

Renewing America's
Food Traditions



FORGOTTEN FRUITS
Manual & Manifesto

APPLES





Front cover

Sierra Beauty apples and wooden box of
Wickson apples

Photos by David Karp & Ben Watson

Opposite page

Photo by Gary Nabhan

Back cover

Hauer Pippin apples in a bowl

Photo by Ben Watson

FORGOTTEN FRUITS
Manual & Manifesto

APPLES

Compiled and edited by Cary Paul Nabhan

With Tom Brown, John Bunker, Tom Burford, Dan Bussey,
Jim Cummins, Regina Fitzsimmons, Suzanne Nelson,
Michael Phillips, Kanin Routson, Chuck Shelton, Gordon Tooley,
Jenny Trotter, Emily Vaughn, DeJa Walker and Ben Watson



EXECUTIVE SUMMARY



THE FIRST-EVER GATHERING OF GRASSROOTS APPLE conservationists in the United States, organized by the Renewing America's Food Traditions (RAFT) Alliance on March 19, 2009 in Madison, WI, acknowledged that not only are many apple varieties endangered, but the unique “apple culture” of America is endangered as well. These experts—who have collectively had more than two hundred years of experience in apple nurseries and orchards—charted a plan that would restore apple diversity to our farms and gardens, restaurants and cideries, home kitchens and festivals.

They noted with concern that:

1. Of some 15,000 to 16,000 apple varieties that have been named, grown and eaten on the North American continent, only about 3,000 remain accessible to American orchard keepers, gardeners, chefs and home cooks. An estimated four out of five apples varieties unique to North America (80 percent) have been lost from commerce.
2. Of the remaining fifth of the varieties still available, 81 percent are now “endangered” in the marketplace, with only one to three nurseries offering such varieties for sale to growers. If we also considered the “threatened varieties” offered by only four to six nurseries, 94 percent of the commercially available apple diversity in North America is either threatened or endangered. Roughly nine out of ten apple varieties historically grown in the U.S. are at risk of falling out of cultivation and falling off our tables.
3. Not even one-fourth of the 20 million apple trees grown in the U.S. in 1900 remain in commercial or home orchards and gardens. Home apple production in the U.S. peaked between World War I and World War II, and now much of the apple juice, puree and sauce consumed in the United States is produced in other countries.
4. One apple variety, the Red Delicious, comprises 41 percent of the entire American apple crop, and eleven varieties produce 90 percent of all apples sold in chain grocery stores.
5. One driver of this decline in available apple diversity has been the demise of independently owned nurseries, which have had their business usurped by the garden-and-lawn departments (“pseudo-nurseries”) of big-box stores. In a survey of ninety-six commercial nurseries that carried heirloom apples in 1988, 45 percent of them had gone out of business by 2009. However, a growing number of the remaining independently owned nurseries are increasing their stock in heritage apple varieties.
6. Over the last half century, there has been a dramatic loss of traditional knowledge about which apples grow best in a particular locality, how to graft cuttings of apple branches (scionwood) onto rootstock, when to harvest particular apple varieties for peak flavor and how to match particular varieties with the uses for which they are best suited.
7. Climate change is reducing the number of winter chill hours being received in apple-growing areas, leading to predictions that, within four decades, apple production will be lost from the Central Valley of California and from southern Pennsylvania, as well as from many warmer localities found at lower elevations across the continent.
8. Despite the economic downturn, heirloom and heritage apple varieties are now being successfully marketed at many of the 5,000 farmers' markets and through many of the 2,500 Community-Supported Agriculture (CSA) projects in the U.S. Both of these

venues for direct-marketing apples have enjoyed 13 to 20 percent growth over the last couple years. Consumption of hard cider is also on the rise in America, offering a means to use many heirloom varieties not well-suited for eating fresh. Future market prospects for heirloom apples look good, both among chefs and cider-makers.

"I knew three or four apples before we started in 1995. I'd experienced maybe five or ten in my life, which is sad, but they just didn't exist [in the marketplace at that time.] Most people have experienced fewer than that. I had a co-worker one time, when I was bringing an apple that we'd produced, he said, 'I never knew there were so many varieties; I only thought there were red, green and yellow.'"

CHUCK SHELTON,
VINTAGE VIRGINIA APPLES, VIRGINIA

This page: Close-up of a
Virgil Apple
Photo by Tami Lax

Opposite page:
A wooden box of
Foxwhelp apples
Photo by Ben Watson

The Renewing America's Food Traditions (RAFT) Alliance's 'forgotten fruit' initiative is currently focused on identifying, recovering and promoting regional apple diversity. Over the past two years we have convened workshops to train fruit orchardists and enthusiasts in grafting, documenting tree histories and distributing scionwood. With the assistance of twenty of the nation's foremost apple experts—most of them over sixty years of age—we developed this status report on apple diversity loss and conservation, and a strategy for how to recover the production, regional marketing and use of apples unique to the United States.

Over the next couple years, the RAFT Alliance will focus on the regions with the highest surviving apple diversity—the Great Lakes, New England and Appalachia—and target regionally adapted varieties in each region for biological conservation and culinary recovery.

We wish to partner with communities to:

- » Assess the status of place-based apples in the region and develop a network of orchardists and community activists to maintain the rare as well as the more common heirloom varieties adapted to the region.
- » Target ninety rare apple varieties in each apple-growing region for recovery, restor-

ing them to our orchards, urban gardens, home kitchens, restaurants, cideries and celebrations.

- » Teach a cadre of young enthusiasts the time-tried skills of grafting, pruning and identifying apple stock and introduce the next generation of home orchard keepers and young farmers to heirloom apple production.
- » Encourage chefs and cider-makers to discern and use apples with distinctive qualities for specific purposes.
- » Foster community pride in maintaining apple varieties that originated in or were named for particular places.

To be successful, orchard keepers, chefs, scientists, historians, and community activists will need to join together in order to revive the apple culture of each of these regions. It is only through collaborative conservation efforts working simultaneously at the local, regional and national levels that we can ensure that apple diversity will contribute to our food security in the future, and not disappear in a time of rapid climate change. We envision an America where a diversity of delicious, nutritious apples come back to the farm, the marketplace and our tables.



"I was born and raised on the fruit farm that my grandfather planted back in the 1890s. We had varieties that today are definitely heirloom varieties. We had Yellow Transparent and Dutchess of Oldenburg, Winter Banana, Jonathan, the old, original Red Delicious, Winesap, Crimes Golden, and many, many Rome Beauties. [But today], most of the interest that we find in the heirloom varieties is in the backyard."

JIM CUMMINS,
CUMMINS NURSERY, NEW YORK



INTRODUCTION

THIS REPORT IS ONE OF SEVERAL MUTUALLY REINFORCING efforts catalyzed by the Renewing America's Food Traditions (RAFT) Alliance to celebrate both heirloom apples and the rich American apple culture that surrounds them. It draws upon the wit, wisdom and insights of many of our country's foremost apple experts and lays out an agenda for stewardship and use that many of us feel have been desperately needed for several years now. It is an agenda that will hopefully recruit and engage the next generation of apple stewards on this continent.

by Ben Watson

Chair, Slow Food USA Biodiversity Committee;
author of *Cider, Hard and Sweet*

As early as Fall of 2003, one of RAFT's partners, Slow Food USA, recognized the need to better protect and promote the many exceptional varieties of apples and pears. We have been most interested in fruits that either originated in the United States—mainly before 1900—or that have had roots in this country for so long that they have long since become “naturalized citizens.” Both RAFT as a whole and Slow Food USA in particular have emphasized those apple varieties that have become inextricably adapted to our climates, our soils and our cultures. That is because they have played a key role in local food security in the past, and may need to do so for the future as well.

Spearheaded by Madison chef/restaurateur Tami Lax, Slow Food USA's Ark Committee (currently known as the Biodiversity Committee) and its consultants identified some 129 classic, historic apples, most of them at risk. It was felt that these varieties were important both in terms of taste quality and in terms of their regional or cultural significance. These apples were added to the Slow Food USA Ark of Taste, a program that identifies and attempts to promote rare breeds, plant varieties and traditional food products.

After a few years, it became clear to Slow Food that having 129 distinct varieties on our US Ark list presented problems, simply because

of the difficulty in trying to focus attention on so many different apples. Some of the historically important ones had declined in the marketplace but remained widely available among connoisseurs and home orchardists; others were extremely obscure or even functionally extinct, unavailable from any commercial nurseries and preserved in perhaps only one or two orchards. Some varieties were strongly and specifically place-based, while others were maintained in private and public collections in many different localities.

Fortunately, around this time, Dr. Gary Nabhan and his associates at Native Seeds/SEARCH had gained some success working with national parks, state parks and historical museums to restore heritage orchards in the landscape. It was suggested that part of the work of the newly formed RAFT Alliance might include a broader heritage orchard initiative. This national effort would be aimed at identifying and promoting a significant number of historic apple varieties still in the American landscape that could jump-start collective efforts to recreate our American apple culture. We felt it was critical to rekindle public familiarity with many of the fine regional apples and their various seasons, flavors and uses. To this end, the many chefs and food writers involved with RAFT through the Chefs Collaborative and Slow Food USA have been a tremendous resource in guiding consumers in their use of these heirloom apples, just as they have helped consumers in their use of the rare heritage breeds of livestock identified by the American Livestock Breeds Conservancy.

We are now hoping to combine the science-based identification methods adapted by Routson et. al (2009) and the Southwest Regis-Tree program based at Native Seeds/SEARCH, with the grassroots efforts of other seasoned organizations, such as the North American Fruit Explorers, the California Rare Fruit Growers, the Home Orchard Society, Maine Organic Farmers and Gardeners Association and Seed Savers Exchange. The RAFT Alliance now seeks to increase the understanding and appreciation of heritage apples and other fruits by:

- » Organizing focused tastings (formal and informal) every fall through Slow Food USA's chapters (convivia) and Chefs Collaborative events around the country, and in other



Tom Burford leading a workshop in an orchard
Photo by Ben Watson

public forums and festivals, highlighting regional heritage varieties and “telling their stories”;

- » Persuading local farmers and orchard keepers to grow rare and regional varieties by establishing a viable market and demand for these apples;
- » Educating chefs, through Chefs Collaborative and Slow Food USA, to the broad range of seasons and specific uses for different apples, using the chefs’ curiosity and culinary creativity to broaden the educational message for local media, consumers, and home cooks;
- » Collaborating with local conservationists and discussing the importance of biodiversity as it relates to historic and regional cultivated varieties;
- » Sponsoring educational workshops focused on traditional orcharding skills, such as grafting, pruning and orchard restoration;
- » Encouraging local “fruit explorers”, including those affiliated with NAFEX, in their search for rare and regional varieties;
- » Establishing an informal network of micro-nurseries throughout the country, where old varieties of apples and other fruits can be propagated and distributed to small-scale commercial orchards, local groups, and individual homeowners, thus placing rare and endangered regional varieties in as many hands as possible.

Although our nation’s “apple literacy” is nowhere near what it was in the 19th century, or even a hundred years ago, many Americans

(including children) are fascinated by the myriad shapes, colors and flavors of apples once they have had the opportunity to see and taste them. As such, we see the apple as totemic—a “democratic” fruit that is as diverse as America itself, an honest and affordable luxury that is within the means of nearly every person. Its enjoyment requires no complex rituals, but the heritage varieties we are focused on have stories to tell, ones that give this simple, straightforward fruit a special meaning among people who know what they are eating and growing. In many ways, we see the apple as the “gateway fruit” that leads to greater understanding and appreciation of our American foodways, in the same way that the Biblical apple in the Garden of Eden was the “gateway” to another kind of worldly wisdom.

Already, some Slow Food USA chapters have begun to identify and “adopt” local apples:

- » the Monadnock Region chapter is focusing on rare New Hampshire native varieties like the Granite Beauty, Mildens and Nodhead;
- » the New York City chapter has championed the Green Newtown Pippin, which originally hails from what is now Queens, and its members are putting the apple back into the hands of local orchardists and planting it in schools and other public places;
- » the Monterey Bay chapter in California recently nominated the locally famous, but now rare, Hauer Pippin or “Christmas” apple to the US Ark of Taste;
- » the Rhode Island chapter is actively researching both the famous Rhode Island Greening apple and another, lesser-known local heirloom, Peck’s Pleasant.

In future years, these and similar grassroots efforts undertaken by local people will have the real and measurable effect of preserving and increasing biological diversity on the ground and without the need for elaborate programs or extraordinary funding. The mission of the RAFT Alliance and its partner organizations is to support and further these local efforts wherever possible and to create an informal network that encourages the sharing of basic information, traditional knowledge and resources. Whether working in small groups or as individuals, we can make a big difference in helping to conserve both nature and culture for future generations.

It is important to realize that none of us can do this important work alone. We must recruit, mentor and inspire youth from America's many cultures to continue these efforts, in the spirit of historic icons like John Chapman (Johnny Appleseed) as well as contemporary apple heroes like Tom Burford, Nick Botner and Creighton Lee Calhoun, Jr. To be successful, we must

pass along the profound knowledge that these people —the traditional orchard keepers, propagators, nursery owners, historians, fruit explorers and conservationists—possess, and relay it to young people who are eager to learn the old ways and to carry them forward into the 21st century, using modern technologies and ecological wisdom.



OVERVIEW

FIRST, THE GOOD NEWS: THE DIVERSITY OF HEIRLOOM apples historically found in American orchards, backyards and hedgerows—upwards of 16,000 named varieties—is greater than the diversity found in any other crop domesticated here or introduced to this continent. Now, the bad news: Today we are at great risk of losing thousands of apple varieties from American landscapes and tables, and, because of that, we are at risk of losing American apple culture. The impending loss of apples is on an order of magnitude greater than that predicted for any other kind of American food—fruit, vegetable, livestock breed, fish or game.

Just one quick indicator: In the 2009 version of the Seed Savers Exchange publication, *The Fruit, Berry and Nut Inventory*, more than 3,000 of the apple varieties available in American nursery trade are accessible only from one to three nurseries on the entire continent. By the objective criteria of relative vulnerability to extinction set by the Renewing America's Food Tradition Alliance, this means that 81 percent of all American apple varieties commercially available to gardeners, orchard keepers, chefs and cider-makers are endangered.

The Fruit, Berry and Nut Inventory focuses largely on the heritage apples—historic varieties which have been in commerce since 1980, and yet they are but only one set of apples at risk



in North America. Susannah Chapman of the Southern Seed Legacy has made an important distinction by reminding us that true heirloom apples—as opposed to the broader domain of heritage apples—are those that have always been passed from hand to hand, generation to generation, regardless of whether they have ever been offered for sale by a commercial nursery.

In addition to these two categories, there are feral apples—most of them seedlings or “pippins”—that survive without human care in hedgerows, abandoned orchards, and even in truly wild habitats. We have no idea of just how many unique feral apples remain out in the landscape. However, in a recent assessment in the Four Corners states, discussed later in this report, 39 percent of all apple varieties found in abandoned orchards had unique qualities not found in the most commonly marketed apples in the U.S. This assessment alone prompted noted journalist Verlyn Klinkenborg to offer this opinion in *The New York Times* on November 9th, 2009:

Those trees are an archive of apple diversity, holding out the possibility of preserving apple genotypes that might otherwise have vanished. But the research makes a broader point. If all

that 19th-century apple diversity reflected different purposes and different needs, it also reflected a taste for difference. So the next apple you buy, think about all its hundreds and thousands of abandoned cousins. Think also of the agricultural biodiversity they represented; think, too, of the diversity of tastes that made them possible. We live now in the world of the generic apple, in large part because our taste buds have gone generic. Cultivating ourselves is the first step toward re-diversifying the fields and orchards around us.

This page: Kanin Routson in an abandoned orchard
Photo by Mark Dohm

Opposite page:
A Hawkeye apple in a tree
Photo by Kurt Friesse

So, just what are we going to do to re-diversify our sense of taste, reaffirm our sense of place and restore the marketplace for the myriad of flavors found in one of our most beloved fruits? How can we ensure that, a generation or two from now, Americans do not assume that a Red Delicious, a Granny Smith or a Honeycrisp is everything that an apple can be in terms of flavor, texture, keeping qualities and uses?

The purpose of this briefing—half manifesto and half manual—is to chart a plan of action to restore apple diversity to our farms, backyard orchards, restaurants and home tables. A plan that:

- » Builds on the seasoned knowledge and wisdom of many heirloom apple experts, but does not assume that the solutions to this problem will come entirely from experts.
- » Seeks to engage chefs, farmers' market managers, urban orchard keepers and consumers in championing their locally esteemed varieties. If there is no market demand for heirlooms, they will surely "die on the vine."
- » Acknowledges that the growing consumer demand for hard ciders, apple wines and spirits, as well as for fresh, seasonal, artisanal, local and heritage foods, offers new markets for unique and underutilized varieties.
- » Aims to involve land managers of historic apple orchards and feral apple trees as allies, whether they work as land stewards in National Parks (34 percent of which have historic orchards in them!), or for land trusts, historic farms or reservations.
- » Supports and celebrates the many nurserymen and -women, arborists, orchard keepers and fruit explorers who have been maintaining historically significant apple trees all along, so that they may be inspired to

continue their own work and, just as importantly, to train others to carry it on.

- » Clarifies the major causes of the loss of apple diversity, particularly the changing structure of the nursery industry, during a time when lawn and garden departments at "big box" chain stores are driving many family-owned independent nurseries out of business.
- » Proposes unprecedented public investment in both the *in situ* conservation of historic orchards and feral trees still in the landscape, and the *ex situ* propagation of heirloom varieties across a broad network of heritage orchards, local and regional nurseries, botanical gardens and arboreta, schools and land-grant universities.
- » Encourages young food activists to acquire a knowledge base about traditional apple varieties and the skill set of collecting, grafting, planting, tending and cooking with distinctive apple varieties. In doing so, we hope they will spread their appreciation for place-based fruit diversity and distinctive flavors to future generations, celebrating cultural and regional folkways and recipes that are as threatened with extinction as the apples themselves.



A BRIEF HISTORY OF APPLE DIVERSITY IN AMERICA



BEFORE WE ROLL UP OUR SLEEVES AND GET OUR HANDS dirty, let us remind ourselves not only of the immensity of the task before us, but what factors have historically driven the early diversification and the subsequent loss of apple varieties. Of all the food and beverage crops historically introduced to North America, the domesticated apple has flourished and diverged into the greatest number of distinctive varieties—encompassing a broad palette of colors, sizes, shapes, textures and flavors. Perhaps no one has summarized this history better than Tom Burford and Ben Watson:

Above right:
Identifying apples at the
Maine Common Ground
Fair
Photo by Gary Nabhan

Bottom right:
Tom Dubutovitch
grafting
Photo by Kanin Routson

Opposite page, top:
RAFT Alliance field trip
to an abandoned orchard
Photo by Mark Dohm

*Although the cultivated apple (*Malus x domestica*) is not native to North America, it was one of the first crops brought to this continent by settlers from England and western Europe. Since the early 1600s the apple has flourished on these shores, and for many years it was considered the quintessential homestead fruit, used for fresh eating from midsummer through early spring, for drying, preserving, cider-making, and in a whole host of useful household products like cider vinegar.*

The apple is inextricably linked to both the traditional rural landscape and the farm economy of America. Early colonists planted apples wherever the climate allowed, from New England to the mountains of northern Georgia. Some of the earliest varieties were grafts taken from European trees, but very soon a whole new “democratic” apple revolution took hold in the United States, as seedling trees (which are genetically different from their parents) sprung up on farms and in frontier orchards like those tended by John Chapman, the famous “Johnny Appleseed.”

Only one in 10,000 chance seedlings might produce an apple whose qualities were considered worth propagating and saving for future generations. Yet because these seedling trees produced

fruits that were unlike the apples they came from, new types of American apples quickly emerged, many of them unnamed varieties that were unique to a particular village, farm, or estate. In the early 1800s, American nurserymen were already offering some 100 named varieties of apples for sale; by 1850, more than 500 widely recognized varieties were being cultivated; and in 1872, Charles Downing documented close to 1,100 different kinds of apples that had originated here in America.

Published over 135 years ago, Downing’s inventory became the first estimate of apple diversity in America. Not long after its release, the fledgling U.S. Department of Agriculture attempted to keep it updated, adding newly found as well as recently imported varieties to the inventory. USDA pomologist W. H. Ragan took on the task of recording all the names and characteristics of apple varieties grown within the U.S. borders during the 19th century. Ragan’s *The Nomenclature of the Apple* was released in 1905, and included 6,654 uniquely named varieties found in nursery catalogs printed between 1804 and 1904. It became the benchmark by which to measure changes in the diversity of apple varieties in the U.S. Ironically, it was published during the peak of home apple production in the U.S. (1900 to 1910) when 200 million apple trees dotted the American landscape.



ASSESSING THE RATE OF LOSS OF APPLE DIVERSITY

BY 1950, THERE WERE FEWER THAN 50 MILLION APPLE trees left in the United States, less than a fourth of the number grown a half century earlier. Although a dramatic decline in apple acreage no doubt triggered a decline in apple diversity, it took several more decades before Americans began to fathom just how much diversity they had lost. It took an apple-loving activist from Tennessee named Cary Fowler to make the first stab at assessing the rate of loss of apple diversity. When he and Canadian activist Pat Roy Mooney were co-authoring the landmark book, *Shattering*, in the early 1980s, Fowler revisited the Ragan list and compared it to any nursery listings of apples that he could get his hands on. Fowler projected that 86 percent of these pre-20th century apples had already become functionally extinct, for they had altogether disappeared from the American marketplace. In other words, in just three-quarters of a century, 5,722 apple varieties had apparently disappeared from American farms and tables. By this count, American growers and chefs have been losing access to some 75 heritage apple varieties every year.

But the comparison of Ragan's and Fowler's estimates does not actually cover even half of the apple diversity that was once harbored on the American continent. Over the last two decades, apple historian and orchard keeper Dan Bussey has been expanding upon Ragan's apple registry to complete a definitive inventory of all named apple varieties once grown in America. To do this, he has compiled the names of apples from hundreds of nursery catalogs and state agricultural extension bulletins, and then carefully determined which of those names were syn-



"Most Americans today don't know what the historic trees are and what they are used for. For them, it's now like an archeological expedition just to discover what an heirloom apple is."

KANIN ROUTSON,
APPLE CONSERVATIONIST

onyms of the same variety. Although Bussey's masterwork has not yet been released, his most recent estimate is that 15,000 to 16,000 unique apple varieties were once named and grown on American soil at one time or another.

We can now update earlier assessments of the diversification and loss of American apples by a number of different measures. To put the currently available number of named apple varieties into perspective, let's compare the minimum estimate of historically available apples—15,000 distinct named varieties—to the number of varieties currently offered by U.S. and Canadian nurseries. In 2001, Kent Whealy and the staff of the Seed Savers Exchange searched printed catalogs and found that only 1,510 apple varieties were then available through nurseries in North America, including modern patented cultivars and recent introductions from other continents. However, in 2009, the Seed Savers Exchange staff updated that inventory, searching websites for the on-line availability of apples from nurseries, as well as using printed "mail-order" nursery catalogs. Surprisingly, the Seed Savers Exchange staff found 3,076 apple varieties were available through on-line sources

"Just notice how artisanal cheese consumption is growing. There's no reason why we couldn't do the same thing with apples. But today, people don't buy as many apples as they used to. They don't buy a bushel or two at a time [as they once did]. Instead, they buy half a peck at a time."

BEN WATSON,
AUTHOR, CIDER, HARD AND SWEET



140 rare varieties are found in seven to ten nurseries, 73 common varieties are found in 11 to 19 nurseries and 54 varieties are exceedingly common, found in 20 or more nurseries. In other words, while four out of five historically named apple varieties have already been lost from the American nursery trade, of the remaining 20 percent, at least nine out of ten (94 percent) of the remaining apples are either threatened or endangered!

Some of these threatened and endangered apple stocks have been collected and conserved in the *ex situ* collections of federal and state government agencies. Certain of these conserved varieties are ones that commercial nurseries may no longer maintain. The USDA-ARS collection held at the Northeast Regional Agricultural Experiment Station in Geneva New York, holds over 2,500 apple "accessions" or separate samples of propagation materials, but this number includes many wild apples from Kazakhstan and the Caucasus, as well as breeding materials and heritage apples from other countries. It is likely that fewer than 1,500 of the apples grown in USDA and state collections are varieties unique to North America. In short, there are many apples that are neither available in the nursery trade nor maintained in government collections.

If we ultimately wish to gain a clearer picture of the status of American apples today, we must figure out how many varieties remain in actively harvested private orchards, farms and gardens, not just in nurseries and gene banks. Such a comprehensive assessment has not yet been compiled, but it may be possible to determine through internet searches how many apple varieties are sold by farms listed on LocalHar-

or through catalogs in 2009, more than twice that found in the 2001 search.

While that may be good news, 2,515 of these varieties are endangered because they are found in three nurseries or fewer, while another 284 are threatened because they are found in just four to six nurseries,

vest.org, or on farms participating in farmers' markets that have their own websites. In any case, what ultimately matters is the number of apple varieties surviving and adapting to the changing conditions in commercial and backyard orchards, as well as how many of those apples reach the tables of our homes, cafes, cideries, restaurants and festivals.

While we do not yet know how many American apples still reach restaurants and grocery stores, we do know how few apple varieties dominate the food industry. The Red Delicious apple now constitutes 41 percent of the entire apple crop in the United States. Including Red Delicious, 11 varieties make up 90 percent of all the apples offered in chain grocery stores such as Safeway, Kroger, Albertson's and Wal-Mart. After Red Delicious, the Golden Delicious, Granny Smith, McIntosh, Rome Beauty, Fuji, Jonathan, York, Gala, Idared and Yellow Newtown apples are represented in those top 11 varieties that most American consumers know and are familiar eating.

What most Americans don't realize is that much of the apple juice and puree consumed in the United States is no longer produced within our boundaries. For their juices, soft drinks and powdered beverages, multinational corporations such as Coca-Cola, Nestle, Motts, and Kraft have been outsourcing their production to China. Because of that, six major American apple juice producers have gone out of business since 2001, leaving only two U.S.-based collectives in the Pacific Northwest to process the bulk of American-produced apple juice. As Chinese-grown apple products have flooded the American marketplace since 1997, the acreage devoted to apples in the U.S. has declined by 15 percent. As Marcia Merry Blake and John Hoefle discovered, "outsourcing... is shrinking American production of apples—more rapidly since 2001—and reducing the once-rich variety of apple types grown in the country."

Fortunately, not all Americans purchase all their apples as processed foods in chain groceries and big-box stores. Carol Goland and her colleagues recently recorded the number of apple varieties reaching Ohio consumers via grocery store chains versus "local food" outlets such as farmers' markets, roadside stands and CSAs. Goland's team revealed that Ohio's farm-

Opposite page:
Identifying apples
at the Maine Common
Ground Fair
Photo by Gary Nabhan

Below right:
Kanin Routson
demonstrating how
to graft
Photo by Gary Nabhan

Bottom right:
An abandoned apple tree
Photo by Mark Dohm

ers' markets are keeping at least 17 additional apple varieties in the marketplace that grocery stores and convenience marts no longer offer. If Ohio orchard keepers are direct-marketing their apples at farmers' markets instead of brokering them to grocery store chains with national distribution networks, they can cultivate many varieties rather than mass-producing just a few. In other words, without the resurgence of the direct-marketing of local, seasonal foods, many heritage apple varieties would have no ready outlets and farmers would be forced to replace their heritage fruit trees with other crops more suited to mass production.

Another positive trend is the recent growth in organic apple production; many organic orchard keepers are inclined to keep an increasingly large number of heritage apples in their mix. Since 1997, the number of apple-orchard acres under organic production has increased in the U.S. by more than 44 percent. Ironically over the same period, the total number of acres in apple production has fallen by 20 percent! We will later recommend how to take advantage of such economic trends, for there is increasing impetus for orchard keepers to make more space for organically grown heritage apples in our rural landscapes.

"I go to twelve to fifteen festivals [each year]...I'll have a massive table with maybe 75 varieties and people's eyes get real wide as they see all the wonderful varieties out there. They've grown up in a supermarket culture where they only know of 8 varieties and they're just dumbfounded to see all these varieties...that are available to them."

TOM BROWN,
APPLE SEARCH, NORTH CAROLINA



ASSESSING CHANGES IN THE NURSERY TRADE AND THEIR IMPACTS ON APPLES



WHILE MANY READERS UNDERSTAND HOW BIG-BOX CHAIN stores have replaced family-owned grocery markets that collectively offered far more food diversity, few of us have thought about how similar trends may have reduced the diversity of fruit trees offered by the nursery industry over the last few decades. These trends appear to be impacting what apple tree varieties are available for home planting and cooking.

Because the nursery trade in lawn, garden and orchard plants has become very lucrative, it has attracted bigger and bigger players, which feature more globalized sources of plant materials. In 2006, U.S. nursery sales topped \$4.65 billion, an increase of 17 percent since 2004. However, just 905 of some 7,200 nursery operations dominated those sales, each of them capturing annual sales of over a million dollars. We project that just one in nine of those businesses captured almost half of all the plant and garden supply sales in the U.S. In other words, fewer

than 20 nurseries and lawn-and-garden shops per state sell most of the apple trees, other fruits and ornamentals planted by Americans today.

But let's take a step back in time to see just how much has changed. In 1987, there were at least 600 more nurseries in the U.S. than there are today, and most of them were locally owned by seasoned nurserymen. About that time, the

lawn-and-garden departments of "big box" chain stores began to seriously compete with those locally owned nurseries. We call these lawn-and-garden departments "pseudo-nurseries" because most of their nursery stock is grown by wholesalers, and they typically lack any staff with horticultural training in grafting or other means of plant propagation. Their cashiers and maintenance staff are seldom able to recommend to customers anything that is locally adapted,

since the bulk of their plant materials are mass-produced, shipped long distances and offered from coast to coast.

By 1987, more than 32 percent of the 69 million households in the U.S. with active gardeners were shopping for fruit trees and annual plants in the lawn-and-garden departments of mass merchandisers, suggesting that even those interested in homegrown food lacked access to or knowledge of outlets selling local cultivars. K-Mart had 2,000 garden centers selling fruit trees among its total of 2,200 stores, taking in \$700 million in revenues from lawn-and-garden sales. Wal-Mart had already gained nearly \$300 million in revenues from lawn-and-garden departments in 980 stores. Some outlets of Target, Home Depot, True Value Hardware and other chains also featured a few widely grown fruit tree varieties in their lawn-and-garden departments.

Today, just a handful of mass merchandisers control the bulk of sales for nearly every kind of nursery stock. Their share of nursery sales has been increasing 4 to 5 percent every five years. At present, a handful of mass merchandisers capture well over a quarter of retail and wholesale revenues from plant sales. In short, the dominance of big box lawn-and-garden departments means that locally owned garden centers

and mom-and-pop nurseries—which historically harbored most of our food diversity—capture an ever smaller proportion of the total sales in fruit trees, including apples.

Perhaps an even more disturbing trend is that edible fruit and nut plants represent only a small proportion (6 percent) of total nursery sales today. Inedible ornamentals and manufactured yard art flood the markets and litter our neighbors' yards. As markets have shifted away from the most locally adapted heritage fruit trees, we have been losing roughly 12 independently owned nurseries per state.

What we still lack is a good estimate of how many locally cherished apples may have been lost as independently owned nurseries go under. We've taken two steps toward that goal, first by assessing nursery closures, then by evaluating whether the remaining nurseries are carrying the rarest apples. We selected 96 American nurseries that featured most of the heritage fruit and nut trees found by Seed Savers Exchange in 1988. Of those 96 nurseries, only 80 percent were again found to be active and featured in the second edition of *The Fruit, Berry and Nut Inventory* that was released in 1993, and only 57 percent were found in the third edition, released in 2001. At the end of 2009, we used the newest version of the *The Fruit, Berry and Nut Inventory* as well as on-line searches to update this analysis. It appears that a few nurseries presumed to have been "lost" in 2001 have reappeared, or were inadvertently missed in the third survey by Seed Savers Exchange. Nevertheless, 43 nurseries (45 percent) that specialized in heirloom fruits in 1988 had been lost by 2009; in other words, only 55 percent of the nurseries have survived (Table 1). The biggest drop was between 1993 and 2001.

That said, the loss of nurseries does have a direct correlation with a loss in heirloom varieties, because it appears that twenty or so nurseries that specialize in heirloom apples have actually increased the number of apple varieties they have carried since 1989. If we look at the number of nurseries offering particularly historic varieties of heritage apples, we see that some legendary heirlooms such as Magnum Bonum and Gloria Mundi are now being picked up by additional nurseries, while others such as Pawpaw, Shockley and Winthrop Greening are still being neglected by most remaining nurseries.

"Back in the 1800s, each of the many commercial nurseries were selling between 130 and 150 varieties of apples. But beginning around 1900 on through the 1930s, the nurseries greatly shrunk the number of varieties they were offering commercially."

TOM BROWN,
APPLE SEARCH, NORTH CAROLINA

TABLE 1

Loss of plant nurseries offering significant varieties of fruit and nut trees

Nursery	1989	1993	2001	2009
Adams County*	✓	✓	✓	✓
Ahrens*	✓			
Ames	✓	✓		
Vernon Barnes*	✓	✓	✓	✓
Bear Creek*	✓	✓		
Bigelow	✓	✓	✓	✓
Buckley Nursery	✓	✓		
Burgess Seed & Plant	✓	✓	✓	✓
Burnt Ridge	✓	✓	✓	✓
California Tropical*	✓			
Callahan Nursery	✓	✓		
Carroll Gardens	✓	✓	✓	✓
Clifty View	✓	✓	✓	✓
Cloud Mountain	✓	✓	✓	✓
C & O Nursery	✓	✓	✓	✓
Columbia Basin	✓	✓	✓	✓
Condon & Weller	✓	✓		
L. E. Cooke	✓	✓	✓	✓
Country Heritage	✓	✓		
Columbian Basin	✓	✓		
Cumberland Valley*	✓	✓	✓	✓
Cummins Nursery	✓	✓	✓	✓
Edible Landscaping	✓	?	✓	✓
FedCo Trees	✓	✓	✓	✓
Henry Field	✓	✓	✓	✓
Forestfarm	✓	✓	✓	✓
Four Seasons	✓	✓	✓	?
Fowler	✓			✓
Gardener's Choice	✓	✓		
Greenmantle*	✓	✓	✓	✓
Gurney's*	✓	✓	✓	✓
Haley	✓	✓		
Hastings	✓			
Hidden Springs*	✓	✓	✓	✓
Freedom Tree	✓	✓		✓
Ison's	✓	✓	✓	✓
Joyce Farms	✓	✓	✓	
Judkins & Son	✓	✓		
J. W. Jung*	✓	✓	✓	✓
Kelly Bros.*	✓	✓		
Forrest Keeling	✓	✓	✓	✓
Krider	✓			
Lawson's*	✓	✓	✓	✓
Lawyer	✓	✓	✓	✓
LBG	✓			
Henry Leuthardt*	✓	✓	✓	✓
Living Tree Centre*	✓	✓		
Long Hungry Creek	✓	✓		
Earl May	✓			

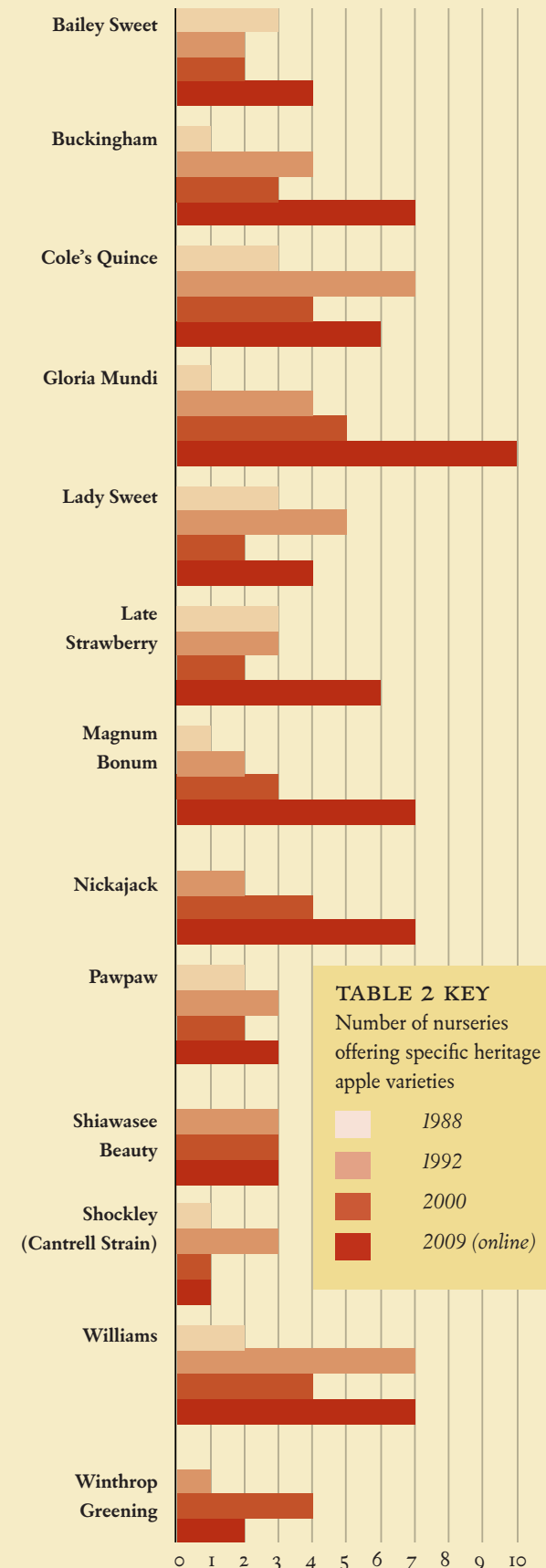
TABLE 1 KEY

✓ = Included in *The Fruit, Berry & Nut Inventory*, by Seed Savers Exchange

* = Noted as being a reliable source of heirloom apples by the Nat'l Park Service in 1982

TABLE 2

Number of nurseries offering specific heritage apple varieties, 1988-2009



WHICH REGIONS CURRENTLY HARBOR THE MOST HEIRLOOM APPLE DIVERSITY?

PACIFIC NORTHWEST

- WILLAMETTE VALLEY OF OREGON
- Botner Orchard, Yoncalla, OR
 - Antique Apple Orchard, Sweet Home, OR

TABLE 3 KEY

Denotes regions rich in heirloom apple diversity

States with highest apple acreage

1. Washington
2. New York
3. Michigan
4. California
5. Pennsylvania
6. Virginia
7. North Carolina
8. Oregon
9. Ohio
10. West Virginia
11. Massachusetts

COASTAL CALIFORNIA

- MONTEREY PENINSULA
- Prevedelli Farms in Watsonville

UPPER RIO GRANDE

- SOUTHERN COLORADO & NORTHERN NEW MEXICO: TAOS, RIO ARriba & TORRANCE COUNTIES
- Tooley's Trees, Truchas, NM
 - Dixon Public Library, Dixon, NM
 - Philmont Scott Ranch, Cimarron, NM

LAKE MICHIGAN SHORES

- MICHIGAN, WISCONSON, NORTHERN ILLINOIS: TRAVERSE BAY, DOOR DOUNTY & COOK COUNTY
- Treemendous, Bangor, MI
 - Weston's, New Berlin, WI
 - Kilcherman's Christmas Cove Farm, Northport, MI
 - Nichol's Farm and Orchard, Marengo, IL

UPPER MISSISSIPPI

- WINN COUNTY
- Heritage Farm of Seed Savers Exchange, Decorah, IA

BLUE RIDGE OF SOUTHERN APPLACHIA

- NORTHERN GEORGIA, WESTERN SOUTH CAROLINA, EASTERN TENNESSEE & CHEROKEE COUNTY, GEORGIA
- Lawson's Nursery, Ballground, GA

LAKE HURON

- EASTERN MICHIGAN AND ADJACENT ONTARIO: FARMSCAPE REMNANTS NEAR DETROIT & IN UXBRIDGE, ONTARIO
- Siloam Orchard, Uxbridge, Ontario
 - Eastman's Antique Apples, Wheeler, MI

NORTHERN APPLACHIAN PLATEAU

- SOUTHERN OHIO, SOUTHERN PENNSYLVANIA, WEST VIRGINIA, KENTUCKY, SOUTHWESTERN VIRGINIA, INCLUDING ADAMS, SCIOTO & LAWRENCE COUNTIES IN OHIO
- Urban Homestead, Bristol, VA
 - North Star Orchards, Cochranville, PA
 - Brown's Orchard & Cider, McDonald, PA
 - Backyard Fruit Growers in Lancaster, PA

BLUE RIDGE OF CENTRAL APPLACHIA

- NORTH CAROLINA, TENNESSEE
- Carver's Orchard, Cosby, TN
 - Heritage Apples, Clemmons, NC
 - Century Farm Orcahrds, Reidsville, NC
 - Morton Orchard, Gatlinburg, TN
 - Big Horse Tree Farm, Lansing, NC
 - Southern Heritage Apple Orchard, Home Creek, NC

COASTAL NEW ENGLAND

- NORTHERN MAINE: AROSTOOK COUNTY
- Sandy River Orchard, Mercer, ME
- MAINE'S ISLANDS TO NOVIA SCOTIA: DOWNEAST ACADIA AND PENOBSCOT BAY ISLANDS
- Five Islands Farm, Georgetown Isl., ME
- SOUTHERN MAINE, COASTAL NEW HAMPSHIRE TO MASSACHUSSETTS & RHODE ISLAND: CUMBERLAND COUNTY/CASCO BAY TO CAPE COD AND RHODE ISLAND
- Fedco, Waterville, ME
 - Ricker Hill, Turner, ME

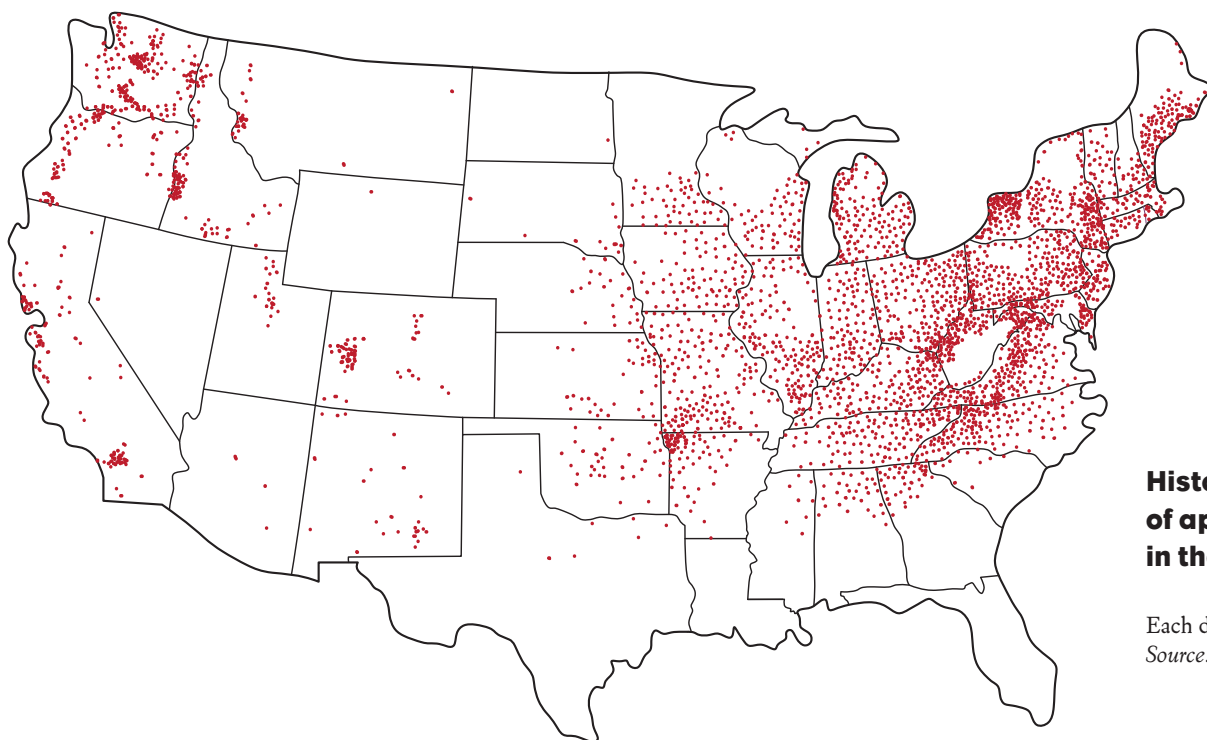
INTERIOR NEW ENGLAND

- WESTERN VERMONT: CHAMPLAIN VALLEY
- Shelburne Orchards, Shelburne, VT
 - Hackett's, South Hero, VT
- SOUTHERN NEW HAMPSHIRE & ADJACENT VERMONT: ROCKINGHAM-HILLSBOROUGH COUNTIES
- Alyson's Orchard, Walpole, NH
 - Applecrest Farm, Hampton Falls, NH
 - Gould Hill, Contocook, NH
 - Poverty Lane, Lebanon, NH
 - Scott Farm, Dummerston, VT
- CENTRAL AND WESTERN MASSACHUSETTS: WEST OF BOSTON THROUGH WORCESTER TO THE BERKSHIRES
- Old Sturbridge Village, Sturbridge, MA
 - Tower Hill, Boylston, MA
 - Clarkdale Fruit, Deerfield, MA
- NORTHERN PENNSYLVANIA
- Holy Root Farm, New Tripoli, PA

TABLE 3

Regions reputed to be richest in apple diversity, mapped against states with highest apple acreage. Within each region, orchards that sell heirloom apple trees are listed.

THE TEN LEADING STATES IN APPLE PRODUCTION ARE NOT necessarily the ones with the greatest remaining apple diversity. Although each state yield varies wildly from year to year due to increasingly unpredictable weather, the eleven leading states in apple acreage include (in more or less descending order): Washington, New York, Michigan, California, Pennsylvania, Virginia, North Carolina, Oregon, Ohio, West Virginia and Massachusetts. We know from previous surveys that the heirloom apple diversity is not



Historic distribution of apple diversity in the United States

Each dot represents 25,000 trees.
Source: USDA Yearbook, 1927

"I have 456 Southern apples in my orchard. I spent fifteen years looking for old apples, and then researched the history of those apples and put [it all] into a book. It was published in 1995 and now it's sold out. I hope to come out with a 2nd edition in 18 months. I also started a nursery in 1988. Now I have other contacts selling heirloom apple trees. The South has been doing more than other regions to find, save and restore these apples."

CREIGHTON LEE CALHOUN,
AUTHOR, OLD SOUTHERN APPLES,
NORTH CAROLINA

This page and opposite
page: close-up of many
apples at the farmers'
market

Photos by Gary Nabhan

particularly high in California and Washington, even though they are always among the states which produce the largest volumes of apples. So, which states and regions do have the highest diversity of heirloom and heritage apples? In March 2009, we asked some of the continent's most seasoned nurserymen, orchard keepers and food historians to map the "apple hot-spots" of North America. Table 3 highlights their answers.

Few regions of the U.S. have definitive references of the place-based heritage apple varieties unique to their communities. Creighton Lee Calhoun's classic *Old Southern Apples* has given us great appreciation of the number of historic varieties found in

the South—particularly in Appalachia and the Piedmont—and it will hopefully be re-released in a new edition within a couple years, with additional varieties included. However, recent interviews indicate that Mr. Calhoun has become pessimistic, or at least cautionary, that many of these will not survive much longer

unless extraordinary efforts are taken to rescue and maintain them. Nevertheless, Lee Calhoun, Tom Brown and Tom Burford are among those Southern apple aficionados who continue to turn up one thought-to-be-lost apple after another, so even in this case it is difficult to make a definitive status report for the entire South. Food historian Rose Houk has recently documented several significant orchards in the Great Smoky Mountains that gleaned the best varieties out of orchards now abandoned in Great Smoky Mountains National Park.

At the same time, John Bunker, Ben Watson, Christie Higginbottom and others continue to document the extant diversity of apples of New England, a region that was once nearly as rich with apples as the South. The region running from the Ohio River Valley up through the Great Lakes presents the third-greatest mother lode of apple diversity, thanks in part to the legacy of Johnny Appleseed. But again, such diversity does not remain static: we must ask not only where the areas once were of historic diversity, but which of these regions are currently suffering from the rapid loss of old-time apple varieties.



GIVEN HISTORIC LOSSES, ARE THERE STILL UNIQUE APPLES TO BE FOUND? YES!

A CASE STUDY FROM THE SOUTHWEST



MANY EXPERTS HAVE SUGGESTED THAT HISTORIC AND abandoned farmstead orchards that date back to the early 20th century may harbor undiscovered feral or forgotten “heirloom” apples not found today in the nursery trade. And yet the distinctiveness of each feral, forgotten fruit has been difficult to assess. However, today, we can use new tools to assess the diversity of apple trees growing at abandoned farmsteads and in historic orchards.

As a case in point, Kanin Routson and his colleagues have sought to genetically identify unknown varieties of apples in the Southwest using DNA microsatellite analysis. Apple trees were introduced to the U.S. Southwest as early as they were on the East Coast, during Hispanic settlement of the region. Spanish immigrants, priests and explorers introduced apples into central New Mexico around Albuquerque, Manzano and Santa Fe during the early 17th century, certainly no later than 1630. Apple trees from Eastern and Midwestern sources were also brought to the Southwest by Mormon and Anglo settlers during the latter half of the 19th century and the early 20th century. Over the last two decades, Routson, Nabhan, Hathaway, Dahl and others have documented remnant orchards of historic apples through the Southwest Register, an on-line directory of historic sites with place-based fruits and nuts now maintained by Native Seeds/SEARCH.

Routson’s research involved collecting leaves from 280 apple trees growing in over forty abandoned farmsteads and historic orchards in Arizona, New Mexico and Utah. The DNA was extracted from these leaves and analyzed for the historic trees. The genetic fingerprints from these trees were compared to the fingerprints of 110 heritage apple varieties—the ones most like-

“When I’ve done some displays of apples people ask me, ‘Why can’t I find these in the store? Why do I have to get the varieties that they have? These should be around because they’re so wonderful!’ And so many of the heirlooms are wonderful... but heirloom varieties run the gamut of really sweet and tasty to really sharp and sometimes bitter, but they all have a purpose and a use and it’s identifying which it is—I think that’s probably the hardest thing for anybody to do.”

DAN BUSSEY, POMOLOGIST, WISCONSIN

ly to have been introduced into the Southwest during the late 19th to early 20th century. This analysis revealed that 120 of the historic trees were 34 widely propagated heirloom varieties. The other 160 historic trees corresponded to 110 “unknowns.” These “unknowns” are either named varieties that were never documented as being introduced into the Southwest, are “extinct” varieties, or are seedling apple trees we mistook to be heirloom trees during our field collecting. These “lost apples” have now been found and remind us that if 110 “unknowns” can be found in a sample of only 280 trees in the remote regions of North America, there are perhaps hundreds of other undescribed apples elsewhere in American landscapes that still await (re)discovery.

In short, a great number of varieties were found in a relatively small sample of historic orchards, including varieties that are not currently in the nursery trade. This rich sample of apples includes a high proportion of unnamed varieties. A diversity of untested, undescribed

fruit trees persists in abandoned orchards that are often hidden in American landscapes, but old orchards are a diminishing resource as old age and changes in land use exact their toll on remaining trees.

While the genetic detection technologies used by Routson and colleagues are largely limited to well-endowed research institutions, this study has shown genetic fingerprinting can be a powerful tool for uncovering identities and relationships between apple varieties. As genetic analysis continues to become more affordable, its accessibility for research outside of academia will likely increase. Tom Burford and Ben Watson have proposed using genetic analysis to determine the actual relationships among the many varieties or strains of the Limbertwig

apple group, taking samples from the historic Morton orchard in Tennessee. Similar testing of the local genetic diversity of heirloom apples might be undertaken in other “hot spots”: like coastal Maine or in the Blue Ridge mountains of North Carolina.

“When an apple is grown in a living soil system, it has flavor. That’s how our great-grandparents grew them. But when we put them under modern production methods, the apple’s flavor changes.”

MICHAEL PHILLIPS, LOST NATIONS ORCHARD, NEW HAMPSHIRE



MAJOR THREATS

“Economic development pressures [are dramatically affecting] traditional apple growing areas. Commercial orchards are in trouble, and they’re having a hard time financially competing in the world marketplace.”

CHUCK SHELTON,
VINTAGE VIRGINIA APPLES,
VIRGINIA

LAND USE CHANGES

Particularly flavorful apples grow on trees that are deeply rooted in particular kinds of soil, and in the rich apple traditions of particular landscapes. Widely heralded apples such as Sonoma Gravensteins carry a certain terroir—the taste of place that is influenced by many environmental factors, not just genetics alone.

But, as Creighton Leigh Calhoun has reminded us, Americans’ relationship to the landscape

has been changing and much of the terrain formerly devoted to apple orchards is now covered by asphalt, concrete or landfills:

Because of the decline in subsistence agriculture in the South, and the rise of railroads bringing in cheap foods from elsewhere, families pulled their apple trees out, subdivided their lands and started buying their food at the store.

Ben Watson and Tom Burford concur and pinpoint when and how apple culture declined:

The incredibly rich and diverse apple culture in America began to decline in the late 19th and



early 20th centuries, chiefly as a result of westward migration away from mixed-use subsistence farms and the dramatic shift in population from the countryside to the city. And although many of the old varieties still exist today, preserved by home orchard keepers and small-scale farmers, the emphasis years ago began to shift toward apples that could be grown in large-scale orchards, then packed and shipped to distant markets.

In the past decade the glossy but tasteless apples that once dominated the produce aisles of supermarkets (the beautiful but mealy Red Delicious is the prime example) have given way to a better-tasting, but still not very diverse or interesting selection of fruits. Gala, Braeburn, Granny Smith and other apples imported from Washington State (or, during the off-season, from the antipodes of Chile and New Zealand) have little of the unique flavor or complexity of locally grown apples, which may be best adapted to a specific growing region, or even to the terroir of an individual orchard.



Top left and right: RAFT Alliance workshop on restoring forgotten fruit
Photos by Mark Dohm



Opposite page: An abandoned orchard
Photo by Mark Dohm

Ironically, many of the states that have had the highest apple production and diversity are now the very states with the greatest loss of farmlands. As the American Farmland Trust has documented, we are losing the richest, most productive farmlands (including orchards) faster than ever before, and the following apple-growing states are among the top 20 states bearing the brunt of farmland fragmentation and loss: Ohio (2), North Carolina (4), Pennsylvania (6), Virginia (11), New York (13) and California (15).

CLIMATE CHANGE

Many orchard keepers and nurserymen have observed that climate change is already limiting where different varieties of apples can be optimally grown and is affecting the quality and yield of many fruit varieties. In order to break dormancy, re-initiate growth and produce fruit, each variety of apple tree must receive a particular amount of “chilling hours,” which are the number of hours temperatures reach between 32 and 45 degrees Fahrenheit during the cooler seasons. Most apple varieties need 800 to 1,200 chilling hours during the winter to flower and fruit, although a few varieties require as few as 500 chilling hours. In the Central Valley of California, where high-chill-requiring apples could once be grown across half of the landscape, only 4 percent of the landscape has conditions that remain suitable for their production. Winter chilling hours in this region have already declined as much as 30 percent since 1950, and by the year 2050 are projected to decline to 60 percent of the 1950 levels. According to predictions made by Eike Luedeling and his colleagues at the University of California at Davis, no apples will be able to be grown in the Central Valley by 2050.

If Central California were the only apple-growing landscape where climate change will soon push apple trees past their threshold of

production, perhaps there would be no cause for alarm. But a study recently released by the Union of Concerned Scientists suggests that similar trends will affect apple production as far north as Pennsylvania, the fourth-largest producer of apples in the U.S. Most apple varieties currently grown in Pennsylvania require 800 to 1,200 chilling hours. In a scenario that assumes that the already high greenhouse gas emissions will continue to go unchecked, the southernmost counties in Pennsylvania will rarely receive even 1,000 chilling hours by 2050. By late in the 21st century, only the northernmost counties in Pennsylvania will receive enough chilling hours to allow some apple production. Pennsylvania’s \$60 million apple industry is likely to be imperiled. Not only will Pennsylvania’s apple production be threatened, but so will that of New York, Ohio, Massachusetts, Michigan and Wisconsin.

Clearly, the relationships among particular heirloom apple varieties, places and cultures are likely to be radically scrambled over the next four decades. While the breeding of new low-chill-requiring apples has been proposed, that will be a slow and rather costly solution. Instead, it may be more important to screen, select and disseminate existing heritage apples from lower elevations, and hotter, more southerly climes to other localities. Inevitably, apple production is likely to retreat into higher elevations wherever mountain gradients allow that possibility.

LOSS OF TRADITIONAL KNOWLEDGE

While farmland loss and climate change are major threats to apple production, the loss of traditional knowledge about apple growing, grafting, selection and culinary preparation are threats to apple culture. As the average age of farmers continues to rise over the last century—the median age is now 57, the average

"Right now we're entering a period of great, shall we say, uncertainty, internationally—in terms of the physical climate of the earth, economic climate, the energy climate... Tree sales are booming [because of it]. People are seeing this on their own... I think that as the myths that American civilization was built upon are falling apart and society—on some level—begins to collapse, people, without much prodding, are going to want to do this. They want... to return to the important things in life, which [include] family, community and self-reliance... If there's a silver lining to a lot of the tragedies that have been happening to many people right now, it is that there's an opportunity for people to do more things for themselves—whether it's growing tomato plants on their porch, or beginning to grow their own food in a postage-stamp-size garden in their front yard, or growing apple trees."

JOHN BUNKER, FEDCO TREES, MAINE



Above: A close-up of the grafting process
Photo by Mark Dohm

Opposite page: Tom Burford in Capitol Reef National Park, Utah
Photo by Gary Nabhan

age of diligent orchard keepers and seasoned nurserymen is no doubt even higher. When someone claims to be an antique apple grower at a community meeting, most folks wonder whether the adjective “antique” refers to the old-time apples or to the gray-haired grower!

Traditional knowledge about how to grow, select, graft, cook with or otherwise use apples is in as much need of searching out and conserving as the varieties themselves. Tom Bunker recalls the days when every large orchard had its own nursery, where dozens of family members and workers learned to graft and propagate apples; now grafting is considered a technical specialty rather than something that nearly anyone can learn to do. Ben Watson notes that fewer and fewer people know exactly when to harvest an apple for flavor and he reminds us that even two generations ago, thousands of families knew which apples were good for winter storage, and how to keep and use them well into April. John Bunker worries that people have forgotten which apples are best for particular uses. In short, local knowledge about apple growing and cooking was so common that it was taken for granted prior to World War II, yet today it is a scarce commodity.

Virginia Nazarea has proposed the idea of cultural memory banks to document and retain such knowledge in communities. What is threatened is the cultural information garnered

over long periods of use by rural communities regarding the care and use of food resources—their histories, myths, songs, recipes and management practices. This cannot be replaced simply by information from horticultural, taxonomic and ecological studies. In order to really conserve a variety, we need to know “the human stories” about that apple, not just the genetic code.

OTHER EMERGING THREATS

Other threats loom on the horizon. There are at least fifteen major diseases and pest species which attack and kill apple trees; some of the strains are getting more virulent and spreading to growing regions where they had previously been only minor problems. For instance, fire blight was not considered a major apple disease in the Great Lakes region until the 1980s, but the number of episodes of fire blight have since reached epidemic proportions in that region, damaging or destroying many young trees.

Genetic engineering or the use of transgenic technologies first allowed the transfer of foreign genes to apples in 1989, and such biotechnological manipulation of the apple genome is now being accomplished in a number of labs around the world. The first field trials of GMO apples were conducted in 1992, and there have now been additional trials not only in the U.S., but in Great Britain and New Zealand as well. Although apple breeders are quick to assert that environmental and food safety precautions are being taken to manage the release of their GMOs, it is not a given that their products will substantially increase disease and pest resistance in apples. The proof will be in the (apple) pudding.

"I do grow some of the disease-resistant ones... but the genetic method by which those apples have resistance is starting to break down and that's just the way things work on earth. Bacteria and fungal disease evolve, so what we know works in one period doesn't work in another."

MICHAEL PHILLIPS, ORGANIC ORCHARD KEEPER AND AUTHOR, THE APPLE GROWER

"I've kept a journal since I was 10, [and looking back on it,] I see that it is filled with a lot of horticultural notes. Such as: I noticed early on that it is important to plant late-blooming varieties, because if you didn't have a late crop of fruit, you could go hungry. That was in some of my notes from the Depression. [As one of the Burford Brothers,] I had a production nursery for forty years. But then I got interested in regionality. I closed the nursery to devote time to this issue, and, since 1993, to education. I am a propagandizer! I want to help people discover that they can have a passion for apples.

TOM BURFORD, POMOLOGIST, VIRGINIA



HOW TO AVERT FURTHER LOSSES AND RETURN MORE APPLES TO OUR FOOD SYSTEM

WE ARE NOT MERELY CONCERNED ABOUT SAVING APPLE genes for future plant breeders; if that were our goal, we would simply sample apple rootstocks, seeds and shoots, culture them in test tubes, and not care whether the trees themselves persisted in orchards or the flavors reached our tables. Instead, we are talking about renewing apple culture, its agricultural resilience and culinary excellence in North America. In essence, we are proposing the biological, cultural and culinary restoration of apple diversity in America, so that more delicious and nutritious apples are accessible to all, not just to the research community or to the elite gourmet. Because there are many threats to apple diversity, there is reason to employ a mix of strategies to conserve, restore and revive them. Let's look at the range of strategies and why we might use them.

IN SITU CONSERVATION OF APPLE DIVERSITY

This set of strategies keeps particular apple varieties connected to their place of origin, ad-



aptation and cultural tradition. *In situ* ("on site") means that the apples stay in the cultural communities and in the foodsheds where they are best known and loved, although climate change may shift where exactly they can be grown. In situ conservation can be done in several ways:

1. Show both economic and moral support for growers (like Bill Moretz of Moretz's Mountain Orchard) who already provide a great variety of old-time apples to the community. Bill does this by offering community-supported agriculture (CSA) shares to his neighbors near Boone, North Carolina.
2. Ensure that historic orchard lands are not developed, but are protected through conservation easements or deed-and-covenant restrictions that local land trusts can assist and support.
3. Promote the establishment of new orchards that will grow local heirloom apples as well as new cideries in areas where older orchards are declining.
4. Take cuttings from older, senescent trees and graft these onto young rootstocks or established trees to maintain the same varieties either in the same historic orchard or in others nearby.

5. Sponsor local scionwood exchanges each spring, as John Bunker of Fedco has done at the Maine Organic Farmers and Gardeners Association (MOFGA) fairgrounds in Unity, Maine.
6. Map and describe historic orchards in online or published directories, as John Bunker has done in his book, *Not Far From the Tree*, and as Kanin Routson, Gary Nabhan and Suzanne Nelson have done through the Southwest Regis-Tree program originally established through Native Seeds/SEARCH's collaboration with other organizations. To learn about the Southwest Regis-Tree, go to: <http://www.nativeseeds.org/regis-tree>. Descriptions of varieties identified in the Southwest can be found at: http://www.nativeseeds.org/pdf/Southwest_Regis-Tree_Fruit_and_Nut_descriptions.pdf. See Appendix 1 for a sample recording sheet for documenting historic orchards.
7. Support local schools, nurseries, historical societies, parks and botanical gardens that not only grow but also feature the stories of these heritage fruits. As a model, none could be better than the North Carolina collaboration among Lakewood Elementary School students, the Slow Food Research Triangle chapter, the Center for Environmental Farming Systems, SEEDS, and David Vernon's Century Farm Orchard, where 400 varieties of Southern apples are actively conserved in an orchard maintained by the Vernons for more than a century.
8. Work with county zoning departments, land trusts and citizens' groups to reduce development pressures on apple-growing areas.

It is critical that any geographic strategy for *in situ* conservation of apple diversity take into account the current and impending threats of climate change and not treat the relationships among heirloom apples, culture and place as if they have ever been static—they certainly will not be in the future. An apple-loving community that cares about its place-based heirlooms can likely find cooler places to grow the same varieties where there is cold-air drainage on floodplains, or shady groves at higher elevations nearby.

We propose that RAFT Alliance collaborators identify up to 90 regional heirloom and heritage apple varieties per region of North America and find means to distribute them to more growers in that region who have orchards in different habitats and at different elevations. Several Slow Food USA chapters have already begun to participate in an “adopt-an-apple” initiative that encourages backyard hobby growers as well as professional orchardists to propagate and celebrate the particular varieties linked to their regional history. Efforts like those of the Chicago Rare Orchard Project (CROP) have engaged young enthusiasts to reconnect with regional flavors through establishing urban orchards in public places. Even in cities and suburbs, there remain many places where apples can take root. The burden of conserving apple diversity need not be placed only on the shoulders of rural dwellers—urban and suburban growers, educators and chefs can play vital roles as well.

EX SITU CONSERVATION OF APPLE DIVERSITY

Safeguarding apples or other heirlooms away from their areas and communities of origin may be a prudent “backup” strategy in areas of rapid development and loss, or during times of rapid climate change. There are several ways this may be done:

1. Rescue scionwood from trees soon to be bulldozed or axed, as Tom Brown, Gordon Tooley, Bill Moretz and others have done for years. When permissions allow, this can lead to sharing that scionwood with other apple experts including: the USDA Clonal Repository for Apples in Geneva, New York, as well as the Seed Savers Exchange in Decorah, Iowa, the membership of the North American Fruit Explorers (NAFEX), the Home Orchard Society or other national conservation programs.
2. Ensure that nurseries and orchards with commitments to heirloom apples receive such plant materials for propagation, as the informal scion exchange networks fostered by Creighton Lee Calhoun and Tom Burford have accomplished.

"I think reviving an orchard and revitalizing [with incorporation of new trees in] an orchard go hand-in-hand—reworking old trees and establishing abused scaffolds are important, but also a replanting schedule and taking wood off of the old trees, grafting those, if it is a significant tree, and reproducing it and planting it."

CORDON TOOLEY, NURSERYMAN,
APPLE HUNTER, TOOLEY'S TREES,
NEW MEXICO



Dan Bussey talking about *in situ* conservation at Capitol Reef National Park, Utah
Photo by Gary Nabhan

3. Place grafted trees in protected and managed landscapes such as National Parks, National Heritage Areas, arboreta or other public places.

4. Develop on-line or other means of collecting and storing the traditional knowledge associated with individual varieties. Create a "cultural memory bank" much like Virginia Nazarea's work with sweet potato conservation in the Philippines.

Information should include historical context, how the apples are grown, grafted and managed, documentation of specific resistance or susceptibility to diseases/insects, cooking/uses, recipes, etc.

5. Establish a network of key regional American Heritage Orchards that will grow and maintain regional priority-conservation varieties of apples (as well as other forgotten fruit and nut varieties), as well as locate, propagate and grow out local feral apples to evaluate them for their potential usefulness and for their natural pest or disease resistance.
6. Sponsor more late-winter scion exchanges such as the ones that MOFGA and Fedco host in Maine, and the Home Orchard Society hosts in Oregon. Such events already attract thousands of enthusiasts.
7. Help the Home Orchard Society and Orange Pippin build their database of apple trees by registering your apple trees at <http://www.homeorchardsociety.org>.

HOW DO YOU FIND POSSIBLE SITES WHERE UNIQUE APPLES MIGHT REMAIN?

Given that you have an interest in conserving apple diversity *in situ* or *ex situ*, how do you find unique apples worthy of that investment? Every fruit explorer has his or her own methods, but some of the best have been compiled by John Bunker in his charming book, *Not Far from the Tree*. By using old maps, aerial photographs and land survey records, John has been

able to relocate the sites where apple orchards historically occurred around Palermo, Maine. In some cases, descendants of the original orchard keepers are still alive and oral histories of the varieties planted might be gained from these local residents. In other cases, elderly neighbors remember being given gifts of apples or even stealing some away in their own back pockets; some remember the specific trees or rows from which the best apples (and particular named ones) arose.

But, lacking contact with anyone who knew the particular orchard in that detail, there is another way to "triangulate" on the identities of apples in a given historic orchard. Often, orchard keepers would submit their best apples for blue ribbon competitions at county or state fairs or note their availability in newspaper ads. By diving into such historic records in local or county archives, you can develop a list of potential varieties that might still be located in that family's orchard(s). Returning to the orchard during fruiting, with pictures and descriptions of those varieties in hand, may be your best option.

Of course, some of these searches have fortuitous twists and turns. John Bunker has also put out "Wanted" posters in counties where he knows "lost apples" once grew. Seeing such posters in post offices and community centers, many old-timers have helped John relocate varieties believed by many to have been extirpated. An orchard of these rediscovered fruits now adorns the MOFGA fairgrounds in Unity, Maine.

In the Southwest, abandoned and historic orchards or orchard remnants were identified

"I have a small nursery catalog [Fedco] and that has allowed me to get rare, endangered local varieties out into the public because I believe that the preservation of vegetables and fruits should be done out in the world, not necessarily in arboretums and collections—although I love both... I think it's important to get them out to people."

JOHN BUNKER, FEDCO TREES, MAINE

"I moved to a farming community in central Maine the day after I graduated from college. And fortunately a lot of the old orchards, small apple orchards...were still there and were still producing fruit. And even though the owners of the farms were generally now working in town, the apple trees themselves didn't realize that the days of small farming were over. So, they were merrily continuing to produce large crops of generally very good quality fruit, wondering why no one was coming to pick them."

JOHN BUNKER, FEDCO TREES, MAINE

using both published historical documentation but also by searching within the national park system, which now includes many old homesteads and farmsteads. The Southwest Regis-Tree project was initiated in the late 1980s by Native Seeds/SEARCH in order to identify and document orchards where remaining trees were likely descendants from those established by Spanish missionaries and Mormon, Mexican and other pioneers and settlers. These trees or orchards are nominated to the Regis-Tree program by filling out a simple survey form (Appendix 1). A catalog of nominated orchards, landscapes or individual trees is currently managed by Native Seeds/SEARCH staff members and collaborators and will soon be available on the Native Seeds/SEARCH website.

STRATEGIES FOR SAMPLING APPLES FROM FARMSTEAD ORCHARDS

Once you've found apples worthy of collection from historic orchards, we recommend collecting as much site-specific information and oral history documentation as possible, to be conserved along with the apples themselves. The steps of collecting apple scionwood include documentation through field notes, maps and permissions, photographs and collecting scion or bud wood from the trees for later grafting.

DOCUMENTATION

Proper field notes should include:

1. Directions to the site. Record clear directions for returning to the site. Useful descriptors include roads, mileage, landmarks and a sketch-drawn map.
2. Describe the orchard. Write a brief description and sketch a map of the orchard. If pos-

sible, record the GPS position of the orchard and note the settings of the GPS (standard settings include: hh°mm'ss" in WGS1984 or UTM NAD1983 or UTM NAD1927). Nailing aluminum tags to individual trees is one of the most effective methods for identifying trees on return visits.

3. Write field notes describing the ownership of the orchard, the condition and approximate age of the orchard, number of trees, species and varieties present. In addition, if the trees have fruit, describe the fruit's size, color, shape, texture and flavor. If there are oral histories or written documentation of the orchard, this should also be recorded or referenced in the field notes. Record additional, site-specific field notes from interviews and observations.
4. Photograph close-ups of the fruit, profiles of the fruit trees and landscapes of the orchards for long-term documentation.

Proper oral histories should include:

1. Name, address and other relevant contact information for person(s) interviewed.
2. Digital or other media recording of interviewee, including recording of their agreement to be interviewed. Include date, time and location of interview. The name of the interviewer should also be recorded at this time.
3. A signed agreement between interviewee and interviewer regarding the treatment and final use of the information collected during the interview. Release forms or a "Memorandum of Understanding" can be used. Copies should be provided both to the interviewee and individual or entity to which the information is being "donated."

SAMPLING APPLES

To avoid repeat sampling of identical varieties, and "rescuing" common varieties like Red Delicious, visit the trees while they are fruiting prior to collecting any scionwood. Select trees with visible graft scars whenever possible. This is also a good opportunity to note characteristics of the trees and fruit that may aid in later varietal identification. If the trees are in poor condition and are not producing fruit, grafting cuttings onto mature trees and/or genetic analysis of the vegetative tissue will later aid in identification.



Above: A Chicago, IL
cider tasting led by Ben
Watson
Photos by Mark Dohm

Right:
Harrison apples next to a
cider press
*Photo by Charlotte
Shelton/Vintage Virginia
Apples*

Collecting scion material is straightforward for healthy trees, but can be problematic for dying ones that have but a few short branchlets remaining. In late winter, collect dormant scionwood and keep it damp and cold until grafting in the spring. This is easily achieved by wrapping the labeled cuttings in damp paper towels and storing them in multiple layers of plastic Ziploc bags in the refrigerator. Cuttings will last longer if lightly frozen (at 32°F or 0°C), but regular freezer temperatures are too cold and will kill the dormant tissue. The ideal scion for splice grafting consists of an un-branched shoot of the previous summer's growth, 1/8 to 3/16 inch in diameter, and 8 to 12 inches in length. Ideally, collect cuttings from the outside edges of the canopy.

Avoid suckers or watersprouts from near the base of grafted trees. Trees that are in poor condition usually lack suitable grafting material and are more difficult to successfully graft. Cuttings can be grafted in spring when the rootstock begins to break bud. The whip-and-tongue graft is standard and effective, though other types of grafting are suitable as well. It's advisable to dip the top end of the scion in a grafting sealant or other similar substance (glue, petroleum jelly, etc.) to prevent moisture loss. In arid regions, it is advisable to cover the newly grafted scion with a plastic bag to increase the humidity until the cutting begins to grow. Remove the bag slowly by first puncturing it when the cutting has leafed out and has begun to grow. Label the grafted trees with aluminum tags. Check in and care for your adopted apple on a regular basis. It may be the only of its kind left in the world.

"Be very careful about what you plant. Know why you're planting it. If it's just for the backyard, just for your own use, by all means plant varieties that have good adaptation to your particular environment. And I particularly emphasize the biotic environment. There are going to be insect and disease sources available to you and you need to circumvent these. I really don't want to see you out there having to spray once a week. Within the heirloom varieties, there probably are some very helpful resistances."

JIM CUMMINS,
CUMMINS NURSERY, NEW YORK





CULTURAL AND CULINARY RESTORATION OF APPLE DIVERSITY



APPLES ARE NOT LIKE PANDAS OR SPOTTED OWLS; they may also be endangered, but they are meant to be eaten or drunk! We will know when they have recovered when they are offered on the table or in the keg at apple tastings, community feasts and cider festivals, and when America has as many *routes des cidres* on the culinary map as it has wine trails.

Ben Watson and Tom Burford have laid out both goals and means to ensure the cultural and culinary restoration of apple diversity:

- » Celebrate the incredible diversity of taste and form that is represented by these classic American apples at tastings and cider festivals.
- » Introduce professional chefs and home cooks alike to the different uses for apples in the kitchen. Each apple has its own unique organoleptic qualities and is best suited for eating out of hand, for pies and pastries, for drying or preserving, or for applesauce, cider-making or other uses.
- » Educate consumers about the concept of locally grown fruit and the proposition (once well known, but now largely forgotten) that a wide range of local apples can be enjoyed from late summer through early spring, and that some varieties even improve after a few months of proper storage. Demonstrate that local apples need not be seen as a short-lived seasonal crop, but can contribute to a strong local farm-based economy.
- » Act as advocates for those small-scale, local and family orchards that still survive in the face of development pressures and low commodity prices due to foreign and domestic competition. These small-scale orchard keepers should adopt a diverse selection of regional varieties and help to reestablish them in local markets at a price that will support local growers and farm laborers.
- » Support the creation of new apple orchards and the restoration of old or neglected orchards wherever possible. Use as a model the Slow Food New York City chapter's Green Newtown Pippin Apple Project, which supplied apple scionwood to the Cummins Nursery for grafting and then donated 85 trees to New York state farms. Those farms are now selling Green Newtown Pippin apples—a variety that originated in New York City—to NYC farmers' market customers. Slow Food USA is promoting this "adopt a food" model to its local chapters around the country. Slow Food chapters and other volunteer groups can help bring place-based endangered foods back to the table by encouraging more producers to grow the food, chefs to serve it and retailers to sell it. An adopt-an-apple guide will soon be available for download from the Slow Food USA web site.
- » Promote the concepts and practices of organic orchard keeping as outlined by Michael Phillips, and encourage its early adoption by "hard cider" orchards which need not worry so much about the cosmetic appearance of their apples. At the same time, recognize that growers in some regions may find it difficult to immediately or completely abandon chemical applications. Encourage all growers to follow a low-spray or integrated pest management (IPM) program in their orchards and to experiment with new and innovative cultural techniques that in time may eliminate the need for even these limited chemical applications.
- » Encourage orchardists at all levels to learn the once commonplace skill of fruit tree grafting and to establish on-site nurseries for the propagation of their own trees as an economic benefit, for the maintenance and

"It's amazing that the public has become a lot more open to trying these older varieties. So, that's our hope to preserve them for the future because if you can sell them, people have incentive to grow them. If not, I don't know if there's enough private support just to support orchards that preserve old varieties that you're not able to do anything with."

BILL MORETZ, MORETZ'S MOUNTAIN ORCHARD, NORTH CAROLINA



In 2007, sales of hard cider sustained a 200 percent year-to-year growth and many new cideries have appeared on the East and West Coasts and in the Upper Great Lakes.

In addition to a half dozen nationally distributed brands of "draft" hard cider, regional, local, organic and exclusively heirloom-oriented cideries have proliferated. The Cider Days festival in north-central

Massachusetts is but one of several events that bring together the many cider-makers of the U.S. and Canada to promote the diversity of culinary uses of heirloom apples. While hard ciders are now following the path blazed by craft

dissemination of known varieties and for the general enhancement of orchard keeping.

- » Work with growers and historians in our communities to nominate local heirloom apples for boarding onto the Slow Food Ark of Taste, if they match Ark criteria. The proliferation of nurseries offering Ark apple varieties as trees or cuttings for sale will accelerate the volume production of fruit for the marketplace. More information about the Ark of Taste can be found at: <http://www.slowfoodusa.org/ark>.

Fortunately, the economic prospects for heirloom apples are, in many ways, better than they have been in over a century. While certain varieties well-suited to fresh eating or baking have begun to make a comeback, the growing appreciation for hard cider and apple wines and spirits is making room in the U.S. market for distinctive, tannin-rich, bittersweet and bittersharp apples for the first time in decades, thus extending variety recovery even further. Cider-making guides written by Ben Watson and Annie Proulx have encouraged greater experimentation with heirloom apple blends and discouraged use of commoditized apple juice concentrate. Since hard cider was commercially reintroduced to America in the early 1990s, there has been astonishing growth in artisanal cideries, their supporting orchards and in consumer demand. In 1987, fewer than 120,000 cases of hard cider were consumed in the U.S., but a decade later, hard cider consumption had risen 20-fold, to more than 2.7 million cases sold. By 2001, more than 4.6 million cases were sold and the next year, the 5 million mark was passed.

"I make a real mean apple pie and I've learned which varieties really lend themselves—you like some that stay firm, keep their slicing and others that sauce down around it so you've got this wonderful filling of apple sauce with apple slices."

DAN BUSSEY,
POMOLOGIST, CIDER-MAKER, AUTHOR,
ORCHARD-KEEPER, WISCONSIN

microbrewed beers and micro-distilled whiskies and vodkas, there are also more modest markets opening up for apple wine, spiced sweet ciders and carbonated apple beverages.

These are not the only trends favoring a renaissance for heirloom apples in many regions of North America. Interest in organic, artisanal, hand-crafted and place-based heritage foods has never been higher. Sales of organic fruits, for example, have been growing by an estimated 12 percent per year! Heirloom apple growers can build on these interests. Chefs are willing to help them match the right apple with a specific use for which it is unsurpassed. For years, orchard keepers of diverse apples didn't get much respect. Perhaps their time has come again.



Above: A cider and cheese tasting in Madison, WI
Photo by Mark Dohm

Top: An apple tree next to a house
Photo by Gary Nabhan

Opposite page: Heirloom apple and cider tasting in Chicago, IL
Photo by Mark Dohm



Photo by Gary Nabhan

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Photo by Mark Dohm

APPENDIX I. REGIONAL REGIS-TREE NOMINATION FORM

TO HONOR OUR HERITAGE OF USEFUL PERENNIAL PLANTS

Name of Site/Feature: _____

Date Submitted: _____

Photo submitted? _____ Map Submitted? _____ Articles Attached? _____

Perennial Species Present: _____

Nominator Name: _____ Phone: _____

Address: _____

City/State/Zip: _____

Visual Description of Nominated Heirloom(s): _____

Location of Heirloom (include map & CISED UTMs): _____

Ownership of Land where Heirloom is Located: _____

Describe how the Plant(s) have been (or could be) utilized: _____

List Estimated Age of the Plant/Orchard: _____

Are there any oral or written histories that include mention of this Heirloom? If yes, please include or describe them on a separate sheet attached to this form. _____

Is there currently public access to the Heirloom? If no, would the landowner be willing to provide for public access? _____

Describe the access or lack of access: _____

Would the owner be willing to share propagation materials with others? _____

List the reasons your nomination should be included in the Southwest Regis-Tree of Useful Perennials and Historic Orchards: _____

Return form to: [contact information for local coordinator or coordinating body]



FOR MORE INFORMATION

RAFT Alliance

<http://www.raftalliance.org>

Cary Paul Nabhan

<http://www.garynabhan.com>

Southwest Regis-Tree, Native Seeds/SEARCH

<http://www.nativeseeds.org/regis-tree>

Slow Food USA

<http://www.slowfoodusa.org>