and care. Overall, this is a useful book that will assist those seeking to dismantle the species monoculture in the mountain west with information on how to modestly expand the landscape tree palette.

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ORCHIDS OF PAPUA NEW GUINEA. Andree Millar. Photography by Roy and Margaret Mackay. 1999. Timber Press, Inc., The Haseltine Building, 133 SW Second Avenue, Suite 450, Portland, Oregon 97204. 128 p. 271 color photographs. \$34.95 +S&H, hardcover. ISBN 0 88192-438-5.

This is a thoroughly revised and updated version of Millar's earlier book based on the author's experiences since she went to reside in Papua New Guinea in 1947. It is a well-illustrated pictorial, geographical and horticultural record of some of the orchids of the area. A two page map of the areas covered orients the reader to the introduction which covers the various areas where orchids grow. She recounts the various trips which highlight the many years and many miles covered in quest of orchid species in some of the highly inaccessible parts of Papua New Guinea.

After a short description of the parts of an orchid, she describes 26 groups and divides each genus into sections as in Schlechter's *Orchidaceae* of German New Guinea. Each section has an introduction to status of genus. Each species has an account of habitat as well as description of plant and flower. The descriptions are not intended to be taxonomic but more for use by horticulturist or hobbyists. Many of the species are accompanied by superb color photographs by Ron and Margaret Mackey.

This book is an excellent reference book for collectors of orchid species, an activity which has gained popularity among orchid hobbyists. Many species as discovered are serving as sources of germplasm for hybrid-

ization or as specimen plants for enjoyment.

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COMPENDIUM OF CORN DISEASES. 3rd ed. 1999. Donald G. White (ed.) in cooperation with the NCR-25 Committee on Corn and Sorghum Diseases and the Department of Crop Sciences, University of Illinois at Urbana-Champaign. APS Press, 3340 Pilot Knob Road, St. Paul, MN 55121-2097. 78 p. 177 color photos, 23 figures. \$37.00, softcover. ISBN 0-890054-234-1.

The third edition of the popular *Compendium of Corn Diseases* has been written to provide a reference to both plant pathologists and general audiences. It is of specific and applied value to crop scouts, agribusiness representatives, area crop specialists, extension agents, growers, educators, students and researchers. Like the previous editions, the third is international in scope, but with a focus on diseases that are of importance in the United States. While comparable in content and organization to earlier editions, it provides an update of symptoms, pathogen descriptions, and more current references as well as information on several diseases that were not important prior to the publication of the second edition in 1980. Description of each disease is condensed (in most cases one-half to two pages) to provide a general overview. Since many of these diseases can display a range of symptoms depending on the environment and genotype, the editor has carefully selected a representative set of 177 high-quality color photographs depicting symptomology of the major diseases to help with field identification. All of the black-and-white photos of disease symptoms from earlier editions have been replaced with diagnostic color photographs. The strength of this book resides in its usefulness for disease identification and to serve as starting point to find more in depth information on corn diseases and their control.

While the compendium is divided into two major sections (infectious and noninfectious diseases) emphasis

is placed on the first section (64 pages) with only 7 pages devoted to abiotic diseases including nutrient toxicity and deficiency, herbicide injury, air pollutants, environmental factors and other abnormalities. The infectious diseases are well organized by causal agent (bacteria, mycoplasma-like, fungi, viruses, and nematodes) and by infected plant part (seed, leaf, stem, roots, and ear). About 90 plant pathologists from academia and private industry contributed updates on individual diseases that provide descriptions of the symptoms, the causal organism, distribution and importance, epidemiology and the disease cycle, and control. While the input from so many scientists has resulted in some inequalities in the depth of coverage of individual diseases, the book succeeds as a diagnostic tool and as an introduction to maize pathology to the targeted audience. The *Compendium of Corn Diseases* is a recommended for anyone that works with maize. It comes at an affordable price of \$37.00 and can be ordered directly from the American Phytopathological Society (1-800-328-7560).

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Fruits&vegetables of Kerala, Kuwait, Al 'Ä€ÄŸimah, Kuwait. 173,188 likes Ä- 233 talking about this. beautiful fruits&vegetable photos around the world.Ä See more of Fruits&vegetables of Kerala on Facebook. Log In. or. Create New Account. See more of Fruits&vegetables of Kerala on Facebook. Log In. Forgotten account? The transport of fresh fruit and vegetables is complicated because each variety has widely differing requirements for safe preservation. The rate at which living fruits and vegetables age and are attacked by microorganisms depends upon the environment during storage and transit. During these periods, the quality and condition of fruits and vegetables are maintained by retention of their optimum temperatures. For safe carriage, this will usually require the commodities to be pre-cooled and maintained at that temperature prior to being loaded into the transport unit, whether that is a reefer or