GROWING AND MARKETING

Ginseng, Goldenseal

and other Woodland Medicinals






Jeanine Davis and W. Scott Persons

REVISED & UPDATED

Praise for *Growing and Marketing Ginseng, Goldenseal and other Woodland Medicinals*

This book is the complete resource for ginseng. I recommend this book to our members and visitors who are interested in learning and growing their own green gold. Thank you for bringing so much helpful and useful information.

—Michael S. Lee, President of WildGrown.com

The definitive guide to growing our shade-loving native medicinal plants for fun and profit. As an ecologist and conservation biologist, I particularly appreciate the fact that woodlot owners can help take some pressure off wild populations through careful cultivation of medicinals on appropriate plots in their forested landscape. By passing on lessons from their vast hard-won experience in this enterprise, Davis and Persons have done a great service.

—James B. McGraw, Eberly Professor of Biology, Department of Biology, West Virginia University

My office is like a shell midden, with the oldest and most decomposed material at the bottom, and more recent and vital material located somewhere near the surface. I am delighted to report that my copy of Davis and Persons' book has always stayed right at the top! wUpgrades to the information found in this book will help maintain this tradition of growing valuable plants close to home, and I believe the plants will join me in thanking the authors for a job well done. May we all go out to the woodlands, drop to our knees in the cool, soft earth, and cultivate, for the love of life, a rare plant.

—Richo Cech, herbal author and gardener at Horizon Herbs, LLC in Williams, Oregon.

The recent popular interest in wild American ginseng spurred by high prices in Asian markets means that now more than ever it's important to create cultivated woods-simulated supplies of American ginseng and other woodland medicinal plants. Scott Persons and Jeannine Davis have combined decades of experience and expertise to create the most significant, must-have reference on growing ginseng, goldenseal, and other woodland medicinal plants. Anyone interested in understanding any aspect of wild American ginseng, it's biology, history, economics, and the practical details of production needs this book.

—Steven Foster, Senior author, *Peterson Field Guide to Medicinal Plants.*

Important revised work on how we can encourage conservation through cultivation of two medicinal and economically important plants that have been on United Plant Savers At-Risk list since UpS created this list.

—Susan Leopold, Executive Director of United Plant Savers.

This work is a plant lover's treasure. What Jeanine and Scott have accomplished with this book will be revealed for years to come, as the layers of wisdom and knowledge are deep. Scientists, herbalists, growers, conservationists, native plant enthusiasts, 'plantophiles' in general will thrill at the research and clear, user–friendly information that is in these pages. You can easily tell that these authors have made this a life long passion and profession

—Kathleen Maier, RH (AHG), Sacred Plant Traditions, LLC

This book is required reading for anyone interested in growing ginseng and other woodland botanicals in a shady site. Persons and Davis have captured the wisdom of a generation of ginseng growers in this comprehensive book, now updated to include practical information for home gardeners who want to enrich a patch of woods with native medicinal plants.

—Barbara Pleasant, award-winning garden writer and contributing editor to *Mother Earth News*

The first edition of this book became an instant classic in the fields of medicinal plant horticulture, sustainable agriculture, and agroforestry. With this latest edition, Scott and Jeanine have remarkably managed to expand, improve and update this classic so that it is now even more useful and full of up-to-date information. Their combined knowledge, experience and wisdom is abundant throughout this book. I heartily recommended this updated edition to anyone interested in native woodland plants and their culture.

—Eric P. Burkhart, PhD., Program Director, Plant Science, Shaver's Creek Environmental Center,
The Pennsylvania State University

Scott Persons and Jeanine Davis have written the only accurate and comprehensive grower's guide to woodland cultivation of American Ginseng and other forest medicinal and culinary herbs. This new revision of their original book is a significant improvement over the first edition, with updated and expanded information. In addition to being full of practical "how to" data, based on both University peer reviewed research, as well as first-hand knowledge and experience, it is a delightful and easy to read textbook. I consider this book as truly a "must read" for anyone who is seriously interested in pursuing this form of Agroforestry.

—Bob Beyfuss, American Ginseng Specialist, Cornell University Cooperative Extension (retired)

This unique book is a comprehensive guide on the history, production and marketing of medicinal plants native to the forests of eastern North America. Practical experiences are included from both an American and Canadian perspective. It is a valuable, easy to read resource for both the beginner and experienced grower.

—Dr. Sean Westerveld, Ginseng and Medicinal Herbs Specialist,
Ontario Ministry of Agriculture and Food and Ministry of Rural Affairs

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Preface I

When I realized that my old book, *American Ginseng: Green Gold,* was rapidly becoming outdated and that a new book was needed, I thought that many of my potential readers would be interested in practical, detailed information and instruction on growing other valuable native woodland medicinal herbs—other species of green gold—as well as ginseng. I asked Dr. Jeanine Davis to be a co-author and cover the additional material. Dr. Davis and I have interacted professionally for many years. I grow American ginseng and a little goldenseal on wooded hillsides in western North Carolina at the edge of the Great Smoky Mountains. Dr. Davis is a professor at North Carolina State University's Mountain Horticultural Crops Research and Extension Center, where she conducts research on a wide variety of native woodland botanicals. Dr. Davis works only about an hour's drive northeast of me, and we often share information, and sometimes we find ourselves speaking at the same conferences—I on woodland ginseng production and she on the cultivation of goldenseal, ramps, and many other native herbs. Our approaches to small-scale farming and our advice to prospective growers are similar and compatible.

There is a great deal of material available, both in print and on the Internet that discusses growing woodland botanicals. Some of the information is excellent, but a significant chunk is partial disinformation. It is often not based on sound research—or even on more than one grower's experience—and profitability is not forthrightly assessed. Cultivating native woodland medicinal herbs in a sustainable manner is often advocated primarily as an enjoyable, even noble, activity. Of course, it *is* a noble and enjoyable activity (or it can be), but Dr. Davis and I have a more hard-core point of view: We are interested in using best management practices and in turning a profit.

Many people helped along the way as Dr. Davis and I researched, wrote, and prepared this text for publication. Plant scientists, agriculture extension specialists, herb growers, and herb buyers freely shared their expertise, and many are acknowledged by name within the text. However, we wish

to express special thanks to some of those who are not mentioned by name: Dr. William G. Bailey (deceased), professor and ginseng researcher at Simon Fraser University in British Columbia; Claude Deyton, agricultural technician in Yancey County, North Carolina; Ed Fletcher, chief operating officer of Strategic Sourcing, Inc.; Tony Hayes, president of Ridge Runner Trading Co.; Michael McGuffin, president of the American Herbal Products Association; Al Oliver, ginseng specialist for the British Columbia Ministry of Agriculture and Fisheries (retired); John T. A. Proctor, ginseng researcher in the Department of Horticultural Sciences at Guelph University in Ontario (retired); Jan Schooley, ginseng and medicinal herb specialist with the Ontario Ministry of Agriculture at the Simcoe Research Station (retired); and Robin Suggs, executive director of the Yellow Creek Botanical Institute. We also wish to express our great appreciation to Karen Hardy and Jackie Greenfield who researched references and helped in many other ways to provide information for the manuscript.

Because we have limited photographic skills, we are indebted to a broad spectrum of friends, colleagues, growers, and even professional photographers for supplying the photographs that illustrate the text. We thank them all here and give credit next to their pictures. Lastly, we are particularly grateful for the generous contributions of two horticultural experts with experience writing about the propagation of woodland herbs. Robert Beyfuss, ginseng grower, researcher, and Cornell cooperative extension agent (retired) for Greene County, New York, reviewed the original manuscript for the ginseng section of the book, suggested needed improvements, and even contributed photographs. Richo Cech of Horizon Herbs reviewed the second section and made suggestions covering all the other native forest botanicals.

— W. Scott Persons, 2005, 2007, 2013

Preface II

When it came time to update our book for the second time, Scott and I agreed we should make a few changes. Since the book was first published in 2005, I have received hundreds, if not thousands, of requests from home gardeners wanting to grow woodland botanicals. Every year I offer propagation workshops and speak at herb conferences, botanical gardens, and to Master Gardeners about how to grow one's own forest medicine. Many of the people who attend have already purchased our book, and they tell us how much they appreciate it. But we wrote the book for commercial growers, and it definitely has that angle to it. When I speak to home gardeners and hobbyists, I don't talk to them the same way that I speak to commercial growers. So, for this edition of the book, we added a section specifically for the home gardener.

Over the past eight years, smartphones and tablets (the electronic kind) have become ubiquitous. People who did not have reliable or fast Internet connections in 2005 now have instant access. In light of this, we changed some of the reference sections; now there are fewer snail mail addresses and phone numbers, and more website URLs and email addresses. We still included names and contact information for some of the companies offering plants, seeds, and supplies, but there are many more out there. Just use a search engine to find them, and of course, check out their quality and reliability. Finally, I expanded the table that contained raw material prices to provide a historical perspective on more than 60 forest medicinals bought and sold in North America. I also added sections on wild-harvesting and the federal regulations on dietary supplements that impact growers. And lastly, we have made this book available in ebook format so you can carry it with you wherever you go.

Once again, many people have helped us make this new book a reality. We want to thank Cynthia Bright, our first publisher, for all her help and support in transitioning this book over to a new publisher. This was her last project before she retired from the publishing business. I especially want to thank Bob Beyfuss, Eric Burkhart, Joe-Ann McCoy, Randy Beavers, Ed Fletcher,

Tony Hayes, Jackie Greenfield, and David Cozzo for many stimulating discussions about these fascinating plants. And finally, I want to remember Andy Hankins, extension specialist with Virginia State University. He passed away suddenly in November 2012. Andy was a very special person who dedicated his life to helping others. He knew a great deal about growing ginseng and shared his information freely in publications and presentations for over 25 years.

— Jeanine Davis, 2013

Author Biographies

Jeanine M. Davis was born in Oak Park, Illinois, and has lived in many states east and west of the Mississippi. After acquiring an A.A. degree in Fine Arts, she changed majors and earned a B.S. degree in Horticulture from Delaware Valley College in Doylestown, Pennsylvania. She then moved across the country where she earned her M.S. and Ph.D. degrees in Horticulture from Washington State University. In 1988, she moved back east to join the faculty in the Department of Horticultural Science at North Carolina State University. There she is an associate professor and extension specialist at the Mountain Horticultural Crops Research and Extension Center near Asheville, North Carolina.

Jeanine's research and educational programs are diverse, covering commercial production of vegetables, new crops, medicinal herbs, organics, and most recently, biodynamics. A constant in her program over the past 25 years has been a devotion to the conservation of native medicinal herbs through cultivation. She has published numerous papers, reports, and webpages on research and activities demonstrating that cultivated herbs can provide a more reliable and consistent product for the market than wild-harvested material while at the same time helping to conserve precious native populations. Jeanine participates in numerous professional and non-profit organizations and speaks at conferences and workshops across North America. She also runs a small farm with her family, raising steer, horses, donkeys, chickens, bees, and vegetable and herb gardens.

W. Scott Persons has successfully grown American ginseng for 34 years. Born in Durham, North Carolina, he graduated from Duke University in 1967 with a B.A. in Philosophy, and then went on to earn M.A. and Ph.D. degrees in Educational Psychology from Emory University. When marriage led him to settle in western North Carolina, Dr. Persons became fascinated with the valuable woodland herb that flourished there on the heavily forested hillsides of his new wife's homestead.

Established in 1979, his woodland ginseng farm has not only supported his family but also supplied planting stock (and often advice and counsel as well) to ginseng farmers all over the country—indeed, all over the world. His first book, *American Ginseng: Green Gold* has helped woods growers from Alberta to Tasmania.

Scott represented American woods growers at the International Ginseng Conference (IGC) in Vancouver in 1994, again at IGC 1999 in Hong Kong, and at IGC 2003 in Melbourne; he also speaks frequently about ginseng at conferences in the United States. As owner/operator of Green Gold Enterprises, Inc. he provides consultative advice on all matters related to forest ginseng farming, and he brokers both domestic and international ginseng root sales. Thus, he has both extensive hands-on growing experience and a broad knowledge of the ginseng trade and the international world of ginseng.

Abbreviations and Definitions

CITES: Convention on International Trade in Endangered Species of Wild Fauna and Flora
EPA: United States Environmental Protection Agency
GAPs: Good Agricultural Practices
HRT: Hormone Replacement Therapy
SARE: Sustainable Agriculture Research and Education Program
SMNPA: Smoky Mountain Native Plants Association
USDA: United States Department of Agriculture
USFWS: United States Fish and Wildlife Service

Definitions

(written in context for this book and in easy-to-understand language):

Annual: a plant that completes its life cycle, including producing seed, in one year, and then dies.

Biennial: a plant that lives two years. It blooms only in the second year, and then dies.

Deciduous: a plant, usually referring to a tree or shrub, that sheds its leaves every year.

Dormancy (seed): a period during which a mature seed "waits", until certain conditions (often a cold period) are met before germinating.

Dormancy (bud): a period during which a bud (on a branch or an underground rhizome) cannot open until it has been exposed to a set number of hours below a certain temperature.

Herbaceous: a plant with stems and leaves that die down each fall and regrow from a perennial rhizome and/or roots each spring.

Mycorrhiza: a symbiotic (mutually beneficial) relationship between a fungus and the roots of a plant.

Perennial: a plant that lives for more than two years.

Scarification: the method of scratching, nicking, or cracking a seed coat so the seed can take in water and start the germination process.

Stratification: a treatment in which seeds are exposed to cold (often moist cold), warmth, or alternating cold/warmth to break dormancy so the seed can germinate.

General Introduction

In our complex world of cell phones, virtual shopping malls, processed foods, and managed health care, many people desire to simplify their lives and make use of what Nature has provided us. For a rapidly expanding segment of the population, this return to a more natural life includes the use of medicinal herbs. A growing number of us take herbs as a natural source of medicine, while others use them because they are often less expensive than prescription drugs. Some people want control over what they consume, so they gather or grow their own medicines and food. The forests of the United States and Canada provide habitats for many of the most popular medicinal herbs. These plants have a special mystique that spans cultures and generations.

For some time, we have noted that there is increasing interest in growing native, perennial, woodland medicinal herbs and that many people wish to gain at least some supplemental income from their production. Small landowners, if they go about it wisely, can grow many of these native medicinals profitably while preserving and even enhancing their woodlands. This book provides guidance not only in the cultivation of native forest herbs but also in the economics of their production and sale.

Aspiring herb growers are often attracted first to American ginseng, because it is the most valuable medicinal botanical and has a broad, well-established market, which has existed almost continuously for over 300 years. Indeed, in the southern part of its range, people often refer to ginseng as "green gold." The first part of this book is devoted entirely to this one native plant.

While little information exists on the production of the other species covered in this book, a good deal has already been written on growing ginseng as a commercial venture, including *American Ginseng: Green Gold* by W. Scott Persons. In writing the 2005 version of this book, *Growing and Marketing Ginseng, Goldenseal, and Other Woodland Medicinals*, we borrowed much from the by then out-of-print 1994 edition of *Green Gold*. The many North American woodland ginseng farmers who read and used that first edition will find portions of the first part of the current book to be generally familiar; however, the content has

been extensively revised and rewritten to update the material and provide the most comprehensive, detailed, practical, and reliable information available on the woodland production of ginseng.

One complete chapter of *American Ginseng: Green Gold* is included in this revision. That is the interview with Oscar Wood. Oscar has passed on, but his story remains engaging and instructive to a beginning ginseng farmer; moreover, reprinting it again preserves the memory of a good and gracious man a little longer.

The second part of this book provides practical guidance in the production and marketing of other native woodland herbs that also have the potential to yield "green gold." Goldenseal and ramps are covered in detail, because their economic potential is well established and reliable information on their propagation is available. Black cohosh, bloodroot, and nine other lesser-known native botanicals are discussed as thoroughly as present knowledge allows, with emphasis on their potential and the uncertainties associated with each. There is not nearly as much information available on growing and marketing any of these herbs as there is for ginseng. Research studies, the experiences of many growers (including the authors), and the knowledge of several long-time buyers were the basis for the advice provided here. The production budgets are best estimates using all available information.

For the 2014 revision of this book, we completely updated the entire book and added a section for the growing number of gardeners, herbalists, and herb enthusiasts who want to grow these amazing plants for their own enjoyment and use. There is also some information about wild-harvesting and some of the new federal regulations concerning dietary supplements.

One of our hopes in publishing this expanded version is that it will encourage the herb grower to diversify as a means of reducing risk and increasing long-term potential.

PART ONE

American Ginseng

For 33 years now, I have grown American ginseng (*Panax quinquefolius*) in the woods not 30 yards from my front door. It allows me a healthy, comfortable, low-stress life that is a treasure to find in our hectic culture. An individual can cultivate a forest garden of this revered herb just to have the fascinating plant around or for his (or her) own consumption, but ginseng also has great potential as a small-scale cash crop with a ready market. With little capital investment, the small farmer can net a greater profit growing ginseng on a rugged, otherwise idle, woodlot than he can net raising just about any other legal crop on an equal area of cleared land. Of course, you have to be willing to bend your back and get your hands dirty, and to take a risk and persevere when the payoff is years in the future. [Author's note: A non-commercial home gardening approach to growing ginseng is discussed in chapter 32, but the home gardener will certainly learn from the material covered in the first half of this book.]

To guide the reader in growing ginseng, I have drawn from my own hands-on experience, from discussions with other experienced growers and agriculture professionals, and from my observations of ginseng operations throughout the United States, Canada, and Australia. Chapters 1 and 2 provide background information, much of it essential knowledge for a grower. The plant's botany, life cycle, habitat requirements, range, and related species are all covered; the regulation of commerce in ginseng is explained at the international, national, and state levels; and the long history of the ginseng trade, including recent changes in the complex ginseng market, is reviewed.

Chapters 3 through 7, in Part 2, "A Ginseng Grower's Manual," cover the three basic methods of growing ginseng (including rough production budgets for each), the harvesting and processing of seeds and roots, and the important business decisions you will need to make. Among other things, you will learn how to select and prepare a planting site; how to acquire your planting stock; what problems you are likely to encounter and how to prevent or deal with them; what has to be done when throughout the year to care for your crop;

what costs and how much labor to anticipate; and who to sell to and how to get the best price for your roots.

Then, in chapter 8, I have supplemented my own thoughts by interviewing a gentleman who was successful growing ginseng with his own individual methods. That interview personalizes the growing experience, which may help you decide whether ginseng farming is for you.

Finally, the Ginseng Resources section in chapter 9 lists root buyers, sources of planting stock, consultants, ginseng-related organizations, etc.; and the Ginseng References section in chapter 10 provides a listing of selected ginseng literature and websites.

While the References includes a few studies and accounts of ginseng's therapeutic benefits, I certainly claim no expertise in either traditional Chinese medicine or modern pharmacology, and a thorough discussion of ginseng's medicinal properties does not fall within the purview of this book. However, most ginseng growers would surely like to believe (as I do) that they are producing a commodity with real potential for human benefit. So I think the subject is worth a moment's attention before proceeding.

Although ginseng (referring loosely to all species of the *Panax* genus) has an exceptionally long and continuous history of medicinal use with an associated high market value, there remains considerable doubt (especially among many Western scientists) as to its real potency. There is compelling evidence that ginseng contains biologically active compounds (primarily steroidal saponins and polysaccharides), but the evidence for their impact on human physiological functions is less certain. Until quite recently, studies on ginseng's medicinal properties were often undertaken without employing strict experimental controls or standardized doses of ginseng. Consequently, a consistency in scientific results has been lacking, resulting in skepticism as to ginseng's genuine benefits.

But more scientists are studying ginseng than ever before, and their new research findings (many published in respected Western journals), are consistently indicating a potential use for American ginseng, *Panax quinquefolius*, in medical therapy. Studies have shown, for example: that an extract of the ginseng berry has potent antidiabetic effects in laboratory mice; that ginseng root enhances copulatory behavior in male rodents (yes, ginseng really is a consistent and dramatically effective sexual stimulant—at least for male rats!); that regular consumption of ginseng by mice stimulates their immune system response in tissues throughout the body; and that ginseng inhibits the growth of most types of human cancer cells—including lung, skin, liver, GI, prostate, colon, and breast—when they are growing in petri dishes or have been implanted into rodents.

Perhaps the most promising research on the anticancer effects of American ginseng was done by Dr. Laura Murphy at the Southern Illinois University School of Medicine's Department of Physiology, whose entry into ginseng research was

initiated by the repeated urging of her younger brother, a woodland ginseng farmer. One line of Dr. Murphy's research focused on American ginseng as a complementary therapy, along with standard chemotherapy, for treatment of breast cancer. When cultured human breast cancer cells are implanted into mice, the mice are regularly injected with a chemotherapy drug, and some of them are also fed American ginseng, tumor shrinkage is much greater in those mice who received the ginseng together with the traditional chemotherapy drug. Thus, ginseng actually appears to help the chemotherapy drug work more effectively, and that suggests the dosage of the toxic drug could be significantly reduced.

Scientists do not yet know how their findings in laboratory animals are clinically relevant to humans, but ginseng, particularly its polysaccharides, may stimulate immune cells located in our digestive tract to produce more potent immune cell stimulators that ramp up the immune system throughout our body. Dr. Murphy investigated one of these immune cell products, called TNF, or tumor necrosis factor, which is a compound known to kill cancer cells. Mice fed whole-ginseng extract for four weeks have four times more TNF in their blood stream. Having obtained these results in mice, Dr. Murphy "fed" ginseng extract to human gut immune cells in petri dishes. After the gut immune cells had time to secrete TNF (and many other compounds), she introduced some of those secretions into petri dishes with human breast cancer or colon cancer cells. Consistently, within 24 hours, the human cancer cells were all dead!

Knowing of Dr. Murphy's work and other recent scientific evidence of ginseng's beneficial properties adds a small sense of satisfaction to the daily chores of my ginseng business (as well as to the writing of this book). I believe it is a good business that I am engaged in and that you are considering.

As this revised edition of *Growing & Marketing Ginseng, Goldenseal & Other Woodland Medicinals* is about to go to press, the prices being paid for wild ginseng are higher than ever before. While this certainly makes woodland ginseng growing even more attractive, should roots continue to bring such high value in the future, wild populations could be threatened by overharvesting, and the United States Fish and Wildlife Service might well feel compelled to prohibit the export of wild ginseng in order to protect the plant. Growers are therefore advised to proactively document their purchases of planting stock and their growing operation in order to be able to prove that their roots were not foraged from wild populations. Increased production of high-grade roots by woodland growers is the best way to keep supply in balance with demand, thereby keeping prices down and protecting the still widespread populations of wild ginseng.

1

American Ginseng: Its Life Cycle, Range, Related Species, and Government Regulation

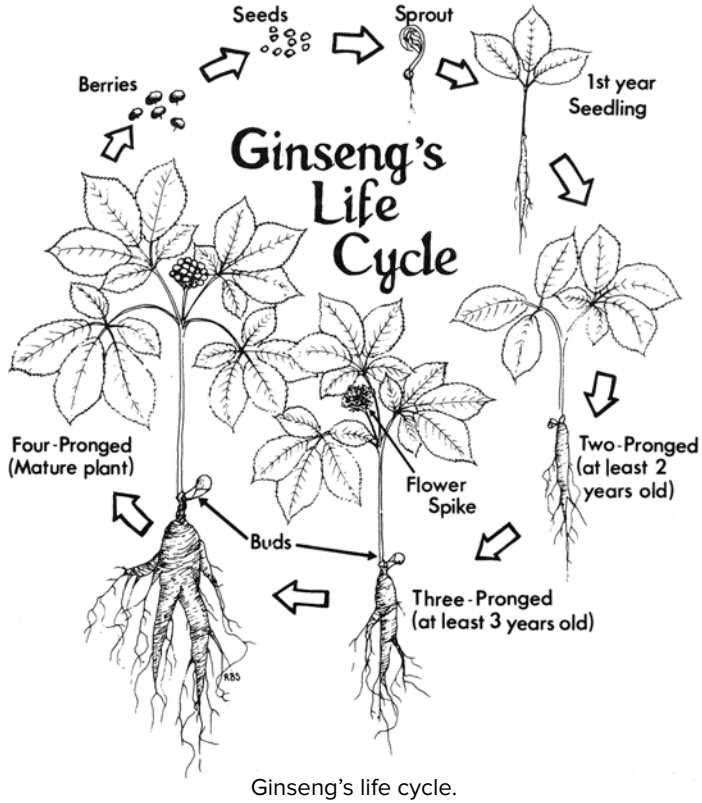
Though it is one of the world's most valuable herbs, American ginseng, *Panax quinquefolius* (Linnaeus, 1753), is a rather ordinary-looking little plant—about 20 inches high—that grows inconspicuously on the floor of hardwood forests throughout eastern North America. Ginseng produces a new stem and leaf top each year, but its value lies buried in its slow-growing tuberous rootstock. The great demand for its root has led to the regulation of American ginseng's harvest and export.

Life Cycle

The First-year Seedling

When it sprouts between late April and early June, a ginseng seedling has a small, short stem supporting three tiny furled leaflets. Within four or five weeks of sprouting, the herb is about three inches tall and leaflets are unfurled and fully developed. At this point, the seedling looks something like a wild strawberry plant. No further foliar growth occurs after midsummer, even if leaflets are damaged or lost. This is true in subsequent growing seasons as well. In autumn, the foliage turns a rich yellow ocher and soon dies off, often hastened by frost.

When the ginseng seed germinates in the spring, it is the young root, or radicle, that first emerges through the seed husk. However, the root does not develop to any appreciable extent until mid-summer, after the leaflets have unfurled and completed their season's growth. The small skinny root then grows from midsummer through the fall and develops a solitary bud at its top, below the ground. The root survives the winter, freezing as the ground freezes. It is from the bud that the single stem and leaves will grow and unfurl the following spring. Interestingly, examination of the bud under magnification reveals the configuration of the next year's foliar top (that is, the number of prongs and leaflets).



Ginseng's life cycle.

Foliage and Berries

In its second year, under optimal growing conditions, the plant can reach five or more inches in height and produce two prongs branching from the central stem, each prong being a single leaf composed of three to five leaflets. If conditions are friendly and fertile, the number of prongs will increase with age, and the plant may eventually reach a height exceeding two feet. In cultivated shade gardens, ginseng typically produces three prongs in its third growing season and often four prongs in its fourth. However, in the wild, plants are usually five to nine years old before they add a third prong and begin to produce berries (with seeds) in any quantity. In later years, particularly healthy and vigorous specimens can have as many as five prongs radiating from the top of the stem, with each prong typically having five leaflets (occasionally, as many as eight).

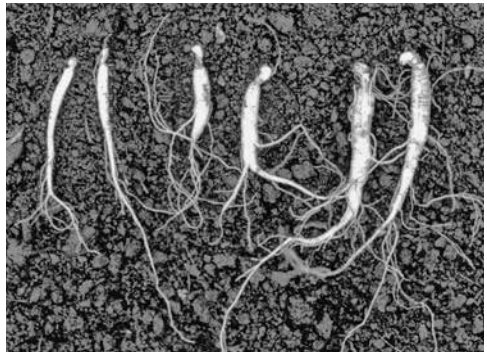
The species name, *quinquefolius*, means five-leafed. The two smallest leaflets on a prong are less than two inches long and the other three larger leaflets are three or four inches in length. The shape of the leaflets is *lanceolate*, with saw-toothed edges ending in a sharp point.

From the center of the whorl of prongs, a delicate cluster of small, nondescript blossoms arises in early summer, usually on

American Ginseng (*Panax quinquefolius*) during its first summer of growth. Photo by James W. Wallace, Jr.

Second-year plant with typical two-pronged leaf development. Photo by James W. Wallace, Jr.

Third-year plant with typical three-pronged leaf development. Photo by James W. Wallace, Jr.



Pairs of roots from one-, two-, and three-year-old woods-cultivated plants. Note bud for next season's growth at top of roots. Photo by Kim Fadiman.

Flower spike beginning to blossom in early summer. Photo by James W. Wallace, Jr.

plants that are at least three years old. Each blossom has five greenish-white petals only a few millimeters in width. A ginseng plant is capable of self-pollination, but reproductive success is greater when sweat bees and other insects cross-pollinate the flower clusters. By July or August, as few as two or three green berries or (on large, older plants) as many as 50 berries follow the blossoms. These kidney-shaped berries about the size of bloated black-eyed peas turn a beautiful bright crimson color as they ripen. Each ripe berry usually contains two slightly wrinkled, hard whitish seeds about the size and shape of a children's aspirin tablet. Young plants sometimes produce berries containing only one seed, and vigorous older plants often have berries with three seeds in them. Under normal conditions, the seeds do not germinate and sprout until 18 to 20 months after they fall from the plant in August or September.

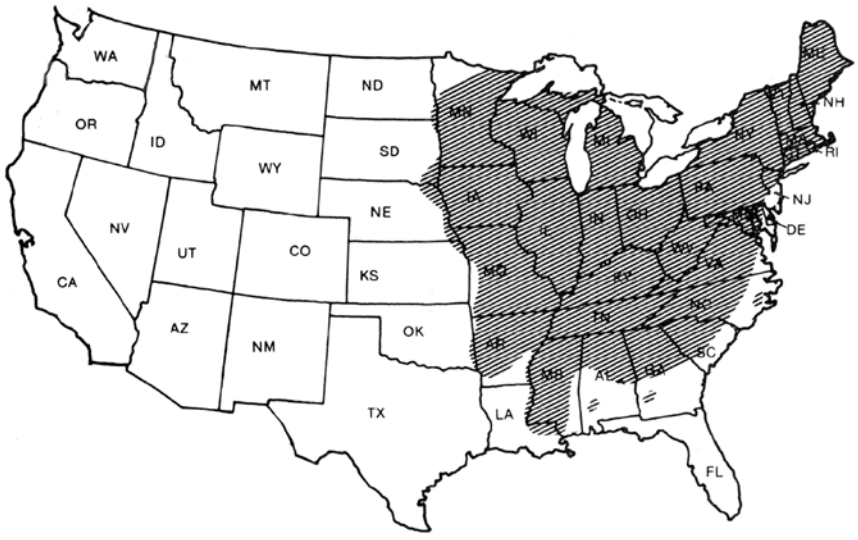
The Root

The root continues to develop each growing season. Young roots are long, slender, and generally light in color. As the root matures, its color often darkens, and the root may become forked with tendrils extending from the main body. Occasionally, the mature root grows into a form suggesting human arms, legs, and torso. The name ginseng means "man root " or "man essence" in Chinese. First-year roots are usually between ⅛ and ¼ inches in diameter, while the main trunk root of four-pronged plants may thicken to an inch or more in diameter and often exceed four inches in length. Under ideal growing conditions, roots can double or triple their size during each of the first few seasons. During harsh conditions such as prolonged drought or if fertilization of otherwise poor soil is stopped, roots can actually decrease in size with commensurate reduction in the size of the foliar top. Of course, malnourished plants eventually die when there is no energy left in the root to support a top. Even under optimal conditions, once the plant begins fruiting heavily, its growth rate gradually slows until increases in root weight are only about 20 percent each year.

When the foliage dies in the fall, the base of the stem breaks off just below ground level, leaving a scar at the top of the root. The next year's bud will have developed on the opposite side of and just above that scar. This yearly scarring produces a root "neck," technically called a rhizome, which bears a series of alternating and ascending marks that indicate the age of the ginseng. Under harsh conditions, plants will lie dormant for one, or even several, growing seasons, and no stem and hence no scar will form. Twenty-year-old plants are not rare, and one venerable survivor over 132 years of age has been documented. (See photo in color section.)

American Ginseng's Wild and Cultivated Range

Ginseng occurs naturally throughout the eastern half of North America as part of the forest flora under hardwood timber. Its range runs from southern Ontario and Quebec to central Alabama, and from the



Wild range of American ginseng in the continental United States

East Coast to just west of the Mississippi River (see Range Map for United States). As with sugar maples and many other plants that grow in northern temperate zones, ginseng's southern range is limited because some extended exposure to cold is required over the winter months to stimulate its seeds and roots to break dormancy and to sprout in the spring. Although there have been reports of wild 'sang (as ginseng is often referred to throughout much of its range) growing as far west as the Texas Panhandle, its western spread is probably curtailed by the drier climate and the lack of hardwood shade trees.

The shaded area of the range map displays ginseng's present wild range in the United States as determined by the Department of the Interior's International Convention Advisory Commission and published by the World Wildlife Fund. Within its natural range, ginseng is being cultivated successfully on sites with good soil, shade, and drainage. Indeed, it has been grown commercially in eastern North America since the late 1880s.

Outside its native habitat, cultivation of *Panax quinquefolius* has been difficult until very recently because so little was known about its horticulture. Since the 1980s, however, two extensive plantings of enormous commercial significance have been established: one in the northeastern provinces of China and the other (less successful one) in the arid interior of British Columbia, Canada. In addition, a few small-scale growers are now farming American ginseng in temperate climates all over the world. There are, for example, successful farmers in Oregon, Washington, Idaho, and North Dakota. In Europe, I know of growers in Switzerland, Sweden, England, France, Italy, Belgium, Poland, a prospective grower in Hungary, and a hydroponic grower in Berlin. I have

also supplied seed for an experimental operation in the treeless Golan Heights of Israel. Even in the Southern hemisphere—in Argentina, Chile, New Zealand, and Australia—enterprising individuals are attempting ginseng cultivation. (Chapter 2 covers more about the history of farming American ginseng.)

Related Species

American ginseng, *Panax quinquefolius*, is one of approximately 700 plant species in the ancient Araliaceae family, which also includes English ivy, schefflera, and sarsaparilla. The 700 modern species of Araliaceae are grouped into approximately 70 genera, one of which is *Panax*. (*Panax*, incidentally, translates as "panacea," or cure-all, which is what ginseng is believed to be.)

The *Panax* Genus

Depending on who is doing the taxonomy, there are anywhere from 5 to 13 species of the *Panax* genus—all forest plants. The five species about which there is little debate are the following:

1. *Panax ginseng* C. A. Meyer, found (now rarely in the wild) in northeast China, the Korean peninsula, Manchuria, and extreme eastern Russia near the Chinese border (where the only sizeable populations remain). It is usually referred to as Oriental or Asian ginseng, or sometimes as "true" ginseng.
2. *Panax quinquefolius* L., found in eastern North America, and commonly called American or Canadian ginseng, or colloquially, "'sang" in its southern range and "shang" in its northern range. The North American Indians used it in a similar manner to the ancient Chinese use of *Panax ginseng*.
3. *Panax trifolius* L., found in North America, and called dwarf ginseng.
4. *Panax notoginseng* Burkill, found in southwest China and Vietnam, and sometimes called Sanchi ginseng.
5. *Panax japonicum* Nees, found only in Japan, and called Japanese ginseng or bamboo ginseng.

Of these five ginseng species, *Panax quinquefolius* and *Panax ginseng* are thought to have exceptional curative properties, and they have the greatest commercial value. (As raw root, *P. quinquefolius* is the more valuable per pound.) They have similar, but distinctive, chemical compositions and are used differently in traditional Chinese medicine. Thus, they do not compete directly with each other in the Asian marketplace. Their foliage is strikingly similar in appearance, as are the roots. The best way to tell the two apart is to break a root in two and look at the cross section. The vascular bundles in *P. quinquefolius* are round, while those of *P. ginseng* appear jagged and irregular, which contributes to its more fibrous quality. Like trillium, mayapple, and other flora that have close counterparts in eastern Asia, American ginseng probably did not evolve into a separate species until the ancient land bridge between Alaska and Siberia disappeared.

Modern chemical analysis shows *Panax notoginseng* has pharmacological proper-

ties similar to the two more widely valued species, which it resembles, and its popularity and commercial value in the world of medicinal herbs is increasing. *Panax japonicum* is used in some regions of China and has modest economic value. *Panax trifolius* is distinctively different in appearance from other ginsengs and has virtually no medicinal use or worth.

Several other Asian species (or perhaps only subspecies or geographical variations of *Panax japonicum*) have been identified—some fairly recently. These include three species found in western China: *Panax pseudoginseng* Wall, or Tienchi ginseng; *Panax zingiberensis* Wu and Feng, or San qi ginseng; and *Panax stipuleanatus*, or Pingbiann ginseng. None of these is widely used medicinally, and none has significant commercial value at present.

Other "Ginsengs"

The plant commonly called "Siberian ginseng," which has been widely marketed as ginseng, is also a member of the Araliaceae family; however, it is not a true ginseng, as it is not a member of the *Panax* genus. Its proper botanical name is *Eleutherococcus senticosis*, and it is a shrub, not an herb. Traditional Chinese medicine uses *E. senticosis* as a sleeping aid and to treat acute bronchitis, but never as a substitute for ginseng. Both the bark and the root of *E. senticosis* do produce some medicinal effects similar to ginseng, and in the 1960s, Soviet scientists touted it as a useful, cheap substitute for Asian ginseng. An American importer, in the process of persuading a customs agent to allow his shipment of *E. senticosis* from Siberia into the United States, explained that it was similar to ginseng. The agent, who apparently could find no guidelines covering *Eleutherococcus*, solved his dilemma by labeling it "Siberian ginseng" and letting it through, thereby setting a precedent. Since then, when sold in Europe or the United States, much of *E. senticosis* was misleadingly labeled as "Siberian ginseng" or even just as "ginseng." Federal legislation, enacted in 2002, now prohibits such false labeling in the United States.

Another member of the Araliaceae family, *Echinopanax horridum*, or devil's club, is found in wet areas all over northwestern North America and is sometimes referred to as Rocky Mountain or Alaskan ginseng. Although a medicinal plant in Native American culture and related to ginseng, it does not have the same medicinal properties.

There are at least ten other plant species from all over the world that are sometimes marketed as ginseng, though they have no botanical relationship to the *Panax* genus or even the Araliaceae family.

Finally, anyone shopping for ginseng is likely to encounter "red ginseng" and "white ginseng." Red ginseng is made from high grade, usually six-year-old, Asian ginseng (*P. ginseng*) roots that are steamed (sometimes with other ingredients) and dried at high temperatures for at least eight hours. This process produces a translucent reddish brown root with the look and feel of hard candy. When sold (usually at high prices) as whole root, red ginseng is

separated into three grades: heaven, earth, and good—with each grade having nine size categories. American ginseng and other species can be processed in this same way, but little market has been developed for such products. Asian ginseng roots are also the source of white ginseng, traditionally made from roots that are of lower grade than those processed into red ginseng. Scraping or removing the outermost layer of root tissue before drying lightens the appearance of the roots. However, sometimes the term "white ginseng" refers to fresh roots or to any ginseng roots—regardless of species—that are dried normally. For example, *P. quinquefolius* that is grown in China and dried normally is sometimes misleadingly labeled as "China White."

Government Regulation of the Ginseng Trade

Convention on International Trade in Endangered Species

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) identifies *Panax quinquefolius* as one of the species that needs the protection of an international trade agreement. (Only ginseng *roots* are included under CITES; seeds and leaves are not.) The United States and Canada are two of more than 160 countries that are party to the Convention, having signed on in 1977. CITES monitors, controls, and restricts trading in the identified species to prevent adverse impacts on their populations and to insure the continued existence of those species in their natural habitat.

In the United States, obligations under the CITES agreement are the responsibility of the United States Fish and Wildlife Service (USFWS), more specifically the responsibility of two divisions of USFWS: the Division of Scientific Authority (DSA) and the Division of Management Authority (DMA). Under the authority of CITES (Article IV), the USFWS will only allow export of American ginseng—both cultivated roots and roots collected from the wild—if the DSA advises the DMA that such export will not be detrimental to the survival of the species. In addition, the DMA must be satisfied that the specimens intended for export were legally collected or cultivated. (Ninety percent of our ginseng is eventually exported—see next chapter.)

In accordance with CITES, the DSA has chosen to use a state-by-state basis in determining whether or not ginseng export will be detrimental to the survival of the species. As of this writing, the DSA has determined that the export of cultivated American ginseng roots would not be detrimental to the survival of the species if a state has a program in place to certify the roots for export. The following states have such a program: Alabama, Arkansas, Georgia, Idaho, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Michigan, Minnesota, Missouri, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Tennessee, Vermont, Virginia, Washington, West Virginia, and Wisconsin. Of these states, Oregon, Washington, Idaho, Maine, and Michigan export only cultivated ginseng. The remaining states have all established

laws and state programs, including a legal foraging season, that regulate the harvest of wild ginseng and require the certification of ginseng roots as either wild or cultivated prior to their export. At present, the DSA finds that in all these remaining states the export of both wild and cultivated ginseng would not be detrimental to the survival of the species.

Every year the DSA reconsiders its nondetriment findings based on information from each state, such as pounds of wild ginseng harvested, average number of roots per pound, average age of harvested plants, and trends in abundance of wild ginseng populations as measured in field surveys. In 1999, the DSA found that throughout all states the continued harvest of wild plants younger than five years would be detrimental to the survival of the species. Therefore, all states must now prohibit the harvest and sale of wild roots less than five years old (as evidenced by the number of scars on the neck, or rhizome). In anticipation of future ginseng harvests, the DSA continues to seek trade and biological information concerning the impact of ginseng harvest and international trade on wild populations of the species. The DSA seeks input from the public, the ginseng industry, and scientific authorities, as well as from conservation groups and other interested parties.

For its part, the DMA requires that each state monitor all commerce in American ginseng (wild or cultivated) within its borders. Beginning with the 1978 harvest season, all states seeking export approval for wild or cultivated ginseng roots were required to have legally mandated ginseng programs that included the following: (1) state registration of dealers who purchase ginseng in the state; (2) requirements that such dealers maintain records and submit annual reports to the state government concerning their purchases and sales of ginseng; and (3) inspection by state officials and the issuance of accompanying State Certificates of Origin for each lot of ginseng being shipped out of the state, documenting that the ginseng was legally foraged or grown within the state. In addition, the DMA issues its own CITES permits, which must be obtained in order to ship American ginseng out of the United States.

In all of Canada, the export of wild ginseng has been prohibited since 1989. In Quebec, the harvest of wild ginseng was prohibited since the species was listed on Appendix II of CITES in 1973. The harvest of wild ginseng (but not the export, since 1989) was allowed in Ontario until June 30, 2008, but both the harvest of, and the trade in, wild ginseng is now prohibited there. Moreover, to be exported, roots can now only be cultivated in open fields under artificial shade on land licensed (with a fee) by the Ontario Ginseng Grower's Association under the Farm Products Marketing Act.

All shipments of field-grown ginseng artificially propagated in Canada must be accompanied by valid CITES documentation. Exports of woods-grown ginseng are currently assessed on a case-by-case basis by the Canadian Scientific Authority. According to Adrianne Sinclair of Environment Canada's Canadian Wildlife Service,

no Canadian export permits are being granted for woods-grown ginseng, due to concerns related to habitat disturbances associated with site preparation and maintenance, the introduction of seed-borne pathogens that are common in cultivated seed sources, and the potential for genetic contamination of wild ginseng populations. Also of concern is the difficulty in differentiating between the roots of wild and woods-grown ginseng. Not surprisingly, there is now very little commercial woodland ginseng farming in Canada. [Author's note: Despite, and perhaps in part because of, these regulations, wild ginseng in Canada is under increasing pressure.]

United States Department of Agriculture

The USFWS works closely with the United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) to enforce and implement ginseng regulations. APHIS is responsible for inspecting all exported and imported ginseng to make sure that it is properly certified as to state of origin, is accompanied by the required CITES permit, and is at least five years old. Since the necks (which are needed for proof of age) of many dried ginseng roots easily break off during shipping and handling, it is fortunate that so far the inspectors are not being too rigorous and technical in their assessments (because every container of roots has individual roots with their necks broken off and therefore of unverifiable age and subject to rejection for export). In addition, a general export permit must be obtained from the USDA in order to export any agricultural product. [Author's note: Contact PPQ-APHIS-USDA, Permit Unit, listed in the Comprehensive Resource Directory under USDA.]

Impact of Government Regulation on the Individual

Because state laws vary slightly, the impact of CITES regulations on the individual will differ from state to state. To determine what the laws are in your state, ask your county agricultural extension or conservation agent about ginseng regulation and what department of state government is administering your state's program. If your agent does not know, then you can contact the United States Fish and Wildlife Service, Division of Management Authority. The DMA will advise you whom to contact in your state. I urge you to learn your state's law, whether you are a digger, a grower, or a buyer. Contact information for the DMA is listed under USFWS in the Comprehensive Resource Directory.

To hunt wild ginseng, you will need to know your state's legal season and any other state laws, such as a license for hunting 'sang, or requirements that you only take plants old enough to bear seeds or that you immediately plant some of the seeds on the site where you dig the plant. Selling wild roots out of state requires a State Certificate of Legal Take. This document will accompany the roots on any resale because ginseng roots (alive or dead) cannot

be exported without state certification. An in-state buyer will have certification forms available himself.

If you are interested in just growing ginseng, then CITES will probably affect you only when you are ready to sell your roots. Furthermore, if you always sell to an in-state buyer or to an out-of-state dealer who has registered as a buyer in your state, then you will likely never have to deal with permits or certifications of any kind. (All you have to do is grow the roots.) In any case, contact your state regulatory office, as they may be able to put you in touch with fellow growers and other knowledgeable people in your area. In addition, if your state should ban the collection of wild ginseng sometime in the future, you may need support from a representative of the state to verify that your roots were grown from seeds that you planted. Along this line (and, of course, for tax purposes), keeping records of your purchases of planting stock is important. A few states require growers to acquire nursery licenses and meet other reporting regulations.

If a grower wishes to sell his roots out of state, he will have to comply with regulations. Like wild roots, cultivated roots must have proper documentation before they can be bought and sold. All ginseng sold across state lines is required to have a State Certificate of Origin accompanying it. State personnel must inspect the roots and determine whether they are wild or cultivated and then issue an appropriate certificate documenting the state of origin. My experience in North Carolina has been that this documentation is convenient to obtain. (Note that seeds or live roots intended for transplanting in the United States need no certification, even if sold out of state.)

In addition to the documentation needed to ship out of state, a grower who wishes to directly export his roots must also obtain a USDA General Export Permit and a CITES permit from the DMA. The grower must then ship or hand carry the roots, along with the necessary documentation, to a designated port of export for APHIS inspection. (Contact the USDA for a list of ports.)

If you live in a state where there is no regulation of ginseng commerce as mandated by CITES, then there can be no legal ginseng buyers in your state, and any ginseng you grow (or forage) cannot be legally exported directly from your state. You will have to ask your county agricultural extension agent or some other state official to write an informal certificate of origin on some official state letterhead, which will allow you to move your roots (accompanied by the informal certification) out of state. Then you will be able to sell your roots to a registered dealer in a state that complies with CITES, and, in turn, that dealer can legally export or resell them as long as he documents buying roots from your state in his annual report to his state's administering office.

While compliance with government regulations is no great burden for the 'sang digger or most growers, anyone who wishes

to buy and resell ginseng is destined to fill out a lot of paperwork. Ginseng buyers must register with their state as dealers and are required to fill out and submit forms supplied by the state, recording all root purchases and sales. In addition to knowing state law and becoming a state-registered dealer, a buyer must thoroughly understand and comply with the CITES regulations (which can be obtained from the DMA—see the Comprehensive Resource Directory under USFWS). To export ginseng, a dealer must follow the same procedures as a grower. This includes acquiring CITES permits and a USDA General Export Permit, and shipping or hand carrying roots (along with the necessary documentation) to a designated port of export for APHIS inspection.

2

History of the Ginseng Trade: Ancient China to the New Millennium

Ginseng, which means "man root" or "essence" in Chinese, is so named because the root sometimes grows into a man-like shape and because its medicinal qualities are believed to benefit the whole man. Ginseng has been a central component of Chinese traditional medicine for thousands of years, used to balance the body and prolong the quality of life in old age as well as to treat a broad spectrum of more specific maladies. Commerce in ginseng probably began soon after its medicinal reputation was established. As it became greatly valued as a life-enhancing herb, its monetary value attracted diggers, traders, and even smugglers. Ginseng has often been worth its weight in silver or even gold, and enterprising people have long made money in its trade and, more recently, in its cultivation. This chapter traces the fascinating history of the ginseng market, from ancient times in the Orient up to our present-day international trade.

Ancient China

Many thousands of years ago, *Panax ginseng* was surely known to hunter-gatherers in mountainous Manchuria in China. It probably was first used as a food and then became revered for its strength-giving and rejuvenating powers. In ancient rural China, the occasional, truly man-shaped root was regarded as divine order implanted in the soil and as immensely valuable. Wealthy warlords wore the dried root around their necks as an amulet of long life and power.

The first unifier of China, Shih Huang Ti of the Ch'in (or Qin) dynasty (221–207 BC), built long stretches of the Great Wall of China and then sought to assure himself of immortality or at least of notable longevity. Legend has it that he sent 3,000 young men and 3,000 young women to the most remote mountains in search of the "divine herb"—ginseng. Unfortunately, none of these young herb seekers ever returned to

the emperor, and he remained without a supply of the root and the means to greatly prolong his remarkable life.

Ginseng first appears listed as a medicinal herb in the *Classic Herbal* of Shen Nung, which appeared during the Han period (from 206 BC to AD 220). Among other wonderful properties, ginseng was said to expel evil effluvia and, if taken for some time, invigorate the body and prolong life. The *Classic Herbal* is thought to be a preservation of much older writings and recommendations, including those made by the legendary Shen Nung, founder of Chinese herbal medicine, agriculture, and animal husbandry, who is said to have lived around 2800 BC.

Insistent demand for ginseng nearly exterminated wild ginseng in China and stimulated international trade in the revered root beginning in the third century AD, when envoys from Korea brought the Chinese emperor ginseng and other valuable gifts in exchange for Chinese silk, medicine, and culture. It was about this time that the first test for true ginseng was devised. Ginseng has always been a rare and highly valued herb (still held in highest esteem by practitioners of traditional Chinese medicine), and apparently there have always been those who sought to pass off substitutes as the real thing. Today there is DNA analysis, but the *T'u-ching Pen-ts'ao*, the history of the Sung Dynasty (around AD 700), records a simpler analytic method (though undoubtedly less certain):

> In order to test for the true ginseng, two persons walk together, one with a piece of ginseng root in his mouth, and the other with his mouth empty. If at the end of three to five li [about a mile-and-a-quarter] the one with ginseng in his mouth does not feel himself tired, while the other is out of breath, the ginseng is genuine root.

It also was early in the history of the ginseng trade that smuggling began. This probably first occurred when the Manchurian province forbade export of the herb. The roots brought a great price, so travelers across the mountains began smuggling ginseng by twining the roots into the braids they wore at the back of their heads. This early contraband practice came to be called "pigtailing." Today, to avoid tariffs, American ginseng is being smuggled into Mainland China.

Korea

Korea claims the title of "The Ginseng Country," and surely deserves it. Since before recorded history, Symmani (which translates as "ginseng man") have hunted wild ginseng after making ritual offerings of food and colored ribbons to the mountain gods. Tales of ginseng as the medicine taken by an immortal, supernatural hermit were being told as early as 4,000 years ago. Records of finding "mountain ginseng" in Korea date back as far as 2137 BC. Geography and climate provide excellent habitat and growing conditions. Korea has been exporting wild mountain ginseng to China since the third century AD and has been cultivating ginseng for export since the beginning of the 20th century. Moreover, research undertaken at the Korean Tobacco

A traditional ginseng farm in Korea, where *Panax ginseng* is an important aspect of the economy and the culture. Thatched roof hutches facing east provide the plants full sun in the early morning but full shade the remainder of the day. Photo courtesy of General Nutrition Corporation.

and Ginseng Research Institute, originally founded in 1899, has established much of the world's understanding of ginseng's medicinal properties.

The thriving ginseng export business and the destruction of its forest habitat gradually reduced the availability of wild Asian ginseng on the Korean peninsula. Today there are almost no truly wild *Panax ginseng* plants left in Korea (or anywhere else in the world, other than limited populations in eastern Russia). To meet China's constant demand, the Koreans learned to cultivate ginseng, first under natural forest shade and more recently in open fields under artificial shade. (Of course, the Chinese began growing ginseng as well.)

Cultivated Korean ginseng plants (*Panax ginseng*) are botanically identical to wild Korean ginseng as well as to the Asian ginseng plants native to China and Russia. Cultivation on a small scale began in the provinces of South Korea in the 16th century, but it was not until the early 1900s that cultivation was undertaken on a scale large enough to produce a surplus for export. During the early 1900s, Korea produced as much as 700,000 pounds of dried ginseng

Harvesting ginseng berries for seed in Korea. Photo courtesy of General Nutrition Corporation.

root per year from wild and cultivated crops. Most of this was exported to China, Japan, and other Southeast Asian countries.

Over time, South Korea gradually increased its production until, in the late 1990s, it was utilizing over 24,000 acres for ginseng farming (almost all of it under artificial shade). Traffic, an arm of the World Wildlife Fund, reported an annual harvest of 20 million pounds of roots in 1998, with about 4.8 million pounds of that exported. Ginseng is a major agricultural product in South Korea. It is shipped to some 60 foreign countries, but primarily to Hong Kong, Mainland China, Japan, and Taiwan, with smaller quantities going into the United States, Spain, Canada, Vietnam, and other Southeast Asian nations.

The Korean Tobacco and Ginseng Corporation (KT&G, which now funds the Research Institute) oversees ginseng cultivation as well as marketing, especially of the red ginseng that the KT&G produces (a value-added product, see Other "Ginsengs" in chapter 1). The corporation attaches a registration trademark, called Cheong-Kwan-Jang in Korean, to its red ginseng products in order to guarantee quality to the consumer. Each year, ginseng and tobacco exported under the KT&G bring in as much as three trillion won ($2.4 billion) in revenue to the country's budget. Much of this is from sales of tobacco products, but ginseng, especially red ginseng products, makes an annual contribution of up to $200 million.

In recent years, there has been a decrease in export revenue from ginseng, but the Korean Ministry of Agriculture and Forestry has plans in place to reverse that trend. Almost one billion dollars will be injected into the Korean ginseng industry to foster "global strategic export." Moreover, approximately 200,000 acres bordering the demilitarized zone will be set aside for potential Asian ginseng production. The plan is to increase the average size and yield of the typical ginseng family farm (of which there were approximately 22,000 in 2001) from 1.3 acres with yearly ginseng sales of $4,000 to 2.4 acres with annual sales of over $14,000. Furthermore, the Koreans are increasingly interested in producing "mountain ginseng," which seems roughly equivalent to our term, "woods-grown," because, according to Dr. Hoon Park of Chung-Ang University, "mountain ginsengs are high in efficacy and very rare and price is very high."

Japan

Wild Japanese ginseng, *Panax japonicum*, has grown in the mountains of Japan since ancient times. It is different botanically from the wild ginseng of Manchuria, eastern Russia, and Korea (*Panax ginseng*). Its roots have a more bitter taste and are not nearly so valuable, though they have a traditional market in China. There is ongoing research in Japan to determine if *P. japonicum* has unique medicinal properties.

Nearly all the ginseng cultivated by the Japanese is the more highly prized *Panax ginseng.* Japan began importing seeds and seedling roots from Korea in 1607. After three hundred years of experimentation, ginseng farming had become a good business; in 1907, ginseng grew in 43 counties, and thousands of Japanese farmers were involved in its cultivation. In the early 1900s, Japan's ginseng suffered a disease epidemic (probably Alternaria), but with no understanding of the causes, nothing could be done. Most of the crops perished, and the farmers plowed their gardens under and started other crops. Today, *Panax ginseng* is cultivated primarily by Japanese rice farmers on ginseng farms, which are small, individual gardens. According to latest figures, the annual crop is only about 21,000 pounds, most of which is exported to Hong Kong.

French Canada

Knowledge of ginseng spread to the Western world beginning with Marco Polo's reports of the root's use throughout China. He recorded in 1274 that ginseng was

Asian ginseng growing in Japan under traditional thatched roof shade. Photo by Al Oliver.

"…powdered, cooked, and used as a tea, syrup, or food condiment, or even burned as incense in the sickroom." Canadian historian Brian Evans has cited the Dutch as being the first to import ginseng roots into Europe in the 1600s. However, the French, with their Jesuit missionaries in northern China, were the more successful early exploiters of the herb's commercial potential in the West. The French were also more appreciative of ginseng's medicinal benefits, recommending its consumption with a little white wine to cure asthma and stomach problems and to promote fertility in women.

In 1702, a French Jesuit priest, Father Jartoux, went to China to help survey the area of Manchuria. There he observed the use of Chinese ginseng and its healing powers, and was able to furnish an account of the plant, including a detailed physical description (presumably with an accompanying sketch) and a description of the

environment where the herb flourished. Father Jartoux's information fascinated another Jesuit missionary farther west, Father Joseph Francis Lafitau, who was living among the Iroquois Indians in North America. Father Lafitau reasoned that the environment of French Canada was much like that of Manchuria and that there was a good chance he would find this wonder herb growing there. Indeed, he did discover the closely related American ginseng, *Panax quinquefolius*, near Montreal in 1716.

Soon after this discovery, the French realized ginseng's value to the Chinese, and French Canadian fur traders expanded into ginseng, paying the Iroquois Indians to dig all they could find. Trade with China began in 1717 and prospered from the beginning. According to Professor Evans, the Cantonese merchants who purchased the first Canadian roots off the clipper ships lightly mixed those roots into lots of Asian ginseng, which look very similar, and were able to sell the mix as lots coming exclusively from either Manchuria or Korea. In time, as wild Asian ginseng became increasingly scarce, American roots took on great legitimate value of their own.

The trade with China went well, until the year 1752, when the price peaked, and the temptation for quick riches proved too much for shortsighted French Canadian traders. They began collecting huge quantities of roots without considering their size or age. This significantly depleted Canadian ginseng, which only grows naturally in southern Ontario and Quebec, and wild ginseng has never again been a major Canadian export. Also, in their rush for profits, the fur traders dried the roots too quickly at excessive temperatures in ovens, destroying their value. The Chinese knew what they wanted and quit buying the undersized, poorly processed roots. Trade with China fell from $100,000 in 1752 to $6,500 in 1754. It took many years to restore the reputation of ginseng from Canada.

The Role of Ginseng in the Settling of America

At the same time that the Chinese stopped buying Canadian ginseng, knowledge of the herb was spreading to the American colonies. Wild *P. quinquefolius* was discovered in western New England in 1750 and in central New York, Massachusetts, and Vermont in 1751. When settlers with knowledge of the root's value spread out from central New England, they discovered ginseng growing throughout the eastern deciduous forests. Though history books largely ignore it, ginseng was one of the two major exports of colonial America, the other being raw furs. Later, as citizens of the new nation continued moving west to settle the land from the Appalachian Mountains to the Mississippi River, wild ginseng often played a critical role by supplying pioneering homesteaders with the immediate cash they needed to buy necessary supplies until their first crops came in.

Early United States-to-China Export

John Jacob Astor of the American Fur Company financed one of the first American shipments of *Panax quinquefolius* to China in the late 1700s. The story goes that ginseng started the Astor fortune. Astor sank

his entire fur-trading capital into ginseng export. His plan was to sell "all the ginseng root I can get" to China. This early gamble paid off. Shortly after his ship, which had carried only ginseng as cargo, returned to New York from China, he had several small heavy kegs brought ashore and delivered to his home. He opened these kegs in front of his young bride, who was delighted to find them filled with silver! Astor had made a $55,000 profit—a sizeable fortune in those days.

Daniel Boone

Just as had been the case with the French in Canada, the fur traders in colonial America were usually the ginseng traders as well. They brought many of the roots to Philadelphia for sale, and the port of Philadelphia became the principal site of ginseng export for the early years of the American ginseng trade. By 1802, ginseng was one of the few products that was profitable enough to absorb the cost of overland transportation to Philadelphia for export. (Over 90 percent of United States ginseng has traditionally been exported to the Orient.)

In Kentucky in 1788, Daniel Boone gathered a few roots for himself and his family and then purchased 12 large barrels for export. He had bought ginseng for export the previous year but had lost his entire cargo when his boatload of roots overturned in the Ohio River en route to Philadelphia. However, ginseng was such a valuable commodity and such a good potential money-maker that he repeated his effort the next year and made his own fortune.

Ginseng "Saves" Minnesota

Truly abundant ginseng stands that allowed constant digging for extended periods grew only in virgin deciduous forests. Thus, brief local ginseng "gold rushes" moved westward with the frontier, as hunters discovered easily accessible ginseng populations and rapidly extracted the bulk of the roots. Despite the need to find new virgin woodlands to harvest every few years, ginseng export from the United States was remarkably constant during the mid-1800s. In 1821, Department of Commerce statistics document that the total ginseng export was 352,992 dried pounds, at a price to the digger of 48 cents per pound. Records show that harvests totaling over 300,000 pounds per year continued for most years through 1888, when ginseng exports reached 308,365 pounds, valued at $2.13 per pound.

William E. Lass, a history professor at Mankato State College in Minnesota, has researched and written an interesting history of the ginseng gold rush in southeastern Minnesota (one of the last). He writes about the important role that ginseng played in the early settlement of that state:

> 'Sang, as it was called on the frontier, was first gathered by colonial pioneers, and it continued to provide a valuable supplement to the meager incomes of later frontiersmen.... In 1859, [there was a deep economic depression with no market for farm products, and] Minnesotans thronged into the woods in search of ginseng.... In time, the ginseng rush became legendary as pioneers reminisced about the weed that "saved"

> Minnesota.... Thousands marketed their first cash crop in two years.... Mankatoans sponsored a "ginseng ball" which was to make diggers "oblivious to the musquito [sic] bite or toil of delving for the bulbous root, whilst tripping the light fantastic" to the music of the Ginseng Polka.
>
> After four productive years, sanging declined sharply.... On February 13, [1865,] the [Minnesota] legislature approved "an Act to preserve and protect the growth of ginseng."

According to Professor Lass, Minnesota exported 245,434 pounds of ginseng in 1860, followed by 208,650 pounds in 1861. This was a significant portion of total United States exports (395,909 pounds in 1860 and 347,577 in 1861). However, by the time the state legislature acted in 1865, only 80,259 pounds were harvested in Minnesota. Unfortunately, the Ginseng Act was ineffective, and the annual harvest continued to decline, in part because the legal digging season was set early in the summer before the seeds matured, leaving no way for the herb to propagate itself during the year of its harvest. Today, only a few thousand pounds of "shang" (as it is now called in Minnesota) are dug each year in the state.

After the Civil War in Southern Appalachia

For a hundred years before ginseng "saved" Minnesota, knowledge of ginseng's value and where to find it was being passed on through generations of mountain families throughout southern Appalachia. (In the South, ginseng only grows in abundance in the cooler mountains.) Ginseng was an available source of supplemental income to folks in rural areas, and, when times were hard, entire families would wander the rugged hillsides, searching the woods for anything they could sell, but mainly for ginseng. Because it provided folks with the cash to buy what they desperately needed, even land on which to start a farm, ginseng became an important part of the mountain culture. During the decades preceding the Civil War, there were regional ginseng rendezvous to which diggers trekked through the mountain passes, leading oxen or horses loaded with roots for sale. In addition to selling their 'sang at these rendezvous, they engaged in games of chance and skill, shooting, wrestling, and sometimes a good fist fight.

The Civil War changed things. In those parts of Appalachia where the armies of both the North and the South along with irregular partisans ravaged farmland and confiscated crops and livestock (not to mention committed acts of violent brutality), a prolonged economic depression suddenly made a large segment of the population almost wholly dependent on diggin' 'sang. Luke Manget, a graduate student in history at Western Carolina University, has written a paper documenting this sudden shift to a ginseng-dependent economy in Cherokee County, North Carolina. As a result of the war, the county lost over half its livestock, over 40 percent of its improved farmland, and 10 percent of its population.

It started producing over 75,000 pounds of ginseng annually (nearly twice as much as the entire state produces now). Manget makes a compelling argument that, spurred by civil strife and global trade, a significant subculture of itinerant 'sang-digging families developed in every southern mountain state and that it was these independent folks whom the "color" writers from eastern newspapers found so fascinating and unfairly characterized as a "wretched class of ignorant poor whites who never seem to have a settled habitation." Thus was created the southern Appalachian stereotype, sometimes referred to as the hillbilly.

History of Cultivation in the United States

First Successful Attempts at Ginseng Farming

As the eastern half of the country was settled, the supply of wild ginseng eventually succumbed to overharvesting. By 1895, less than 200,000 pounds were being exported annually to China, most of it entering through the port of Hong Kong. Depletion of the wild populations was accelerated by the practice of digging the plants early in the summer; even more damaging in the long term was the intense cutting of hardwood trees and the trampling and grazing of the forest floor by fenced livestock, which destroyed the forest habitat and prevented the plant from reestablishing itself. The dwindling supply of wild 'sang encouraged farmers to attempt its cultivation.

Undoubtedly many farsighted early ginseng diggers benefited from immediately planting back the berries from the roots they dug; however, the first efforts at growing ginseng using standard farming methods failed so frequently that it was widely believed *P. quinquefolius* could not be cultivated. This belief still lingers today. One acquaintance recently told me that planting seeds from ginseng wouldn't do any good, because 'sang seeds wouldn't sprout unless "they had been run through a bird first"!

Eventually a few folks figured it out: ginseng requires a cool, shaded environment, a soil rich in humus, and good drainage but with a moisture-retaining mulch; it is adapted to moderately fertile soil, low in nitrogen; and the seeds from ripe red ginseng berries will not sprout for a year and a half. In the 1870s, Abraham Whisman of Virginia became the first American known to successfully cultivate ginseng. Soon afterward, George Stanton, a tinsmith from Apulia Station in Onondaga County, New York, began to grow green gold in some quantity, and he is generally recognized as the first successful commercial ginseng farmer in America. His technique was to plant in an open, tilled area and then build a shade structure over the planting using narrow strips of wood lath spaced a few inches apart, thereby simulating the light and shade pattern produced by a forest canopy of leaves. (Other early growers were successful creating plowed beds in the woods; they had to hack through tree roots, but avoided the time and expense of shade construction.) Stanton's original ginseng plot was only 129 square feet and eventually produced only five pounds of dried roots,

Early one-tenth acre ginseng garden farmed by Mr. Frink of Scott, New York. George Stanton's wood-lath roof design, simulating the forest leaf canopy, provided Frink's plants with partial shade throughout the day. Photo courtesy of Bob Beyfuss and Cornell Plant Pathology Herbarium.

which sold for $16.83. He learned to greatly increase his yields, and Stanton's records document one garden that produced 106 pounds of dried roots, which sold for $575.

Cycles of Boom and Bust

George Stanton loved his gardens and genuinely wanted to share the rewards of profitable ginseng farming. Several publishers laughed at him, but he managed to have a small circular on ginseng farming printed and a New York newspaper article written about his success. Interest boomed with remarkable speed. By 1895, enthusiasm for growing 'sang was so high that the United States Department of Agriculture published its first bulletin on ginseng cultivation: George V. Nash's *American Ginseng*, which was revised and reissued in 1898 and became widely distributed. Nash, and others in farm and garden journals, also wrote glowingly about the Chinese market and reported that large cultivated roots were often selling for a higher price than wild roots. At the turn of the century, nearly every outdoor magazine ran ads for ginseng seeds, many of them touting 'sang farming as a fabulous get-rich-quick business.

With effective open-field cultivation practices now known and the enterprise receiving great encouragement from both authoritative sources and unprincipled huck-

Early 20th-century wood-lath shade structures. Photos courtesy of Bob Beyfuss and Cornell Plant Pathology Herbarium.

sters, ginseng farms sprang up throughout the eastern and midwestern states. Department of Commerce records document total exports of 149,069 dried pounds (at $5.38 per pound) in 1901, increasing to 160,101 pounds (at $5.20 per pound) in 1903. Most of this increase was probably due to the addition of cultivated ginseng, although it is impossible to be certain, since no distinction between wild and cultivated ginseng was made at that time. Indeed, no official export records distinguished wild from cultivated roots before 1980.

This first cultivation boom started to die about 1904 with a widespread outbreak of Alternaria blight, a foliar fungal disease for which there was then no treatment. Discouraged by the loss of most of their seed crop, many growers did not replant. By 1909, the thriving ginseng farming business had dwindled, and that year's census of United States agriculture reported only 23 acres under cultivation.

Just as the last remaining growers were struggling to hang on, Dr. I. C. Curtis of Fulton, New York, reported in *Special Crops*

Magazine his success in treating the blight with Bordeaux mix (half copper sulphate, half lime). As word of this preventative treatment got out, ginseng acreage dramatically increased again, and it became widely recognized as an important alternative cash crop. By 1929, 434 acres were being cultivated by small farmers throughout the Midwest and eastern United States. Demand was so high that exporters could not meet it, and prices exceeded $12 per pound.

Marvin Dickman, a modern Missouri 'sang grower, gives this first-hand account of the American ginseng trade at the beginning of the Depression:

> I saw ginseng being grown commercially for the first time back in summer of 1929, when I was five years old. An old man grew it on terraces on a steep hillside near Hunter, Carter County, Missouri, about 90 miles east of here. Near a very rugged area of south Missouri called the "Irish Wilderness." He had moved the plants in from the woods, and cultivated them with a mule-drawn cultivator.…
>
> Apparently the old man was successful, because that fall of 1929 he dug his ginseng and shipped it in a flour barrel, and got over $1000 for the barrel of roots. It was around $12 per pound that year, at the start of the Depression. He hauled the barrel of dried roots to the railroad station in his mule-drawn buggy with iron-tired wheels that were warped so that they went "in and out" as he drove along.

Then, just as both production and price were peaking once again, a different kind of problem arose: war in the Far East. Between 1929 and 1949, first the Sino-Japanese War and then World War II reduced and eventually blockaded all American trade with China. Without the Chinese buyers and consumers, there was little market for American 'sang, and most folks got out of the business. Only in Wisconsin did a few growers hang on hopefully, storing their dried roots for eventual sale and maintaining planting stock. Today, Wisconsin remains the center and by far the largest producer of cultivated ginseng in the United States.

After the hiatus of the war years, as communications and general trade with the Far East improved, demand for American ginseng was renewed. Growers sought to fill an ever-growing demand, many of them starting with seed obtained from the four Fromm brothers of Marathon County, Wisconsin. Most ginseng, both wild and cultivated, was still first shipped to Hong Kong (under British governance), rather than directly to Mainland China, and this trade through Hong Kong has continued even though the island has reverted to Chinese control.

The scale of ginseng farming grew slowly but steadily during the 1950s and '60s. Sometime during the 1970s, annual cultivated production (almost exclusively from open fields under artificial shade) began to exceed the wild harvest in poundage. In 1972, President Richard Nixon's visit to China resulted in a boost in ginseng sales.

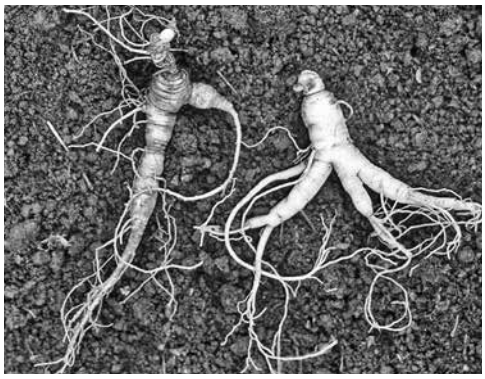
In 1975, the United States government, as part of re-establishing relations, presented the Chinese government a gift of American ginseng. By 1977, the year when our country instituted CITES regulations (see chapter 1), the export of American ginseng, both wild and cultivated, reached a value of $26.5 million. The majority of that value was in the wild roots because, as soon as cultivated production resumed in quantity after World War II, the buyers began paying much more for wild roots than for field-grown roots. In 1977, wild roots brought about twice as much as roots grown in open fields under artificial shade.

United States trade missions continued to promote American ginseng, and the demand increased further. According to the United States Fish and Wildlife Service's Division of Management Authority, 1,600,000 pounds of dried American ginseng roots, including 140,000 pounds of wild roots, were certified for export in 1992. Most of this ginseng, worth approximately $70,000,000, was resold through the Hong Kong auction market. Much of the cultivated root made its way into Mainland China, and most of the wild root either stayed in Hong Kong or was resold in upscale markets throughout the rapidly developing Pacific Rim countries (especially those with large populations of Chinese origin).

United States ginseng production peaked in 1996 at over 2.3 million pounds of dried root (2.2 million of that being field grown). Unfortunately, this coincided with dramatically increased production of American ginseng in China and especially in Canada (see below). Not surprisingly, the rapidly growing world supply of field-grown root led to a rapidly deteriorating per pound price for field-grown roots. Prices fell and stayed under $20, which is barely above the cost of production for a small-scale, artificial-shade family ginseng farm like those in Wisconsin, so most United States field growers have gotten out of the business. Only about 150 shade growers remain in business (down from 1,500 in the early 1990s), producing only about 500,000 pounds of root for export. There has been, however, a rather dramatic upward trend in cultivated prices over the last few years (see Recent Prices at the end of this chapter), and interest in artificial-shade farming has started to return. Presently, the United States is third to Canada and Korea in ginseng exports (all species), and is the fourth largest producer of ginseng, following the People's Republic of China, Korea, and Canada.

The Value of Wild vs. Cultivated

For a long time, buyers paid as much for American ginseng grown in gardens as they did for roots foraged from the forest. A very small percentage of roots from a ginseng garden may be hard to distinguish from wild roots, but tilling the soil preparatory to planting, weeding, and fertilizing inevitably yield faster-growing roots that are on average noticeably smoother, lighter colored, denser, bigger for their age, and less bitter tasting than wild roots. These differences are more marked when



Freshly dug roots: wild (left) vs. field cultivated (right). Photo by Mark Haskett.

Dried roots: wild (left) vs. field cultivated (right). Photo courtesy of Dennis McClintic.

the roots are grown big and fast under the ideal light conditions provided by artificial shade than when the ginseng is nurtured more slowly in a woodland garden, where all conditions are less uniformly ideal and where the shade trees are competing for soil nutrients.

Probably, until the last half of the 20th century, buyers routinely mixed cultivated roots with the relatively more abundant but variable wild roots before export. Little mixing occurs today. It became impractical as ginseng farming moved to mechanized, intensive cultivation practices in open fields under artificial shade. Increasing quantities of large three- and four-year-old roots were produced, and separate pricing and marketing emerged.

Wild American ginseng is now greatly valued over cultivated American ginseng by Asian consumers, mainly because it much more closely resembles the revered wild Asian root (although scarcity is probably also a factor). In addition, wild roots are valued because they have grown without human manipulation, and it is believed that the slower-growing wild roots (Asian or American), which are harvested at an older age, absorb more curative power from the forest soil. There are some pharmacological studies that show more biologically active chemicals and greater concentrations of them in wild roots—especially older ones—than in cultivated roots, although other studies do not support this.

The relatively little ginseng grown in tilled woodland gardens has never been historically or commercially significant, and most of it was almost certainly mixed with wild roots. Today, such woods-cultivated (see chapter 5) roots are finding their own market niche, although some of the very highest grades are still mixed with wild ones, and some of the lowest grades are dumped into field-grown lots.

[Author's note: The chapters on ginseng that follow this history are based on the author's opinion that the future of small-scale American ginseng farming is probably in the forest. Here the grower can produce

roots nearly indistinguishable from wild roots, which are certainly not in oversupply and whose price is currently 10 to 25 times the field-grown price.]

History of Cultivation in Canada

Ontario: A Parallel Story

In 1896, not long after George Stanton harvested his first plantings in New York, Clarence Hellyer sowed wild seed near the small town of Waterford in southern Ontario. Whether or not he was aware of, and benefited from, Stanton's experience is unknown, but Hellyer was also able to cultivate ginseng successfully in open fields under wood-lath shade. He soon formed a partnership to grow ginseng with his brother, Albert. In 1917, two of Albert's sons, Audrey and Russell, formed Hellyer Brothers, whose last crop was dug in 1970. They contracted to sell their production to a Colonel I. E. York, also of Waterford. Colonel York, a druggist, world traveler, and wild ginseng buyer, paid the Hellyers well for their roots and made nice profits for himself on the resale. To promote ginseng farming in his buying area, York published a pamphlet on the cultivation of ginseng, and by 1929, between 30 and 40 farmers were producing ginseng in southern Ontario.

During the next 25 years, which encompassed the Depression, the Sino-Japanese War, and World War II, most of these Ontario growers abandoned their gardens as did their counterparts in the United States. However, the Hellyer brothers (like the Fromm brothers in Wisconsin) persevered, dealing with the adversities of the times, which included $58,000 worth of unpaid-for ginseng left sitting on the dock the day Pearl Harbor was bombed. When the war ended, and trade with the Chinese community in the Far East resumed, mainly through Hong Kong, the Hellyers prospered.

Unlike Stanton, and later the Fromm brothers, they did not sell their seed widely or promote the growing of ginseng. Even though root prices were rising, there was only slow steady growth in Canadian production outside the Hellyer family. In 1962, no more than eight ginseng farms of any size existed in Ontario, but by 1983, between 50 and 60 Ontario growers were cultivating approximately 150 acres total. Then dramatic changes began to occur.

Just as ginseng was being more widely appreciated as an alternative crop, tobacco farmers in southern Ontario were having difficulties. They turned to green gold as an alternative to tobacco, and the Canadian government supported them. The Ginseng Growers Association of Canada (GGAC) organized in 1984, and in 1988 the Ginseng Research Gardens were planted at the Agriculture Canada Research Station in Delhi, Ontario, with start-up money from the government's Tobacco Diversification Program. To help farmers succeed in changing crops from tobacco to ginseng, a team of researchers from the Ontario Ministry of Agriculture, the University of Guelph, and Agriculture Canada began ongoing studies of disease control, optimal nutrition, root-drying methods, etc. With

ever-improving, more efficient cultivation practices, Ontario ginseng production soared during the 1990s so that, entering the new millennium, there were approximately 4,500 acres of ginseng in the ground in Ontario, and 2.5 million pounds are now being dug and exported annually.

When field-grown prices began to drop precipitously in 1994, many of the relatively small-scale family ginseng farms in Wisconsin were unable to maintain profitable operations and, because these small growers stopped replanting, three-fourths of United States production has been lost. In Ontario, on the other hand, ginseng farms are typically larger and better able to mechanize operations and achieve economies of scale. Furthermore, research has helped to optimize cultivation practices and maximize production. Growers struggled to survive in a difficult market but are now in position to do very well indeed, if recent prices hold.

British Columbia: Ginseng Farming on the Stock Exchange

Out in the barren regions of south-central British Columbia (BC), where most of the land looks like hilly scrub desert and agriculture is limited to a few river valleys, another green gold rush began. Indeed, that is what Al Oliver, retired BC Ministry of Agriculture's Ginseng Specialist, entitled his history of ginseng in BC: *The "Green" Gold Rush*. No wild 'sang has ever been found in British Columbia. It certainly seems too dry and too hot for ginseng; but, when provided with artificial shade and occasional irrigation, *Panax quinquefolius* adapted here to an environment far different from its native cool, moist, acidic deciduous forest habitat. Utilizing dry, open plateaus of land bordering the rivers, enterprising folks were able to produce annual crops totaling as much as two million pounds of dried root.

In 1982, John Latta, a former real estate investor, planted five irrigated acres of American ginseng under artificial shade in Botanie Valley near Lytton, BC. Some years earlier, while visiting Hong Kong, Mr. Latta had seen a prized, wild Asian ginseng root sell for $64,000. He researched the plant and its cultivation and convinced himself and a number of investors that they could become wealthy by growing ginseng in British Columbia. They purchased seed and shade technology from Ontario and Wisconsin, and the dry climate of the province's interior helped control disease. Latta's operation flourished, expanded rapidly into the world's largest ginseng producer, and was listed on the Toronto Stock Exchange in 1989, and on the NASDAQ in 1999. He called it Chai-Na-Ta, which is phonetic Cantonese for Canada. At the height of its early success, in 1992, the Chai-Na-Ta Corporation grossed $7.9 million, with an estimated value at maturity of its existing plantings in excess of $100 million. Of course, that was the time to sell stock in Chai-Na-Ta, not to buy it.

Latta's success and his promotional efforts quickly attracted other growers. In 1986, The Associated Ginseng Growers (TAGG) of British Columbia formed and

Growing ginseng under polypropylene shade cloth with irrigation piping, which is needed in the arid interior of British Columbia. Photo by Al Oliver.

the provincial Ministry of Agriculture began to strongly support ginseng farming. Planting peaked around 1994, when 129 listed growers were farming almost 3,000 acres of ginseng in BC. The model John Latta provided, and which others copied, was one of a large-scale corporate farming operation, very different from the family ginseng farm that is the model in the United States.

The dramatic drop in prices in the mid-1990s forced most of the small-scale growers out of ginseng, and even the big corporate farms began to struggle to remain profitable. By 2002, TAGG listed only 40 growers. By 2012, there were only two ginseng farms still operating in the province. The innovative risk takers who figured out how to grow ginseng in an alien environment got rich quickly but just as quickly had their fortunes reversed. It is a story of boom and bust, in some ways similar to the Klondike Gold Rush that occurred just to the north 100 years earlier.

American Ginseng Farming in China

Chinese farmers have been growing Asian ginseng for a long time, but it was not until 1975 that they first imported large quantities of American ginseng seeds (from Canada). With their accumulated knowledge of Asian ginseng production techniques, the state-controlled farms in the northeastern provinces—Liaonong, Jilin, and Heilongjiang—were successful with *P. quinquefolius* from the beginning and have been

Planting on a large scale in British Columbia. Photo courtesy of Chai-Na-Ta.

An aerial view of Chai-Na-Ta's Schellers Ranch, a 92-acre ginseng farm under polypropylene shade in Lillooet, British Columbia. Photo courtesy of Chai-Na-Ta.